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4th International Conference on New Business Models

New Business Models for Sustainable Entrepreneurship, Innovation, and Transformation

Full Conference Proceedings

1-3 July 2019 | ESCP Europe Berlin | Germany

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Colophon

Edited by Florian Lüdeke-Freund and Tobias Froese, with support from Claire Eckmann and Harris Azhar
Chair for Corporate Sustainability, ESCP Europe Business School, Berlin

Edited in June 2019

We thank the numerous authors and reviewers without whom these proceedings would not have been possible!

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Reference

Lüdeke-Freund, F. & Froese, T. (2019): Proceedings of the 4th International Conference on New Business Models: New Business Models for Sustainable Entrepreneurship, Innovation, and Transformation, Berlin, Germany, 1-3 July 2019. Berlin: ESCP Europe.

ISBN 978-3-96705-001-1

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Words of Welcome

Dear Friends and Fellows,
Dear Business Model Enthusiasts,

It is a great honour to welcome you to a (most likely) sunny Berlin and the 4th International Conference on New Business Models, which is dedicated to "New Business Models for Sustainable Entrepreneurship, Innovation, and Transformation"!

Our aim is to motivate vivid discussions on new business models with the potential to contribute to a sustainable development of the natural environment and mankind. Corresponding business models and business activities require entrepreneurs and innovations that foster transitions to future-fit societies, building on values such as responsibility and justice. And this endeavour, in turn, requires much more progress in inter-, multi-, and transdisciplinary research.

Therefore, we aim at creating new connections between entrepreneurship, innovation, and transition studies to find new ways to better understand and tackle the obvious ecological and socio-economic crises that current and following generations are facing. Even though stories about the world's doom and gloom are omnipresent, we should never lose our faith - our faith in mankind and our faith in ourselves as researchers, business women, consumers, parents, and friends.

Now, more than ever, it is important to connect, communicate, argue, share and combine our individual and collective knowledge and skills. Therefore, our hope is that NBM@Berlin 2019 will be much more than 100 academic presentations from 35 countries – thanks a lot for submitting and reviewing so many papers!

We hope that it will be a real meeting that motivates real conversations between friends and fellows and that furthers the development of a worldwide community of experts and enthusiasts dealing with the various intersections of business and sustainability studies.

Berlin, 10th June 2019

Prof. Dr. Florian Lüdeke-Freund
NBM@Berlin 2019 Conference Chair

Instead of a Prologue

FIVE VIEWS INTO THE FUTURE OF SUSTAINABLE BUSINESS MODEL RESEARCH

Q&A with Nancy Bocken[1], Henning Breuer[2], Lorenzo Massa[3], Christian Nielsen[4] and Stefan Schaltegger[5]

[1] Professor in Sustainable Business Management and Practice at Lund University, IIIEE in Sweden
[2] Founder of UXBerlin – Innovation Consulting (www.uxberlin.com), and Professor for Business and Media Psychology at the University of Applied Sciences for Media, Communication and Business in Berlin, Germany
[3] Adjunct Professor at University of Bologna, Department of Management, Italy
[4] Professor at Aalborg University, Denmark, Co-Founding-Editor of the Journal of Business Models, Co-Organiser of the Business Model Conference
[5] Professor for Sustainability Management, Head of the Centre for Sustainability Management (CSM) and the MBA Sustainability Management at Leuphana University Lüneburg, Germany

QUESTION 1:
WHAT DO YOU THINK IS THE MOST IMPORTANT PROGRESS THAT HAS BEEN MADE AT THE INTERSECTION OF BUSINESS MODEL AND SUSTAINABILITY RESEARCH IN THE PAST DECADE?

Nancy Bocken
"First of all, we made advancements by starting to conceptualize what a "business model for sustainability" is as opposed to a more traditional profit-oriented model. Second, by focusing on "business model for sustainability" or "sustainable business models", we were able to move beyond the more limited focus on Product Service Systems or PSS and separate research agendas on social and green business models, towards a broader unified agenda for sustainable business models.
Third, the latest research focuses more on designing and experimenting with sustainable business models, and tools and methods, which allows us to bring back notions from earlier research on PSS, which suggested the need to consciously 'design' better business models to achieve the highest environmental (and social) impacts, making the circle round again.
Finally, talking about circles, new topics such as circular economy and sharing economy should keep sustainability researchers on their toes to identify and help pursue the business models with the greatest environmental and societal gains."

Henning Breuer
"The intersection as such has received much more attention, and develops from a niche into a mainstream topic even for innovation management scholars and practitioners. Numerous case studies and analytical works allowed us to demonstrate different business cases for sustainability, to derive reusable design patterns to create sustainable business, and to critically review the economic, social and environmental impact of business models. They also helped us to better understand, how shared values and normative management play a pivotal role in the design and development of sustainable business models."

Lorenzo Massa
"I am biased here, clearly. In my view it has to do with two related things.
On the one hand, the fact that the sustainability lens applied to business models has resulted, among other things, in challenging the traditional view on business models, for example in relationship to one the central parts of business model analysis, which is understanding value creation (also delivery and capture). This has resulted, among other things, in tools and other artefacts that come as a very interesting complement to traditional ones, and stimulate us to embrace the ability to think contingently and ask "what type of perspective on the business model is useful under what circumstances?" I am thinking here about tools such as the value mapping of Nancy Bocken, or the Triple Layered Business Model by Joice - I think there is tremendous value in having a plurality of perspectives - even if the meaning and significance of what I refer to as "mental ambidexterity in (strategic) thinking" may not be sufficiently discussed and perhaps even recognized.
On the other hand, the business model lens has somehow started to contaminate the sustainability discussion with a design twist - and moved it away from the "more normal" sustainability discussion ingrained in the normative (as in many articles that appeared in Journal of Business Ethics) and in organisation theory - as with articles that appeared in AMR or AMJ - authored by leading figures such as Tima Bansal, Rutt Aguilera, Aragon-Correa, Shangai Sharma, etc. The business model holds the potential to help sustainability research embrace more convincingly a third paradigm in research (beyond the normative and org theory traditions), which is that one of design sciences, or the *mode 2 type of knowledge production*, to use the words of Van Aken."

Christian Nielsen
"The notion of business models, and along with it a focus on the creation of value, capture of value and sharing of value, has been a major influence in freeing sustainability from the ties of merely being a strategy project leading to a sustainability report. The notion of value propositions has been an important factor in refocusing management attention from outputs (profits) to outcomes (impact). Further, while the stakeholder perspective has had a close connection to sustainable thinking, business model research has contributed by highlighting the

importance of thinking in terms of strategic partnerships in value creation and platform-based business models."

Stefan Schaltegger
"Cross-fertilization happens in both directions: First, business models have been introduced and established as a new lens and fundamental approach to better integrate sustainability considerations in corporate strategy, the organization and its up- and downstream activities. Second, corporate sustainability research has inspired business model research to consider a broader range of stakeholders as well as more comprehensive management approaches and perspectives."

QUESTION 2:
WHAT KIND OF RESEARCH OPPORTUNITIES DO YOU SEE FOR THE NEXT DECADE, IN TERMS OF THE PHENOMENA WE STUDY, THE THEORIES AND METHODS WE APPLY?

Nancy Bocken
"There are numerous possible directions, some with a more theoretical orientation, and others more focused on stimulating the urgent need for the uptake of sustainable business models in practice, and yet others clearly blending theoretical and practical contributions. Among those, I highlight a few gaps and opportunities:

- The need for cumulative theoretical development on sustainable business models. This will help embed the sustainable business model discourse into mainstream management journals.
- Understand the role of business (models) in sustainability transitions.
- Understanding and guiding processes for sustainable business model innovation, through approaches such as ethnography and more action-oriented approaches in order to close the idea-action gap for sustainability.
- Understanding the real impact of sustainable business models and how they can lead to solutions for sustainable production as well as more thorny topics such as sustainable consumption (through concepts such as 'degrowth' or 'sufficiency' as part of business models)."

Henning Breuer
"Empirical research and theories on impact assessment (including measuring current impact and estimating future impact of emerging business models) are crucial to make our work even more relevant. In order to support impact and innovation management, we also need more easily accessible tools and methods. We have a bunch of ideation and mapping tools, but we need advanced methods across the whole innovation to foster awareness, to generate and convey our insights and to develop and scale sustainable business models. In a European project we are already working on gamified methods to facilitate sustainability-oriented innovation and entrepreneurship."
Lorenzo Massa

"I think the answer to this question is already implicitly contained in the answer above. Overall this will have to do with opportunities to bring research in sustainability closer to the idea of design science research - things such as action research will also fit this picture. A main question remains onto whether dominant views into what constitutes production of scientific knowledge - for example the possibility of an over-obsession with contribution to theory in today's dominant paradigmatic view - will create a natural antibody to neutralise efforts of this type. I think contributions that have appeared in, for example, the Journal of Cleaner Production reveal some openness to the possibility that my concern is misplaced and that a move towards design science paradigms is already happening. My perspective is that this shift is a good thing. Not everybody would agree."

Christian Nielsen

"I am hoping to see more critical studies to help us understand under which circumstances sustainability research and business models can interact, but also to identify areas where they clash; for example when businesses are bound by return-on-equity goals or other corporate "performative" objectives that keep them afloat. Along the same lines, qualitative studies can help us understanding barriers to, and mechanisms in, creating and developing sustainable business models, as well as the supporting decisions behind them. It is my hope that future research will lift the notion of business models from circular and shared-economy type business model configurations into providing solutions to the production of waste, but also to informing the greater problem of our throw-away culture and thus also to strengthen the ties to the larger scope of the 17 UN SDGs."

Stefan Schaltegger

"A lot of conceptual and theoretical advances have been made. Now more empirical research on transformational processes and effects are needed dealing with questions such as: How are conventional business models transformed to sustainable business models, in corporate practice and what are the challenges and benefits? Do, and if yes, how do companies with more sustainable business models contribute to market transformations?"

Conference Programme

1st July 2019

	Tangoloft
5:00 pm - 6:00 pm	Welcome Reception Location: Tangoloft Berlin, Gerichtstraße 23, 13347 Berlin, www.tangoloft-berlin.de
6:00 pm - 7.30 pm	Dive-in to Values-Based Innovation Management Location: Tangoloft Berlin Introductory Note: Dive-In to Values-Based Innovation Management Henning Breuer, UX Berlin Innovation Consulting, University of Applied Sciences HMKW Fishbowl Discussion Panelists: Henning Breuer, UX Berlin Innovation Consulting, University of Applied Sciences HMKW Philip Baumann, Ecosia, Roman Meier-Andrae TÜV Nord Mobilität
7.30 pm - 9:00 pm	Get Together Location: Tangoloft Berlin

Track	Session Title
Track 1	Business models for a circular economy
Track 2	New business models, sustainable development, and corporate strategic management
Track 3	Social Entrepreneurship as a transformative force towards sustainability
Track 4	Circular communication in a circular economy: how social media communication shapes sustainable business models
Track 5	New business models for sustainable entrepreneurship
Track 6	Open Innovation Enabled by Emerging Technologies: What are the Implications for New Business Models?
Track 7	New business models for sustainability transition
Track 8	Insights on business models from young academics
Track 9	Sustainable business models for a sharing economy
Track 10	Practitioner Session (1): The Smart Business Modeler – Using Business Model Patterns (R. Bohnsack) Practitioner Session (2): Climbing Mount Thriveability (R. Thurm)

Conference Programme

2nd July 2019

	Lecture Hall 1 (K18)	Lecture Hall 2 (D-176)	Lecture Hall 3 (D-275)	Lecture Hall 5 (D-014)	Seminar Room (D-008)	Seminar Room (D-009)	Seminar Room (D-011)	Forum
8:15 am - 8:45 am	Registration & Coffee Location: ESCP Europe Berlin Campus, Heubnerweg 8-10, 14059 Berlin							
8:45 am - 9:00 am	Opening (Andreas Kaplan; Florian Lüdeke-Freund)							
9:00 am - 10:30 am	Keynotes (Lorenzo Massa; Stefan Schaltegger)							
10:30 am - 10:45 am								Coffee break
10:45 am - 12:15 pm		Track 6 (1)			Track 1 (1)	Track 5 (1)	Track 2 (1)	
12:15 pm - 1:15 pm								Lunch
1:15 pm - 2:45 pm		Track 6 (2)		Track 3 (1)	Track 1 (2)	Track 5 (2)	Track 2 (2)	
2:45 pm - 3:15 pm								Coffee break
3:15 pm - 4:45 pm		Track 7 (1)	Track 8 (1)	Track 3 (2)	Track 10 (1)	Track 4		
5:00 pm - 6:15 pm	ABC Panel Discussion							
6:15 pm - 6:45 pm	Transition to Boat (meet in front of ESCP Europe and walk to Caprivibrücke)							
6:45 pm - 7:45 pm	Boat Tour (starts at Caprivibrücke, ends at Märkisches Ufer/Fischerinsel)							
8:00 pm - open end	Conference Dinner, Umspannerk Ost restaurant							

Conference Programme

3rd July 2019

	Lecture Hall 1 (K18)	Lecture Hall 2 (D-176)	Lecture Hall 3 (D-275)	Lecture Hall 5 (D-014)	Seminar Room (D-008)	Seminar Room (D-009)	Seminar Room (D-011)	Forum
8:15 am - 9:00 am	Registration & Coffee Location: ESCP Europe Berlin Campus, Heubnerweg 8-10, 14059 Berlin							
9:00 am - 10:30 am	Keynote (Nancy Bocken) + Editors Panel							
10:30 am - 10:45 am								Coffee break
10:45 am - 12:15 pm		Track 7 (2)		Track 3 (3)	Track 1 (3)	Track 5 (3)		
12:15 pm - 1:15 pm								Lunch
1:15 pm - 2:45 pm		Track 7 (3)	Track 8 (2)		Track 1 (4)	Track 5 (4)	Track 2 (3)	
2:45 pm - 3:15 pm								Coffee break
3:15 pm - 4:45 pm		Track 10 (2)	Track 8 (3)		Track 9		Track 2 (4)	
5:00 pm - 6:00 pm	Conference Closing & Outlook into NBM 2020 (Florian Lüdeke-Freund, Jan Jonker)							

Introductory Note & Fishbowl Discussion

Dive-In to Values-Based Innovation Management

Values, i.e. notions of the desirable, guide individuals as well as organisations into our common future. If they are appropriately understood and applied, values provide a powerful lever for innovation management. In particular, business model Innovation cannot be well understood, designed, or managed without recurring to values and normative orientations of the stakeholders being involved. Pro-environmental companies such as Ecosia exemplify the potentials of values-based business development, but also established corporations attending to customer values learned how to manage innovation based on what we care about This, we will learn from and discuss with our guests: Philip Baumann of Ecosia, Roman Meier-Andrae of TÜV Nord Mobility, and Prof. Dr. Henning Breuer.

Speaker & Facilitator

PROF. DR. HENNING BREUER is founder of UXBerlin – Innovation Consulting (www.uxberlin.com), and professor for business and media psychology at the University of Applied Sciences for Media, Communication and Business in Berlin, Germany. Since 2001, he has provided strategic consulting on future scenarios, new business models and ethnographic insights for large companies, young start-ups and public organisations. As visiting professor and researcher he worked at Waseda University (Tokyo), the University of Chile (Santiago), and the University of Applied Sciences in Potsdam. His recent textbook, together with Florian Lüdeke-Freund, is on Values-Based Innovation Management (Palgrave, 2017).

Participants

PHILIP BAUMANN is Head of Product at Ecosia, the search engine that plants trees. Please click here to find out more: www.linkedin.com/in/philipbaumann/

ROMAN MEIER-ANDRAE is Head of Corporate IT & Digitalisation as well as a Member of the Executive Board at TÜV Nord Mobilität. Please click here to find out more: www.linkedin.com/in/romanma/

Date and place

July 1st, 2019, 6pm to 7:30 pm, Tangoloft, Gerichtstraße 23, 13347 Berlin

Keynotes

Cognition in Business Model Innovation research and practice

DR. LORENZO MASSA

Recent development in business model (BM) research suggest that a BM may resemble what students of complexity have referred to as a complex system – a system made of numerous parts which are linked by non-obvious interdependencies. The notion of complexity and of a complex system, I argue, have important implications for several areas related to business models and business models innovation, including modelling and visual representation, cognition, communication or measurement. And yet, the received business model research on this topic is scant. I aim at offering what in my view are some of the important insights we can gain from more convincingly exploring the meaning and significance of complexity for business model research and practice.

Lorenzo Massa is adjunct professor at University of Bologna, department of Management. He has been scientist at the College du Management (CDM – CSI and GERG), visiting scholar at the Wharton School (UPENN), visiting researcher at MIT Sloan School of Management, and Assistant professor at Vienna University of Economics (WU). He teaches in Executive MBA, MBA and Master programs. He sits on the board of EPFL based Innovation Forum Lausanne (IFL) and he is expert mentor for Mass Challenge Switzerland.

His research lies at the intersection between strategy, innovation management and sustainability and has been published on outlets such as the Academy of Management Annals, the Journal of Management and the Oxford Handbook of Innovation Management. Massa holds graduate degrees with distinctions in Mechanical Engineering from the Dublin Institute of Technology (B.Eng.) and the University of Genoa (M.Sc. Eng.) and a Ph.D. in Management from IESE Business School.

Keynotes

Sustainability transformation and new business models: The role of sustainable entrepreneurs, incremental and radical innovations

PROF. DR. DR. h.c. STEFAN SCHALTEGGER

A sustainability transition of the economy and society requires sustainability transformations of the core business of companies, their products, supply chains, and thus their business models. Extant research literature has furthermore identified sustainable entrepreneurs as key actors initiating and managing sustainability transformations at different levels, such as the organizational, supply chain, customer, competitor and societal level. While the existing sustainable entrepreneurship literature has addressed the general ambition and role of entrepreneurs for sustainability transformations and while the business model literature has emphasized the role of business model design and transformation for corporate sustainability, the links between the two have not been explored, so far. This presentation raises the question how the design of a sustainable business model and different transformational processes and impacts managed by a company are or could be linked.

Stefan Schaltegger, PhD, is professor for sustainability management, head of the Centre for Sustainability Management (CSM) and the MBA programme at Leuphana University Lüneburg, Germany. The focus of his more than 450 publications is on sustainable entrepreneurship, practices and methods of corporate sustainability, including business models, stakeholder theory, and sustainability performance measurement, accounting and management. Stefan Schaltegger is a member of the editorial board of sixteen international scientific journals and member of the jury of the German Sustainability Award. He is a methods partner of the Next Economy Award, an award for sustainable start-ups, chairman of the Steering Committee of the European Environmental Management Accounting Network (EMAN), and has served as member of the steering committees and boards of various companies and research programmes of the German Federal Ministry for Science and Education and the Swiss National Science Foundation.

Keynotes

Circular business model experiments – Exploration of the role of business experiments in wider societal transitions

PROF. DR. NANCY BOCKEN

This talk will discuss concepts of business model experimentation and the 'ecology of business models' notion to explore the potential role of business in driving the wider Circular Economy transition. Business model experimentation for a circular economy is about the much needed (re-)design of business models that slow, close and narrow resource loops. Such experimentation is necessary to (1) set in motion transitions within organizations, and, (2) test which new business models are most suitable. To assess the real impact of new business models, the 'ecologies of business models' approach analyses the symbiotic and competitive relations between new and existing business models. For example, to what extent do clothing take-back services reduce the environmental impact of consumption, or worsen it via legitimizing a growing consumerism culture?

Nancy Bocken is Professor in Sustainable Business Management and Practice at Lund University, IIIEE in Sweden. She focuses on different approaches for sustainable business innovation such as experimentation and business model innovation. She is also Associate Professor at TU Delft, Industrial Design Engineering and Fellow at the University of Cambridge Institute for Sustainability Leadership, and Visiting professor at Lappeenranta University of Technology and Maastricht University. She co-founded HOMIE who are involved in 'pay per use' business models, starting with washing machines, to drive sustainable consumption and 'circularity'.

ABC Panel – Academic / Business / Consulting

RETHINKING STRATEGIC MANAGEMENT: CAN BUSINESS LEAD THE WAY TO A SUSTAINABLE FUTURE?

In the last thirty years, the link of strategy and sustainability has come a long way both in business practice and academia. However, in spite of many technical advances, some political progress, and the efforts by thousands of corporate and NGO organizations during recent decades, sustainable conduct is not reflected in the current state of our socio-ecological systems. Natural scientists and global risk assessments continue to express great urgency for cross-sectoral and transformative collaborative action toward positive systems impact. But who will take the lead for this vital journey? Major investment firms call on "business to lead, not just live, with purpose". This hands-on "ABC" (Academic, Business, Consulting) panel seeks to answer the question, "CAN business lead the way to a sustainable future?" Does the corporate sector have sufficient comprehension and concern of the magnitude and pace of disruptive socio-ecological developments in its operating environment? Does it have sufficient actionable knowledge about how to make business sense of sustainability at this time in the 21st century? What else might be required to take the lead? Management researchers, business representatives and consultants with extensive experience will try to answer these questions from the perspective of their professional and institutional contexts. Impetus and foundation for this panel has been our collaboration in development of the book 'Rethinking Strategic Management. Sustainable Strategizing for Positive Impact' (in-press, 2019) from Springer. Additional perspectives and details from a dozen other authors are also included in this publication. With this panel we want to build on and continue this discussion.

Panel Chair

PROF. DR. THOMAS WUNDER spent the early part of his career as a strategy consultant and strategy practitioner for Horváth & Partners Management Consultants in both the EU and USA. He was associated with the Balanced Scorecard Collaborative (BSCol) in Boston and an affiliate of the North Highland Company in Atlanta, where he helped to build Cordence Worldwide, a large-scale global alliance of local consulting firms with over 2.800 experts in more than 65 offices today. In all these years, Thomas supported executive leadership teams of MNCs at various organizational levels. In 2010, Thomas transitioned to academia as a full professor of Strategic Management at the Neu-Ulm University of Applied Sciences in Bavaria, Germany, where he is leading the Master of Advanced Management program. Since then he has dedicated his research, writing and teaching to the integration of corporate strategy with sustainability, which is summarized in

Essentials of Strategic Management. Effective Formulation and Execution of Strategy in 2016. He also edited a practitioner-oriented German book on CSR und Strategic Management (2017) as well as Rethinking Strategic Management. Sustainable Strategizing for Positive Impact (2019) for Springer.

Panelists

PETRA KUENKEL is a full Member of the International Club of Rome and the Executive Director of the Collective Leadership Institute, a Germany and South Africa based social enterprise building collaboration competency for transformative change. As a seasoned systems scientist, visionary author and expert in complex multi-stakeholder settings she promotes systems transformations by scaling-up collective stewardship skills for decision-makers from corporations, public sector and civil society. With her educational background in change management, organizational psychology and political science she has profound international experiences in corporate change, development cooperation and policy implementation. She is a leading strategic advisor to pioneering international initiatives that tackle sustainability challenges. Based on successful transformation processes, she developed the dialogic change methodology and the Collective Leadership Compass, a guiding tool for navigating change in complex multi-actor settings. Kuenkel's ground-breaking publication The Art of Leading Collectively received international attention; her writings have appeared in numerous professional journals as well as the Guardian and Huffington Post. For more information, please visit www.collectiveleadership.com or www.clubofrome.org.

ALEXANDER MEYER ZUM FELDE is a principal in the Hamburg office of The Boston Consulting Group. He is BCG's expert principal on sustainability. His fields of expertise include sustainability strategy, circular economy, sustainable investing and climate change. He has supported clients across the world and in every major industry concerning sustainability opportunities. Moreover, he is responsible to manage BCG's external relations with Sustainability Partners and Academia concerning sustainability topics.

RUEDIGER A. ROEHRIG is Managing Partner of SGA, leads The Natural Step Germany and is international council member. SGA, a certified B Corp and European network organization, advocates context-driven, purposeful innovation leadership in business, by practicing holistic approaches to people, operations and strategy development. As the representative of the non-profit The Natural Step in Germany, SGA collaborates with 10 other offices around the world, to advocate The Natural Step Framework for Strategic Sustainable Development (FSSD). Ruediger looks back at 30 years of professional experience in industries such as aeronautics, automotive, machine and plant manufacturing, and renewable energies, in almost all strategic and operative functions, working at, amongst

others, Siemens Automotive and Roland Berger Strategy Consultants. Engaging with SGA clients as entrepreneur, interim manager, consultant, trainer and coach, he combines strategic thinking with hands-on operational experience and sound leadership experience. Ruediger has a degree in aerospace engineering (Dipl.-Ing.) of the University of the German Armed Forces, Munich.

GEANNE VAN ARKEL is Head of Sustainable Development for Interface in Europe and holds a master's degree in Biomimicry from the Arizona State University. She focuses on sustainable development within and outside the company Interface. She links individuals and companies to assist each other on the path toward sustainable innovation. The approach she takes is developing regenerative, inclusive, circular new business models and partnerships by learning from natures. Design with purpose, passion, full product transparency and open communication are the fundamentals of inspiring others in discovering the opportunities of sustainability. According to Geanne, creativity, collaboration and sharing knowledge are crucial for accelerating the required system change towards an inclusive circular bio-based low carbon economy in which the Sustainable Development Goals are achieved by 2030.

PROF. DR. DR. h.c. STEFAN SCHALTEGGER is professor for sustainability management, head of the Centre for Sustainability Management (CSM) and the MBA programme at Leuphana University Lüneburg, Germany. The focus of his more than 450 publications is on sustainable entrepreneurship, practices and methods of corporate sustainability, including business models, stakeholder theory, and sustainability performance measurement, accounting and management.

Journal Panel

Publishing in scientific journals is important for every researcher, particularly for early-stage researchers who have to publish in high-quality journals to make a career in academia. But sometimes it is not an easy task to identify the optimal journal for articles dealing with business model topics. This gets even more challenging when these articles deal with sustainability issues, as this brings together two domains: business model and sustainability research.

The experts on our panel will discuss such challenges from an editor's perspective to offer a 'behind-the-scenes' perspective on what happens when journals have to deal with topics that are rather new, less 'mainstream', and maybe beyond their traditional disciplinary boundaries.

Panelists

DROR ETZION is an Associate Professor of strategy and organizations at the Desautels Faculty of Management, and an associate member of the McGill School of the Environment. He is currently a Senior Editor at Organization Studies. Dror's research focuses on "grand challenges": the unyielding, intractable problems that characterize the Anthropocene. His work suggests that managing for sustainability through local, open, emergent initiatives increases the recruitment of diverse stakeholders, fosters creativity, and yields impactful outcomes. In other work he is examining business approaches to managing the energy-water nexus. His research has been published in Academy of Management Review, Journal of Management, Nature Sustainability, Organization Science, Organization Studies, Strategic Management Journal and other outlets.

MORTEN LUND is Associate Professor and Center Director at Business Model Design Center. Morten is an experienced entrepreneur and executive manager, who founded, consulted, and invested in multiple ventures with disruptive business models. Morten co-founded the Business Design Center He has a combined academic, pragmatic, and creative profile, leveraging the link between research and industry. His educational background is an M.Sc. in Business Economics, with specialization in organization and business strategy. Further, he holds a Ph.D. degree in business models from the Technical Faculty at Aalborg University, Denmark. Morten is currently most involved in management, but teaches in business models on both master and bachelor level at Aalborg University and Copenhagen Business School.

YULIYA SNIHUR is an Associate Professor of Strategy, Entrepreneurship, and Innovation at the Toulouse Business School, France. Yuliya teaches and studies strategy-formation processes in new ventures and the evolution of strategic management in existing firms based on the analysis of firms' business models. She

is researching the role of time and language in strategy-making by applying theories of organizational imprinting, complexity, and cognitive framing. To this end, she uses hand-collected interview data, fieldwork, and longitudinal datasets to build theory. Yuliya has published in such journals as Academy of Management Journal, Journal of Management Studies, Long Range Planning, and Strategic Entrepreneurship Journal. Yuliya was the finalist for the 2018 Academy of Management Organization and Management Theory division's Best Entrepreneurship Paper Award and has received the 2014 Heizer Dissertation Award by the Academy of Management Entrepreneurship division. She serves as Associate Editor at Long Range Planning. Yuliya received her PhD in management from the IESE Business School (Barcelona, Spain), prior to which she worked in corporate finance.

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Conference Tracks

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Facilitators: Ralph Thurm (workshop 1), René Bohnsack (workshop 2)

TRACK I

BUSINESS MODELS FOR A CIRCULAR ECONOMY

Track I: Business Models For A Circular Economy

Chairs: Niels Faber[1], Jan Jonker[2], and Abhishek Agarwal[3]

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Business models based on linear thinking create a pattern (take, make, dispose) where the extraction of resources, production, and use lead to unwanted side effects seen as negative externalities such as waste, pollution or social exclusion. The underlying concept of transformative value-creation based on so-called double-obsolescence is counterproductive to address nowadays-pressing societal and environmental challenges. The Circular Economy (CE) is one of the perspectives that might offer innovative and radical solutions at the system level to tackle these wicked problems. Strategically speaking, it revolves around organizing value preservation, restoration, and revitalization. The transition to a circular economy requires a rethinking of supply chains into value cycles, forming the building blocks of a system transition. The circular economy aims to integrate externalities giving way to a new generation of business models. These are based on organizing closed loops and driven by principles such as design for circularity, decomposability, and strategies to optimize the use of functionalities. Given this rather one-sided material perspective we explicitly add to this view the need to incorporate social inclusiveness. Recent research shows that at present, an estimated 9% of our economy can be categorized as circular.

In this session, which is the fourth in a row with the same subject after NBM@Toulouse (2016), NBM@Graz (2017) and NBM@Sofia (2018), we like to explore once more the consequences of this thinking on the creation and adaptation of business models for the circular economy. In particular, we focus on three subjects, namely (1) organizing closed loops (leading to a coherent typology), (2) strategies that enhance the use of functionality and (3) the promoting social inclusiveness.

A Business Model Typology for Valorising Agro-waste and By-products

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This project NoAW (http://noaw2020.eu/) has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement No 688338.

Extended abstract

Circular economy is a more recent economic model that aims to reconcile economic growth with the preservation of the environment. It is based on the insight that our natural resources are limited and that with a population estimated to reach 9 billion people in 2050, the current linear 'take-make-dispose' model is no longer sustainable (EMF 2013). New and sustainable business models are needed for a transition to a circular economy. One potential business approach consists of creating value from waste via technological-oriented business model innovations (Bocken et al. 2014).

Our research aim is to identify and characterise different types of business models that valorise agricultural waste and by-products via cascading or closing loops. To our knowledge, no coherent circular business model typology has been developed so far for the agricultural sector.

Valorising agro-waste and by-products is challenging due to the heterogeneity, seasonality and perishability of resources, the changes in volumes and quality over

time and regions, and the variety of conversion steps and end-uses sectors. Moreover, there are different valorisation opportunities in alternative sectors leading to new products and applications, with a lower or higher value, as outlined in the value pyramid for biomass valorisation (Rood et al. 2017). From a business perspective, valorising agro-waste requires a new vision of customer-supplier relationships, new forms of organization and new marketing strategies, at the crossroads of various value chains.

In general, the business model still represents 'a slippery construct to study' (Casadesus-Masanell and Zhu 2013), as there is neither consensus on the definition nor on the conceptualisation, and a lack of a common theoretical framework (Zott et al. 2011, Spieth et al. 2014). However, advancing business models concepts and theory is important for describing and classifying businesses, for scientific investigation, and/or to develop practical recommendations and facilitate decision-making for managers (Baden-Fuller and Morgan 2010; Taran and Boer 2015). Until now, several propositions have been made of how to categorize sustainable or circular business models (Lewandowski, 2016). The ReSOLVE framework proposed by the Ellen MacArthur Foundation is based on the different strategies 'regenerate, share, optimise, loop, virtualize, exchange' (EMF 2013). Bocken et al. (2014) divide sustainable business models into eight archetypes which are classified in higher order groupings and describe the main type of business model innovation: technological, social or organisational. Stubbs and Cocklin (2008) are tempting to develop an ideal type of a sustainability oriented business model. According to Fielt (2013), a characterisation of each business model type should include specific classification criteria (e.g. level of innovation) and business model framework elements, such as customer, value proposition, organisational structure, economics and/or other value dimensions.

For our aim, we have selected six cases from Europe (out of 33 international cases studied in the H2020 project NOAW) that convert agricultural by-products into valuable products via a circular economy (cascading or closing loops) approach. These six cases have been selected because they represent well six different types of circular business models for valorising agro-waste and by-products and because they belong to one region, however with different local contexts (which will allow us to further study these contexts but under similar conditions). Qualitative semi-structured interviews and on-site visits have been performed for these cases except for one that is largely documented in online articles and academic literature (Schieb et al. 2014, Thénot and Honorine, 2017). All cases have been analysed according to the type of initiative, resources and transformation

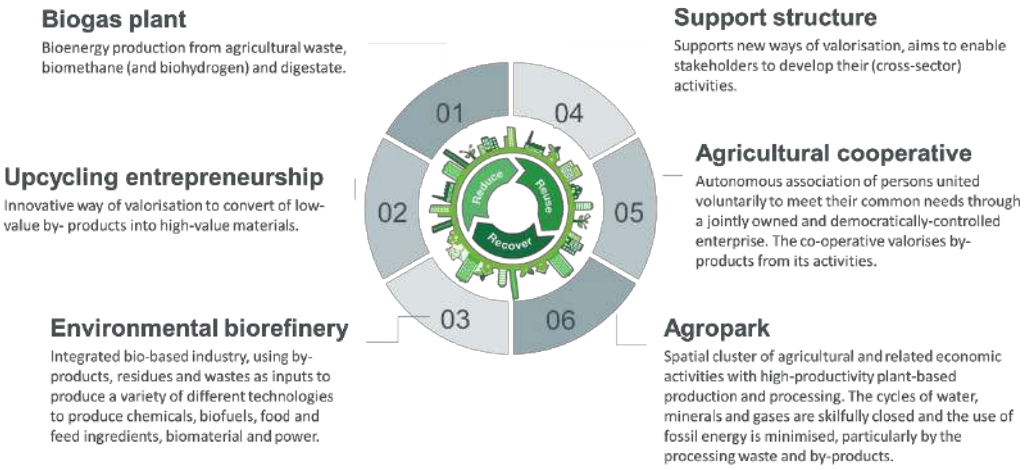
processes, value propositions, key partners, customers, strategic approaches and type of business model innovation (table 1).

Table 1: Cases analysed

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6
Type of initiative	Farmer with a biogas plant	University spin-off	Eco-industrial cluster	Local cluster of stakeholders	Union of wine cooperatives	Agribusiness park
Resources and transformation process	Pig manure & vegetables; anaerobic digestion	Cow manure & wine; anaerobic digestion	Cereals and sugar cane by-products; full scale biorefinery	Organic urban food and agro-waste; anaerobic digestion	By-products from wine; extraction process	Combined heat electricity and water recirculation systems
Value proposition	Biogas, electricity, fertiliser	Electricity, fertilisers, PHA for bio-materials	Plant proteins	Biogas, network	Compost, ingredients for food & pharma industries	Heat, electricity
Key partners	Local farmers	Cooperative, two other universities	Agrofood enterprises, research	Local authorities, enterprises and research	Cooperatives and research	Vegetable producers (greenhouses) and traders
Customers	Public suppliers and private households (electricity), wholesaler (fertiliser)	Feed-in of electricity	Enterprises	Local enterprises	Enterprises	Data-centres use electricity and produce heat for greenhouses
Strategic approach	Enlarge product portfolio for mixed market sectors	Innovation, upscaling, pilot-scale demonstration, consultancy	New markets for large volumes of by-products	Support for networking, niche strategy (organic)	Innovation, mixed market sectors	Networking, economies of scale
Innovation type	Technical	Technical	Organisational, technical	Social, organisational	Technical	Organisational

The cases differ in their way of value creation (from lower to higher value) and/or in their organisational structure as shown in figure 1: (1) biogas plant, (2) upcycling entrepreneurship, (3) environmental biorefinery, (4) support structure, (5) agricultural cooperative and (6) agropark.

Figure 1: Typology of circular business models for valorising agro-waste and by-products



The typology shows the diversity but also a complementarity of circular business models for valorising agro-waste and by-products. The identification of various value creation mechanisms and types of valorisation pathways highlights the importance of exploiting biomass firstly for higher-added-value products, before using it as an energy source. Cascading biomass use plays a key role in the development of the circular economy. The typology is useful because it classifies best practices serving as reference for other businesses, while visualising also evolutions in the typology. The classification also helps investors and resource or equipment suppliers understand the positioning and long-term perspectives of the business. It even may serve to reveal potential innovations and unsolved R&D issues. The typology is unique as an overarching model and in its specificity for the agricultural sector; it therefore contributes to a better conceptual understanding of circular business models. However, it should not be considered as static: some initiatives tend to move from one type to another according to their business development strategy and also because their existence and continuity depend on context-specific conditions (e.g. biogas plants often need product or marketing innovations as they depend on public subsidies being limited in time). The boundary conditions should be investigated more in-depth in relation to the type of business model. Also, typical agricultural characteristics still need to be integrated in the framework such as heterogeneity, fluctuating volumes of resources, flexibility in production due to seasonality, and consequences for markets who are traditionally not facing large fluctuations in product outputs (like chemical products) in terms of volumes and product specificities. These would make potential bottlenecks transparent.

Keywords

Circular economy, business models, typology, agro-waste and by-products

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Anaerobic digestion business models in the UK and the circular economy

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Abstract

The UK anaerobic digestion (AD) industry has seen a surge in the implementation of new business models over the last decade (Savills World Research, 2018), perhaps due to recent legislation and a shift towards a more circular economy (CE). However, the AD industry faces challenges as a result of the increased competition for the feedstocks and the increased land use. This limits the AD industry potential to contribute to the transition to a circular economy. There are limited research / case studies, that document the innovative AD business models and the multitude of value they offer, that align to the circular economy principles. Therefore, this study aims to critically evaluate a variety of AD business models to understand their challenges in order to effectively partake in the transition to a circular economy. This study will use a qualitative method and will draw upon four operational and uniquely contrasting AD plants in the UK and semi-structured interviews of twenty representatives from the UK AD sector, policy makers and supporting institutions. We would utilise thematic approach to analyse interview data This study would contribute towards the understanding of how AD business models are evolving and changing, and how they could effectively contribute to the transition to a circular economy. Additionally, by identifying the challenges currently faced by the AD business models, recommendations will be drawn to offer real value to both AD developers in the UK and to the literature on transition to a circular economy.

Keywords

anaerobic digestion; circular economy; business models

Analyzing co-creation in business models as going circular

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Extended abstract

Recently, novel business ideas and concepts have emerged to address the urgent need to substantially improve resource performance across the economy and decrease the environmental impacts from consumption and production activities. The concept of Circular Economy (CE) has attracted an increasing amount of interest not only from academia but also from businesses, since one of the cornerstone objectives is to increase profit whilst decreasing environmental impacts (Ghisellini et al., 2016). In the quest of a transition from a linear to a circular economy, businesses from diverse sectors have started to explore ways to reuse products or their components and restore more of their precious material, energy and labor inputs (Ellen MacArthur Foundation, 2013).

The business potentials of businesses and business models going circular are vast as identified by Nasr (2011) who suggest that material and energy reductions through remanufacturing of 80 per cent may be within reach. According to Urbinati, Chiaroni and Chiesa (2017) circular economy business models can be explored based on the degree of adoption of circularity along two major dimensions: (i) the customer value proposition & interface, i.e. the implementation of the circularity concept in proposing value to customers; (ii) the

value network, i.e. the ways through which interacting with suppliers and reorganizing the own internal activities. In the study by Linder and Williander (2017, p. 183) a circular business model (CBM) is defined as a business model in which the conceptual logic for value creation is based on utilizing economic value retained in products after use in the production of new offerings. Thus, a circular business model implies a return flow to the producer from users, though there can be intermediaries between the two parties.

In this context, despite the vast increase of studies on the topic of CE published in the last few years, little attention has been devoted to the effect that CE may have on sustainability and development of circular business models (Parida and Wincent, 2019). Some scholars have argued that, evidently, clear and active approaches to include sustainability in business strategy and business models should be of interest to practitioners, as reactive measures from legislation or for marketing purposes are generally not a significant contributor to the objectives of the organization (Rashid et al., 2013). Thus, the development of successful CBMs calls for integration with customers and collaboration spanning the entire value chain (Ibid.). In practice however, a recent study has documented that many firms experience a lack of integration of sustainability issues in business development, typically hampering a transition to CE (Ritzén and Ölundh Sandström, 2017).

Successful closed-loop manufacturing systems and CBM call for integration with customers and collaboration spanning the entire value chain (Rashid et al., 2013). In this novel context of innovation ecosystems for going circular, organizations need to act within a *value network* in order to succeed. Even more, the silos of consumers and producers are breaking, and the point of contact is no longer simply transactional, instead, the market becomes a forum for co-creation of value (Prahalad and Ramaswamy, 2004). Consequently, the process to co-create mutual value could become a learning experience shared between both parties (Payne et al., 2008), setting new challenges for organizational capacity to absorb the new knowledge and rapidly adapt accordingly. It strongly relates to the business models of the organizations as value is no longer created within an organization but in exchange of different actors.

Therefore, the authors of this abstract have started to analyze a number of organizations that are in a starting point to develop a circular economy business model or have reached their first results of establishing businesses based on closing material loops. The analysis is focused on describing the core business strategy that these organizations have defined for going circular and specifically scrutinizing the actions (or non-actions) of co-creation that occurs in their value network. Chosen organizations are three large mature OEMs, both B2C and B2B, and a small C2C service provider. A summary of the included cases is can be found in Table 1 below. Qualitative data has been collected in the form of recorded interviews with cases A-D, as well as notetaking during workshops with case C and D respectively.

Table 1: Description of company cases included in this study.

Case	Company characteristics	Value proposition	Approach in relation to CE	Main BM	CE maturity	Points of contact with users during product life-cycle	Established Co-creation procedures	Co-creation criticalities
A	Large, B2B, B2retailers, Professional- and consumer products in gardening and forestry	High performing, long lasting, premium product	Not clear, under development	Multi-brand, B2B sales, B2C through retailers	Low, in scope for future, no real cases	**Development:** Occasionally **Sales:** Through retailers **Use:** None **After use:** None	Long tradition of customer studies	Need to shift focus
B	Small C2C service provider	Easy to use, self-managing sharing platform	Rent instead of buy	Peer-to-peer commission	High, core business	**Development:** Occasionally **Sales:** None **Use:** None **After use:** Feedback	Workshops	User community is core of business
C	Large, B2B, hygiene and health products and solutions	Efficient and high-quality products	Recycling of used tissues	Multi-brand, B2B sales	Medium, successful project	**Development:** Occasionally **Sales:** Direct **Use:** Minor **After use:** None	Collaboration throughout value chain	Co-creation of business model was key to CE success
D	Large, B2B/B2C, Automotive	Premium brand high performing, cost effective products with service during use	Not clear, under development	Single brand, B2C sales and leasing solutions	Low, strategy under development	**Development:** Frequent user studies **Sales:** Through retailers and direct **Use:** Through service business **After use:** None	Long tradition of customer studies	Partnership is highlighted as key in CE strategy

The use of multiple cases provides an opportunity to highlight some key contextual differences and similarities in the challenges and opportunities the cases face in going circular. These empirical illustrations of organizations fully in action of innovating their business models reveal some interesting issues regarding co-creation. The four cases all have different experiences with co-creation, but overall it is not regarded as a prioritized activity. However, for case C, the success of a

recent project related to CE was highly dependent on co-creation together with their customers. How this successful project further develops how the organization fosters continued work with co-creation is to be explored.

Case A and case D are in different industries, yet share some organizational characteristics and are at a similar stage in how they relate to CE. Both companies have been operating for very many years, with long traditions of product development and manufacturing, posing a challenge for the introduction of new business models. As their new endeavors towards CE are developing, it is clear that co-creation needs much more consideration not only with existing users, retailers and suppliers, but also with new organizations such as waste management firms.

Finally, case B provides an interesting contrast. As a sharing platform provider, they are a new actor navigating in a landscape dominated by traditional consumerism. In order to grow, they are looking for ways of co-creating with established organizations, who are not yet sure how to react to this new actor. Furthermore, by offering a digital service, they are highly dependent on how they co-create with a broad user community, and currently face a challenge of low user retention rate.

Keywords

Circular economy, circular business models, value network, co-creation

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Are we ready for circular business models?

An investigation of firms and consumers' attitudes towards footwear eco-leasing

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Extended abstract

The apparel and footwear industries generated between 5% and 10% of global pollution impact in 2016, with the footwear sector alone accounting for approximately one-fifth of this impact (Quantis, 2018). The production of footwear causes major concerns in relation to water consumption, carbon emissions, resource depletion and the disposal of an ever-increasing amount of post-consumer (end-of-life) shoe waste (Joy et al., 2012; Lee and Rahimifard, 2012). Although recycling is generally regarded as the most suitable approach to deal with discarded shoes, it is estimated that globally only 5% of the 20 billion pairs of shoes that are thrown away each year are to some extent recycled, while most of the remaining 95% end up in landfill (Staikos and Rahimifard, 2007). The main reason for this is that shoes are often made of multiple materials – such as rubber, leather, polymers and textile – whose separation is technically difficult and financially unappealing due to the relatively low economic value that can be regained through recycling (Lee and Rahimifard, 2012).

New business models that focus on selling a product's usage and performance instead of the product itself – also referred to as product-service systems (PSS) – have been championed as a promising strategy to decouple economic growth and material consumption, thereby paving the way for a circular economy (Laumann

Kjaer et al., 2018; Romero and Rossi, 2017; Yang et al., 2018). In particular, eco-leasing – the long-term rental of a product that, once the end of its useful life is reached, undergoes a combination of remanufacturing and recycling processes to become a source of secondary raw materials for the production of new goods (McDonough and Braungart, 2002) – is a PSS-type of business models that could help close the loop between post-use waste and footwear production. One of the few examples of a subscription-based eco-leasing service for children shoes is 'Endless', developed by Belgian product design studio Edmire (Edmire, 2019); whereas Nike has a 'reuse-a-shoe program' in place to collect used trainers and recycle them to produce new pairs of athletic shoes (Nike, 2019).

Despite the potential of PSS like eco-leasing to drive the transition to a circular economy, their wider implementation and diffusion remains limited (Vezzoli et al., 2015). While some success stories exist of the application of the product lease concept to valuable items such as cars and electronics, the possibility to apply it to fast-moving consumer goods like shoes has not drown as much attention yet (Li and Xu, 2015; Tukker, 2015). As a result, it is not known to what extent firms in the footwear industry are familiar with circular business models based on PSS. Moreover, PSS often have low acceptance and adoption rates among both companies and consumers (Camacho-Otero et al., 2018; Catulli, 2012; Cherry and Pidgeon, 2018; Piscicelli et al., 2015). There is, however, a dearth of research on firm and consumer attitudes towards eco-leasing in the context of footwear.

This study aims to fill these knowledge gaps by answering the research question: *"How do manufacturers and consumers from the Italian footwear sector perceive the opportunity to implement circular business models based on eco-leasing?"* We combined qualitative and quantitative methods in a mixed methods study (Creswell and Plano Clark, 2011) to (i) assess firms' awareness of the concepts of circular economy, PSS and eco-leasing; (ii) uncover the benefits and barriers associated to eco-leasing by firms and prospective customers; and (iii) identify the personal characteristics and key factors that determine a positive attitude towards eco-leasing among end consumers.

First, 13 in-depth interviews were conducted with professionals of the Italian footwear industry working for different shoe manufacturing firms (including micro-enterprises, SMEs and multinational companies). The interviews, which lasted on average 60-75 minutes, were transcribed and analysed using content analysis (Neuendorf, 2017). Second, a survey questionnaire was developed and sent (between August and September 2018) to a convenience sample of

prospective end consumers of footwear eco-leasing. The questionnaire was filled in by 378 respondents and analysed by using graphics analysis and two ordered logistic regressions (Winship and Mare, 1984).

The interview analysis revealed that professionals of the Italian footwear sector are somewhat familiar with the concept of circular economy, while only two interviewees had previously heard of PSS, and none of the 13 professionals interviewed was able to correctly define eco-leasing. The main advantages of implementing eco-leasing mentioned by the interviewees were the opportunity to establish stronger relationships with business partners and suppliers, establish a dynamic organisational culture, and increase customers' loyalty by distinguishing themselves from competitors. The main obstacles identified by the interviewees were the difficulty to build and manage supply chain partnerships, the need to accurately calculate the environmental impacts of eco-leasing, the development of reverse supply chains to manage the return flow of used shoes, the higher manufacturing costs and the lack of financial incentives offered by governments.

From the perspective of the end consumers, the main perceived benefits of eco-leasing were the possibility to wear footwear made of safe and healthy (recycled) materials, make use of the maintenance and repair services offered by shoe manufacturers, avoid the accumulation of old footwear in their households, and the desire to consume more responsibly and protect the environment. On the contrary, respondents raised concerns about paying in instalments and a loss of control. Moreover, they felt eco-leasing was not appropriate for them and questioned its suitability for everyday clothing and footwear.

The ordered logistic regressions also allowed us to identify the factors that influence consumer attitudes towards eco-leasing. The analysis revealed that male and older responders tended to be less interested in eco-leasing; while the explanatory variables that were more strongly related to a positive evaluation of eco-leasing were 'self-concept' (i.e. the wish to take care for the environment and being regarded as an innovative, open-minded individual) and 'emotions' (i.e. the possibility to satisfy a desire for change without feeling guilty about buying a new pair of shoes). 'Self-concept' was also the strongest predicting variable for a negative evaluation of eco-leasing. Finally, respondents who declared to buy more pairs of shoes per year were less likely to be interested in eco-leasing.

The results of this study provide novel insights into the adoption and acceptance of circular business models based on eco-leasing by firms and consumers. While

PSS appear to be in principle applicable to fast-moving consumer goods like footwear, consumers seem to prefer paying for their shoes in a single transaction (rather than instalments) and might not consider eco-leasing as a suitable solution for them. Furthermore, the barriers identified by Italian shoe manufacturers and the little perceived benefits of implementing eco-leasing indicate a still limited appetite of the shoe sector for innovative business models for closed-loop production systems.

These findings extend extant knowledge on PSS-based circular business models. When the interviewees were asked to reflect upon the potential opportunities that Italian shoe manufacturers could seize by implementing eco-leasing, most of the potential drivers that were mentioned had already been identified by previous studies on PSS. One aspect, namely the opportunity for front-runners to create stronger relationships with their key partners, however, has not been highlighted by existing literature. Since developing PSS often requires multiple companies to work together no matter which type of PSS and industry are considered, the opportunity for firms to increase their competitiveness and resilience by relying on a 'community effect' can be regarded as a first contribution of this study to the general knowledge on circular PSS.

In some cases, the insights collected through the interviews on the potential drivers and barriers to eco-leasing from a firm's perspective were in conflict with the findings of previous studies on the implementation of PSS by manufacturing companies. While PSS are generally thought to possess a lower intangible value compared to traditional goods due to their perceived inconvenience (Tukker, 2015), most interviewees regarded the high intrinsic value that many end consumers could associate to eco-leasing (e.g. an innovative and sustainable option) as one of the main opportunities that shoe firms could seize. It is difficult, however, to generalise this finding to other types of PSS and product categories given that not all goods are regarded by people as suitable as shoes to express their identity.

Finally, while scholars have usually looked at the possibility to collect larger volumes of feedback from end consumers as one of the main opportunities that front-runners could achieve by implementing PSS (Baines et al., 2017), most interviewees regarded processing ever-increasing amounts of data more as a hassle than a potential benefit. This finding calls for further research on the organisational capabilities required to reap the benefit of big data and harness the promises of a data-driven circular economy.

Keywords

Product-service systems (PSS), eco-leasing, footwear, circular economy

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Circular business model experimentation: Exploring metrics

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Abstract

Circular business model experimentation continuously tests new business model ideas that can narrow, slow, close and regenerate energy and resource loops. An experiment requires defining a metric, or indicator, that can be used to measure progress towards circularity. While it is clear that 'circularity checks' are needed during experimentation, it is not yet clear what metrics can be used for these checks, and how they can become part of the experimentation process. We therefore investigate *how firms can measure progress towards circularity during circular business model experimentation*. As a first step, we develop an initial set of possible metrics from the literature. In a second step, we apply and test this set through action research in several experimentation workshops with circular economy oriented projects, both in startups and incumbents. The results and insights from these workshops will be presented and discussed during the NBM conference.

Keywords

circular economy, business model experimentation, lean startup, lean analytics

Circular business models in social housing associations: Bridging ecological goals and social contexts

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Abstract

In order to address the lack of attention to the social dimension of circular business models, this paper focusses on these models in the context of a social housing association. Due to their dominant social mission and strong ties with local communities, housing associations need to consider the social dimension of sustainability within circular business models. The first objective of this paper is to investigate the circular business models that can be adopted by housing associations and to categorize them in a set of archetypes. This paper recognizes that circular business models are not isolated but situated in networks in which linkages with communities may be highly important for housing associations. The second objective is therefore to investigate the important characteristics of linkages with communities within the networks in which the circular business models of housing associations are situated. Through an in-depth case study involving a grey literature investigation, 2 focus groups and 15 interviews, we found that circular business models in housing associations are likely to be decoupled from their social activities. The results highlighted that two-way linkages with communities may avoid decoupling and potentially lead to the emergence of a new set of socially inclusive circular business models.

Keywords

circular business model strategies, social context, social network

Circular Economy in the Agricultural Sector

Farm based biogas production as a way forward

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Extended abstract

There is a need for a transition towards a more circular economy in our society. Transitioning to a circular economy represents a systemic shift that builds long-term resilience, generates business and economic opportunities, and provides environmental and societal benefits (Ellen Macarthur Foundation, 2019). However, the circular economy requires firms to rethink their business models. Agricultural businesses have the potential to implement a transition through the development of new sustainable business models including waste handling and energy production. Implementing sustainable business models to support transitioning to circular economy by any sector including the agricultural sector is challenging. Björklund (2018) found two major groups of barriers (internal and external) when it comes to implementing sustainable business models in the agricultural sector. The external barriers that the study found were resistance or lack of support from actor(s); unsupportive government; and business culture in Swedish agriculture while the internal barriers were restrictive mindset with fear and/or resistance of innovations within the firm; lack of competences about strategic management, leadership and marketing; insufficient resources. However, to our knowledge, no research has done a more in-depth empirical study into the context of the renewable energy in the form of biogas which can be produced on agricultural farms from manure and harvest residues at the same time as a high quality biofertilizer is produced. Therefore, the purpose of this study is to identify barriers and drivers important for the transition towards a circular economy in the context of agricultural businesses and producers of biogas.

Another purpose of this study is to explore how different stakeholders could promote this transition in their different roles.

Research has pointed out the crucial role of business model innovation for sustainability for achieving a circular economy (e.g. Lüdeke-Freund et al., 2019). At the same time the research and understanding of circular business models is still limited (De Angelis, 2016). A study based on a questionnaire to Swedish farm biogas managers concluded that biogas production could be an important catalyst for improving, integrating and diffusing sustainability (Karlsson, 2019).Therefore, it is important to understand what effects for both farmers and municipalities can be achieved through business model innovation towards the transition to circular solutions.

To conduct the research, a case-study approach is used within an ongoing project at Halmstad University. The case is a farmer cooperative, Vessige biogas Economic Association working with farm-based biogas production and the municipality in which the cooperative is situated, Falkenberg municipality which is also involved. The project will investigate what motivations and obstacles there are for developing the circular business models and what policy evolution and behavioral change could possibly drive a positive development of biogas production in the agricultural sector.

Sweden has increased biogas production during recent years and a large share of the biogas produced is upgraded and used as vehicle fuel (International gas union, 2015). By using the digestate as organic fertiliser, a farmer is able to eliminate or significantly reduce the use of synthetic fertilisers that constantly increase in price (Hellström et al., 2015). Biogas closes the cycle and creates a circular economy where waste and residual resources become valuable resources, such as climate friendly biogas, biomethane and biofertilizer (Swedish Gas Association, 2019). It has been shown that biogas solutions can contribute to all of the 17 UN Sustainable Development Goals which indicates that biogas solutions need to be studied and understood in a broad, cross-sectoral system perspective (Hagman and Eklund, 2016).

In spite of the fact that many benefits can be gained from farm-based biogas production (renewable fuel, high-quality fertiliser, reduced greenhouse gas emissions and rural development) and that the biogas industry is a perfect example of a circular economy (Hagman and Eklund, 2016), Swedish farm-based biogas production have been struggling with low profitability and the

development has reached a status quo. Vessige biogas Economic Association is a cooperative of farmers who want to develop their farming activities (current BM) by developing new business concepts aimed at future biogas expansion. The cooperative has been extensively studied in their early phases of business model innovation (Karlsson et al., 2018 a and b) and also in an education for sustainable development context (Hoveskog et al., 2018).

This research have through participatory workshops with farmers, consultants, students and researchers suggested a number of ideas and prototypes for new business models (BM). A network-level BM with a strong focus on stakeholder collaboration was suggested for addressing also environmental aspects along with the profitability aspects (Karlsson et al 2018b). A network-level BM may consist of a group of upstream suppliers (e.g., technical equipment and biological feedstock suppliers), downstream suppliers (e.g., biogas and digestate distributors and retailers), and customers (e.g., municipalities and manufacturing industries) (Huttunen et al. 2014). Competitive advantage and sustainable value creation in biogas production can thus be achieved in the cooperative.

The situation have now changed for the Vessige cooperative and thanks to a governmental support system (Klimatklivet) distributed via the Swedish EPA the cooperative can now realize a large investment and start the development towards new sustainable BMs. Falkenberg municipality also have an interest in this realization since it will create business opportunities, facilitate the fulfillment of climate goals and contribute to rural development in the municipality. Therefor the current research focus on readiness for transition, stakeholder involvement and implementation of circular business models in this new situation. The results will provide insights into how production and market for biogas and biofertiliser can be sustainably secured as well as which standards, control means and legislation promotes the circular solutions. New knowledge is gathered for increasing the agricultural companies readiness for developing and implementing circular business models. Profitable circular business models and initiatives will inspire others and will be copied and expanded both nationally and internationally.

The data collection will be done via interviews with stakeholders both within the Vessige cooperative and outside. Suppliers of substrate for the biogas production and customers for biogas and biofertiliser will be addressed and involved in participatory activities. Also municipality officials and policy makers will be interviewed. Data from interviews will be also complemented with other types of

information from articles, reports and policy documents. The expected results are to identify obstacles and drivers which are most perceived as important for the transition towards a circular economy in agricultural businesses and how different stakeholders could promote the transition in their different roles. This research would contribute to the literature of circular and sustainable business models in the context of the agricultural sector and more specific biogas production.

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Circular economy, organizations, and business models: a literature review

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Abstract

This paper examines the concept, the assumptions, and practices related to circular economy from an organizational and managerial perspective. While circularity is advocated as a solution to sustainability-related issues, organizational and management scholarship remains marginal in research. This systematic literature review assesses how the concept has translated so far into organizational strategies, business models, and practice. An agenda for research is proposed.

Keywords

Circular Economy, Management, Business Models, Literature Review.

Introduction

The notion of a circular economy has been gaining traction in recent years (Bocken, Olivetti, Cullen, Potting, & Lifset, 2017; Esposito, Tse, & Soufani, 2018; International Reference Centre for the Life Cycle of Products, Processes and Services (CIRAIG), 2015; Merli, Preziosi, & Acampora, 2018). Supported among others by the Ellen McArthur Foundation and the McKinsey Global Institute, this concept brings environmental concerns to the fore and is advocated as a viable solution to sustainability-related issues, such as the accelerated use of limited natural resources (Esposito, Tse, & Soufani, 2018). From an organizational perspective, this holistic concept is an evolution of systems thinking, although it is not too often conceptualized from a systems perspective (Kirchherr, Reike, & Hekkert, 2017). The circular economy model is opposed to a linear model of mass

production and mass consumption, and is promoted as it could offer a wide array of opportunities and challenges for organizations. However, research on how the concept translates into organizational strategies, business models, and practice is still limited.

Circular economy's several definitions are derived from associated concepts, such as sustainable development, ecological transition, green economy, functional economy, life-cycle thinking, cradle-to-cradle thinking, shared value, industrial ecology, extended producer responsibility, and ecodesign (CIRAIG, 2015). These associated concepts, with varying degrees of comprehensiveness, are often related to interdisciplinary environmental sustainability research and, to a much lesser extent, corporate social responsibility. As a result, organizational and management scholarship as a whole do not seem to have incorporated it into a comprehensive research agenda.

Despite the interdisciplinary character of the concept of circular economy, organizational and management scholarship have plenty to contribute to the theoretical and practical development of the concept, in areas as broad as corporate social responsibility and strategy and in more specialized areas, such as entrepreneurship, project management, and consumer behavior. This research attempts to give a meaningful contribution in that direction. By systematically reviewing literature on circular economy from 2010 to 2018, this research examines how the concept of circular economy has translated into organizational strategies, business models, and practice and the roles played by organizations in its implementation. Moreover, we examine how opportunities and challenges are addressed in the implementation of circular strategies and business models. Then we discuss how organizational and management scholarship can contribute to advancing knowledge about the circular economy concept and its organizational, managerial, and policy implications. The paper concludes with a proposed agenda for research.

Conducting a literature review: research methods

In order to assess the circular economy concept and how it translates into organizational strategies, business models, and practice, we conducted a systematic literature review. A systematic literature review allows us to determine what we currently know and do not know about a particular topic. It allows the researcher to draw evidence-based conclusions about the topic in question, since it applies the same level of rigor that would be applied to any well-conducted and clearly-reported primary research (Tranfield, Denyer, & Smart, 2003; Briner & Denyer, 2010). Indeed, it "addresses a specific question, [and] utilizes explicit and transparent methods to perform a thorough literature search and critical appraisal of individual studies" (Briner & Denyer, 2010, p. 329).

This literature review was conducted in five stages. In the first stage we identified the review questions. We started from a broad question – *how does the circular economy concept translate into organizational strategies, business models, and practice?* – and then narrowed it down to the following questions: (i) What is a circular economy? (ii) What are the roles played by business organizations in a circular economy? (iii) How is it understood in business organizations? (iv) How do business organizations implement circular strategies? (v) What are the opportunities and challenges for the implementation of these strategies? (vi) How do organizations create and/or adapt their business models so as to implement circular strategies? (vii) How can traditional business models evolve towards circular business models?

The second stage consisted in the journal selection. Since this literature review concerns organizational and management research, we first selected the top journals in these fields, featured in the Financial Times top 50 journals used in business school research rankings. However, the notion of a circular economy stems from different concepts and from different disciplines. As a result, the literature on circular economy is scattered through several research fields. In order to overcome this challenge, we selected interdisciplinary journals that, albeit not specifically concerned with organizations and management, do present peer-reviewed research in these fields, such as the *Journal of Cleaner Production*. Fourteen additional journals were selected according to this criterion. The 64 selected journals are listed in Figure 1.

[INSERT FIGURE 1 ABOUT HERE]

The third stage consisted in the comprehensive search in the ABI/INFORM Collection and EBSCO Academic Search Complete databases. We also searched Science Direct only for research published in the journals *Ecological Economics, Environmental Development, Journal of Industrial and Production Engineering, Renewable and Sustainable Energy Reviews, Resources, Conservation and Recycling,* and *Sustainability*. In addition to the expression "circular economy", we used the following associated concepts as keywords: (1) blue economy, (2) collaborative economy, (3) donating, (4) frugal innovation, (5) functionality, (6) maintenance and repair, (7) reselling, (8) responsible finance, and (9) sharing economy. We found a total of 750 studies where these 10 keywords were mentioned in titles and/or abstracts.

The fourth stage of the literature review consisted in establishing sample selection criteria and evaluating the quality of the studies in the pool. After locating and selecting a sample of 89 relevant studies, we critically appraised the selected studies according to three criteria: (1) the theoretical and practical importance of the research; (2) the clarity and coherence of the study report; and (3) the extent to which methods were appropriate and rigorous. Then the results were categorized according to the papers' main focus. The first category – conceptualization – groups research pertaining to the questions *What is a circular economy? What are the roles played by business organizations in a circular economy?* and *How is it understood in business organizations?* In this category we selected a total of 22 published studies.

The drivers, enablers, and strategy implementation category groups 48 studies on topics related to the questions *How do business organizations implement circular strategies?* and *What are the opportunities and challenges for the implementation of these strategies?* The third and final category – business models – concerns research pertaining to the questions *How do organizations create and/or adapt their business models so as to implement circular strategies?* and *How can traditional business models evolve towards circular business models?* This category provided our initial set with 19 studies. The 89 selected papers and the respective journals where they were published are listed in Figure 2.

[INSERT FIGURE 2 ABOUT HERE]

In the fifth and final stage of the literature review we analyzed and synthesized the findings from the papers, as we discuss in the following sections. We did not add any categories to the ones discussed in the previous paragraphs. That is, the selected studies are discussed hereinafter according to their contribution to advancing the circular economy concept, assessing drivers and enablers of a circular economy, evaluating the implementation of circular strategies, and developing circular business models.

Mapping definitions and practices of the circular economy

Defining circular economy

A first area of research concerns the definition of the concept. The circular economy concept first gained momentum in China in the 1990's, motivated by the national need to maintain a high pace of economic growth in a context of natural resources limitations. However, there is no clear evidence of where it originated (Winans, Kendall, & Deng, 2017). In recent years, mostly supported by the Ellen McArthur Foundation and the McKinsey Global Institute, the notion of a circular economy has been gaining traction worldwide as a viable solution to sustainability-related issues (Bocken, Olivetti, Cullen, Potting, & Lifset, 2017; Esposito, Tse, & Soufani, 2018; International Reference Centre for the Life Cycle of Products, Processes and Services (CIRAIG), 2015; Merli, Preziosi, & Acampora, 2018). Indeed, the circular economy concept is particularly interesting because it encompasses ways for businesses to implement the concept of sustainable development (Kirchherr, Reike, & Hekkert, 2017).

Circular economy has been defined in several scholarly studies as well as in policy and practitioner reports, but there is no single agreed upon definition of the concept. Most frequently, circular economy definitions comprise a combination of reduce, reuse and recycle activities. Nonetheless, these definitions often come short of emphasizing that the implementation of the concept requires a systemic shift (Kirchherr, Reike, & Hekkert, 2017). The Ellen MacArthur Foundation (2013, p. 7) provides the most common definition, according to which circular economy is "an industrial system that is restorative or regenerative by intention and design. It replaces the 'end-of-life' concept with restoration, shifts towards the use of

renewable energy, eliminates the use of toxic chemicals, which impair reuse, and aims for the elimination of waste through the superior design of materials, products, systems, and, within this, business models". In their review of 114 definitions of the circular economy concept, Kirchherr and colleagues (2017, pp. 224-225) comprehensively define it as *"an economic system that is based on business models which replace the 'end-of-life' concept with reducing, alternatively reusing, recycling and recovering materials in production/distribution and consumption processes, thus operating at the micro level (products, companies, consumers), meso level (eco-industrial parks) and macro level (city, region, nation and beyond), with the aim to accomplish sustainable development, which implies creating environmental quality, economic prosperity and social equity, to the benefit of current and future generations"*.

Kirchherr and colleagues' (2017) definition is favored in this study because it integrates the key factors that distinguish the notion of circular economy from other sustainability-related concepts. First, their definition not only implies a systems perspective; by addressing simultaneous actions at the micro, meso, and macro levels, they underscore the holistic and inter-level of action and change that the circular economy requires. Second, it explicitly addresses the four 4R framework components – reduce, reuse, recycle, and recover (this final 'R' representing an expansion of the more common '3Rs' and meaning material recovery), thus reinforcing the core principles of the circular economy as opposed to the 'take-make-waste' linear economy thinking. Third, this definition clearly places all participants in a value chain, suppliers, producers, and consumers as pillars and key enablers of the circular economy. Fourth, according to this definition, circular economy goes beyond economic prosperity and environmental quality; it aims to bring social equity to the fore, thus addressing a major gap in the circular economy literature (Merli, Preziosi, & Acampora, 2018; Moreau, Sahakian, Griethuysen, & Vuille, 2017; Murray, Skene, & Haynes, 2017; Sauvé, Bernard, & Sloan, 2016).[1]

As expected from a new stream of research, the concept of circular economy features characteristics of a socially-constructed umbrella concept, that is, a comprehensive concept under which a number of other concepts coming from different epistemological fields meet, such as sustainable development, functional or performance economy, life-cycle thinking, industrial ecology, and shared value

[1] What Kirchherr and colleagues (2017) call micro, meso, and macro levels should not be confused with the micro, meso, and macro levels of analysis in organizational and management studies, which respectively refer to individuals, groups, and organizations.

(CIRAIG, 2015; Homrich, Galvão, Abadia, & Carvalho, 2018). This integration of previous concepts under an umbrella concept is arguably where the circular economy "can and should make its greatest contribution" (Bocken, Olivetti, Cullen, Potting, & Lifset, 2017, p. 477). Indeed, by integrating various resource strategies, the circular economy concept "offers a new framing of these strategies by drawing attention to their capacity of prolonging resource use as well as to the relationship between these strategies" (Blomsma & Brennan, 2017, p. 603).

Drawing on Gallie (1956), Korhonen, Nuur, Feldmann, and Birkie (2018, p. 545) argue that circular economy has already become an essentially contested concept, since "there is agreement on the means and goals of [the] concept but disagreements on how to define it, which units of analyses to use to capture the dynamism, what the conceptual cornerstones are and what methodology of enquiry is appropriate". According to them, circular economy is a cluster concept comprising groups of subconcepts. Furthermore, they argue, the circular economy concept fits Gallie's (1956) seven criteria, namely: (i) potential value in the concept (since all societal sectors are interested in circular economy), (ii) internal complexity (since there are numerous arguments in favor of and against circular economy), (iii) various describability (since the concept's several descriptions and arguments for what features should be prioritized mirror different interests and preferences, (iv) openness (meaning that knowledge on human impact on the natural environment is continuously evolving), (v) aggressive and defensive use (that is, how rapidly circular economy has drawn worldwide attention despite little of scientific research on the concept), (vi) original exemplar (meaning that users of the concept often refer to an authority on the subject; in this case, Kenneth Boulding's "spaceship earth" (1966), Georgescu-Roegen's book on thermodynamics in economic systems (1971), and Frosch and Gallopoulos (1989) "Strategies for Manufacturing"), and (vii) progressive competition (meaning that the original exemplars' work is sustained notwithstanding the distinct emerging definitions and applications of the circular economy concept) (Korhonen, Nuur, Feldmann, & Birkie, 2018).

The circular economy concept holds the promise of a paradigm shift. However, a thorough paradigm shift only occurs when the new paradigm is embedded in everyday life (Korhonen, Nuur, Feldmann, & Birkie, 2018), which does not seem to be the case. So as to assess whether circular economy is a new sustainability paradigm, Geissdoerfer and colleagues (2017) examined the main conceptual similarities and differences between sustainability and circular economy. The similarities include intra and intergenerational commitments motivated by

environmental hazards, increasing agency for the multiple and coexisting pathways of development, an essentially global perspective, and the adoption of multi-/interdisciplinary research approaches in order to integrate non-economic aspects into development (having system design and innovation at the core). Furthermore, the authors list among the similarities potential costs and risks, the need for diversification so as to take advantage of value creation opportunities, the necessary cooperation of different stakeholders, often implemented via regulation and incentives, and the frequent problems to implement technological solutions. Private businesses are assigned "a central role among relevant stakeholders because it commands more capabilities and resources than any other actor" (Geissdoerfer, Savaget, Bocken, & Hultink, 2017, p. 764) and business model innovation is perceived as a key enabler of industry transformation.

The differences refer to aspects such as origins of the term, goals, main motivation, what system is prioritized and to whose benefit, timeframe of changes, perceptions of responsibilities, and interests behind the use of the term. The final two aspects are particularly interesting for this literature review, since both have direct or indirect implications to businesses and other organizations. While in sustainability responsibilities are shared, though not clearly defined, in the circular economy both institutional actors (regulators and policymakers) and private businesses play a key role. As far as interests behind the use of the term are concerned, sustainability refers to an aligned interest between stakeholders. In turn, the use of circular economy is motivated by economic advantages for businesses and less resource consumption and pollution for the environment (Geissdoerfer, Savaget, Bocken, & Hultink, 2017).

Reviewing some limitations and challenges of the circular economy concept

Several critiques of the concept have been identified. The first one concerns its vagueness. Despite the rapid attention it has been gaining in recent years, Korhonen, Honkasalo, and Seppälä (2018, p. 37) argue that "the scientific and research content of the [circular economy] concept is superficial and unorganized" and that it "seems to be a collection of vague and separate ideas from several fields and semi-scientific concepts". Although promising, especially for the attention that circular economy has recently raised among scholars, businesses, and policy-makers, the concept has limitations and challenges that need to be addressed. Korhonen, Honkasalo, and Seppälä (2018) refer to thermodynamic limits, system boundary limits, limits posed by physical scale of the economy, limits posed by path-dependency and lock-in, limits of governance and

management – for instance, "intra-organizational and intra-sectoral management of inter-organizational and inter-sectoral physical flows of materials and energy" (2018, p. 41) – and limits of social and cultural definitions.

The second set of critiques concerns its relation to the growth-dependent economic model. Skene (2018) provides a critique of key subconcepts that underpin the circular economy. The first issue regards the definitions of waste, which miss energetic waste. Another issue refers to how the circular economy is based on the idea of a closed-loop system in perfect equilibrium, as if it was mirroring the natural world. However, the author stresses that nature continuously changes and "because of the countless interactions and pervading laws of thermodynamics, we cannot hope to restore an equilibrium state" (p. 482). Furthermore, he criticizes the assumption according to which economic growth is decoupled from virgin resource consumption (CIRAIG, 2015; Esposito, Tse, & Soufani, 2018; Murray, Skene, & Haynes, 2017). The problem, Skene (2018) argues, is that the circular economy relies on an economic model supported by the same neoclassical economic principles of globalization, which inherently requires growth.

The third critique focuses on its practical impacts. Skene (2018) also critiques the idea of extended lifetimes. A practical challenge in this regard would be the idea of product as service, since environmental benefits are not guaranteed, services generate significant environmental and financial costs (e.g., transport for servicing professionals, replacement parts, longer-lasting materials, and global service support centers). Also, research on consumption with ownership versus consumption without ownership indicates that there are significant sociocultural barriers for cases where identifying with a brand community is important (Bocken, Olivetti, Cullen, Potting, & Lifset, 2017). Moreover, Skene (2018, p. 484) argues that "manufacturing rarely occurs in the same locality as sales, recycling and servicing, meaning that any benefits are likely to be externalized". Another central assumption of circular economy thinking disputed by Skene (2018) concerns eco-efficiency. According to this principle, nature is very efficient and greater sustainability would result from increased efficiency. Nonetheless, eco-efficiency stands in stark contrast to modern ecological knowledge, since the biosphere's many sub-systems operate sub-optimally for the overall functioning of the system.

A fouth set of critiques focus on its limited relation with equity and justice. Moreau and colleagues (2017, p. 497) argue the circular economy concept "lacks the social and institutional dimensions to address the current material and energy

throughput in the economy", without which the necessary societal transitions to a circular economy would not occur. From an institutional perspective, institutions play a key role in distributing costs among economic agents, rather than transferring them onto the environment. From a social stance, the authors propose the adoption of social and solidarity economy principles. The social and solidarity economy is a social movement and existing practice, which includes different types of economic initiatives, such as new social relations and new currencies. These principles place people above profit and work "at the local or regional level, bringing together cooperative efforts and promoting democratic participation in economic activities" (Moreau, Sahakian, Griethuysen, & Vuille, 2017, p. 503). In this regard, these principles' major contributions to the circular economy would pertain to equity, thus "avoiding cost shifting in time and place, and models of collaborative and democratic governance systems, which challenge the profit motive" (op. cit.), supported by evolving institutional conditions.

Implementing circular strategies

The literature has examined the implementation of circular strategies in several levels. Circular economy strategy implementation requires efforts at the micro, meso, and macro level. At the micro level, Su and colleagues (2013) refer to cleaner production methods and ecodesign. At the meso level, the authors mention practices such as developing eco-industrial parks as well as a waste trading system. At the macro level, which they relate to a city or regional scale, Su and colleagues (2013, p. 217) refer to "more complex and extensive co-operative networks between industries and industrial parks from primary, secondary and tertiary sectors".

A significant part of research has focused on the implementation of a circular economy policy in China. Research indicates significant achievements and a promising future. However, challenges for successful implementation include "lack of reliable information, shortage of advanced technology, weak economic incentives, poor enforcement ability of legislation, poor leadership and management, lack of public awareness, and lack of a standard system for performance assessment" (Su, Heshmati, Geng, & Yu, 2013, p. 222). Furthermore, the Chinese experience in the development of eco-industrial parks indicates that key challenges refer to facilitating cooperation between firms along the value chain, therefore turning outputs into inputs to such an extent that a linear production system may be converted into a circular system (Mathews, Tan, & Hu, 2018). Indeed, while the development of circular supply chains within regional

industrial parks may be perceived as an advantage of Chinese policy in comparison with OECD countries, the main concern in China lies in "building effective network governance processes as circular resource flows are being created" (Mathews, Tan, & Hu, 2018, p. 176) in the country.

An additional barrier to promoting the development of eco-industrial parks refers to cooperation in developing technological solutions for them. Despite the fact that a number of businesses develop technologies according to their respective internal capabilities, the successful transition from industrial park to eco-industrial park calls for policies encouraging the development of technologies related to substitution, reuse, or recycling of raw materials, as well as energy and by-products. While the topic still deserves further research, how to encourage technological cooperation among businesses and industrial parks might benefit from a common platform for information sharing and communication among industrial parks (Zhu, Geng, Sarkis, & Lai, 2014).

A second research area concerns the assessment of the potential contribution of technological development to a circular economy beyond industrial parks. In this line, Garmulewicz and colleagues (2018) evaluate how a circular economy could benefit from three-dimensional (3D) printing by disrupting the existing materials value chain. While the authors conclude that 3D printing can be an enabler of a circular economy, a few obstacles should be considered. First, technological barriers include "the functional quality of 3D printed products, their high cost, and, in turn, the limited consumer demand for such recycled products" (Garmulewicz, Holweg, Veldhuis, & Yang, 2018, p. 122). Second, the main economic barriers refer to the demand for 3D printed products and to the cost of 3D printed in comparison with conventional products. Third, organizational barriers regard the availability of open data and hardware for knowledge and information sharing among different organizations. Finally, legislation and social obstacles might be overcome through regulatory incentives, since they are associated with the acceptance of recycled over virgin materials (Garmulewicz, Holweg, Veldhuis, & Yang, 2018).

A third research area focuses on the challenges to the implementation of circular strategies include the assessment of Extended Producer Responsibility (EPR) regulations. EPR has been partially effective in implementing some aspects of circular economy. However, research indicates that there is still need for effectively enforced "harmonized recycling standards for all recycling activities, whether financed under EPR or not" (Kunz, Mayers, & Wassenhove, 2018, p. 64). Taking into consideration that EPR has fallen short of encouraging manufacturers

to change their products' designs for easier recycling, Kunz et al. (2018) argue that EPR might benefit from differentiation of recycling costs. That is, rewarding producers for designs that enable easy and cheap recovery of material would lead to higher recovery of material from waste.

A fourth research area concerns circularity in value chains. Two empirical studies in Australia evaluate the implementation of circular strategies. The first one regards the Australian agri-food industry. Following the principles of industrial ecology, Pagotto and Halog (2015) offer a number of recommendations for policy makers. Firstly, they recommend the implementation of a sustainable resource management (SRM) for the entire Australian agri-food industry chain, meaning an integrated approach "that manages materials/resource life cycles aiming to achieve economic efficiency and environmental sustainability" (Pagotto & Halog, 2015, p. 1183). The implementation of an SRM would allow for the identification of inefficiencies in the production processes, "reducing production and waste management costs, increasing competitiveness and improving the producers' public image, once their products are produced in a sustainable way" (op. cit.). Moreover, Pagotto and Halog (2015) argue that the implementation of "integrated waste management, energy, and fertilizer production in large centralized (regional) units or smaller decentralized local units" (Pagotto & Halog, 2015, p. 1184) would help reduce the reliance of non-renewable energy in this particular industry, especially in subsectors concerned with food processing and dairy and meat products. With regard to bioenergy production, the authors suggest governmental incentives for the construction of biorefineries.

Another empirical study examines the role of the mining industry in a circular economy. Based on the case of Mount Morgan mine, in Australia, Lèbre and colleagues (2017) argue that processing mining waste is not sufficient to guarantee a desirable environmental outcome. Indeed, by coupling mineral extraction and acid mine drainage mitigation in a proactive way, a mining company might leave the mine site in a better condition, since it would incorporate environmental rehabilitation into the mining project's design. As for implementation tools, Kalmykova, Sadagopan, and Rosado (2018) propose a Circular Economy Strategies Database, including 45 strategies to be applied to different parts of the value chain. The second is a Circular Economy Implementation Database, including over 100 case studies of 35 of those 45 strategies. These are classified by scope (i.e., substance, material, product, sector, or system), strategy name, number, and part of the value chain, and

implementation level (meaning policy/planning/vision, research and development, knowledge and experience transfer, pilot scale, and market ready).

A fifth research area concerns industrial eco-parks and their evaluation. It is argued that the successful implementation of circular economy-related initiatives requires sound indicators for their evaluation. According to Su, Heshmati, Geng, and Yu (2013), these indicators are firm-specific. Therefore, a unified, standardized set of indicators might fail to capture the actual level of implementation of circular economy initiatives. At the meso level, China has developed different sets of indicators to evaluate the overall eco-efficiency of industrial parks. Different Chinese governmental agencies have different concerns. Therefore, the indicators implemented by these agencies cover distinct sets of dimensions. On the one hand, resource output rate, resource consumption rate, integrated resource utilization, and reduction rate in waste discharge. On the other, material reducing and recycling, economic development, pollution control and administration and management perspectives. At the macro level, indicators have yet to be developed, especially those that go beyond economic and environmental aspects and also comprise a social dimension (Zhu, Geng, Sarkis, & Lai, 2014).

Developing research on circular business models

Research has focused of the definition, and forms of circular business models. Nußholz (2017) proposes a new definition of a circular business model. Drawing on the resource efficiency and business model innovation perspectives, she defines a circular business model as "*how a company creates, captures, and delivers value with the value creation logic designed to improve resource efficiency through contributing to extending useful life of products and parts (e.g., through long-life design, repair and remanufacturing) and closing material loops"* (p. 12). The proposed definition attempts to clarify which resource efficiency strategies can be considered critical strategies for circular business models. Furthermore, it takes into consideration that product and material loops are frequently closed only within a larger value chain network. Thus, circular business models may give a relevant contribution to *"a value chain network that enables a circular strategy through coordinated business model innovation"* (p. 13). Underlying the idea of business model innovation is a circular strategy embedded in the firm's value proposition. The definition also attempts to underscore that firms *"should strive to take responsibility for closing material loops when the end-of-life is irreversibly*

reached and ensure that a gain in resource efficiency is achieved" (p. 13), regardless of where they are positioned in the value chain.

Several authors have crafted typologies of sustainable and circular business models based on different criteria. First, Esposito, Tse, and Soufani (2018) discuss Lacy and Rutqvist's (2015) proposition of five new business models designed according to circular economy principles. Second, Urbinati, Chiaroni, and Chiesa (2017) address the lack of a framework which clearly explains how organizations can create and/or adapt a business model by the development of a taxonomy of circular business models. This taxonomy builds on two major dimensions: customer value proposition and interface and value network, meaning interaction with suppliers and reorganization of internal activities. It identifies different degrees of circularity as adopted by firms in different industries. The third taxonomy aims to evaluate the effects or business models on true sustainability issues. Dyllick and Muff (2016) propose a three-stage typology of sustainable business models (SBM). SBMs range from Business Sustainability 1.0 – in reference to refined shareholder value management – to Business Sustainability 2.0 – with impacts measured based on the triple bottom line – to Business Sustainability 3.0 (True Sustainability). According to the authors, a truly sustainable business *"looks first at the external environment within which it operates and then asks itself what it can do to help overcome critical challenges that demand the resources and competencies it has at its disposal"* (Dyllick & Muff, 2016, p. 166). The conclude that that major sustainability issues cannot be solved by businesses alone.

Integrating circular business models with sustainable business models and value chains.

In addition to research on the path from sustainable to circular business models, we included in our pool of selected papers research that do not explicitly refer to circular business models. At any rate, these studies examine business models in light of concepts associated with circular economy, particularly sustainability and sustainable development. Based on four case studies, Geissdoerfer and colleagues (2018) propose a framework to integrate circular business models and supply chains towards sustainable development. Their framework explains how different circular business models drive circular supply chains in closing loops, slowing loops, intensifying loops, narrowing loops, and dematerialising loops.

Sustainability-oriented business model innovation can also be examined through the lens of a triple-layered business model canvas. As illustrated by the Nestlé Nespresso business model, this canvas tool allows for a visual representation of a

business model, which contributes to "developing and communicating a more holistic and integrated view of a business model; which also supports creatively innovating towards more sustainable business models" (Joyce & Paquin, 2016, p. 1474). The key contribution of triple-layered business model canvas is the fact that it allows for a triple bottom line perspective to sustainability, therefore including economic, environmental and social dimensions. The canvas integrates environmental and social canvas layers, which respectively stem from lifecycle and stakeholder perspectives, into an extended business model canvas that also includes the standard economic layer.

Circular business models: areas of implementation

Research suggests that most circular business models are predominantly implemented around waste. Focusing on waste as a useful commodity, Tse et al. (2018) argue that the use of underutilized resources might amount to a 10 billion-dollar property renting business, which could be created without the use of additional energy, metal, or other resources used to build houses. Furthermore, a business model based on circular economy principles might lead a company to increase its gross profit by 50% while reducing material use by 90%. This would be accomplished by recovering and remanufacturing used components. Also, the authors estimate that appropriate waste use might "turn around a country's underutilized biomass resources to tap into an $80 billion market for advanced chemicals and energy" (Esposito, Tse, & Soufani, 2018, p. 10). So as to develop a model that allows for leveraging the use of underutilized resources, three key drivers are proposed, namely resource constraints, technological development, and socioeconomic opportunity. By following such an approach, business models would be based on 'reincarnation' and efficiencies in product design, systems design, and the use of new materials. Research shows that most circular economy-related business initiatives focus on waste and recycling. It is argued that more advanced circular strategies would require significant social, institutional, and organizational changes that go well beyond these new business models and circular product deign (Bocken, Olivetti, Cullen, Potting, & Lifset, 2017).

Business models, new products and services

As seen above, significant area of research concerns production optimization and value chains. At the same time new areas of research focused on circular strategies focused on the relation between companies and customers are emerging. The first one concerns the nexus between business models and product design. Taking into account the challenges associated with circular business models and product

design, Bocken and colleagues (2016) develop a simple framework of business model and product design strategies to be simultaneously implemented. Circular design strategies aim to either slow or close resource loops, including designing long-life products (e.g., design for attachment and trust or for reliability and durability) and designing for product-life extension (e.g., design for ease of maintenance and repair or design for dis- and reassembly). The framework comprises six business model strategies, namely: (i) an access and performance model, defined as that which provides "the capability or services to satisfy user needs without needing to own physical products" (p. 313), such as car sharing; (ii) a product value extension model, defined as that which exploits residual value of products or collection of products between different businesses, such as product return initiatives (e.g., IKEA's Sell-Back Program); (iii) a classic long-life model, defined as that which focuses on delivering products with long life cycles; (iv) a sufficiency encouragement model, defined as that which actively seeks "to reduce end-user consumption through principles such as durability, upgradability, service, warranty and reparability, and a non-consumerist approach to marketing and sales (e.g., no sales commissions)" (op. cit.); (v) a resource value extension model, defined as that which exploits the residual value of resources, thus giving new forms of value to otherwise 'wasted' materials; and (vi) an industrial symbiosis model, defined as "[a] process-orientated solution, concerned with using residual outputs from one process as feedstock for another process, which benefits from geographical proximity of businesses" (op. cit.), such as eco-industrial parks.

The second area concerns sharing economy. Sharing economy, which has recently emerged as a disruptive approach to traditional business models, is one of the circular strategies examined in our research. Drawing on a multi-year research program, Muñoz and Cohen (2018) propose the Sharing Business Model Compass, an actionable framework and generative tool that allows "entrepreneurs, investors, incubators, and incumbents interested in entering the sharing economy to create, present, and evolve a compelling sharing business model as well as evaluate its extent of robustness" (Muñoz & Cohen, 2018, p. 114). The authors have compiled illustrative evidence of applications of the Compass on the website sharingcompass.com, which includes cases in countries as diverse as Australia, Brazil, Canada, Germany, and Indonesia (Muñoz & Cohen, 2018).

A third area of research concerns business models related to reuse. As said, research indicates that the main source of economic value from circular economy to a business organization is achieved through recycling, whereas the reuse principle seems to be underutilized as a source of economic value. As for the

reduce principle, examined business models include a kind of take-back system to acquire waste suitable for recycling. Research also demonstrates that either the take-back service or the sold products made from recycled materials were closely related to an existing business (Ranta, Aarikka-Stenroos, & Mäkinen, 2018).

The fourth research area concerns market acceptance and customer behavior. One key issue in the transition towards a circular business models lies in particularly in value propositions for a business to consumer scenario (Lieder, Asif, Rashid, Mihelic, & Kotnik, 2018). Indeed, Gullstrand Edbring et al. (2016) demonstrate that consumer behavior in the Swedish furniture industry varies greatly according to consumption models and product groups. Buying second-hand furniture and short-term renting are favored over long-term renting. In turn, collaborative consumption has higher comsumer acceptance for seldom-used products.

A last and fifth research area concerns the social orientation of circular business models. Both multinational enterprises and small- and medium-sized firms are increasingly interested in the potential benefits of the circular economy and are therefore beginning to explore different business models. However, business models have been mostly concerned with the technological aspects of sustainable business models (Schroeder, Anggraeni, & Weber, 2018). More socially-oriented business models and practices, such as *"ethical trade, consumer education to reduce unsustainable consumption, and sufficiency-driven business"* (p. 3), have not been included among the core elements of circular business models. Indeed, the main enabling factor for these business models has been *"an environmentally conscious corporate culture including management and staff"* (p. 4).

Circular economy, organizations, and management research

The notion of a circular economy holds the promise of a paradigm shift, but how to translate the promise into achievable and effective action still requires further research. As this literature review demonstrates, organizational and management research has been relatively silent on the circular economy concept and on the challenges for its successful implementation.

Management scholarship can give a valuable contribution to its development. In times of disruptive change, management usually thrives on knowledge from other fields, as it has done since its early developments as a discipline. Emerging theories

and approaches from sustainability research might shed light on concepts key to the development of a circular economy. For example, an intergenerational perspective (Wade-Benzoni, 1999), which implies a move away from organization-centered systems thinking, can potentially alter the conceptualization of economic interests and help expand circular economy's main drivers.

We propose several research areas. First, research on temporality can also give a meaningful contribution to circular economy thinking and implementation. For instance, the idea of a long-present (Kim, Bansal, & Haugh, forthcoming) as opposed to the present as a point in time might be very useful in the development of circular economy initiatives. Indeed, this research demonstrates the value of incremental changes towards the future when trade-offs between a desired present and a bright future were expected. All in all, the paradigm shift will not happen overnight through massive disruptive innovations, but rather through consistent incremental actions. A shift towards a circular economy requires the gradual development of circular systems around given value chains. Collectively, these various systems might help us get closer to an ideal circular economy.

In line with this research, Ferraro, Etzion, and Gehman's (2015) study on how to tackle grand challenges through robust action suggests a closer look at the construct of time. First, the authors define grand challenges as very complex problems, characterized by several interactions and associations and nonlinear dynamics; these problems are difficult (if not impossible) to forecast; and they implicate multiple criteria of worth, meaning that these problems may be interpreted differently by the several actors involved. Grand challenges affect large populations and their impacts transcend a single organization or even a single community.

Moreover, Ferraro, Etzion, and Gehman (2015) discuss three different yet complimentary robust action strategies. These strategies do not offer definitive solutions to grand challenges. Rather, underlying these strategies is the notion of long-term, sustainable engagement around a series of incremental actions. Ferraro and colleagues' (2015) theoretical model of robust action strategies also suggests a present longer than it is usually perceived. That is, three complimentary strategies (participatory architecture, multivocal inscription, and distributed experimentation) encompass a series of actions. This series of actions would form a cycle that might be perceived as pertaining to a long present. Then another cycle would follow and so on.

The integration of the long present concept with robust action strategies suggests that actions be designed, monitored, and evaluated in light of these notions. That is, effectiveness should not be measured according to metrics that reflect a point in time. Also, effectiveness should mirror multiple accounts of worth, so that the different actors perceive value in the actions.

These insights might inform empirical research on circular economy. One such grand challenge are the limited natural resources, a challenge involving governments, businesses, non-governmental organizations, and the society at large. This grand challenge encompasses not a problem, but a complex set of problems to which there is no single solution. The concept of robust action might help assess the effectiveness of circular economy-related initiatives.

Conclusions

This research examined the circular economy concept, its assumptions, and practices from an organizational and managerial perspective. This systematic literature review, comprising studies from 2010 to 2018, assessed how the concept translates into organizational strategy, business models, and practice as well as the roles played by organizations in its implementation. Also, we examined how opportunities and challenges are addressed in the implementation of circular strategies and business models.

Our study reviewed the potential of the circular economy concept and how it holds the promise of a paradigm shift. Nonetheless, despite businesses' increasing interest in the topic, how to translate the promise into achievable and effective action still requires further research. Organizational and management research has been relatively silent on this promising concept as well as on the challenges to its successful implementation.

Future organizational and management research on circular economy can include topics such as the roles of different types of organizations involved in circular economy initiatives. Corporate Social Responsibility in general and Political Corporate Social Responsibility in particular might inform research on the roles of governmental organizations, businesses, and non-profit organizations, without which institutional policies might not fully accomplish their objectives. Furthermore, Corporate Social Responsibility might contribute to the development of the social dimension missing in circular economy thinking, thus moving beyond job creation. Lastly, the theoretical and practical development of

circular economy calls for more empirical research that critically appraises successes and failures of circular economy implementation.

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Figure 1. Selected journals in alphabetical order

Publication Title
Academy of Management Journal
Academy of Management Review
Accounting Review
Accounting, Organizations and Society
Administrative Science Quarterly
American Economic Review
California Management Review
Contemporary Accounting Research
Ecological Economics
Econometrica
Energy Policy
Entrepreneurship Theory and Practice
Environment: Science and Policy for Sustainable Development
Environmental Development
Global Environmental Change
Harvard Business Review
Human Relations
Human Resource Management
Information Systems Research
International Journal of Production Research
Journal of Accounting and Economics
Journal of Accounting Research
Journal of Applied Psychology
Journal of Business Ethics
Journal of Business Venturing
Journal of Cleaner Production
Journal of Consumer Psychology
Journal of Consumer Research
Journal of Finance
Journal of Financial and Quantitative Analysis
Journal of Financial Economics
Journal of Industrial and Production Engineering
Journal of Industrial Ecology
Journal of International Business Studies
Journal of Management
Journal of Management Information Systems
Journal of Management Studies
Journal of Marketing
Journal of Marketing Research
Journal of Operations Management
Journal of Political Economy
Journal of the Academy of Marketing Science
Management Science
Manufacturing & Service Operations Management
Marketing Science
MIS Quarterly
MIT Sloan Management Review
Operations Research
Organization Science
Organization Studies
Organizational Behavior and Human Decision Processes
Production and Operations Management
Quarterly Journal of Economics
Renewable and Sustainable Energy Reviews
Research Policy
Resources, Conservation and Recycling
Review of Accounting Studies
Review of Economic Studies
Review of Finance
Review of Financial Studies
Strategic Entrepreneurship Journal
Strategic Management Journal
Sustainability
Sustainability Science

Figure 2. Selected studies and corresponding publication outlets

Database	Publication Title	Total
ABI/INFORM Collection	California Management Review	**9**
ABI/INFORM Collection	International Journal of Production Research	**3**
ABI/INFORM Collection	Journal of Business Ethics	**2**
ABI/INFORM Collection	Journal of Industrial Ecology	**15**
ABI/INFORM Collection	Journal of Management Information Systems	**1**
ABI/INFORM Collection	Journal of Marketing Research	**1**
ABI/INFORM Collection	Journal of the Academy of Marketing Science	**1**
ABI/INFORM Collection	MIS Quarterly	**1**
ABI/INFORM Collection	MIT Sloan Management Review	**2**
ABI/INFORM Collection	Sustainability Science	**3**
EBSCO Academic Search Complete	Journal of Cleaner Production	**41**
Science Direct	Ecological Economics	**4**
Science Direct	Environmental Development	**1**
Science Direct	Journal of Industrial and Production Engineering	**1**
Science Direct	Renewable and Sustainable Energy Reviews	**1**
Science Direct	Resources, Conservation and Recycling	**2**
Science Direct	Sustainability	**1**
Total		**89**

Configuring new business models for circular economy

From patterns and design options to action

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Abstract

This article introduces the 'dynamic circular economy-driven business model configurator', which aims to guide companies in sensing opportunities and seizing/designing business model concepts for circular economy. The configurator is based on patterns and design options consolidated from theory, retrospective case analysis, and action research with five manufacturing companies.

Keywords

Business model innovation, circular economy, business model configurator, business model pattern, action research

Introduction

Often seen as a means to achieving sustainability, circular economy (CE) is gaining importance in the agenda of government, companies, investors and the civil society. CE aims to establish a resource effective and efficient economic system (Geissdoerfer et al., 2017a) by intentionally narrowing, slowing and 'ideally' closing materials and energy flows (Bocken et al., 2016; EMF, 2015).

From an organizational perspective, building capabilities for CE requires not only

technological or product innovation, but systemic value innovation with the configuration of new business models (BM) in fit with CE principles (Schulte, 2013). Designing and implementing these new BMs is challenging, as companies need to dare and discover how to break the incumbent 'industry recipes' (Matthyssens et al., 2006) or 'rules of the game' (Teece, 2010) impregnated with the linear (i.e. take-make-dispose) mental model.

Using the lens of dynamic capabilities (Matthyssens, 2019; Teece, 2017), Pieroni et al. (2019) suggests three stages to guide companies in breaking the linear 'industrial recipes' through CE-driven BM innovation. These are: (i) *sensing and making sense* of CE opportunities in the ecosystem, (ii) *seizing* the opportunities by designing new CE-oriented value generation architectures (i.e. CE-oriented BM concepts), and (iii) *transforming/renewing* operational capabilities accordingly to implement the CE-oriented BMs. The first stage of *sensing and making sense* of CE opportunities requires decision-makers in the companies to "recognize internal beliefs", "identify the need to learn about CE", "question linear assumptions" and adopt an "explorative attitude through *external sources*" (Pieroni et al. (submitted)).

The external sources to help the organizations are many, as different approaches on how to innovate BMs for CE are already available in academia/practice (Pieroni et al., 2019). The majority of conceptual frameworks for CE-oriented BMI are typologies and taxonomies (Accenture, 2014; Bakker et al., 2014; Bocken et al., 2016; BSI, 2017; Diaz Lopez et al., 2019; Forum for the Future and Unilever, 2016; Lacy et al., 2013; Lüdeke-Freund et al., 2019; Nussholz, 2017; Planing, 2018; Weetman, 2016; WRAP, 2018), which explain potential mechanisms or solutions (i.e. the new CE-driven 'recipes') for designing CE-oriented BMs. Additionally, inspirational cases of companies embracing the CE principles are flourishing. Despite this aforementioned diversity in intellectual content, a question that still remains is how to transfer this conceptual knowledge/learnings to the real world practice in an effective and useful approach?

First, some work is necessary to establish consensus on terminologies (Pieroni et al., 2019). Additionally, improvements are required to explore the full potential and possibilities of BM configurations to embed CE-oriented strategies (Pieroni et al., 2018). Lastly, companies deciding to perform CE-driven BMI ask for more specific, simple and 'digested' version of the 'external content/knowledge' to *make sense* of which type of CE-oriented BM would work for their context.

The aim of this research is to create a link between available conceptual knowledge and action. This article introduces the *dynamic CE-driven business model configurator,* which intends to guide companies in sensing and making sense of CE opportunities and seizing or designing CE-oriented BMs with systemic value concepts. Based on CE-oriented BM patterns consolidated from reviewing theory and practice (i.e. with retrospective analysis of more than 150 cases) and action research cycles with manufacturing companies, a prototype of the configurator (i.e. an Excel tool that generates content for a printed collection of patterns, design options and frameworks) was proposed and preliminarily tested in three companies from three industrial sectors.

The next three sections explain the research method applied to build the configurator, present the configurator logic and discusses initial application with manufacturing companies, and conclude with remarks about expected results, limitations and future research.

Research method

The development of the dynamic CE-driven BM configurator followed a hypothetic-deductive approach (Gill and Johnson, 2002), including cycles of theory development followed by empirical development and testing (Fig. 1).

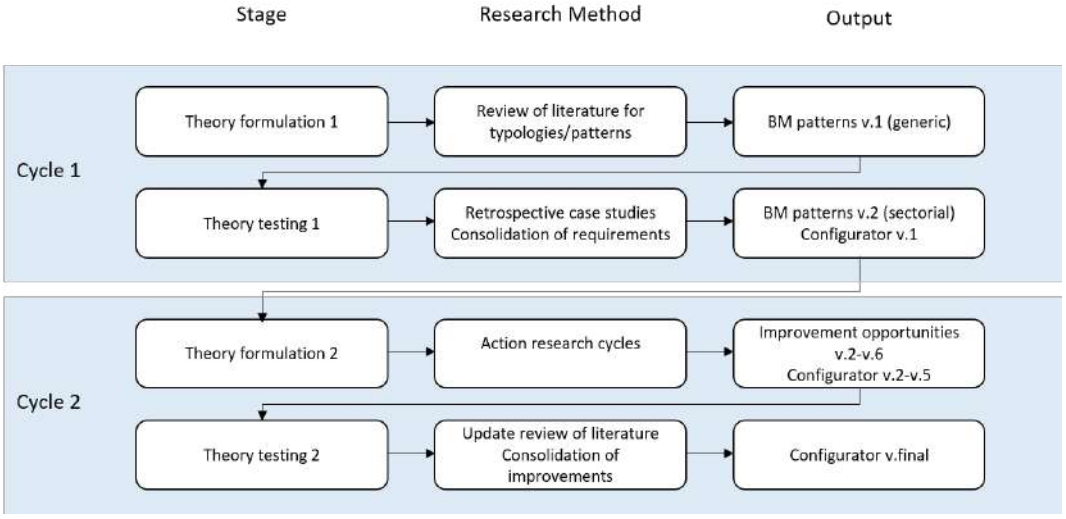

Fig. 1- Research method.

Cycle 1

Existing conceptual patterns (i.e. archetypes, types, typologies, strategies) of BMs for CE were identified from a previous literature review study (in Pieroni et al. (2019)). By applying content analysis (Dresch et al., 2015), the patterns were

compared, consolidated and categorized in two clusters: (i) upstream and (ii) downstream (Urbinati et al., 2017). Due to the complexity of CE, spanning the boundaries of single organizations, the patterns within each of the aforementioned clusters were further categorized based on Amshoff et al. (2015), who suggest that patterns affect different hierarchical levels. Two sub-clusters were introduced: prototypical (i.e. describing the logic of an industry or role of actors in the value chain) and solution patterns (i.e. describing building blocks or elements of one BM) (AMSHOFF et al., 2015).

Afterwards, retrospective case studies were conducted to add a contextual perspective and provide insights about potential sectorial particularities (Wells, 2016). Grey literature was reviewed to identify existing cases of companies that have adopted CE-oriented BMs. The cases were selected from secondary sources – i.e. knowledge databases on CE developed by international organizations (Ellen MacArthur Foundation and the Knowledge Hub developed by Circle Economy). Primary source - i.e. companies websites and public reports – were checked for additional information when necessary. The selected cases followed two criteria: (i) explicitly present examples of new BMs for CE; and (ii) from specific industry sectors: electronics, capital goods, textile, furniture, medical devices, and food.

The analysis of the cases, for extraction of patterns, followed the same aforementioned procedure, adding one more category, i.e., industry sector. The patterns emerging from the retrospective case analysis served the purpose of testing the validity of the generic patterns emerging from literature. Additionally, the sectorial patterns contributed to expanding or adding particularities for the breadth of patterns (typology) and for the logic of patterns combination (taxonomy/morphology).

Lastly, information about possible BM design options associated with the different patterns and their combinations were extracted and categorized according to BM elements: systemic outcomes/potential for CE (economic, resource decoupling, and secondary environmental or social effects); value proposition statement; offering (products/services); customers; value/benefits for customers; network; value/benefits for network; upstream or delivery capabilities; downstream or creation capabilities; revenue mechanisms; costs; and financial model. These twelve elements were adapted from previously developed BM frameworks (Biloslavo et al., 2018; Kraaijenhagen et al., 2016), which build on the ‘value concept’ largely disseminated in BM literature/industries (Osterwalder and Pigneur, 2010; Richardson, 2008).

The outputs of Cycle 1 were used as foundations to create a conceptual framework or initial version of the dynamic CE-driven BM configurator to be refined/validated in practice in Cycle 2. The configurator was inspired by previous works (Barquet et al., 2013; Hellek et al., 2013) that applied similar approach from Design Sciences to propose practical tools able to support BMs' design during the development of product-service systems.

Cycle 2

Action research (AR) cycles were carried out in five manufacturing companies from three sectors (i) capital goods, (ii) electronics, and (iii) furniture sectors. AR is a form of applied research that combines scientific methods with organizational knowledge and involves the active collaboration of researchers and companies' members to propose solutions to real organizational problems while building theory in practice (Coughlan and Coghlan, 2002; Goedkoop et al., 1999; Mathiassen, 2017). The cycles of AR were carried out from February 2018 to February 2019. After each AR cycle, improvement opportunities for the configurator were identified and considered for changing the configurator throughout cycles, generating different versions (e.g. v1, v2…vfinal). In parallel to these AR cycles, new theoretical relevant scientific articles emerging from literature after we had already started the AR cycles were collected and considered for expanding or also validating the configurator´s 'backbone' (e.g. the sustainable or CE BM patterns taxonomy documented in Lüdeke-Freund et al. (2018) and Lüdeke-Freund et al. (2019)). The output of Cycle 2 was the final version of the configurator with sector-specific recommendations for the capital goods, electronics, and furniture sectors.

Preliminary Results

The dynamic CE-driven BM configurator

The *dynamic CE-driven BM configurator* is structured in three modules: (1) identification of opportunities, (2) configuration of BM ideas, and (3) configuration of BM concepts. Each module of the configurator is supported by specific conceptual frameworks (Fig.2).

The first module is supported by typologies of CE-oriented patterns for upstream and downstream BM architecture and including both generic and sectorial particularities. The second module is supported by a taxonomy with potential combinations of patterns, i.e., based on sectorial case studies. The third module is

supported by a morphologic box organizing the design options according to the specific BM patterns. The application of each module is explained next.

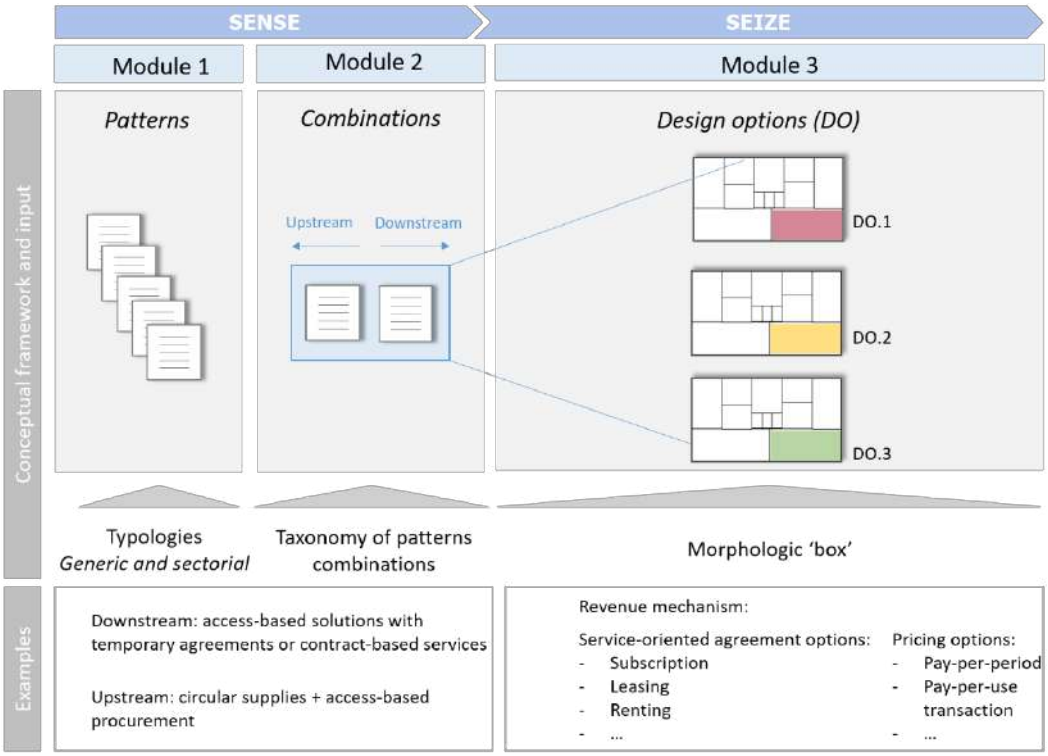

Fig. 2- Foundations of the CE-driven BM configurator.

Module 1 – Identification of opportunities of BMs for CE

This module involves an analysis of the current BM in terms of CE strategies (i.e. which linear and circular characteristics/patterns are present).

Moreover, change drivers that can lead to opportunities or restrictions for developing CE-oriented BMs are investigated, with the support of a structured checklist covering trends in (1) market, (2) collaboration and value network, and (3) macro-factors following a PESTEL (political, environmental, social, technological, economic and legal) analysis.

Lastly, several BM opportunities or possibilities of BM patterns (i.e. generic mechanisms or solutions for designing CE-oriented BM (Lüdeke-Freund et al., 2019; Remane et al., 2017) – see Fig. 2) with case studies examples are available to support companies in ideating about what would be the most adequate for their context. The configurator also provides guidance on the selection of adequate patterns suggesting promising alternatives that relate with the input of opportunities or restrictions.

Module 2 – Configuration of CE-oriented BM ideas

Inspired by the value innovation literature (Matthyssens, 2019), we define CE-oriented BM ideas as specific mechanisms for CE-oriented BM innovation adapted/specified to each company's context, usually adding information that is not generalizable – e.g. customers; value proposition – and triggering a deeper questioning of existing frames. CE-oriented BM ideas can be understood as combinations of patterns (previously identified in Module 1) specified for a particular organizational context. The combination of BM patterns to configure/create BM ideas occurs in two steps by asking the questions:

(i) 'What will the company offer?' - aiming to capture patterns related to the downstream part of the BM.

(ii) 'How will that be offered?' – aiming to explore patterns for the upstream part of the BM.

After combining patterns in different potential BM ideas/configurations (downstream and upstream), the configurator provides a 'benchmarking' or 'estimation' of potential benefits (i.e. systemic benefits for economy, environment and society, plus benefits for customers assembled from case studies) to support companies in making a prioritization or decision of which BMs to detail further.

Module 3 – Configuration of CE-oriented BM concepts

The third module involves two steps. First the prioritized CE-oriented BM ideas are transformed into solution principles with initial value proposition concepts. This involves: indicating key stakeholders that could benefit from the BM idea, describing 'what would the stakeholders get' (i.e. implicit promise) with the BM idea, and consolidating/confirming the potential benefits/values for the stakeholders and for the aspects of CE and sustainability (e.g. economic, resource decoupling, or secondary environmental/social effects).

As a second step, the configurator suggests design options (i.e. available options or attributes for designing the elements of the BM (Lüdeke-Freund et al., 2019), e.g., 'pay-per-use') to configure all twelve elements of the BM. Moreover, it highlights the potential differences in configurations, providing information about cases that can support the discussion and decision/choice. The final deliverables of this module are BM concepts, which are representations that enable

articulating the complete logic of how the new/reconfigured CE-oriented BM will work (Lay et al., 2009). Differently than Amshoff et al. (2015), the BM concepts generated by this configurator are more specific and closer to the context of the companies, because of the sectorial logic of the patterns. However, a further stage of assessment and detailing (customization) are important, as explained in the conclusions.

Application of the configurator in manufacturing companies

For the initial application, the configurator was structured in Excel. Future versions envision the utilization of more dynamic software. The Excel version of the configurator was used as a supporting tool for the application in the five manufacturing companies, generating information to populate more interactive frameworks (e.g. a collection of printed patterns or design options in the format of cards, printed frameworks for combination of patterns or visualization of the BM concept) that are more suitable for groups' discussion.

Modules 1/2 and 3 occurred in two separate workshops, lasting approximately 6h each and involving participants with diverse skills and expertise, e.g. marketing/sales, services/product development, after sales/customer services, operations, corporate social responsibility, IT, business strategy and finance. Representatives from the company leadership or top management participated in all workshops. The number of participants varied from three to ten, according to the company size.

Based on the results obtained in each AR cycle (Table 1 and Fig. 4), there is a strong indication that the configurator is useful to facilitate fast ideation and simulation sessions of CE-driven BM innovation, providing knowledge about CE from external sources in an interactive and focused process.

The feedback provided by individual participants were also positive to the usefulness of the configurator. Participants mentioned that the configurator "made the process easier" and "has clarified and confirmed many choices that have been based on assumptions earlier". Moreover, according to their opinion, strengths or differentials of the configurator are: "the use of examples from different industries to stimulate ideation", "interesting/great to see more/different cases/examples of companies experimenting with circular BMs and the information of what works and trade-offs, also showing cases of discontinuation of initiatives".

However, improvements related to the usability of the configurator were suggested. Some of these were incorporated along the AR cycles, producing positive effects in the usability as illustrated in Fig. 4 and also with the increased efficiency in the transformation of BM ideas into BM concepts (Table 1).

Table 1 – Results obtained with the application of the configurator in the action research (AR). Legend: BM- business model.

AR# *Sector*	**CE-oriented BM ideas** *Modules 1 and 2*	**CE-oriented BM concepts** *Module 3*
01 *Electronics*	68	4
02 *Capital goods*	31	3
03 *Furniture*	10	8
04 *Electronics*	19	8
05 *Furniture*	4	4

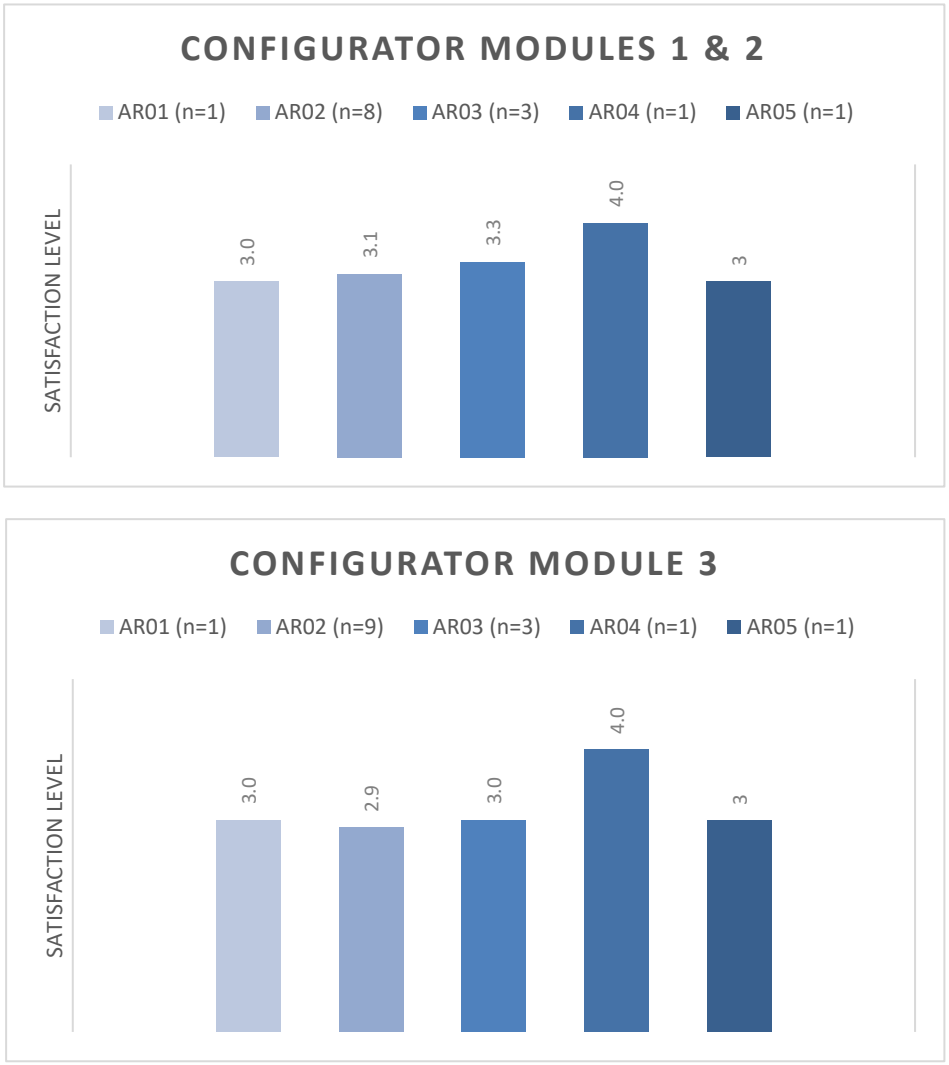

Fig. 3 - Feedback provided by individual participants in each action research (AR) according to the configurator modules (Legend - Scores: 1 = Unsatisfactory; 2 = Needs improvement; 3 = Satisfactory; 4 = Very satisfactory/ n = participants).

Final considerations about usefulness

The configurator is a planning tool suited for the very early stage of when manufacturing companies decide to move towards circular economy. Its purpose is to trigger change of mindset towards CE by acting around the dynamic capabilities concept (individual managerial and organizational skills). As mentioned in the introduction, CE will require 'breaking industry recipes' and consequently the silo/organizational-centric view. However, we understand that this require parsimony to increase awareness and change the organization capabilities while respecting and convincing people. Hence, the configurator starts

with the organizational-centric approach (e.g. using BM frameworks that are inheritances from linear economic logic or having one company leading the process), but it leads the companies to gradually realize the importance of collaborations and the organizational or ecosystem view for CE. For instance, one of the patterns' category for the 'upstream' is called 'collaborate to close the loop', and they contain several ways or actors being created in the value chains of specific industries (or cross industries) to guarantee the circularity of products and materials. In our view and also in accordance to recent research (Perey et al., 2018), some actor(s) in the value chain have to take the lead and start thinking about CE first internally, then absorb the concepts, and then lead the initiatives that will definitely occur collaboratively. The configurator wants to incentivize more of those individual actors acting in the position of manufacturers to change their perspectives and way of operating and inevitably influence others. From the preliminary applications, we noticed a positive uptake of this logic, as all five companies realized the importance of partnerships and necessary changes in the value chain either because they lacked the capabilities required for CE or to justify the investments for establishing reverse flows. Therefore, the companies proceeded with this investigation of how to collaborate and promote changes in the value chain based on their planned BM concepts, but using other methodologies.

Conclusions

To answer to the question - how to transfer conceptual knowledge and learnings about CE-driven BMI to the real world practice in an effective and useful approach - this article introduces the *dynamic CE-driven BM configurator.* The configurator was built from CE-driven BM patterns consolidated from reviewing theory and practice (i.e. with retrospective analysis of more than 150 case studies for BMs), followed by action research cycles with manufacturing companies in electronics, capital goods and furniture.

This managerial tool intends to guide decision-makers in companies with sensing and making sense of CE opportunities and seizing or designing CE-oriented BMs with systemic value concepts.

This research contributes to the academic community and the New Business Models conference by building knowledge in the intersection of CE and new BMs/ BM innovation literature, envisioning both academic and practitioner perspectives. Moreover, the logic of the configurator could be expanded to fit

other applications/drivers of BMI (e.g. servitisation, digitization). This work will also largely benefit companies that are planning to engage in CE and need to define where and how to start with fast modelling and simulations of scenarios of different CE-oriented BM concepts.

Some limitations or challenges of this research are related to the nature of the literature review techniques (i.e. snowballing and grey literature reviews) and retrospective case studies (i.e. based mainly on content analysis of primary and secondary sources of information), potentially leading to selection bias. Moreover, inclined to create a tool that will be understood and practically applied by companies, the configurator still rely on some well-known concepts of linear economic dynamics (e.g. using BM frameworks that are inheritances of linear economic logic or having one company leading the process), which might mislead some users in underestimating the complexity/dimension of changes required for linear economy. Furthermore, the configurator still requires further development to cope with requirements appointed by the companies and empirical verification.

Future research to address those challenges envisions:

(i) the inclusion of a 'module 4', to enable the assessment of customer value potential (qualitative), economic potential (quantitative), resource decoupling potential (quantitative), and potential secondary effects on environmental or social aspects for BM concepts;

(ii) transferring the configurator to a more flexible/dynamic software (ideally online tool);

(iii) adjusting the level of information in the design options (more concise/abstract);

(iv) refining the logic of suggestion of patterns configurations;

(v) conducting new AR cycles for expanding the coverage of industrial sectors (food, medical devices and textile);

(vi) testing the final versions of the configurator by consulting specialists from academia and practice;

(vii) conducting case studies with a broader group of manufacturing companies in different organizational contexts.

Funding and acknowledgements

This paper is one of the outcomes of the research project CIRCit (Circular Economy Integration in the Nordic Industry for Enhanced Sustainability and Competitiveness), which is part of the Nordic Green Growth Research and Innovation Programme (grant numbers: 83144) and jointly funded by NordForsk, Nordic Energy Research, and Nordic Innovation. The authors would like to thank the CIRCit consortium - Research Institutes of Sweden (RISE), Technology Industries Finland, Innovation Center Iceland, Norwegian University of Science and Technology (NTNU) and colleagues from the Technical University of Denmark – for facilitating the engagement with companies and participating in enriching discussions about Circular Economy. We are particularly grateful for the technical support received from Eivind Kristoffersen, Mariia Kravchenko and Fenna Blomsma in the action research cycles. Special thanks goes to the participating companies and their engaged collaborators for the opportunity and close cooperation that made this research possible. Lastly, we thank the anonymous reviewers for their suggestions and considerations.

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Could Circular Business Models Provide a Solution for E-waste?

Insights from a Refrigerator Recycling Company

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Extended abstract

Introduction

A growing number of companies have begun to include the concept of sustainability in their strategy consideration. Business model innovation looks at how organizations create and capture value at every stage of an offering's journey to market (Geissdoerfer, Vladimirova and Evans, 2018). The low-level of integration that organizations have achieved between the business model innovation concept with sustainability is mainly due to sustainability being treated as an add-on rather than as a core source of value (Yang, Vladimirova and Evans, 2017). Additionally, the lack of documented case studies makes it challenging for firms to understand how to innovate business models and identify alternatives that integrate sustainability (Barquet *et al.*, 2016).

Fast global development has brought along a set of new opportunities for Sustainable Business Model Innovation (Prendeville and Bocken, 2017). A way to approach unexplored possibilities through lifecycle thinking of product-service offerings is broken down into Beginning of Life (BOL), Middle of Life (MOL) and End of Life (EOL) (Yang *et al.*, 2017). In today's literature we find EOL Management

as a commonly presented challenge. Many manufacturers miss opportunities to create and capture value while products are in use or at the end of the life cycle, when they are recycled or discarded (Yang, Vladimirova and Evans, 2017). One reason is the vision of recycling as the go-to option and a lack of exploration of value uncaptured from used products (Yoon and Jang, 2006; Lee, Cooper and Hicks, 2010; Tong, Tao and Lifset, 2018).

This study aims to explore the business possibilities of value uncaptured during the lifecycle stages of refrigerators. The main question lies on how can circular business models support the creation of sustainable solutions for end-of-life refrigerators. The authors expect that the results of this study would find additional value to mere recycling of components through the creation of circular business models. The methodology we followed is a single-case study (Yin, 2018) based on a recycling company through the utilisation of the Sustainable Value Analysis Tool for Value Creation, which allows to identify value uncaptured at each lifecycle stage (Yang et al., 2014). The Sustainable Value Analysis Tool for value creation was selected versus other tools due to its focus on transforming uncaptured value into sustainable value opportunities across the full life of a product. The previous use of this tool has helped a range of organizations to discover value opportunities both internally and externally.

State of Practice

E-waste is one of the fastest growing streams of global waste. The production of large quantities of e-waste is a consequence of increased global consumption of electronic products, and an outcome to technological products obsolescence caused by fast-paced new technology developments (Widmer *et al.*, 2005). Refrigerators fall under the definition of e-waste, meaning that their treatment must follow the Waste Electrical & Electronic (WEEE) regulations from EU (European Parliament and the and he Council Of The European Union, 2012).

Today's society is highly dependent on refrigerators which are ubiquitous for their various applications. The refrigerator sector has proved to grow steadily due to digitalization of their offerings and innovative technologies are now incorporated to this electric appliance (Deng, Wen and Zhao, 2008). Some companies have found and created a business case out of the management of EOL of these products. However, current documented solutions are limited to the recycling of individual refrigerator components.

The recycling process begins with material separation. The component which retains the highest value is the refrigerators compressor due to a high constitution of copper. The retrieval and recycling of the copper represents a labour-intensive activity, which has led European recycling companies to export the compressors to other countries. This situation has created a growing market for scrap-copper. This process brings along undesired implications related to social aspects such as uncertainty in regulations for the strenuous labour required, and to environmental aspects as uncertainty in the appropriate handling of hazardous components and substances. These two elements contribute to the urgent call for a more sustainable long-term solution. (Streicher-Porte and Geering, 2010).

Theoretical Background

Literature identified under the concepts of "e-waste", "business models" and "circular economy" has provided interesting insights on the challenges faced by previous studies on e-waste management. These challenges are mainly related to the allocation of business cases and the high level of complexity caused by data uncertainty within supply chains, which relates to quantity, quality and timing of production inputs (Bressanelli, Perona and Saccani, 2018).

Recent contributions suggest that the lack of efficient collection and appropriate recycling infrastructure is one of the major challenges for closed-loop material cycles (Yoon and Jang, 2006). Documented cases have referred to vacuum cleaners, desktop computers, computer hard-disk drives, components in vehicles among others (Parajuly *et al.*, 2016). A general conclusion in these cases is the understanding that any EOL product regarded as e-waste is not carefully handled, which reduces the possibility to identify and extract any remaining value by the time it reaches recycling facilities (Ghodrat *et al.*, 2016). Previous case studies have shown that not many manufacturing companies have considered value at the EOL (Yang, Vladimirova and Evans, 2017). Further research has been suggested around the connection of product's value losses to design features and understanding relationships between non-efficient separation and commonly used materials (Sousa-Zomer et al., 2018). However, there is still a gap in knowledge that helps companies evaluate solutions from life-cycle thinking to understanding and capturing value through circular business models (Jiao, 2017).

Methodology

Although industry and academia have shown growing interest in the integration of sustainability goal-supporting activities and design into their business approach, there is still a lack of understating around the allocation of industrial problems into sustainable solutions. In this study, the authors explore alternative possibilities for the treatment of EOL refrigerators, which would allow to capture potentially unconsidered value. This attempt draws its sight to a circular business model as a means of creating balance between the three main sustainability pillars (economic, social and environmental aspects) (Nußholz, 2017).

This research draws upon a single-case study (Yin, 2018) approach with a recycling company. Our methodology includes a review and establishment of state-of-the art for value identification in waste-considered products. Also, empirical research is suggested through semi-structured interviews and workshop sessions which will be executed with members from a recycling company, refrigerator manufacturing companies, and EOL retrieval and handling companies.

This will provide the possibility to perform value-mapping activities with the Sustainable Value Analysis Tool that allows cross-area stakeholders to understand and identify the magnitude of the current situation along with potential solutions (Yang, Vladimirova and Evans, 2017). This tool was selected due to the possibility that it offers to embed sustainability concerns in manufacturer's offerings, EOL in particular (Yang *et al.*, 2014)

Expected results

Through the application of the Sustainable Value Analysis Tool for Value creation in the industrial problem of refrigerator recycling, researchers will provide the company with a new set of value opportunities in the BOL, MOL and EOL of refrigerators. In future research we will explore the development of circular business models to help capture value opportunities in the EOL. This study generates implications for both research and practice, and aims to cover the gap between research-based tools that identify value and companies who face this type of challenges in their operations, through the development of circular business models.

Conclusions

This study presents an industrial challenge and establishes that a sustainability-based solution could be provided to the refrigerator recycling industry through the exploration of value through the complete lifecycle of the product. We suggest the application of the Sustainable Value Analysis Tool for Value creation. The further development of this exploratory study will evolve into a conceptual circular business model that allows the replicability of this case into similar challenges across different industrial sectors.

Acknowledgements

This work is funded by H2020 TRUST (Twinning for industrial sustainability) and VINNOVA (Swedish Agency for Innovation Systems). This work has been carried out within the Sustainable Production Initiative and the Production Area of Advance at Chalmers University of Technology. The support is gratefully acknowledged.

Keywords

Circular Business Models, E-waste Management, EOL Management, Refrigerator Recycling

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Creating Value from Waste

Lessons Learned for Circular Innovation Networks

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Abstract

In a circular economy, organizations search for business models that aim for product's longevity and closing material loops. For this, radical and systemic innovation is needed, on a technical level as well as on business level. Although technologies are promising, the rate of successful initiatives is relatively low. Organizations struggle with developing profitable business cases for these valuable products based on raw materials out of 'waste streams'. First they need to identify residual flows and then search for profitable sales channels. We explored obstacles and challenges that organizations encounter, while developing these innovative circular products and at the same time not being able to conquer the market. Using the Value Hill concept, we identify challenges and obstacles in the pre-use, the in-use and the post-use phase. We elaborate on the lessons learned (*) Collaboration is necessary, organizations need to align strategies in a circular system of intertwined business models; (*) there is need for new circular business models, which value social and ecological impact, but always in an economic viable way; (*) storytelling contributes to creating awareness and makes organizations eager to join the development of innovative circular products'(*) organizations need to involve all stakeholders in the marketing activities of innovative circular products, including intermediaries, business partners and the end-customer and (*) the network needs to be orchestrated by a motivated driver, since upscaling the initiatives needs a lot of efforts and alignment between partners with diverse ambitions.

Keywords

sustainability, multiple value creation, circular economy, business models, value systems, story telling

1. Introduction

The concept of a circular economy is recognized by both academics and practitioners as proposition to face today's societal, economic and environmental challenges. Organizations are looking for ways to optimize social and environmental values, while maintaining economic viability. For this, radical and systemic innovation is needed, on the technical level as well as on the business level. Organizations search for business models that aim for product's longevity and closing material loops. For instance, the Dutch textile sector offers great opportunities for reusing products and materials. Annually, 75 million kilo textile is collected, while still approximately 135 million kilo is disappearing as residual waste. At least 65% of the post-consumer textiles can perfectly be recycled. It can be processed into a wide range of products, in low-value materials, such as cleaning cloths, mops and blankets as well as high-quality materials, through yarn development for new textile applications, for isolation or acoustic panels and via heat and pressure techniques into plate material. Another example: water treatment companies are increasingly focusing on recovering energy and raw materials from waste water. By placing fine sieves, toilet paper and other sludge material can be removed from the water. This leads to energy savings in the water purification process, and the residue can serve as a raw material for different applications. Although technologies are promising, the rate of successful initiatives is relatively low. Organizations struggle in finding profitable business cases for these valuable products based on raw materials out of 'waste streams'. Companies need to identify the right residual flows and sales channels. Our research focuses on the obstacles and challenges that organizations encounter, while developing innovative circular products, but at the same time not being able to conquer the market.

2. Creating value from waste

Circular economy

Circular economy is defined as "an economic and industrial system where material loops are closed and slowed, and in which every chain in the systems creates and

captures value", (Ellen McArthur Foundation, 2015). An important boundary condition for realizing a circular economy includes the development of new business models. The concept of circularity has been conceptualized by Kirchherr et al. (2017) who indicate that circular systems always include efforts to Reduce (reducing raw material use), Reuse (reuse products and components) and Recycle (reuse of raw materials) residues .

The urge for this new economy is high. Worldwide, the use of raw materials has increased eightfold in the past century. The richest countries are now using on average ten times more raw materials than the poorest countries. The increase in use of raw materials has been driven in recent decades by income growth as well as by population growth. The UN has established 17 Sustainable Development Goals as a blueprint to achieve a better and more sustainable future for all by 2030 (https://www.un.org/sustainabledevelopment/). They address the global challenges the world is facing, including those related to poverty, inequality, climate, environmental degradation, prosperity, and peace and justice. The circular economy is indicated as one of the important conditions to promote prosperity while protecting the planet.

More and more organizations are making progress to organize their business at a circular manner, but still circular initiatives are limited to pioneers who are active on a small scale. Those pioneers recognize the benefits of closing loops and improving resource efficiency, like cost savings due to re-using material, creating competitive advantages and entering new markets (e.g. Kalmykova et al., 2017; Lieder and Rashid, 2016; Rizos et al., 2016). Nevertheless, many are still struggling with a lack of a framework explaining how companies willing to become circular adapt their existing business model or create a new one (Antikainen and Valkokari, 2016).

Value Creating System

Operating in a circular economy requires not only a proper management of raw materials and products, but also calls for new partnerships and business models (Bocken et al., 2013; Schaltegger et al., 2016). Circularity cannot be reached in isolation, thinking in value networks is the starting point. This transition requires a radical systematic change (Jonker et al., 2014), in which organizations have to take the effects of their own business and the direct effects on its suppliers, customers, and other stakeholders into account, and vice versa. The key elements of a circular system (1) concentrate on creating value for a broader range of

stakeholders and (2) take into consideration the benefits from societal and environmental perspectives (Boons & Ludeke-Freund, 2013) in an economic context. Innovation processes create more leverage for change than other processes within the organization. Hence, innovation can be a well-suited mean to trigger upcycling waste streams in a circular system. These innovation processes outreach collaboration in a chain, in which each chain sub-optimizes its own processes, it requires decisive and conscious sharing of resources and risks by all stakeholders, and transparency and trust are essential (Janssen et al., 2018).

Business models are often explained as the basis of how companies create, transfer, and capture value according to their internal activities and relationships with stakeholders, among which suppliers and customers (e.g. Zott et al., 2011; Osterwalder and Pigneur, 2013). A circular business model is defined as the rationale to create, deliver and capture value with and within closed material loops (Mentink, 2014). Circular business models are by nature networked: they require collaboration, communication and coordination within complex networks of various and different actors and stakeholders They address the need to adapt to a changing business environment, causing a necessity to adjust value chains at a business eco-system level. Valente (2012: 586) explains that "what is sustained is a result of a complex interactive and idiosyncratic process where firms and their stakeholders build cognitive complexity within a network system in a way that creates synergistic value creation". He suggests that, for a 'sustain-centric ambition', organizations in value networks have to collaborate in such way that it includes all relevant organizations and embraces all related systems (inclusion), understands all causes and effects of these systems in interrelationships (interconnectedness) and any position of privilege by "a fair distribution of resources, opportunities, basic needs, and property rights" (equity).

Organizations need to reconsider how they can maximize their contribution to the product and materials when reducing the usage of natural resources and creating positive societal and environmental impact (Kraaijenhagen et al., 2016). By working together, companies in a value chain can increase their positive impact on all players, society and the environment. Value creation requires truly joining forces in which value is created simultaneously. For the alignment of activities in a value network, organizations need to interact in a more synchronized fashion, which make inter-organizational collaboration crucial and at the same time complex. Companies say: "technically we know what we have to do, but how do we convince others, the entire chain of suppliers and customers? We are interested in why and how some organization are able to innovate to a circular

economy while others face major setbacks. Circular economy is defined as “an economic and industrial system where material

3. Method

Research design

This submission aims to answer the following question: What are -and how do organizations deal with- obstacles and challenges while creating value from waste? We use an explorative case study approach to gain insights into the difficulties and practices organizations use to deal with them.

We started our research together with Noble Environmental Benelux (Noble), who has developed a technology that uses only pressure and heat to convert any cellulose waste stream residue into ECOR-plates. First batches have been created from waste including coffee grounds, spent beer hops, textiles and sieve residues. Panels have resulted in a range of materials or products, like retail graphics, trade show displays, decorative walls and hangers. The organization explores ways for upscaling business. We have also explored other initiatives that aim to use new technologies to convert waste streams into new products. In this paper, we elaborate on five cases, which we will explain in the next section.

Interviews were conducted with a broad range of stakeholders of different value networks and lasted one to one and a half hour. We conducted interviews with directors and sustainability experts. Data was collected on the vision towards sustainability, current sustainable efforts, value propositions, multiple value creation and collaboration in a value system. It was of crucial importance to gather information on the nature of their practices to generate data on the consequences of their actions and to identify ways how to improve their practices. We also organized several workshops (15 groups of four to six people) with business students and experts (mixed and separate) to discuss the value proposition of two of these cases. We used the Business Innovation Kit (UXBerlin) to explore, discuss and define potential value propositions.

Cases

Because of the expected increase in population and wealth, demand for consumer goods and services will grow. In order to produce these goods, many more natural and material resources will be needed. Our cases focus on the use of natural fiber

residual flows and post-consumer textiles as raw material for different markets. The organizations search for opportunities to develop business propositions for these circular products.

'Roadside-grass as packaging': The Dutch Paper and Cardboard Knowledge Centre and the Branch Association for Organic Residual flows are interested in new Fiber applications. The route of converting natural grass as raw material for specific packaging products has been proved. For roadside grass, there are challenges. Stakeholders indicated that besides the challenge of the quality of the materials (large variety of types of plant parts, existing macro and micro pollution) and strength of the packaging, one at least as great challenge lies in the agreements and coordination among partners and stakeholders.

'Paddy straw as promotional material': Indian rice farmers burn their rice fields when the rice is harvested (paddy straw). This is the quickest and cheapest way to start planting new rice seeds and growing new rice. Open-field burning of rice straw does effectively remove large volumes of biomass and it helps to control unwanted weeds and a variety of unwanted pests and diseases. However, this also causes air pollution, which is a danger to human health and environment. Noble is looking for possibilities to turn this paddy straw into non-toxic, biodegradable and re-usable ECOR-plates that are suitable for the furniture or packaging industry. This would also be beneficial for Indian farmers, who could gain additional income by getting paid for selling it to Noble. Noble explores the added value of paddy straw plates as material for Indian wedding boxes, displays for retail and company gifts compared to current offers.

'Textile plates as store interior': The textile industry is one of the most polluting industries in the world. By recycling and reusing textiles, the use of new raw materials can be reduced, which results in less impact on the environment. Wearable collected clothing is currently resold on the second-hand market by commercial or charity companies. On the one hand, non-wearable textile is demolished and fiberized, whereas the quality of the fiber is retained and new yarns can be developed for new clothing. On the other hand, recycled textiles are used for isolation material in the automotive industry or are burned as waste. Together with fiberizing organizations, Noble explores the potential of textile ECOR-plates as interior in stores.

'Sieve material as soil protection': The public water sector is using large installations for waste water treatment to generate clean drinking water. In this

cleaning process, lots of sieve material is generated, which is transported to a central location in the south of The Netherlands were it is treated as waste. By better sieving this material, the water sector generates extra capacity in the waste water treatment installation resulting in less energy costs. If this waste stream can be used in new products, less costs have to be made for handling this waste or even income can be generated. Waste processors become raw material suppliers. Together with the Water Boards and the construction sector, Noble is looking for potential customer segments with interests in ECOR-plates based on sieve material. They explore the use of these plates as bank protection, acoustic road screens or inhouse (office) use like furniture.

'Combined isolating roof panel': In the construction sector the use of isolation (temperature and sound) material is growing because of global warming and worldwide climate targets. The building sector askes for material that is easy to handle with a good price. More and more architects prescribe the use of ecological material when designing a house or building. In addition, more and more end users are willing to pay a small amount extra for sustainable materials. There are already good ecological isolation materials on the market, which are successful. One of them is made of textile waste. This organization is contributing to ecological and social impact because the sorting of the textile is done by employees with a distance to the labor market. The isolation plates can be made of textile waste too. Noble explores if this isolation material can be connected with ECOR-plates (textile) into one panel, which is easy to handle for the constructors. Both organizations are interested in this new opportunity, which will create ecological and social impact.

4. Results

Value proposition

A business model describes very clearly how an organization creates, delivers and captures value. We use the Value Proposition Method of Osterwalder et al. (2014) to illustrate our findings of each case. By addressing the relationship between customer segments (clarify the customer understanding) and value propositions (intentions to create value) in the so-called Value Proposition Canvas, we focus on the 'circular offer' to the market, which is in a circular economy created by multiple organizations. The value proposition (square) is divided into products & services, pain relievers and gain creators. Pain relievers describe how products and services can alleviate customer pains. Gain creators describe how the products

and services benefit the customers. The circle divides the customer segment into customer jobs, gains and pains. Customer jobs describe what customers want to achieve in their work and private life. Gains are about the results that customers want to see or the concrete benefits that they are striving for. Pains concern undesirable results, risks and annoyances.

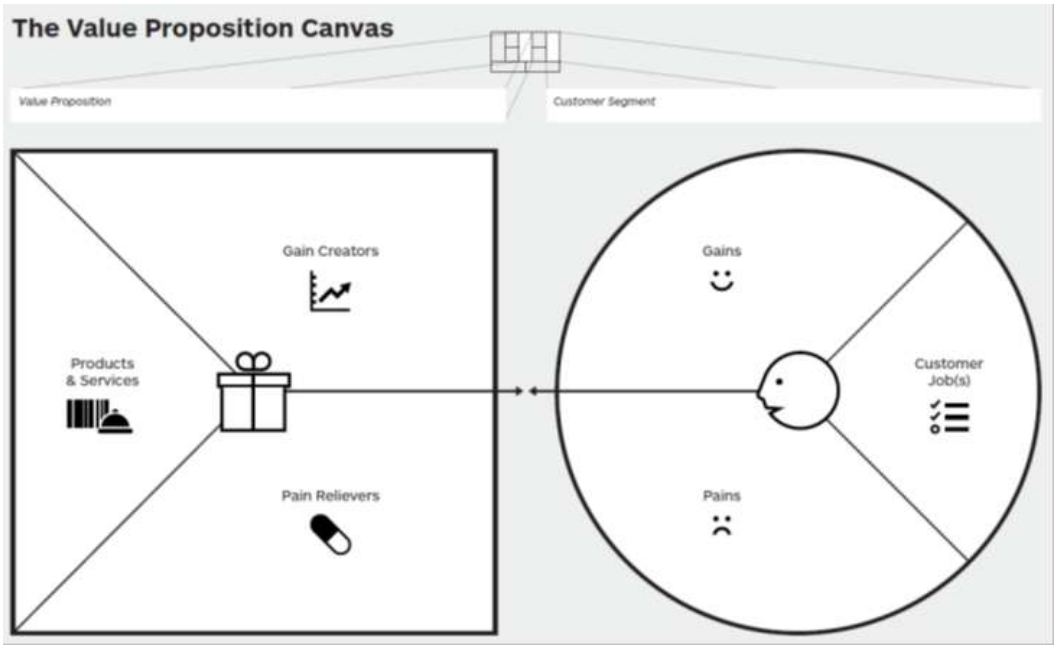

Figure 1 The value proposition canvas

'Roadside-grass as packaging': There are several technological developments to upcycle roadside-grass into high quality products. Piloting organizations aim to earn money in the frond-end of the chain, while reducing waste at the end of the chain. Respondents have identified the packaging market as potential sales channel. Although technologies seem promising on a small scale, organizations face challenges in upscaling these initiatives. Difficulties relate to achieving quality standards (large variety of types of plant parts, existing macro and micro pollution), agreeing on shared investments, allocating revenues and costs. New cracking technologies are explored to make it possible to gain value from these separate fractions, whose revenues then can contribute to the investment cost of the upcycle process. Also legal aspects of roadside grass (waste versus raw material) and reducing logistics are a point of attention.

The value network is represented by SMEs who contribute to the upcycle process of roadside grass as raw material for the packaging industry, including biomass providers and processors of biomass fractions in the paper industry. The value

proposition for the paper industry focusses on finding alternative fibers for the production of paper, since wood is expected to be scarce in the future. To develop a viable business model, the value of preserving biodiversity and conserving natural resources should be taken into account in the business model, next to economic value.

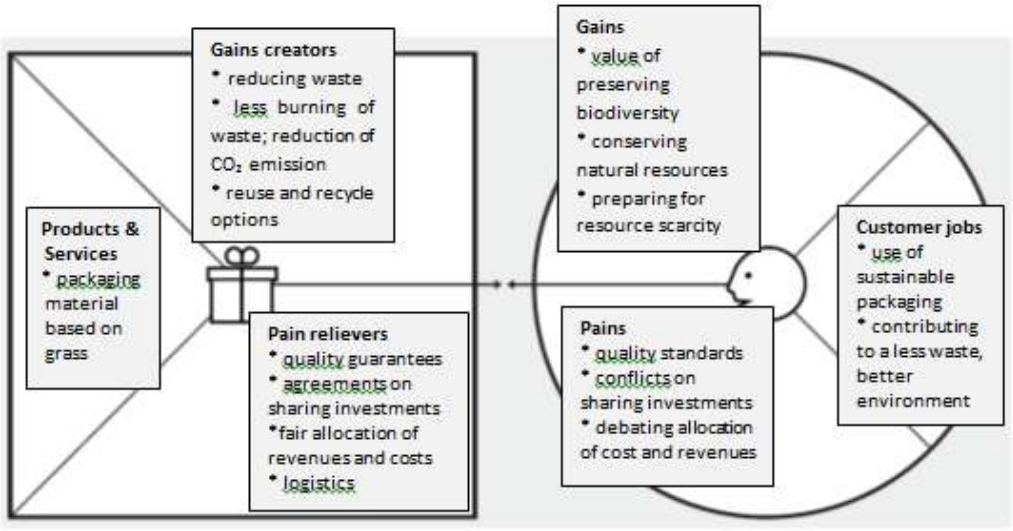

Figure 2 The value proposition canvas 'Roadside-grass as packaging'

'Paddy straw as promotional material': Noble has the ambition to contribute to a better environment by reducing burning of paddy straw and to contribute to prosperity by creating jobs in India. One of the potential sales channels Noble explores is the use of paddy straw as input for developing ECOR-plates for promotional material, like wedding boxes and pop-up displays.

Findings indicate that sustainability is not on the top of the mind of the distributors of displays, the Indian market is not yet asking for sustainable alternatives. In fact, cardboard displays are used once and then destroyed. A sustainable advantage of ECOR-plates is the possibility of re-using the material. However, respondents empathize that reusing products is seen as an additional logistic operations which makes it unnecessary complex. Price is the common driver, even if that means that concessions need to be made on quality (bearing strength, life span). Some respondents expect that ECOR-displays will have potential for brands that use sustainable impact in their marketing strategy and to increase sustainable brand image. Circularity can then be part of the story of the product.

In India, the invitation to a wedding always includes a wedding box. Indian people find it important to customize this box, which is often luxurious designed and contains gifts and program details. Although there are most of the time over 200 optional boxes per store, people really want to make it extraordinary and special. If Noble wants to compete in this market, the material has to be strong and should not transform over time. The product has to last at least 6 months (time between invitation and wedding) or even longer, if the guests want to use the box to store jewelry items for instance. To enter the market, respondents think that Noble needs to open an store, where people can personalize their wedding boxes and choose items to complete them or Noble should collaborate with local distributers who care for the content. ECOR-plates can easily be customized with printing and bending techniques, which is a pre. The price should be similar or cheaper than current alternatives. Since people are not asking for it, the story needs to be told to accelerate personal motives.

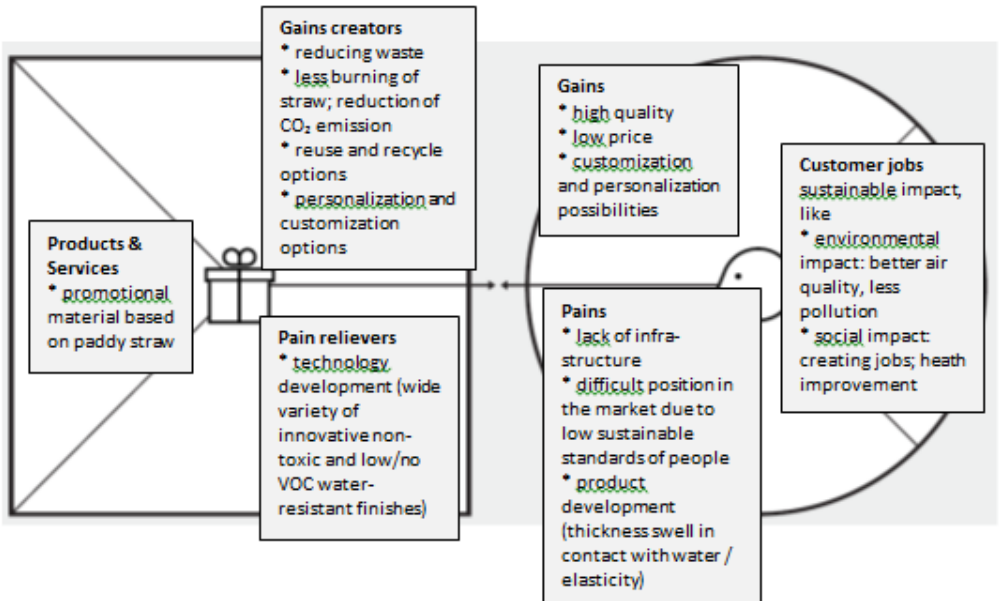

Figure 3 The value proposition canvas 'Paddy straw as promotional material'

'Textile plates as store interior': Noble is experimenting with post-consumer textile to develop ECOR-plates . They explore the potential use as store interior, like fitting rooms and counter desks, or to make hangers and packaging boxes. We explored which social, ecological and economic aspects are important for stores, brand owners and trade associations.

Findings indicate that organizations feel pressure from the government and NGOs for dealing with the large amount of post-consumer textile. They look for ways to re-use or upcycle textile. Some organizations have set targets to be completely circular in the future, for instance by targeting exclusive use of recycled or other sustainable raw materials for all products in 2030. We found that the clothing sector mainly focuses on optimization of the beginning of the value chain; collecting and recycling of textiles is not seen as a priority. This is due to the lack of a financially feasible and workable logistic system and that absence of a final (sale) destination. The application of textile in ECOR-plates is endorsed as good alternative only when it is not possible to use textile fibers for making new yarn with sufficient quality. Complementary, using this waste stream as input will also decrease the use of other raw material as wood, for store interior, which will contribute to the prevention of resource scarcity. Some respondents have doubts about the quality insurance and making agreements with other partners on investments and allocation of cost and revenues in the system. Other respondents see benefits of ECOR-plates to be used in pop-up stores and to easily change colors and themes of the walls.

Textile producers acknowledge that they could have an informative and stimulating role in sustainable clothing concepts. They feel that telling the circular story will be effectual, because awareness for upcycling textile waste is created. When the textile fiber is still visible in the interior, it becomes concrete and tangible, and thereby contributing to a sense of recognition and connection. Thus, on the one hand, storytelling increases consumer awareness and can stimulate a positive change in sustainable behavior of consumers, on the other hand it positively influences the reputation of fast fashion brands. However, one respondents emphases that story telling is a temporarily solution. In the end, the circular systems needs to become the standard, as it is nowadays for class recycling. No one thinks it is special to pour wine from a bottle of recycled glass.

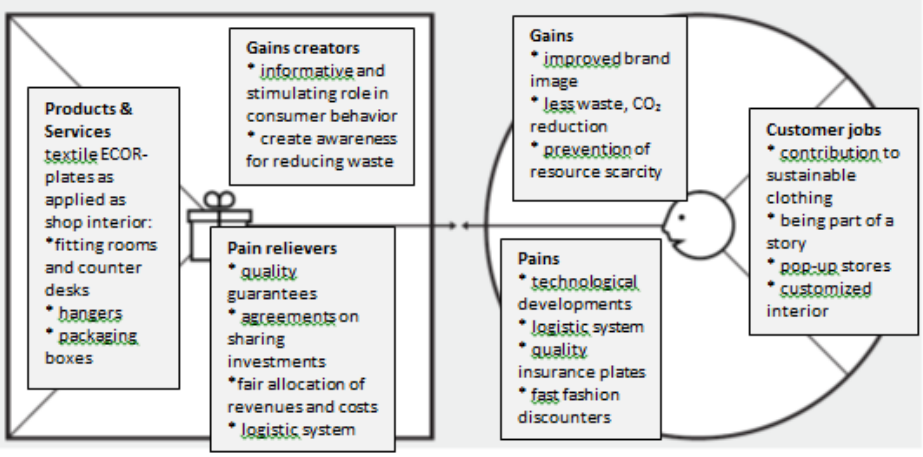

Figure 4 The value proposition canvas 'textile 'plates as store interior'

'Sieve material as soil protection': ECOR-plates are a good replacement of wood and synthetics and they are light weighted, strong and biodegradable. We investigated the financial and ecological opportunities and obstacles when using ECOR-plates as soil protection compared to current used materials. The current materials often contain plastic that has to be removed from the soil after a period of time. The ECOR-plates are currently tested in the ground to establish how fast it dissolves, the degree of solubility and the influence on soil strength. There are still many uncertainties. The price has to be compared with the traditional soil protection materials. Respondents indicate that the social and ecological impact of ECOR-plates needs to be explained to the market. Furthermore, other markets needs to be explored, since a bigger market than only soil protection has to be selected to generate enough impact because the amount of sieving material is very large. It has to be defined what role the Water Boards will play in the production of plates, in relation to the constructors. More research is needed on how these questions can to be solved in collaboration with Noble and the Water Board; and most likely together with some selected constructors of soil protectors.

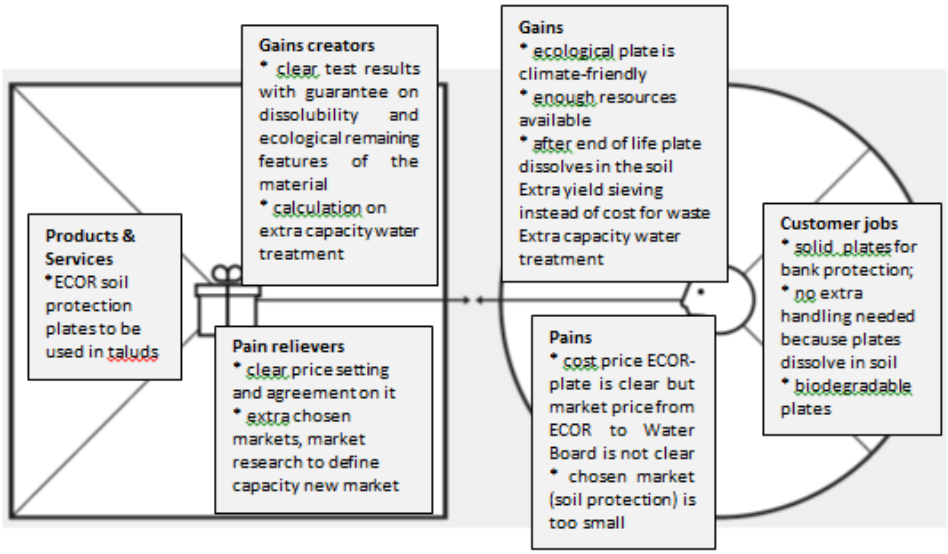

Figure 5 The value proposition canvas 'Sieve material as soil protection'

'Combined isolating roof panel': ECOR-plates can serve as isolation plate when it is connected to (textile) isolation material. We investigated the characteristics of this new isolating roof panel made of textile and ECOR-plates, that can assure the releasing on the market within 5 years. The soft isolation material is made of collected textiles. Combining this material with a solid ECOR-plate, this combined isolating roof panel can easily be secured inside the roof of a building. The combined panel would totally be of ecological material. Findings indicate that the ECOR-plates have to be tested on fire resistance: the isolation material is fire resistant, for the ECOR-plates this cannot be guaranteed yet. New houses need material passports, the values of the roof plates need to be captured for this system. Also a competitive market price has to be set: the construction sector is quite price-oriented. Respondents think that the price will always be a bit higher than the price for the traditional product, however, they feel that the isolation quality is better and the handling is easier if the two are fastened into one combined panel. Challenges that are indicated are the return logistics, it has to be guaranteed that the panel can be returned after it's usage: this is already the case for the isolation material at the moment. More research is needed to define who is going to make the combined product, partners need to negotiate the next steps in the process. There has to be a partner that 'takes up the glove' and bring this circular innovation on the market. Agreements need to be made on responsibility to the customer, the intermediaries and the constructors.

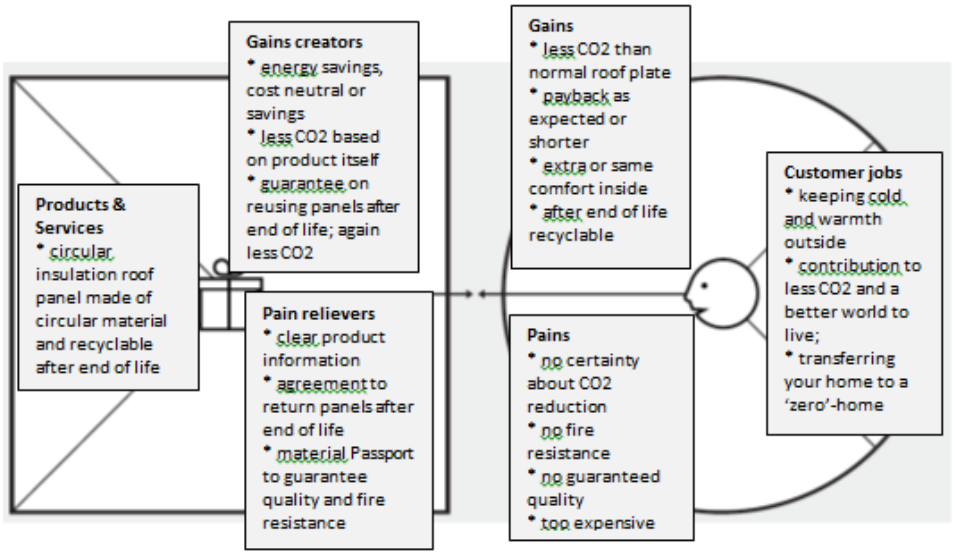

Figure 6 The value proposition canvas 'Combined insulatin g roof panel'

4. Conclusion and Discussion

Obstacles and challenges

We use the concept of the Value Hill (Achterberg et al., 2016) to elaborate on the obstacles and challenges. The Value Hill is a circular business strategy tool that provides companies with an understanding of how to position their business in a circular context and to develop future strategies for a circular economy. It provides an overview of the circular partners and collaborations essential to the success of a circular value network. The Value Hill proposes a categorization based on the lifecycle phases of a product: pre-, in- and post-use of a product. The pre-use phase (uphill) is the phase before use, in which value is added to the material in different steps (eg. mining, production, distribution). The second phase is the in-use phase of a product (top of the mountain) and here the value is at its highest. And the third phase is the post-use phase (downhill), where the product loses value. In a circular economy, the value is recaptured by feeding the complete product or its components back into a previous phase (e.g. production or directly back into the use-phase). In every phase different business activities take place.

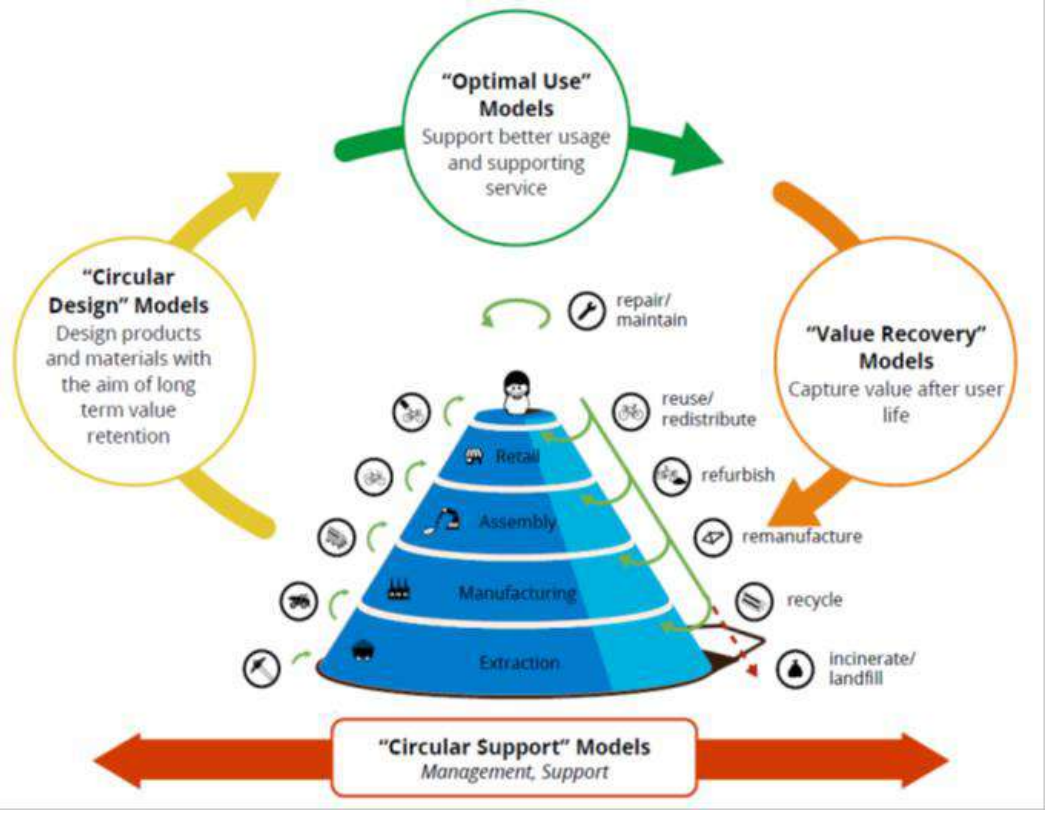

Figure 7 Business model categories mapped on the value hill (Achterberg et al., 2016)

In the pre-use phase, organizations need to look in different ways at waste-streams: not by focusing on 'getting rid of garbage as cheap as possible' but by creating an equal playfield in which players are committed to partnership for a longer time. Tensions arise from diversity or disagreeing on specific matters, such as strategic goals, organizational cultures, and adjacent competences. In the in-use phase, organizations face difficulties in pricing the circular products compared to new products and explaining the added values of circular products. The quality-level of the circular product should be met or exceeded. Other challenges are prolonging of the use phase, by optimizing re-use, like for instance with changing store interior or displays. In the post-use phase, challenges are connected to aspects of logistics (tracking, collecting and returning waste streams) and legal restrictions, like gaining permits for processing waste streams. Recycling of waste streams into plates is a suitable and innovative solution for creating value, but only when re-using the material into original products related application is not possible anymore. To capture the value from used products, collaboration within the value network is essential. There is a need for coordination of activities, information flows, material flows, energy flows and services.

Lessons learned

Collaboration is necessary, organizations need to align strategies in a circular system of intertwined business models. Collaboration is necessary and difficult, specifically when it goes beyond the boundaries of business. Experts and partners in the value network need to align strategies and activities when designing, initiating, catalyzing and capitalizing the value. It is important to integrate the different perspectives of stakeholders into a collaborative system. Stakeholders need to define together which value networks can be connected to complement organizations business models in the value system. This idea of a 'networked business models' is in line with the Ellen MacArthur Foundation way of circular value creation 'cycle 3. The power of cascades: creating new combinations of resources and material components, and the purchasing of upcycled waste streams'.

There is need for new circular business models. Circular business models should value different types of impact, but always in an economic viable way. By closing material loops and using waste streams as useful inputs to other products and processes, demand reduces primary raw material use and resource depletion. Although most markets are still price driven, frontrunners show examples of new business models like leasing, products as a service and cooperation models. Regional processing of waste and applying the circular product in the domain of the waste supplier contribute to the success of the business case. Bocken et al., (2016) explored product design and business model strategies for a circular economy. They differentiate between slowing and closing business model strategies. Slowing strategies are the 'access and performance model', 'extending product value', 'classic long life' and 'encourage sufficiency'. Closing strategies like 'extending resource value' and 'industrial symbiosis'.

Storytelling contributes to creating awareness and makes organizations eager to join the development of innovative circular products. Storytelling is "the process of developing and delivering an organization's message by using narration about people, the organization, the past, visions for the future, social bonding and work itself in order to create a new point of view or reinforce an opinion or behavior" (Gill, 2014 pg. 3). Frontrunners need to tell their stories, tell how they went beyond all the hassle of 'how to get through it'. The stories prove that the system can work. This contributes to the creation of value systems and accelerates the transition to a circular economy. This is in line with findings of Pulizzi (2012), who emphasizes that storytelling is becoming an increasingly important means of

communication for companies because it relates to all stakeholders and thereby improves the reputation of the brand both internally and externally.

Involve all stakeholders in the marketing activities of innovative circular products, including intermediaries, business partners and the end-customer. When it comes to creating sales, all stakeholders in the value system depend on the demand of the end customer, the so called derived demand. All intermediaries need to commit themselves to sustainable innovation and should be convinced to participate. For example, the 'combined isolating roof panel' should be marketed to hardware stores, contractor and homeowner; the 'sieve material as soil protection' to water board, contractors and municipalities.

The network needs to be orchestrated by a motivated driver. Upscaling the initiatives needs a lot of efforts and alignment between partners with diverse ambitions. A central (new) entity or person should take the lead and to keep track of the big picture, otherwise the initiatives fades. Orchestration is defined by Dhanaraj and Parkhe (2006) as a coherent set of deliberate actions to create value with and extract value from a network, and consists of directing, influencing and coordinating activities. This can be done by the organization that has the most drive to bringing the product to the market or a new entity established by all value adding partners, but someone needs to take the lead, otherwise the market will not pick it up. Orchestrating practices helps to create a fair deal in the network and ensures the long-term viability of the network, which show to be important to manage circularity in innovation processes (Janssen and Stel, 2017).

4. Practical implication and contribution

The paper aims to contribute to accelerating the transition to a circular economy by identifying sales opportunities for waste streams and by developing circular business models, in which different partners work together in a value network. An area both of interest of academics and practitioners. By gaining insights into the obstacles and challenges, we add lessons learned to this relative new academic debate. Organizations can adjust their innovation practices and collaboration efforts in order to tackle the difficulties. Organizations acknowledge the benefits of circular systems to balance impact from economic, ecological and social value. Findings serve as inspiration for organizations to look at the benefits of transferring cost items related to waste disposal as opportunity to yield money by developing circular products. Besides the economic benefits, organizations can realize environmental and social impact, by reducing waste, energy and

developing greener products. Storytelling creates awareness for innovative circular products by sharing viable and tangible value proposition.

Acknowledgement

The research is made possible with a SiA kiem VANG / CE grants of the Dutch association 'Regieorgaan Praktijkgericht onderzoek'. We also would like to take this opportunity to thank the organizations for participating in our research. And the graduation students of the Centre of Expertise for Sustainable Business for their help in data collection and reporting on their assignment.

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Critical success factors for circular business models within the agricultural sector

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Abstract

In the transition from a linear, 'take-make-dispose' economy to a sustainable usage of all renewable resources in circular or cascading ways, stakeholders' strategies striving for value creation are adapted. Implementing a circular economy requires a change at a system level, involving all actors of value chains within diverse economic sectors. At an enterprise level, innovative business models are needed that offer market opportunities for new products. Circular business models deal with the question of how to create, deliver and capture value with and within closed material loops. We aim to understand under which conditions new business models within the agricultural sector successfully contribute to a circular economy. 33 cases have been studied and semi-structured interviews have been performed, in order to investigate critical success factors. Results show that various success factors exist, which can be grouped in five categories: (1) technical and logistic, (2) economic, financial and marketing, (3) organisational and spatial, (4) institutional and legal, and (5) environmental, social and cultural factors. Findings indicate that the transition to a circular economy in the agricultural sector let individual business models evolve towards dynamic and integrated business models in which the macro-environment sets the boundary

conditions for successful operations. Moreover, there is a high degree of interactions between all actors in the circle. This implies that not only an individual companies' business model is impacted, but that a new, integrated business model for all circle actors is required, asking for an open and flexible management and a transparent communication.

Keywords

circular economy, business models, agricultural sector, success factors

Designing Circular, Collaborative, and Scalable Business Models for Recycling

A Case Study of Reusing Textile Fibers in Biocomposite Products

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Extended abstract

Problem and objective

Today's societies face many sustainability problems, such as increased amounts of waste as well as resource scarcity due to high consumption habits. The circular economy offers solutions to mitigate these problems (Geissdoerfer, Savaget, Bocken & Hultink, 2017). Material streams can be reorganized, value can be preserved and products can be redesigned. The reorganization of value chains and successfully market their sustainability solution requires suitable circular business models. A circular business model can be seen as a specific type of sustainable business models (e.g. Bocken et al., 2016; Lüdeke-Freund et al., 2016). There is a plurality in conceptualizations of circular business models. For example, Bocken, de Pauw, Bakker, & van der Grinten (2016) suggest slowing loops (i.e., reuse), closing loops (i.e., recycling), and narrowing loops (i.e., efficiency). Lüdeke-Freund, Gold & Bocken (2019) distinguish six major circular business model patterns: repair and maintenance, reuse and distribution, refurbishment and remanufacturing, recycling, cascading and repurposing, and organic feedstock.

Despite the advances in circular business models, a case can be made that present frameworks contain two limitations. First, to close the loop, and thereby solve the

environmental problems, diverse actors have to collaborate (Bocken et al., 2016). The majority of conceptualizations of circular business models do not take into account this collaborative nature (Pierone, McAloone & Pigosso, 2019). Second, circular business models should deliver benefits for the environment, while at the same time provide superior value to the end consumers (Boons and Lüdeke-Freund, 2013). In practice, this endeavor faces many challenges. For example, recycling business models need to connect the downstream and upstream ends of supply chains, and need to organize reverse logistics that connect users, raw material suppliers, and parts manufacturers (Lüdeke-Freund et al., 2019). Recycling of materials is often downcycling and results in materials that are of lower quality compared with virgin resources which is considered a barrier for the transition towards a circular economy (Bocken et al., 2017). Therefore, many projects with recycling business models never scale up and the intended impact remains elusive. However, upcycling of waste may offer better scaling potential as in the case of upcycling a normal or premium price may be charged. (Kraaijenhagen et al. 2016).

This study aims to develop a comprehensive framework for recycling business models that are also collaborative and also takes into account the requirements for scalability. Towards that end, we ask '*how can insights from circular, collaborative, and scalable business models be combined to achieve viable recycling business models?*'

Review of the literature

The literature on circular business models, as well as the literature on collaborative business models contain valuable insights into how to design business models for recycling. Moreover, for the sustainability innovation to have an impact, it needs to be scalable. In this paper, we review these three streams of the literature and present a list of criteria that should be met to realize viable recycling business models. The criteria are presented in Table 1.

Table 1. Criteria for circular, collaborative and scalable business models

Circular (recycling) (Bocken et al., 2016; Lüdeke-Freund et al., 2017)	**Collaborative** (e.g. Lüdeke-Freund et al., 2016; Rohrbeck et al., 2017; Breuer and Lüdeke-Freund et al., 2017)	**Scalable** (e.g. Stampfl, Prügl and Osterloh, 2013); Van Winden & van den Buuse, 2015)
Involve a divers set of actors	Integrate the interest of various actors	Scalable production technology (level of automation of processes and scalability of IT-infrastructure)
Require particular knowledge in fields such as product design and material sciences	Align expectations of value outcomes	Positive cost/ benefit structures
Increases the recyclability (e.g., recycling with less energy)	Balance in benefits and contributions	Not bound to domestic laws
Increases the recyclability (e.g. efficient pick-up of products)	Build on personal match and trust	Can gain network effects (going viral and critical mass)
Turning 'wasted' materials or resources into new forms of value	Have an open attitude	Solves a problem
Has predictable and reliable return flow	Are open to customization	Is simple
Requires take-back systems to collect/ source materials	Involves an articulated value creation architecture	Based on previous user knowledge
Has efficiencies in production (producing faster and with less energy)		Low levels of uniqueness (city, regional, national, international)
Contains more efficient forms of recycling (market value vs. original costs)		Partners operate in many geographies (urban, regional, national and international)
Customers have interest in the environment or are business-to-business		Availability of other stakeholders who can fulfil roles of partners

In an ideal case, manufacturers themselves develop business models for resource reuse	More functionalities can be added

Approach/method

To study the present problem, we use a design-oriented approach (Zimmerman, Forlizzi & Evenson, 2007; Hevner *et al.*, 2008). The main premise of this method is to develop the framework through multiple interactions and interaction with practice, and it comprises of three phases. First, based on our literature review, we drafted a conceptual framework consisting of a list of criteria and relationships between the criteria. Second, we studied three cases of circular economy projects in the Netherlands[2]. For each case, business models will be designed using the identified criteria. We design the business models by first conducted semi-structured interviews with all partners including prospective customers. Subsequently, we analysed the interviews according to the criteria of the framework established in phase 1. Based on our findings, we adjusted the framework, revised the business models and continued with a workshop in which we collectively (i.e., all partners and prospective customer) iterated the business models. The iteration continuous until there are business models that meet the partners' requirements. Finally, using the final business models, we revised the framework including its criteria.

The cases concern upcycling of waste by creating biocomposites based on textile waste fibre and bio-plastic for the business-to-business market. However, each case has developed different products for different markets, consists of different partners, and may require different business models. The motivation for our case selection is to enhance the richness of data, while retaining a clear and manageable variety among the cases.

[2] Our empirical case is a circular economy initiative around textile fibres. Textile fibres that were harvested from what were initially urban waste streams, for example coffee bags from a big coffee producer, and waste products from an office furniture producer, are combined with bioplastics to create new products such as denim wall panels, coffee tables and noise-cancelling panels. These products are produced with the help of digital production techniques as well as different material combinations. A range of companies and other actors closely collaborate along the value chain of these products, in their quest to 'close the loop'.

Expected results/ findings

The aim of this of this study is to develop a comprehensive framework to design recycling business models that are collaborative and scalable. We expect that such a framework is a challenge. In other words, in practice it is difficult to design circular business models that are also collaborative and scalable at the same time. With regards to the criteria for each area of the business model, we expect that there are overlap between the criteria across the three themes. Not all criteria will have same importance regarding the attainment of environmental benefits. Therefore, we suggest that there will be a clear ranking in the criteria. We also expect that the criteria have reinforcing and opposing relationships.

Limitations and future research

We identified two limitations with our study, and suggest the following future research avenues. First, our cases contain only business-to-business markets. Future research should also study business-to-consumers markets. Second, our cases focused solely on the upcycling of waste materials through creating biocomposites. We suggest that other types of recycling may require different business models. We also suggest that future research study on how to present solutions to the identified tensions between the criteria for circularity, collaboration, and scalability.

Keywords

Business models, circular economy, collaborative, upscaling, recycling

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Mind the gap: How to increase circularity in SMEs?

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Abstract

The implementation of Circular Economy practices is a highly relevant issue for numerous reasons. However, contextual factors that are crucial for the transition to a CE are often neglected. The role of the size of the company in this process was investigated in this study, placing a focus on small and medium-sized enterprises. The aim of this research was to identify improvement opportunities for SMEs that allowed them to establish circularity in their company.

Keywords

Circularity assessment, Importance-Performance Analysis, Business Model Innovation, Small and Medium Sized Enterprises (SMEs)

Introduction

Publications such as the Brundtland Report (1987), Limits of Growth (1972; 2004) and Rockström et al. (2009), in which the Planetary boundaries concept is described, have highlighted the fact that resources on earth are finite; however, we are observing an exponential growth of: *"population, food production, industrialization, pollution and consumption of non-renewable natural resources"* (Meadows et al. 1972, p.25). Some reasons for this growth may be found in an escalation of a product-based linear economy with a take-make-dispose tradition. Following this tradition has resulted in great prosperity, wealth, comfort and a high level of technological development in some parts of the earth, but has also

led to human-made climate change, rising sea levels, scarcity of raw materials, mass extinction of all kind of species and huge landfills. *"Over the last four decades the global use of materials tripled from 26.7 billion tons in 1970, to 84.4 billion tons in 2015 (…) it has been accelerating"* (de Wit *et al*., 2018, p. 11).

As the shift towards more sustainable social and economic systems has occurred, various concepts have emerged including the Circular Economy (CE). According to the Ellen MacArthur Foundation (EMF), the CE concept has gained acceptance since the 1970s, with the target to counteract the take-make-dispose economy that emerged at the time. The CE was not a novel creation, but was instead based on and has been adapted according to various schools of thought (Regenerative Design, Mimicry, Industrial Ecology, Performance Economy, Cradle to Cradle) (Ellen MacArthur Foundation, 2012). CE has not yet been conclusively defined; hence, the following definition by Kirchherr et al. (2017), who reviewed 114 definitions, was used as a basis for this research: Kirchherr defined CE as "*an economic system that replaces the 'end-of-life' concept with reducing, alternatively reusing, recycling and recovering materials in production/distribution and consumption processes. (…) with the aim to accomplish sustainable development, thus simultaneously creating environmental quality, economic prosperity and social equity, to the benefit of current and future generations. It is enabled by novel business models and responsible consumers"* (Kirchherr et al., 2017, p. 229).

CE is a topic of increasing importance on the political agenda, as well. The European Commission (2015) stated that a CE can promote new business opportunities, innovation and the creation of new jobs, while saving energy, raw materials and minimizing the impact of activities on nature. It is estimated that a transition to a CE could reduce emissions by 48% by 2030 and by 83% by 2050, based on current levels, especially in the food, mobility and the construction sector (Ellen MacArthur Foundation, 2015).

To achieve these goals, however, it is necessary to make substantial changes and adopt new strategies on various levels, which range from strategies enacted by individual actors to those applied by systemic changes. Based on the findings of recent research, three areas of future research on the CE have been identified:

- First, the term *CE* requires theoretical clarification so that conceptual ambiguity can be eliminated, since *"(…) most authors conceptually simplify the Circular Economy to resource input, waste and emission output"* (e.g.,

Geissdoerfer et al., 2017, p.765). This definition, however, does not fully capture the concept and its potential applications in practice.

- Second, despite the already widespread diffusion of the CE and a growing number of CE tools and reports (e.g., Ellen MacArthur Foundation 2015; European Commission, 2015; de Wit et al., 2018), decision-makers in companies lack specific guidance regarding how to implement CE practices.

- Third, while the existing tools and methods can be used to effectively and progressively implement the CE, certain contextual factors are often neglected, such as the type of industry, the size of a company, or the availability of resources and the corporate culture (Masurel, 2007), all of which potentially influence company activities.

These contextual factors are considered as particularly relevant to small and medium-sized companies (SMEs), because their needs and resources differ from those of large companies (Ghisellini et al., 2016). The implementation of a CE, however, offers a huge potential for innovations and competitive advantages in companies of all sizes (Zamfir et al., 2017). In addition, the European Commission (2014) particularly emphasized the role of SMEs by introducing green action plans for them, aiming to improve resource efficiency, support green entrepreneurship, use green value chains and facilitate green market access.

For these reasons, and especially by addressing SMEs in the context of the CE, the focus of this research was to identify ways to improve CE implementation in SMEs. The aim of this study was to explore how decision-makers perceived the importance and performance of specific CE activities in SMEs. The Importance Performance Analysis (IPA) (Martilla & James, 1977) was applied as an evaluation method. The results of this analysis provided information about the CE activities that were considered important but rather poorly performed in the SMEs. The findings of the study allowed us to identify ways SMEs can increase circularity.

Theoretical background

In general, SMEs differ from larger organizations in terms of their available resources. This lack/scarcity of resources affects several types of activities. However, this general observation did not reflect on the perceived importance and performance of CE in this study. In this context, it is helpful to gain a better

understanding of factors that enable or act as barriers to the actual implementation of CE business practices (Rizos et al., 2016).

Several studies have addressed barriers and enablers for CE in the form of literature reviews (de Jesus & Mendonça, 2017; Govindan & Hasanagic, 2018) or by combined literature reviews and case studies (Rizos et al., 2016; Ritzén & Sandström, 2017; Pheifer, 2017; Kirchherr et al., 2018; Caldera et al., 2019, Tura et al., 2019). Due to the novelty of the CE and the low amount of existing empirical research, these studies were generally explorative in nature; however, correlations among the categories of barriers and enablers can be observed (Table 1).

Authors	Barriers	Drivers/Enablers
Rizos et al., 2016	Lack of supply and demand network, lack of capital, lack of government support, administrative burden, lack of technical know-how, lack of information, company environment culture	Company environmental culture, networking, support from demand network, financially attractive, recognition, personal knowledge, government support
Ritzén & Sandström, 2017	Financial, structural, operational, attitudinal, technological	No driving or enabling factors were analyzed
Pheifer, 2017 **	Product design, lack of reverse supply-chains, lack of understanding of the concept itself, governmental/policy barriers	Mandatory eco-design/C2C strategies/design for residual value governments, policy and legislation to integrate ecological and societal costs into final price
de Jesus & Mendonça, 2018	Technical, institutional/regulatory, financial / market, social / cultural	Institutional/regulatory, financial/market, social/cultural, technical
Govindan & Hasanagic, 2018	Governmental issues, technological issues, knowledge and skill issues, management issues, circular economy framework issues, culture and social issues, market issues	Policy and economy, health, environmental protection, society, product development
Kirchherr et al., 2018	Cultural, market, regulatory, technological	No driving or enabling factors were analyzed
Caldera et al., 2019	Lack of knowledge/skills/awareness, time constraints, lack of financial resources, risk of sustainable practice implementation, existing organizational culture, current regulations and policies	Integrated strategy, continuous improvement, stakeholder engagement, streamlining processes

Tura et al., 2019	Economic, social, institutional, technological/informational, supply chain, organizational	Environmental, economic, social, institutional, technological/informational, supply chain, organizational

Table 1 - Identified studies on barriers to and enablers for the CE
** Only the most relevant barriers and opportunities have been listed.

Differences between the literature reviews and case studies, as well as the use of different samples, potentially led to different evaluations and depths of investigation. In the following section, an overview of the most frequently encountered barriers and enablers is provided.

All studies mentioned (Table 1) identified significant barriers regarding a lack of capital (financial barrier) and a lack of customer demand (social barrier). Furthermore, Caldera et al. (2019) mentioned that a lack in technical expertise could act as a barrier, especially in SMEs. Technical or technological factors were most often cited as one of the main barriers in the literature (de Jesus & Mendonça 2018, Govindan & Hasanagic, 2018).

One of the most recent, largest studies (Kirchherr et al., 2018) related to CE barriers (*n*= 208 survey respondents, 47 expert interviews) found technical barriers to be negligible, but identified a hesitant company culture as the most significant barrier, which may be justified by current market barriers, and particularly thelow virgin material prices and high upfront investment costs. Rizos et al. (2016), however, found that company culture was a central enabler for the implementation of CE, especially the commitment levels and mind-set of the staff. It is important to note that only SMEs that had already applied "green solutions" in their business models were included in the sample in this case study.

However, this observation of a difference between a hesitant company culture (Kirchherr et al., 2018) and a supportive company culture (Rizos et al., 2016) could indicate that it might be considered difficult to initiate the transition towards a CE. Although institutions such as the European Commission and the Ellen MacArthur Foundation have promised companies that transition to the CE great benefits, it is unclear whether these promises really act as enabling factors for SMEs. This research addresses this research gap and explores precursors that have not been studied previously, examining how the individual perceptions of decision-makers affect CE implementation in SMEs.

Methodology

This section is divided into three parts, starting with an illustration of the literature research conducted to identify central CE categories.The methodological approach taken and the sampling strategy used are subsequently presented.

Literature review

Based on the studies mentioned in Table 1, a semi-structured literature review was conducted to identify potential opportunities for the implementation of a CE in enterprises. Literature on the topic of CE were identified by initially searching the Scopus abstract and citation database and with the Google Scholar web search engine using the keywords “circular economy” and then refining the search by using the keywords “enabler,” “enabling factors,” “driver,” “driving factors” and “opportunities,” as well as the reference lists of the identified studies (Tab. 1). Statements and quotations in the texts that referred to potentials for improvement through the application of CE strategies were subsequently recorded. The literature selection was constantly extended until no further unique statements for each respective category could be identified.

Methodological approach

A questionnaire[3] was then used to investigate potential areas for improvement in companies. This questionnaire was developed with the procedure for an Importance Performance Analysis (Martilla & James, 1977). The IPA is a useful method (Sever, 2015) that can be used to detect gaps between particular aspects of importance and performance. It was originally developed for marketing research, but was lately adapted for use in the health services (Abalo et al., 2007), tourist services (Azzopardi & Nash, 2013), or to examine public perception of electronic vehicles (Riedner et al., 2019).

In this questionnaire, respondents were first asked to describe the perceived importance of the six categories in the respective company. Second, the same categories were used, but the respondents were asked to describe the perceived performance of the companies. A uniform explanation of these categories was provided on the questionnaire for clarification purposes (Tab. 2). This approach was taken to determine whether a gap existed between the individual perception

[3] See Appendix

of the importance and the performance of the respective categories and reveal opportunities to bridge this gap. The respondents' answers also revealed external factors that influenced the companies. Based on the literature on CE barriers (Table 1), we examined whether the market (Kirchherr et al. 2018), technology (Ritzén & Sandstörm; 2017, de Jesus & Mendonça 2018; Govindan & Hasanagic, 2018), or legislation (Rizos et al., 2016; Pheifer, 2017; Caldera et al., 2019) had the strongest influence on the companies included in the sample. A pairwise comparison method (Stern et al., 2012) was used to investigate the perceived influence of these three external factors. Again, on the use of a questionnaire allowed us to determine which of the three factors was regarded as the main influencing factor in the respective company of the respondent. Since the study was carried out to gain more insight into ways to improve CE implementation, this was considered as a supplemental question. Furthermore, the industry sectors were classified according to the ÖNACE 2008[4] standards, and we collected information on the size of the company, the year of foundation, the location of the company, and the gender, age and the position in the company of the interviewed person.

Sampling strategy

Because research on perceptions on ways to apply strategies to promote the transition to the CE, particularly in SMEs, is still scarce, this empirical study was explorative. The findings of research on barriers to and enablers of CE (Tab.1) represented the theoretical backbone of this study, but the practical application of the research was partly predefined by the Interreg project Start Circles[5]; therefore, certain requirements for the sampling were specified:

- Geographical boundaries were defined on the basis of the program area Austria - Slovenia. Companies in the provinces of Styria, Carinthia, Burgenland and Slovenia were considered for the sample.

- The size of the enterprise represented the second limitation. As a result, the sample only included small and medium-sized enterprises (SMEs). The definition of SMEs was based on the definition recommended by the EU[6].

[4] http://www.stat.at/web_en/classifications/implementation_of_the_onace2008/index.html (Accessed: 17.05.2019)
[5] http://www.si-at.eu/de2/start-circles/ (Accessed: 17.05.2019)
[6] http://ec.europa.eu/DocsRoom/documents/10033/attachments/1/translations (Accessed: 17.05.2019)

The aim of the project was to contact representatives at 80 SMEs, 40 of which are based in Austria and 40, in Slovenia. Due to the expertise of project members, companies that work in the wood and polymer industries were selected. In Austria and Slovenia, the respective 40 SMEs could be roughly divided into 20 SMEs in the wood industry and 20 SMEs in the polymer industry, respectively. The SMEs in Austria were identified by searching the Compass Group database (data export date: 24 April 2019).

The ÖNACE classification was used to select all companies in the wood or polymer industries for the sample. Single-person enterprises were not included in the sample due to their weak organizational structures and lack of strategies and resources. 513 companies from the wood industry and 210 companies from the polymer industry were contacted by e-mail and asked to participate in the survey.

Results

The Results are split into two sections. First, the results of the literature review are presented, followed by initial results of the survey.

Results: Literature research

Overall, statements were extracted from 35 articles. As a result, six CE relevant categories (Table. 2) were established based on the gathered quotations.

Table 2 shows relevant quotations that were extracted from the literature. These were arranged thematically and grouped into categories. Six CE categories were defined and are shown below. The uniform explanation for the category included on the questionnaire is also shown.

CE categories	***Explanation in the questionnaire***	***Examples of codes used for categorization***	***Source***
Sustainability	*Companies that decrease their environmental impact because of their corporate philosophy and not because of legislative forces or strategic reasons display **sustainability**.*	*"reduced environmental impact"* *"management's value and belief system"* *"(...) consisting in placing profit in a secondary role of importance, for the benefit of employers, the community, and nature."* *"Idealistic/altruistic motive"*	*Linder & Willander (2017), Cambra-Fierro et al. (2008), Zamfir et al. (2017), Crals & Vereeck (2004), Hemingway & Maclagan (2004)*

Resource efficiency	*Companies that maximize the effective use of resources, which not only reduces material and energy consumption, but also reduces waste disposal, wastewater treatment and emissions display* ***resource efficiency****.*	*"Higher resource efficiency also means reduced costs (…), as well as for waste disposal, waste water treatment and emissions."* *"Resource efficiency or narrowing resource flows, aimed at using fewer resources per product."* *"Great strides have been made in improving resource efficiency."* *"Resource productivity for EU28 has improved."* *"East China regions have genuine interests in improving resource efficiency and environmental performance."* *"Efficiency can help reduce environmental impacts and resource use and thus support competitiveness."*	*Stahel (2012), Bocken et al. (2016), Ellen Mac Arthur Foundation (2012), European Commission 2015, Geng et al. (2012), Lüdeke-Freund (2015), Linder & Willander (2017)*
Differentiation	*Companies that have the capacity to distinguish themselves from competitors by finding new business opportunities and transforming the business in a way that enhances market attractiveness (e.g., marketing) display* ***differentiation****.*	*"CE will give the companies new profit possibilities, increase competitive advantage."* *"…improved or new products, services, or processes with which firms seek to differentiate themselves on the market…"* *"…increase market share and to differentiate the organization from its competitors…"* *"…a green-based competitive advantage existing when a firm does well by doing good— i.e., where the firm finds a relative cost or differentiation benefit, versus its peers…"*	*Lewandowski (2016), Rauter et al. (2018), Gadenne et al. (2009), Arend (2013), Bocken et al., 2014)*
Collaboration with stakeholder(s)	*Companies that work together with stakeholders (e.g. suppliers, customers) and integrating them into internal processes or procedures display* ***collaboration with stakeholder(s)****.*	*"Strong collaboration network tend to be crucial in terms of improving sustainability performance."* *"Collaborative consumption models are recognized as one of the best available options on consumer side to shift from the present business-as-usual model to CE."* *"Industrial symbiosis construed as networks of organizations cooperatively sharing "wastes" has created irresistible imagery and high hopes for a time when virtually all water, energy, and materials will be used more than once, and not to do will have become societally unacceptable."*	*Geissdorfer et al. (2018), Ghisellini et al. (2016); Chertow & Park (2016), Lewandowski, (2016)*

Independence from resource supply	*Companies that reduce the degree to which they rely on the availability of external inputs from a limited number of companies or sources display **independence from resource supply**.*	*"It replaces the concept of waste with the one of restoration and aims to decouple economic growth from the use of virgin resources."* *"CE-type arrangements of the physical flows of materials and energy would reduce virgin inputs to the system and waste and emissions outputs from the system."* *"…supply risk and scarcity of resources…"*	*Ellen Mac Arthur Foundation (2015), Korhonen et al. (2018), Parchomenko et al. (2019), Ghisellini et al. (2016), Reike et al., (2018)*
Life cycle knowledge	*Companies that possess information about product utilization by, e.g., studying returned products after use can better understand customer behaviour and product durability, which can be used to improve products and increases customer loyalty. These companies display **life cycle knowledge**.*	*"Improved product failure knowledge…"* *"Caterpillar engineers study returned components and continually improve the company's ability to remanufacture them at lower cost and higher quality."* *"…securing of spare parts over the whole car life cycle, as well as market share and brand protection…"*	*Walsh (2010), Ellen MacArthur Foundation (2013); Seitz (2007); Ghisellini et al. (2016)*

Table 2: Illustration of CE categories

Sustainability is displayed by companies that decrease their environmental impact because of their corporate philosophy and not because of legislative forces or strategic reasons. As in Rizos et al. (2016), this category was created to shed more light on the companies' cultures. If sustainability itself does not constitute a reason for the transition, then other motivational factors are usually characterized by their contribution to profit (Zamfir et al., 2017).

Resource efficiency increases profits by reducing material or energy consumption (Linder & Williander, 2017). This category is characterized by optimum resource utilization, which, on the one hand, can reduce costs (Stahel 2012) and, on the other hand, can reduce waste and emissions (Bocken et al. 2016).

Differentiation can be demonstrated by companies that differentiated themselves from others by creating new value propositions and, thereby, addressing their customers directly (Bocken et al., 2014, Lewandowski, 2016, Rauter et al., 2018). The ability to differentiate oneself from competitors is a central aspect in marketing and allows companies to obtain revenue. Companies that find

sustainable concepts or solutions (e.g., Fairphone[7], Recover Brands[8]) can increase in market attractiveness and gain competitive advantages on the market.

Cooperation with stakeholders is regarded as a key element of CE, since a product is associated with an entire supply or value chain; therefore, circularity increases as the number of sustainable partnerships increases (Lewandowski, 2016). Concepts such as Industrial Symbiosis or Eco Parks (Chertow & Park, 2016) can only be applied through cooperation, whereby waste can be used for other purposes than being deposited in a landfill, and material cycles can be closed.

Independence from supply of resources implies that certain strategies can be used to resolve the dependence on raw materials, thereby, increasing the companies' resilience (e.g., oil prices, lack of supply) (Ghisellini et al., 2016). In order to overcome dependency, the Ellen MacArthur Foundation (2012) emphasizes the 3Rs principles (Reuse, Recycle, Remanufacture), which were defined in an attempt to close material cycles[9]. In the scientific literature, the concept of the 3Rs has been extended up to 10 Rs (with the addition of Refuse, Reduce, Repair, Refurbish, Re-purpose, Recover, Re-mine) to minimize the material input (Reike et al., 2018).

Life cycle knowledge refers to information that is obtained about product usage to minimize errors and improve the company representatives' understanding of customer consumption patterns (Walsh, 2010), as well as optimizing the product itself by securing spare parts or remanufacturing parts (Seitz, 2007, Ellen MacArthur Foundation 2013).

An illustration of the relationships among the individual categories and their main influences is provided in Figure 2.

[7] https://www.fairphone.com/en/ (Accessed: 17.05.2019)
[8] https://recoverbrands.com/ (Accessed: 17.05.2019)
[9] https://www.ellenmacarthurfoundation.org/circular-economy/infographic (Accessed: 17.05.2019)

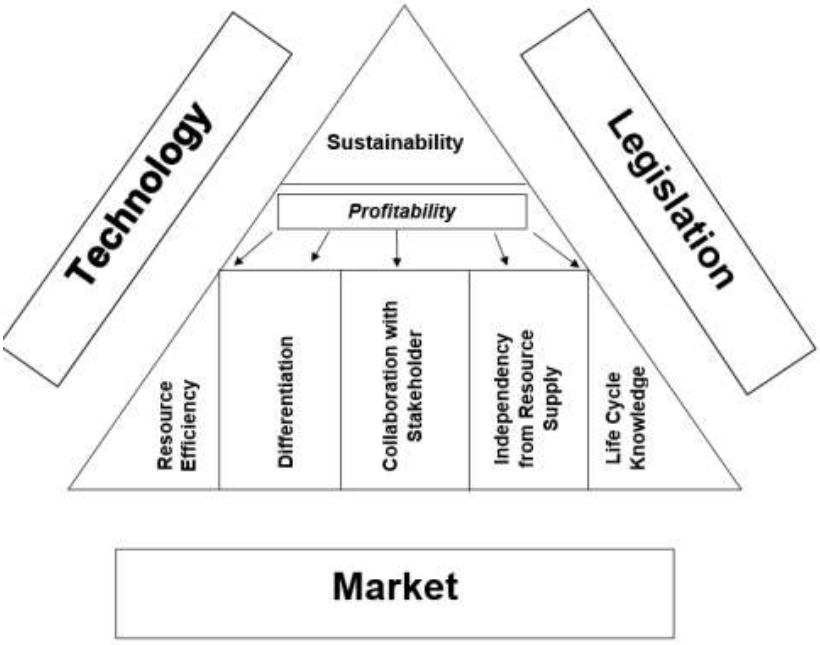

Figure. 2: Illustration of the six categories (based on Table 2) and external influencing factors

Preliminary results of the survey

A first test phase of the survey was performed in December 2018 and January 2019 with 15 SMEs.

The majority of responses on the questionnaire (*n* = 6) could be allocated to the ÖNACE category "Manufacture of goods." The respondents indicated that the market orientation exerted the greatest influence on their company, along with influences that arose from legislation or new technologies. The main gaps were identified in the two categories "resource efficiency" and "independence from resource supply." Therefore, revisions in these categories could be made the respective companies' business models to promote the transition to the CE.

Four of the responses from the other nine SMEs could be allocated to the ÖNACE category "service activities," which were related to legislation. The dominant business opportunity gap was identified in the category "collaboration with stakeholders."

A more detailed analysis of the similarities and differences between the perceived importance and performance of CE business opportunities will subsequently be made with a larger sample of SMEs (*n* = 70-100) to identify gaps.

This study contributed to a better understanding of factors that promote the transition to the CE in SMEs and allowed us to identify topical areas in which strategic changes could be made to drive circularity in the respective business models of the companies.

Appendix

Interreg Start Circles Questionnaire for SMEs

Dear Sir or Madam,

In the course of an Interreg Project called "Start Circles", the Karl-Franzens-University Graz conducts a brief survey to support and to get a better understanding of small and medium-sized enterprises (SMEs), in the regions (Styria, Burgenland, Carinthia, Slovenia).

The Questionnaire should take around 8-10 minutes.

Be assured that all answers that you provide will be kept anonymously and will not be forwarded to any further parties who are not part of the project.

There are neither right nor wrong answers in this survey, as only the opinion of your person is asked.

If an error occurs or you need some help please contact: daniel.holzer@uni-graz.at

There are 15 questions in this survey

How important are the following categories for your company?

[]

In the following group of questions, we would like to know how important the individual categories are for your company

A description of the categories is provided by moving your mouse over them

*

Please choose the appropriate response for each item:

	Important			Neither Important nor Unimportant			Unimportant
Sustainability	○	○	○	○	○	○	○
Resource Efficiency	○	○	○	○	○	○	○
Differentiation	○	○	○	○	○	○	○
Collaboration with Stakeholder	○	○	○	○	○	○	○
Independence from Resource Supply	○	○	○	○	○	○	○
Life Cycle Knowledge	○	○	○	○	○	○	○

[]

The following question is a direct comparison of three categories (Market versus Legislation versus Technology)

Which of the following categories are the driving factors for your company?

*

Please choose the appropriate response for each item:

	Important	Rather Important	Neither Important nor Unimportant	Rather Important	Important	
Market	○	○	○	○	○	Legislation
Market	○	○	○	○	○	Technology
Legislation	○	○	○	○	○	Technology

How satisfied are you with the performance of your company in the following categories?

Please don't be irritated, as we use the same group of questions again. This time we ask you about the **performance** level of your company in each category.

[]

How satisfied are you with the performance of your company in the following categories?

A description of the categories is provided by moving your mouse over them

*

Please choose the appropriate response for each item:

	Satisfied			Neither Satisfied nor Dissatisfied			Dissatisfied
Sustainability	○	○	○	○	○	○	○
Resource Efficiency	○	○	○	○	○	○	○
Differentiation	○	○	○	○	○	○	○
Collaboration with Stakeholder	○	○	○	○	○	○	○
Independency from Resource Supply	○	○	○	○	○	○	○
Life Cycle Knowledge	○	○	○	○	○	○	○

Questions about your Company

[]

In which year was your company established?

*

Only numbers may be entered in this field.

Please write your answer here:

[]

Is your company a...

*

Please choose **only one** of the following:

- ○ Micro sized enterprise // 1-9 employees / Turnover ≤ € 2 million / Balance sheet total ≤ € 2 million
- ○ Small sized enterprise // 10-49 employees / Turnover ≤ € 10 million / Balance sheet total ≤ € 10 million
- ○ Medium sized enterprise // 50-249 employees / Turnover ≤ € 50 million / Balance sheet total ≤ € 43 million
- ○ Large sized enterprise // more than 250 employees / Turnover > € 50 million / Balance sheet total > € 43 million

[]Where is your company located? (Country/Province) *

Please write your answer here:

[]

In which branch of industry is your company located?

The following options are the ÖNACE 2008 classification

For more information visit the website: **http://www.statistik.at/KDBWeb/kdb_Einstieg.do**

*

Please choose **only one** of the following:

- ○ AGRICULTURE, FORESTRY AND FISHING
- ○ MINING AND QUARRYING
- ○ MANUFACTURING, PRODUCTION OF GOODS
- ○ ELECTRICITY, GAS, STEAM AND AIR CONDITIONING SUPPLY
- ○ WATER SUPPLY; SEWERAGE, WASTE MANAGEMENT AND REMEDIATION ACTIVITIES
- ○ CONSTRUCTION
- ○ WHOLESALE AND RETAIL TRADE; REPAIR OF MOTOR VEHICLES AND MOTORCYCLES
- ○ TRANSPORTATION AND STORAGE
- ○ ACCOMMODATION AND FOOD SERVICE ACTIVITIES
- ○ INFORMATION AND COMMUNICATION
- ○ FINANCIAL AND INSURANCE ACTIVITIES
- ○ REAL ESTATE ACTIVITIES
- ○ PROFESSIONAL, SCIENTIFIC AND TECHNICAL ACTIVITIES
- ○ ADMINISTRATIVE AND SUPPORT SERVICE ACTIVITIES
- ○ PUBLIC ADMINISTRATION AND DEFENCE; COMPULSORY SOCIAL SECURITY
- ○ EDUCATION
- ○ HUMAN HEALTH AND SOCIAL WORK ACTIVITIES
- ○ ARTS, ENTERTAINMENT AND RECREATION
- ○ OTHER SERVICE ACTIVITIES
- ○ ACTIVITIES OF HOUSEHOLDS AS EMPLOYERS; UNDIFFERENTIATED GOODS- AND SERVICESPRODUCING ACTIVITIES OF HOUSEHOLDS FOR OWN USE
- ○ ACTIVITIES OF EXTRATERRITORIAL ORGANISATIONS AND BODIES

[]What other service activities does your company provide? *

Only answer this question if the following conditions are met:
Answer was 'OTHER SERVICE ACTIVITIES' at question '7 [C4]' (In which branch of industry is your company located? The following options are the ÖNACE 2008 classification For more information visit the website: http://www.statistik.at/KDBWeb/kdb_Einstieg.do)

Please write your answer here:

[]Does your company sell... *

Please choose **only one** of the following:

- ○ Products
- ○ Services
- ○ Products and Services
- ○ Other

[]Does your company sell... *

Please choose **only one** of the following:

- ○ Products
- ○ Services
- ○ Products and Services
- ○ Other

[]What kind of products/services does your company provide? *

Please write your answer here:

Questions about your Person

Lastly, we would like to ask some questions about your person

[]

What is your position in the company?

*

Please write your answer here:

[]What is your year of birth? *

Only numbers may be entered in this field.

Please write your answer here:

[]What is your gender? *

Please choose **only one** of the following:

- ○ Female
- ○ Male

[]Do you have any comments on the questionnaire?

Please write your answer here:

[]

If you are interested in actively participating in the "Start Circles" development project and being supported by further project partners (conducting workshops, involvement in development partnerships, support in the development of innovations), please enter your e-mail address and the name of your company and we will contact you in the near future.

Please write your answer here:

Thank you for participating!

To get more Information about the **Interreg Project Start Circles** I invite you to visit the homepage:

http://www.si-at.eu/en2/start-circles/

Submit your survey.
Thank you for completing this survey.

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Opening the (black) box of closing the loop: An empirically derived taxonomy of how companies create new use lives for waste materials

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Abstract

This paper aims to ground the study of circular economy business models (CEBMs) in practice by empirically examining CEBMs centered around recycling activities in firms that are not waste management service providers at their core. Specifically, it seeks to answer the following research question: How do closed- and open-loop recycling CEBMs compare in practice? The research question is examined through an exploratory multiple case study. The units of observation are six circular economy frontrunner companies, and the units of analysis are the recycling typologies closed-loop, open-loop: upcycling and open-loop: downcycling. The clearest difference between the models was in their value creation processes, particularly how firms acquire waste materials. A fourth recycling typology, ambiguous value change, was created for cases in which it is not inherently clear whether the materials achieve a higher quality and/or functionality in their second lives. The analysis also found different value propositions for the different models, and found that companies need to additionally think about upstream value propositions to incentivize partners to collaborate. The case companies' differences in value delivery and value capture seemed to be largely a function of the firms' inherent properties rather than of their recycling models. The findings showed that there are differences between closed- and open-loop recycling business models and that in CEBMs, the lines between business model components – especially between value creation and delivery, and between value creation and value proposition – can become blurred.

Keywords

circular economy, closed loop, circular business model, sustainable production, value creation

Taming the Elephant in the Room

Consumer Acceptance of Circular Economy Business Models

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Extended abstract

The contemporary 'Linear Economy' (LE) has been fed by a one-way resource use, 'take-make-dispose' logic. In the LE, consumers often don't concern themselves with the details—what was taken, how it was made, and how is it disposed—but can often enjoy the simplicity of the sanitized consumption process (Borrello *et al.*, 2017). The LE is a potentially self-destructive model that not only endangers the natural environment, but also the resilience and security of the economic system as it exploits the resources base of production and emits damaging substances and waste.

In response to these threats, the idea of the Circular Economy (CE) has gained momentum as a solution and template for the future economy (Su *et al.*, 2013; Ghisellini, Cialani and Ulgiati, 2016; Merli, Preziosi and Acampora, 2018). The CE is a prescriptive sustainable transition outcome that aims to decouple economic growth from resource use and establish resiliency (Hofmann, 2019) by maintaining a high value of products in the economic system, with materials flowing from the end of one value cycle to the beginning of the next, while sustaining balance with the natural environment's regenerative capacity. At the core, the CE characterizes system-wide requirements to *refuse* (Reike, Vermeulen and Witjes, 2018), *reduce*, *reuse*, and *recycle* materials (Ghisellini, Cialani and Ulgiati, 2016), as well as employ renewable energy, distinguish biological and technical material flows, and design

products and systems to facilitate circularity (Braungart, McDonough and Bollinger, 2007; EMF, 2012).

While the CE concept has received considerable ontological inquiry (Ghisellini, Cialani and Ulgiati, 2016; Geisendorf and Pietrulla, 2017; Kirchherr *et al.*, 2017; Korhonen, Honkasalo and Seppälä, 2018) and circular economy business models (CEBM) (Urbinati, Chiaroni and Chiesa, 2017; Geissdoerfer *et al.*, 2018; Lüdeke-Freund, Gold and Bocken, 2018), the role of consumers who have to accept, buy, and participate in the CE products and service offerings (e.g. potentially more demanding take-back systems) is surprisingly under-researched to date from a conceptual perspective (Planing, 2015; Camacho-otero, Boks and Pettersen, 2018).

This paper aims to contribute to filling this gap by analyzing fundamental CE principles from the consumer perspective to synthesize and structure latent acceptance and contribution problems that different aspects of circular consumption might provoke for different products and by drawing on related literature to gain a better understanding of these implications.

In the CEBM and product requirement perspective, mechanisms aim to *close* or *slow* resource loops, through sharing, reusing, recovering, repairing and maintaining products and their value (Bocken *et al.*, 2016). These are further facilitated by various guidelines that include the product's material arrangement and composition, e.g. durability (physical, functional, emotional), modularity, repairability, as well as being composed of biological content or recycled content that is technically and feasibly recycled (den Hollander et al., 2017).

Indeed, when intentionally designing closed loops, a business may be challenged to optimally balance CE principles, given the prevailing economic forces that may affect profitability and consumer acceptance. While contemporary product and BM development may leverage every means available to capture the most demand with the strongest value proposition (e.g. achieving higher convenience and lower cost), a circular designer would aim to comply with CE guidelines to the highest degree. If natural materials or standardized plastics must be utilized to enable circularity to persist, product differentiation and the perception of aesthetics may be also required to change depending on extant social norms; (e.g. slim form with sleek finishes may be renounced for improved durability or use of recycled materials). Cox (2013) highlights that "significant psychological, emotional and social factors which underpin the rapid churn of products in the

modern throwaway society" (p.27), turn the perspective back to the consumer. What is the consumer role in closing the loop for a CE?

In modest cases, new circular principles may be implemented and disguised behind the scenes, while the customer facing product or service remains unaffected. This would be a technological silver-bullet solution. However, given the predominant linearity throughout the economy and the often-prescribed transition from ownership to access models for a CE, it is conceivable that increasingly circular business models and products may look, feel, or behave differently. For example, consumers may need to e.g.: adopt alternative consumption patterns such as product-service-systems (PSS), value natural or recycled materials, or commit to returning products to their manufacturer. The EU has also acknowledged the importance to understand consumer acceptance within the Circular Action Plan Framework (European Commission, 2015), supporting an expansive behavioral study on consumer engagement in the circular economy. However, this study was limited to a population survey of repairability and durability preferences, unable to deliver comprehensive assessment of the consumer role and acceptance from a more encompassing standpoint (Cerulli-Harms et al., 2018). Hence, this paper seeks to employ the theoretical lens of social practices to provide contextual dimensions to extend the understanding of the circular consumer.

Social practice theory (SPT) takes a step back from the individual as the central focus (Reckwitz, 2002), and employs a meso - macro perspective to understand the behavior of everyday consumption (Spaargaren, 2003; Shove, 2004; Shove and Walker, 2010). Practices are characterized as routinized behaviors (Reckwitz, 2002) performed by 'practitioner' agents which are influenced, not only by the agent's cognition, but the alignment of contextual factors, contained in three core elements: *materials*—e.g. artefacts, tools, infrastructures, technologies; *competence*—e.g. know-how, skills, understanding; and *meanings*— e.g. social significance, symbols, aspirations (Shove and Walker, 2007; Røpke, 2009; Shove, Pantzar and Watson, 2012). Spatial and temporal dimensions are considered, (Schor, 1993; Southerton, 2003, 2006) along with the interlinkages of elements (Shove and Walker, 2010), as consumption is shift to the performance of practices (Spaargaren, 2003), (e.g. doing laundry, in your home, in the morning; rather than consuming detergent, water, electricity, machine-bearings, and clothing-fibers.) From this perspective, "…it is the engagement in the practice… that explains the nature and process of consumption" (Warde, 2005, p.138). If innovative products or new social ideologies are introduced, they may not alone be successful in

joining the practice, if other elements are not well aligned, e.g. infrastructure, skills, aspirations (Shove, Pantzar and Watson, 2012).

Consequently, SPT has become a promising lens for investigating sustainability transitions and the CE (McMeekin and Southerton, 2012; Mylan, 2015; Hobson *et al.*, 2018). As the CE suggests a different relationship with consumption than today—changes in practices and underlying factors may occur. Additionally, the servitization of products converges with SPT, as the result-oriented nature of PSS (cf. Tukker 2015) aligns well with the conceptualization of practices. Therefore, we suggest that SPT provides a suitable frame to further investigate the consumer role in the circular economy.

This paper contributes to the conceptual knowledge gap, by first reviewing the CE literature following the review method of Tranfield, Denyer, and Smart (2003) with related keywords e.g. consumer, acceptance, implications and perspectives, to take stock of the current consumer acceptance discourse, based on qualitative content analysis (Mayring, 2014) and (1) collate and categorize CE design principles that may affect consumer acceptance. (2) These CE principles are qualitatively analyzed to reveal latent consumer implications for different product types, stepwise along the consumption stages (Evans 2016) through the lens of Social Practice Theory (Shove 2010). (3) A typology of consumer acceptance dimensions is developed and applied to CE business model mechanisms and design principles. These perspectives provide insight into the suitability of circular products and services to meet the needs and expectations of consumers.

Keywords

Circular Economy, Circular Economy Business Model, Consumer Acceptance, Enablers, Barriers, Social Practice Theory

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What's the "use" of circular business models ?

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Extended abstract

This paper investigates the problem of developing circular economy business models and the challenges facing the building industry in practice. Despite the recent attention to circular economy in both research and practice, applications to the building industry are falling short (Geldermans, 2016; Ghisellini, P., Ripa, M., & Ulgiati, S. 2018; Nußholz, Rasmussen, & Milios, 2019). The aim of this research is to examine the opportunities and barriers to the implementation of circular economy in the building sector, also referred to as *circular construction*. In particular, building organizations have recently demonstrated an interest in innovating circular business models in order to transition their cradle-to-grave business to circularity. Recognition of this interest arose from ethnographic research in the building organization VELUX A/S, a company best known for its roof windows, but also deeply engaged in the research into and development of sustainable buildings. The research was then furthered with two workshops – one internal and one external – and secondary data such as circular building materials and events concerning circular construction. The research finds that – akin to other industries – the building industry places an inordinate amount of attention on the reuse and recycling of material and little attention on extending the use of buildings (and thus their materials). This paper argues that one of the major shortfalls of current circular economy approaches in building is a lack of business models valuing the use phase of buildings, given these long-lasting products' life span.

Theoretical background

Theory development on sustainable business models including a circular economy approach is expanding (Lacy & Rutqvist, 2015; Bocken et al., 2016; Simons, 2017). Scholars utilize different definitions of circular economy that may consider the material dimensions, or economic aspects; but for the purposes of this paper, the Ellen McArthur Foundation (EMF) definition is used: 'A Circular Economy is an economic and industrial system where material loops are closed and slowed and value creation is aimed for at every chain in the system' (EMF, 2013), a system which 'aims to redefine growth, focusing on positive society-wide benefits' (EMF, 2019). Thus far, the focus on circular economy business models has tended towards easily handle-able and transferable products, as opposed to durable goods (Leising, Qvist, & Bocken, 2018). Part of the problem could be the tension between economic and social or ecological valuation, because there is more economic activity involved in shorter-lived products that can be transformed into new products for consumption. Following these views, Flynn and Hacking (2019) describe the ideological conflict arising from circular economy standards within a neoliberal governance system. Indeed these material input and output focused valuations can reduce (or even eliminate) waste and improve efficiencies (and global trade), but they neglect a true life-cycle approach and potentially encourage design for planned obsolescence.

In theory we can see this reflected in the consideration of time as a factor for sustainable business models: As Lozano (2018) underlines in his review of sustainable business model literature: 'The time dimension is conspicuously missing in SBMs discourses' (p.4). Indeed the tendency of research on circular economy for building tends to focus on two distinct time frames, pre-construction and re-use, while glossing over the use phase (e.g. Leising, Qvist, & Bocken, 2018; Nuñez-Cacho et al., 2018; Nußholz, Rasmussen, & Milios, 2019). In their literature review of circular economy for buildings, Hossain and Ng (2018), find that most research that considers circular economy for building either consider cradle-to-grave (planning to demolition) or cradle-to-gate (planning to construction approval), and only 2% consider cradle-to-cradle (planning to next integration) (p.767). They also point to economic and social sustainability, fundamentally tied to the use phase of buildings: 'Sustainability assessment cannot be fully evaluated without considering the economic and social aspects, and most of the studies did not take those aspects into account' (Hossain & Ng, 2018, p.776).

Methodology

This research uses qualitative methodology, namely a one-year ethnographic study at VELUX headquarters and two industry workshops – one internal to VELUX

architects and the other within the 2018 Active House Alliance Symposium. The ethnographic study involved office presence 1-3 times per week between January 2018 and January 2019, and it included observation of daily activities, informational meetings, and internal workshops and events, which were documented in note taking (Strauss & Corbin, 1998). These ethnographies include: 49 distinctive documentations of meetings, observations, emerging questions, and interactions; 40 internal communication documents; and 19 secondary articles and documents linked to these ethnographies.

The first workshop took place on the 25th of October 2018 in Zurich, Switzerland, and involved approximately 25 VELUX architects from VELUX sales offices around the world, but primarily from Europe. During this workshop, architects were asked to identify steps in the process of a building, from ideation to completion. Later, when they had identified stages of input, process, and output, they were asked to identify what the outputs related to VELUX products are; in other words, what the value during the use phase of the building is. The second workshop took place on the 8th of November 2018 in Lecco, Italy, and involved about 20 participants from the Active House Symposium, which ran from the 7th to the 8th of November. These participants included architects, engineers, and professional house builders, who were asked to rank aspects of Building Information Management (BIM) (a tool for detailed planning for the life cycle of a building) by *sustainability importance*, *professional practicality*, and *economic viability*. Participants could rank levels 1-3 for each of these categories, with one being the top priority, and then scaling down to the third most prioritized aspects. The aim was to identify how a design tool that can be combined with life-cycle approaches (such as life-cycle assessment, LCA) to design for circular construction might imbed a variety of building aspect prioritizations in the industry. These rankings were then compiled into a spreadsheet, from which the BIM aspects were given an average rank and weighted average rank for each category.

Initial Findings

To give an impression of the ethnographic data, a table is first presented with some of the quotes and notations derived during the ethnography period. This is followed by the outcomes from Workshops 1 and 2, which are briefly discussed.

Table 1: Ethnographic sample references

Date	Categorization	Speaker / Company	Reference
01-04-18	Internal meeting	Anonymous	"Much of company does not appreciate the need to understand the users better."
09-24-18	External event	Nadia Yen / First Gulf	"At the end of the day, what's really important is how it's operating, how it's being used." (referring to the building)
09-26-18	Internal event	John Sommer / MT Højgaard	"The most sustainable thing you can do is to build a building that will last 500 years or more."
09-26-18	Internal event	Andreas Hermelink / Ecofys	"The renovation rate is too slow, the renovation depth is too shallow, and it's not clear which buildings most need renovation."
11-20-18	External event	Torben Klitgaard / BLOXHUB	"It's very much the agenda now to talk about the value of circularity."
01-25-19	Internal meeting	Anonymous	"Buildings that are loved are used for 100s of years. Now they completely skip the whole use phase."
02-18-19	External event	Stephanie Hubold / QVARTZ	"When we brought circular economy to the World Economic Forum, it was a niche topic. And now it's broadly recognized, also from our clients." (Moderator: Isn't there a discourse around capitalism still being the driving force?) "Indeed we see those opportunities that have a real business case...if you can show the business case, you can get them to change."
02-26-19	Internal meeting	Anonymous	Efforts at changing company mindset from being just about product to being about "green" and "healthy" outcomes, including circularity.
04-03-19	External event	Ditte Lysgaard Vind / Lendager Group	Three phases: business model, product, process. Process as most interesting because you can look at it more systematically, and this goes back to the business model. Don't start with good product now, but ask what is there demand for in the market? And then figure out how to make

Table 2: Workshop 1 Use-phase values

		Outputs (Use Phase)
Inputs (e.g. Materials, energy, finance)	**Process** (e.g. visioning, drawing, collaboration certificates)	knowledge
		good sleep quality
		motivation
		understanding / awareness
		comfort
		pride / privelege
		innovation
		uniqueness
		health
		privacy / security
		happiness
		productivity
		well being
		recharging

Table 3: BIM aspects and top rankings

BIM Factor	Important												Avg.	Weighted
Integrated design between different disciplines	1	1	1	1	1	1	1	2	2	2	2	2	1,4	0,12
Better flux of data, information, knowledge	1	2											1,5	0,75
Different dimensions for different purposes	2	3											2,5	1,25
From conceptual design to as-built detail	1	1	2	2	2								1,6	0,32
Energy analysis	1	2	3	3	3								2,4	0,48
Industry 4.0 / Prefabrication and automation	2	2											2,0	1,00
Construction management (time and cost)	1	1	3	3	3	3							2,3	0,38
Operation and maintenance	1	1	2										1,3	0,43
Customized parameters for Active House specifications - Comfort / Energy / Environment	1												1,0	1,00
Informed platform after "as-built"	1	2	3	3	3								2,4	0,48
Upgrading with monitoring phase	2												2,0	2,00

BIM Factor	Practical							Avg.	Weighted
Integrated design between different disciplines	1	1	1					1,0	0,33
Better flux of data, information, knowledge	1	1	1	3				1,5	0,38
Different dimensions for different purposes	2							2,0	2,00
From conceptual design to as-built detail	1	2	2	2				1,8	0,45
Energy analysis	1	1	2	2	2	2	3	1,9	0,27
Industry 4.0 / Prefabrication and automation	1	2	2	3				2,0	0,50
Construction management (time and cost)	1	2	3					2,0	0,67
Operation and maintenance	1	1	1	2	2	3	3	1,9	0,27
Customized parameters for Active House specifications - Comfort / Energy / Environment	1	2	3					2,0	0,67
Informed platform after "as-built"	2	3						2,5	1,25
Upgrading with monitoring phase	2	3	3					2,7	0,90

BIM Factor	Economical										Avg.	Weighted
Integrated design between different disciplines	1	1	1	2	2	3					1,7	0,28
Better flux of data, information, knowledge	1	1	1	2	3						1,6	0,32
Different dimensions for different purposes	3	3									3,0	1,50
From conceptual design to as-built detail	2	2	2	2							2,0	0,50
Energy analysis	1	2	3	3							2,3	0,58
Industry 4.0 / Prefabrication and automation	2	3	3	3							2,8	0,70
Construction management (time and cost)	1	1	1	1	2	2	2	2	3	3	1,8	0,18
Operation and maintenance	1	1	1	2	2						1,4	0,28
Customized parameters for Active House specifications - Comfort / Energy / Environment	1	2	3	3							2,3	0,58
Informed platform after "as-built"	2										2,0	2,00
Upgrading with monitoring phase	2	2	3	3	3	3	3				2,7	0,39

The sample ethnographic references in Table 1 are meant to give an indication of the kinds of notes developed over time. One main observation crosscutting internal and external meetings and events is the rising popularity of circular construction that appears to come at odds with the status quo of construction sector business models. Simultaneous to attempts to generate new business from trade activity based on reusing and recycling business materials, there is an increasing concern for (and helplessness about) the use (or in technical terms, the *operations*) of buildings. The initial findings from Workshop 1 (Table 2) demonstrate the use phase value that could potentially be commensurated and captured in circular business models for building. Further, the initial findings from Workshop 2 (Table 3) show that building professionals do not rank operation and maintenance, the factor most linked to the use phase, as the most important for sustainability (landing instead at fourth place out of the factors). However, they do rank it as the number one most practical factor, as well as the second most economical factor. These findings underscore a disparity between the value placed on buildings in use and the reflection of this value in current business models for building, wherein economic value capture is heavily focused on the production phase. But they also indicate that there is a practical and economic opportunity to develop business models around the durable use of buildings.

Discussion and Conclusion

This research sheds light on the neglected use phase of durable products, such as buildings, in circular economy business models. Although circular economy aims to approach sustainability from a life cycle perspective, not all life cycle phases are considered equally in business models. Yet, this blind spot to value in the use phase highly impacts human health and environmental sustainability, several aspects of which are elucidated in the results in Table 2. And these aspects could be practically and economically addressed, as highlighted in Table 3, through circular business models that incorporate value from the use phase – for example with the use as life cycle tools such as BIM combined with LCA. Leising, Qvist, and Bocken, (2018) explain the difficulty of reimagining value in buildings due to the multifarious partners, materials, and life spans involved. But this is not disconnected from the transition from product to service economy. Perhaps the difference for durable product business models is that the service becomes about perpetuating products for higher quality over longer time spans through the paid service of those products.

Ultimately this is a problem of time and economic models. For durable goods, such a buildings, it is easy to imagine that the financial value capture will be more tangible for companies attempting circular economy if their business focuses on the inputs and/or outputs, especially when it falls within a time span wherein they can plan their participation. Yet in terms of sustainability, there is some irony here: the business models that could make building companies more sustainable in the long run are dropped to the wayside when companies consider they might not last long enough for the value to be relevant. Thus, the challenge is not just the circular flow of materials through the life of businesses, but further into the care of materials through the potentially long life of the products.

Keywords

circular construction; circular business models; life cycle; use phase; valuation.

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TRACK II

NEW BUSINESS MODELS, SUSTAINABLE DEVELOPMENT & CORPORATE STRATEGIC MANAGEMENT

Track II: New Business Models, Sustainable Development & Corporate Strategic Management

Chairs: Romana Rauter[1], Yuliya Snihur[2], and Christian Nielsen[3]

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Sustainable business models are intensively discussed as a means to foster a necessary transition towards more sustainable societies. On the one hand, a multitude of examples of business models with a sustainable core, like circular business models and asset-sharing business models, exist. On the other hand, there are also many examples of "regular" business models that are being tuned towards higher levels of sustainability, for example through the use of partnerships, or other resource-minimizing choices.

The successful transition towards more sustainable businesses is dependent upon a number of factors. Amongst them, we highlight the relevance of two factors from a corporate management perspective: a) the content-based dimension referring to the inclusion of sustainability goals in corporate strategy; and b) the time dimension referring to the timeline of implementation of these goals, including questions about scalability and longevity. Both factors relate to strategic management issues, including a future vision of success as seen from the management perspective, potentially offering a "set of guidelines that determines decisions into the future" (Mintzberg, 1978: 935). The corporate strategy decision to invest in a more sustainable business version of the existing business model(s), or to develop new sustainable business models from ground up, is a complex matter. Our point is that building sustainable and scalable business models rests upon strategic management decision-making within the firm, as does the subsequent management of the business model portfolio.

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A Multi-level Perspective on Business Model Transitions

Allsafe and RetailCorp's Evolutionary Journeys

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Abstract

Transitions towards 'better' business models have long been a focus of alternative business model research. Such research to date has mostly focussed on transition outcomes, in the form of the aspired business models to be created. However, we know little about the multi-transition journeys leading to such outcomes. We propose a mid-range theory for such study by bringing together a multi-level perspective on socio-technical transitions and a social practices perspective on business models. We illustrate the resulting multi-level perspective on business model transitions through the automobile supplier Allsafe's and the multinational RetailCorp's three-decade business model transitions. Our findings explain the occurrence and shape of business model transitions through the emergence of new dominant practices reconfiguring the business model: First, in an exogenous emergence, such practices migrate into business models from external developments: For instance, Japanese manufacturing practices drove Allsafe's past transition from an automobile parts trader to an industrial manufacturing company, RetailCorp's eco-efficient value creation was driven by practices pushed by the Carbon Disclosure Project. Secondly, endogenous emergence transpires from protected niches inside an organization: Self-bred humanistic management practices fuelled Allsafe's most recent transition; unique practices of corporate responsibility were indispensable to their latest transition. We propose a future research agenda for a multi-level perspective on business model transitions.

Keywords

Business model transitions, alternative business models, theories of practice

Introduction

Transitions towards 'better' business models have long been a focus of alternative business model research (e.g. Schaltegger et al., 2016, Randles and Laasch, 2016, Laasch, 2018a). Such research to date has mostly focussed on transition outcomes in the form of the aspired business models. However, we know little about the evolutionary journeys leading to business model transitions or about how sequences of business model transitions build up one on another.

We intend to contribute to the conference track "New business models, sustainable development, and corporate strategic management" chaired by Romana Rauter, Yuliya Snihur, and Christian Nielsen. We believe our emphasis on (strategic) business model transitions in existing organizations makes this paper a suitable contribution to this track. Also, the discussion and implications of strategic niche management as the strategizing practice underlying such transitions appears highly relevant to this session.

Conceptual Framework: Multi-Level perspective on Business Model Transitions

We propose a mid-range theory for the study of sequences of business model transitions by bringing together a multi-level perspective on socio-technical transitions (Geels, 2002, Geels, 2011, Geels and Schot, 2007) and a processual social practices perspective on business models (Boons and Laasch, 2019, Boons et al., 2018, Feuls, 2018).

Through a practice lens, business models are understood as unique bundles of practices (Feuls, 2018, Boons et al., 2018) of value proposition, creation, exchange, and capture enacting according the dominant organizational value logic (Laasch, 2018b). As conceptualized in *Figure* , Business model transitions (both occurrence and form) can be explained through a multi-level perspective. When novel practices have matured sufficiently in protected niches, they may migrate into the business model regime of dominant practices. For this to happen, the existing bundle of business model practices has been loosened or opened up to integrated

these new practices by higher level 'landscape' pressures, such as legislative pressures, shifts in consumer demands, or institutionalized industry practices. Given the entanglement of practices in these bundles, interweaving a new core practice creates processes of realignment changing also existing practices of value proposition, creation, exchange, and capture.

[INSERT FIGURE 1 ABOUT HERE]

Methods: Oral History

We conducted two comparative in-depth case studies with intensive on-site immersions at both Allsafe and RetailCorp (anonymized). Core to the data collection were oral history focus sessions in which groups of long-time employees both drew and narrated the company's business model transitions over time. Additional interviews with 144 individuals (72 per company) provided a nuanced and multi-facetted image of business model transitions. Coding involved harmonizing the groups' drawings, and resolving contradictions and ambiguities through triangulation with interviews and further empirical material (see Table 1).

[INSERT TABLE 1 ABOUT HERE]

Illustrative Case Studies

We illustrate the resulting multi-level perspective on business model transitions through two complementary case studies:

Allsafe. As illustrated in Figure 2**Error! Reference source not found.**, the a utomobile supplier Allsafe has undergone a thirty-year journey of regular business model transitions. Early business model transitions were driven by the integration of Japanese Production practices, a later one by disruptive humanistic management practices, and the most recent ongoing transitions by sustainability practices related to dematerialization. Each transition was driven by a realignment of the business model practices bundle, to accommodate the new core practice. New practices in the business models can be considered antecedents of the transition.

[INSERT FIGURE 2 ABOUT HERE]

RetailCorp. Figure illustrates how, ever since 1991, the global RetailCorp has periodically experienced the embedding of corporate responsibility sustainability practices as part of business model transitions. This integration of such practices into the business model was always accompanied by a deliberate strategic business model change episode orchestrated by RetailCorp's high-level leadership. Unlike in Allsafe, these new practices' embedding into the business model can be considered consequences of the business model transition.

[INSERT FIGURE 3 ABOUT HERE]

Findings: Exogenous-Endogenous Origins; Push-Pull Emergence

From our empirical work we came to distinguish the four types of transition patterns illustrated in Table 2.

[INSERT TABLE 2 ABOUT HERE]

Our findings explain some business model transitions (particularly in the Allsafe case) through the emergence of new dominant practices reconfiguring the business model. We call this practice-push transitions: First, in an exogenous emergence, new practices migrate into business models from external trends: Japanese manufacturing practices drove Allsafe's past transition from an automobile parts trader to an industrial manufacturing company. Secondly, endogenous emergence transpires from protected niches created inside an existing business model: Humanistic management practices that fuelled Allsafe's recent transition.

Conversely, in RetailCorp, novel practices do not explain the occurrence of a business model transitions. Practices related to corporate responsibility and sustainability, however, significantly changed the shape of a new emerging business model's bundles of value proposition, creation, exchange, and capture as they were pulled into it as part of the transition. We call this practice-pull transitions. As in Allsafe, such practices emerged either exogenously (e.g. eco-efficient value creation was driven by practices pushed by the Carbon Disclosure Project) or endogenously (e.g. ; unique food waste practices, became part of RetailCorp's latest business model).

Conclusions, Discussions, Future Research

We have conceptualized a multi-level perspective on business model transitions and illustrated how such a perspective can be employed to analyze transitional patterns. In the following we will briefly mention salient discussions and implications.

Evolutionary patterns. The original multi-level perspective on socio-technological transitions has become an important mid-range theory to identify varieties of transitional types, patterns, dynamics, and pathways (e.g. Geels and Kemp, 2007, Geels and Schot, 2007). Similarly, our multi-level perspective on business model transitions may serve for similarly important insights for business model transitions, particularly in the context of environmental sustainability transitions (Elzen et al., 2003, Geels, 2011, Loorbach and Wijsman, 2013, Markard et al., 2012, Shove and Walker, 2010).

Strategic niche management. A multi-level perspective on business model transitions suggest a key role for strategic niche management (Kemp et al., 1998, Schot and Geels, 2008, Sushandoyo and Magnusson, 2014) to foster business model transitions. Such strategic niche management involves the creation of protected spaces for nurturing to maturity, practices meant to become parts of future business models. Such strategic niche management as a process of business model innovation may serve as a middle ground between highly controlled business model innovation modes, and their experimentation-based counter parts (e.g. Brunswicker et al., 2013, Sosna et al., 2010, Foss and Saebi, 2017). It and connects the business model innovation discussion with the burgeoning field of strategy as practice (Jarzabkowski, 2004, Jarzabkowski and Spee, 2009, Kornberger and Clegg, 2011, Seidl and Whittington, 2014, Vaara and Whittington, 2012, Whittington, 1996).

Business model evolution. So far the relationship between multiple-business models has typically been discussed in a parallel fashion (e.g. Snihur and Tarzijan, 2018, Casadesus-Masanell and Tarziján, 2012). However, the evolutionary lens (e.g. Bohnsack et al., 2014, Demil and Lecocq, 2010, Schaltegger et al., 2016) of the multi-level perspective, suggests that there always is a legacy of pre-existing business models from which new business models evolve, incrementally adding to pre-existing business model attributes. The tendency of business model innovation and change literature to consider the last business model is prone to miss insights that can be gained from a longer sequential, historic analysis (Bansal

and DesJardine, 2014, Bansal et al., 2014, Longoni and Cagliano, 2016, Orlikowski, 1996, Thornton and Ocasio, 1999, Goehrung, 1982, Kroezen and Heugens, 2018).

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FIGURES AND TABLES

Figure 1 A multi-level perspective on business model transitions

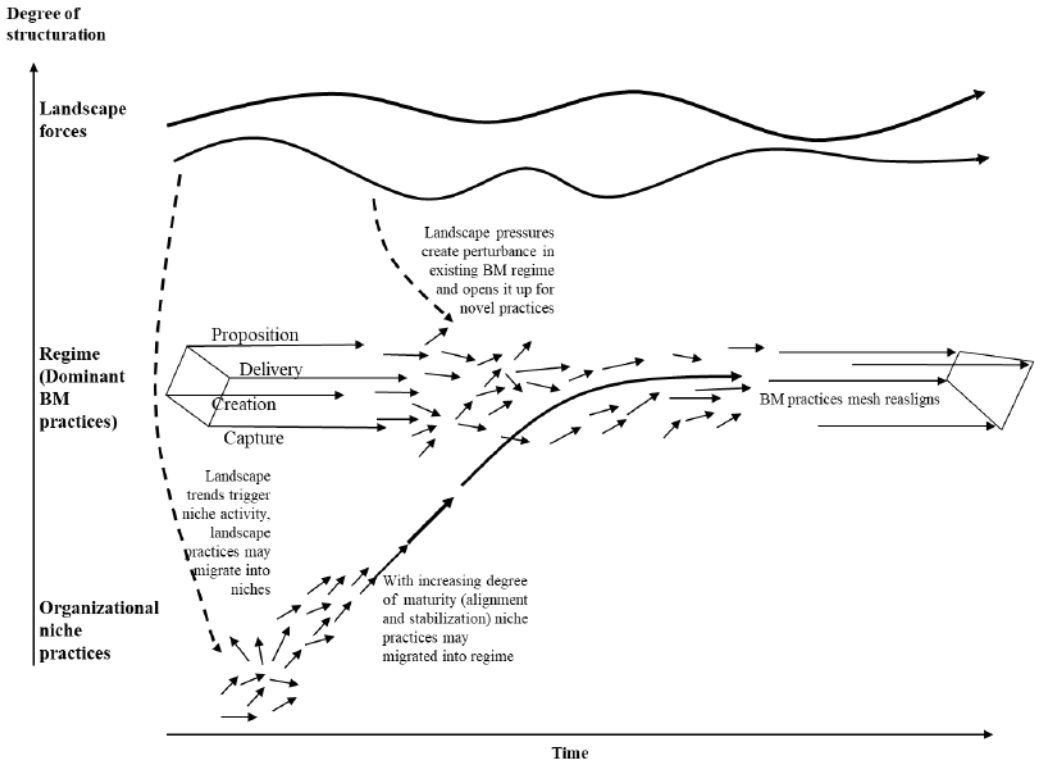

Figure 2 Allsafe's business model evolution

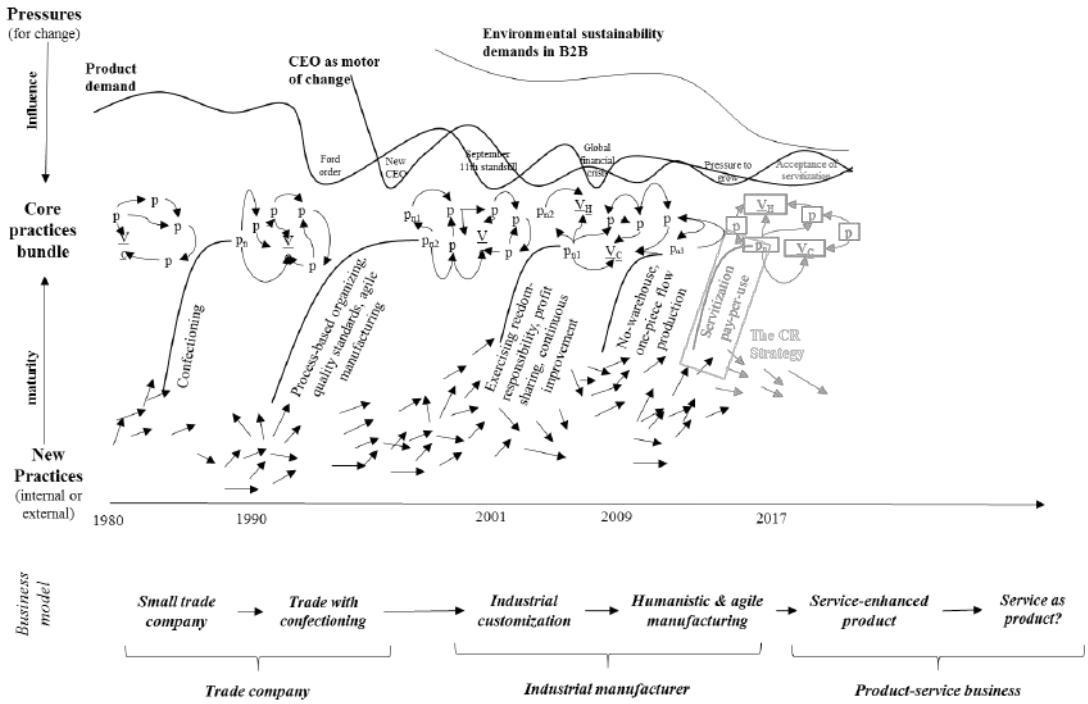

Figure 3 RetailCorp's business model evolution

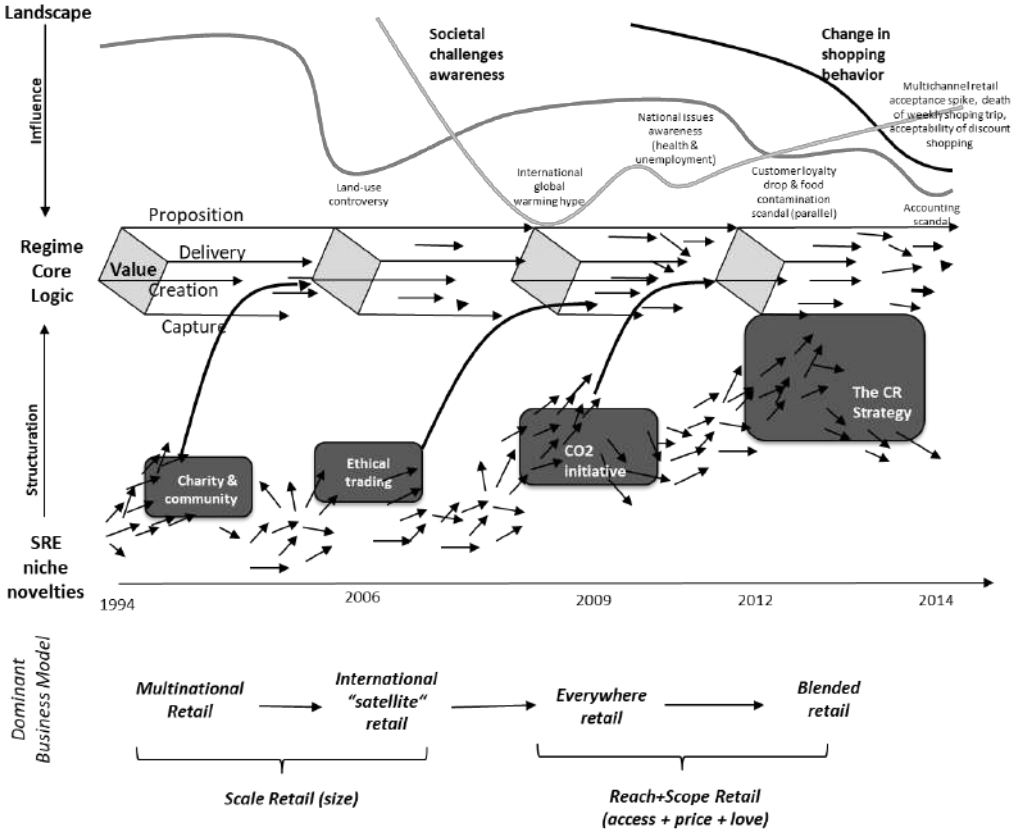

Table 1 Case studies' baseline information

	Allsafe	**RetailCorp**
Type of business	Automobile Supplier	Food and General Retailer
Employees/ Revenues 2017	260/ 62 million Euros	476,000/ 62.91 billion Euros
Period of evolution studied	1980-2017	1991-2017
Individual interviews/ Interviewees	72/72	104/ 72
Workshops/ Participants	3/15	4/14
Additional sources	Participant observation, internal documents, newspaper coverage	Participant observation, internal documents, annual reports/ CSR reports, internal magazine, newspaper coverage

Table 2 A typology and examples of business model transition dynamics

		Force behind practice emergence	
		Push	Pull
Origin of practice	Exogenous	Allsafe's Industrial Customization model was pushed into existence by the adoption of Japanese production practices popular in the car manufacturing industry environment.	RetailCorp's Everywhere Retail model, depended on energy/ carbon-efficient value creation practices, promoted by the global Carbon Disclosure Project, of which RetailCorp became an active member.
	Endogenous	Allsafe's Humanistic Manufacturing model pushed into existence by company's unique humanistic organizing practices.	RetailCorp's Blended Online-Offline model was enabled by the loyalty created through the home-bred practices forming RetailCorp's corporate responsibility strategy.

Business models as practice:

The humanistic business model of allsafe

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Abstract

Current conceptualizations of business model innovation continue to build on static views of business models, which are then conceptualized as changing at the component or architectural level. In this paper we develop and apply a processual perspective on business models, based in theories of social practice. This allows us to take a closer look at social practices as constituting elements of business models, and dynamics of enrolment, assemblage and co-evolution as central to processes of business model innovation. We provide insight into the added value of this conceptualization through a case study of the German SME Allsafe. The analysis shows how business model innovation may originate sometimes from outside the firm, while at other times new practices emerge from within. Also, the dichotomy of component and architectural change is challenged, as we uncover a dynamic in which component change morphs into architectural change.

Keywords

Business model innovation; organisational practices; humanistic management

Introduction

The rapidly expanding literature on business models indicates that this concept allows researchers and practitioners to address new empirical phenomena like innovative modes of provision (for instance platform-based sharing, Acquier et al., 2017) or take a fresh look at enduring phenomena, such as the change of business propositions to include social and ecological values (Randles and Laasch, 2016), at times in the form of "humanistic business models" (Laasch et al., 2015). While thus providing a useful addition to the conceptual repertoire of management and business studies, several reviews of the academic literature on business models (BM and business model innovation (BMI) reveal a number of biases and gaps (Foss and Saebi, 2017, Massa et al., 2017, Zott et al., 2011).

A first characteristic of the literature is a persistent lack of conceptual clarity (Suddaby, 2010) which is sometimes interpreted as distinct perspectives on the 'same' empirical phenomenon (Massa et al., 2017). The lack of clarity concerns the construct of a business model, as well as the way in which it is positioned towards other constructs and theoretical framings.

A second feature of the literature is that, with few exceptions, business models are conceived as static entities: a complex set of attributes describing a particular way in which a firm 'creates and appropriates value' (Teece, 2010). The business model canvas, a popular visualization of the various dimensions of the construct, exemplifies this quality, but it is also evident from the variety of definitions listed in overviews (Massa et al., 2017).This extends to the literature on business model innovation. While some address the process of change (for example Roome and Louche, 2016), much of this work conceptualizes innovation as a question of which building blocks can be fitted together, rather than theorize about the process of assembly of those elements. Rather than theorizing a process of change, there is a view of business models as the product of design, where the step between design and implementation is not problematized (Zott and Amit, 2010).

A third characteristic is specific for the literature on BMI. Here innovation is situated at either the architectural or the component level (Foss and Saebi, 2017). This resonates with the distinction between 'incremental' and 'radical' innovation, but it obscures the possibility of incremental change leading into radical innovation.

While previous work on business models has illuminated interesting developments in the ways through which firms generate value, the above limitations have also led to white spots. In this paper we aim to begin to fill these gaps by adopting a consistently processual perspective on business models. Using the lens of theories of practice, we present a conceptualization and empirical case of business model evolution, which we view as a process of assembling social practices. To facilitate the empirical study, we also provide a methodological protocol that fits with our conceptualization.

As our case we will have chosen a firm which currently positions itself as employing a humanistic business model. This choice is driven by the fact that in order to bring into focus the ways through which firms assemble social practices to create and appropriate value, we can learn specifically from firms that seek to move beyond profitmaking and competitive advantage (Arend, 2013, Ocasio and Radoynovska, 2016). With its explicit focus on creating value, the business model construct seems especially suitable to support the analysis of social enterprises and sustainable businesses. The aim of this paper is to make a conceptual and empirical contribution to the study of business model innovation that allows such analysis. Thus, in the paper we answer the following research questions:

> *RQ1: How can the lens of theories of practice be used to generate a processual perspective on business models?*
>
> *RQ2: How do firms construct business models by assembling social practices into business models?*

We begin by outlining our conceptual perspective, which consists of a specification of business models as activity systems, and a practice-based definition of business models. We then present a methodology for collecting and analysing data consistent with our processual perspective. This leads into the case description and analysis. Conclusions follow.

Business Models as social process

The business model construct has been defined in a variety of ways. Massa et al. (2017) provide a convenient categorization, with conceptualizations defining a business model as denoting either: attributes of real firm, cognitive/linguistic devices used by managers to interpret firm characteristics and processes, or formal conceptual representations of how a business functions. As each of these orientations in effect creates a distinct construct, it is important to clarify our

position. We work within the first category, starting from the observation that every firm has, to paraphrase Mintzberg's terminology, a 'realized' business model: it creates value that is delivered to customers and it also to some extent succeeds in capturing part of the value it creates (either as direct profit, or as investment that will deliver create future profits) (Mintzberg, 1978). Looking back, we may ask how this realized business model emerged, looking forward, we can address questions about how it might morph into another incrementally or radically different form. In either case, we are interested in questions that do not deal so much with the characteristics of the business model as an entity, but rather of the emergence, persistence and dissolution of the business model over time. These are questions that call for a process perspective (Abbott, 2016, Langley et al., 2013).

This resonates with the work of Zott and Amit (2010) who define a business model as an activity system, a "set of activities, as well as the resources and capabilities to perform them—either within the firm, or beyond it through cooperation with partners, suppliers or customers." The interdependency of these activities, and the fact that they are performed not by one firm, but a set of actors, constitutes the particular focus of the business model concept; as such it is distinct from viewing the firm as a nexus of treaties (Aoki, 1990), or a set of (inter-organisational) routines (Casadesus-Masanell and Ricart, 2010). We develop a process view on such activity systems by combine this with a practice perspective.

Schatzki (2005), Schatzki (2006) has proposed such a perspective, and it has been developed specifically in such areas as strategy, marketing and finance (Whittington, 2006, Whittington, 2011). Defining organizations as social sites, they are constituted of practices and material arrangements.

Social Practices

Practices are actions shaped by "understandings of how to do things, rules, and teleo-affective structure" (Schatzki, 2005). With various elaborations of this definition around (Nicolini, 2012), we will employ the basic approach advocated by Shove et al. (2012), who define social practices as being constituted of three interrelated elements: material objects, meanings and competencies. Thus, a social practice such as accounting combines artefacts such as excel sheets (material) with notions of legitimate ways of calculating costs and income (meaning) with specific competencies (the socialized skills associated with being an accountant. According to Gherardi (2012) practices are recognizable as being:

(1) socially sustained and constantly reproduced, (2) recognized by a community of practitioners, and (3) sustained by a normative basis which is aesthetical and ethical. While there exists a variety of theories of social practice (Nicolini, 2012), each with their own theoretical lineage, one of these explicitly views social practices as activity systems.

Organizations are 'meshes' of such practices (Nicolini, 2012, Gherardi, 2012, Schatzki, 2006). The notion of interrelated practices makes the lens of social practices immediately relevant for the conceptualisation of business models, as it conceptualises (a) the particular types of interrelatedness of individual practices, and (b) it emphasizes the processes of assembling, maintenance and enrolment that are requires to keep practices in place.

The Interrelatedness of Practices

There are various ways in which the interrelatedness of social practices has been conceptualized. Gherardi (2012) discusses this in terms of representing the texture of practices; Shove et al. (2012) discuss it as practice complexes; and Schatzki (2011), interested in macro phenomena such as socio-technical regimes, deals with it in terms of bundling. Each of these engage with the related question of how to delineate a single practice; without an answer to this it is not possible to analyse how they interrelate. Gherardi (2012) takes a pragmatic approach: interested in understanding the texture of practices it suffices to isolate a part of it, which can be done through definitions of practitioners, or through some theoretical distinction. This then leads to an exploration of the ways through which it connects to other practices.

In this paper we will use the distinction between overlapping and connecting practices (Schatzki, 2005). Overlap occurs whenever two or more practices invoke similar meanings, utilise the same material arrangements, or compete for time from the same organizational members possessing the necessary competencies. Practices connect as the result of one practice forms the (material or meaning) input of another practice. We will refer to connected practices as assemblages.

Dynamics of Social Practices

Process approaches are uniquely equipped to study dynamics of emergence, persistence and dissolution, as they do not presuppose the existence of entities such as organizations, institutions, and indeed, practices (Langley et al., 2013).

Instead, conceptualizing social phenomena as events or activities as they unfold over time allows us to gain insight into these dynamics. It also suggests an alternative way to conceptualize dynamics, as change is not conceived in terms like innovation and design, which reflect the unfreeze-change-refreeze paradigm (Weick and Quinn, 1999). We build up on Actor-Network-Theory (ANT) (Callon and Law, 1982, Law, 1992), more particularly, on the conceptual imagery of assembling networks of actors enacting practices (Latour, 2005), insights from processes of translation driving the assembling (Callon, 1991, Callon, 1986). We also build on the heterogeneous agency of human and nonhuman (materials and devices) in enacting strategy (Callon and Law, 1997, Akrich and Latour, 1992).We argue that a practice perspective suggests the following groups of dynamics:

(1) The emergence, enrolment/habituation and dissolution of individual practices, as well as experimentation and learning of agents within that practice. Practices cannot be invoked instantaneously, so as components of business model there is a question of accessibility. Organizations and their members need to become enrolled into practices (Callon and Law, 1982, Shove et al., 2012). From the practice-literature on accounting, strategy and marketing it is also clear that the practices that combine to form a business model have a 'life of their own' (Vaara and Whittington, 2012). This includes the insight that such practices exist 'outside' the organization and consequently there is a process of translation (Czarniawska and Sevón, 1996) through which they become part of the organization (Whittington, 2006).

(2) The assembling and disassembling of bundles of practices into business models. This is likely a process which combines emergence and co-evolution with negotiated assemblage and experimentation. The work of Casadesus-Masanell and Ricart (2010) is helpful here, as it distinguishes business models from strategy, and proposes that the latter is about choosing (and constructing) a business model. It also mentions the decomposability of business model as an empirical variable The intentional part of assembling (both by individual firms and through negotiating with others) requires that we mobilize the literature which takes business models as formal or informal linguistic devices (Massa et al., 2017). Such devices are part of the practice of 'business modeling' or strategizing (Casadesus-Masanell and Ricart, 2010), which we conceive as assembling.

To summarize, defining a business model as an interrelated set of social practices accomplishes three things: (1) by looking at activities (doings and sayings through which a organizational members engage with each other and with social actors outside its boundary of membership), rather than firm characteristics (such as 'channel to consumers' or 'revenue model'), we can study the emergence, dissolution, and dynamics of persistence of constituting elements of a business model, (2) by seeing these activities as social practices, we acknowledge that they exist on their own, and within many firms, and (3) we enable the analysis of the process through which individual practices become assembled into a business model with some continuity, but which also evolves over time.

Method

We conducted an in-depth illustrative case study through a theories of practice lens. During the three months before on-site data collection, it was ensured that the data collection could be conducted from a deeply immersed position in Allsafe, participating in and observing all kinds of aspects of practices throughout the company. Data collection was conducted by two of the authors, who interviewed about and observed practices over a period of 10 days at Allsafe's headquarter and only factory in Engen in southern Germany. This approach of combining observation and interviews resonates with other empirical studies which employed a practices lens (Vaara and Whittington, 2012).

Data collection with Allsafe consisted of 72 interviews conducted with company employees, the primary source of data used for the analysis underlying this article. Additionally, we conducted three workshops each with 5 employees forming a focus group, on-site observation as participants in office life, production, meetings, and celebrations. On-site data collection concluded in a member-checking open-invitation meeting which approximately 65 people (approximately one third of the company membership attended). In sporadic follow-up phone calls and mails, particular aspects were clarified further. The resulting data collected consisted of approximately 50 hours of interview recordings all of which were transcribed, just over 400 pictures, 25 internal documents, and the two books written by the Allsafe's CEO Detlef Lohmann.

All 72 interviews were semi-structured applying the following pattern: Interviewees were first asked for whom Allsafe offered what kind of value, leading to a description of the business model's value proposition (see findings section). This was then followed up by asking interviewees to describe the essential

practices that lead to the realization of this value proposition. Interview texts were coded inductively, clustering similar mentions of practices and leading to Table 1 describing the business model practices in the three areas of value creation, exchange, and capture and to the list of value types offered by the company to distinct stakeholder groups (see second part of the findings section). These interview analyses were triangulated with other pieces of data, particularly the Allsafe books and on-site observations. The description of how practices interrelated were then used to develop the interrelations between practices depicted in Figure 1 and to describe the processes through which people were enrolled to enact the business model as a mesh of practices we found.

Allsafe's business model of humanistic management practices

At the time of our study, Allsafe was a medium-sized company located in Engen close to Lake Constance in southern Germany. As an automotive and aerospace industry supplier it produced load restraint systems that fix loads in ground and air transport.10 Allsafe had won dozens of awards and commendations for its innovative capacity and quality leadership.11 Their motto was 'Sicherheit made in Germany' (safety made in Germany). Since foundation in 1964, the company had experienced drastic shifts in its business model and underlying practices, evolving from a small trade company towards industrial manufacturing. It was currently moving towards a servitization business model.12 Their then dominant business model was best characterized through its combination of humanistic and advanced manufacturing practices. While having been a guarantor for success through two economic crises, this business model now appeared to be on the brink of a new change episode due growth pressures and an environmental-sustainability-driven trend towards servitization.

Our initial research interest was to explore what new insights we might derive from processual and practice-based perspectives on business models. The following finding section provides an analysis of the bundle of practices that is Allsafe's business model, beginning with (A) an introduction of the individual practices, on to (B) describing how they interrelate, and to (C) how people become enrolled, maintain and readjust these practices.

[10] http://www.allsafe-group.com/en/load-restraint/
[11] http://www.allsafe-group.com/en/company/allsafe-milestones/
[12] http://www.allsafe-group.com/en/company/allsafe-milestones/

A. Individual Practices Related to Humanism and Commercial Production

The individuals interviewed described Allsafe's business model through a number of typical practices of the company. Before presenting these we exemplify what elements constituted a practice in our study. A good example are practices related to equality, more specifically , practices centred on eye-level- interaction13. These included working in inter-disciplinary teams and projects, job rotation between administrational and manufacturing roles. It was common that in times of high demand administrational staff on all levels including the CEO would help out on a Saturday production shift. Every new employee in Allsafe first gathers basic work experience in both production and administration. Another example is that the head of production would personally greet every employee every morning. Similarly, the CEO had made it a common practice, to personally deliver parcels and letters to his employees every morning to create a personal connection and to catch up current affairs, both professional and personal.

Employees also described how the enactment of these practices and therefore the enactment of Allsafe's business model relied on elements of meanings, material and competence. First, these practices had both a commercial and a humanistic meaning. Commercially, they meant that close collaboration could be achieved between office employees and people in production, between temporary staff and permanent employees, between German and non-German employees. Achieving this collaboration was key to achieving efficient, effective processes and agile responses to customer demands, as these relied heavily on flexible eye-level collaboration. They also had a humanistic meaning, grounded in the CEO's strong belief into the collaborative and positive sociable 'togetherness' ('Miteinander').

Secondly, key to the practices' enactment were specific material arrangements such as locating offices and factory floor on the same level with production. This is unusual in manufacturing companies as typically offices are above the factory floor, creating a material/physical barrier. This related also to shared canteens, bathrooms, and leisure areas. Third, equality in diversity also required a variety of competences. For instance, previously 'team leaders' trained to become 'team coaches', having to transfer their competence profile from a hierarchical command position, to an eye-level support of other team members in fulfilling their tasks. Non-German employees were offered and paid German courses if they

[13] A German documentary produced on the company was titled Augenhöhe (translates as eye-level).

benefitted from them, so that they could communicate on eye level (relates to the personal development practices bundle). In order to be able to interact on eye-level, new employees in manufacturing often stated that they had to get used to not to be looked down on by their administration colleagues, as it was typical for the majority of other manufacturing companies. Table 1 illustrates meanings, materials and competences for all core practices constituting Allsafe's business model.

[INSERT TABLE 1 ABOUT HERE]

Table 1 above illustrates the types of practices considered key to the functioning of Allsafe's business model as they had emerged from the coding of interviewees' answers. Value creation activities, that relied on activities that allowed Allsafe to create agile differentiation, where practices were centred on speed and flexibility, providing innovation and product differentiation 'on the go', adapting to changing customers' needs and demands. This central value creation feature also related to continuous change towards new structures and organizing principles, driven by the 'motor-of-ideas' which the CEO was perceived to be due to his practice of regular 'visionary' inputs for improvement. Such past inputs had let, for instance, to the practices of 'pragmatic organizing' without barriers and hierarchies, as well as to the key bundle of practices related to 'protected empowerment, making sure employees enacted freedom with responsibility, but were not punished for errors, in order to provide a safe space for these practices.

The value exchange function in Allsafe was the most pronounced bundle of unique practices. Internally, these practices were centred on relations aspects, such as the ones of equality in diversity, which was illustrated with greater detail further above. This also related to a bundle of practices ensuring wider self-determination of employees, both in terms of self-determined flexible work schedules and vacation planning, but also in terms of everybody being allowed to spend sensible amounts of money for their activities, without having to ask a superior for permission. A key bundle of practices related to radical transparency, included the practice to be transparent about activities and outcomes. For instance, on a material level, all office walls at Allsafe were transparent and company results were continuously made public and updated through on bulletin boards across all their facilities.

These practices were enabled by another bundle of practices, related to a belief into natural matching processes and an active abandoning of control or forcing

things to happen that are not a natural fit. A bundle of practices was centred on people as naturally inclined to cooperate instead of competing between each other and as caring for both each others' wellbeing and Allsafe's best interest. The director of organizational development referred to this as the trust in 'homo cooperans', as opposed to a purely self-interested competitive 'homo oeconomicus', the common image of man in neoliberal economics (Lohmann and Lohmann, 2016). The same principle applied to customer relations, where other manufacturing companies would have sales-representatives with the sole purpose of increasing sales numbers, Allsafe's customer consultants were primed to build good relationships with customers and to only sell if there was a sensible demand from the customer, even if it went against Allsafe's financial interest, and possibly against customers' order, that a customer consultant perceives could be changed to better serve customers' needs.

Unusual, practices like the ones just described in sales, closely related to Allsafe's unusual value capture practices. Unlike typical for-profit-companies, Allsafe's value capture was not primed towards capturing as much value as possible, in order to reinvest and grow. Instead, value capture was primed towards company preservation and redistribution of value created to employees. In the best interest of company preservation, Allsafe was aimed at cautious growth. It was a common perception among Allsafe employees that the heterogeneous value offered to a variety of stakeholder groups could only be preserved by protecting the unique practices of their business model. Particularly, new employees, necessary for growth were perceived to take time to be able to practice freedom with responsibility and many of the related key practices, at the heart of Allsafe's business model. Accordingly, Allsafe's strategic leaders were more focused on managing the company for stability and sustainability, than for growth; a particularly delicate tasks as customer demands for products were rapidly increasing. Allsafe also made it a common practice to redistribute profits, both through a profit sharing scheme all employees, from CEO to cleaning staff were enrolled, and through a practice of continuously improving employees' social and health benefits out of profits.

B. Interlinked Practices Forming Allsafe's Business Model

The above description provides a good overview of individual areas of business model practices. However, it does not yet show their interrelatedness, how these practices are bundled and interwoven to form Allsafe's business model as an assembly of practices. In the conceptual section we introduced several forms of

how practices may interlink which we are easily observable in Allsafe. Figure 1 depicts these connections.

[INSERT FIGURE 1 ABOUT HERE]

First, we see how practices connect through shared meanings, materials, and competences. Skim-reading through the right part side of Table 1, one can quickly identify where practices interlink through shared elements. In the 'meanings' column, the vast majority of have both a meaning related to commercial benefits and one to humanism. Close to every second practice requires a variety of social skills, therefore linking many practices' underlying competences. Among the material elements of practices, Allsafe's office layout and physical features are further connecting elements between practices. For instance, the walls were the central material element of a variety of practices. They were material for the practice bundle of 'Transparency in action and results', in the form of glass walls enabling to see on what, or with whom colleagues were working, or as display media for departments and the whole company's up-to-date results. In the form of movable walls for the flexible re-organizing of workspace, they enabled practices of project-based organizing through the temporary restructuring of workspace. Walls of the meeting room where external visitors were first received, served as communicators for the practice of 'humanistic practices diffusion' and they created an atmosphere conducive to practices of personal development when equipped with inspirational quotes and works of art.

The linking of practices through elements of materials, competences and meanings can also be exemplified by zooming in on individual practices, such as the CEO Detlef Lohmann's practice of delivering the postal mail to his employees' desks in the mornings.14 This is a sub-practice in the bundle 'avoiding hierarchies and barriers', inside the larger bundle of 'pragmatic organizing'. The 'CEO postal delivery' practice shares the commercial meaning of creating agile operations and flow of ideas and the humanistic meaning of freedom of access in community of equals with other subpractices in the practices bundle of minimizing barriers and hierarchies. As most others of Allsafe's business model practices, it requires advanced social skills of the CEO who has to quickly switch modes of interaction as he interacts with the full range of people and personalities across the business. In his book, Lohmann explains how this practice is shared by several human

[14] This practice was described in depth in the opening chapter of the CEO Detlef Lohmann's book introducing Allsafe's unusual organizing and management practices LOHMANN, D. 2012. *...und mittags geh ich Heim,* Vienna, Linde..

'carriers'. He describes how he adopted this practice from his predecessor and adapted it to a changed company and production employees describe a very similar practice of the head of production personally welcoming every production worker, normal employees or leased labourers, at the beginning of shifts.

The second interrelatedness is through sequential input-output relations, were one practice becomes prerequisite for others. Such linkages were identifiable through interviewees' description of how one practice linked into another. For instance, a majority of interviewees mentioned how the practice of 'exerting freedom with responsibility' was a necessary prerequisite for the practice of 'avoiding hierarchies and barriers' to work. Figure , shows how all of these practices come together as the interwoven bundle of practices that is Allsafe's current agile and humanistic manufacturing business model. For instance, the key practice of 'exercising freedom with responsibility' is connected to the practice of 'avoiding hierarchies and barriers', without which exercising freedom with responsibility would not be possible. It also connects to a variety of further practices, for instance, agile manufacturing for which exercising freedom with responsibility becomes a necessary prerequisite. Of particular importance are mutually-reinforcing feedback loops, such as the one between 'exercising freedom with responsibility' and practicing a 'positive culture of error'. With the former practice the latter is more effective and vice versa. In summary, Allsafe's bundle of practices that is its business model is tied together by materials, competences, and meanings shared between practices as well as through the input-output relations in which practices become mutually reinforcing as practices are prerequisites for again other practices.

The resulting mesh of business mode practices was centred on practices with the humanistic leitmotif of freedom with responsibility, which enabled an agile manufacturing business model. This business model's practices' two main meaning components of commercial and humanistic value resulted in a blended type of value created from all practices. Interviewees described this truly heterogeneous value proposition, offering a variety of types of value to five main groups (bold lettered in Figure 1):

(1) **Employees.** Interviewees most frequently stated Allsafe's value proposition for employees, consisting of, for instance, joyful and fulfilling work, freedom and self-determination, socio-economic stability and an excellent work-life balance.

(2) **Customers.** This was followed suit by highlighting a customer value proposition, of highly customized, products and a close service-oriented, positive relationship.

(3) **Society.** Interviewees also consistently referred to the value their products offered to society, namely vial and transport safety. Employees often referred to their products avoiding accidents and improving society's safety on the road.15 A second type of value Allsafe offered to society was the promotion of more humanistic business practices.

(4) **Suppliers.** Another group were Allsafe's which interviewees perceived to benefit from long-run amicable relationships aimed at mutual benefit, goodwill, trust and disposition for shared problem-solving and development.

(5) **Owners.** As a minor point, employees also referred to a value proposition to company owners, due to Allsafe's profitability and continuous increase in firm value and other nonfinancial reasons to be proud of the company. Owners, included not only a Swedish investor holding a considerable amount of shares, but also the owner-CEO Detlef Lohman, as well as a considerable number of employees participating in Allsafe's co-ownership scheme.

C. Enrolment and Socialization of People into Business Model Practices

How are actors enrolled into Allsafe's business model practices? From the above description of Allsafe's core business model practices, it appears no far stretch to say many of these practices are unique. This implies that organizational actors, particularly new employees, may find enacting them unusual, challenging or even personally impossible. However, enrolment initially and continuously, into these practices is crucial to the viability and continuous construction and reconstruction of the business model necessary for its maintenance.

An initial enrolment challenge presents itself with new employees and other people involved in enacting Allsafe's business model practices, including among others, suppliers and customers. These practices were particularly relevant, as

[15] This value of safety was so engrained among employees that the researcher was insistently nudged to always wear a helmet when using a bike kindly provided by Allsafe for his commute.

Allsafe in the mid-end 2010s was experiencing rapid growth pressures and opportunities, which in turn created the need to both higher large amounts of new employees and to open up a second production facility. A first set of practices addressing this challenge, relates to Allsafe's external engagement (see 'humanistic practices diffusion' in Figure). Allsafe's external engagement practices, including the writing of an award-winning management bestseller on Allsafe's practices16, coverage in the leading German business journal 'Handelsblatt' in an issue titled 'The world's craziest companies', the television documentary 'Augenhöhe', and the practice of opening their doors for visitors, attracts a variety of like-minded people, interested and open to engaging in these unusual practices, particularly the humanistic ones.

Secondly, a unique mesh of human resources practices 'attraction and retention of "right" people' (see Table 1) creates a self-reinforcing cycle. New employees undergo a one-day work trial 'Probearbeiten' in which they are not given a particular tasks. Rather they are given a workspace in the area they are being hired for and have to make themselves useful by connecting to potential future colleagues. Through this process, it becomes automatically clear to what degree people are able to flourish in a work-environment of self-responsibility, and to which degree they are able to show the proactive social competence that is an element the majority of Allsafe's practices. Once people are hired a second practice, or rather non-practice is that people are rarely fired. A general consensus appeared to be that because of the unique nature of humanistic practices, people who are not able to enact the unusual freedom-responsibility paradigm characterizing many practices, typically resign anyway. Finally, hiring was often based on word-of-mouth, both attracting 'right' employees and deterring 'wrong' employees. The enacted belief was that prospective new employees who were closer to a homo cooperans would self-select the company, and the homines oeconomici would either not begin to work for the company, or quit quickly once they realized they did not fit into a work environment of cooperation for mutual benefit.

Also the ongoing socialization of already enrolled actors in the practices was a key aspect for maintaining Allsafe's unique mesh of business model practices. A first, relevant mesh of practices was the financial incentivization (see 'Providing financial opportunities' in Table 1) through profit sharing and employee ownership schemes, and an above-average pay for leased labourers. It created an interest,

[16] Detlef Lohman's book titled '...and by lunchtime I go home' LOHMANN, D. 2012. *...und mittags geh ich Heim,* Vienna, Linde. won Germany's management book of the year award in 2012.

incentive and openness to engage into unusual humanistic practices, as these were perceived to immediately relate to Allsafe's economic success fuelling these incentive schemes. Also the practice of continuous development of people on their job and the development of their job profiles (see 'Providing development opportunities' in Table 1) helped to ensure continuous enrolment and re-enrolment of employees in Allsafe's meshes of practices. Examples are employees' job crafting, shaping their own areas of responsibility and the targeted training of employees. For instance, during the time of the data collection production team leaders were retrained to become team coaches. Such team coaches would, instead of managing others, helping them to manage themselves and therefore creating a context increasing the enrolment of all production workers into practices enacted with both freedom and responsibility.

Finally, enrolment into practices also related to changes in practices, ensuring the dynamic consistency, which ensured the business model's continuous adaptation.[17] While the big picture stayed the same, still there was change and continuous improvement, adjusting the business model activity systems to a changing business environment and to internal development. Creating new practices reinforcing the existing business model practices system. Key were Allsafe's practices centred on continuous improvement projects (in German 'kontinuierliche Verbesserungsprojekte', abbreviated KVP). Employees of all kind (from production labourer to CEO) proposed projects and participated in them on eye level. Employees that were not used to key tasks of, for instance, presenting and leading were successively integrated in the KVPs increasing their competence to contribute.[18] One key KVP titled 'We before me', aimed at counteracting a perceived deterioration of the social fabric and a surge of egoistic behaviours, threatening the collaborative practices of the business model. A second key mesh of practices was related to following Allsafe's CEO as 'vision motor' for the direction of the company's ongoing differentiation, including products, new processes and markets. Employees' trust in enacting the new practices suggested by Detlef Lohmann, ensured the orientation, and slow move of the business model's practice mesh was in line with a future vision of company development.

[17] Business models exist in states of dynamic consistency, changing internally, while staying the same on a big picture level DEMIL, B. & LECOCQ, X. 2010. Business model evolution: In search of dynamic consistency. *Long Range Planning,* 43**,** 227-246..

[18] This resembles the socialization of people into and learning of new practices through legitimate peripheral participation LAVE, J. & WENGER, E. 1991. *Situated learning: Legitimate peripheral participation,* Cambridge, Cambridge University Press..

CONCLUSIONS

In seeking to develop a deeper understanding of instances of business model innovation, we have drawn on theories of social practice to develop a processual perspective of business models as continuously evolving assemblages of practices, and put this perspective to work on the case of Allsafe. We summarize the contribution of this work in three conclusions.

First, a practice-based understanding of business models provides a conceptual language for understanding how business models come about and evolve over time. Rather than positing business model innovation as an unproblematic instantaneous event, it instead allows for a careful consideration of the way in which a business model is assembled through the combining of different practices. This process has been conceptualized as a combination of intentional assemblage, and emergent enrolment of the organization and its members into new practices, which are then maintained through processes of enrolment of further members.

A second contribution is specifically to theorizing on business models. The practice lens makes clear that business models are constituted by practices that have a life outside these business models; they are developed and supported by communities of practice, and can be part of different business models. Further theoretical development is necessary to clarify the precise way in which practices evolve in relation to business models. Beyond the literature on social practices, this theorizing can draw on theories of organizational institutionalism. The development of humanistic practices within Allsafe, and the advocacy about those practices beyond the boundaries of the firm, is in our view a clear example of institutional entrepreneurship.

A third contribution is specifically to the understanding of processes of business model innovation, which have been classified in terms of the dichotomy between architectural and component change (Foss and Saebi, 2017). Our conceptualization, with its notions of assemblage and enrolment, allows for the possibility of a slow process of evolution in which component change morphs into architectural change. The case of Allsafe, is a clear example of how practices co-evolve in a piecemeal fashion to result in distinctly different business models.

These contributions in our view indicate the added value of a processual view on business models which draws on theories of practice.

Table 1 Allsafe's business model practices across value proposition, creation, and exchange

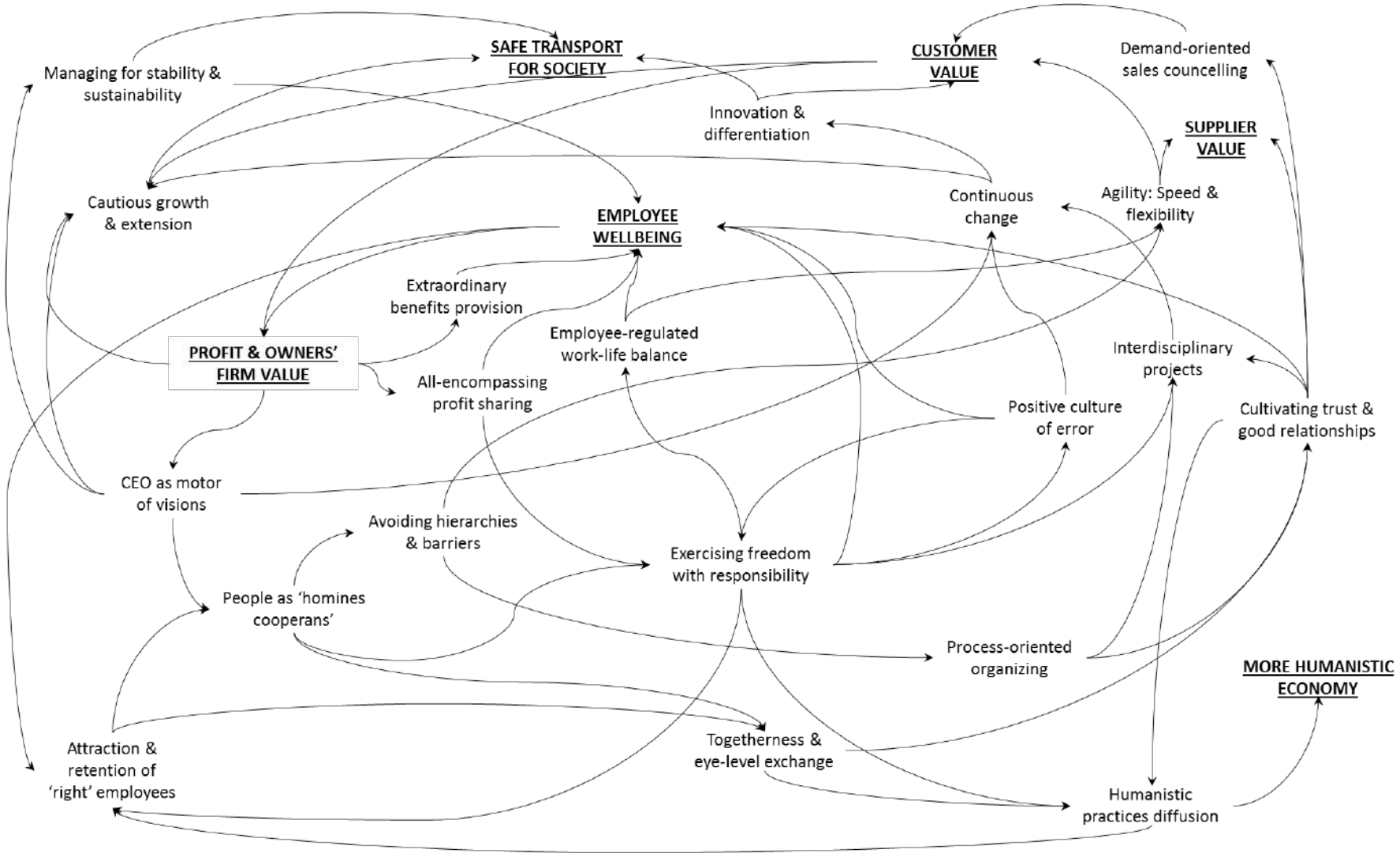
	Meshes of practices	Practice bundles	Exemplary practice(s)	Key elements of practices		
				Material	**Competence**	**Meaning**[19]
Creation	Agile differentia-ting	Being quick and flexible	-Making local, immediate decisions -Office staff supporting on shop floor	Budget accessible for everyone	Ability to make (good) decisions	H: Trust in employees
		Innovating and differentiating	-Continuous improvement projects -Everybody innovates and changes their area of responsibility	Large round-table in meeting rooms	Ability to work in heterogeneous teams	C: Accessing everybody's knowledge for improvement H: Everybody is free to drive change, 'Mitgestaltungsrecht'
		CEO as 'Visionenmotor'	-Periodic introduction of novel initiatives, which are initially hard to grasp	CEO's whiteboard with idea-compository	CEO's visionary capability and employees' ability to act upon trust	CEO safeguarding employee welfare (H) and of company success (C)
	Pragmatic organizing	Minimizing barriers and hierarchies	-Distributed budget access -Project-based organizing -Training leaders to become enablers	Seamless one-level workshop-office floor, movable walls	Ability to serve and protect the team	C: Agile operations and flow of ideas H: Freedom of access in community of equals
		Process-based organizing	-One-piece flow production -Cross-functional teamwork	Cellular workstation layout, seamless one-level workshop-office floor	Teamwork ability in workstation	C: Agility: Eliminating waiting time between production processes H: Reducing social isolation in manufacturing
	Protected empower-ment	Exercising freedom with responsibility	-Self-approval of actions with occasional peer reviewer, 'Vier Augen Prinzip' -Self-determination of job responsibilities	Additional remuneration for taking responsibility versus lower wage demands due to additional freedom?	Self-confidence and sense of responsibility and mastery of job ('Selbstverantwortung')	C: Reduction of bureaucracy for agility H: Trust in human competence and responsibility
		Positive culture of error, 'Fehlerkultur'	-No scolding over mistakes -CEO backup/support, no overruling of decisions	No financial consequences for employee	Ability to give and appreciate constructive criticism	C: Fostering entrepreneurialism H: Positively accepting errors as part of human nature
Exchange	Augenhöhe (eye-level exchange)	Enabling human interaction	-Favoring personal conversation over emails -CEO delivers postal mail	Glass walls, connected open office structures, post box	Personal communication skills and other social skills	C: Agile cooperation H: Appreciation of personal relations
		Protecting human dignity, fostering	-Proactive minorities/refugees hiring -Knowledge and usage of first names	Variety of workplaces suiting diverse people	Tolerance, sympathy, appreciating others	C: Access to new human resources

[19] Most of Allsafe's business model practices appeared to adhere to two logics giving them meaning: 'H' stands for meaning derived from a humanistic logic, while 'C' stands for meaning derived from a commercial logic.

		diversity, minorities, and the individual	-Shaping of job profile to personal conditions (e.g. single mothers) -Higher pay for temporary staff			H: Appreciation of all human beings
		Cultivating 'We-feeling' (Wir-Gefuehl)	-All-company Christmas dinner with newbie show -Goal achievement lunches 'Erfolgsessen'	One-location operations	Social skills for harmoniously integrating diverse people	C: Mutual support in commercial tasks H: Sense of belonging
		Transparency in action and results	-Displaying (C-suite) company KPIs and internal statistics everywhere	Glass walls and info walls	Ability to constructively deal with criticism	H: Transparency and access as moral values
	Natural fit, voluntary nature, and space for discretion	Treating people as 'homines cooperans'	-No supervision -Self-forming teams	Competence-profiles hung out on shop floors	Ability to take initiative, self-organize, and collaborate	C: Savings and agility due to less need for control H: Positive image of (wo)man ('Menschenbild')
		Self-determining work attendance	-Flexible attendance -Self-approving vacations	No time-punch	Time management & responsible behavior	C: Savings and agility H: Valuing employees' self-determination & family
		Demand-oriented sales counselling	-Selling less than customer requests, against own commercial interests if better for customer	Sales remuneration avoid customer instrumentalization	Empathy with customer needs and ability to match product features	C: Customer trust and retention H: Benefitting customer as another human being
		Attraction and retention of 'right' people	-One-day work trial 'Probearbeiten' -Word-of-mouth hiring -No firing, 'wrong' people leave anyway	Safe work environment	Accessible and supportive attitude among colleagues	C: People who can perform H: Creating a harmonious community
Capture	Investing in employees	CEO as 'Visionenmotor'	-Language courses -Employee pet projects	Inspirational art and quotes on walls, central company library	Drive for self-improvement	C: Better performing, innovative employees H: Personal human development
		Investing in wellbeing	-Annual updating of social benefits -Ergonomic workplaces -Provision of water and fruits	Free capital for investment	Empathy to detect social needs	C: Functioning employees H: Healthy human being
		Providing financial opportunities	-Profit participation without exceptions (e.g. the cleaning lady) -Employees investing in shares	Profitable business	CEO's and co-owners' openness to pass on parts of their profits	C: Employee motivation H: Recognizing the value of all human beings through reward
	Preservation of company and of its legacy	Cautious growth	-Forfeit growth opportunities if threatening humanistic culture -Rejecting some client orders if compromising	Physical boundaries to growth (e.g. building size, machine capacity)	Ability to balance the forfeiting of business opportunities with the need for stability	C: Protecting financial capital H: Protecting the 'Allsafe family' of disruption and

						humanistic culture as a good independently
		Managing for stability and sustainability	-Concern for healthy social structures (e.g. higher paid leased labourers)	Steering wheel sculpture in CEO's office	Long-term orientation and strategic planning capability	Imagery of captain steering boat to a safe haven (C), doing the best for the entrusted crew (H)
		Humanistic practices diffusion	-Continuous media interaction -Open doors for externals	Humanistic quotes on walls, books, newspaper articles, documentary, business club talks	Drive to share the (competitive) advantages with economic ecosystem	C: Transformation of commercial practices H: Benefit people and companies through humanistic practices

Figure 1 Interrelated Practices System of Allsafe's Business Model



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Business model transformation in large incumbent firms –towards an attractive and sustainable society

The case of an energy utility

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Short Abstract

A possible pathway towards sustainability transformation requires mass markets to become more sustainable (c.f. Hockerts and Wüstenhagen, 2010; Schaltegger, 2002). Even though large incumbent firms often have developed resources and capabilities in marketing, distribution, production, financing, and a large customer base, which can be used when further developing and commercializing a new technology (Alvarez & Barney, 2001), these assets and routines for large scale operations could at the same time act as a barrier for introducing a new business model (Kim and Min, 2015; Wadin et al. 2017).

This paper focus on aspect of business model innovation for sustainability and dynamic capabilities in large incumbent firms, where transforming a business model in an existing organization can be considered especially difficult (Kindström, 2010; Smith et al., 2010). More specifically we study how an incumbent utility transforms towards customer centric renewable energy business models. In order to reach this research objective, we have conducted a longitudinal case study of the development of a business model for residential solar PV process in a pro-active, large and incumbent Swedish electricity utility. We employ literature on business model for sustainability (c.f. Boons and Lüdeke-Freund, 2012; Stubbs and Cocklin, 2008), business model ambidexterity (Khanagha, 2014), strategic

paradoxes (Smith et al., 2010), and dynamic capabilities theory (Teece, 2018; 2010; 2007; Weissbrod and Bocken, 2017; Demil and Lecocq, 2010) and examine how the firm makes use of dynamic capabilities to transform their business model.

Keywords

business models for sustainability, business model transformation, large incumbent utility, residential solar energy deployment

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Ecological-Inclusive Business Models for Sustainable Development

A Case Study on Agro-Food Hybrid Organisations in Sub-Saharan Africa

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Abstract

The Sustainable Development Goals (SDGs) proposed by the United Nations have encouraged companies to innovate their business models to achieve triple-bottom-line sustainability. Among the most interesting and effective examples of sustainable business model innovation are hybrid organisations. As these organisations change the fiduciary duty and structure of the firm, they blur the distinction between the profit and non-profit logic and rely on business model innovation to pursue their mission. This study focuses on the business models of bottom-of-the-pyramid hybrid organisations, which we refer to as ecological-inclusive, because of their inclination to produce positive environmental value while at the same time including low-income stakeholders in their value chain. The goal of this paper is to investigate how and to what extent sustainability aspects are integrated within ecological-inclusive business models, identifying possible business model archetypes. To do so, the authors applied a selective and inductive qualitative content analysis to 15 ecological-inclusive business models. By analysing and comparing the sampled business models we are able to propose two different archetypes of ecological-inclusive business models, according to the low-income stakeholders engaged as customers: the “young sunflower” and the “adult sunflower”. These archetypes explain how bottom-of-the-pyramid hybrid organisations face the challenges posed by the context in which they operate to fulfil the quest for corporate sustainability.

Keywords

Ecological-inclusive business models; business model canvas; qualitative content analysis.

1 – INTRODUCTION

Sustainable business model innovation has recently become a material issue within sustainable business model research, drawing more interest towards the factors of success or failure in the design or reconfiguration of sustainable business models (Evans et al., 2017; Geissdoerfer, Vladimirova & Evans, 2018). Research, however, has first focused on establishing a common theoretical grounding for sustainable business models, acknowledging the need for further empirical studies (Boons & Lüdeke-Freund, 2013; Evans et al., 2017; Schaltegger, Hansen & Lüdeke-Freund, 2016). As a result, there is room to test the application of analytical methodologies to case studies to investigate the drivers for the success of sustainable business models. Empirical studies have been carried out focusing on top-end companies in developed markets (Morioka, Evans & Monteiro de Carvalho, 2016; Ritala et al., 2018), or on projects by top-end companies in bottom-of-the-pyramid markets (Filardi, Delarissa Barros & Fischmann, 2018), but there is still the need to analyse business models of hybrid organisations in bottom-of-the-pyramid markets (Battilana & Dorado, 2010; Díaz-Correa & López-Navarro, 2018; Gebauer, Haldimann & Jennings Saul, 2017).

This study aims to contribute to the research field of sustainable business model innovation by analysing the business models of a set of agro-food hybrid organisations in Sub-Saharan Africa. By doing so, the authors aim to shed light on the reciprocal influence of coexistent ecological and social concerns on the design of the business models of hybrid organisations. This coexistence is not to be understood as a form of social or environmental consciousness, or as a tendency to do “less bad”, but rather as an actual effort to simultaneously deliver positive social and environmental value. As a result, our goal is to contribute to the understanding of the key factors for the achievement of a triple-bottom-line mission for hybrid organisations oriented at bottom-of-the-pyramid sustainability, and to identify possible archetypes for their business models. The business models of these organisations, which we define as “ecological-inclusive”, are analysed and compared to detect common features and understand how, and to what extent, these organisations integrate social and environmental aspects within their business models.

To do so, the authors conducted a selective and inductive qualitative content analysis (Elo & Kyngäs, 2008; Elo et al., 2014) on a set of sample sustainable business models. The cases are herein represented and analysed using the business model canvas (Osterwalder & Pigneur, 2010) to enable a more straightforward comparison and understanding of the most meaningful features defining a sustainable business model. The quest for comparability led the authors to narrow the scope of the analysis to a single business sector and the geographical boundaries to a consistent socio-economic context. Both were selected to produce the largest possible sample of organisations, for which secondary information was available from a reliable source. Notwithstanding these boundaries, which somehow limit the possibility of generalising its outcomes, our research can pave the way for applications of the same methodology to other contexts, as it has been argued in similar studies (Díaz-Correa & López-Navarro, 2018; Gebauer. Haldimann & Jennings Saul, 2017).

2 – SUSTAINABLE BUSINESS MODELS: A LITERATURE REVIEW

Over the last decade, international organisations have increasingly encouraged companies to reconsider their possible contributions to sustainable development (UN Global Compact, 2013; United Nations, 2015; World Business Council for Sustainable Development, 2010), because no sustainable development is possible without a sustainable development of corporations (Kourula, Pisani & Kolk, 2017; Schaltegger, Lüdeke-Freund, & Hansen 2016). As a result, corporate sustainability (Garriga & Melé, 2004) and the triple bottom line (Elkington, 1997) have become increasingly popular among companies as approaches to create long-term stakeholder value (Hart & Milstein, 2003; Kolk, 2016). Following these approaches, companies would try to address an array of social, environmental and economic issues and transform themselves accordingly to contribute to the goal of a sustainable development which respects the planetary boundaries (Whiteman, Walker, & Perego, 2013).

To this extent, the Sustainable Development Goals (SDGs) proposed by the United Nations (United Nations, 2015) were and still are considered an important step forward, and the contribution of private companies has always been perceived as fundamental for the success of the SDGs (Sachs, 2012). Although some authors argued for a substantial lag between sustainability talk and practice in large companies (Cho et al., 2015; Gray, 2010), these are still perceived to face fewer implementation problems, compared to smaller entities, when it comes to corporate sustainability (Gallo & Christensen, 2011; Hörisch, Johnson &

Schaltegger, 2015; UN Global Compact, 2017). Support from CEOs and an ethically-inspired leadership appears to be one of the key drivers for successful organisational changes for sustainability, albeit not a guarantee of success, as spreading down the change can still be challenging (Lozano, 2015; UN Global Compact, 2017).

Business model innovation has been recognised as a promising solution to bring the change for corporate sustainability into being (Bocken et al., 2014; Schaltegger et al., 2012). Most interestingly, some authors argued that business model innovation would represent a more effective and beneficial way to pursue corporate sustainability, while at the same time involving fewer risks than other kinds of innovations (Chesbrough, 2007; Choi & Wang, 2009; Lindberg, Meinel & Wagner, 2011). As a result, sustainable business model innovation has recently risen to prominence as a research field (Geissdoerfer, Vladimirova & Evans, 2018) and as a process to design, redesign and adopt new business models to overcome the barriers preventing organisations from being simultaneously profitable and beneficial to the natural environment and society (Boons, & Lüdeke-Freund, 2013; Geissdoerfer, Bocken & Hultink, 2016; Schaltegger, Hansen & Lüdeke-Freund, 2016).

Bottom-of-the-pyramid businesses are among the most interesting examples of sustainable business models (Geissdoerfer, Vladimirova & Evans, 2018), as they aim to engage stakeholders with low incomes while providing more affordable and accessible services in innovative and sustainable manners (Bitzer & Hamann, 2015; Hahn, 2012). The customer base for such business consists of over 4 billion people living with less than $2 per day, who form the so-called “bottom of the pyramid” (Prahalad, 2012). Since it was first identified, the bottom of the pyramid has been considered a promising market, especially for multinational corporations (Prahalad & Hart, 2002), albeit a challenging one (Olsen & Boxenbaum, 2009). Targeting low-income customers requires substantial innovations in the business model of an organisation (Prahalad, 2012), and the challenge of achieving long-term profitability while addressing customers with limited financial resources adds to the traditional barriers to sustainable business model innovation (Evans et al., 2017; Gebauer, Haldimann & Jennings Saul, 2017).

Although the bottom of the pyramid was first described as a potential market for large multinational corporations (Prahalad & Hart, 2002), it has been argued that the nature of these companies, as well as their distance from these consumers, would make them less effective without the support from non-profit entities, such

as NGOs (Pitta, Guessalaga & Marshall 2008). The need for cooperation between corporations and NGOs to successfully develop business models which are sensitive to the culture and to the socio-economic context of developing countries is an indication of how a bottom-up process is perhaps more effective (Dahan et al., 2010; Pitta, Guessalaga & Marshall 2008). In addition, it supports the claim that to become successful, business models for bottom-of-the-pyramid markets should be collaborative (Gebauer, Haldimann & Jennings Saul, 2017) and rely both on internal resources and on the external capabilities available in these markets (Sanchez, Ricart, 2010).

In this respect, the collaboration between corporations and hybrid organisations is considered an important opportunity to develop corporate sustainability initiatives (Haigh et al., 2015a). Hybrid organisations design or reshape their business models to address relevant social or environmental issues (Haigh et al., 2015b). As a result, their business models have been defined as "sustainability-driven" and represent a good business case for sustainable management (Díaz-Correa & López-Navarro, 2018; Haigh & Hoffman, 2012). Their hybrid nature is given by the fact that these organisations, while addressing sustainability issues, will also pursue for-profit activities, trying to make their mission profitable (Alberti & Varon Garrido, 2017). By doing so, they blur the distinction between profit and non-profit logic and present different legal statuses (Haigh & Hoffman, 2012).

Given their peculiar nature, hybrid organisations represent a form of organisational innovation. Achieving both positive social and environmental impacts and profits with the same business model represents a challenging tension which has been investigated by the hybrid organisation literature (Pache & Santos, 2013; Ramus & Vaccaro, 2014; Mair, Mayer and Lutz, 2015; Stevens, Moray and Bruneel, 2015). This two-fold goal, in fact, could produce paradoxical outcomes, positive for the mission but negative for profits. Hybrid organisations, for example, could end encouraging their customers to produce positive environmental and social outcomes by themselves, without involving the organisation (Jay, 2013). As a result, it is interesting to investigate if, and how, bottom-of-the-pyramid hybrids (Hockerts, 2015) can stay profitable in the long term and at the same time, effectively achieve their mission.

Research has produced many definitions of sustainable business models, but not all of them stress the importance of simultaneously and consistently delivering both social and environmental positive value (Geissdoerfer, Vladimirova & Evans, 2018). Bocken et al. (2014) described archetypes of sustainable business models,

but some of the archetypes focus mainly on technological innovation to improve eco-efficiency and reduce pollution, as opposed to other archetypes which present a dominant social component. The simultaneous creation of environmental and social positive value, although not ruled out, appears not to be a requirement, even among the archetypes under the organisational grouping. Other formulations, such as the Strongly Sustainable Business Model (SSBM), lay the emphasis on the creation of positive social, environmental and economic, as well as on the inclusiveness, as this triple-bottom-line value has to be co-created by engaging the wide audience of the stakeholders (Upward & Jones, 2016). Strongly Sustainable Businesses, however, are relatively unexplored as a formulation, especially from the point of view of empirical research.

Empirical research, accordingly, focused on bottom-of-the-pyramid hybrid organisations only aiming at a social impact (Agarwal et al., 2018; Brueckner et al., 2010; Hockerts, 2015), or on building social and environmental impact indicators for such organisations (Holt & Littlewood, 2015). Some authors, on the other hand, focused on bottom-of-the-pyramid venture initiatives (Duke, 2016; Filardi, Delarissa Barros & Fischmann, 2018; Gebauer, Haldimann & Jennings Saul, 2017) or on analysing business model innovations in frugal products and services (Howell et al., 2018; Pansera & Owen, 2015; Rosca et al., 2017; Winterhalter et al., 2017). These studies, however, focus, on the one hand, on single innovations (e.g. a product or a service) and, on the other hand, on venture initiatives by western firms. As a result, they do not assume the case of organisations which, as a whole, build their entire business model around sustainability. In addition, studies on sustainable business model focusing on major companies are outside of the hybrid organisation realm (Morioka, Evans & Monteiro de Carvalho, 2016; Ritala et al., 2018), and even the authors covering hybrid organisations in developed countries call for applications of the proposed research methods to different contexts (Díaz-Correa & López-Navarro, 2018).

A sound analysis of hybrid organisations in bottom-of-the-pyramid markets with business models oriented to triple-bottom-line sustainability is still missing. These particular business models, which we could refer to as “strongly sustainable” (Upward & Jones, 2016), or as “ecological-inclusive”, holistically connect different Sustainable Development Goals and embed them into the value proposition to solve specific social and environmental concerns. Since we are referring to bottom-of-the-pyramid hybrid organisations, we will hereinafter refer to this particular type of sustainable business models as “ecological-inclusive”, to emphasize the effort to produce positive environmental outcomes while including

low-income stakeholders. Another most noticeable feature of these ecological-inclusive business models is the fact that they embrace a proactive strategy instead of an accommodative strategy (Bocken et al., 2014). As a result, ecological-inclusive business models cannot be limited to do "less bad", but they have instead to produce positive impacts both from the social and from the environmental point of view.

This hybridisation between planet-first and people-first missions potentially bears inside the seeds of a new institutional plurality, strategic orientation and business model and has hence to be investigated accordingly (Cornforth, 2014; Ebrahim, Battilana, & Mair, 2014; Jay, 2013). The authors argue that investigating how hybrid organisations integrate sustainability aspects into their ecological-inclusive business models can be fundamental to understand how business model innovation can serve the quest for corporate sustainability. A sound research methodology is fundamental to analyse a sample of hybrid organisations and to develop archetypes which are able to explain how these organisations face the tension between profit and non-profit mission, while engaging bottom-of-the-pyramid stakeholders in their core operations. In this respect, using qualitative content analysis to investigate the business models can help us to solve the question surrounding these hybrid ecological-inclusive organisations. Business models, in fact, enable us identifying how key components and functions are connected and combined within an organisation and between the organisation and the external environment to create and deliver value (Osterwalder, Pigneur, & Tucci, 2005; Osterwalder & Pigneur, 2010).

3 – RESEARCH METHOD

A content analysis relies on examining different text-based resources. To investigate how hybrid organisations integrate sustainability aspects in innovative ecological-inclusive business models, the authors used an inductive and selective content analysis (Elo & Kyngäs, 2008; Elo et al., 2014; Guthrie, Petty, Yongvanich, & Ricceri, 2004) over a collection of cases of ecological-inclusive business models. We chose this method to ensure credibility, consistency and transferability to our methodology. An inductive analysis, furthermore, will enhance the understanding of the issue, by establishing categories to group the entries accordingly (Cavanagh 1997).

Inductive content analysis, as defined in Elo & Kyngäs (2008), follows a five-steps path:

1. Open coding
2. Coding sheets
3. Grouping
4. Categorisation
5. Abstraction

This process is consistent with the conceptual framework for business model design and analysis provided by the business model canvas (Osterwalder & Pigneur, 2010). The nine building blocks of the business model canvas will be used as the fundamental monads to examine each organisation in the sample. Besides, the use of the business model canvas allows the comparison between companies. The business model canvas, as a result, will be used as a framework in the open coding step while reading and systematising the qualitative content for each company. By doing so, we will be able to identify, for each organisation, the customer segments, the value propositions, channels, customer relationships, revenue streams, key resources, key activities, key partnerships and the cost structure.

The information thus collected can be combined and displayed in an appropriate coding sheet (Figure 1). The “Impacts” row does not belong to the business model canvas as in Osterwalder and Pigneur (2010) and is added to summarise and list the most noticeable outcomes of the activity of the organisation as far as sustainability is concerned. We will make use of colours to indicate whether environmental or social aspects or actors are successfully integrated into each block. The yellow colour hence denotes the presence of social features in a block of the business model, while green represents the presence of environmental features. With the research question being how bottom-of-the-pyramid hybrid organisations address the tension between financial, social and environmental missions, it is most interesting to look at the simultaneous presence of cells labelled with green and cells labelled with yellow inside each block. The coding sheet, as a result, will appear more yellow and greener as more evidence of social and environmental aspects being simultaneously integrated into the business models is collected.

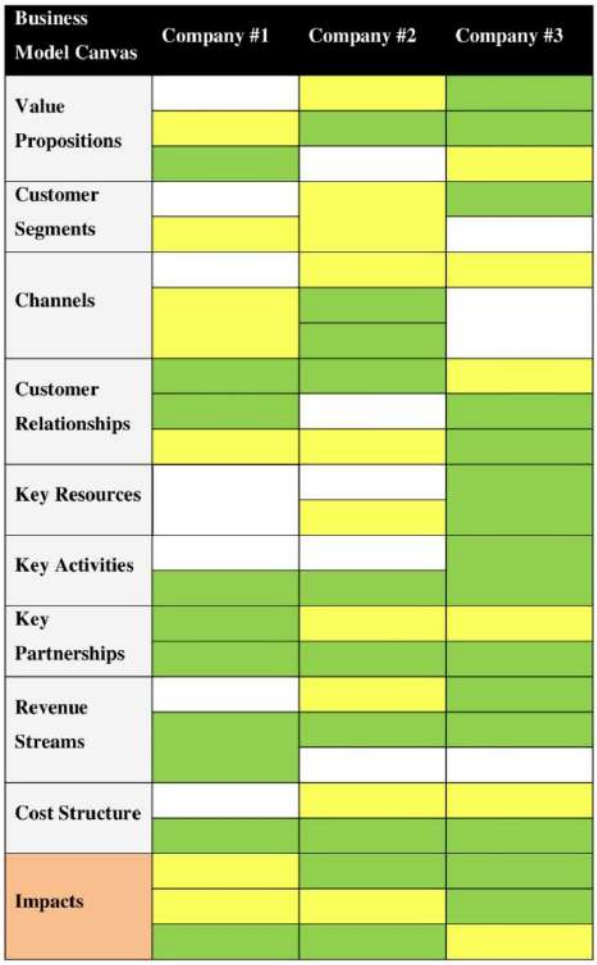

Figure 1: Sample coding sheet. Yellow stands for social features, green for environmental features, while white stands for absence of social or environmental features.

Having filled in the coding sheet, the authors were then able to draw the most noticeable features which make these ecological-inclusive business models innovative. The content analysis allows the identification of categories to understand how different types of ecological-inclusive businesses shape their business model to achieve their mission. Examining the business models, besides, will provide insights on how pro-societal and pro-environmental activities, rather than cost-increasing measures, can instead be integrated inside the core business of a company as profit-increasing activities. The explanation of these inherent connections through a business model can help to identify underlying low-cost innovation opportunities (Amit & Zott, 2012; Chesbrough, 2010; Zott & Amit, 2008).

For the scope of our analysis, we decided to use the following definitions for each block of the business model canvas (Figure 2), which are derived from the business model canvas (Osterwalder & Pigneur, 2010). The use of the business model canvas developed by Osterwalder & Pigneur (2010) instead of other formulations such as Joyce & Paquin (2016) or Upward & Jones (2016) is driven by the fact that the former is more established within the business model research field compared to the latter and more consistent with the information we were able to retrieve from our source database.

Business Model Canvas	Question
Value Proposition	How does the organisation create value with its products and/or services?
Customer Segments	Which customers does the organisations create value for?
Channels	How does the organisation reaches the different customer segments?
Customer Relationships	Which kind of relationships does the organisation establish with each customer segment?
Key Resources	Which are the most important resources to make the business model operative?
Key Activities	Which are the main activities carried out to make the business model operative?
Key Partnerships	Whom has the organisation to partner with to make its business model work?
Revenue Streams	Where does the organisation generate the revenue required for its going concern?
Cost Structure	Which costs are required to make the business model work?

Figure 23: Business model canvas and questions answered by each canvas.

4 – SAMPLE CONSTRUCTION

This study relies on a set of business cases retrieved from a third-party database. The source of the cases is the Publication Database of the Inclusive Business Action Network (IBAN), which contains to this day 486 case studies of organisations aiming at including bottom-of-the-pyramid consumers, suppliers, entrepreneurs and employees. The Inclusive Business Network Publication Database, in turn, collects the publications from various other sources, such as the Growing Inclusive Markets (GIM) database and the set of cases available on the website of the Business Call to Action (BCtA). The United Nations Development Programme (UNDP) launched and supported these two initiatives which date back to 2008,

whereas the Inclusive Business Action Network was established in 2014 and is managed by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

To ensure comparability across the sampled companies, the authors decided to focus the analysis on a uniform set of countries. The study should, in fact, be focused on a default and uniform geographical context. The political and socioeconomic contexts, in turn, will be as similar as possible for the entities to be examined. As a result, the hybrid ecological-inclusive organisations in the sample will have to address the same problems and needs when it comes to shaping their business model to contribute to the achievement of the Sustainable Development Goals (SDGs). Thus, the authors used regional groupings from the 2017 Sustainable Development Goals Report (United Nations, 2017) to determine the clusters of countries. We decided to focus our study on the regional group "Sub-Saharan Africa", which offers the largest number of case studies compared to other regional groups. To this day, in fact, the Inclusive Business Network Publication Database collects 166 case studies for this regional group.

In order to better ensure cross-firm comparability, the authors decided to focus the analysis on a single business sector. Hence, we selected the agricultural and food sector, which contains 72 case studies, the highest number for this regional group. Agriculture, moreover, is one of the business sectors with the most connections to the Sustainable Development Goals (SDGs). It is also one of the business sectors where interactions between different Sustainable Development Goals (SDGs) are the most challenging. For example, food production in Sub-Saharan Africa tackles the SDG 2 - "Zero Hunger" while supporting other SDGs such as SDG 1 - "No Poverty" and SDG 3 – "Good Health and Well-Being. At the same time, however, food production can constrain other SDGs such as SDG 13 – "Climate Action" (Nilsson, Griggs & Visbeck, 2016). As a result, we expect the agriculture and food sector in bottom-of-the-pyramid markets to present multiple opportunities and challenges to develop and shape innovative ecological-inclusive business models (Prahalad, 2012).

Eventually, in order to reduce the numerousness of the database and to obtain the final sample, the authors laid down some requirements to be applied. As a result, we require the sampled organisations to meet the following criteria:

- Independent and managerial governance: the sampled enterprises would present various organisational forms, provided that they have managerial

governance and their business management is independent from other public or private entities (e.g. large multinational corporations, local governments, intergovernmental organisations - IGOs). This criterion allows us to exclude ad-hoc projects and short-term initiatives, whether they are carried out by corporations with a going concern perspective or not;

- Mixed mission: according to this requirement, the firms would be selected only if they create a positive impact on SDGs related to both environmental and social aspects;

- Established companies: the sample will include only companies which have already gone beyond the start-up stage. As a rule of thumb, we will select companies with more than three years of activity since the establishment date;

- Complete, impartial, non-biased information: finally, we set this requirement to exclude all the cases where the lack of information prevented us from having a deep understanding of the business model. Besides, this criterion would leave out all the organisations for which forms of communication bias could mine the accuracy of the information included in the case studies.

Following these criteria, the database was reduced to 15 sampled organisations. A description of the sample is reported in Figure 3. For each company, the table lists the country of origin, its legal form, the date of establishment, the main products or services, the Sustainable Development Goals addressed and the low-income stakeholder engaged. A brief description of the mission is also included. Six of these organisations are based in Kenya, three South Africa, two in Mozambique and Ghana, and one in Nigeria and Uganda.

Organisation	Country	Legal Form	Established	Main Product/Service	SDGs Addressed	BoP Stakeholders Engaged	Mission
Baobab Produce Mozambique	Mozambique	Private Limited Liability Company	2013	Baobab products	1; 2; 4; 5; 8; 12; 13	Women harvesters	Creating a local value chain around Baobab fruits for women harvesters.
Claire Reid Reel Gardening	South Africa	Social Enterprise	2010	Organic gardening solutions; Training services	1; 2; 4; 12	Harvesters, both women and children	Alleviating food shortages and promoting self-sustaining communities through simple, cost-effective and convenient means of agriculture.
Honey Care	Kenya	Social Enterprise	2000	Honey products; Beehives; Training services	1; 2; 5; 8; 12; 15	Subsistence farmers - beekeepers; BoP Consumers	To bring social impact by profitably providing trusted healthy honey products and snacks.
IMAI Farming Cooperative	South Africa	Cooperative	2010	Organic horticultural products; Training services	1; 2; 5; 8; 10; 12	Women farmers	Reducing food waste and creating income opportunities by producing and marketing vegetable atchar pickle made from surplus horticultural production.
Integrated Tamale Fruit Company	Ghana	Private Limited Liability Company	1999	Mangoes production	1; 2; 5; 12; 15	Smallholder farmers; women as employees	Harvesting and processing organic mangoes, improving the living standards of smallholder farmers.
Kenia Tea Development Agency	Kenya	Private Limited Liability Company	2000	Agricultural Services	1; 2; 5; 12; 13	Smallholder farmers	Investing in tea and other related profitable ventures for the benefit of the shareholders and other stakeholders.
Kickstart International	Kenya	Social Enterprise	2005	Irrigation tools for agriculture	1; 2; 8; 12; 13; 15	Subsistence farmers	Lifting millions of people out of poverty quickly, cost-effectively and sustainably.
Mobah Rural Horizons	Nigeria	mSME	2000	Pot-in-pot products	1; 2; 5; 8; 12	Subsistence farmers	Providing solutions to store perishable crops for rural farmers.
Mozambique Honey Company	Mozambique	Private Limited Liability Company	2010	Honey products	1; 2; 15	Subsistence farmers - beekeepers	Developing the honey chain while alleviating poverty.
Muliru Farmers	Kenya	Community-Based Enterprise	2004	Natural remedies; Environmental awareness trainings	1; 2; 8; 11; 12; 13; 15	Medicinal plant farmers	Cultivating traditional medicinal plants to protect the last Kenyan rainforest.
Muthi Futhi	South Africa	Community-Based Enterprise	2010	Medicinal plant ingredients; Organic fruits	1; 2; 5; 15	Women farmers	Protecting the biodiversity and creating sustainable jobs for rural women by cultivating and processing indigenous medical plants.
One Acre Fund	Kenya	Social Enterprise	2006	Financing and training services	1; 2; 4; 8; 12; 15	Smallholder farmers	Helping smallholders grow their way out of hunger and building lasting pathways to prosperity.
Safi Organics	Kenya	Private Limited Liability Company	2015	Rice Production	1; 2; 3; 13	Subsistence farmers	Empowering smallholder farmers in Kenya through an agricultural circular economy.
Unique Quality Product Enterprise	Ghana	Eco-Inclusive Enterprise	2012	Fonio Production	1; 9; 10; 13	Women farmers	Empowering marginalised women in Ghana by reviving the cultivation of indigenous crops.
Yice Uganda	Uganda	Social Enterprise	2012	Agricultural Services	1; 2; 10; 12; 15	Smallholder farmers, with a focus on women and youths	Facilitating farmers' access to demand-oriented agricultural and training, flexible financial services and quality farm inputs to reduce hunger, illnesses and poverty among small holder farmers in Uganda.

Figure 3: Sampled organisations.

5 – FINDINGS

One of the most noticeable features of our sample is that we can find organisations offering similar products and services. In particular, we have two organisations focused on honey production (Honey Care and Mozambique Honey Company), two organisations which produce natural remedies (Muliru Farmers and Muthi Futhi) and three organisations which developed innovative tools and

solutions for horticulture and agriculture (Claire Reid Reel Gardening, Kickstart International and Mobah Rural Horizons). Besides, three organisations focus their activity on marketing indigenous varieties of fruit and grain (Baobab Products Mozambique, Integrated Tamale Fruit Company and Unique Quality Product Enterprise). Kenya Tea Development Agency, One Acre Fund and Yice Uganda, on the other hand, all aim to increase the access to the markets and financial capital by offering an array of services to the smallholder farmers. Two organisations, finally, rely on waste and excessive production to promote a circular agricultural value chain for smallholder farmers (Imai Farming Cooperative and Safi Organics). Whether these groups would share common features and consequently form different groups will be confirmed or denied during the grouping and abstraction stages.

The results of the coding process are displayed in the coding sheets included as annexes at the end of the paper. Our analysis shows that environmental and social features can be found in all the value propositions of the sampled organisations. This evidence basically confirms us that the sampling method used produced indeed a sample which is consistent with our premises. Each of the entities in our sample displays an evolution of the value proposition, from a traditional single-purpose proposition towards a triple-bottom-line proposition where societal needs and environmental concerns are considered alongside doing economically viable business. As our sample shows, this orientation to the simultaneous creation of economic, social and environmental positive value presents some significant challenges when it comes to the profitability and scalability of the business.

Regardless of the groups of companies, which we have previously identified according to the product or service provided, our sample suggests that the main distinction lies indeed within the “Customer Segments” block of the business model canvas. We will, therefore, explain this difference as it emerges from the organisations in our sample, and describe two possible archetypes of ecological-inclusive business models. As previously said, the “Customer Segments” block of the business model canvas is used to identify the different kinds of customers whom the organisation is addressing to while carrying out its business activity. It is then important to verify whether bottom-of-the-pyramid customers are engaged as customers by each organisation, as well as whether these customers are somehow related to the environmental sustainability realm.

As far as the presence of social and environmental features is concerned, our sample suggests that social features are a constant presence within the "Customer Segments" block of the business model canvas. All the 15 sampled hybrid organisations address bottom-of-the-pyramid customers, whether in the form of consumers or as producers, and, in this specific case, as smallholder and subsistence farmers. The main goal of all the organisations in our sample is to provide affordable products or services either for bottom-of-the-pyramid households or for bottom-of-the-pyramid farmers, or both. By engaging the smallholder subsistence farmers, most of them manage to lift the farmers out of absolute poverty by providing additional income or alternative income sources. At the same time, however, some of the organisations in our sample are also targeting bottom-of-the-pyramid consumers, as they feature in their range of products also food products which are affordable for the low-income households.

The main dichotomy which our sample suggests is between two types of hybrid organisations: the ones which focus only on downstream customers, and the ones which manage to engage also their suppliers as upstream customers. Some of the organisations included in our sample, in fact, do business not only by marketing agricultural or food products but also by selling agricultural inputs or services to the farmers, which are indeed both suppliers and customers. Other organisations, on the other hand, engage with the farmers by providing training in organic farming or hygiene practices, but only to ensure the quality of the products, and without receiving revenues in exchange.

Overall, the 15 sampled organisations can be divided into two different groups, according to the low-income stakeholders engaged as customers. The first group comprises those hybrid organisations which, besides selling agricultural products to upstream customers, also provide substantial support to smallholder farmers whether in the form of training, access to farming inputs, to financial credit or insurance services. As a result, they earn revenues both from selling agricultural products and from the services they provide to the farmers. This group includes three organisations, namely Honey Care, Integrated Tamale Fruit Company and Kenya Tea Development.

The second group includes those hybrid organisations which target only downstream bottom-of-the-pyramid customers, be they smallholder farmers or households. Two sub-types of organisations fall into this category: the ones whose customers are smallholder farmers (Kickstart International, One Acre Fund, Safi Organics and Yice Uganda) and the ones whose customers are bottom-of-the-

pyramid households (Baobab Products Mozambique, Claire Reid Reel Gardening, Imai Farming Cooperative, Mobah Rural Horizons, Mozambique Honey Company, Muliru Farmers, Muthi Futhi and Unique Quality Product Enterprise). The organisations in the first sub-type provide products or services to smallholder farmers, and these are their only source of revenues. Alongside their main products or services, they also promote and provide training in sustainable agriculture practices. The organisations in the second sub-type, on the other hand, focus their activity on the production and marketing of agricultural products. Even if they provide some sort of training to their suppliers, that is, to smallholder farmers, in sustainable agriculture practices, they do not receive any revenue in exchange.

All these organisations engage at least one bottom-of-the-pyramid stakeholder as a customer and carry out their business activities with the aim of addressing the substantial needs of these stakeholders. By doing so, they also address environmental concerns by promoting sustainable farming practices. To some extent, thanks to their inclusive nature, they can all be considered capacity builders. However, the extent to which they manage to incorporate this capacity building within their business models and value creation strategy is somehow different between the two groups. The hybrid organisations in the first group, in fact, do not limit themselves to increase an existing capacity. Instead, they create capacity from scratch by providing innovative solutions to allow the farmers to carry out new activities, improving their living standards and the agricultural outputs in a sustainable way.

6 – DISCUSSION

Having acknowledged the distinction between the two groups of organisations, we can use a metaphor to describe two different possible archetypes of ecological-inclusive business models. The metaphor used is the one of the sunflower, and it is an image which makes reference both to the agro-food business sector, which is the scope of our study and to the concept of the flourishing enterprise (Laszlo et al., 2014).

Young sunflowers follow the sun

We found the behaviour of the hybrid organisations with ecological-inclusive business models included in the first group to resemble the one of young sunflowers. Before they eventually bloom, young sunflowers track the movement

of the sun in the sky, moving from east to west, and backwards, during the day. If we consider the sun as a metaphor of the social and environmental purposes, hybrid organisations with the "young sunflower" behavioural pattern will move from downstream to upstream in their value chain, engaging both consumers and suppliers as their customers, in an effort to create positive environmental and social value along the whole value chain. The "young sunflower" business model archetype is characterised by a strong attitude towards the resolution of the challenges faced by bottom-of-the-pyramid stakeholders upstream and downstream the value chain. They create a strong bond with their suppliers, providing them with fundamental farming inputs, such as beehives, or valuable services, on the condition that they supply all their agricultural outcome to Honey Care, Integrated Tamale Fruit Company and Kenya Tea Development Agency.

Adult sunflowers always face eastward

The hybrid ecological-inclusive organisations in the second group, on the other hand, act as "adult sunflowers". When sunflowers finally bloom and become adult, they stop tracking the sun in the sky and always face eastward during the day. Likewise, the organisations in the second group, have their focus oriented in just one direction, downstream, either towards households or towards smallholder farmers. They either market agricultural products to consumers or provide services to smallholder farmers. In the case of smallholder farmers, these organisations may provide them with some training services, but only to ensure product quality and so that the agricultural outcome can be marketed as produced from certified organic farming. As far as these organisations are concerned, however, producing and selling agricultural products to downstream customers does not prevent them from pursuing significant positive environmental and social outcomes upstream in the value chain. These hybrid organisations, in fact, aim to improve the living standard of smallholder farmers by paying them fair prices, allowing them to move away from subsistence farming.

The value of partnerships

All the companies make extensive use of collaboration and partnerships with third parties, to overcome the challenges of doing business in bottom-of-the-pyramid markets. Partnerships are fundamental to achieve scalability and to expand to other markets, but also to produce positive social and environmental value for the stakeholders engaged. Our sample suggests that scalability can be more of a challenge for young sunflowers compared to adult sunflowers, as they might have

to build by themselves the upstream supply capacity required to fulfil the downstream demand. In this regard, partnerships can be fundamental for hybrid organisations with a "young sunflower" business model to increase the access to farming inputs, financial capital and other services for their suppliers. This evidence supports the claim that collaboration is the key to success for business models in bottom-of-the-pyramid markets (Gebauer, Haldimann & Jennings Saul, 2017).

7 – CONCLUSIONS

Our study contributes to the research field of sustainable business model innovation by providing an empirical analysis of the business models of 15 hybrid organisations in agro-food bottom-of-the-pyramid markets. Our research offers an insight into the solutions developed by these organisations to address relevant social and environmental concerns related to the Sustainable Development Goals (SDGs). The main outcome is the identification of two possible ecological-inclusive business model archetypes, which we called "young sunflower" and "adult sunflower". Although the scope of our study is limited to a specific business sector and to only one of the regional groupings proposed by the United Nations, its results are indeed interesting. We suggest that future research should test the presence of a dichotomy between young and adult sunflower ecological-inclusive business models in other contexts, and using larger samples.

Our research, finally, suggests that content analysis has, indeed, an interesting potential when it comes to analysing business models, and can hence be used as a methodology for empirical studies on sustainable business model innovation. As far as the sampling method is concerned, third-party publication databases such as the one offered by the Inclusive Business Action Network (IBAN) can be useful sources to build an unbiased sample. However, the availability and quality of the qualitative information from third-parties, especially on hybrid organisations in bottom-of-the-pyramid markets, can pose significant constraints to the research activity. As a result, we suggest a direct collection of the information through interviews and questionnaires as an improvement for similar studies.

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Annexes

Business Model Canvas	Baobab Products Mozambique	Claire Reid Reel Gardening	Honey Care	IMAI Farming Cooperative
Value Propositions	Buying, processing and trading nutrient-rich baobab products such as powder and oil,	Addressing food insecurity among low-income households and children	Selling high-quality honey products,	Producing and marketing atchar picke
		with organic gardening solutions as bio-degradable paper strips with organic seeds,	including accessible honey products for BoP consumers,	made from surplus vegetable, and by that, reducing waste
	empowering women harvesters,	as well as by providing training in organic gardening	while promoting the conservation of woodlands for apiculture	and creating additional income for vegetable farmers
	and increasing the resilience of local communities by providing them with an alternative source of income.	to develop the skills of women and children to provide them with new income opportunities.	and providing subsistence farmers with inputs, training services and market access.	while at the same time training them in organic farming practices.
Customer Segments	Consumers in local and international markets	High and middle-income households	Consumers in local and international markets	Consumers in local and international markets
		BoP households		
	BoP consumers in local markets	Schools	BoP consumers in local markets	BoP consumers in local markets
		Community gardens	Subsistence farmers	
Channels	Retail	E-commerce or retail (for high/middle-income consumers)	Retail (consumers)	Retail
		Distribution through project partners (for low-income consumers)	Direct engagement (smallholder subsistence farmers)	
		School projects	Co-creation (farmers provide feedback through questionnaire)	
Customer Relationships	Transactional	Training in organic farming	Training and support in beekeeping practices	Transactional
		Engagement in community garden projects	Door-to-door supply of beekeeping equipment, collection of honey and payment	
Key Resources	Local network of baobab subsistence harvesters in Manica province	Semi-automatic machine to place the seeds in the paper strips	Local network of subsistence farmers	Shared agro-processing plant
	Baobab forest resource	Financial resources to scale up the business (demand is higher than the supply)	Beekeeping equipment	Local network of farmers
	Baobab pulp and seeds processing facility	Financial resources and a local network of well-trained sales agents to provide training to manage the school projects and the community gardens	Well-trained personnel to provide training in professional beekeeping to subsistence farmers	Rainwater harvesting dam

Key Activities	Buying, processing and trading baobab fruits and derived products	Producing and selling bio-degradable paper strips with organic seeds	Honey collection, packaging and distribution	Collecting and processing surplus perishable agricultural outcome
	Training women in Manica province on harvesting and processing techniques	Training children and women from low-income households in gardening	Capacity building and training activities	Providing training in hygiene, food processing and entrepreneurship
	Sustainable management of the baobab forest resource (assessing the cultivated areas, replanting baobab trees, determining sustainable harvesting yields)	Promoting projects to create community gardens and gardens in school.	Engaging beekeepers by collecting feedbacks through performance monitoring questionnaires	Selling atchar pickes to BoP consumers
Key Partnerships	Eco-Micaia Ltd. owns 80% of Baobab Products Mozambique, offers business development services	Lonely Road Foundation, for community projects Unilever, for the distribution of the products, fundraising and training of sales agents	Impact investors to promote social projects	Small Enterprise Development Agency, Supports IMAI for the product development and product packaging
	Micaia Foundation provides training in sustainable harvesting practices	Reach Scale, for business development Labelpak, for product development	NGOs – Africa Now, to earn the trust of local communities and ensure transparency	University of Limpopo, tests the products of IMAI and sometimes buys its product
	PhytoTrade Africa supports with the natural resource assessment of baobab areas	SPACE, to manage the school programme Avocado Vision manages the training of the sales agents	Development agencies, to promote joint beekeeping projects in rural communities	Limpopo Department of Agriculture, offers technical expertise on irrigation infrastructures
Revenue Streams	Sales revenues	Sales revenues Fundraising (to finance community projects)	Sales revenues	Sales revenues
Cost Structure	Cost-driven (producing affordable nutrient-rich baobab products for BoP customers)	Cost-driven (producing affordable gardening solutions) Relying on fundraising for school projects and community gardens	Cost-driven (eliminating intermediaries between farmers and retail, ensuring larger profits for the beekeepers)	Cost-driven (reducing costs by sharing resources between farmers)
Impacts	Improved living standards of women harvesters	Increased food security for BoP households and children	Beekeeping became an important source of income for smallholder farmers	Decreased seasonality of revenues for local smallholder farmers
	Promoting gender equality (women as shareholders are actively engaged in the company)	New income opportunities for women in low-income households	Promoting gender equality (more than 40% of female beekeepers)	Encouraging farmers to form rural cooperatives and empowering women
	Adaptation to climate change by providing an alternative source of income	Reducing water consumption needed to grow vegetables in water-scarce contexts	Decreasing deforestation (farmers no longer rely on selling firewood as a source of income	Reducing food waste and loss of valuable agricultural outcome
	Sustainable management of the baobab forest resource	Decreasing soil erosion thanks to organic farming	Pollinators increase and protect the biodiversity and is positive for agriculture	Reducing groundwater depletion thanks to rainwater harvesting

Business Model Canvas	Integrated Tamale Fruit Company	Kenya Tea Development Agency	Kickstart International
Value Propositions	Cultivating, processing and selling large volumes of certified organic mangoes for local and international markets,	Providing effective management services to smallholder tea farmers,	Developing and selling affordable manual irrigation pumps for subsistence farmers,
	providing smallholder farmers with farming inputs using interest-free loans	enhancing the climate resilience of tea farmers with drought-tolerant tea varieties	promoting sustainable agricultural practices and water management.
	while shifting agricultural production away from perennial crops with high environmental impact.	and promoting climate mitigation measures.	
Customer Segments	Consumers in international markets	Buyers in local and international markets	Smallholder farmers
	Subsistence farmers	Smallholder farmers	
Channels	Retail (consumers)	Wholesaling, at factories	Retail
	Direct engagement in the Organic Mango Outgrower Associations (OMOA)	Auctions for agricultural commodities	
		Supply agreements with buyers	
		Direct engagement in the governance of the company	
		Provision of services through subsidiaries	
Customer Relationships	Outgrowing scheme	Transactional (consumers)	Co-creation (through focus groups)
	Support and training for the farmers to obtain licenses and certifications of organic farming	Long-term relationships with smallholder farmers, encouraged by the provision of services	
Key Resources	Local network of mango subsistence harvesters	Network of over 550,000 smallholder tea farmers	Raw materials – especially iron, to manufacture the pumps
	Packing and processing unit	Collection centers and factories	Human capital for new technology development
	Financial resources to lend farming inputs to the farmers at zero-interest rate	Subsidiaries to provide financing services, health insurance, to carry out philanthropy projects and to supply renewable energy to the farmers	Local networks of suppliers, distributors, retailers
	Mango plantation and seedling nursery		
Key Activities	Cultivating, processing and selling organic mangoes to local and international markets	Collecting and processing tea leaves to sell high-quality tea in international markets	Market research to explore new business opportunities to improve farming techniques
	Providing access to farming inputs to subsistence farmers through zero-interest loans	Providing training to smallholder farmers through Farmer Field Schools	Development, manufacturing and distribution of irrigation solutions for smallholder farmers
	Providing training and support activity on organic farming techniques, to obtain organic farming licences	Training smallholder farmers in sustainable agricultural practices to obtain the Rainforest Alliance Certification	Monitoring the impact of the innovative irrigation solutions

Key Partnerships	Organic Mango Outgrower Association (OMOA) - network of subsistence outgrower farmers	Rainforest Alliance, Unilever and the Dutch Sustainable Trade Initiative, to certify all the factories to the Sustainable Agriculture Network standards	E-Business International, provides support for remote controls on the quality of production
	Children To School Project (CTSP) to support the school system, also by planting five-acre mango farms in each school	The Kenyan Ministry of Agriculture, The Tea Board of Kenya and the Tea Research Foundation provide support in the assessment of climate vulnerability	Donors: Bill & Melinda Gates Foundation, Rockefeller Foundation, David & Lucie Packard Foundation
			Alwaleed bin Talal Foundation – to expand the business to Western Africa
		Ethical Tea Partnerships collaborates with KTDA to provide training on climate risk and adaptation measures	IKEA Foundation – to expand the business to Southern Africa
			ExxonMobil Foundation supports Kickstart in its projects to empower female farmers
Revenue Streams	**Sales revenues**	KTDA charges a 2,5% management fee to the factories. The farmers take turns in running the factories (5 farmers elected for 3-year mandates) and 70% of the final market price of the tea goes to the farmers	Sales revenues, from selling affordable water pumps to subsistence farmers
	Payments from the farmers for the farming inputs loaned	Smallholder farmers pay KTDA's subsidiaries for the services provided	
Cost Structure	Cost-driven (achieving economies scale to ensure a greater bargaining power for mango harvesters)	Value-driven (strongly focused on the quality of the final product, this translates into a 20% premium)	Cost-driven (economies of scale and lean thinking to make the pumps as affordable as possible for the farmers)
Impacts	Promoting gender equality (female employees in the processing unit)	Improving the living standards of smallholder tea farmers	Improving the living standards of smallholder farmers
	Increasing significantly the income of subsistence farmers	Empowerment of smallholder farmers as shareholders and managers (especially women)	Creating new business and working opportunities, even beyond farming
	Preventing deforestation to cultivate traditional crops	Increasing the climate resilience in the tea value chain	Increasing the climate resilience of rural communities
	Protecting biodiversity with complementary beekeeping activity	Climate change mitigation through tree planting projects and the development of small hydro plants to produce renewable energy	Preventing harmful environment practices carried out by subsistence farmers in extreme poverty

Business Model Canvas	Mobah Rural Horizons	Mozambique Honey Company	Muliru Farmers	Muthi Futhi
Value Propositions	Producing affordable cooling devices called "pot-in-pot" products	Selling high-quality honey to local and international markets	Cultivating medicinal plants and processing them into essential oils and medical remedies	Cultivating and processing indigenous medicinal plants, promoting their use to solve health issues in rural communities
		but also affordable honey to low-income consumers	enhancing rainforest and biodiversity preservation, promoting ad-hoc harvesting instead of exploiting wild stocks	decreasing the pressure on wild stocks of these plants
	which do not require electricity	and promoting sustainable beekeeping practices.		while creating permanent jobs in rural communities, especially for women
	for subsistence farmers and BoP households		and generating additional income for smallholder farmers.	and training subsistence farmers on organic farming practices.
	to avoid the waste of perishable agricultural products.			
Customer Segments	Smallholder farmers	Consumers in local and international markets	Consumers in local and international markets	BoP consumers in local markets
	BoP households	BoP consumers in local markets	BoP consumers in local markets	Other companies, to produce other remedies
Channels	Retail	Retail (formal market)	Retail	Retail (consumers)
	Direct door-to-door sale to customers	Network of local distributors (BoP consumers, informal market)		Business-to-business (B2B)
Customer Relationships	Personal assistance (product use demonstrations to rural communities)	Transactional	Transactional	Transactional (consumers)
				Long-term relationships (B2B)
Key Resources	Raw materials - clay	Local network of beekeepers	Local network of farmers	Local network of farmers
	Skilled workers in rural communities to manufacture the pot-in-pot products	Local network of "Bee Promoters" for capacity building	Equipment to extract essential oil from dried leaves	17 hectares cultivated and a plant nursery, all managed with sustainable agricultural practices and organic farming
	Sales assistants	Processing and packing facility	Production, packaging and storing facility	Processing and packaging facility
Key Activities	Exploring demand for pot-in-pot products in rural communities	Provide training in beekeeping, hive management and hygiene to ensure product quality	Recruiting local subsistence farmers for the cultivation of medicinal plants	Purchasing compost from smallholder farmers
	Training local crafters on how to produce pot-in-pot products, according to the specifications required by the customer	Processing, packing and marketing honey and honey products	Buying medicinal plants from subsistence farmers and processing them into herbal remedies to be sold in local and international markets	Cultivating and processing medicinal plants to produce medicinal remedies for BoP consumers and other companies

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	Training local crafters on how to produce pot-in-pot products, according to the specifications required by the customer	Processing, packing and marketing honey and honey products	Buying medicinal plants from subsistence farmers and processing them into herbal remedies to be sold in local and international markets	Cultivating and processing medicinal plants to produce medicinal remedies for BoP consumers and other companies

Business Model Canvas	One Acre Fund	Safi Organics	Unique Quality Product Enterprise	Yice Uganda
Value Propositions	Providing asset-based financing and training to smallholder farmers	Processing waste rice husk into biochar	Promoting the cultivation and processing of fonio as as climate resilient crop	Providing access to agricultural knowledge, capital and markets for subsistence farmers,
		which is sold as a cheap fertiliser to smallholder farmers	using traditional farming methods,	
	while increasing the climate resilience of smallholder farmers	and by doing so replacing inorganic fertilisers and increasing carbon storage in agricultural soil.	training women in rural communities	while at the same time increasing agricultural yields by promoting sustainable agriculture practices.
	and promoting a sustainable intensification of agriculture to prevent the loss of forests.		recovering infertile and abandoned communal land	
Customer Segments	Smallholder farmers	Smallholder farmers	BoP consumers in local markets (children, pregnant women, elders)	Subsistence farmers
Channels	Direct provision of farming inputs	Direct sale	Retail	Farm agents (100% women)
		Door-to-door sale through young farm agents		
Customer Relationships	Personal assistance	Dedicated personal assistance, training on sustainable soil treatment solutions and organic farming	Transactional	Direct engagement in training, hygiene and Farming programmes
	Co-creation			
Key Resources	Local network of smallholder farmers	Raw materials (waste rice husk)	Local network of fonio harvesters	Local network of farm agents (100% women)
	Farming inputs	Technology and processing facility	Access to abandoned plots of land	Information Technology to provide agricultural information and collect payments through mobile phones
	IT solutions	Local youth employed as farm agents	Female employees for fonio processing and quality controls	
Key Activities	Asset-based financing for smallholder farmers and distribution of farming inputs	Collecting and processing waste rice husk to produce biochar	Supporting women in gaining the access to the abandoned plots of land	Training on sustainable agriculture practices
				for subsistence farmers
	Training on sustainable agricultural practices to increase yields in without affecting the environment	Selling affordable biochar to smallholder farmers	Training and employing women in fonio harvesting and processing	Giving flexible loans (30% as farm inputs, 70% as money)
	Facilitating the access to the market for smallholder farmers		Buying fonio from female smallholder harvesters, processing it and marketing under the label "DIM Fonio"	Programmes to promote hygiene
	Providing crop insurance to increase the climate resilience of smallholder farmers	Training young local as farm agents to distribute the biochar		Promoting organic agriculture
				in refugee camps.

Key Partnerships	Safaricom is a strong partner with its digital integration projects	Kenyan Agricultural and Livestock Research Organisation (KARLO) helps Safi Organics to develop sustainable solutions for local agricultural challenges	Pagsung Women Association, provides training on fonio processing quality control and hygiene standards	Agro Market Days provides market and agricultural information through smartphones and mobile apps
	Global Innovation Fund, to develop new solutions for smallholder farmers in six sub-Saharan African countries	Agriculture Sector Development Support Program (ASDSP) encourages technological innovation and promotes sustainable farming practices	Kwame Nkrumah University of Science and Technology, supports PWA and UQPE with the tests required to obtain fonio quality certifications	Gutsinda Development Group provides a knowledge sharing platform for farmers
	Local governments, to develop tailored solutions for smallholder farmers in different regional contexts	Takachar provides training and solutions to convert the waste rice husk into biochar	Send Ghana provides training in agronomic and climate-smart agricultural practices	Kiva provides zero-interest loans through a micro-lending website
Revenue Streams	Sales revenues, affordable subscription fee paid by the farmers	Sales revenues	Sales revenues	Sales revenues, affordable subscription fee paid by the farmers
Cost Structure	Cost-driven (reducing transaction costs through digital tools)	Cost-driven (producing an affordable organic fertiliser)	Cost-driven (fonio has to be affordable to feed pregnant women and children)	Cost-driven (annual subscription is $0.30)
Impacts	Improving living standards of smallholder farmers	Improving the living standards of smallholder farmers	Improving the living standards of women in rural communities	Increasing the income of smallholder farmers
	Improving food security in rural communities, by increasing agricultural yields	Creating income and working opportunities for local youth		Women empowerment (all the farm agents are women)
	Increasing the climate resilience of smallholder farmers	Improving soil conditions and reversing the decline of soil fertility	Recovering degraded land, restoring soil with sustainable practices	Preserving soil ecosystems with sustainable agriculture practices
	Promoting sustainable agriculture practices, reforestation projects and climate change mitigation measures	Carbon sequestration and waste reduction by converting waste rice husk into biochar	Reducing the emission of methane by using waste to produce organic compost	Preventing groundwater pollution by replacing synthetic fertilisers

Exploring the Differences Between Commercial and Sustainable Business Models: A Conceptual Framework

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Abstract

This paper draws on institutional logics to explain the differences between commercial and sustainable business models, and contributes to understanding the cognitive barriers to sustainability transitions. The framework developed shows that institutional logics influence cognitive structures and ultimately real-world expression of different business model taxonomies, dominated by commercial or sustainability logics.

Keywords

Sustainable business models, commercial business models, institutional logics, barriers.

Introduction

Business models substantially influence activities and relationships in society. They shape workplaces, how goods and services are consumed, and relationships along the whole value chain from resource extraction, through manufacture, distribution, use and disposal (Demil et al., 2015). The design and choice of business model therefore has implications for the degree of positive or negative impact a business has on society and the environment. This means that businesses can actively contribute to creating a future that is fairer, healthier, and happier for all people and that protects and enhances our relationship with the natural environment (World Business Council for Sustainable Development, 2010).

However, in response to global challenges to achieving these objectives, current business approaches have been identified as insufficient, with changes required "at the core of the business model" (Bocken et al., 2014, p. 44).

In this paper I will differentiate 'sustainable business models', being new approaches that address sustainability challenges, and contrast this with the current typical business model approach, which I will refer to as 'commercial business models'[20]. As a relatively new field of research, the extant sustainable business model research is focused on the characteristics of organisations that are seeking to be more sustainable, and the concepts that lead to what could be described as a sustainable business model (Dentchev et al., 2018). However, as this research area progresses, it is necessary to consider the barriers to uptake of sustainable business models.

Laukkanen and Patala (2014) identified attitudes, values and common understanding as major barriers to the update of sustainable business models. This is because individuals are guided by norms and beliefs when undertaking reasoning for business model design (Bettis and Prahalad, 1995; Chesbrough and Rosenbloom, 2002). In this paper, I argue that institutional logics can be used to identify and characterize the differences in norms and beliefs, and that these may shape business models, leading to, for example, commercial or sustainable approaches. This is because logics provide the social context that guides practices and behaviours through shared understandings and values (Thornton and Ocasio, 1999).

Specifically, this paper responds to the research question: How do institutional logics inform individuals' understanding of business model characteristics? The contribution of this paper is therefore to bring together these literatures in order to consider the underlying differences between commercial and sustainable business models. These differences are important to understand because they will help direct where more research and action is needed to move individuals embedded in commercial business models towards greater consideration of sustainable alternatives. The paper also contributes to several of Dentchev et al.'s (2018) calls for further research in the field, including at the intersection with the commercial ('traditional') business model field, and a more robust

[20] While sustainable business models may also be commercial models, I will use the term 'commercial business models' to distinguish between the concepts. This nomenclature aligns with the entrepreneurship literature to distinguish social and commercial entrepreneurship (e.g. Austin, Stevenson and Wei-Skillern, 2006; Estrin, Mickiewicz and Stephan, 2013).

conceptualization and theoretical development of the antecedents of sustainable business models.

This paper is divided into three sections. First, I provide a brief overview of the business model literature comparing commercial business models and sustainable business models. Secondly, I provide a similarly brief overview of institutional logics with specific focus on commercial and sustainability logics. Finally, I bring these two literatures together, integrating institutional logics into Osterwalder, Pigneur, and Tucci's (2005) levels of business model abstraction.

Business model literature

In this section I compare the descriptions of commercial and sustainable business models, and implications for how 'value' is perceived within the two sub-literatures. I draw on the mainstream business model literature to characterize commercial business models, and the sustainable business model literature to characterize sustainable business models. I then highlight the literature on business models as cognitive structures, and how these impact business model decision-making.

Commercial and sustainable business model focus

The focus of the business model in the mainstream literature is economic for the organization (Breu*er et al*>, 2018). This is variously described as "realisation of economic value" (Chesbrough and Rosenbloom, 2002, p. 529) and "to generate profitable and sustainable revenue streams" (Osterwalder, Pigneur and Tucci, 2005, p. 10). This focus highlights an implication that 'value' in the mainstream business model literature is value to the customer and financial return to the organisation (Biloslavo, Bagnoli and Edgar, 2018). For example, Teece suggests an effective business model "entices customers to pay for value, and converts those payments to profit" (2010, p. 172). Similarly, for Chesbrough and Rosenbloom (2002) a key business model element is the cost structure and profit capture, and Magretta (2002) discusses value and cost from the perspective of the customer, and how financial value is captured for the firm, and Gordijn's (2004) e3value approach across value exchange, value activity, and value object is entirely focused on economic value across.

In contrast, sustainable business models are focused on "creating significantly increased positive effects and/or significantly reduced negative effects for the

natural environment and society" (Lüdeke-Freund et al., 2018, p. 147). For example, Rauter, Jonker, and Baumgarner suggest sustainable business models, "must also add a positive social value and/or minimize negative environmental impacts" (2017, p. 145). In the same way, Geissdoerfer, Bocken and Hultink describe sustainable value as "environmental, economic, or social effectiveness, efficiency, or resilience" (2016, p. 1219). This different focus shows how in a sustainable business model, 'value' is deliberately extended from the financial focus of mainstream business model literature (Schaltegger, Hansen and Lüdeke-Freund, 2016).

Business models as cognitive structures

A key stream of business model literature is conceptualising business models as cognitive structures (Massa, Tucci and Afuah, 2017). That is, this research stream considers the structures individuals hold in their minds about the business model. These structures inform individuals' actions and decision-making. Within this research stream, Martins et al. (2015, p. 105) define business models as "cognitive structures that consist of concepts and relations among them that organize managerial understandings about the design of activities and exchanges that reflect the critical interdependencies and value creation relations in their firms' exchange networks". In other words, business models in an individual's mind hold key concepts about how the business model functions, with respect to the firm and its network.

The extant literature in this stream includes several key case studies that demonstrate the role of cognitive structures on subsequent organizational success, including cognitive bias towards established business models. For example, Tripsas and Gavetti (2000) investigated Polaroid management's inability to change its cognitive frame away from the existing model to adopt newer technologies and ways of operating. Similarly, Chesbrough and Rosenbloom (2002) found that Xerox would evaluate new technologies from the perspective of the established copier business, and as a result missed out on value creation from new technologies that needed to operate in different ways. This literature shows the potential impact of business model cognitive structures on the ability, or inability, of organisations to consider and implement alternative business models.

Despite the focus on this research stream, there remains a lack of understanding about the details or drivers of the cognitive structures of business models. In the

following section I consider how the cognitive level of institutional logics may provide insight into this area.

Institutional logics literature

Institutional theory seeks to explain uniformity of organizational approaches and practices through describing the socially constructed pressures in which organisations operate (Suchman, 1995). According to the theory, the social forces of institutions lead to isomorphic pressures, whereby organisations mimic established forms and practices (DiMaggio and Powell, 1983). Individuals' identities and goals are cognitively bounded and embedded within these social, cultural, and political structures (2012). Friedland and Alford (1991) conceptualized institutional logics as each institutions' organising principles. Thornton and Ocasio further developed this conceptualization, defining logics as "socially constructed, historical patterns of material practices, assumptions, values, beliefs and rules by which individuals produce and reproduce their material subsistence, organize time and space, and provide meaning to their social reality" (1999, p. 804). Institutional logics thus hold the shared approaches and values that have developed over time and guide acceptable actions and decision making.

Scholars have investigated the impact of invoking different logics at the individual level. In a study invoking the commercial and family logics, Schilke (2018) found that the commercial logic was associated with greater attention being paid to external factors in order to be competitive with others in the market. This led to greater likelihood of changing decisions based on others' behaviour, whereas the family logic focused on 'what is right for us', and resulted in greater resistance to changing decisions from external pressures. The family logic also emphasised quality and a 'right way of doing business' compared to the commercial logic.

This paper focuses on the commercial and sustainability logics, which represent different approaches and values. Laasch (2017) conceptualised these two logics in an organisational context. The logics are described with respect to characteristics such as key stakeholders, basis of interaction, and organisational goals (see Table 1). Commercial logic characteristics manifest as, for example, individuals seeing customers and shareholders as the primary stakeholders, and contractual responsibilities and competition as the basis of interaction with other organisations. For individuals operating under this dominant logic, the type of value that is the focus is financial. Under the sustainability logic, individuals see

society and the environment as key stakeholders, and collaboration with other organisations as the basis of interaction. Value under the sustainability logic is environmental, social, and economic.

Table 1 Institutional logic characteristics (Source: Laasch, 2017)

Characteristic	Commercial	Sustainability
Reference institutions	Capitalist market system	Supra-national organisations, e.g. United Nations
Conceptual basis	Capitalism, neoclassical economics	Sustainable development, Brundtland Report, international development
Human characteristics	Opportunistic, self-interest-driven, seeing others as means to an end	Relational and caring, concerned with needs of oneself, others and humanity as a whole
Main stakeholders	Customers, shareholders	Humanity, society, environment
Basis of interaction	Contractual responsibilities, market exchange, competition	Moral responsibilities, multi-stakeholder exchange, collaboration
Environmental relationship	Exploitation, natural environment as input	Conservation, natural environment as a good
Type of value	Financial	Environmental, social, economic
Normative goal	Maximization of financial value and economic growth	Balancing and sustaining environmental, social and economic value
Time horizon	Short to medium run	Long run
Governance criteria	Efficient, effective, profitable	Inclusive, equitable, restorative
Orienting parameters	Price, cost, revenue, margin	Triple bottom line, resource conservation and replenishment
Reference publications	Friedland and Alford (1991); Pirson and Lawrence (2010); Thornton and Ocasio (2008)	Brundtland (1987); Dyllick and Hockerts (2002); Kates et al. (2005); Stubbs and Cocklin (2008)

Some business model literature draws on institutional theory to explain hybrid organisations that combine aspects of different logics into a single business model (e.g. Laasch, 2017). However, it is unclear in the literature how institutional logics interact with the concept of business models.

Synthesis: Business models and institutional logics

There is a strong alignment between commercial business models and the commercial logic, as well as sustainable business models and the sustainability logic, as outlined in the previous sections. I suggest that commercial business models reflect the commercial logic described, with goals associated with "maximization of financial value and economic growth" (Laasch, 2017, p. 162). Similarly, the sustainable business model reflects the sustainability logic with a goal of "balancing and sustaining environmental, social and economic value" (Laasch, 2017, p. 162). Despite this alignment, there is limited literature connecting the business models and institutional logics concepts. In this section I adapt a framework to integrate the concepts.

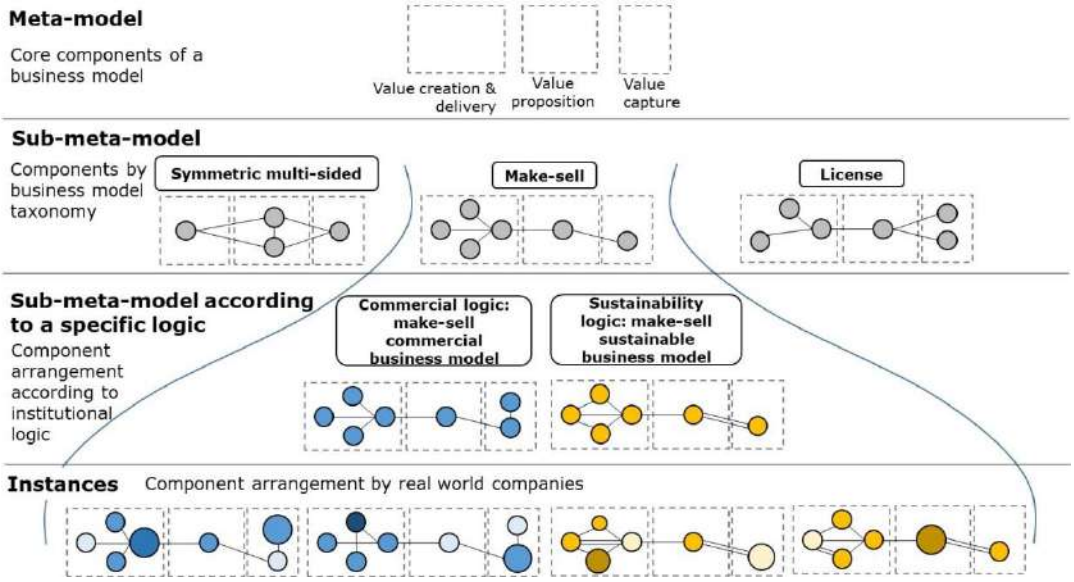
The concept of business models is explored at different levels of abstraction in the literature. To capture the possible levels, Osterwalder, Pigneur, and Tucci (2005) proposed a hierarchy of the business model concept. At the most abstract level is the meta-model, which identifies generic components that are relevant across business model types[21]. At the second, sub-meta models level, are taxonomies of types – generic business models with similar characteristics. This could include 'make-sell', 'resell', or 'license' taxonomies of business models, which draw on the core components in different ways to make up the business model. At the most detailed level are real world businesses. Businesses draw on the appropriate taxonomy and express these in ways that fit the organisation's specific context, stakeholder relationships, and objectives.

Even with the differences in values and focus discussed previously, Brehmer et al. (2018) found that at their most fundamental, the business models of sustainable organisations are generic. That is, the underlying business model taxonomy for sustainable business models is not different from commercial business models. I therefore suggest that the sub-meta models level has two parts: shared taxonomies across different logics at the higher level (e.g., 'make-sell' or 'licence'); and the expression of those models according to the different logics at the lower level (e.g., 'make-sell commercial business model' or 'make-sell sustainable business model'). These then inform business model decisions at the level of

[21] There is no consensus on the core components in the literature; however components identified commonly include value proposition, value creation and delivery, and value capture (e.g. Chesbrough and Rosenbloom, 2002; Teece, 2010); as well as literature that adds to these components with external organisation, volume and structure of costs, margin (Demil and Lecocq, 2010); and customers, product/service offerings (Fjeldstad and Snow, 2017).

individual organisations. Figure 1 shows the updated hierarchy to capture these differences.

Figure 1 Business model hierarchy with institutional logics (adapted from Osterwalder et al. (2005)**). Circles indicate business model components; grey circles represent abstract component arrangement by taxonomy; blue and yellow represent underlying logic (values, believes, practices) for commercial and sustainability logics, respectively); sizes and depth of colour demonstrate how these components and expression of the logic may vary between real world organisations.**



This framework shows that general business model components are arranged according to business model taxonomies. These components are then further interpreted according to the different logics. The expression of business model type according to a specific logic then provides a 'blueprint' of, for example, a make-sell commercial business model or a make-sell sustainable business model. This framework thus reflects findings in the literature that business models reflect underlying values, and how these may be acting as a barrier to moving towards sustainable business models. This is of interest because it highlights the role of shared values and understanding at the levels of institutional logics, and how these inform the business model types. The 'blueprint' then informs the arrangement of different 'real world' organisations.

Here I have argued that the differences in business models reflect the respective dominant institutional logics of each. Specifically, I argue that because these logics are in the minds of individuals, they shape individuals' cognitive structures of

business models. This means that individuals operating within a commercial logic are constrained, due to how the dominance of the commercial logic shapes the individuals' cognitive structures of business models. Therefore, the transition to sustainable business models requires a change in the in the dominant logic of the individual, and this may facilitate a change in cognitive structures of business models.

Concluding remarks

Bocken et al. suggest that new business model approaches provide an opportunity to "re-conceptualise the purpose of the firm and value creating logic and perceptions of value" (2014, p. 43). I have argued that the values to achieve this are captured in a different logic than the commercial logic which is guiding current commercial business model approaches. Therefore, all business model taxonomies may have sustainable forms, if influenced by the sustainability logic. This suggests that transition to sustainable business models may require interventions at the level of the dominant logic. This may then provide opportunities to influence individuals' cognitive structures of business models. Further research is needed to explore this relationship.

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Industry business model patterns for business model innovation – The case of the electricity industry

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Abstract

This paper addresses the question of how a pattern taxonomy of activities in an industry can be used to innovate business models. At the example of the electricity industry – an industry that is facing several changes due to digital technologies, liberalization, and renewable energy technologies – we present a systematic process of building a business model pattern taxonomy using a modified Delphi card sorting approach. In doing so, this paper contributes to understanding how patterns and pattern taxonomies can be used in business model innovation and provide a methodology to catalogue emerging new business models in traditional industries.

Keywords

business model patterns; business model innovation; electricity industry; modified-delphi card sorting.

Radical Resource Efficiency as Business Model Innovation

A Case Study from the Restaurant Industry

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Abstract

Radical resource efficiency is a design and engineering approach to manufacturing that can potentially yield dramatic improvements in energy and material productivity. This design approach proceeds through identification of systemic leverage points and tracing their cascading effects throughout an activity system. Ideally, these effects build upon and amplify each other, yielding further efficiencies. Because it closely aligns with the conceptualization of business models as systems of interconnected and supporting activities, I argue that radical resource efficiency can be a source of business model innovation. In this paper, I explore the application of radical resource efficiency principles in a restaurant in Montreal. The leverage point in the restaurant design was the decision to use food preparation technology in a novel configuration. This choice led the restaurant to also choose to be vegetarian and raw. The resultant activity system generated marked improvements in resource efficiency and at the same time led to the development of a compelling strategic position. However, other efficiency choices in the restaurant were unrelated to the food preparation leverage point, and did not markedly influence strategy. Analysis reveals that cascading efficiencies were more easily attainable towards the beginning of the restaurant's value chain but more difficult to attain at its end. Moreover, because radical resource efficiency reduces slack, waste and flexibility it constrains expansion and scaling up.

Keywords

Radical resource efficiency, leverage points, activity systems, activity maps, sustainability

Introduction

Of the many business model templates devised to promote sustainability, one group focuses on principles of eco-design, in particular efforts to "maximize material productivity and energy efficiency'' (Lüdeke-Freund et al., 2018: 153). This is an eminently course common-sensical goal because less waste contributes to sustainability while at the same time reducing costs and thereby improving profitability. Efficiency efforts are part and parcel of the quotidian work of designers and engineers and can easily yield to incremental improvements throughout value chains. But, in some instances, concerted, systemic efforts to reduce materials and energy usage can translate into radical innovation.

Indeed, the promise of radical resource efficiency as a source of breakthrough models or production was one of the compelling arguments in the book *Natural Capitalism* (Hawken et al., 2000), an influential tract on sustainability, design, engineering and the economy first published in the year 2000. Perhaps the most elegant example of transformative innovation in the book was the hypercar, a radical departure from the dominant vehicular design. This re-imagination was made possible by a series of interconnected changes in the subsystems of a vehicle. The thinking that yielded this redesign is illuminative, and orients the research question of this study.

The key insight behind the hypercar was the decision to make it extremely lightweight. Whereas typical cars are manufactured from heavy steel, the hypercar was built of carbon fiber, a material widely employed in race cars. The revelatory discovery that followed was that the weight reduction made possible by using carbon fiber quickly multiplied. Every pound taken away was actually closer to a pound and a half, since the suspension and other support mechanisms required for a heavy car were either eliminated or minimized. As the car became lighter, entire systems could be discarded entirely, such as electric steering and power brakes, further reducing the weight. With a lighter car, the original engine size seemed superfluous, and the designers were able to reduce its size and output so much that a traditional internal combustion engine was no longer the best choice. Instead, small electric engines placed near the wheels could do the job much more efficiently, reducing weight yet more.

Moreover, although carbon fiber was very expensive, prohibitively so at small-scale, it in fact introduced cost-savings at other junctures in the value chain. Pieces of the frame could be molded to larger sizes, dramatically reducing the number of components that needed to be designed and manufactured. The pieces were so light that people could carry them, rather than relying on cranes and lifts. They snapped together, rather than being welded. Paint was mixed in during manufacture of panels rather than sprayed on at the end of production in a notoriously expensive, delicate process that made heavy use of toxic materials. Other savings accrued after manufacturing, in the usage phase of the car's life. Namely, the cost of fuel, compared to gasoline, was markedly lower. All in all, the hypercar demonstrated that radical resource efficiency cascaded and could dramatically alter how a product was designed, manufactured and used.

These interconnected activities and cascading effects of one major design choice are an example of a leverage point: "a place within a complex system (a corporation, an economy, a living body, a city, an ecosystem) where a small shift in one thing can produce big changes in everything" (Meadows, 1997). Some of the most compelling, and perhaps disruptive, business models are those in which a novel insight functions as a leverage point and triggers a re-imagination of the activity system around which a company is structured (Yunus et al., 2010, Etzion, 2018). For this leveraging to be impactful, the kernel of the novel idea must be tightly interlinked with other nodes in the organization's activity system and business model (Zott & Amit, 2010). Indeed, by definition, a competitive strategy is one where activities reinforce each other in unique and novel ways (Porter, 1996). The greater the compatibility and fit between activities in the system, the more compelling the model.

In *Natural Capitalism* and elsewhere (Lovins, 2013), Hawken, Lovins and others suggested that opportunities for radical resource efficiency abounded. They described ways of laying pipes out on the factory floor in ways that dramatically reduced the number of pumps and motors required to propel fluids; another example emphasized "over-insulating" buildings in a manner that permitted HVAC systems to be eliminated entirely, in a process known as "tunnelling through the cost barrier" (Lovins et al., 1999). These examples, as compelling as they are, focus on material and energy-intensive production processes such as factories and buildings, and may be limited to operational improvements as opposed to strategy. Whether radical resource efficiency can yield high-impact improvements at smaller organizations, or in the service sector, is unknown. In this paper I examine *whether the precepts of radical resource efficiency can inspire business*

model innovation in non-manufacturing contexts, and specifically the restaurant industry.

Research context and design

To explore this question, I studied Foodchain, a fast-casual restaurant in Montreal (https://eatfoodchain.com/en). Founded in 2018 by an experienced, award-winning team consisting of two chefs, a boulanger, a designer and a management consultant, FoodChain's primary business was serving lunch to workers in the dense downtown area where it was located. The restaurant is vegetarian, but does not explicitly declare itself to be oriented to sustainability, nor does it attempt to pursue a differentiation strategy based on organic fare. The team simply believed that doing business in 2018 implied making sustainability-oriented decisions, but that these choices did not necessarily need to be trumpeted.

This paper is an extension of a teaching case study I wrote about Foodchain and its business model. Over a period of three months, I interviewed the managing partner repeatedly, read internal company documents, and visited the restaurant frequently, interacting with employees and observing the restaurant at different times of day.

Key insights

Like the hypercar, the leverage point that triggered the model redesign at Foodchain was one design choice that cascaded through the activity system. However, this choice was not related directly to sustainability. The restaurant' model is, in essence, designed around a piece of machinery called a Robot-Coupe. Robot-Coupes are industrial-grade food processing machines often found in large kitchens and major food preparation centres. Robot-Coupes have been in existence for decades and are used all over the world to quickly slice large amounts of raw materials. It is rare to see more than one in a kitchen, but FoodChain has eight: one for each salad on the menu. This means that FoodChain can produce a massive amount of food very quickly – the machines are simply loaded with all the vegetables required for each serving of a specific salad and run through in one batch. The ingredients for each batch are washed, peeled, weighed and portioned previously, ready for processing in one bowl kept in refrigeration. Because each machine is dedicated to only one salad, there is no need to wash the machines between servings, and the bowl that holds the uncut vegetables is used to collect the sliced ingredients as the exit the Robot-Coupe. Slicing occurs only after an order is placed, so that a salad is served extremely fresh. In as little as 21 seconds

from the moment an order is processed by the cashier, a complete salad can be prepared and served, although actual preparation times typically range from 60 to 90 seconds.

This innovative use of the machine enables a further set of choices in the restaurant's business model (see Table 1):

Table 1: Activities directly deriving from the choice to employ Robot-Coupe machines.

Choice	Rationale and implications
No Meat	Meat cannot be chopped in the same machine as the vegetables because of food safety concerns, and also because its texture is unsuitable; it cannot be sliced effectively. FoodChain's positioning as vegetarian derived automatically.
No Cooking	If there is no meat in the restaurant and it is vegetarian, there is a possibility to not cook at all. And in fact, raw food and especially firm fruits and vegetables such as cauliflower, mushrooms, apples and cucumbers are the most suitable ingredients for the machine. If there is no cooking, there is no need for exhaust piping and ventilation systems to be installed and maintained. In terms of future expansion, any commercial space can potentially be a FoodChain site, whereas other restaurants must consider building specifications and ventilation feasibility.
Minimalist menu	To minimize food preparation times, washing of the machines between servings is unfeasible. Each salad therefore requires a dedicated machine, meaning that the menu has to be small. This simplifies kitchen operations vastly. To ensure streamlining, the restaurant enforces a no modifications policy; customers cannot ask for any changes to how a menu item is prepared. Overall, equipment and staff in the restaurant are always ready to prepare each menu item with no lead time, leading to very few delays in the busy lunch hour.

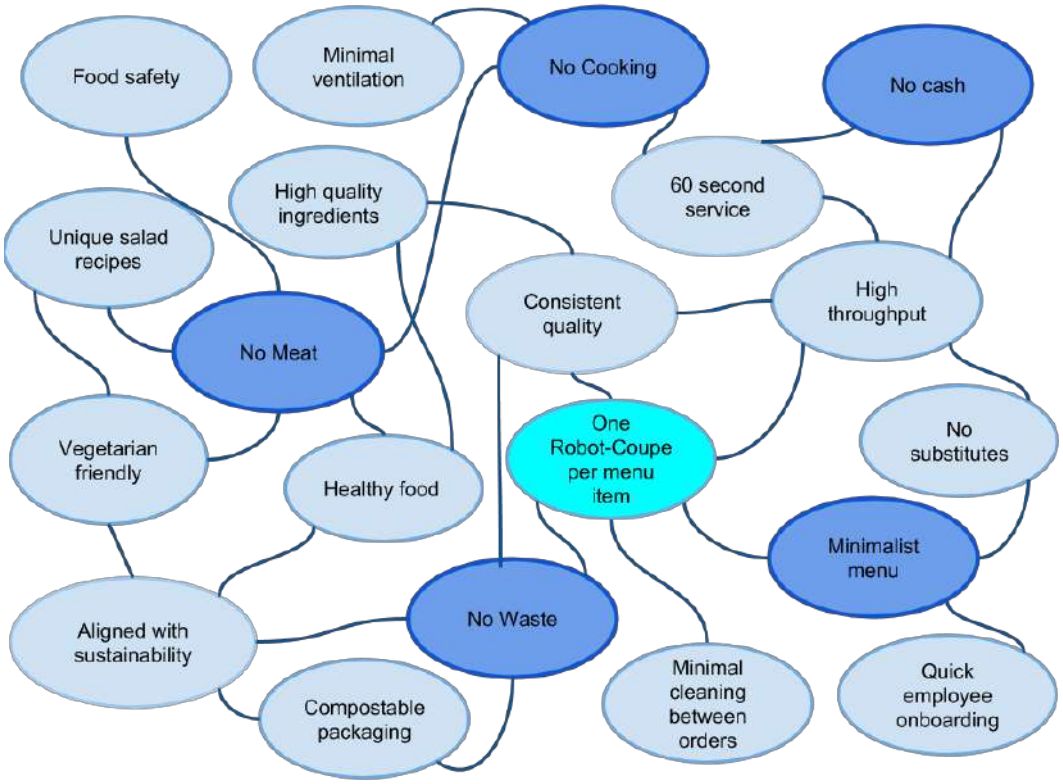
However, other important aspects of the efficiency gains pursued by FoodChain do not seem to cascade directly from the choice to employ Robot-Coupes (Table 2):

Table 2: Activities not deriving from the choice to employ Robot-Coupe machines.

Choice	Rationale and implications
No Cash	All purchases are transacted with either credit or debit cards. This makes the transaction process faster and the restaurant more secure, because there is no cash on the premises. The register does not no need to be balanced at the end of the day.
No Waste	FoodChain recognizes that individuals often err in sorting waste into separate streams for waste, recycling and trash. Therefore, except for glass beverage bottles, all containers and utensils are made of compostable materials. Thus, there are only two streams of waste: bottles and everything else. This speeds up customer departure times.

Figure 1 presents these discreet choices in an activity map (Porter, 1996). The Robot-Coupe leverage point is highlighted. Major choices, corresponding to the table above, are presented in dark blue. The activity map depicts the extent to which the choices are interconnected and comprise a compelling strategy. At the same time, the diagram makes apparent the cascade of choices made possible through radical resource efficiency. Notably the “No Cash” choice is only weakly linked to the other main nodes. The “No Waste” choice is linked to the choice of using a Robot-Coupe because it reduces cleaning, but this is a relatively minor linkage.

Figure 1: FoodChain activity map.



The managing partner at FoodChain, a former management consultant, emphasizes that running a restaurant is challenging because it is essentially "just-in-time manufacturing with a retail front - using perishable items with very fluctuating demand". Figure 1 suggests that the nodes that represent manufacturing (food preparation) – no meat, no cooking, minimalist menu – reveal more interconnections and a clearer cascade that emanates from the Robot-Coupe as leverage point. By contrast, the modes that represent the post-manufacturing, retail phase of the value chain – no waste, no cash – are less linked to the Robot-Coupe, and less densely interlinked overall.

Moreover, in terms to scaling up and impact, the activity map also shows some of the constraints to future expansion and diversification. Offering additional menu items, for example, better suited to evening menus and colder weather is challenging, given the tight linkages FoodChain's efficiencies and strategy have created. Options to diversify into other lines of business in food preparation and delivery, such as catering, delivery and wholesale, are similarly limited. These are

challenges both in terms of strategy design, and in terms of scaling up sustainability practices.

Conclusion

The Foodchain case study underscores the potential of applying principles of radical resource efficiency to business model design in a way that promotes sustainability. Not unexpectedly, the benefits of this design approach are more apparent in the earlier, manufacturing-like stages of the value chain in a restaurant, and less apparent in the post-production phase. Intuitively it indeed seems more difficult for radical resource efficiency to yield the same step changes in efficiency gains in aspects of the business that are less tightly controlled operationally. Retail has many more “degrees of freedom” than manufacturing.

Activity maps, an important component of the strategy toolkit, appear to be useful to explore and highlight radical resource efficiency opportunities. Both radical resource efficiency and strategy are built on the notion that it is the connection between choices that determines success: not just the choices independently, but more importantly the tightness of the linkages between them and their density. Future research can further investigate the use of activity maps as a multifunctional tool for designing effective strategies for sustainability. Currently, they seem to stand apart from the tools typically employed for business mode generation (e.g. Osterwalder & Pigneur, 2010).

An even more ambitious goal is to develop a tool to rigorously map and test the compatibility between nodes and the strengths of linkages between them. It may be possible to employ simple scores, even a Likert scale, to assess the meaningfulness of each link in an activity map, and then employ measures from network theory to quantify the efficiency that can ensue for the business model in its entirety. In particular, a good measure would capture whether the model can generate substantive cascading effects. A tool of this type has the potential to compellingly identify opportunities for radical resource efficiency through marrying business model innovation with system dynamics.

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Revealing the Sustainable Value Creation and Value Capture Potential with a Multicapital Approach

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Abstract

This paper clarifies the concepts of value creation and value capture related to sustainable business model. Additionally, the paper applies a multicapital approach combined with triple bottom line, multi-stakeholder and system dynamics perspectives, and concretizes and demonstrates sustainable value creation and value capture potential in a case study.

Keywords

Sustainable business model, value creation, value capture, multicapital approach

Introduction

Being a reflection of corporate sustainability strategy, sustainable business model (SBM) translates strategic objectives into the business logic of the company and further daily operations and value creation activities (Rauter et al., 2017). SBM aims at creating greater positive environmental and societal value overall, thus optimizing the value for the company itself as well as for a wider network of stakeholders, including society and the environment (Bocken et al., 2019). Essential functions of any business model are the value propositions and the value creation and value capture mechanisms employed (Chesbrough, 2007; Teece, 2010). In the SBM research, the concepts of sustainable value proposition and sustainable value creation have risen to the center of the discussion (e.g. Bocken

et al., 2019; Patala et al., 2016; Sulkowski et al., 2018; Yang et al., 2017), but the value capture of SBM is the least explored element (Morioka et al., 2018), even it is equally critical. The value capture represents the value that the company generates for itself from its value proposition (Abdelkafi and Karl Täuscher, 2016).

The understanding of sustainable value creation is essential for targeting Sustainable Development Goals (United Nations, 2019) and further, the understanding of value capture logic is vital for the successful implementation and diffusion of SBMs. A company that cannot earn a profit from its value creation activities cannot sustain those activities over time (Chesbrough, 2007). Companies are mainly interested in creating sustainable value if that brings economic benefit (Yang and Evans, 2019), i.e. increased revenue or decreased costs (e.g. Engert et al., 2016; Schaltegger et al., 2012). Actually, it is not truly realistic to expect commercially oriented businesses to fully refocus on sustainability challenges and value creation for the common good (Agafonow, 2013; Dyllick and Muff, 2016). However, the value captured tends to be many times intangible (Morioka et al., 2018), and companies do not see the full value capture potential. This raises the need for research on how companies can translate sustainable value created to the other stakeholders into the captured value to itself. New perspectives on assessing the full value capture potential are needed.

This study aims at clarifying sustainable value creation and especially value capture potential. As presented in Figure 1, value creation is prerequisite for value capture, but on the other hand, value capture is a necessary driver for a firm to engage in value creation. Even if the value capture potential exists, it may not be fully visible for companies. This study helps companies to recognize the potential and motivate them to create sustainable value. Further, realized value capture motivates companies to create even more sustainable value leading to a virtuous circle. To address the aim, this study combines the prior literature and findings from an empirical case concerning the sustainability strategy work of the Kekkilä Group in 2018[22]. The study first conceptualizes the concepts of value creation and value capture related to SBM. Further, this study applies a multicapital approach (e.g. McElroy and Thomas, 2016) as a promising perspective on assessing sustainable value creation and value capture potential.

[22] http://kekkila-bvb.com/

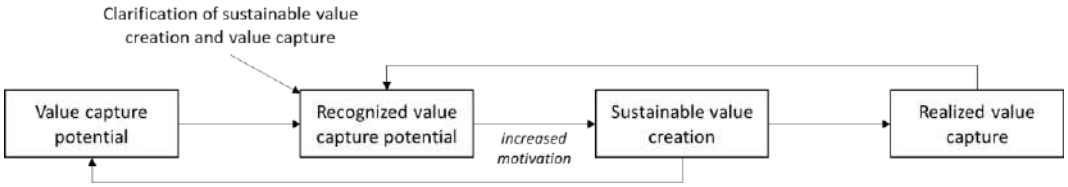

Figure 1. Conceptual framework of the study

Approach

Multicapital approach

Instead of focusing solely on creating customer value and capturing profits itself (Chesbrough, 2007; Teece, 2010), companies aim at creating economic as well as environmental and social value for multiple stakeholders through new SBMs (den Ouden, 2012; Sulkowski et al., 2018; Yang et al., 2017). The focus is not just on short-term profit maximization, but also other forms of non-monetary value and maximizing long-term well-being (den Ouden, 2012; Lankoski and Smith, 2018). Multicapital approach is proposed to broaden the view from shareholder benefits and generation of economic capital to considering the impacts on society and environment and other forms of vital capitals (McElroy and Thomas, 2016).

The capital-based philosophy itself is not a new idea and there have been an emergent discourse of reporting on multiple capitals in the areas of corporate reporting and organizational accounting (Coulson et al., 2015). Recently, the capital-based approach is proposed to connect corporate sustainability performance with the concept of strong sustainability (Nikolaou et al., 2019). However, in SBM literature the multiple capitals are seldom used. Within SBMs, a capital-based approach refers to maintaining and regenerating natural, social and economic capital (i.e. sustainable value creation) while capturing economic value (Schaltegger et al., 2016).

The capitals represent stocks of value that are the basis of company's value creation, and further, all companies increase, decrease or transform capitals through activities (IIRC, 2019). The multicapital approach assesses the performance of a company in terms of what its impacts on vital capitals are (McElroy and Thomas, 2016). There are different categorizations for vital capitals, e.g. definitions used in the Integrated Reporting framework[23], the Five Capitals

[23] http://integratedreporting.org/

Model[24] and the Multicapital Scorecard[25], but when generalized, the multicapitals can be categorized to economic (financial and non-financial), manufactured, intellectual, human, social and relationship, and natural capitals. Natural capital (N) consists of all renewable and nonrenewable natural resources and ecosystem services (e.g. air, water, land, minerals, forests, biodiversity and ecosystem health). For example, when creating environmental value, such as increase biodiversity, the aim is to increase natural capital, whereas responsible use of resources is linked to protecting natural capital. Human capital (H) consists of knowledge, competencies, skills, experience, health, values, attitudes, motivation and ethical entitlements of individuals. Social and relationship capital (SR) refers to the institutions and the relationships within and between communities, groups of stakeholders and other networks of individuals sharing their intellectual and human capital. Intellectual capital is embedded in the other capitals, for example through the personal knowledge. Manufactured capital (M) consists of physical objects, systems or ecosystems created and/or cultivated by humans and used to create products and services, such as equipment and infrastructure. Financial capital (F) refers to the pool of funds available to a company, whereas non-financial capital (NF) may or may not be monetized, such as brand value.

Sustainable value creation and value capture potential from multicapital perspective

In order to identify the forms of sustainable value creation and value capture from multicapital perspective, we reviewed the scientific literature on SBMs and corporate sustainability. We used the Finna search service of the Lappeenranta Academic Library, which has access to 109 databases such as EBSCOhost, Elsevier SD Freedom Collection, SAGE Premier, Scopus, ProQuest Central and the Wiley Online Library. Getting a comprehensive view, we included also practice related business studies (FIBS, 2018; Future-Fit, 2019; Kiron et al., 2013) into the literature review. We analyzed the data through the thematic content analysis method (Myers, 2013) resulting in the summary of sustainable value creation and value capture potential presented in Table 1.

Sustainable value creation potential refers to different general sustainable value forms companies aim at creating for multiple stakeholders. For example, SBMs consider the health and safety of employees, customers and citizens through carefully planned and managed processes, product responsibility and value

[24] https://www.forumforthefuture.org/
[25] http://www.multicapitalscorecard.com/

creation activities contributing the well-being of society, e.g. healthy living. The identified sustainable value forms represent different types of vital capitals and the three dimensions of the triple bottom line (McElroy and Thomas, 2016). Further, we identified value capture potentials, which describe how part of the value generated for stakeholders can be transformed into value useful for the company (Geissdoerfer et al., 2018). In order to identify these value capture potentials, we reviewed the studies concerning the relationship between corporate sustainability activities and firm performance but also the literature on drivers and motives for sustainability actions. We found cost and revenue impacts as direct financial motivations but also several other business case drivers as well as other non-economic value drivers, reflecting that the objective of business may also be something other than profit maximization (Lankoski and Smith, 2018).

Table 1. Sustainable value creation and value capture potential ([1] Azapacic, 2003; [2] Bocken et al., 2019; [3] Evans et al., 2017; [4] den Ouden, 2012; [5] Future-Fit, 2019; [6] Nikolaou et al., 2019; [7] Patala et al., 2016; [8] Bansal and Roth, 2000; [9] Engert et al., 2016; [10] FIBS, 2018 ; [11] Kiron et al., 2013; [12] Schaltegger et al., 2012; [13] Svensson et al., 2018; [14] Ditlev-Simonsen and Midtunn, 2011; [15] Saeidi et al., 2015; [16] Hockerts, 2015.)

Sustainable value creation potential		Source
Environmental bottom line: Natural capital		
Resources (N)	Responsible use of resources (materials, water, energy); Use of renewables; Reduced use of finite resources; Reduced need for physical goods/resources	1; 2; 3; 4; 5; 6; 7
Emissions (N)	Reduced emissions; Pollution prevention (air, water, land)	1; 2; 3; 4; 5; 6; 7
Waste (N)	Reduced waste and waste prevention; Waste management	2; 3; 4; 6
Biodiversity (N)	Secured/increased biodiversity	1; 3; 4; 6; 7
Livability of the environment (N)	The physical beauty of nature; Responsible land use; Reduced noise	1; 3; 4; 7
Environmental well-being (N)	Increased and ensured long-term well-being; Positive environmental value, e.g. afforestation	2; 4; 5
Social bottom line: Human, social and relationship and manufactured capitals		
Health & safety (H/SR)	Product responsibility; Customer/employee/citizen health and safety; Ensured long-term well-being of society	1; 2; 3; 4; 5; 6; 7
Labour standards & practices (H)	Decent working conditions, e.g. wages, benefits, safety at work, job satisfaction	1; 3; 7
Stakeholder & human rights (SR)	Respecting employee, stakeholder and human rights, e.g. no child labor or forced labor	1; 5; 6; 7
Ethical principles (SR)	E.g. honest competition, anti-corruption; No harmful social impacts	5; 6; 7

Equality & diversity (H)	Equal opportunities and non-discrimination	1; 3; 4; 6; 7
Training & education (H)	Employee/customer/stakeholder training and education	1; 6
Partnerships (SR)	Fruitful and reciprocal relationships	1; 4
Community development (SR)	Belonging; Support of locals; Secure livelihood; Encouraged sufficiency and sustainable living	2; 3; 4; 6; 7
Social well-being (H/SR)	Happiness; The well-being of larger groups of people	3; 4; 5
Economic bottom line: Economic financial and non-financial capital		
Employment (NF, F)	Job creation, employment	1; 6; 7
Viability & stability (NF)	Viability/resilience/stability of the network/ecosystem	2; 3; 4
Wealth (F)	Wealth at individual/company/societal levels, e.g. contribution to GDP; Economic benefits for stakeholders	1; 2; 4

Value capture potential		**Source**
Economic financial value drivers		
Costs (F)	Cost reduction	1; 8; 9; 10; 11; 12; 13
Revenue & profit (F)	Increasing revenue and profit margins; Price premium	1; 8; 9; 10; 11; 12; 13; 14
Economic non-financial value drivers		
Stock value (NF)	Higher stock price; Long-term value for shareholders	1; 8; 10; 14
Competitive advantage (NF)	Strategically integrated corporate sustainability; Cost leadership and differentiation; Competencies	8; 9; 10; 11; 13; 14; 15
Risk management (NF)	Risk reduction, e.g. reduced risk of pollution incidents	1; 8; 9; 10; 11; 12; 16
Efficiency & quality (NF)	Increased eco-, resource- or socio-efficiency (e.g. employee productivity) and product quality; Better control of processes	1; 8; 10; 11; 13; 16
Market share (NF)	New markets; Larger market share	8; 11; 16
Stability & resilience (NF)	Ensured good operating conditions for the future; Long-term sustainability and survival	8; 10
Reputation & brand value (NF)	Sustainability as a component of corporate reputation; Increased reputation and brand value	1; 9; 10; 12; 13; 14; 15
Other business value drivers		
Customer satisfaction (SR)	Increased ability to meet (sustainability oriented) customer expectations; Perceived sustainable value	1; 10; 11; 15
Stakeholder satisfaction (SR)	Increased ability to meet (sustainability oriented) stakeholder expectations, e.g. sustainability-oriented investors/supply chain partners	1; 9; 11; 14
Stakeholder relationships (SR)	Enhanced and open/trusted/transparent customer/ stakeholder relationships; Attractiveness as partner	1; 10; 11

Attractiveness as employer (SR)	Employee motivation and satisfaction; Ensured employees commitment; Attracting new/top talents	1; 8; 10; 11; 12
Innovation capabilities (H/SR)	Increased capability to innovate due to thinking in diverse dimensions	8; 9; 10; 11; 12; 14
Other value drivers		
License to operate (SR)	Maintaining license to operate; Social license to operate	1; 8; 9; 10; 11
Social & environmental responsibility (H/SR)	Contributing to long-term sustainable development; Increased individual satisfaction, morale and "doing right thing" feelings	8; 9; 13; 14

Many previous studies on corporate sustainability have focused on "does it pay to be green" and have identified individual causal links between corporate sustainability activities and economic performance of a company. However, the value capture of sustainable value creation activities is multidimensional and complex process, when a more systemic and dynamic approach is needed. An integrative approach that can systematize and structure all, not just individual, unidirectional links is required (Lankoski, 2008). The link between sustainable value creation activities and company financial performance is fully mediated relationship (Saeidi et al., 2015), for example, increased reputation and competitive advantage followed by higher customer satisfaction or employee satisfaction, innovativeness and efficiency gains are external and internal mediators in the relationship between sustainable value creation activities and captured economic value (Saeidi et al., 2015; Schreck, 2011). Mediators help explain why does it pay to be green or not and further, contingencies, i.e. moderators (e.g. the industry company is part of, company characteristics, such as large vs. small firms) help explain when does it pay to be green (Dixon-Fowler et al., 2013; Schreck, 2011). To understand how companies create sustainable value and can benefit from these activities, requires paying attention to interactions among multiple stakeholders as well as long-term outcomes (Ortiz-de-Mandojana and Bansal, 2016; Sulkowski et al., 2018). However, what is profitable for one company or benefits one stakeholder or increases value in one dimension of sustainability may not be profitable for another company or destroys value from another stakeholder´s perspective or in another dimension of sustainability (Lankoski, 2008; van Bommel, 2018; Yang et al., 2017). This raises the complexity even more. Therefore, we suggest a multicapital approach combined with system dynamics perspective (Abdelkafi and Täuscher, 2016) and triple bottom line and multi-stakeholder perspectives to assess sustainable value creation and value capture potential.

Key insights

As we discussed in previous chapter, within SBMs, the value is seen as multiple environmental, social and economic value forms, and value creation is considered from multi-stakeholder perspective and covered impacts on multiple vital capitals. Therefore, we propose that SBMs' value creation as well as value capture potential, assessed in multiple capitals, is higher compared to more traditional business models focusing on customer value and profit maximization.

We concretize and demonstrate the sustainable value creation and value capture potential of SBM through multicapital approach in a case study concerning Kekkilä Group's sustainability strategy work. Kekkilä has ambitious goal to move from market-driven company to the company that shapes the future by being a part of a larger food system and solving a global food challenge. It has set six sustainability initiatives aiming to address the challenges related to global food production and contribute sustainable development. We use one of those initiatives, *creating sustainable product portfolio and services* and it's three intended sustainability impacts (i.e. sustainable value propositions): *saved natural resources*, *improved well-being* and *more sustainable socio-ecological systems*, as an example. Figure 2 illustrates (at a high level) how this initiative aims to create sustainable value for multiple stakeholders, i.e. users, actors in network level and broader in society, and further, what motivates the company to create sustainable value, i.e. what is the value capture potential. The sustainable value creation potential is expressed as multiple value forms and capitals. Further, the sustainable value creation potential perceived by multiple stakeholders is translated into value capture potential by the company, which is expressed as direct and indirect effects and monetary and non-monetary value potentials.

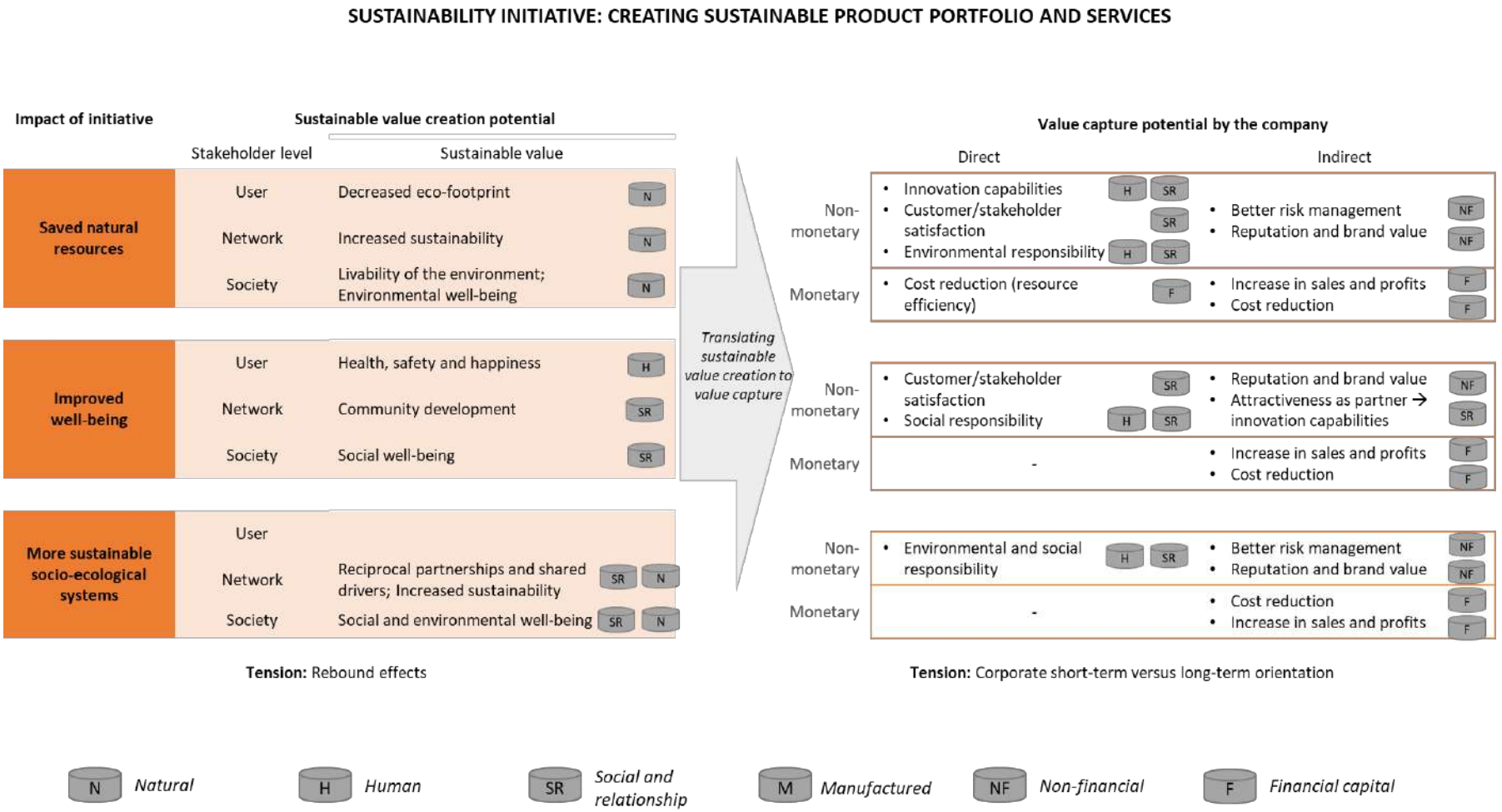

Figure 2. Multicapital perspective to sustainable value creation and value capture

For example, the initiative aims at *saving natural resources*. From stakeholders' perspective, this creates environmental value, such as decreased eco-footprint, increased sustainability, livability of the environment and environmental well-being, and increases or protects natural capital. From company's perspective, saved natural resources means increased eco-effectiveness, customer or stakeholder satisfaction and environmental responsibility. Eco-effectiveness is directly translated into financial capital through cost reduction, whereas increase in environmental responsibility and social and relationship and human capitals are not directly translated into financial capital. However, increase in environmental responsibility might lead to better risk management and further cost reduction or increase in brand value and further increase in sales and profit margin in the long run. Our analysis shows that other intended impacts, *improved well-being* and *more sustainable socio-ecological systems*, are not directly translated into financial capital, referring to that they both have the social welfare as the end objective (Lankoski and Smith, 2017). Profit can be as one of the end objectives, but solely not. However, improved well-being and more sustainable socio-ecological systems increase other forms of capitals that are possibly realized as financial capital indirectly, even if that is sometimes uncertain and is not just dependent on company's own actions. This may lead to temporal tension, i.e. trade-off between short-term and long-term sustainability orientation, and there is a risk to undervalue long-term outcomes (Hahn et al., 2015).

The approach presented in Figure 2 looks quite linear and static but revealing the full sustainable value creation and value capture potential demand more dynamic approach. Figure 3 adopts the idea of virtuous cycles in business models (Casadesus-Masanell and Ricart, 2011) that describe how the positive effects of implementing sustainability activity encourage to increase the sustainability efforts even more, i.e. generating positive feedback loops. Kekkilä's choice to create sustainable product portfolio and services have several potential consequences relating to sustainable value creation and further value capture potential. First, adopting the sustainable product portfolio and services lead to improvements in company's own processes relating to increased resource efficiency translated directly into cost reductions, and increased innovation capabilities translated into opportunities to decrease costs and/or increase revenues. Second, multiple stakeholders perceive new sustainable products and services as valuable allowing the company to capture value out of its value propositions. In this connection, we identified three types of virtuous cycles based on different motivations to create sustainable value.

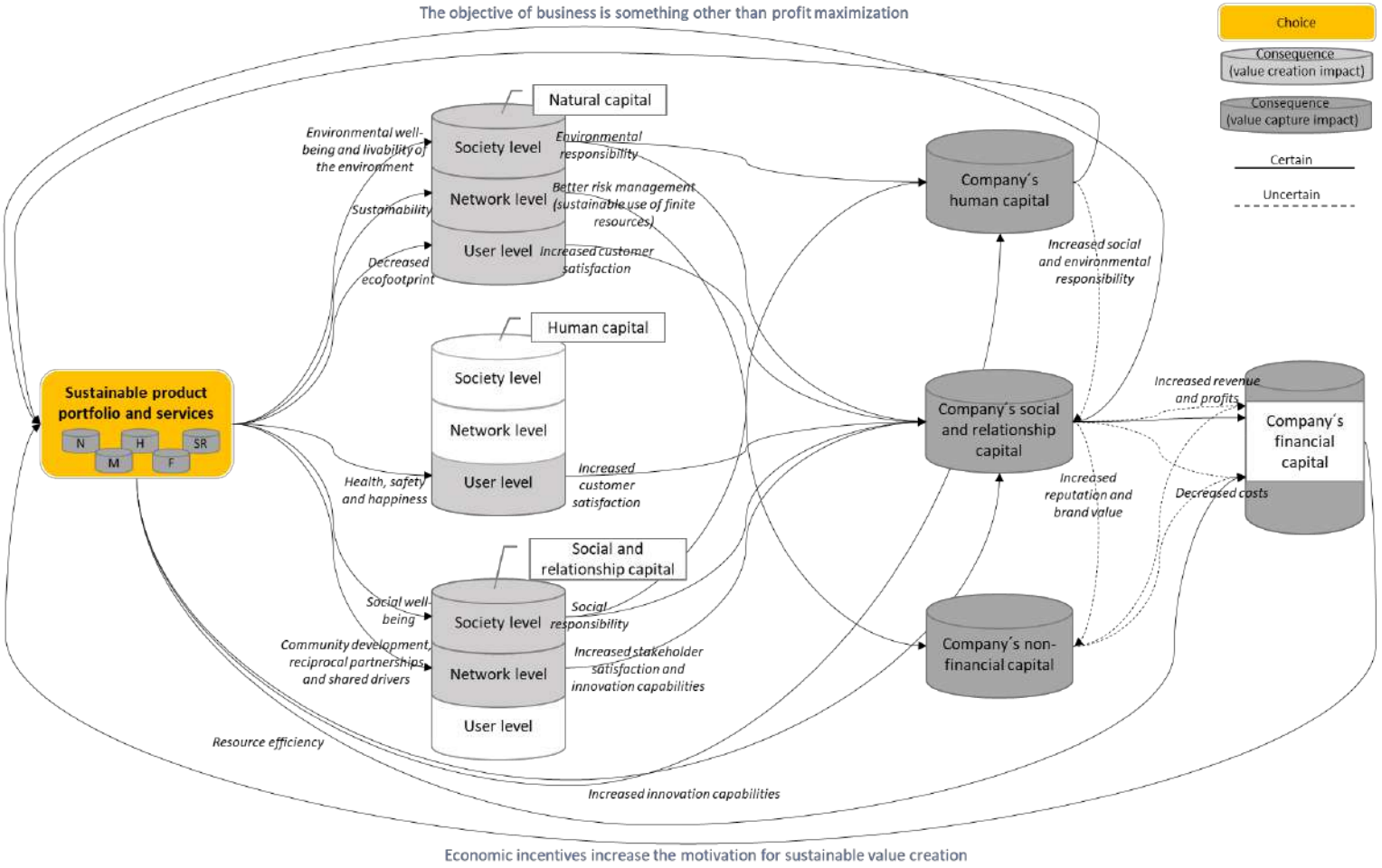

Figure 4. Potential virtuous cycles to sustainable value creation and value capture

For example, responding to customer/stakeholder demand by creating more sustainable product portfolio and expecting increased revenues for that, represent the first type, which focus on direct economic incentives and increases in company's financial capital. The second type covers sustainability activities derived by indirect economic incentives. For example, the use of peat, which is categorized as fossil resource in the EU ETS, is a central part of Kekkilä's business model. More sustainable use of peat lead to better risk management, which in turn may lead to financial gains and foster to develop even more sustainable product portfolio. Additionally, we found commitment to social and environmental responsibility as intrinsic value, not a preidentified path to cost reduction or increased revenue. For example, Kekkilä envisions empowering citizens, building communities and supporting community gardening to support food security.

Discussion and conclusions

This study has three main contributions. First, the study clarifies the concepts of value creation and value capture related to SBM by providing more detailed categorization of different value forms, i.e. the summary of sustainable value creation and value capture potential. Second, this study demonstrates the sustainable value creation and value capture potential of SBM through multicapital approach. It concretizes sustainable value creation, when potential impacts are indicated to certain capital. Therefore, their value form is easier to identify and further translate to value capture potential. In Kekkilä case, many of the impacts were somewhat abstract by nature and multicapital approach guided to consider the value creation potential from different perspectives. Third, the study adopts system dynamic perspective and the idea of virtuous cycles in business models to identify positive feedback loops between sustainable value creation and value capture that continuously strengthen the SBM development.

From theoretical perspective, this is an attempt to foster the development of unified definitions, and the approaches presented in this study provide premises for more detailed design and analysis of the sustainable value creation and capture potential of new SBMs. From managerial perspective, this study explains the value capture potential of sustainable value creation to foster the adoption of more SBMs. Tensions, trade-offs and conflicts in sustainable value creation represent the rule rather than the exception, hence turning a blind eye to value destruction perspective leads to a limited effort towards sustainable development (Hahn et al., 2015). Therefore, we propose that further research should integrate multicapital approach with the analysis of tensions more closely.

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Small but More Sustainable?

Business Case and Barriers Perceptions in SMEs and Large Firms

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Abstract

Sustainability is more and more becoming a critical success factor for firms; the shared value and business case for sustainability conceptions can support business model change or innovation towards sustainable business models (SBM). Small firms are the most spread organizational model worldwide and can play a relevant role in terms of economic and social development. The corporate social responsibility literature have often depicted small business as less engaged and more constrained with respect to environmental and social practices. This paper aims to translate the organizational size debate in the field of SBM, by analyzing small and large firms' perceptions about their drivers to business case and their implementation constraints towards a more sustainable business model.

Keywords

Sustainable business model, business case for sustainability, small business, barriers, drivers.

Introduction

Effective implementation of sustainability into firms' business models requires a strategic perspective (Baumgartner and Rauter, 2017), leading to a new vision on firms' mission, strategies and operations.

The literature has recently highlighted the need to think strategically about sustainability, in order to overcome the old ideas about corporate social responsibility (CSR) as moral obligation and external-driven initiative hardly incorporated in business processes (Frederick, 1994).

The shared value concept (Porter and Kramer, 2007 and 2011) has recognized a strategic role to the integration of societal progress into business aims: firms can gain competitive advantages from incorporating social needs in their strategies and business models, so that economic and social value can simultaneously be produced. To reach this purpose, a shift from a responsive CSR towards a strategic one is needed: firms can incorporate shared value by reconceiving products and markets, by redefining productivity in the value chain and by enabling local cluster development (Porter and Kramer, 2011).

Firms' strategic approach towards changes led by sustainability can be described with taxonomies already proposed for corporate social responsiveness models (Wilson, 1975; Carroll, 1979): the shift from reactive, defensive, accommodative and proactive posture indicates an increasing degree of integration of environmental and social issues into strategies and business.

The passage to higher degrees of integration could be facilitated by the recognition of the business case for sustainability (Schaltegger et al. 2012), which in turn is led by specific drivers in the mind of sustainable entrepreneurs (Jolink and Niesten, 2015): cost and cost reduction, risk and risk reduction, sales and profit margin, reputation and brand value, attractiveness as employer, innovative capabilities.

These drivers are in fact describing the potential positive impact of sustainability implementation on the financial model pillar of the business model (Ballon, 2007) or on other measures of firm success that can be considered as mediators of financial performance (Cantele and Zardini, 2018). The business model is the link between strategies and operational activities (Rauter et al. 2017) and embedding sustainability inside it means rethinking business model components (Osterwalder, 2004) to reach a sustainable business model (SBM) (Stubbs and Cocklin, 2008, Boons and Ludeke-Freund, 2013, Bocken et al. 2014) or a business model for sustainability (BMfS) (Schaltegger et al. 2016).

The recent and quickly developing literature on SBM and BMfS is multifaceted, having deepened different aspects of the topic: theoretical classification of

archetypes (Bocken et al. 2014) and patterns (Ludeke-Freund et al. 2018), new tools and frameworks to represent the business models and the value creation (Bocken et al. 2013, 2015, Joyce and Paquin, 2016), and a lot of case studies in different industries and contexts (Dentchev et al. 2018). Further studies have also added insights on internal and external drivers of SBM (Rauter et al. 2017) and on barriers or hindering factors (Engert et al. 2016; Laukkanen and Patala, 2014).

Among organizational factors and potential drivers and barriers (Cantele and Zardini*, forthcoming*), the size of the firm has not been studied in deep among SBM literature, exept for a few cases (e.g. Collins et al. 2007 and Wells, 2016); few studies have analyzed the peculiarities of SMEs in terms of sustainability management or innovation, mainly in light of knowledge-based or resource-based approaches (Bos-Brouwers, 2010; Halme and Korpela, 2014; Hörisch et al. 2015, Klewitz and Hansen, 2014), while more contributions can be found in a more "traditional" stream of literature dedicated to corporate social responsibility in SMEs, where these firms are depicted as constrained by a list of limitations and barriers (Vázquez-Carrasco & López-Pérez, 2013): lack of time, resources, appropriate information and support services (El Baz et al. 2016, Jamali et al. 2009, Roberts et al. 2006) or difficulties in measuring the benefits and maintaining the momentum of activities (Jenkins, 2006) or in establishing the business case (Battisti and Perry 2011, Lee, Herold and Yu 2015).

Research design and method

Taking for granted the relevance of SMEs in terms of economic, social and environmental impacts worldwide, this paper aims to contribute to a renovated debate on size differences in the more recent context of SBM literature. In particular it aims to answer to the following research questions:

What barriers and drivers do SMEs perceive in the implementation of their sustainable business models?

What SMEs think about large firm's approach towards sustainability and viceversa?

The research has been conducted with a qualitative methodology, by analyzing data from interviews, reports and other internal documents collected in 30 Italian firms of different size (13 small, 6 medium and 11 large firms). The semi-structured interviews were made with key-informants in the firms, mainly the president, CEO

or higher management staff, and followed an interview guide including open questions about their vision of sustainability and firm purposes, together with more precise requirements in terms of management practices, business models, benefits and constraints experienced in sustainability implementation. The firms were selected as known for their social and environmental commitment; the analysis followed an inductive coding process informed by the aims of the research (Creswell, 2003; Miles, Huberman, and Saldaña, 2014).

Key insights and implications

The analysis of the interviews highlighted that small entrepreneurs have a clear perception of the business case for sustainability; among the benefits described, most were referred to the possibility to gain competitive advantage through differentiation policies enabled by sustainability practices and products; also customer satisfaction, a more effective management, employees' commitment and product innovation were cited. Despite this clear recognition, about all entrepreneurs assert that benefits can only be acquired in the long run, and that they are difficult to measure. The long-term perspective is also cited in terms of time span for firm's aims: implementing sustainability cannot be associated with a short-term perspective; but even if entrepreneurs assert to be driven by their innate values ("sustainability is in the DNA"), they all have in mind the economic driver as essential. Explicit economic benefits are identified by some entrepreneurs in terms of consumption and cost reduction and increase of sales by product innovation. But in most cases sustainability is perceived as leading extra-costs, that are not always covered by a sufficient market acknowledgement.

Large firms' interviews show the relevance of external pressures from customers, community and other stakeholders, while internal factors, and in particular the entrepreneur's approach towards sustainability, appear the most influential for SMEs.

Large firms also assert the pivotal role of reputation as driver of sustainability practices, while a strategic approach towards differentiation is less felt than it is in SMEs.

Among barriers and hindering factors some entrepreneurs also cited the lack of public administration support or the bureaucratic burden of some certifications or other sustainability tools; but none of these factors (neither the costs, nor the bureaucracy and the difficult market recognition) appears as a decisive obstacle.

The main focus of most entrepreneurs (both small and large) is on business culture, which is perceived as the key factor which, if present, could lead to overcome potential barriers; by contrast, when sustainability is not embedded in entrepreneur's culture, the potential barriers become effective.

When asked to describe the perceived differences between SMEs and large firms, most interviewees assert that sustainability implementation could be easier for SMEs due to their rapid decision process; resources limitation cited by most of the literature, in the interviews appears mainly referred to organizational structure (only one or few people to preside over each function) and employees competencies, rather than to financial constraints; only large see small firms as financial constrained, while among small entrepreneurs the perception is that "it can be done with what one's got". The other difference revealed by small entrepreneurs' interviews (but not explicitly acknowledged by large firms' interviewees) is the perception of large firms as obliged to be responsive, and most of time without a genuine embeddedness of sustainability into business models, which lead to greenwashing or façade initiatives.

This synthetic analysis of first insights has highlighted that differently from what often indicated by the CSR literature, small business are not necessarily unaware of the economic driver of sustainability, but conversely do believe it can lead to organizational success, even if in a long-term perspective. Further, their initiatives sometimes appear more embedded than those of large firms in their business models: even though some limitations are perceived, these are not determining factors against implementation, while this risk could be higher for large firms constrained by their less flexible and more "traditional" business models, which often lead to façade and short-term initiatives, rather than to radical innovation towards sustainability.

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Social and psychological product value perceptions

An exploratory study

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Extended abstract

The distributed value is perceived by the customer as the difference between the total value and the total cost of the product (good, service, idea, information, experience), also corresponding to the perceived value of use of the product, which includes experiences, sensations and mental states. Note that the total cost to the customer comprises all types of costs, financial (price, ability to pay, opportunity cost) and non-financial costs (physical, psychological and social aspects related to the use of the product, such as accessibility, embarrassment, usability, etc.), in which he expects to incur to evaluate, obtain and use the product.

The tetrad-value theory (Carvalho & Sousa, 2015, 2018) enhance the traditional approach of the Triple Bottom Line (Elkington, 1997) and includes economic, social, ecological and psychological values.

The economic value exists in all type of product, being the basis for its existence in the market. For the organization, this type of value consists of revenue and profit, which may not only be of a financial nature. For example, for an organization with social purposes, non-financial profit goes through the effective fulfillment of its specific mission. The economic value for the customer has to do

with the satisfaction of their need through the product acquired. There may also be economic value for society, through job creation and wealth growth, as well as economic externalities, which are shared by various stakeholders.

Social value may or may not exist in a product. It is closely linked to other types of values, manifesting itself in better processes of socialization, increased social inclusion, equal opportunities, increased health and/or safety in the community, or by increasing the quality of life of the society. Thus, this type of value is more common in social products linked to the activity of the third sector, although it also exists in many for-profit financial products. Thus, when the product has social value, then it will have an added value for the customers.

Other important value is ecological, which is related to the environment, sustainability and protection of the planet. The concern with this type of value has become general, since our quality of life depends on how we produce the products and consume them, avoiding as much as possible a negative ecological footprint for life on the planet. Not all products have an ecological value, but it is an important asset when it is created.

The fourth value - psychological or transformational value - is often confused with social value, probably because it has a special impact on it, being integrated into that type of value in all models so far. It should also be noted that Schumpeter (1909) said that the founders of the subjective concept of value (Jevons, Walras, Menger) never spoke of social, but only of individual value, because we only can measure product utility (value of use) individually. When a product promotes a change in attitude and behaviors (e.g., additive behaviors, healthier or ecological lifestyle, awareness of various types of discrimination, change of mentality, openness to new ideas, more knowledge or new acquired competences, self-realization, sense of self-efficacy), then we are faced with an intrinsic psychological value to that person, and that may or may not have a social impact.

On the basis of this theory, we develop a study to assess the perception of value in relation to the main groups of products. We used a questionnaire with a table where the respondents mark the types of value they considered to exist in each type of product. These groups follow the Portuguese distribution of goods and services (National Classification of Goods and Services – National Institute of Statistics), and we choose 20 types of products, being some of them made explicit: (1) food products, (2) tobacco, (3) clothing and footwear, (4) social reintegration services for ex-prisoners, (5) housing, (6) household appliances, (7) antibiotics, (8)

anti-depressants and anxiolytics, (9) public transports, (10 mobile phone, (11) internet, (12) amusement park, (13) libraries and museums, (14) hotels, (15) schools, (16) cosmetic products, (17) foster care service for children at risk, (18) domiciliary support services for elderly, (19) disability support services, and (20) social cantina.

They were used the following definitions to help the participants to assess the products:

As economic value: "*The ability of the product (good, service, idea, information, experience) to meet the human needs of the consumer for which it was designed, as well as to create financial or non-financial income for its producer or supplier*."

As ecological value: "*The ability of the product to contribute to the preservation of natural capital (environment, planet or biodiversity*)".

As social value: "*The ability of the product to have a positive impact on the community (social welfare, nutrition, shelter, health, social equity or quality of life*".

As psychological value: "*The ability of the product to influence or transform the lives, mentalities, knowledge, skills or behaviors of some consumers*".

We have used a sample of 194 persons (52% female; aged between 18 and 54 years old) to do this first exploratory research.

The results show that different types of products are perceived to present different types of values depending on the subjective evaluation of the respondents as expected. It was clear that there are products with more impact on social level and other on psychological level with statistically significant differences. This exploratory study confirms that people are mainly concerned with the product value for themselves, based essentially in their own interest, showing that social value is not their fundamental criteria. Thus, scholars' generalization about the way people assess product's value, considering that the personal impact is a social issue, should be rethought at the light of tetrad-value theory. This approach presents a new taxonomy to classify the types of product value perceived by consumers based on four main pillars: economic, ecological, social and psychological. There are in the literature other taxonomies that somehow consider psychological aspects, such as emotions, affective, personal

and holistic aspects (e.g., Babin, Darden, & Griffin, 1994; Hirschman & Holbrook, 1982; Holbrook, 1994; Sheth, Newman, & Gross, 1991; Zeithaml, 1988). However, our approach considers that psychological value is related to the impacts on people's life, transforming their behaviors in particular. Thus, our theoretical and practical contribution is related to the importance of considering psychological aspects as we have defined in products' marketing processes (creation, distribution and communication), as well as in the creation of new sustainable business models.

Keywords

Tetrad-value theory, perception of value, psychological value, social value, distributed value.

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Sustainable Business Model Innovation and Acceptance of its Practices Among Spanish Entrepreneurs

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Abstract

Sustainable business model innovation debate is mostly focusing on the use of certain practices and tools to implement sustainable objectives in new firms. Our paper contributes to this debate examining the factors influencing the entrepreneur's election of the practices to develop sustainable business model innovation (SBMI). We conducted an empirical analysis on a population of Spanish entrepreneurs (N=234) and applied a sound behavioral framework and the PLS-SEM algorithms to factor out those elements. Based on this analysis, we argue that Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Hedonic Motivation, Habit, Costs, Speed, Funding, Security and Behavioral Intention might affect the entrepreneurial acceptance of the practices leading to SBMI. We also argue that knowing about these factors benefit incubators, mentors and agencies balance them into their support to sustainable business development. Our analyses open a novel research line by studying those factors influencing entrepreneurial use of sustainable innovation practices and facilitating future development of full-scale models explaining this usage.

Keywords

eco-innovation, triple bottom line, factors, acceptance, sustainable business model, PLS-SEM

Introduction

New business modelling, or innovation of business models, is being a fruitful field for research (Wirtz, Göttel, & Daiser, 2016). However, scholarly studies on practices for business modelling are not that common (He, Miao, Wong, & Lee, 2017). And to the best of our knowledge, research on the motivations and factors driving the acceptance of those business modelling practices by eco-entrepreneurs is in its very early infancy (Exhibit 1 shows a summary of our approach to this research topic, as will be further explained below). To fill this gap, we firstly acknowledge the dynamic perspective of the development of business models (Cavalcante et al., 2011). Additionally, this perspective also argues the need for innovation of business models is recognized and acted upon by individuals (and maybe after a critical mass or success, by collectivities). Authors like Cavalcante and colleagues (2011: 1329) advocate for these individuals' cognition, motivation and actions as the behavioral triggers of the dynamic venturing process (usually laid out as the pursuit of a vague idea or vision), and the methodologies and practices (even the mindsets) entrepreneurs, innovators and early employees use seem consequences of those triggers

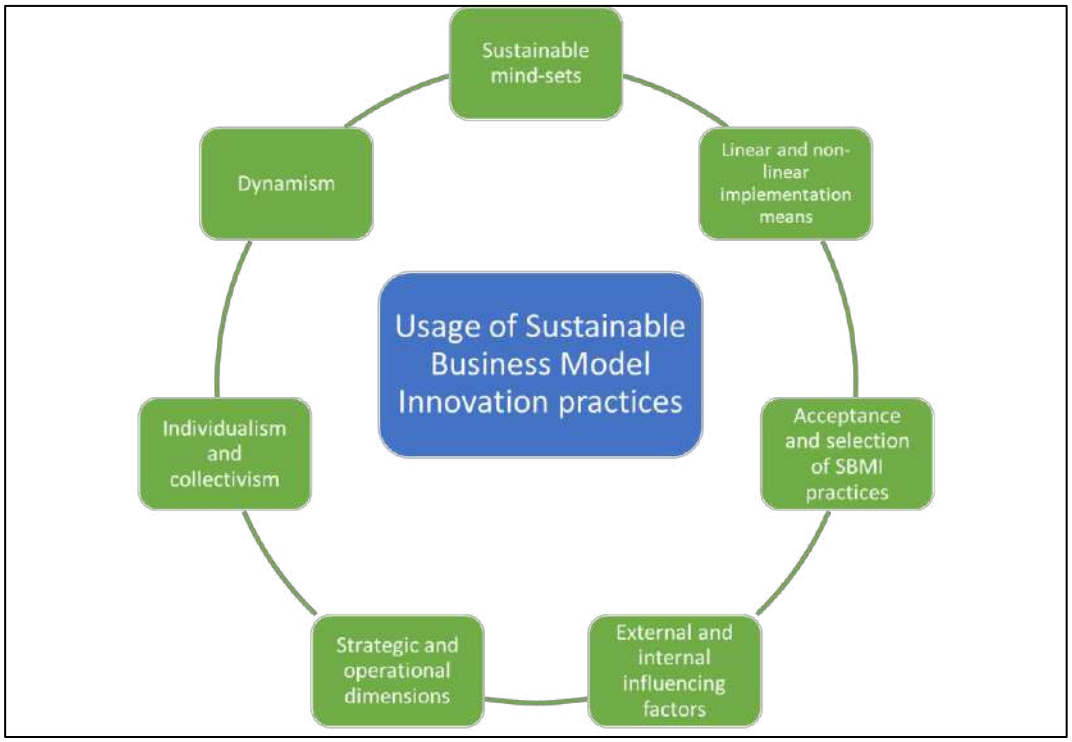

Exhibit 1. Summary of concepts included in our research on usage of SBMI practices.

Out of the different entrepreneurial mindsets, the one advocating for more sustainable and environmentally-friendly business models is relevant for a broadening base of researchers. As a research line, these mindset studies have recently started and mostly concentrate on external factors (Hussain, Rigoni, & Cavezzali, 2018; Pipatprapa, Huang, & Huang, 2017) which configure the current definition of eco-innovation. But already there have been calls (Song & Yu 2018: 136) for research on internal (organizational and individual) factors that explore how individual abilities help connect business model eco-innovation strategy with successful eco-innovation (Kiefer, del Río, & Carrillo-Hermosilla, 2018). Thus, secondly, this paper complements main-stream studies on external collective factors, investigating their balance with the business model internal collective and individual factors, and how they play a role in the selection of practices for successful eco-innovation.

Thirdly, from an implementation and operations perspective, sustainable business model innovation (SBMI)[26] strategy and the dimensions of its implementation (Kiefer, Carrillo-Hermosilla, Del Río, & Callealta, 2017) seem crucial for established and new firms in terms of survival, outperforming the competition or aiming at effects lasting longer than product or process innovations (Wirtz et al., 2016). One would think that given this relevance, SBMI implementation theoretical means would be many. But research and practice might be pointing to believe that alternatives to roll out any SBMI strategy into practice seem to follow either a linear sequence (Boons & Lüdeke-Freund, 2013) or a non-linear development (Steve Blank, 2013; York, Jonathan L; Danes, 2014). And this polarization is giving way to a rising debate among scholars which is being enriched by its different perspectives (see for example, Hansen, Wicki, & Schaltegger, 2018; Kiefer, Carrillo-Hermosilla, & del Río, 2018; Lüdeke-Freund, Carroux, Joyce, Massa, & Breuer, 2018; Tiemann, Breuer, Fichter, & Lüdeke Freund, 2018). The debate currently concentrates on the practices and tools for SBMI development or implementation. But we ask, how entrepreneurs decide between a linear or a non-linear SBMI process? And which factors affect this entrepreneurs' selection of design and implementation practices to use for SBMI? Our answers to these research questions aim to shed light on one of the potential causes of the success of a sustainable new business model (SBM): the reasons why entrepreneurs choose certain practices for SBMI development before others. We theorize these motives (internal and external) drive the selection and use of SBMI practices, and this

[26] Carrillo-Hermosilla and colleagues (2010) listed many definitions of the term eco-innovation. In this paper, we take on that definition that focuses in the eco-innovation of business models, rather than products or services, in what other authors call sustainable business model innovation (see (Geissdoerfer, Vladimirova, & Evans, 2018: 406)

usage might lead to overperformance and success of new SBMs. Also, different key stakeholders involved in the development of SBMI (mentors, government agencies, incubators or investors) might use our answers to better tailor their support programs, balancing those factors and causes.

Such analyses of the underlying factors motivating the usage of one method or practice are not rare in business research (Venkatesh, et al., 2003; Venkatesh, et al., 2012; Lima & Baudier, 2017). They not only consider external and collective factors, but also internal and individual variables. Along this line, Venkatesh and colleagues (2003) introduced the Unified Theory of Acceptance and Use of Technology (UTAUT) scales explaining a user's behavior from her intention to use a technology, tool, or practice by putting up a summarized model of psychological and sociological theories (Venkatesh et al., 2003: 427-437). Like the original UTAUT, the rationale behind our framework is: a SBMI practice, together with other internal and external factors, generate a cognitive and emotional reaction in the entrepreneur that results in the actual use of that method or practice, in an endless, self-reinforcing cycle (Venkatesh et al., 2003: 427). Using UTAUT scales, we aim to answer our research questions building eleven factors[27] (endogenous constructs) affecting the entrepreneur's use of different practices or methods to innovate business models to achieve economic, social and environmental goals. Complementarily, we order these factors according to the strength of their relationship with their determinants. Finally, our research helps to identify which stakeholders seem relevant and influence that entrepreneurial behavior.

To accomplish our aims, we have performed factor analyses using the PLS-SEM algorithms on a sample (N=234) of experienced Spanish entrepreneurs. We have opened a novel way of analyzing the ecological, social and economic effects when eco-innovating business models, that not only considers reflective but also formative relationships among behavioral and non-behavioral latent constructs and their exogenous predictors. We have explored not only static factors (e.g. performance, cost, security) but also others that could reflect the dynamism of SBMI (e.g. hedonic motivation, speed, social influence).

The rest of this summary paper is organized in a literature review, describing the main SBMI literature as well as a revision of the constructs we have identified

[27] The eleven constructs are: Intention to use, performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price/cost and habit (Venkatesh et al., 2012: 158) and speed, funding and security.

affecting the usage of SBMI practices. Thirdly, we conclude with a brief discussion on our findings, their implications and limitations.

Literature background

Methods to eco-innovate business models

Although the literature on SBMI is vividly expanding, there is a certain divergence of conceptualizations and lack of commonalities in its many references. For purposes of this paper, we have reviewed the extant literature on SBMI technologies, practices and methods, and extracted the conceptual implications that helped us identify the behavioral and external constructs of an entrepreneur's acceptance of practices and methods to define and implement ventures aiming at triple bottom line goals. In this paper, we interchangeably use eco-innovation and sustainable innovation (Boons & Lüdeke-Freund, 2013: 11).

We agree with Carrillo-Hermosilla and colleagues (2010) that eco-innovation aims to "reduce the environmental impact caused by consumption and production activities". But we also argue that this specific goal should extend beyond technical and process innovation to include the development of new SBMs which, for instance, is identified as a basis to "diffuse large scaled environmental technology systems" (Kanda, Sakao, & Hjelm, 2016).[28] It is on this SMB eco-innovation concept that we concentrate on in this paper. Not only due to its potential to expand the traditional economic performance criteria to include environmental and social metrics (OECD, 2012; Boons et al., 2013; Bergset & Fichter, 2015: 124), but more importantly, because it can consider the dynamic relationships between business, society and nature (Marcus et al. (2010).

Despite differences on the purposes driving entrepreneurs (Bergset & Fichter, 2015), sustainable entrepreneurs' main concern seems precisely the successful performance (along the triple bottom line: Stubbs & Cocklin, 2008) and competitiveness of their SBMs. SBMs performance and competitiveness is then measured by the value they provide to conventional stakeholders (shareholders, customers), but also to the environment (internal and external to the business model), and society (internal and external individuals and groups to the firm's organization) (Bocken et al, 2013). More specifically, a SBM's performance and competitiveness could depend over time on specific salient stakeholders and lead

[28] For Kanda and colleagues (2016) these new SBMs should include six non-technical components (market, finance, resources, activities, partnership and ownership) which complement the technical elements for sustainable development

users, that we denominate as valueholders (Peralta, Carrillo-Hermosilla, & Crecente, 2018).

In the context of the broader SBMI concept, there also seem to be a clear sustainability vision: when companies and start-up firms build business models 'for' (voluntary), or 'of' (as a reaction to regulations) sustainability, they also integrate in them the effects of the society and/or the natural environment. They reinforce their regular innovation activities aiming at improved economics (Schaltegger, Lüdeke-Freund & Hansen, 2012).

But it is in the how that concern and vision get implemented where things apparently get confusing. The two methodologies or sets of practices mostly used by entrepreneurs to implement new SBMs, namely the New Product Development(NPD process) and Lean Startup (LS) (see Table 1), are well described in their respective stages, challenges, activities and tools (Steve Blank & Dorf, 2012; Geissdoerfer, Savaget, & Evans, 2017). But beyond certain commonalities, like experimentation and learning from experience (Wirtz et al., 2016: 15), confusion builds up when they refer to, for example, learning from mistakes, failures and tests (Wirtz et al., 2016)[29].

The *product development process* (Steve Blank, 2009)
With this term Blank referred to the traditional, stage-gate, incremental way of executing a SBMI strategy (called also new product development, NPD: York, Jonathan L; Danes, 2014)). In this case, the activities (technologies: Harms, Marinakis, & Walsh, 2015: 5) aiming at developing new business models for sustainable value traditionally follow a process similar to this: Idea, concept design, development, launch, post-sale. Sustainable new ventures following this NPD process commonly depart from the enhancement of the existing value propositions, and/or the efforts aimed at complementing the existing value propositions with new ideas (Carrillo-Hermosilla, Del Río and Könnölä, 2010; Geissdoerfer and Jan Hultink, 2016). Those activities and technologies have been mapped, for example, by Geissdoerfer et al. (2016) in a series of phases combining into a comprehensive process named the

[29] Most probably, this confusion has made the literature on how to develop a SBM concentrate on stating the elements (inter-organizational networks, societal systems, stakeholders, value proposition, supply chain, customer interface, tools or financial models: Boons & Lüdeke-Freund, 2013: 13, Stubbs & Cocklin, 2008) needed for designing and implementing SBMs. Few authors describe the methods and practices (Geissdoerfer et al., 2017; Henriksen et al., 2012; Tiemann et al., 2018) that entrepreneurs can use to overcome the 'design-implementation gap' (Geissdoerfer, et al., 2017) and accomplish their SBM business goals. In this paper we reference the New Product Development (NPD) or conventional stage-gate process and the Lean Startup (Steve Blank, 2013; Eisenmann et al., 2011) as theoretical methods or practices suitable for SBMI and to bridge the design-implementation gap (Weissbrod & Bocken, 2016). See Table 1.

Cambridge Business Model Innovation Process. Commonly, this NPD process uses methods and technologies associated to the Business Plan or any of its sub-plans: Marketing, Financial, Operations, and to ideation tools like Design Thinking.
Lean startup (LS) or Lean Innovation
LS is seldom considered a SBMI methodology although since its inception (Ries, 2011) it integrated new business modelling with the consideration of all stakeholders to develop sustainable, growing business models (Eisenmann, Ries, & Dillard, 2011). Considering it as a business model eco-innovation method (Peralta et al., 2018), it combines Blank's (2006) customer development process, agile software experimentation (Dybå and Dingsøyr, 2008, Brown, 2008), and business model design (Osterwalder, 2004). LS approaches the creation of business models considering all the relevant stakeholders since the inception of the idea, and not as one of the final steps of the development of that business idea, when the idea is rounded up in a value proposition and ready to be launched (marketed or commercialized).
Using neither the NPD, nor LS processes
Although not specifically described anywhere to the best of our knowledge, many entrepreneurs, due to lack of knowledge, tools, time or out of a need for simplification, prefer to "fly without instruments", as one of our expert entrepreneurs put it. Most of the 'agnostic' entrepreneurs usually depart from any form of basic business planning, to then falling into frequent rounds of experiments, similar to those proposed by LS.

Table 1. SBMI practices as methodologies available in the literature on eco-innovation.

Our overall research context is then one of individuals and firms looking for practices and methodologies to develop and implement sustainable strategies (Song & Yu, 2018). In this context, environmental and social factors inhibit or support economic performance of firms and startups, probably in dynamic cycles, and externally and internally affect their structures, development, and their sustainable strategies. Research on those factors address the organizational capabilities for eco-innovation (Kiefer et al., 2018) and their relationship with competitive advantages or financial performance (Song & Yu, 2018: 136) or with the tools needed to cope with those factors (Tiemann et al., 2018). Ours is a paper willing to satisfy a growing demand for research beyond these organizational capabilities focusing on individual skills, abilities and traits. We contribute to clarify how entrepreneurs can successfully develop competitive SBMs (Stubbs & Cocklin, 2008) from the factors that affect the entrepreneur´s individual behavior.

The design and implementation of SBMs by eco-entrepreneurs are guided by their acceptance of those SBMI tools, practices and complex methods, similarly to what Lima & Baudier (2017) described. This behavioral approach to design and implementing an innovative SBM analyzes the individual traits influencing that acceptance. In this paper, we study these individual traits and factors, as they did, using the Unified Theory of Acceptance and Use of Technology (UTAUT: Venkatesh et al., 2003).

UTAUT in the context of business model eco-innovation practices

The UTAUT and UTAUT2 models are two widely accepted syntheses of information technology (computer technology) acceptance for users and consumers (Venkatesh et al., 2012). We have selected this framework as it has been developed out of a review and synthesis of eight prominent models explaining the users' acceptance of technology[30] and given its stronger explanatory power. Originally, these two models addressed the theoretical relationship between technology use[31] and the mechanisms that drive this use (what the authors called 'behavioral intention'). The UTAUT model, focusing on technology users, referenced "four key constructs (i.e., performance expectancy, effort expectancy, social influence, and facilitating conditions) that influence behavioral intention to use a technology and/or technology use" (Venkatesh et al., 2012: 159). UTAUT2, a later development (Venkatesh et al., 2012), focused on technology consumers and included in the model a set of three new constructs (i.e., hedonic motivation, costs/price, and habit: Venkatesh et al., 2012: 160). This adaptation was needed to address the specific context of consumer technology use.

To extend the validity of these models, as well as expanding them to other expressions of technology (beyond IT), Venkatesh and his colleagues demanded "careful theoretical consideration to the context being studied" to advance and complement with new constructs the "scope and generalizability of UTAUT"

[30] The UTAUT framework outperforms the earlier theoretical models with an adjusted R2 of 69 percent, exceeding the adjusted R2 (40 percent) of the list of earlier prominent theoretical models that UTAUT is based on (see Venkatesh et al., 2003:Table 1 for the list of models included)

[31] Technology is here understood in the classical concept of "the application of scientific knowledge to the practical aims of human life or, as it is sometimes phrased, to the change and manipulation of the human environment." (Enciclopaedia Britannica, November 2018). Alternatively: "1a. the practical application of knowledge especially in a particular area; 1b: a capability given by the practical application of knowledge; 2.: a manner of accomplishing a task especially using technical processes, methods, or knowledge; 3.: the specialized aspects of a particular field of endeavor" (Merrian Webster, November 2018). Consequently, although 'technology' is often regarded as apps or hardware, it is also including practices, methods, skills, or knowledge, used to accomplish any objective.

(Venkatesh et al., 2012: 160). More specifically, Venkatesh et al., 2012: 158) demanded (1) identifying new constructs and (2) altering the original relationships in UTAUT[32].

UTAUT-SBMI

Following (see also Exhibit 2) is a review of how the original UTAUT concepts are addressed in the context of SBMI for entrepreneurial initiatives.

Behavioral intention (BI) and Usage (US)

Following the original contribution of the UTAUT model in terms of the relationship between an individual's intention to use a method or technology and the dependent final usage (Venkatesh et al., 2003: 427), our contribution is to explain how a founder's intention to use a particular method (practice or technology) to develop a SBM drives her actual use of that method.

The methodological options to use for developing new sustainable ventures that we have considered in our research are NPD, LS and 'neither NPD nor LS' (see Table 1).

Performance expectancy (PE)

"Performance expectancy (PE) is defined as the degree to which an individual believes that using the system will help him or her to attain gains in job performance" (Venkatesh et al., 2003: 447). In our context, the five constructs summarized under performance expectancy in the original UTAUT ((ibid: 447): perceived usefulness (triple bottom line goals), extrinsic motivation (e.g., building business models 'for' or 'of' sustainability) , job-fit (e.g. individual-skills based jobs), relative advantage (e.g., improved economics thanks to reduced environmental and social costs), and outcome expectations (e.g., "reduce the environmental impact caused by consumption and production activities") are referring to the entrepreneur's expectations to successfully eco-innovate a business model.

[32] Venkatesh and colleagues included a third requirement ("introducing new relationships") to extend the validity of the original model into other fields. This paper is an introduction of the factors intervening in the next UTAUT-SBMI, and we concentrate on the first two requirements which specifically relate to them. A later paper will also address the third requirement to describe and validate the acceptance of SBMI practices full-scale model.

Effort expectancy (EE)

"Effort expectancy is defined as the degree of ease associated with the use of the system" (Venkatesh et al., 2003: 450). This construct is formed of three determinants: "perceived ease of use, complexity, and ease of use" (ibid: 450). In the context of SBMI, SBMI processes and practices help clarify a complex and often ambiguous design-implementation gap (Geissdoerfer, Savaget, & Evans, 2016). We theorize that their improved view of that gap may be one of the reasons behind their acceptance by eco-entrepreneurs.

The Effort Expectancy construct captures then the feeling and experience of seasoned entrepreneurs about SBMI complexity, for both linear and multilinear methods. The NPD process adopts a linear design and implementation based on its causal and managerial approach (Makridakis, Hogarth, & Gaba, 2010; Sarasvathy, 2001). Problems may arise if the cumulative knowledge gained during its initial phases does not fit with the market or with the valueholders that should eventually support the SBM growth. LS multilinear implementation combines causality with effectuality (Frederiksen & Brem, 2017; Sarasvathy, 2001), and its implementation is cyclical and adaptive, with continuous pivots, iterations and development of ephemeral support business models: Bajwa, Wang, Nguyen Duc, & Abrahamsson, 2017; McGrath, 2010) as the new business model integrates the needs and support of valueholders, which seldomly is a linear, straight process.

Social influence (SI)

"Social influence is defined as the degree to which an individual perceives that important others believe he or she should use the new system" (Venkatesh et al., 2003: 451). In this case, the three constructs representing Social Influence in UTAUT are "subjective norm, social factors, and image" (ibid: 451). Given the sustainable entrepreneurial context of our research, we have included those constructs as part of the selection criteria we have used to identify a list of nineteen stakeholder groups, with potential to influence the entrepreneur's behavior. To make up this list, we have integrated the work of Steve Blank and Dorf (2012), Hart and Sharma (2004), Peralta and colleagues (2018) and Von Hippel (1986), together with other grey sources and the experience of the authors.

From a SBMI perspective, this Social Influence construct seems to reflect more intensely than the rest of our factors the dynamism of sustainable entrepreneurism. More specifically, stakeholders, and the influence they have over a new venture, are dynamic and temporal. And the valueholder concept captures that dynamism and erratic, sometimes unforeseen, influence on the

performance and growth of SBMs. Out of our stakeholders list and considering the static and geographically local nature of our current research, SI can shed some light on the conceptual work of Steve Blank & Dorf (2012), Hart & Sharma (2004), Mitchell, Wood, & Agle (1997) and Von Hippel (1986), detecting who the significant stakeholders (valueholders) are, if any, for our sample of entrepreneurs.

Facilitating conditions (FC)

"Facilitating conditions are defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system" (Venkatesh et al., 2003: 453). Three determinants build facilitating conditions: "perceived behavioral control, facilitating conditions, and compatibility" (ibid: 453).

Hedonic motivation (HM)

"Hedonic motivation is defined as the fun or pleasure derived from using a technology" (Venkatesh et al., 2012: 161). This construct relates to the "perceived enjoyment" of the entrepreneur in using a method or technology to ease her development of a new sustainable venture. And complements the earlier (extrinsic) constructs from motivation theory as it is an intrinsic construct.

Costs/price (CO)

Following the concerns expressed by Venkatesh and colleagues (2012: 161), entrepreneurs, particularly those included in our research, bear the cost and economic burden of the SBMI process, whether because they are the first investors or because they need to seek for the initial funds to start the process (Karadag, 2015). This search for funds along the stages of development of the new business model is to become a constant, as the new venture develops its sustainable business model(s) (Blank, 2014). And this driver certainly affects the individual's intention and behavior of the method to use. The theoretical constructs affecting costs are the pricing of the applications to effectively use each method or tool, the costs associated to collaboration of the founding team using the same SBMI method and the costs associated to fulfilling the requirements of each method's stages.

Habit (HT)

"Habit is viewed as prior behavior; and second, habit is measured as the extent to which an individual believes the behavior to be automatic" (Venkatesh et al., 2012: 161). To this extent, prior experiences are a predictor of habit as they form beliefs

and influence behavior. In our context, habit is also a perceptual construct, intrinsic to the individual.

New constructs in UTAUT-SBMI

By (1) adding new constructs, and (2) altering the original relationships in UTAUT Venkatesh and his colleagues extended their original model into UTAUT2 (Venkatesh et al., 2012: 158). Similarly, we have tailored further the UTAUT and UTAUT2 framework to our population of users (i.e. experienced entrepreneurs). We have expanded those constructs (1) identifying three new key conceptual constructs (speed, funding and security), and (2) altered some of the original relationships, hypothesizing new influences between the constructs and their determinants, in line with our sustainable context.

Speed (SP) [33]

Speed is defined as "fast, fearless decision-making, cycle time, speed and tempo" (Steve Blank & Dorf, 2012). This new construct into the UTAUT model does not captures extrinsic determinants (market velocity, technology changes, regulations updates) as they might be better addressed by other constructs (FC and SI). It is best described as a collection of intrinsic predictors: adaptation and improvisation (together with execution) (Duxbury, 2014: 22), commitment ("passion and drive": Jain, 2011; Sai Manohar & Pandit, 2013), tempo (Blank & Dorf, 2012) and timely knowledge creation for decision making (Nonaka, Toyama and Konno, 2000: 14). This construct might help to cope with situations of no-references, time-scarcity, and complex developments, where multiple and simoultaneous paths require different degrees of attention. For some authors, tt is the velocity (or the lack of it) in testing core business facts that is associated to failure of new businesses (Bertels, Koen, & Elsum, 2015; Nonaka et al., 2000).

Funding (FU)

Funding is defined as the need for money to start and scale any venture, whether it is for product development or any other "liquidity events" (Blank, 2016). This is formed out of three constructs: financial strategic management (Karadag, 2015; López, Contreras & Espinosa, 2012), competitiveness and control (López, Contreras & Espinosa, 2012) and growth/scaling (Picken, 2017; Powell & Bitner, 1992). It is academically well grounded that survival and performance of startups and new business models is tied to the presence of financial management

[33] The exogenous indicators for these new endogenous constructs and for the rest of the constructs are available from the authors upon request.

(Karadag, 2015) which affects the founders' ability to earn credibility and legitimacy, but also to building a supportive culture, and have everyone involved in addressing risk and uncertainty (Picken, 2017).

Funding of a new SBM might also be related to higher competitiveness (López, Contreras & Espinosa, 2012: 94), and tools and metrics to control it. Being competitive and in control of the new venture usually means an alignment of financial and overall strategies, which usually is reflected in higher funding and easier exits (therefore, better chances to grow to further investment rounds).

Repetition and scalability are also predictors of our funding construct, as they are signs of successful development of an effective new business model and organization (Powell & Bitner, 1992). When it exists, this growth ability of new SBMs might complement and expand their credibility and positively affect their funding.

Security (SE)

Security is defined here as the probabilistic prediction of economic uncertainty that affects decision making of individuals (Makridakis et al., 2010). We see it as intrinsic to the individual. Our construct is best described by these predictors: knowledge creation (Nonaka, Toyama and Konno, 2000), revision of goals and actions (type of mindset: Sarasvathy, 2001; Ye, 2016) and heuristics (Ye, 2016: 404). Knowledge is created by the spiral interactions between explicit and tacit knowledges (Ye, 2016: 7-9) and affect how individuals predict their future and, therefore their security (usually expressed economically).

The cyclical building of knowledge departs from a revision of losses, failed alliances and contingencies (or opportunities). It leads to a revision of goals and actions that defines how an individual faces the future and uncertainty (predicting them or controlling them), which differentiates a managerial mindset from a more entrepreneurial one (Sarasvathy, 2001; Ye, 2016). Managers, whose judgements are based on probability and advocate for planning and probabilistic predictions of uncertainty (Makridakis, Hogarth and Gaba, 2010: 87), and entrepreneurs, that aim at controlling uncertainty, minimizing the need for prediction, are subject to rationality coupled with intuition. The differences are in that they use different heuristics (Ye, 2016: 404) or use the same heuristics differently. These available heuristics for SBMI are the two different approaches to SBM modelling we described earlier, which help decision makers to cope with uncertainty and gain security (for them, their developments and teams).

Brief discussion and conclusions

From our research questions inquiring how entrepreneurs decided which SBMI practice to use and which factors affected this choice, we hypothesized (1) those factors depend on dynamic external and internal conditions; (2) entrepreneurs tend to use the methods and practices they know, require the least effort, help them get funded and provide them with the most fun; and (3) only certain valueholders seem actual influencers of the SBM development.

First, our paper provides empirical support to the factors we theorized are influencing the acceptance of entrepreneurs of SBMI practices to design and implement their SBMs. We have identified, described and empirically supported behavioral structures (composites and factors) that influence the usage of any of the SBMI methods or practices commonly available for business modelling. Based on extant behavioral models of acceptance of technology and business practices, we have developed a strong framework of eleven factors, combining academically grounded concepts (intention, performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, costs/price, habit) and three new constructs (i.e., speed, funding, security), derived from the relevant literature on SBMI. We have also supported the modes of relationship of those factors, which in some cases differ from the conventional reflective mode and include formative modes. Complementarily, we have successfully captured missing latent elements contributing to clarify how entrepreneurs build SBMs.

Second, these factors are constructed using external and internal influences and include collective and individual determinants. In doing so, we have contributed to advance the research on the individuals' relevance when creating SBMs. Our stronger constructs, built with those considerations in mind, Effort Expectancy (i.e., the easiness of use, or "actionability", of the SBMI method) and Hedonic Motivation (i.e., the enjoyment and learning the SBMI method produces) partially support our second hypothesis. These two constructs and Behavioral Intention, which also shows unexpected strength, shed light on which could be the relevant constructs to be taken into account when entrepreneurs select a SBMI practice. As a first approach to knowing what drives the entrepreneurial use of SBMI practices, our paper provides support to the underexplored field of implementation practices of eco-innovation at the strategic, operational and tactical levels. This is particularly relevant when starting up a firm, as the entrepreneurial team faces uncertainty when implementing their plans in any of those three levels. Having a sound SBMI strategy is deemed as a required component for success (Amit & Zott, 2012; Baldassarre, Calabretta, Bocken, &

Jaskiewicz, 2017; Boons & Lüdeke-Freund, 2013; Evans et al., 2017; Klewitz & Hansen, 2014) and we argue that knowing which factors drive the acceptance of a design and implementation method can additionally strengthen any strategy development, most particularly eco-innovation strategies. This might be relevant for entrepreneurs, incubators, accelerators, mentors and academic institutions devoted to teaching entrepreneurship, as they present concrete areas needing special attention. For example, making one particular SBMI practice more actionable than other lures entrepreneurs to it, independent of its efficacy. And the same happens with those practices that are more enjoyable, whether they are properly fitted for successful SBM development. Our findings complement those of Kanda and colleagues (2018), suggesting a clear bias of the roles they identified of support agents towards balancing all constructs in their activities with entrepreneurs. This might mean that an incubator should probably build on the actionability and enjoyment of a particular SBMI practice to introduce other relevant aspects like Security, easier access to Funding, Speed and the rest of our eleven constructs and rightly balanced them in their incubated projects.

Finally, we also contribute to the current sustainable business modelling and stakeholder discussions by identifying groups of valueholders that may be more salient or more influential for seasoned entrepreneurs. Partially different from those proposed by our theory (Mitchell, Wood, & Agle, 1997), our significative valueholder groups are potential customers, investors, employees of the current SBMI project and teachers/instructors. National/regional government also appeared as meaningful, but their negative loading seems to reflect a lack of understanding/negative effect of these institutions on eco-entrepreneurs.

Limitations and future research

The main limitation of the current research is its static, frozen-picture-like view of the elements or structures (constructs) that influence the entrepreneurs' use of one SBMI practice. Other similar studies (Lima & Baudier, 2017; Venkatesh et al., 2003, 2012) have shared the same concern. Usage of a SBMI practice, in a very complex environment as the creation of SBMs, is never static. It changes with time, experience and failure (Blank, 2010; Eisenmann et al., 2011). Our exploratory research is, to the best of our knowledge, the first of its kind, acknowledging not only external influences, but also entrepreneurs internal composite-constructs. Its purpose is to explore SBMI design and implementation from the individual (Felin & Foss, 2005; Song & Yu, 2018). But it lacks the 'time', 'learning', and 'valueholder' effects, considered dynamically. This might be a novel and promising line of

research, starting from our factors and investigating their evolution with each stage of the SBMs development towards growth and success.

Another limitation is the localization of our sample. Future research on the acceptance of SBMI practices following the path we just opened could provide a wider perspective of this research, including samples from other countries and adding other characteristics (i.e., corporate vs. non-corporate entrepreneurs, Western vs. Asian countries, eco-countries vs. non-eco-countries).

A final concern is the relationship of the factors and the actual usage of a SBMI practice. Due to space limitations, we were not able to present here these relationships in a model that fits those elements into a sound SBMI practice acceptance theoretical model. Furthering into that line, strengthening the current relationships of the factors and uncovering new relationships among the factors are two wide and needed new research fields.

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Taking stock of sustainable business models: Past accomplishments and future promises

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Abstract

Ten years after Stubbs and Cocklin's (2008) seminal article on sustainable business models (SBM), the current study takes stock of the literature on SBMs in the period 2008-2018 through a systematic literature review. The main aim of the article is to gain insights into 1) the characteristics of SBM studies to date (e.g. methods; sectors; scope; geographical focus); 2) how SBMs have been defined and 3) what avenues for further research the SBM community sees as particularly promising to explore. The review shows a sharp increase in SBM articles over the last three years, yet at the same time a persistent emphasis on qualitative work that draws primarily on illustrative case studies that focus on a limited variety of sectors. Studies mostly focus on explaining how SBM's work and should be implemented and managed and focus less explicitly on exactly what SBMs offer. Essential elements of a SBM definition are 1) an integrated view on sustainability; 2) a broad notion of value; 3) an explicit stakeholder-focus and 4) a system-perspective rather than an organization-centric one. Future research suggestions revolve around three main dimensions, namely 1) the scope and methods of studies; 2) developing and managing SBMs and 3) the outcomes of SBMs. These results do not only illustrate the road travelled thus far, but also add conceptual clarity to the sustainable business model concept and offers suggestions for research projects that can build the foundations for the next ten years of research on sustainable business models.

Keywords

business models for sustainability, sustainable business models, sustainable business model innovation, literature review

Towards Sustainable Business Models for Living Labs

A long-term Business Model Study of Austrian Urban Mobility Labs

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Extended abstract

Keywords

Business Model, Urban Mobility, Living Lab, Sustainable Organization

Problem

The Austrian Federal Ministry for Transport, Innovation and Technology created a new programme initiative to fund a set of real-world laboratories to provide a vital innovation ecosystem for mobility and transport. Five Urban Mobility Labs (UML) located in four urban areas have been selected for funding (duration 4 years) and started operation in 2017. The five UML offer specific innovation enabling service (service packages) embedded in an initial Business Model. The labs gained already first experiences on the viability of initial Business Model during the first year of operation. In order to cover the risk of a high dependency of public funding (which is mostly limited in time), the lab management teams face the challenge to actively further develop the UML Business Model in terms of sustainability. Particular attention needs to be drawn on the fit between the offered value and the customer segments as well as on diversified revenue streams (Mastelic *et al.*, 2015). There is a shortage of knowledge on how a persistent and viable Business Model of such Living Labs can be developed and which success factors play a role.

Background and Related Work

As the Austrian UML initiative is oriented towards the concept of Real-Life Labs and Living Labs (Breitfuss *et al.*, 2018), the Living Lab approach (Leminen, 2015; Ballon and Schuurman, 2015) has been used as a scientific basis for the present work. Since Living Lab organizations are complex units, Schuurman (2015) proposes a distinction between three different Living Lab activity levels (macro, meso, and micro level). This paper focuses on the "macro level", where Living Labs are seen as a Public-Privat-People Partnership (PPPP) consisting of different stakeholders, organized to carry out Living Lab research and user-driven open innovation projects. The non-profit-organization European Network of Living Labs (ENoLL) acts as a supporting, a labelling and a knowledge sharing network for their member Living Labs. According to ENoLL website, historically more than 440 Labs have been labelled as Living Labs since 2006, but currently only 167 Living Labs are listed as active. There are certainly many reasons for stopping Living Lab activities and not every Living Lab is or was a member of ENoLL. Since we are aware of the central role of a Business Model in maintaining a complex organization, such as a Living Lab, we hypothesize a dependency between a sustainable Business Model and the lifespan of a Living Lab.

There is already a lot of research available on, for example Living Lab case studies (Juujärvi and Pesso, 2013; Haider *et al.*, 2016), Living Lab Methodology (Ståhlbröst and Holst, 2012) and even on designing and exploring Living Lab Business Models (Schaffers *et al.*, 2007; Katzy, 2012) but very less on how to keep a Living Lab alive (Mastelic *et al.*, 2015). There is a need for in-depth longitudinal analysis of Living Lab Business Models covering aspects on growing partner network, scalability, and replicability in terms of other domains or geographical locations (districts, cities, regions etc.). This paper serves as a continuation of the accompanying study by Berger et al. (2016) in the exploratory process of Austrian UML initative.

Overall, the research goals are to (1) analyse the current UML Business Models of the five UML concerning strength and weaknesses, (2) determine the main challenges in the Business Model development process, and (3) identify empirical success factors for sustainable UML Business Models.

Methodology

To answer the research questions, a method mix of desk research (review of existing secondary sources e.g web presence of UML, dissemination material, etc.) and qualitative methods have been selected. In order to get an insight into the

UML Business Model, 2 times 10 semi-structured interviews (two responsible persons of each UML) are planned. The first circle of the interviews took place between July 2018 and January 2019. The second circle of interviews is planned for 2020 in order to capture the evolution and the future prospects of the UML Business Model. The first interviews lasted about 70 minutes and were electronically recorded. The first interviews were evaluated through qualitative content analysis (Mayring, 2015) by analysing the conversation logs systematically. Furthermore, the results were summarized in form of a Business Model Canvas (Osterwalder and Pigneur, 2010) for each UML and outlined in an overall tabular comparison of strength and weaknesses. Between the two rounds of the survey, a Business Model workshop is planned to enable the exchange of knowledge between the UML and to generate ideas for the future development of the UML Business Models.

Findings

Since the UML organization differs a lot from a conventional company due to its multi-stakeholder structure and the public funding conditions, the initial set up and further development of a viable Business Model is a complex activity. Although the general conditions of the labs are the same for all five labs due to the guidelines of the funding agency, the initial Business Models of the labs are very different. Three labs are operated by universities, two by public administration bodies. Due to different thematic and geographic focus of the labs, there is a broad variety of service offerings observable. A first analysis of the offered services regarding clarity, service-market-fit, and possible pricing models shows different degrees of maturity. We also discovered different strategies in terms of value creation (provision of services by partners or by UML themselves) and marketing and communication activities.

Conclusion and Outlook

Overall the research work adds empirical insights on how a UML Business Model evolves on a long-term perspective. This research contributes on the one hand to the Business Model Innovation community due to long-term empirical insights of Business Model development processes of complex multi-stakeholder organizations. On the other hand, the Living Lab community gets a better understanding of what factors are driving the success of a Business Model and what development steps are necessary for keeping a Living Lab alive. Furthermore, the present research also serves to evaluate existing frameworks and models for developing viable Business Models.

Based on the gained research insights a comprehensive list of success factors and hands-on recommendations will be derived. This should help UML organizations in developing a viable Business Model in order to support sustainable innovations in transport and mobility.

Acknowledgement

This research was supported by Know-Center GmbH which is funded within the Austrian COMET Program under the auspices of the Austrian Federal Ministry of Transport, Innovation and Technology, the Austrian Federal Ministry of Digital and Economic Affairs and by the State of Styria.

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When is Financing of Circular Business Models a Perceived Problem

A study of potentially correlated features

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Abstract

This study explores the challenge with obtaining financing for companies transitioning to PaaS models, and their related features. From our multiple case study we draw the conclusion that financing is an issue, and that it will require new strategies from both manufacturing firms and financiers to overcome.

Keywords

Circular economy, Business model, Product-as-a-service, PSS, Finance.

Introduction & Background

An economic system can be defined as a way of organising the production and distribution of goods and services, according to specific structures, rules and processes. This “operating system” of human societies moulds the way we interrelate with each other and the natural system. Since mankind belongs to and is dependent on the natural environment for satisfying its needs and surviving, it is vital to preserve and regenerate our natural ecosystems.

However, today’s current economic system relies on an indiscriminate use of resources and oblivious management of our “operating system” that have put our ecological environment under an unprecedented and dangerous pressure. This

situation, as argued by many authors from different scientific fields (Stahel 2010, EMF 2012, Tukker 2015, Bocken et al. 2018), coupled with other macro-trends such as an increasing global population, is not sustainable and requires a new "operating system" to ensure sustainable development and the mankind survival.

Over the past few years, the concept of circular economy (CE) has gained increasing attention as a means to pursue sustainable development. A CE is essentially an economy with greatly reduced material throughput, driven by renewable energy which demands a great transformation and a tremendous structural change.

In other words, there is a need to decouple economic wealth creation from the consumption of finite resources. Such a shift requires the adoption of a radically new value creation and distribution logic which should be translated in innovative business models where products, components, services, materials, and their by-products circulate at their highest value for the longest period (Hopkinson et al. 2018). However, research shows that the obstacles to such a transition are manifold and include the following, as shown in table 1:

Table 1. Obstacles to transition to PaaS models.

Financial: Measuring financial benefits of circular economy; Financial profitability
Structural: Missing exchange of information; Unclear responsibility distribution; Lack of Political support
Operational: Infrastructure / Supply chain management; Develop appropriate market signals
Attitudinal: Perception of sustainability; Risk aversion
Technological Product design; Integration into production processes

(Sources: Elaborated from UN Environment Inquiry 2017, Ritzén and Sandström 2017)

Different rationale and tools are therefore imperative, and in this paper we will focus on - out of several resource allocation strategies - the financial mechanisms that could hinder a transition to a CE. When a company moves to a PaaS model, the ownership of the product is retained in the company. This is one of the strongest incentives for circularity and resource efficiency, as the driving force of the company changes from a flow-oriented (sell as many products as quickly as possible) to a value-saving (keep the product as long as possible) business logic (Stahel 2010).

Our assumption is that this change in ownership may have major consequences for the manufacturing company's balance sheet. Instead of the products disappearing from the balance sheet when sold, they will remain as an asset throughout the period the company uses them for their rental/service activities. Hopefully - from a circular perspective - for many years. This means that the company's cash flow will change which, in turn, will impact the need for capital and external financing. Earlier studies show that financial market players do not value long-term stable revenue and cash flows sufficiently high, but work with risk and credit assessment, where the more short-term impact on cash flow and balance sheet, as well as difficulties in establishing a correct residual value for used products, become a problem (Linder and Williander 2015, FinanCE 2016, EIB 2015, Circle Economy 2016). However, the literature on to what extent and under what circumstances this is a real problem for the transition remains scarce.

The degree of complexity is amplified at a business ecosystem level. Today's economy is characterised by a high level of interdependence and interconnectedness that is boosted by an exponential development of technology. Products and services are embedded in wider and more complex systems than ever before (Roome and Looche 2016). Therefore, any business activity including financing, is heavily dependent on and affected by the organisation's network and external environment (Bocken et al. 2018, Roome and Louche 2016). It follows that business success, particularly in terms of successful transition towards a CE system, largely derives from how rapidly and effectively organisations evolve. Increasing attention needs to be given to the relationship between social, economic and financial systems, economic opportunities, technology, know-how and social and environmental conditions (ING 2015, Roome and Looche 2016).

This research investigated the potential challenges in obtaining the necessary capital for companies who want to transition from selling goods to selling function or service. The study has been conducted in Sweden encompassing both

manufacturing firms and financial actors. However, the current analysis mainly considers the work and results from data collection with the manufacturing and production companies. This will ensure a clear focus of the analysis while providing sufficient information on the discussed topic. A separate paper further evaluating data and information elaborated from the interaction with financial stakeholders could be developed, as a next step.

The following research questions have been answered:

- *Is availability of capital a real challenge for firms who want to transition to PaaS models?*

- *If so, what seems to be the likely features of the companies who experience the problem?*

Method

This study benefitted from a variety of sources which have supported wide-ranging and complex research questions whilst strengthening sources reliability (Yin 2009). A mixed-data approach seems to be particularly valuable when applied to social sciences since these intrinsically deal with complexity and contradictions (Bryman and Bell 2011).

According to complexity theory the adoption of a case study approach is an instrumental and guiding tool to investigate a phenomenon as an integrated whole (Anderson et al. 2005). Moreover, case studies are likely to greatly contribute to knowledge creation in relatively unexplored research fields (Yin 2009) such as finance in the CE. Consequently, the study of cases presents a portrait of some companies and their potential to embrace circularity through the elaboration of several sources and tools that can be applied in similar contexts.

In this multiple case study a range of data have been adopted including the use of qualitative and quantitative data from secondary and primary sources. The collected secondary sources comprise documentation from publicly available documents such as market reports, analyses, third-party articles from websites and publicly available financial reports. The primary sources were collected during individual interviews in person and over the telephone; exchange of emails and workshops with two types of key players, i.e. manufacturing firms and financial actors.

Set of companies:

The cases in our study consists of ten different manufacturing and selling companies. They represent a wide spread of businesses of different sizes, in diverse industries, owned by various types of actors and with diverse levels of circularity status. They are all companies that either already use PaaS models and/or want to expand into these models, see table 2 for a brief overview, based on interviews and publicly available financial data:

Table 2. Brief overview of investigated companies

Company	Short description of value proposition and circular ambitions	Turnover (MSEK)	No of employees
A	A designs, manufactures and sells office furniture. A has a classic linear business model and a clear sustainability profile with high circular ambitions. A is at the beginning of the development towards PaaS models, and have so far conducted a few test sales.	4137	2279
B	B designs and sells functional clothing for an active life and works exclusively with different types of circular models (e.g. recycled materials in garments and garments that can be recycled). PaaS models are still a relatively small part of sales, though increasing.	137	42
C	C manufactures and sells interior fittings for service vans. C looks for new business models mainly through the addition of digital services, and sees the transition to PaaS models as a long-term project, which has not yet started in practice.	231	89
D	D designs, manufactures and sells small light electric vehicles for taxi use. D is in the start-up phase and looks for expansion paths, both through product sales and PaaS models.	5	9
E	E rents out forklifts to companies in different industries, both short and long term. The offer includes services/uptime agreement. Each forklift is rented several times and sold on a secondary market at the end of the rental period.	1523	437
F	F designs and manufactures lighting and fittings from used components and leases them to property owners. F is in the start-up phase and sets out to drive a sustainable and circular business.	1	4
G	G buys, rents and leases out coffee and vending machines to a broad business market. Since the start, G has used a model where machines are rented or leased out for at least two rounds, usually to the same customer. The offer includes coffee, service and repair.	950	405

H	H is a global giant in electricity transmission, infrastructure, industry and transportation. The product line ranges from electric motors, transformers and robots to switches and pushbuttons. Most of the products are long-lived (40+ years) and it has been difficult to accelerate circular development mainly due to customer resistance.	33030	8027
I	I rents out entrance mats to companies and public organisations. This circular business model has been in place since the start of the company, with almost all of the turnover being generated from the PaaS business.	33	27
J	J buys and sells used furniture. The furniture are reconditioned and, if necessary, repaired and sold with warranty. About 30% of the turnover is PaaS based, and the company's goal is to continuously expand that part.	45	30

Definitions of features and criteria used for classification:

From the interviews and from publicly available financial reporting, we have gathered some descriptive statistics about these case companies, which allows us to compare them and draw some conclusions in relation to our research questions. The data are not statistically proved, yet they provide us with some valuable insights about situations when financing of a transition to PaaS cannot be expected to be solved with a business as usual approach, but will need some extra attention.

The criteria we have chosen to look at, the data source and the different possible outcomes for each of them, are summarised in table 3:

Table 3. Criteria for analysis.

Criteria	Data source	Different possible outcomes
Circular expansion plans	Interviews	• Y – Yes, the company plans to expand the PaaS business • N – No circular expansion plans
Is availability of capital in relation to the transition, a problem or not?	Interviews	• Y – Yes, the company has already encountered issues with obtaining financing • Y → N – The company expects to encounter issues when starting/continuing expansion • N – No, the company has not encountered and does not expect to encounter issues with financing
Circularity level (in terms of PaaS)	Interviews	• L – No, or very small, existing PaaS business • M – Less than 50% of turnover is PaaS based • H – More than 50% of turnover is PaaS based
Ownership	Interviews	• Family • Founders • Small engaged group • Investment company • Private equity fund • Listed on stock exchange (or combinations of the above)
Business maturity	Financial statement	• Start-up – Less than 10 years on the market • Established – More than 10 years on the market
Financial stability (EBIDTA/turnover – average over 3 years)	Financial statement	• Not stable – Below 0% • Stable but low – Less than 5% • Stable – More than 5%
Size	Financial statement	• SME – Less than 500 MSEK turnover, and less than 250 employees • Large – More than 500 MSEK turnover, and more than 250 employees

Findings

The first research question - if the availability of capital is actually a challenge for the companies who want to expand their PaaS operations - are summarised below in table 4:

Table 4. Is availability of capital a challenge or not?

Company	Circular expansion plans	Financing is an issue
A	Y	N →Y
B	Y	N →Y
J	Y	N →Y
I	Y	N →Y
D	Y	Y
F	Y	Y
C	Y	N
E	Y	N
H	Y	N
G	Y	N

From this, we can draw the following conclusions on if financing is a real issue for expansion of PaaS models or not:

→ Yes. Many companies that have expansion plans for their PaaS business have already experienced or assess that they will experience, difficulty with financing.

To analyse the second research question about what typical features seem to be correlated with the fact that the company has an issue with financing or not, we combine the other selected criteria with the issue level, as depicted in table 5:

Table 5. Correlation between the challenge and selected features.

Company	**Financing is an issue**	**Circularity level**	**Ownership structure**	**Business mat**	**Fin. stability**	**Size**
A	N →Y	L	Family	Est	Stable but low	L
B	N →Y	L	Founders + small group	Est	Stable but low	SME
J	N →Y	M	Founders/ family	Est	Stable	SME
I	N →Y	H	Founders/ family	Est	Stable	SME
D	Y	L	Founder + small group + listed	Start-up	Not stable	SME
F	Y	H	Founders/ family	Start-up	Not stable	SME
C	N	L	Investment comp	Est	Stable	SME
E	N	H	Large group/listed	Est	Stable but low	L
H	N	L	Large group/listed	Est	Stable	L

G	N	H	Private equity	Est	Stable	L

From this, we can draw the following conclusions on how these features seem to correlate with the experienced level of issue with obtaining finances, for our companies.

Circularity level:

Companies with high, low and medium circularity levels (i.e. the current part of the turnover related to PaaS sales) are represented in both the group that is experiencing financing issues and the group that is not. Hence, the circularity level as such does not seem to be correlated with the issue of financing.

Ownership structure:

All companies experiencing an issue, or assessing that they will have an issue when they expand the PaaS models, are owned by family, founders and/or a small engaged group of owners. One of them is also listed on a stock exchange. The companies that do not have an issue with financing are either part of a larger group or have financially strong owners, such as investment companies. Hence, there seems to be a correlation between issues with financing and ownership structure.

Business maturity:

Start-ups in general have issues with financing and this is also the case here. However, also the established firms have difficulty with financing. Hence, the fact that the company is established does not guarantee exempt from issues with financing.

Financial stability:

All companies that are financially unstable (i.e. the start-up companies) have issues with financing. However, some of the companies with a stable financial situation have the same problem. Hence, financial stability of the company does not guarantee exempt from issues with financing.

Size:

All SME's experience issues with financing. All large companies, except one, are assessed not to have issues with financing. The large company that does have an issue with financing is the only one of the established companies that also faces a stable but low profitability. Hence, there seems to be a correlation between issues with financing and size, at least partly. SME's in general seem to face the problem more often than large companies, but large companies are not exempt from issues with financing.

It is not possible to draw any statistical conclusions from these facts, but the combined insights from these descriptive statistics suggest the following tentative correlations between different company features and the issue with financing:

➔ Even if the company is financially strong and has a mature business, it does not guarantee that the PaaS expansion can take place without special consideration of financing. SME's are more likely to encounter issues than larger companies. Companies owned by family, founders or small engaged owner groups are also more likely to encounter issues than companies that are part of larger groups.

Discussion

The results of our study can be used to better understand what type of companies can expect to meet challenges when transitioning to PaaS models. These insights can, in turn, be useful for developing strategies to meet the challenge - both for the manufacturing firms themselves and for the financial actors.

Normally, stable and profitable companies can test PaaS business models on a small scale without external financing. As soon as a PaaS model is to be scaled up, however, unanimity is high among our interviewed companies, that an external financier is required. At some point of the PaaS based income share of total sales (and which may vary for different companies depending on the financial position), short-term liquidity will need to be strengthened. This confirms the "liquidity gap" theory in the literature (ING 2015). The stronger the balance sheet is, the longer a company can manage without external borrowing.

Companies that are subsidiaries in larger groups and/or have strong owners can normally obtain working capital financing within the group, either from a mother

company or from a dedicated finance company within the group. As long as the group is stable, financing is not a concern for the individual subsidiary. However, the cost of internal financing compared with costs of external loans has not been considered here. This is potentially worth studying further, since internal financing is more costly than external financing.

Small start-up companies are normally in search of capital for general expansion of the business, and problems in obtaining financing are not limited to the expansion of PaaS models.

Overall, the issue with financing is a real challenge for most companies transitioning to and expanding PaaS models. To succeed in this endeavour - and thereby contribute to the overall transition to a CE and the awaited environmental gains - it is strongly suggested that companies work strategically with this issue. Strategic work could involve purely internal activities, such as adjusting KPIs to cope with the new balance sheet situation and, in the more developed case, treat the new PaaS business as a "special purpose vehicle" (Govindarajan and Trimble 2010) to allow for different business models with different KPIs to be run in parallel. However, based on some of the data collected from the financial actors of our study, when creating a strategy for expansion of PaaS models the following aspects involving the external financier are particularly important to address:

- A profitable business case is central to all assessments of creditworthiness and refunding capacity. Specific challenges in relation to the PaaS business case includes the fact that the PaaS model might be new in the industry, which means that the financier does not have adequate benchmark data, to assess the business case. In addition, the time perspective of the assessment changes, with the relatively longer payback time for each product produced. The financier needs to update risk assessment, both in terms of time perspective and in terms of business case benchmarks.

- Collateral needs special attention. In the PaaS cases, "normal" collateral, such as valuable fixed assets or a fast churning inventory, might not be available. In fact, in a PaaS model aiming for high circularity, the goal is to have an inventory with products which churn as slowly as possible. This is challenging from a traditional financing perspective. The notion of collateral will have to be rethought, possibly including contracts and customer relations. The realisation of

this type of collateral - at the event of bankruptcy - is also challenging in an industry with emerging PaaS models, due to unestablished secondary markets.

As suggested in the literature (Bocken et al. 2018, Roome and Louche 2016), there is a need for expanding networks and business ecosystems in relation to expansion of PaaS models. Our findings suggest that the companies aiming for PaaS need to establish a close relation with their financiers. There is a need for a deep understanding of the customer's business from the financier's side, potentially also including understanding of the customer's customers. The financier thus becomes an important part of the new business ecosystem around the emerging PaaS business.

It remains to be seen whether a lack of financing will actually hinder the shift to circular business models, or only postpone it, until the challenges are solved. The purpose of this paper is to augment the knowledge of the challenges, so as to increase the probability to overcome them.

Conclusion

On the backdrop of the global environmental challenges of our time, a CE promises to provide an important piece of the solution puzzle. Circular business models in general, and PaaS models in particular, are important and powerful enablers of the transition, since they engage industry and business with their huge potential to scale up new production and consumption patterns.

We set out to investigate one of the least explored challenges of the transition to PaaS for manufacturing firms, namely the need for financing. In a multiple case study, based on data collected in interviews and workshops together with a number of manufacturing firms and financial actors, we conclude that financing is an issue for most manufacturing firms, regardless of previous experience with PaaS models, financial stability, size and business maturity. Manufacturing firms owned by large corporations and strong owner groups, such as investment companies, seem to be the exception, and might not be as strongly reliant on external capital for the expansion. Our research also suggests that the financial actors who wish to be part of this emerging business, need to revise their view on collateral and set out to truly understand the business of their customers. The financiers have an important role to play in the new business ecosystems around the emerging PaaS business.

With this study, we have made an empirical contribution to the field of CE and finance. Our conclusions are preliminary and we strongly recommend that more research is undertaken in the area of both financing strategy and the financiers' role in emerging circular business ecosystems.

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When new business models go bad irresponsible innovation and the case of cycle hire schemes

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Abstract

Innovations are needed to help tackle grand challenges such as climate change, and innovations to business models are a particularly promising area for sustainability. This is because business models influence what value is created and how, and can fundamentally alter the underlying logic used by a business. Business models can also profoundly influence how technological innovations are deployed within society. However, innovation outcomes can be unpredictable; unintended consequences are not just possible but probable. To minimise negative impacts and enhance the success of sustainable business models, socio-ethical factors must be incorporated and managed. Research on responsible innovation, which seeks to manage socio-ethical factors, is well developed but has often used a technocentric lens. As such, it is unclear how socio-ethical factors interact with business model innovation processes and how they manifest themselves in the final business model configuration. In this research, we seek to explore the ex-tent to which the business model influences the type and nature of socio-ethical impacts and start to think about how they could be better managed to enhance the social desirability and ethical acceptability of business model innovations. To do this we explore cases of 'irresponsible' business models within the context of new cycle hire businesses in Europe. We contribute by linking the concepts of responsible innovation and business models, as well as highlighting how normative and socio-ethical factors can be integrated into business model design and organisational strategy.

Keywords

responsible innovation, business model innovation, socio-ethical factors

TRACK III

SOCIAL ENTREPRENEURSHIP AS TRANSFORMATIVE FORCE TOWARDS SUSTAINABILITY

Track III: Social Entrepreneurship as Transformative Force towards Sustainability

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Social entrepreneurs deal with social problems and entrepreneurial opportunities at the same time (Austin, Howard, & Wei-Skillern, 2006), and hence they are frequently referred to as "hybrid organizations" (Doherty, Haugh, & Lyon, 2014), "social enterprises" (Defourny & Nyssens, 2017) or "social ventures" (Desa & Basu, 2013). Due to their innovative approach towards social problems, social entrepreneurs often introduce new breed of business models, where "the logic of doing business is based on solving environmental and social sustainability problems" (Schaltegger, Lüdeke-Freund, & Hansen, 2012, p.7). Despite the honourable efforts of these organizations, they face several difficulties on their quest towards a more sustainable society. Amongst them, solving "social problems often demand fundamental transformations in political, economic and social systems" (Alvord, Brown, & Letts, 2004, p.260). Such transformations take time, which offsets the financial needs of the organization on the short term, one of the key challenges for social enterprises.

Considering the long-term objectives versus the short-term needs of the social enterprise, as well as the high-risk of failure, can we truly mark social entrepreneurship as a transformative force towards sustainability? How deep goes their impact in "enhancing the quality of life and enriching human existence around the globe" (Zahra, Rawhouser, Bhawe, Neubaum, & Hayton, 2008, p. 129)? And do cross-sectoral partnerships really hold the key for innovation and transformation towards a more sustainable society (Selsky & Parker, 2005)?

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Accountable markets: Degrowth, solidarity and social enterprise

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Extended Abstract

Scholarship and practice focused on sustainable development, civil society and the social and solidarity economy are increasingly drawn into practical and theoretical engagement with markets. For sustainable development practitioners and scholars, "making markets work for the poor" (MM4P) has become a rallying cry for venture philanthropy and pro-business channels of "official development assistance" or overseas aid. This is increasingly through the format of what is known in development circles as 'inclusive business' (Perez de Mendiguren Castresana, 2013). Secondly, the increased outsourcing of public services and the need to diversify sources of income for voluntary action organisations is concentrating attention upon markets, amongst the scholars and practitioners of civil society and third sector arenas in the Global North (Eikenberry & Kluver, 2004). Finally, there is a growing awareness of congruent interests between on the one hand civil society, the third sector and sustainable development; and on the other hand the growing awareness of Social & Solidarity Economy organisations (Gismondi et al, 2016).

However, much of this increased engagement is often conducted within a framework which views markets and trading as 'necessary evils'. This is understandable given the way that so-called 'market efficiency' and the alleged superiority of the Private Sector has been deployed since the 1970s as a blunt instrument to bludgeon the Public and Third Sectors both North and South of the globe.

But the neoliberal view of markets is relatively recent and the preceding classical view of 'self-regulated' markets only several hundred years older. Markets as "a meeting place for the purpose of barter or buying and selling" (Polanyi, 1944

[2001, p. 59) have been around for thousands of years as Polanyi noted. In addition, that neoliberal view of markets is almost always tied to the idealised notion of continued economic growth, a notion that is increasingly challenged with the sustainable development community and beyond, challenges which are yielding alternative understandings of economic 'development' such as Doughnut Economics (Raworth, 2017) and Degrowth (Kallis et al, 2018).

So then, could it be possible to reshape markets to be more accountable and more suited to truly sustainable and solidarity economies and societies?

We will argue that not only is it possible but it is already happening in quiet ways, more often in the Global South than the North. One example is the technique of Participatory Market Systems Development (PMSD) pioneered by international NGO Practical Action for over a decade. Mainstream market systems development uses traditional neoclassical assumptions about supply and demand and traditional value chain analysis to encourage so-called market based approaches to economic growth. Originating from USAID, the US body for disbursing overseas aid, it deploys classical/neoliberal views of markets. In contrast, PMSD implicitly acknowledges Polanyi's insight that markets are embedded, changeable and configurable. PMSD entails first identifying all the relevant stakeholders to map current and desired patterns of economic activity, for instance in developing a regional market for milk-based products. Maintaining engagement with those stakeholders is a key element to pro-poor economic development.

Other examples include development-focused interventions within the supply chains of Peruvian Alpaca; Callon's (2015) thought experiment on designing 'alternative' markets; Chakrabarti & Mason's (2014) description of 'bottom-up market design' for the so-called 'Base of the Pyramid' (BOP), the poorest people of the world; and the Riversimple business model for hydrogen fuel cell cars as a mobility service instead of a product.

We will further suggest that these and other examples have many similarities to a core element of the technique of Social Return on Investment for evaluating social impact, a technique widely used by UK social enterprises. That core element is the prior engagement of beneficiaries in the elaboration of appropriate methods for evaluating the social impact of an enterprise. That core element Indeed, when social enterprise and similar initiatives are more thoughtfully focussed on systemic social impact (Pappi-Thornton, 2016) or on community wealth-building (Bhatt & Dubb, 2015; McInroy, 2018) we will argue that they have the potential to also

enable more accountable and environmentally sustainable coordination of economic activity – markets that work for degrowth and solidarity.

Keywords

degrowth, markets, solidarity, social enterprise

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Cleaning up the economy: How environmental social enterprises organise to create sustainable business models

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Abstract

Environmentally motivated social enterprises sit at the heart of business model innovation for sustainability. By putting environmental purpose at their core, they provide important knowledge on how the economy can potentially transition onto a more sustainable path by organising institutions differently. This paper offer an institutional analysis of the SBMs of Environmental Social Enterprises (ESE), with an emphasis on how they integrate environmental logic and which barriers they face in doing so. The analysis is based on nineteen purposefully sampled Environmental Social Enterprises (ESEs) in the United Kingdom and the focus is on; core characteristics of ESEs and their business model; how the business model integrates environmental purpose; and whether there are barriers and/or trade-offs in the implementation of heterogeneous institutional logics. Results (preliminary) show that ESEs are hybrid organisations innovating for the good of the environment and society, reinvesting their financial surplus in their purpose. By doing so, they build novel business models for sustainability, delivering broad forms of value creation and generating heterogeneous value logics. The environmental logic resonates throughout the model, influencing all decision-making processes and providing internal and external legitimacy. They are firmly driven by environmental mission, creating positive externalities in their communities and pushing innovative sustainable practices within their sectors. In order to maintain financial sustainability and ensure their continued existence, they continuously modify their business model to overcome barriers and conflicts between different institutional logics and overcome external constraints such as lack of funds and government policies. They furthermore provide timely

knowledge on organising business institutions with a fundamental commitment towards environmental sustainability.

Keywords

sustainable business models, social enterprise, institutional logics, sustainability entrepreneurship, hybrid organisations.

Entrepreneurial Interconnections Poverty

A Developing Country Perspective

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Abstract

Much has been written about how entrepreneurship can contribute to poverty alleviation and growth in developing countries, however research doesn't seem to support the claim adding that only high-growth startups and their ecosystems seem to have impact on growth. For entrepreneurship to be an effective option for the poor it must be worked out at the essence of the ecosystem level, that is, the dynamic interconnections among its elements and their evolution over time. This short paper introduces a poverty perspective to current entrepreneurial ecosystem literature by way of an entrepreneurial interconnections poverty measurement in preparation for empirical research. Its purpose is to make visible a knowledge gap that is key in a developing country context.

Keywords

Economics of entrepreneurship, entrepreneurial ecosystems, multidimensional poverty, entrepreneurial interconnections poverty.

Introduction

The evolving literature on entrepreneurial ecosystems (EE) (Mason & Brown, 2014; Stam and Spigel, 2016; Borissenko and Boschma, 2017) has as its key insights that entrepreneurship (i) is not about entrepreneurs alone but about entrepreneurs and their ecosystem; (ii) is not about government policies for private sector development but about a self-governing system; (iii) is not about individualism and market competition but about network collaboration and coordination for the good of all. From these perspective it would be expected that the more appropriate and developed the initial conditions of an EE and the higher the degree of entrepreneurial innovation achieved, the higher the impact of entrepreneurship on development, as has been observed in industrialized countries (Szerb *et al*, 2018). In contrast, in a developing country context, the initial conditions of EEs are usually poor (incomplete and disconnected) and the degree of innovation is usually very low or non-existent and therefore the impact of entrepreneurship on development might be negligible or even negative (LaFuente *et al*, 2018). Similar observations were found earlier by Stam and van Stel (2009).

These two opposite scenarios are not comparable. Most entrepreneurship effort in a developing country context[34] is intended to diminish a complex problem of unemployment, poverty, inequality and exclusion through self-employment and low quality entrepreneurship, and by facing context with an entrepreneurial attitude given own limited resources and abilities (Tassi et al, 2017). While in an industrialized country context, entrepreneurship is generally directed to solve a competitive advantage problem (Spigel, 2015). Thus for consistency purposes this paper separates the initial conditions of EEs according to country stage of development[35] or the type of entrepreneurs it tends to produce.

More generally, entrepreneur types could be classified within a continuum range from the lowest to the highest degree of innovation they bring: necessity-based Kirznerian[36], opportunity-based Kirznerian, sustaining innovation-based Schumpeterian and disruptive innovation-based Schumpeterian. The difference between Kirznerian (alert) and Schumpeterian (creative) entrepreneurs is discussed in the economics of entrepreneurship literature (Kirzner, 2008). The

[34] Usually individual or household effort based on tight family networks.
[35] This practice is not new, for example GEM uses the concepts of resource-driven, efficiency-driven and innovation-driven to describe different levels of development.
[36] Greater innovation comes with greater risk. A potential explanation of why subsistence entrepreneurs cannot innovate.

concepts of necessity-based and opportunity-based entrepreneurs, at their early stage, were introduced by the Global Entrepreneurship Monitor reports since 2001. The difference between sustaining and disruptive innovation was explained by Christensen (1997). Also the essence of an EE is the quality and depth of interactions among its elements (entrepreneurs, stakeholder organizations and institutions) in many dimensions (Stam and Spigel, 2016). Table 1 show types of EEs consistent with the different types of entrepreneurs by motivation and development stage[37]. It is a simplified proposition given that both, entrepreneur types and their EEs, can be thought of as in a continuum according to degree of innovation and degree of sophistication due to motivation and development stage. Nevertheless, Table 1 is an effort to avoid the "high-growth only" EE perspective that dominates the EE literature.

Table 1: Entrepreneurship and ecosystem consistency

	← **Degree of innovation** →			
Type of Entrepreneur	Necessity-based Kirznerian	Opportunity-based Kirznerian	Sustaining innovation-based Schumpeterian	Disruptive innovation-based Schumpeterian
Type of EE	Minimum Kirznerian EE	Optimal Kirznerian EE	Minimum Schumpeterian EE	Optimal Schumpeterian EE

Source: Own.

Notice the thick dark line that separates the necessity-based and opportunity-based Kirznerian entrepreneurs and their respective EEs. It is meant to symbolize an income poverty line (e.g. US$ 3/day) below which households of necessity-based entrepreneurs barely survive (also called subsistence entrepreneurs). Starting from the left, the minimum Kirznerian EE can be thought of as the threshold level for a set of key support interactions in a location[38], consistent with the income poverty line, such that income poverty is reduced[39] for necessity-

[37] Stam & van Stel (2009) recognize that empirical research needs to account for "much heterogeneity in the kinds of entrepreneurs and the kinds of economic contexts in which economic growth takes place."
[38] Location refers to a geographical area: rural town, small city, large city or a metropolitan area.
[39] Entrepreneurship can contribute to reducing multidimensional poverty as will be explained later.

based Kirznerian entrepreneurs in that location, in a sustainable[40] and resilient manner. The optimal Kirznerian EE can be thought as the optimal level for a set of key support interactions in a location such that it strengthens the market development achieved and promotes its expansion and diversification for opportunity-based Kirznerian entrepreneurs in that location. In contrast, the minimum Schumpeterian EE would be the threshold level for a set of key support interactions in a location such that sustainable competitive advantage is improved for sustaining innovation-based Schumpeterian entrepreneurs in that location, while the optimal Schumpeterian EE would be the optimal level for a set of interactions such that it strengthens innovation capacities and capabilities and promotes its expansion and diversification for disruptive innovation-based Schumpeterian entrepreneurs. It is important to notice that the set of key interactions are interconnected and vary with changing levels of innovations. In all four cases the implicit hypothesis is that interactions and their density are the main explanatory cause when aligned to the desired effect. The table is also useful to understand that developing countries usually participate in the first two columns at the same time, with large number of Kirznerian entrepreneurs in the first, living below the income poverty line. It also helps to understand that having an optimal Kirznerian EE in place is a necessary condition for moving toward to the third column where the management of greater risk becomes more important (Simons, 2019).

This short paper attempts to conceptually identify the set of key support interactions with an emphasis on the minimum and optimal Kirznerian EE cases, which would be the basis for survey questions and data collection in two producer markets in the metropolitan city of La Paz, Bolivia. The paper seeks to accomplish these objectives by a combination of the multidimensional poverty and the entrepreneurial ecosystem approaches as its conceptual guide.

Entrepreneurial interconnections poverty: A mixed ecosystem and poverty approach

The individual is the unit of analysis since the early unidimensional income poverty measurement and was maintained into the multidimensional measure of poverty[41], while aggregation is at the national and subnational level. Income

[40] When economic benefits are not less than the economic costs in four dimensions: Financial, social, informational and environmental.
[41] Sometimes the household was used as unit of analysis and frequently consumption expenditure was used instead of income.

poverty based on the Foster-Greer-Thorbecke (FGT) methodology (Foster *et al*, 1984) measures the proportion of poor and how poor they are in reference to a poverty line or threshold[42]. Today's complement to income poverty is the Global Multidimensional Poverty Index (MPI) by the Oxford Poverty and Human Development Initiative (OPHI, 2018), based on the Alkire-Foster (AF) methodology (Alkire *et al*, 2015). The MPI measures (i) the proportion of multidimensional poor (incidence) considering deprivation in at least three among 10 indicators in three dimensions: Health (nutrition and child mortality), education (years of schooling and school attendance) and living standards (cooking fuel, sanitation, drinking water, electricity, housing and assets); (ii) how poor they are on average (intensity); and (iii) how to reduce the multidimensional poverty index (incidence*intensity) by looking at the contribution of each indicator to the index through their interaction with the other indicators.

All poverty dimensions and indicators mentioned above cross, with varying degree, with key dimensions of the EE approach when applied to the context of necessity-based Kirznerian entrepreneurs in developing countries: (i) access to a reliable source of income to finance minimum household consumption expenditure of the poor crosses with entrepreneurship and startup activity as a potential source of income, compared to the option of labour income dependent on the availability of quality employment[43]; (ii) access to quality basic health services crosses with the minimum health services needs of poor subsistence entrepreneurs for the purpose of work; (iii) access to quality basic education crosses with the minimum entrepreneurial education needed by poor subsistence entrepreneurs; and (iv) general access to infrastructure crosses with the minimum infrastructure needs by poor subsistence entrepreneurs (energy, water, ICTs and transportation).

Research at OPHI also recognized missing dimensions in the MPI: quality of work, empowerment, physical safety, social connectedness and psychological wellbeing (Alkire, 2007). These missing dimensions are also connected with entrepreneurship: (i) quality of work crosses with the self-employed and informal nature of the massive necessity-based or poor subsistence entrepreneur's characteristic in developing countries; (ii) empowerment crosses with the basic entrepreneurial spirit or attitude needed for business development in a complex

[42] Minimum standard required by an individual to fulfill his or her basic food and non-food needs, expressed in monetary value.

[43] This is the main source for the argument that entrepreneurship can help reduce income poverty.

context with limited own resources; (iii) physical safety from violence against property and person crosses with culturally embedded need for property rights and institutions; (iv) social connectedness crosses with entrepreneurial interconnections and ecosystem culture.

A potential criticism to poverty measurement is its ex-post policy character. It is highly informative about who is poor, how poor, where they are and their profile but it does not really say for example how to increase the income of the poor. That is left to policy design experimentation. Poverty measurement has also been thought out at the individual level but aggregated at the subnational and national levels allowing geographic visualization through poverty maps. In contrast the EE approach works at the location level (town, city, metropolitan area), not at the individual entrepreneur or the individual firm level, however its literature could fall into an ex-post policy character if it concentrates only in describing the profile of entrepreneurs, organizations and context of successful EEs. For entrepreneurship to be an effective option for the poor it must be worked out at the essence of the ecosystem level: the dynamic interconnections among its elements and their evolution over time. Following Motoyama and Watkins (2014) methodologically an EE should be analysed from the perspective of the interconnections among entrepreneurs (E-E), among key support organizations (O-O) and between entrepreneurs and those organizations (E-O) within location context conditions. This is the reason for an Entrepreneurial Interconnections Poverty (EIP) approach proposed here. Those interconnections could follow a structure as in networks or not, they can evolve over time, interconnect with other EEs and be subject to external influence and shocks. But most importantly the EIP approach would be useful ex-ante in policy design by EE actors. The key insight of the proposed Entrepreneurial Interconnections Poverty (EIP) approach and its potential contribution is that knowledge of context and profiles of individual organizations and individual entrepreneurs' conditions are insufficient for income poverty reduction in a location. To reach that objective, it is necessary to develop an evolving culture of dynamic interconnections among actors (E-E, O-O, E-O) such that a minimum support EE is available for poor subsistence Kirznerian entrepreneurs and an optimal support EE is available for opportunity-based Kirznerian entrepreneurs. Table 2 presents some further literature review with this perspective.

Table 2: Set of key support interactions for the minimum Kirznerian EE

DIMEN-SIONS	INDICATORS	AUTHOR
Between entrepreneurs	Community learning & support	Motoyama & Watkins (2014)
	Novice-experienced meetings	Motoyama & Watkins (2014)
	Shared family networks *	Tassi (2017)
	Mentoring & coaching services	Motoyama & Watkins (2014)
	Dealmaker services	Mason&Brown (2014); Feldman & Zoller (2011)
	Access to a co-working space	Mitev *et al* (2018)
Between support organizations	Frequency of information exchange	Motoyama & Watkins (2014)
	Frequency of joint organization of events	Motoyama & Watkins (2014)
	Frequency of participation on each other's events	Motoyama & Watkins (2014)
	Agreements on self-organization	Ostrom (1990); Barja (2018)
	Agreements on self-governance	Ostrom (1990); Barja (2018)
	Agreements on costs sharing	Ostrom (1990); Barja (2018)
	Dealmakers support for agreements	Ostrom (1990); Feldman & Zoller (2011); Barja (2018)
	Have staff with E experience	Motoyama & Watkins (2014)
	Make lists of local experienced Es	Motoyama & Watkins (2014)
	Get feedback from experienced Es	
	Build belief, trust & commitment	Barja (2018)
Between entrepreneurs & key support organizations	Soft skills training & advice for Es *	Balcar (2017)
	Hard skills training & advice for Es *	Balcar (2017)
	Digital skills training & advice for Es *	Stone (2015)
	Legal and tax assistance & advice for Es	
	Dealmaker services	Mason&Brown (2014); Feldman & Zoller (2011)
	Business model assistance *	Motoyama & Watkins (2014)
	Establish startup fund & connect	Motoyama & Watkins (2014)
	Establish a co-working place for Es	Mitev et al (2018)
	Establish a local trade fair for Es	Gerhard & Peñaloza (2017)
	Build trust, commitment & connections	Barja (2018)
Connections outside the EE location	E-E, O-O, E-O events	Motoyama & Watkins (2014)
	Startup weekends	Motoyama & Watkins (2014)
	Regional/international trade fairs	Gerhard & Peñaloza (2017)
	Input/output networks	Tassi (2017)
	Mentoring services	Motoyama & Watkins (2014)
	Dealmaker services	Mason&Brown (2014); Feldman & Zoller (2011)

Source: Own.

The four dimensions express the objective of concentrating in interconnections as key guide to selection of their component indicators. Selected indicators must capture key interconnections aspects for each dimension and they must be expressed in numbers within a well-defined range (determined from survey data). The threshold criteria for each indicator is a number representing the minimum acceptable value for that indicator (determined from survey data) which must be consistent with the income poverty line. A location is poor in a specific indicator if its value is below the threshold (incidence). Once Table 2 has been filled, a location would be EI poor if it has a large number of indicators below their threshold, besides knowing why it is poor by dimensions and indicators, which can visually be represented by interconnection maps. The distance of the indicator to its threshold value would measure how poor is the EE in that indicator (intensity) and the weighted average of normalized distances would allow measures of EIP intensity for each dimension. Then a global index of EIP for the EE location could be computed by multiplying incidence*intensity. The latter would be useful to capture the impact of individual indicator variations on the index in interaction with the other indicators. Indicators with a star (*) in Table 2 would probably not be necessary for the optimal Kirznerian EE[44] case given that the average opportunity-based Kirznerians would have the means for technical and/or university education and be better prepared to take advantage of the EE in their four dimensions, while the average poor necessity-based Kirznerians won't have neither.

The proposal here has been thought out for one EE location only, however, the same idea can be taken at the national and subnational level by a weighted aggregation of individual EEs when the objective is to study interconnections between EEs and develop national and subnational indexes, as well as disaggregation by demographic and context characteristics as control variables.

Methodological approach for the empirical research

Implementation of the idea starts with mapping key ecosystem organizations and representative necessity-based and opportunity-based entrepreneurs within a specific geographically well-defined location, that would be considered an EE. Key organizations could be local family firms, microfinance organizations, universities and technical institutes, municipal government and other government agencies, NGOs and firm services companies, with no regard of economic sector. The next step would be to implement questionnaires and interviews for representative

[44] It would have other indicators instead.

entrepreneurs and key organizations in order to generate the data for the suggested indicators presented in Table 2[45], which could be organized in layers of support.

Table 3 is the actual proposal for the EIP index based on Table 2. The index has four dimensions with same weight of ¼ each. Each dimension has own number of indicators (questions) with equal weight. Each indicator generates a yes=1, No=0 answer for every actor interviewed**.** The poverty cut-off for dimension E-E is any 3 negatives of 5 indicators**.** The poverty cut-off for dimension E-A is any 3 negatives of 6 indicators**.** The poverty cut-off for dimension A-A is any 3 negatives of 6 indicators**.** The poverty cut-off for dimension A-E is any 2 negatives of 4 indicators**.** The overall EIP cut-off is any 11 negatives among all 4 dimensions and 21 indicators**.** Aggregation would allow simple computation of interconnection poverty proportions (intensity) by dimensions and overall ecosystem as expected. The selection of cut-offs is arbitrary but can be changed to better represent a location.

Two survey questionnaires are currently being developed based on Table 3, one for entrepreneurs (dimensions E-E and E-A) and another for stakeholders (dimensions A-A and A-E). Some key filters for each case are the following questions which would allow building particular sub classifications:

	Filters for entrepreneurs	**Filters for stakeholders**
1	Did you start your business out of necessity?[46]	Does your organization have interests on entrepreneurs in your community?
2	How old is your business?	How old is your organization?
3	Which economic sector does your business belong to?	What economic sectors does your organization work with?

[45] Indicators in Table 2 can only be suggestions for a starting list to be corrected by experimentation and revision of case studies on practical experiences in developing countries which would also inform on potential threshold and optimal values.

[46] This is a key question for separating necessity-based from opportunity-based entrepreneurs, which can be further complemented with consumption expenditure questions in order to identify those below the poverty line (US$s 3.67/day is used in Bolivia).

Table 3: Dimensions, Indicators and Weights of the EIP Index

Dimensions	Indicators	Weights
E-E (1/4)	Do you prefer to develop your business either alone or with your family?	(1/20)
	Do you have a mentor who advices you over your business frequently?	(1/20)
	When you develop a prototype for a new business idea do you look for support from others?	(1/20)
	Do you have a preferred place to meet with other entrepreneurs to share experiences?	(1/20)
	Did you receive help in connecting with other entrepreneurs in your community in the last year?	(1/20)
E-A (1/4)	Did you receive training in soft skills in your community in the last year?	(1/24)
	Did you receive training in hard skills in your community in the last year?	(1/24)
	Did you receive help in connecting to organizations with interests on entrepreneurs in your community in the last year?	(1/24)
	Did you receive help from organizations in your community when developing a prototype?	(1/24)
	Did you receive help from organizations in your community when developing new market segments?	(1/24)
	Did you receive help from organizations in your community to verify the profitability of your new business ideas?	(1/24)
A-A (1/4)	Did your organization exchange information with other organizations from your community about entrepreneurs and their businesses last year?	(1/24)
	Did your organization contribute to joint events with other organizations in your community last year?	(1/24)
	Does your organization participate in the events of other organizations with interests on entrepreneurs in your community?	(1/24)
	Is your organization part of some network with other organizations with interests on entrepreneurs in your community?	(1/24)
	If your organization is part of some network of organizations, has it defined administrative and operational objectives?	(1/24)
	Did your organization receive help in connecting to other organizations interested in entrepreneurs in your community?	(1/24)
A-E (1/4)	Do key employees of your organization have entrepreneurial experience?	(1/16)
	Did your organization provide support to local entrepreneurs in the last year?	(1/16)
	Did your organization receive advice from expert local entrepreneurs?	(1/16)
	Did your organization receive help in connecting to entrepreneurs of your community in the last year?	(1/16)

Note: Most questions must have follow up questions for needed completeness.
Source: Own.

The surveys will be implemented in two large natural entrepreneurial fairs within the metropolitan city of La Paz in Bolivia at one moment in time: Newer “Feria 16 de Julio” operates two days per week with majority necessity-based Kirznerian

entrepreneurs and older and permanent “Feria Huyustus” with majority opportunity-based Kirznerian entrepreneurs. Both fairs sell local produce in textiles, leather, wood works, metal works, handicrafts, foods and some information technologies. Entrepreneurs in commerce will not be taken into account. Both fairs also contain entrepreneurs at different stages of development as well as established small businesses. All of these characteristics would provide rich variation in the data. After detailed mapping of both fairs and support organizations around them, and after determining a representative sample and size, the survey would be implemented with the help of UCB students. Implementation of a pilot survey will be important to correct for clarity of questions and to simulate the computations of indicators.

Discussion and conclusions

While the multidimensional poverty literature allows thinking in terms of multidimensional poverty thresholds or minimums which define when a person is poor and by how much, the ecosystem approach allows thinking in terms of location multiple dimensions and interconnections among multiple stakeholders. This methodological incompatibility has expressed itself in government policy. For example, while poverty policy has concentrated in improving general levels of health, education and infrastructure, entrepreneurship policy for necessity-based and opportunity-based Kirznerian entrepreneurs has concentrated on improving entrepreneurial training and microfinance. However, neither developed specific policies for promoting interconnections among ecosystem stakeholders within EE locations and outside of them. This was generally left to market transactions, social policy and trade fairs. However, EEs have self-governance and coordination transaction costs characteristics that require them to operate outside the price system (Barja, 2018). The EIP measurement approach proposed here for income poverty reduction in a location, does it by promoting evolving dynamic interconnections among actors such that a minimum Kirznerian EE and an optimal Kirznerian EE are achieved by rounds of experimentation.

Beyond informational purposes, the location EIP measurement can be a useful tool for collective action by key EE actors. Also, when computed at national and subnational levels with demographic and context disaggregation and identification of interconnections among EEs, it can be used for government and private sector policy design and action. The perspective that the EIP tool brings is based on the implicit hypothesis that it might be a missing piece in poverty policy as it empowers local actors for the search of non-market collective action solutions. It can contribute to a better understanding of the entrepreneurship-

poverty relationship and more importantly it can contribute to the effectiveness of entrepreneurship in poverty alleviation. However, the EIP approach proposed has its own limitations in that it doesn't measure correlations and less so causality among key ecosystem variables. It is also limited to Kirznerian type entrepreneurs and their required EEs, thus not considering the very small number but more innovative Schumpeterian type entrepreneurs and their required EEs in a developing country context.

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Entrepreneurship for Sustainable Innovation

Changing the System to the Better

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Extended abstract

Growing concerns about overuse of natural resource, environmental degradation and social inequality have led to a call for a transition to a more sustainable economy and society. Based on the statement of the UN World Commission on Environment and Development, Our Common Future (Brundtland, 1987), the idea of sustainable development has become mainstream. Elkington (1997) introduced the concept of sustainable development in form of a Triple Bottom Line (TBL) concept, in which companies are called upon to pursue responsible practices and to give equivalence to the ecological, social and economic dimensions in decision-making. The need for sustainability-oriented innovation is widely acknowledged, but experiences and research highlighted that innovation alone is insufficient (Adams et al., 2016). In addition to technological advances and new business models, effective implementation and transformation are key elements. Implementation requires support from an ecosystem of diverse stakeholders. Transformation happens through adoption and diffusion mechanisms that are sensitive to cultural contexts and local needs.

In practice and research, sustainable entrepreneurship is seen as a pioneer of the transition to a more sustainable economy (Shepherd and Patzelt, 2011; Schaltegger and Wagner, 2011; Schaltegger, Beckmann and Hockerts, 2018). Tiemann, Fichter and Geier (2018) state that 'public policy has increasingly recognised the importance of entrepreneurship for sustainable economic growth

and solving fundamental challenges such as climate change' (p.83). Sustainable entrepreneurship is a relatively new field of research that is currently under development (Sarango-Lanlangui, Santos and Hormiga, 2018). Based on a systematic overview of the existing literature, Binder and Belz (2015) show that sustainable entrepreneurship is an increasing focus in entrepreneurship literature.

Traditionally, entrepreneurship is seen in terms of economic development. Scientific literature understands entrepreneurship as a process in which individual actors proactively identify, evaluate and exploit entrepreneurial opportunities and transfer them into successful business models (Shane and Venkatamaran, 2000). Environmental and social issues are rarely considered at all. However, a clear distinction from other types of entrepreneurship, such as social entrepreneurship, is often difficult to make. Furthermore, Bohnsack and DiVito (2019) recognized that 'types of sustainable entrepreneurs are likely to be diverse and nuanced. Some want to do good while doing well and others want to do well while doing good, which has implications for the performance and longevity of ventures' (p.27).

We are convinced that both the definition and the role of sustainable entrepreneurship need to be sharpened and clearly operationalized. Research is needed in order to reveal and define those factors that will allow drawing a distinction between "conventional" entrepreneurs and 'true' sustainable entrepreneurs. In practice, sustainable entrepreneurs often have the desire to contribute to a more sustainable world but end-up as 'conventional' start-ups. At the same time, conventional entrepreneurs might realize in their entrepreneurial process that their business outcome contributes to social and environmental well-being. Based on these considerations we are currently working on setting up a research agenda using cases from two on-going FHNW initiatives 'Swiss Startup Challenge' and 'Swiss Student Sustainability Challenge' which will allow us to systematically examine conventional start-ups in comparison with sustainable entrepreneurship ventures. Both FHNW initiatives have only recently started but already include more than 100 cases. This research will contribute to the further development of a theory of sustainable entrepreneurship.

Our research design includes three foci. One is to establish a set of research questions to clarify in how far the motivations and objectives of young ventures founded in the spirit of contributing to a Sustainable Development differentiate from those of start-ups with a rather conventional approach of identifying business opportunities without taking care of environmental and social concerns.

Doing so, we would like to challenge some of the theoretical assumptions of sustainable entrepreneurship claiming 'that on the individual level sustainable entrepreneurs tend to derive their will to act more sustainably from their personal values or traits' (Kraus et al., 2018:p.1). Only if there is to be found a noticeable difference, those definitions of sustainable entrepreneurs in literature asserting this difference are tenable. Another focus is on the question how incubators as the FHNW's initiatives can support young ventures to make sustainability-oriented innovation (SOI) really happen. Changing the system to the better according to sustainable development goals (SDG) is only given if the specific needs, motivations, and normative background of sustainable entrepreneurs are considered appropriately when providing them support, knowledge, and an exchange platform. However, research claims that 'insights on the requirements and success factors of implementing effective university support systems for sustainable entrepreneurship' (Tiemann, Fichter and Geier, 2018:p.18) and that targeted support for start-ups in 'green lead markets' is often missing (Fichter and Clausen, 2013). Furthermore, we believe that innovation for impact – a significant contribution to the achievement of the SDG – is only possible if the sustainable entrepreneurs develop a concrete understanding about the impact of their sustainable innovation at the early stage of entrepreneurship. They have to have a theory of change/success and are able to learn and optimize their desired outcome in terms of its impacts on sustainability. Holt and Littlewood (2015) in their research on hybrid organizations state that 'understanding what positive and negative impacts might occur is crucial to achieving value creation to support sustainable development and address acute social and environmental problems' (p.122). Hence, the third research focus is on how to visualize, monitor, and evaluate the young venture's impact on sustainability as well as to use this for impact optimization (their contribution to the achievement of the SDG).

The expected results will contribute to the further development of a theory of sustainable entrepreneurship, resulting in improved knowledge for improving the understanding of the role of sustainable entrepreneurship for systemic change towards sustainable development and provides new insights for assessing and benchmarking the SDG impact of sustainable entrepreneurship. As we are at the beginning of the conceptual design of our research, we are open to collaboration on extended data access.

Keywords

Sustainable Entrepreneurship, Sustainability-oriented Innovation, Systemic Change, Impact Assessment.

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Examining the Social Entrepreneurship Challenges in Nigeria

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Abstract

Social entrepreneurship is an innovative social value-creating activity that can take place among the non-governmental institutions, not-for-profit organisations, business, or government sector. Social entrepreneurs identify a challenging gap in society, discover the root causes of the problems and apply their entrepreneurial skills to proffer solution. The multi-case study was used to examine the challenges facing social entrepreneurs in Nigeria. Findings reveal that social entrepreneurship are yet to receive widespread recognition and necessary support from both the society and the Nigeria government, so, this has made full extent of its contribution inaccessible. Operating social enterprises has peculiar problems and is frequently a more complex task than that of operating other businesses. The study finally analyses the social enterprise challenges and suggests the best ways for the sustainability of social entrepreneurship for the society benefits and the well-being of the masses.

Keywords

Innovation, Social Entrepreneurship, Social Enterprise, Social Entrepreneur, Social Values, Social Mission.

Introduction

Social enterprise is described as an organisation that addresses a social problem through business methods (Roundy 2014). According to Global Entrepreneurship Monitor report, social entrepreneurship is taking root in both developing and developed nations, with more entrepreneurs focusing on doing good – rather than solely making a profit. There is a quieter and less-publicized entrepreneurial revolution spreading across Africa that involves social entrepreneurs creating enterprises to produce social good more so than profits (Mirvis and Googins 2018). Social entrepreneurs develop ventures with a mission to solve a pressing social problem (Spinelli and Adams 2012), and they also engage in the act of providing innovative solution to the society challenges.

Social enterprises are established with the mission to render social mission and the desire for better living. Social entrepreneurship may be defined as ventures that address social issues as their prime strategic objective and do so in an innovative and creative fashion (Carter and Jones-Evans, 2006). While aiming never to compromise social mission, social entrepreneurs will look for alliances and sources of resources wherever they may be found most easily (Carter and Jones-Evans, 2006). Kwedi, (2014) defined social entrepreneurship as any business activity that apply innovative and sustainable strategies to design and develop new products fulfilling unsatisfied needs in the society while targeting the masses. Social entrepreneurs are those 'rare breed of leaders' who search for change, respond to it and exploit it as an opportunity to develop new business models for the social empowerment (Vasakaria 2008).

Social entrepreneurs are arguably one of the most hopeful groups of people you will ever encounter. Problem solving is hard. Harder still is to solve the underlying issues that lead to those problems in the first place. Their ultimate goal is to put themselves out of business by creating a world without poverty, with equal access to health care and education, gender and racial parity, and a protected, natural environment- Haber (2016).

However, many researchers have argued that the social entrepreneurs exist primarily to provide programs and services that are of self-benefit to the masses. Whether in a developing economy (Nigeria, India, Cameroon) or in a developed country (United States, Europe) the masses would mean the very poor (the bottom of the pyramid) or simply the middle-class, respectively (Kwedi 2014). Weaver (2018) and Dacanay (2013), stated that social enterprises represent hope

in developing countries, where people are suffering from inadequate medical services, education, environmental challenges and other basic amenities. Social entrepreneurs use their skills not only to create profitable business ventures but also to achieve social and environmental goals for society (Scarborough 2013). However, as social entrepreneurs are driven by an ethical obligation and desire to improve their communities and societies, egoism can drive them to follow unethical practices ((Zahra, Gedajlovic, Neubaum, Shulman, 2009).

The purpose of this research is to examine the challenges being faced by social entrepreneurs in Nigeria and their significance impacts on the masses. In the rest of this paper, we establish an in-depth understanding of the impacts and challenges of social entrepreneurs in Nigeria with a multi-case study. The researcher observed that the social entrepreneurs face several challenges in developing countries, especially Nigeria, despite its meaningful objectives and selfless contribution to the welfare of the masses. In association with previous scholars (Weaver, 2018; Dacanay, 2013; Bornstein and Davis, 2010; Sivathanu and Bhise, 2013) on the study, we investigate the social entrepreneurs funding, institutional support, acceptance from the public, sustainability of the social enterprise and other environmental challenges. Finally, based on the submissions of various stakeholders and observations from the society, we suggest various options required for sustainability of social enterprise in Nigeria.

Literature Review

Mair and Marti (2006) see social entrepreneurship as different from other forms of entrepreneurship in the relatively higher priority given to promoting social value and development versus capturing economic value. Social value is derived from entrepreneurial activities that seek to address problems related to people and the planet, regardless of profit orientation (Spinelli and Adams 2012). Robinson (2006) defined social entrepreneurship as a process that includes the identification of a specific social problem and a solution to manage it; the evaluation of the social impact, the business model, and the sustainability of the venture; and the creation of a social mission-oriented for profit or a business-oriented non-profit entity that pursue the double bottom line. Social entrepreneurship encompasses the activities and processes undertaken to discover, define, and exploit opportunities in order to enhance social wealth by creating new ventures or managing existing organisation in an innovative manner (Zahra, Gedajlovic, Neubaum, Shulman, 2009).

Dees, (1998) summarised the roles play by social entrepreneurs as change agents in the social sector by;

- adopting a mission to create and sustain social value (not just private value);
- recognising and relentlessly pursuing new opportunities to serve that mission;
- engaging in a process of continuous innovation, adaptation and learning;
- acting boldly without being limited by resources currently in hand;
- exhibiting a heightened sense of accountability to the constituencies served and for the outcomes created.

Social entrepreneur focuses on a social mission; they may also be quite social in the way they carry out their activities, share knowledge, and celebrate their work. The motivation of a social entrepreneur is not necessarily profit but a benevolent attitude motivated by a deep-seated need to give to others (Galpin and Bell 2010). The Schwab foundation for Social Entrepreneurship holds that social enterprise models combine business practices and principles with the passion and compassion required to create a fair and just world. Social entrepreneurship is described as 'a process involving the innovative use and combination of resources to pursue opportunities to catalyse social change and/or address social needs' (Mair and Martí 2006; Montessori 2016). Social entrepreneurs develop important innovative solutions for complex societal challenges (Lubberink et al. 2018). As also reviewed by ((Vasakaria 2008), social entrepreneurship has changed from being a philanthropy to innovative business model.

In a review of social entrepreneurship, Carter and Jones-Evans (2006) delineated social entrepreneurs as those that engage with network activity not only to leverage resources and strengthen their own venture but also to deliver impact and create new social value. However, social entrepreneurs are expected to set out exhaustive plans for capital expenditure and to detail the social outcomes to be achieved in the face of very high levels of uncertainty (Dacin, Dacin and Tracey 2011).

Carter and Jones-Evans (2006) presented seven operational areas in which social entrepreneurs worked;

- poverty alleviation through empowerment (e.g. the micro-finance movement);
- healthcare, ranging from small-scale support for the mentally ill 'in the community' to larger-scale ventures tackling the HIV/AIDS pandemic;
- education and training, such as widening participation and the democratisation of knowledge transfer;
- environmental preservation and sustainable development, such as 'green' energy projects;
- community regeneration, such as housing associations;
- welfare projects, such as employment for the unemployed or homeless and drug and alcohol abuse projects;
- advocacy and campaigning, such as Fair Trade and human rights promotion.

In a review of social enterprise by Kay and McMullan (2017), they stated that consideration of social value will inevitably involve the commitment of resources, and when these are typically limited, investment in social impact assessment is foregone. For social entrepreneurs to achieve social value, they need to address basic human needs by targeting untapped or market failures, filling gaps through partnerships and deploying new business models (Mohampeloa 2017); Seelos and Mair, 2005). Moreover, Sivathanu and Bhise, (2013) state that social entrepreneurship is not a panacea because it works within the overall social and economic framework, but as it starts at the grassroots level it is often overlooked and deserves much more attention from academic theorists as well as policy makers.

Qualities of Social Entrepreneurs

Sivathanu and Bhise (2013) suggest the following qualities of social entrepreneurs:

- Ambitious: Social entrepreneurs tackle major social issues, from increasing the college enrollment rate of low income students to fighting poverty. They operate in all kinds of organizations: innovative nonprofits, social purpose ventures, and hybrid organizations that mix elements of nonprofit and for-profit organizations.

- Mission driven: Generating social value —not wealth—is the central criterion of a successful social entrepreneur. While wealth creation may be part of the process, it is not an end in itself. Promoting systemic social change is the real objective.

- Strategic: Like business entrepreneurs, social entrepreneurs see and act upon what others miss: opportunities to improve systems, create solutions and invent new approaches that create social value. And like the best business entrepreneurs, social entrepreneurs are intensely focused and hard-driving in their pursuit of a social vision.

- Resourceful: Because social entrepreneurs operate within a social context rather than the business world, they have limited access to capital and traditional market support systems. As a result, social entrepreneurs must be skilled at mobilizing human, financial and political resources.

- Results oriented: Social entrepreneurs are driven to produce measurable returns. These results transform existing realities, open up new pathways for the marginalized and disadvantaged, and unlock society‘s potential to effect social change.

Methodology

The multi-case study was used to examine the impacts and challenges facing social entrepreneurs in Nigeria. To select cases, information oriented sampling was used as diverse cases reveal more information than average or similar cases (Eisenhardt and Graebner, 2017). Five founders, fifteen managers and twenty-one employees, and thirty-five beneficiaries were considered for face to face interview. The qualitative research method was used for in-depth exploration of the study.

The semi-structured interview guide consists of 50 questions was prepared while the case selection was carefully done by conducting pilot study of five social enterprises in the South West Region, Nigeria. The interviews were conducted in Yoruba language and English, and at times the combination of the two languages, as determined by the respondents. The interviews took place between October 2018 and January 2019. Direct Interviews were conducted throughout the study with major stakeholders to establish the challenges being faced by social entrepreneurs and the impact on the masses. Data was analysed using thematic analysis to examine common patterns and underlying themes (Caringal-Go and Hechanova 2018) on social entrepreneurs impacts and challenges. The real names of the organisations were not revealed according to an agreement between the researchers and the respondents.

The interview was commenced with the brief overview of the research subject, followed by the major objectives of the research and procedures, and then discussed the required duration of the interview. The five cases are named A, B, C, D, E to represent the selected social enterprises. The researcher captured and coded the transcribed interviews, directly written interviews and as well as the information from the secondary sources.

Findings and Discussion

The findings of this study provide evidence that social entrepreneurs face lots of challenges in the delivery of their social mission. The study observed that there is less recognition to the social entrepreneurs' activities in the society, low participation from stakeholders, inadequate internal funding, lack of grants from external bodies (government), an informal operation of the social enterprise, economic policies among others.

In addition to the above findings, we also observed the following challenges from the respondents;

- People's perception about the social entrepreneurs; the belief
- Ineffective communication between the social entrepreneurs and the target beneficiaries.
- Insufficient support from other business sectors.
- Lack of adequate research and development to foster.
- Mismanagement of fund donated for the provision of social value.
- Improper organisation of the social entrepreneurship sector.
- Lack of strong entrepreneurial orientation among the social enterprises.

The study provides evidence that masses need support from social entrepreneurs to ameliorate their standard of living especially in the areas of education, health, infrastructural amenities (electricity, water supply, good road, technological development) and aids to innovative ideas. The result from this study is similar to the work of Sivathanu and Bhise, (2013).

According to one of the founders, social enterprise is easier to establish but hard to sustain especially in developing countries, because of difficulties in attracting donors. In another founder opinion, some people believe in investing their money on profitable businesses than putting their money in non -profit organization. Furthermore, few beneficiaries claimed that it took them many efforts to get assistance from social enterprise and mostly the social entrepreneurs' contributions are very limited.

Conclusion

This study confirms the belief that social entrepreneur faces challenges in the delivery of social mission. It also establishes the notion that social enterprise has significant impacts on the masses in the provision of social values. In this research, we analyse the stimulating situations surrounding the operation of social enterprise and its possible significance to the society. However, we believe that

the outcome of this study will generate basis of expansion of new research in the field of social entrepreneurship in Nigeria. The Government intervention is highly important to the sustainability of social enterprises. According to Mohampeloa (2017), core sustainability drivers focus on ensuring that there is a sense of agency, availability of resources, a consciously created awareness, a sustainable approach and the crafts of practice to act in the service of a more environmentally sustainable and socially just world. There is the need to pass legislation to give legal recognition to social business and establish a regulatory agency to ensure transparency, integrity, and honesty in this sector (Yunus and Weber 2010).

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Financing Social Entrepreneurship Franchising Approach

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Extended abstract

Social organizations mainly cope with social problems that the markets and the states have trouble or even fail to solve and, therefore, social entrepreneurs have been emerging in different locations throughout the world (OECD, 2010). Instead of being driven by financial returns, social organizations are focused on creating social and/or cultural values and they are not moved by its appropriation (European Commission, 2013). Regardless of its non-profitable nature, a social enterprise needs to be financially sustainable, if it is to reach its social goals. However, it is well acknowledged that social organizations struggle to be financially independent through income generation (Zafareiropoulou & Koufopoulos, 2012). As an example, in a recent survey performed to NGO's operating in Portugal (Project Entrance, 2018), social entrepreneurs have identified financing, as among the most critical problems they have to face. Therefore, social entrepreneurs must look for ingenious ways to solve their financial constraints. In this framework, social franchising has emerged as a strategy to overcome this problem. Moreover, franchising has also been adopted by non-profit organizations as a strategy for growth (Meuter, 2008). The alliance in a network of small social organizations allows them to gather the advantages of big organizations namely in terms of access to capital sources and rapid growth (Zafareiropoulou and Koufopoulos, 2012). However, in spite of the apparent auspicious solution it presents to social entrepreneurship, the franchising arrangements have been showing high failure rates in the social sector (Meuter, 2008).

Social franchising has been defined by the German Foundation for World Population as: ''[…] *a process by which the developer of a successfully tested social concept, the franchisor, in order to scale up the coverage of a target group and the quality of product (service) enables others, the franchisees, to replicate the model using the tested system, using the brand name, in return for social results, system development and impact information*'' (Meuter, 2008). In sum, to reach their social aims, social enterprises run social franchising networks and organizations following commercial franchising principles (Sivakumar & Choormans, 2011). As a result, the adequacy of the strategies used by the commercial franchising companies by the social franchising networks must be questioned, as there are considerable dissimilarities between the two sectors (Meuter, 2008).

Sivakumar and Choormans (2011) identify a few important differences. First of all, and the most obvious, is the fact that whereas commercial franchising focus on profitability, social franchising emphasizes the social impact of the organization's activities (Tracey & Jarvis, 2007). Second, there is a crucial difference regarding the type and level of risk sharing by a social and by a commercial franchisee. It is a social instead of an economic contract that runs the relationship between the social franchisor and its franchisees which seems to lead to a lower probability of social franchisees' adhering to the contracts (Lonnroth et al., 2007). In addition, consumers, which are in fact beneficiaries, may many times not be able to pay for the products or services and, therefore, donors (Tracey & Jarvis, 2007) are a very important third party in what is usually a dual relationship. These significant contrasts suggest the need to adapt the franchising strategy in a contingent fashion (Meuter, 2008) and that adjustment might be especially important in those strategies concerning the selection of franchisees (Sivakumar & Choormans, 2011) and the control and supervision of operations and results.

In the traditional franchising literature, an important advantage of franchising is that is works as a mechanism that aligns the incentives of the trademark owner and the managers of the units. However, in social franchising, that compatibility of incentives may not emerge spontaneously in the relationship, since social problems dominate the economic issues. The empirical literature on social franchising mostly covers cases where the beneficiaries of the social projects are parties outside the franchise relationship. This work analysis the possibility that the internalization of the beneficiary in to the franchise relationship might allow the realignment of incentives between the franchisor and the franchisee. In this framework, we intend to examine (a) the differences between the projects in which the beneficiary has an active role in franchising relationship (i.e., it is the

franchisee) and the projects in which it has a passive role (as employee or consumer of a service) (b) the outcome of these differences in the alignment of incentives between the parties in the relationship and (c) the resulting impact in the survival/failure of the social enterprise.

Keywords

Social franchising, social entrepreneurship, social organization financing.

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Redefining value(s) to understand social enterprises' business models

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Abstract

Through the exploration of value theories, this conceptual papers aim at proposing conceptualizations of 'value' that could serve as a basis to theorize social business models. Preliminary conclusions suggest that we should separate monetary value, use value and social value.

Keywords

Value theory, social business model, social enterprise,

Main text

Introduction

How can we describe adequately the business models of social enterprises? Business model theory propose a clear approach to explain how companies create value and survive in competitive environment. Students of social enterprises tend to rely on traditional business model frameworks to describe social business models (see for example: Margiono, Zolin, & Chang, 2017; Spieth, Schneider, Clauß, & Eichenberg, 2018; Yunus, Moingeon, & Lehmann-Ortega, 2010). However, they do not justify the theoretical adequacy of such transposition, while for-profit companies and social enterprises are unlikely to have the same success drivers. The goal of this paper is to draft more solid theoretical foundations for social business models. On the theoretical side, this task is important to find how activity configurations lead to success or failure of social enterprise. On the practical side, a valid theory of social business model will help identify important

factors and build relevant tools and frameworks to help social entrepreneurs model their activity.

To define possible theoretical foundations for social business models, I explore the concept of value. Indeed, the concept of value is central in business model theories, but the 'value' that is created by classical businesses may not be the same as the 'social value' that social enterprises aim to create. Thus, if we want to explain the different value creation mechanisms in the case of social enterprise, we need to define more precisely what 'value' means in that case. The question addressed by this paper is then: **How value is theorized in traditional business theory? And how can we adapt these concepts to the case of social business models?**

To answer this question, I explore the theoretical foundations of seminal papers on business model (by going back to the references they cite). Then I discuss their relevance for social business model, in comparison with existing work on social business model. The paper is organized as following: first, I briefly review the literature on social enterprises and business model theory. Then I show that what tend to be quite indistinctively called "value" in traditional business model literature covers in fact many concepts like: use value, willingness to pay, revenues, margin, profits… that can be sorted into use value and monetary value. Then I discuss the concept of "social value" emerging in the social business model literature. I conclude that a social business theory should account for these three type of value : monetary value, use value and social value.

Social enterprises and business model theory

Social enterprises (SE) are organizations pursuing both social goal and economic activities. The economic dimension is defined by the EMES network through a bundle of indicators like the production of good/service, a high autonomy, the existence of economic risk taken by the organization and the presence of paid workers (Defourny & Nyssens, 2010, p. 43). Concerning the social dimension, it can be related to the specific need addressed; the relation between actors, the population targeted or to general values that the organization defends (Defourny & Nyssens, 2017). A recent stream of research is trying to identify which kind of business models social ventures can adopt to fulfil their social mission (Margiono, Zolin & Chang, 2017; Mair & Schoen, 2007; Woolley, Bruno & Carlson, 2013). Scholars define a business model as the description and combination of resources and activities used by an organization to create, deliver, and capture value (Amit & Zott, 2001; Casadesus-Masanell & Ricart, 2010; Demil & Lecocq, 2010; Zott, Amit

& Massa, 2011). Three main elements constitute a business model (Osterwalder & Pigneur, 2010): the value proposition (product/service offering, customer segments, customer relationships), value creation (activities, resources, partners, distribution channels) and value capture (revenue/cost model). The contributions on social business model usually rely on these frameworks. However, several problems rise when we examine the fit between the activities of social enterprise and the business model framework.

First, the objective of a classic business model is to creates value for the parties involved and generates profit for the focal firm (Zott & Amit, 2010). However, the absence of the profit motives is usually cited as a core difference between social and classical enterprises, even if this difference can be seen as a continuum rather than strict categories (Peredo & McLean, 2006). Secondly, in the case of social enterprises, those who pay are not necessarily those who receive the good or services (the payer or client is not always the target beneficiaries). Social business models are thus likely to be multi-sided business models and novel cognitive frames may be needed to understand these complex business models (Baden-Fuller & Mangematin, 2013). The third difficulty, that I try to adress in this paper, is to conceptualize adequately the notion of value for social business model. The concept of value is central in the literature on social business models (as in the classical literature). Questions such as the characterisation of value proposition, social value propositions, value creation or value capture are crucial to describe business models. Below, I explore the conceptualisation of value related to the notions of value proposition, value capture and social value.

From value proposition to use value

The notion of value proposition can be related to the one of use value. In this section, I explore the concept of use value, which on subjective judgements such as utility, perceived utility, and pro-social preferences.

Utility

In the philosophical tradition, utilitarian define utility as happiness, pleasure or the satisfaction of informed preferences. Informed (or rational) preferences are the preferences someone would have if she had all the information concerning the consequences of her actions, and if these preferences were not restrained by any beliefs that could lead to self-censorship (Kymlicka, 2002). Utility can stem from any experience someone wants to accomplish.

Perceived utility or perceived use value

Perceived utility is “the consumer's overall assessment of the utility of a product based on perceptions of what is received and what is given” (Zeithaml, 1988:p.12). The concept of perceived utility is close to the definition of value proposition in business model theory. Osterwalder define value proposition as a mix of element catering customer’s needs (Osterwalder & Pigneur, 2010), it represents value for a specific target customers (Osterwalder, 2004). More precisely he cites Kambil for who customer value is “the difference between perceived benefits (the extent to which a product or service fulfills or exceeds customers needs) and perceived costs (the full costs associated with the product or service)” (Kambil, 1996:p.10).

Making the distinction between utility and perceived utility is usefull to understand what social enterprises are doing. For some social enterprises, what beneficiaries want is not necessarily what is good for them (Ansari, Munir & Gregg, 2012; Lumpkin *et al.*, 2013). The goal of a social enterprise can be to change the perceived value of the beneficiaries concerning a product.

Pro-social preferences

Social enterprise business models are likely to rely at least partially on pro-social behaviour and stakeholders intentions to benefit society: some donators will provide money, some consumers will accept to pay a premium; the social entrepreneur will take the risk of starting an activity that may not be sustainable… Many mechanisms can explain why people judge valuable enact such pro-social behaviours. First, donators or volunteer can experience direct personal utility from their participation to a social enterprise such as acquiring new skills, create new social relationships, gain prestige or reputation. Secondly, people conducting pro-social behaviour can just feel good about helping others. Charitable help is indeed linked to well-being and happiness (Post, 2005), the “warm glow effect” in economic theories (Graff Zivin & Small, 2005:p.3). People can also behave in a certain way to respect social norms.

From value capture to money

Money

For Bowman and Ambrosini, value capture consist in capturing exchange value (Bowman & Ambrosini, 2000). On the other hand, concerning strategic network theory, Jarillo define value added as margin: “when business people talk of activities with more or less value added, they are actually referring to activities with better or worse margins” (Jarillo, 1995:p.32). This definition is different but

there is still the idea of generating exchange value that will lead to better margins and profit, in the form of money. Monetary value or prices are not necessary related to the usefulness of a product. Adam Smith explains this with the diamond–water paradox. Water have a great value in use but a low value in exchanges, on the contrary, the diamond has a low use value but is can be used to get great quantity of other goods in exchange for it (Smith, 1817).

Willingness to pay

Perceived use value is sometime translated into monetary terms (Bowman & Ambrosini, 2000) through willingness to pay. This definition of value using monetary proxies is used in the business model literature. In their seminal paper, Amit and Zott, citing Porter, define value as 'the amount buyers are willing to pay for what a firm provides them. Value is measured by total revenue… A firm is profitable if the value it commands exceeds the costs involved in creating the product' (Porter, cited by Amit & Zott, 2001:p.496). Amalgamate perceived utility and willingness to pay can be misleading in the case of social enterprises because the targets are sometime are sometime disadvantaged population who can be unable to pay even if they value the product (Santos, Pache & Birkholz, 2015). In that case the willingness to pay, or actual purchase behaviour do not always equals the perceived utility.

Social value

In this section, we review the definitions of 'social value' in the literature on social enterprise and discuss how it could be conceptualized in social business model.

Social value in social enterprise literature

Authors who study social business models tend to as the idea of social value named social profit (Yunus, Moingeon & Lehmann-Ortega, 2010), mission (Mair & Schoen, 2007; Margiono, Zolin & Chang, 2017; Vial, 2016; Woolley, Bruno & Carlson, 2013) or social value (Hlady-Rispal & Servantie, 2018; Sparviero, 2019). The idea of social value or social mission is a recurring idea in the literature on social enterprise, however it is difficult to define what is 'social' and what is not. Various definitions co-exist within the literature. Michelini and Fiorentino use business models and refer to Porter and Kramer's idea of shared value (Michelini & Fiorentino, 2012). In their "big idea" of creating 'shard value', Porter and Kramer define shared value as "practices that enhance the competitiveness of a company while simultaneously advancing the economic and social conditions of the communities in which they operates", and value is defined "as benefits relative to costs" (Porter & Kramer, 2019). Spieth et al. identified empirically "three

categories of social missions: Enhancing the availability and accessibility of resources, supporting people with disadvantages, and achieving fairness."(Spieth *et al.*, 2018:p.5). Defourny and Nyssen note that an enterprise may be qualified as social because of the nature of the goods or services they provide (health, education…), because they pay attention to disadvantaged social groups or aim at promoting broader societal values like economic democracy or sustainability (Defourny & Nyssens, 2017:p.18). Several authors mention the potential contribution of social enterprises to the Millennium Development Goals (Seelos & Mair, 2005; Vial, 2016; Woolley, Bruno & Carlson, 2013). Other authors make some more technical attempts to describe the mission of SE such as addressing neglected problems with positive externalities (Santos, 2012) or solve market failures (Austin, Stevenson & Wei-Skillern, 2006). As Santos note, the definition of the 'social' is either tautologic or normative (Santos, 2012) because it would necessitate to define what is a 'social' need and who deserve 'social' help. Santos's 'positive theory' is that the domain of social entrepreneurship are neglected positive externalities. However, we cannot escape normativity: when we qualify an externality as positive or negative we implicitly rely on moral criteria (Claassen, 2016). Economic theories are rooted in utilitarian philosophy and Santos's perspective too, as he rely explicitly on them and define social welfare as the aggregation of utilities (Santos, 2012). Even if a normative discussion concerning social enterprise may be usefull, we will try to avoid normativity in the framework we are building.

Social value as social expectations

How to escape subjectivity and normativity in the definition of social value? We believe that an exit door for this dilemma might be to describe the normative reasoning of actors themselves rather than trying to find an objective definition. For example, in her research about price determination in a fair trade organization, Reinecke distinguish subjective value and the social process of valuation (Reinecke, 2010). Social value would correspond to this social process. The concept of utility is powerful because it does not imply to define substantively what each people desire. Similarly, the concept of social value could be a black box representing what people evaluate collectively as valuable for society. The empirical definitions of what is 'social value' can thus be diverse and could be described using various theories such as economics of convention (Boltanski & Thévenot, 1991), descriptive ethics, institutional theory...

Propositions

After this review, we propose to keep three main construct to study social business model : money, utility and social value. I will not enter the debate about the nature of money and will simply define it as an item accepted as payment. I define utility according to the philosophical perspective as the satisfaction of subjective preferences. These preferences can concern a personal benefit (use of goods and services, money, reputation…), or include benefits for others through pro-social preferences (helping others, reduce inequality…).Then, I define social value as a collective perception of the fairness of the social business model outcomes. As this perception may depend on the goal of the social enterprise and on the definition of fairness used, I leave voluntarily a relativist criteria to evaluate social value.

Type of value	**Definition**	**Evaluation before relationship**	**Evaluation after relationship**
Money	Item accepted as payment	Ideal price or willingness to pay	Payed price
Use value	Satisfaction of personal or pro-social preferences	Perceived value	Satisfaction
Social value	Improvement of fairness within society	Judgement concerning the fairness of a state of the world	Evaluation according of the business model according to fairness criteria

Table 1 – Three types of value

I argue that we need these different types of value because they are not necessarily commensurable with each other. The link between money and use value is easily made in the context of trade and the exchange of commodities. However, social enterprises may partially evolve in non-market environment. They may create use value that do not find a monetary counterpart when beneficiaries are unable to pay, and receive monetary income that do not correspond to the sale of commodities. The resources they manipulate does not necessarily go

through money and market exchanges. Then, we need to be able to describe these resources for themselves as use value. Volunteering may be seen as relationship generating use value of different types for the volunteer (social relationships, recognition...) and the organization (labor helping to achieve the organization's goal). On another hand, producing social value, attaining a more desirable state of the world, may include the production of use value or the use of money, but is not limited to this. For example, decreasing inequalities imply generating use value for the disadvantaged population but the measurement of the satisfaction of their needs tells nothing about the reduction of inequalities.

Furthermore these three type of value may correspond to three different types of forces in social enterprise environment : generating monetary may be necessary to survive in a market environment, the generation of use value imply that the activity is in adequacy with stakeholders' needs, and the production of social value may interact with institutional pressures.

Crafting a theory of value for social business models is an ambitious task and I only drafted a few propositions that need to be refined and tested empirically. I also did not discuss the question of "value creation" and the value of labour and resources (especially natural ones) that may be employed in this process. I choose a quite agnostic definition of "social value", however, it would be worth exploring more precisely the different types of social goals that social enterprises have in order to define which social business model fits which goal.

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Sustainable Business Models At The Bottom of The Pyramid

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Extended abstract

Despite the growing interest in the Bottom of the Pyramid (BoP) literature, issues like social and environmental topics in the BoP context and business models of BoP entrepreneurs need to be developed further (Khalid & Seuring, 2017; Puente, Cervilla, González, & Auletta, 2017). In this research, we attempt to address these gaps in the BoP literature. Our argument is that we will have a sustainable society inasmuch as BoP entrepreneurs implement sustainable activities. We do not know the structure of business model of BoP entrepreneurs and how their activities help the society to overcome social, cultural and environmental problems. BoP entrepreneurs confront many challenges, for instance to achieve capabilities for alleviating their lack of resources (Shivarajan, Srinivasan, & Shivarajan, 2015) and to develop strong business models to be able to scale and come out of poverty (Cervilla & Puente, 2013). The goal of this research is twofold, first we want to draw the SBM of a BoP entrepreneur and second, we want to study how the business models of BoP entrepreneurs can contribute to resolving social, cultural and environmental issues. In order to understand how the business models of BoP entrepreneurs may contribute to the transformation of the society into a more sustainable place, we will draw our study into three literatures: BoP literature, business model literature and sustainable business model literature.

The concept of Bottom of Pyramid (BoP) was coined for the first time by Prahalad & Hart (2002) and became the framework for discussing poverty in business academy (Ana Maria Peredo et al., 2017). Kolk, Rivera-Santos, & Rufín (2014) in their literature review stated that research on the BoP mostly puts the accent on

consumers despite the fact that the effect of the strategy suggested by Prahalad & Hart (2002) has no clear empirical support. In order to address the critics made by some scholars (Karnani, 2009), London (2014) developed the BoP Protocol. He stated the importance of the Business Models (BM) behind BoP ventures. London & Hart (2004) called for a more collaborative alliance with the BoP. In the same line, London (2014) stated that companies should work in equal condition with BoP communities for co-creating new ventures. In this context, Shivarajan et al. (2015) extend the BoP poverty alleviation approach by considering the poor nor just as mere consumers but as valuable suppliers of intellectual property. They show a case regarding the knowledge of the poor about the protection of agricultural biodiversity based on the study made by Grupta (2010).

Business Model (BM) literature has become popular since the boom of e-commerce in 1990s (Zott & Amit, 2010). One of the most influential papers in the BM field, is the one written by Magretta (2002). In her paper titled "Why Business Models Matter" she argued that every successful BM must consider the following elements: 1) a clear identification of the customer that a company want to serve, 2) a clear identification of what customer really appreciate or value and 3) the effective way of doing income. Zott et al., (2010) claim that the research on BM was made from a different perspective among them 1) the use of information technology in organizations, 2) strategic issues for instance value creation, competitive advantages, firm performance, and 3) innovation and technology. In this line, Wirtz, Pistoia, Ullrich, & Göttel (2015) point down the fact that there is a convergence in studying BM from a strategic point of view. The stream of research on BM from the strategic perspective, support that firms can compete through their business models (Casadesus-Masanell & Ricart, 2010).

Sustainable Business Models (SBM) is an emerging field (Fancy, Dembek, & Dembek, 2017). Lüdeke-freund (2010) define SBM from a strategic management perspective as "*a business model that creates competitive advantage through superior customer value and contributes to the sustainable development of the company and society*". We have some outstanding contribution regarding the definition of SBM (Ludeke-Freund, 2010; Morioka, Bolis, Evans, & Carvalho, 2017). At the same time, we have some researchers that deal with the development of a framework and tools for the implantation of SBM (Stubbs, Cocklin, & Stubbs, 2010). Others like Joyce & Paquin (2016) expanded the Canvas Business Models by incorporating environmental and social issues in its design . Following the logic of Michelini & Fiorentino (2012), we can restate their claim by stating that healthy BoP entrepreneurship needs a healthy society (and) at the same time a healthy

society needs healthy BoP entrepreneurship. So BoP entrepreneurs by implementing SBM they will contribute to the society by developing sustainable entrepreneurship.

The research will be exploratory and qualitative. The information will be collected from the multiple case study approach with in-depth interviews. From a preliminary reconstruction cases of BoP entrepreneurs in different regions of Bolivia, for instance: La Paz, El Alto, Viacha, Cochabamba, Santa Cruz and Tarija from a sustainable perspective, we could show how sustainable activities are embedded in their business models. The case of ASARBOLSEM in La Paz, shows how BoP entrepreneurs can make a business sustainable by matching values upstream and downstream of the venture. The cases of MINKHA in Cochabamba, ARTECHI and PAUROCA in Santa Cruz shows how their activities preserve the culture and the biodiversity of each region. The cases of a BoP entrepreneurs in El Alto and Viacha dealing with balanced animal feed and dairy products, respectively, demonstrate how their activities looks for solving lack of competitiveness and migration issues of the countryside. Last but not least, La miga a bakery venture in Tarija, show how her activities help to improve social issues by preserving the health of consumer by employing natural resources in the production of bread.

Keywords

Sustainable Business Model, Bottom of the Pyramid, Entrepreneurs

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The HRM strategies for labor market integration of refugees in turkey: The case of a social entrepreneur

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Abstract

This case study reports on the labor-management strategies of a social entrepreneur that employs refugees as part of its workforce in Turkey. Supported by qualitative data, the results will be of interest to policymakers, NGO-Rs as well as organizations that are looking for ways to have a more diverse workforce.

Keywords

Refugee Employment, Social Entrepreneur, Human Resource Management, Turkey.

Main text

This case study reports on the business model innovations of a social entrepreneurial organization (SEO) from Turkey and it's labor management strategies for refugee employment. The social mission of the case SEO is to provide income opportunities for mothers that are from disadvantaged groups (e.g. low-income families, single women, women who experienced domestic violence and refugee groups). Refugee employment is a relatively new phenomenon in the country and in integrating refugees into its workforce the SEO seeks ways of addressing a social problem in this specific context and to attain business objectives as well (Schaltegger et al., 2012).

The number of people driven away from their homes in the world has skyrocketed, reaching 68.5 million people by the end of 2017. More than a third of these people are refugees that are running away from their countries for the reasons of conflict and persecution. Since the starting of the Syrian Civil war in 2011, 6.3 million Syrians have sought refuge in other countries (UNHCR, 2018). Turkey has adopted an open–door policy since the outbreak of the war until 2016, which resulted in a major influx of Syrians arriving through the border. Turkey remains *the world's top refugee-hosting country* with 3,6 million Syrian refugees as of December 2018 (Refugee Association, 2018; UNHCR, 2018).

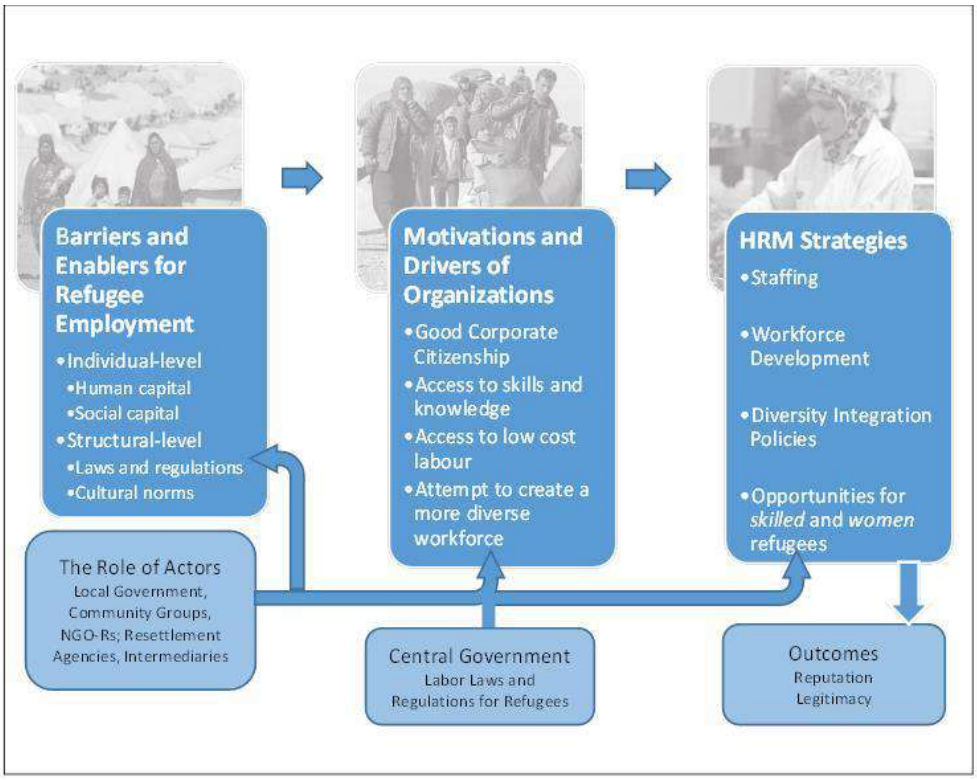
Refugees face numerous barriers in relation to finding employment in the host country. Even though each refugee's experience is unique, the literature points to some common issues that can be summarized as *individual* and *structural barriers* that are slowing down the processes of finding meaningful employment for the refugees (e.g. Campion, 2018; Baranik et al., 2018; Wehrle at al., 2018). During the labor market integration processes support from local labor market institutions such as the local government, resettlement agencies, NGOs and intermediaries are very important for refugees (Verwiebe et al., 2018; Garkisch, 2017). Employing special groups of employees (e.g. immigrants or refugees) presents unique challenges for local organizations (Guo, & Ariss, 2015; Gericke et al., 2018; Newman et al., 2018a). The organizations are recommended to understand the needs of the refugees, find specialized ways to attract them and adopt alternative strategies to integrate them into their workforce (Zikic, 2015). Prior studies based on refugee experiences have repeatedly reported about the discrimination that refugees experience during the job search (e.g. Verwiebe et al., 2018). Therefore, through understanding the characteristics of these groups, organizations can adopt proactive, inclusive and differentiated recruitment strategies (Guo & Ariss, 2015). In summary, the data points to the large gaps in refugee access to the labor markets and underlines the urgency of acting for better integration policies and practices.

In Turkey, Syrian refugees are given rights to work in 2016, however, they are found to experience difficulties in benefiting from these rights (Saraçoğlu & Bélanger, 2019). And there are only a few scientific studies on individual experiences of discrimination against refugees (e.g. Knappert et al., 2018; Sunata & Tosun, 2018)) and no study examining the organizational strategies of Turkish businesses. Consequently, I believe Turkey provides a useful context to explore the strategies of businesses in integrating refugees into their workforce.

A social entrepreneurial organization can be broadly defined as an innovative and social value creating organization, that is not defined by its legal form (Austin et al., 2006), but chooses the primacy of the individual and social objectives over the capital, reinvests surpluses and applies democratic governance principles (Monzon & Chaves, 2017). SOEs, however, are different than other social-mission organizations as they choose not to rely on donations but aim to create their own financial resources in order to address social issues (Newman et al., 2018b). The way SOEs discover, define and aim to find solutions for pressing social issues is by building solutions into their business models (Haigh & Hoffman, 2012). Different than traditional entrepreneurial organizations SOEs firstly aim for value creation rather than value capturing (Santos 2012). Alter (2007) classifies SOEs based on their mission orientation (mission centric, mission related and unrelated mission) and the level of integration between social programs and business activities (embedded, integrated and external). For example, in the embedded social enterprise, financial and social benefits are achieved simultaneously, and the target population (e.g. customers, employees) is integral to the business activities. As such the business model of these SOEs can include employing disadvantaged populations and thus, aim to contribute to employment creation as part of their social mission (Alter, 2007).

Despite similarities with a traditional entrepreneurial organization, operating with dual bottom lines (financial and social) causes internal and external tensions for a SOE (Battilana, J., & Lee, M., 2014). For example, when the beneficiaries of the SOE and the customers are not the same, the management of the SOE becomes even more complicated (Santos et al., 2015). In the literature organizational mission, financial and human resources are identified as obstacles affecting SOEs in advancing their goals (Austin et al., 2006; Doherty et al., 2014). Based on a national survey in the UK, Bridgstock et al. (2010) demonstrate the ways in which diversity management can contribute to innovation and business performance of SOEs. In the same vein, Lee et al. (2019) recognize the internal conflicts caused by the hybridity nature of SOEs and suggest participatory human resource practices (e.g. open communication and information sharing) and the development of a diversity climate in order to manage these tensions. In summary, the literature notes hiring and socialization strategies (Battilana, J., & Lee, M., 2014; Bruneel et al., 2016), job design and high involvement work practices (Truong, & Barraket, 2018; Lee et al., 2019), organizational climate (Bridgstock, et al., 2010; Lee et al., 2019) and leadership development (Thorgren, & Omorede, 2018) as some of the HRM strategies that SOEs can employ in order to better manage the internal challenges.

Figure 1 The Conceptual Model of the Research Study



With the aim of examining the HRM strategies for labor market integration of refugees, a conceptual model that takes into consideration barriers and enablers for refugee employment, the role of varied actors, motivations and drivers of organizations and HRM strategies is constructed (Figure 1). Based on the conceptual model of the study, this case study examines the labor management practices of a social entrepreneur from Turkey and asks the following research questions.

- How does a social entrepreneurial enterprise integrate refugees into its workforce?

- What are the sustainability implications of social entrepreneurial enterprise`s labor management strategies?

As refugee employment is a recently emerging field of study, I suggest using literature on migrant employment together with diversity management and social entrepreneurship for this study. In order to answer the first research question, the

two variables that are used are the hiring and socialization strategies of the SOE. With the purpose of examining the complexities of refugee employment, HRM strategies for local and refugee women are collected separately and compared. In order to answer the second question a more sustainability-based assessment is used, and environmental, economic and social goal achievement is investigated for the SOE (utilizing multiple informants). With the intention of examining goal achievement, the mission of the SOE is compared with the outcomes of the enterprise.

To explore the distinctive challenges in managing the human component of SEOs with hybrid nature, this study adopted an in-depth study of a Turkish SEO that employs a diverse workforce. An organization that has been around for longer periods of time suggests that the founders have tackled with varied people-related issues and will provide valuable insights into the problem area. There are many entrepreneurial companies that are founded by refugees and that prefer to provide employment for refugees (Yagcı, 2018); however, there are fewer local companies that employ refugees as part of their social mission in the country. And the latter form is expected to bear a higher conflict in labor-management relations for the basic reasons of cultural clashes. Therefore, the case SEO was selected based on the criteria of i) SOE that is operating more than 5 years, ii) Integration of refugees into the workforce, and iii) Not founded by a refugee. Bebemoss is founded in 2014 by Izabela Ersahin, a French mother who lives in Istanbul. The social mission of the company is to provide income opportunities for disadvantaged mothers. The company produces crochet toys and knitwear for babies from organic materials, which are sold in retail stores and online shops both locally and abroad. The company provides income opportunities to one hundred women, of which 30 are refugees. The women reside in periphery areas of the city, they work from home and they are paid by the piece.

Data were collected during 2017-2019 from multiple sources to capture the key challenges of the phenomenon analyzed (Yin, 1994): observations, in-depth interviews, secondary data, and social media analysis. Observations were made during the founder's meetings with third-party organizations and workforce training. In-depth interviews were conducted with the founder of the company, a partner, the workforce (Turkish and Syrian Refugees) and an NGO leader. An Arabic language translator was used for interviews with the refugees. In the absence of printed documents, the secondary data relies on a documentary movie and social media of the SEO.

The findings display the changes made to the mission-centric and embedded business model of SOE between the time of its establishment and now (5 years). Over time, as the social entrepreneur's experience has built up, the types of HRM strategies for hiring and socializing have also progressed. These changes are discussed in light of the internal and external factors affecting the SOE. The study, additionally, explores the motivations and drivers for employing refugees and identifies human resource management strategies (HRM) that eliminate discrimination during staffing and workforce development for refugees (Figure 1). Furthermore, the study discusses the achievement of sustainability goals and the barriers for not fully accomplishing these goals.

By using literature on social entrepreneurship and refugee employment, I aim to contribute to the literature in three distinct ways. First, I want to highlight the role of various actors in shaping the labor market integration processes of refugees in the very relevant context of Turkey. Supported by qualitative data, the results will be of interest to policymakers, NGO-Rs as well as organizations that are looking for ways to have a more diverse workforce. Second, I aim to expand the literature on refugee employment, with special emphasis on hiring and integration policies. Third, I aim to bring explanations on to the motivations of social entrepreneurs for employing refugees and contribute to the literature at the intersection of HRM and social entrepreneurship.

Acknowledgment: The author wishes to acknowledge the financial support of Bogazici University Research Fund with Grant Number 11560.

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The Role of Virtual Learning Environments in the Democratization of Entrepreneurship Education in Africa

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Abstract

The lack of access to effective Entrepreneurship Education (EE) is a key factor constraining the level of entrepreneurial intentions and behaviors of entrepreneurship graduates across Africa. Based on an extensive literature review on EE programs and pedagogical approaches in Africa, this short paper explores the differences in efficiency, effectiveness, and inclusiveness of EE programs between two different pedagogical approaches: Traditional Classroom Learning and Virtual Learning Environment.

Keywords

Entrepreneurship Education, Virtual Learning Environments, Entrepreneurial Intentions and Behaviors, Africa, Democratization of Education.

Introduction

In recent years, entrepreneurship has been increasingly recognized as a valuable tool for the achievement of sustainable growth (Ayodeji & Oluwatayo, 2015), yielding the basis for business initiatives and development agencies to cooperate for a more inclusive and effective development path (Barcelona Centre for International Affairs, 2014). In a recent report (Robb, Valerio & Parton, 2014), the World Bank emphasized the need for more entrepreneurship education in Africa.

The promise of transformative growth of entrepreneurship in the socio-economic spectrum encouraged multiple African governments to conduct reforms of the education systems, in an effort to boost effective education, job creation, and economic development. Yet, Bwisa (2017) points out that, in most African countries, very few entrepreneurship graduates are self-employed. In line with the World Bank's remarks, Kew et al. (2015) concluded that the key constraint affecting the level entrepreneurial intentions and behaviors of entrepreneurship graduates across Africa is the lack of access to effective and inclusive Entrepreneurship Education (EE).

Although a robust body of research supports the role that entrepreneurship education has in raising the level of entrepreneurial self-efficacy, as well as the link between entrepreneurial self-efficacy and entrepreneurial intentions (Piperopoulos & Dimov, 2015; Turker & Selcuk, 2008; Wilson, Kickul, & Marlino, 2007), research on how different pedagogical approaches to entrepreneurship education programs influence the level of entrepreneurial self-efficacy, intentions, and behaviors is scarce (Fayolle & Gailly, 2013). Valuable studies in this research stream focus essentially either on entrepreneurship programs' specific educational variables, such as content, evaluation methods, and structural and educational support (Soutaris, Zerbinati, & Al-Laham, 2007; Piperopoulos & Dimov, 2015; Krueger & Carsrud, 1993; Bae et al., 2014; Turker & Selcuk, 2008), or on entrepreneurship programs' participants' characteristics, such as motivations, background, and context (Bae et al., 2014; Ang & Hong, 2000; Wang & Wong, 2004; Henderson & Robertson, 2000; Lee, Chang & Lim, 2005; Luthje & Franke, 2003; Turker et al., 2005). But thus far, very little is known on how the art of teaching and learning entrepreneurship influences entrepreneurial intention and behavior (Fayolle & Gailly, 2013). This warrants a closer look at how different pedagogical approaches (traditional classroom learning versus virtual learning environments) influence entrepreneurship education programs in three key dimensions: efficiency, effectiveness, and inclusiveness.

With this in mind, we set out to explore how an increasing level of virtual online education and collaborative integration within a student-centered environment might contribute to the democratization of EE in Africa. The democratization of EE refers to the provision of inclusive, effective, equal learning and teaching experiences (Iloanya, 2017). By evaluating and comparing the influence of traditional classroom learning versus virtual learning environment entrepreneurship education on the levels of entrepreneurial self-efficacy, intentions, and behaviors of entrepreneurship graduates, this paper aims to

conceptualize the potential for the level of online and collaborative integration within a student-centered environment to improve the efficiency, effectiveness, and inclusiveness of EE in Africa. With *traditional classroom learning (TCL)*, we are referring to teacher-centered, one-way, offline-learning spaces, where teachers are transmitters of knowledge and learners merely absorb and capitalize on what is delivered by the teacher. *Virtual learning environments (VLEs)* are student-centered, multi-way, online-learning spaces, where learners and educators participate in online interactions of various kinds, including individual online learning and collaborative project-based learning.

Discussion of the state of virtual educational technologies in the context of Africa's higher education institutions is of great interest and importance (Rivers, Rivers & Hezell, 2015). Although many of the most vulnerable African economies are lagging behind in this technological race to develop and implement educational digital technologies, it is important to notice that this trend is changing. Some of Africa's high-tech entrepreneurship booming economies – namely, Kenya, Ivory Coast, Nigeria, Ghana, and South Africa (KINGS) – currently have over 20 years of experience in the development, implementation, evaluation, training, and policy development of virtual educational technologies (Rivers, Rivers & Hezell, 2015).

We begin this paper with a review of relevant streams of research and previous study results on the relationship between entrepreneurship education and entrepreneurial self-efficacy, intentions, and behaviors. Next, we identify and describe three EE program dimensions. We conclude with a conceptual framework that compares EE program dimensions in TCL-based programs versus VLE-based programs.

Background

Entrepreneurship Education in Africa

Despite the different realities in each one of Africa's 54 member states, high levels of poverty, rising income inequality, and declining commodity prices are a constant in most of Africa's economies. According to 2019's African Economy Outlook, Africa's working-age population is projected to increase from 705 million in 2018 to almost 1 billion by 2030. At the current rate of labor force growth, Africa needs to create about 12 million new jobs every year just to prevent unemployment from rising even higher. This is why it is urgent for young people to be efficiently, effectively, and inclusively educated in the field of

entrepreneurship; it is urgent for Africa's youth to become job-creators instead of job-seekers (Jesselyn Co & Mitchell, 2006).

As Kuratko (2005) puts it, "entrepreneurship is more than the mere creation of business". Entrepreneurship is a dynamic process of vision, change, and creation that requires the application of energy and passion towards the creation and implementation of new ideas and creative solutions (Kurtako & Hodgetts, 2004). Entrepreneurship education (EE) consists of "any program or process of education for entrepreneurial attitudes and skills" (Fayolle, Gailly & Lassas-Clerc, 2006). Although scholars have described various types of EE targeted towards specific goals (Jamieson, 1984; Laukannen, 2002; Liñán, 2004), we can generally distinguish two main areas of EE: *about* entrepreneurship and *for* entrepreneurship. *Education about entrepreneurship* considers entrepreneurship as a social phenomenon and educates through the studying and transfer of theories and knowledge regarding the entrepreneur, the firm creation, and the entrepreneurial process. *Education for entrepreneurship* considers the learning experience of the dynamic entrepreneurial process by focusing on the development of competencies, skills, aptitudes, and values (Postigo & Tamborini, 2002). While business academics and practitioners have evolved past the question of whether entrepreneurship can be taught, there is still very little knowledge on how the art of teaching and learning entrepreneurship influences entrepreneurial self-efficacy, the antecedent of entrepreneurial intentions and behaviors (Fayolle & Gailly, 2013).

Entrepreneurial Self-Efficacy

Self-efficacy regards one's self-perception in their own abilities and skills to perform a particular task (Bandyra,1986; Wilson, Kickul & Marlino, 2007). Several lines of evidence suggest that since entrepreneurial self-efficacy, meaning how an individual perceives his or her self-perception in their own abilities and skills to launch a new venture, can predict one's intentions to launch a new ventures (Krueger & Brazeal, 1994; Koh, 1996; Luthje & Franke, 2003; Wilson, Kickul & Marlino, 2007). It can also be a reliable predictor in educational settings (Piperopoulos & Dimov, 2015; Turker & Selcuk, 2008; Wilson, Kickul, & Marlino, 2007). A number of studies have postulated that EE programs designed to foster the development of students' entrepreneurial self-efficacy level results in increasing graduates' entrepreneurial intentions (Robinson & Sexton, 1994; Chen, Greene & Crick, 1998; Pittaway et al., 2010; Wilson, Kickul & Marlino, 2007; Zellweger, Sieger & Halter, 2011). Nevertheless, we do not yet know which role the form in which EE is provided plays in this relation. Research on how different

pedagogical approaches influence the relationship between entrepreneurial self-efficacy and entrepreneurial intentions remains limited (Fayolle & Gailly, 2013).

Entrepreneurial Intentions and Behaviors

The most important research challenges on entrepreneurial intentions are in the intention-behavior link (Fayolle & Liñán, 2013). Bae et al. (2014) define entrepreneurial intentions as the desire to own or start a new business. Extensive research supporting the positive predictive ability of behavioral intentions in future behavior (Ajzen, 1991; Sheppard, Hartwick & Warsha, 1988) has led various scholars to regard entrepreneurial intentions as a crucial antecedent of actual entrepreneurial behaviors (Krueger, Reilly & Carsrud, 2000; Lee et al., 2011). According to Ajzen's Theory of Planned Behavior (1991), intention to perform a behavior arises from three independent determinants: (a) attitude, (b) subjective norm, and (c) perceived behavior control. *Attitude* towards starting a new business regards how the individual evaluates their performing, either positive or negative, of starting a new business (e.g. "For me, choosing a self-employed career would be foolish/inspiring"). *Subjective norm* towards starting a new business refers to the individuals' perceptions of social pressures, from family and friends to start a new business (e.g. "Most people who are important to me are supportive/unsupportive of my desire to start a new business"). *Perceived behavioral control* towards starting a new business refers to individuals' entrepreneurial self-efficacy (e.g. "I am confident/unconfident on my ability to gather the resources needed to build a viable business"). Although social-psychological studies present intention as the single best predictor of actual behavior (Bagozzi, Baumhartener & Yi, 1989), entrepreneurship academics and practitioners cast doubt on whether entrepreneurial intentions predict actual entrepreneurial behaviors (Douglas & Shepherd, 2002).

Gartner (1985) defines entrepreneurial behaviors as the exercise of continuous action to gather resources and build viable business structures. According to Gollwitzer (1993), the intention-behavior bridge is built on the distinction of two separate states: (a) the state of willing, in which the behavior to start a new venture is desired, and (b) the state of planning, in which the steps that lead to the achievement of the desired behavior of starting a new venture are specified (Orbell, Hodgkins & Sheeran, 1997). Gollwitzer (1990) and Heckhausen (1991) postulate that the intention-behavior link starts with a *deliberative phase*, characterized by the consideration of the costs and benefits of performing the behavior, and follows with an *implemental phase*, characterized by the formation of plans that specify when and where the behavior will be initiated (Orbell,

Hodgkins & Sheeran, 1997). Gollwitzer (1993) describes these plans, *implementation intentions*, as the key to initiate the movement from intention to behavior. Although multiple studies have provided empirical evidence on how the formation of implementation intentions, specifying when and where a particular behavior will be performed, increases the likelihood that the final goal will be achieved (Gollwitzer, 1993; Orbell, Hodgkins & Sheeran, 1997), this is new ground for entrepreneurship research (Kautonen, Van Geldere & Tornikoshi, 2013). This relatively limited understanding of which mechanisms in the entrepreneurial process affect how entrepreneurial intentions generate entrepreneurial behaviors (Kautonen, Van Gelderen & Tornikoski, 2013; Laspita et al., 2012), led Fayolle and Liñán (2013) to claim an urgent need to empirically and theoretically investigate the entrepreneurial intention-behavior link moderated by EE.

The Democratization of Entrepreneurship Education

Educational technologies advancements are transforming higher education at an incredible speed. New learners' interests, needs, and preferences characterize the journey from "transmitted" to "harvested" knowledge (Kundi & Nawaz, 2010), from passive information consumption to independent learning environments (Young, 2003; Baumeister, 2005). Thus, two competing pedagogical approaches may be compared: traditional classroom learning versus virtual environment learning.

Traditional classroom learning (TCL) is a teacher-centered, one-way, offline-learning space, where teachers are transmitters of knowledge and learners merely absorb and capitalize on what is delivered by the teacher. Virtual learning environments (VLEs) are student-centered, multi-way, online-learning spaces, where learners and educators participate in online interactions of various kinds, including individual online learning and collaborative project-based learning. According to Dillenboug, Schneider, and Synteta (2007) and to O'Leary and Ramsden (2002), VLEs consist of: (a) designed information space, (b) social and collaborative space, (c) comprehensively represented content, (d) students as actors, not spectators, (e) integration of heterogeneous technologies and multiple pedagogical approaches.

Iloanya (2017) describes the 21st-century revolution of Higher Education Institutions as the democratization of education; the "change from what used to be teacher-dominated and teacher-centered learning, to student-centered learning". The aim of this paradigm shift is to empower the development of critical thinking, problem-solving, and collaboration, by guiding learners along the process

of learning through self-exploration. The democratization of Entrepreneurship Education (EE) refers to the provision of inclusive, effective, equal learning and teaching entrepreneurship experiences (Iloanya, 2017). Thus the relevance of investigating the potential for a more democratized pedagogical approach to improving the efficiency, effectiveness, and inclusiveness of EE in Africa (Kuratko, 2005; Solomon, Duffy & Tarabishy, 2002).

Efficiency refers to the current problem of high resource intensiveness of entrepreneurship programs that do not translate in more entrepreneurship graduates launching new ventures. Although the strong role of entrepreneurship education in raising the levels of self-efficacy and entrepreneurial intentions of entrepreneurship education has been widely accepted (Bae et al., 2014; Piperopoulos & Dimov, 2015; Soutaris, Zerbinati, & Al-Laham, 2007; Turker & Slcuk, 2008; Wilson, Kuckul, & Marlino, 2007), current TCL-based programs' high resource intensiveness and one-size-fits-all formats yield limited efficiency.

The ***effectiveness*** of entrepreneurship education refers to the low level of entrepreneurial intentions and behaviors of entrepreneurship graduates (Bwisa, 2017; Jesselyn Co & Mitchell (2006); Kew at al., 2015; Robb, Valerio & Parton, 2014). Although there is no doubt that Information and Communication Technologies (ICTs) are at the core of 21st-century education (Knight C., Knight B, & Teghe, 2006), it is important to realize that learning is not to be managed and controlled, but rather facilitated and guided (Dalsgaard, 2006). Current TCL-based programs may even feature some e-Learning content and support models, like online slides and e-mail communication; yet, these are still characterized by one learning-model fit all, where learning takes place through the instructor (teacher-centered) in a one-way transmission form. In these settings, entrepreneurship programs become significantly less effective due to: (a) non-collaborative, (b) non-engaging, and (c) standardized and structured knowledge consumption.

Inclusiveness regards the lack of context- and gender-sensitive entrepreneurship programs that make access to EE a privilege of few and yield a significant gender gap between the entrepreneurial intentions and behaviors of female and male participants. Current TCL-based programs adopt a one-size-fits-all approach that does not address students' individual learning needs (Scherer et al., 1990; Kourilsky & Walstad, 1998). In these settings, entrepreneurship programs become significantly less inclusive due to the lack of (a) flexibility, (b) integration of individual interests, motivations, and fears, and (c) adequate self-efficacy building.

Towards A Virtual Learning Environment-based Framework of Entrepreneurship Education

Overall, Virtual Learning Environment-based entrepreneurship programs seem to hold the promise to increase efficiency, effectiveness, and inclusiveness of entrepreneurship programs for a population that would be otherwise excluded. Table 1 summarizes the comparison between Traditional Classroom Learning- and Virtual Learning Environment-based education across these three key dimensions.

Table 1 about here

This conceptual framework may provide valuable guidance for subsequent empirical studies in the evaluation of how a selected pedagogical approach, defined by the level of online and collaborative integration within a student-centered environment, influences the level of entrepreneurial intentions and behaviors of entrepreneurship graduates, particularly for student-centered environments in Africa's KINGS economies.

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Tables and Figures

Table 1: The Key Dimensions of Traditional Classroom Learning vs. Virtual Learning Environments

Dimension	Traditional Classroom Learning	Virtual Learning Environment
Efficiency	TCL is associated with **limited efficiency** due to its rising education and training costs, and stagnant student scores. Zhang et al. (2004) suggest that TCL's low efficiency is related to: • A rigid and outdated **one-size-fits-all format** that does not fit new learners' preferences and needs; • **High costs** associated with brick-and-mortar maintenance, teaching staff, and updating and redistributing the latest materials.	VLE is associated with **rising efficiencies** due to its low infrastructure and training costs, and increasing learning output. Zhang et al. (2004) argue that VLE's efficiency is related to web-based collaborative tools that leverage: • **Learner customized** and flexible learning environment, based on standardized levels of content quality; • **Cost-effective model**, offering a broader selection of knowledge that can be easily updated.
Effectiveness	TCL is associated with **low effectiveness** due to its high reliance on teacher-centered learning. Phillips et al. (2008) claim that TCL's low effectiveness is related to: • **One-way teacher-led** communication, where students are perceived as empty canvas expected to passively receive knowledge from teachers' systematic and scripted lesson plans and to replicate it in summative evaluation;	VLE is associated with **high effectiveness** due to the opportunity for student-centered learning. Young (2003) posits that VLE's high effectiveness is related to: • Group learning in a **highly personalized environment** that can be both one-to-many and many-to-one, where students are encouraged to create meaning from new information and to connect with it through the reflection of prior experiences;

	• **Knowledge is limited to the teacher** and students are excluded from the process of reflection and meaning creation.	• **Active and collaborative creation of knowledge** where intellectual partnerships among teachers and students thrive and critical thinking and higher-order learning are achieved.
Inclusiveness	TCL is associated with **non-inclusive learning** due to student's access to knowledge being highly conditioned by household income and entrenched perspectives on gender roles. Shabaya and Konadu-Agyemang (2004) maintain that TCL's low inclusiveness is related to: • High costs associated with TCL education raise education tuition fees to a level that it becomes a **privilege for few, rather than a right for all**; • **The male-dominated learning environment**, where education for women (homemakers and caregivers) is generally not regarded as important as education for men (resource owners and breadwinners).	VLE is associated with **more inclusive learning** due to the opportunity for on-demand learning and virtual participation. Radović-Marković, Nelson-Porter, and Omolaja (2009) argue that VLE's higher inclusiveness is related to: • Lower-costs and customized content yield the opportunity for **massive online participation,** yet fostering individual and collaborative learning; • **Greater flexibility** in terms of time, location, educational program selection make learning a universal interest and right.

The Support Function in Ecosystems: A Case Study of Social Entrepreneurial Ecosystems in Bolivia and Ecuador

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Abstract

Social Entrepreneurs are driven by the idea of addressing social needs through innovative business models and leadership, and thus providing novel solutions to improve the capacity of our society. To succeed, they need to be surrounded by an ecosystem to provide them with access to different type of resources to run and scale their business models. Through a qualitative study in 6 cities and rural communities in Bolivia (6 focus groups and 41 interviews) and in Guayaquil, Ecuador (19 interviews and 3 focus groups) this paper aims at contributing with a detailed analysis on the different factors related to the establishment, evolution and operation of supportive entrepreneurial ecosystems in support of social entrepreneurs.

Keywords

Social Entrepreneurship, Entrepreneurial Ecosystems, Support

Introduction

Social Entrepreneurs are driven by the idea of addressing social needs through innovative business models and leadership, and thus providing novel solutions to improve the capacity of our society (Austin et al, 2006; Dees et al. 2004). They rely on the existence of multiple resources, such as (a) support networks, partnerships and alliances, (b) financial, cultural and institutional support, and (c) access to human - and working- capital, needed to achieve such mission (Montgomery et

al., 2012; Cohen, 2006). Thus, entrepreneurial ecosystems can provide social entrepreneurs with access to different kind of resources due to their network composition (B-Hert, 2006).

To date, however, only few studies have investigated in depth the composition and structure of supportive ecosystems for social entrepreneurs (Roundy, 2017). Existing literature in the field provide us with limited insights on the support function within ecosystems, including only few arguments on how social entrepreneurs benefit from this type of support. Therefore, the objective of this paper is to contribute with a detailed analysis on the different factors related to the establishment, evolution and operation of supportive entrepreneurial ecosystems in support of social entrepreneurs

The needs of Social Entrepreneurs

Social entrepreneurs use market-based strategies and innovation to address social or environmental needs (Certo & Miller, 2008; Dees, 2007). Unfortunately, they are confronted several constraints (Hemingway, 2005). There is a large volume of published studies describing critical challenges and faced by social entrepreneurs. We summarize them in the following table:

Type of challenge	**Authors discussing it on the literature**
Mission, legal form and strategy Lack of orientation, mission drift, difficulties to formulate sustainable short- and long-term strategy, inadequate legal forms	Austin, Stevenson, & Wei-Skillern, 2006; Certo & Miller, 2008; Dees, 1998; Honig, 1998; Mair, Robinson, & Hockerts, 2006; Wei-skillern, 2006
Education and competences Lack of managerial and financial knowledge; difficulties when matching mission and values; strong and specific competences needed to achieve social impact	Certo & Miller, 2008; G. Dees, 2007; Letaifa, 2016; Volkmann, Tokarski, & Ernst, 2008; Webb, Kistruck, Ireland, & Ketchen, 2010; Wincent et al., 2016
Funding and resource attraction difficulties to manage and achieve financial sustainability; complex ways to access to capital; challenges of attraction	Bloom & Dees, 2008; Letaifa, 2016; Roundy, 2017; Shaw & Carter, 2007; Wincent et al., 2016

investment attraction; complex efforts to access to financial services	
Human resources: *Selection and engagement of right profile of people; relying on volunteers; challenges to compete with market rates in terms of salaries*	Dees, 2012; Letaifa, 2016; Roundy, 2017; Sharir & Lerner, 2006; Totterman & Sten, 2005
Evaluation and performance *Difficulties to establish/determinate performance indicators and impact on social or environmental projects; social return on investment is often subjective*	(Ardichvili, Cardozo, & Ray, 2003; Autio, Kenney, Mustar, Siegel, & Wright, 2014)

Table 1: Challenges and needs of Social Entrepreneurs

The first challenge is related to their mission, legal form and strategy. Different from commercial entrepreneurs, social mission is a central attribute for social entrepreneurs (Austin et al., 2006). Drift in the social orientation is one of the most important concerns, as some social entrepreneurs tend loose the focus of their mission with the maturity of their organization (Wronka, 2013). This concern is also related with subsequent strategic choices related to generating or not income (profit), develop parallel profit and non-profit activities (hybrid businesses) or only adopt a non-profit type of organization.

The second challenge is related to education and competences of social entrepreneurs. Social entrepreneurs often lack managerial and business skills (Dees, 2007). Some of them even recognize not to have post-secondary education at all. This lack of formal education also represents a barrier for them in the daily business activities, but in the strategic development of their venture (Mair et al., 2006). Funding and resource attraction are the third challenge and one of the main obstacles for social entrepreneurs. They are constantly looking to capture the stakeholder's interest and trustworthiness to gain the support for their social venture (Shaw and Carter, 2007). Moreover, their social missions are often seen as opposed to the creation of economic value and profitability (Mair & Martí, 2006). In addition to this, access to finance (venture capital, investment funds, banks or investors) requires competences and time effort that is often not feasible for social entrepreneurs (Casson & Della Giusta, 2007).

The attraction of qualified human resources for social entrepreneurs is often a challenge. Social entrepreneurs often cannot afford to pay market rates to employees or be competitive with benefits packaged offered by others (Sharir & Lerner, 2006). In addition to this, it appears difficult to attract the right profile of people, sharing their same values, ideas, vision, and able to create social connections and alliances based on limited resources (Volkmann et al., 2008). Moreover, social entrepreneurs rely often on volunteers, whose commitment and availability can fluctuate over time.

And last but not least, the performance evaluation of social entrepreneurs is hardly based on economic indicators, while the social impact measurement is a complex, subjective and insufficiently adopted in practice (Mair & Martí, 2006).

How do social entrepreneurs address these needs?

Social entrepreneurs can support organizations such as incubators, coworking spaces, accelerators within their ecosystem (Williams & Lee, 2009), but also from other mechanisms of providing support to their needs in terms of knowledge, mentoring, networking, capital providers, legal and accounting advise and technical services (Roundy, 2017). Some of the organisations within the ecosystem also support social entrepreneurs by promoting their services and connecting them with a broader network (Kabbaj & El Ouazzani Ech Hada, 2016).

The reliability and accessibility of resources (e.g. physical infrastructures, intellectual, human and financial resources) is another challenge for social entrepreneurs (Biggeri, Testi, & Bellucci, 2017). For this purpose, a stable structure and a strong network can help social entrepreneurs (Lumpkin, et al., 2013). For example, collaboration and alliances between private firms, NGOs, government, suppliers and customers (Dahan, Doh, Oetzel, and Yaziji, 2010) with social entrepreneurs would be recommended. A successful ecosystem is therefore, one where different resources are deployed, accessible and shared among all different members (Ozdemir, Moran, Zhong, & Bliemel, 2016). The presence of the scholars, experts and volunteers is considered as a key aspect to facilitate the presence of these resources support entrepreneurship processes due to their contribution to knowledge generation, through research and innovation. (Boh, De-Hann and Strom, 2015).

Biggeri et al., (2017) claim that a supportive ecosystem is one in which all participants, especially social entrepreneurs, are able to operate with minimum constraints and with all kind of different resources available (funds, volunteers, and skilled human resources). One key player in ecosystem offering support to social entrepreneurs are incubators (Letaifa, 2016). They offer not only office facilities but also consulting, training, publicity, connection with investors and networking in the related areas (Roundy, 2017). Some incubators are specialized in working only with social entrepreneurs. These social incubators present significant advantages, more specifically in coaching, business and entrepreneurship education, interchange with other social entrepreneurs and strategic stakeholders, and the possibility to obtain funding (Casasnovas and Bruno, 2013). One of the major contributions from incubators to social entrepreneurs are the development of new business knowledge and the possibility to get coached by experts or mentors in the field (Roundy, 2017).

Methodology

We have conducted a qualitative study in 6 cities and rural communities in Bolivia (6 focus groups and 41 interviews) and in Guayaquil, Ecuador (19 interviews and 3 focus groups). The selection of these locations was based on the opportunities and challenging conditions in terms of entrepreneurial activity evidenced by these countries. According to the Global Entrepreneurship Monitor (GEM) in both countries, a high percentage of start-ups are initiated by people pertaining to a low socio-economic level, with low schooling level, and confronted with different challenges in terms of progressing or scaling their business ideas. Using a semi structured interview protocol, we have studied several elements related to the support function of ecosystems for social entrepreneurs, including different type of stakeholders involved in the entrepreneurial ecosystem such us government institutions, academics and researchers, incubators, NGO's, banks, social and vulnerable entrepreneurs, local leaders, international organizations related to social entrepreneurship, and other entities promoting entrepreneurship at local level in those communities.

Preliminary findings

This paper considers the support function of ecosystems as a necessary condition for the creation of value propositions. Some of the results obtained from the preliminary analysis shows some important patterns in terms of the support function of ecosystems. Social Entrepreneurs claim to be aware of their business model, including their potential customers, activities and opportunities for

growth. However, they are determinant to say that they are willing to receive the support needed in terms of knowledge (coaching, mentorship, professional development) and this is marked as the first need often expressed. Secondly, we identify that governments, although they are doing different activities to promote and sustain entrepreneurial development and activities among their local environments, is still seen far from bringing their policies and efforts to the service of the community and relevant stakeholders. This condition retains their local ecosystems to accelerate innovation, growth and to offer further opportunities to local social and vulnerable entrepreneurs. In terms of organizations offering support, the presence of incubators and other entities working with entrepreneurs is something recently incorporated to local ecosystems. These organizations (co working spaces, incubators) along with activities (events, workshops, fairs) offer a space for networking, promotion and visibility to the business models of social entrepreneurs. Despite these efforts, different stakeholders argue that there is much more potential to be unleashed, as there are many more resources underused or underexplored within their ecosystems. We expect to present our full paper version of this research during the NBM conference in Berlin conference ad receive valuable feedback for our ideas.

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Value-Based Pricing Applied By Dutch Social Entrepreneurs

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+ This paper has been submitted at OMRISE Conference Series on Integrating Simplification: the rise of Integrative Self-Managed enterprises at Banasthali University in Jaipur, 2017.

Abstract

This paper provides an exploration and practical implications regarding the ways social entrepreneurs implement social value through their pricing strategies, and more broadly their customers. It offers a different perspective to innovate the business model by using new pricing strategies (Lüttgens & Diener, 2016). Setting the right price is important for every entrepreneur, but it is one of the most neglected tools in the marketing, according to Hinterhuber (2003). Pricing is the only variable of the marketing mix that creates revenue and determines the competiveness of the company (De Toni et al., 2016). Most scholars consider value-based pricing superior to cost-based and competitive-based pricing strategies. However, many companies neglect the use of value-based pricing in their business model (Liozu, et al., 2015).

Pricing strategy need to be consistent with the company's purpose and customers' needs. The reality however is that most entrepreneurs choose traditional pricing strategies like cost-plus pricing and competition-based pricing without considering value based pricing. Raju (2010) suggests that it's estimated that only about 8% of American businesses can be considered sophisticated players in pricing strategies.

We do not have such data for other parts of the world yet. The implementation of value-based pricing requires deep organizational changes that have transformational power for the company and the employees. It most often has to shift from cost or competitive based to customer value (Liozu, et al., 2015).

With the growing online information on prices, customers have more access to more pricing information. Customers are becoming savvy and price sensitive, especially in times of crisis. There is also a growing need among entrepreneurs to change the traditional way of doing business. Social entrepreneurs are the ones looking for new business models and pricing strategies that fit their business purpose. They are experimenting with new pricing strategies and are actively changing the traditional economy.

Keywords

Value Based Pricing, Social Entrepreneurs, pricing strategies

1. Introduction

Pricing is one of the most neglected tools in the marketing industry, according to Hinterhuber (2003). The subject of pricing has also been receiving less attention from both practitioners and academic scholars, which seems odd, since an average 5% price increase leads to a 22% improvement in operating profits. Pricing is considered a powerful tool for marketers. Pricing is the only variable of the marketing mix that creates revenue and determines the competiveness of the company (De Toni et al., 2016). Most scholars consider value-based pricing superior to cost-based and competitive-based pricing strategies. However, many companies neglect the use of value-based pricing (Liozu et al., 2015).

To effectively start pricing products and services strategically, there is a need to understand the wishes and needs of the customer. Understanding the customer is vital, instead of product led thinking the focus should be on customer led thinking. Starting at the opposite side of the spectrum (Nagle, Hogan & Zale, 2011), it also requires deeper understanding of the market and the competition.

Product-led cycle

Customer-led cycle

Pricing can be divided in three main categories: cost-based pricing, competition-based pricing and value-based pricing (De Toni et al., 2016). The definition for describing value-based pricing is: "*Setting prices primarily based upon perceived or estimated value by the customer*" (Macdivitt & Wilkinson, 2012). Another definition with more emphasize on customer is by Hinterhuber (2008a: 42), namely "Customer value-based pricing approaches use the value a product or service deliver to a predefined segment of customers as the main factor for setting prices". According to Magnus Johansson, there are two value definition namely customer perceived value and differentiation value (Hinterhuber & Liozu, 2018).

Value based pricing (VBP) is applicable for every entrepreneur. But one could imagine that value based pricing is more in alignment with the mission of social entrepreneurs. Social entrepreneurs are also developing new business models with a focus on both social- and profit goals. This is challenging and generally requires more time compared to more traditional business models. The research done by Verloop (2011) shows that 42% of Social Enterprises is not profitable, 27% not even after five years. She found that many social enterprises struggle to grow beyond the professionalizing phase and get stuck in what is sometimes called "the valley of death" (Verloop, 2011). They face four main challenges there:

- Untraditional and complex business models;
- Management development issues;
- Limited access to (venture) capital, and;
- Legislation issues.

Social entrepreneurs are often ahead of traditional businesses in looking for opportunities (Porter & Kramer, 2011). Social entrepreneurs are passionate advocates of their social mission and are combining that with a business sense for innovation and growing new business models with strong determination (Dees, 1998). They aim to improve systems, invent and disseminate new ways of approaches and accelerate sustainable solutions that create social value next to economic value. Social entrepreneurs are emerging in focusing on meeting the needs of their customers (Porter & Kramer, 2011). They can be seen as change agents in developed economies who are willing to apply innovative and pricing methods. These pricing methods make them interesting subjects for research.

The main reason for this paper is to gain more knowledge and insights on why and how social entrepreneurs choose value based pricing as their pricing strategy. Furthermore, we want to learn more about the implications of using VBP. Therefore, we selected 10 Dutch social entrepreneurs to gain more insights on their conviction about VBP as a revenue model. The outcome of this research will contribute to a better understanding of the use of VBP as an innovative pricing strategy in the context of social entrepreneurship. This paper is probably unique as it focuses on both social entrepreneurs and value-based pricing strategies. This poses great challenges because both topics are relatively new and there is limited scholarly information available. At the same time, this research has a practical relevance. It provides information to social entrepreneurs to review their own pricing strategies, which enables them to choose new pricing strategies that fit the values of their company and help them avoid the 'valley of death'. VBP may enable them to potentially gain competitive advantage and create a unique customer proposition. In the following sections, we will address the topics of social entrepreneurship and value creation followed by pricing strategies and more specific a value based pricing and its different forms. To position the idea of creating value to the customer we will introduce the Value Triad, as this will be applied as a framework for collecting the data on the topic of why social entrepreneurs use VBP.

2. Theoretical background

Defining social entrepreneurs

Scholars don't agree on the definition of social entrepreneurs. Banks has first introduced the term in 1972. He noted that social problems could be deployed by managerial practices (Hoogendoorn, 2011). This doesn't mean that social ventures

can't make any profit, but it is not central to their value proposition (Martin & Osberg, 2007). Creating value is explicit and central to their organization, which results in a different mindset for the social entrepreneur. Wealth to them is not meaningful in itself. The definition used in the paper is given by Hoogendoorn (2011) is as follows: "Social entrepreneurs concerns individuals or organizations engaged in entrepreneurial activities with a social goal." The main purpose of a social entrepreneur is to produce measurable impact by opening up new paths and unlocking society's full potential to help stimulate social change.[47]

Social entrepreneurs are different from business entrepreneurs. Figure 1 shows social enterprises and the difference in the impact they want to have and what their priorities are.

Figure 1: Social enterprise (Martin & Osberg, 2007)

Though the topic of capital among Dutch social enterprises has been studied (Verloop 2011), there is not enough information available about the social entrepreneurs and their experience with pricing strategies. There is however an emerging market for Dutch social enterprises. In the Netherlands there has been a rise of social entrepreneurs between 2013 – 2015, the growth has been around 36 percent. The main reasons for the growth have been the elimination of judicial obstacles by the government, growing investment opportunities for social enterprises and the ambition of governmental organizations towards working with social enterprises. At the same time, social companies are becoming increasingly popular. These social entrepreneurs are outperforming traditional companies and have many fans. There are many social enterprises like Tony Chocolony (slave free chocolate), The Colour Kitchen, Snappcar (sharing cars), Fairphone ('honest' phone) and Peerby (borrowing with neighbors). Companies seem to become more

[47] http://www.pbs.org/opb/thenewheroes/whatis/

proactive and responsive to complex problems. The emerging young groups of innovators with more money to spend are challenging the old charity ways and the philanthropical industry. Being socially responsible seems to be accepted also in the mainstream entrepreneurship scholarly works thanks to pioneers like Ben & Jerry's and The Body Shop (Hoogendoorn, 2011). This transformation is about the redirection of corporations from translating their purpose from profit towards shared values (Porter & Kramer, 2011).

Value creation

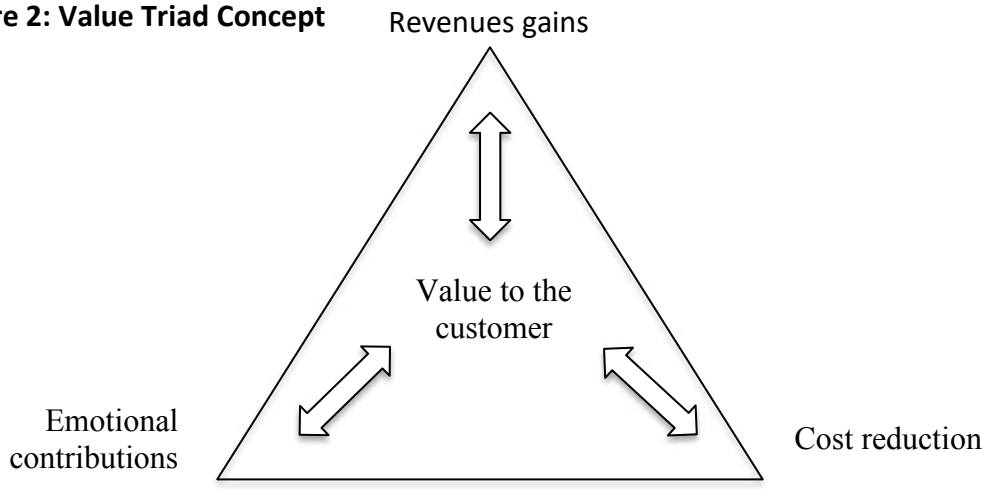
Understanding value is equally important because it will make it easier to understand the needs of the customer. It is good to know that value has two components, namely a perception, and an expectation. If customers have to choose between two products, they select the offer that captures most completely what they were looking for. This is based upon the expectation of the value that a product or service can deliver. And also their perception guides them further in their choices, which can be influenced by advertisement or a good feeling towards the product of service. A value approach demands a great commitment to innovation, creativity, and exploiting of entrepreneurs' uniqueness (Macdivitt & Wilkinson, 2012).

According to Koller et al. (2010), companies create value by investing capital to generate future cash flows at a rate of return that exceeds their cost of capital. If companies grow faster, they attract more capital at attractive rates of return. Consequently, they create more value. This implies that companies should only generate on invested capital greater than the cost of capital. This presents problems that many companies encounter, because they still have an outdated view on value creation, according to Porter & Kramer (2011). They ignore the needs of the customer and the long-term impact their activity has on the environment. Value is an important measurement in a market economy. In the traditional economy, the ability of a company to create value for its shareholders and the amount of value it creates are the most important measurements (Koller et al, 2010). A growing body of research claims that companies that maximize the value of their shareholders will create better jobs, more satisfied employees and will be sensitive to social corporate responsibility. Furthermore, value-focused companies want to ensure that human capital and natural resources are used correctly. There are therefore reasons to study how companies create value, according to Koller et al. (2010). Sharing value can be a solution to this challenge. It is the combination between the principle of the economic value and social

values. This involves creating economic value in such a way that it also creates social value (Porter & Kramer, 2011). According to Porter & Kramer (2011), companies can create economic value by creating social value. There are three ways to do that namely, reconceiving products and markets, redefining productivity in the value chain and building supportive industry clusters at the company's location.

When connecting the success of a company to societal improvement, the dynamic of the market will change. It can potentially create differentiation and new markets. Social entrepreneurs can play a role in making this concept mainstream. They are pioneering new product concepts to meet societal needs. They are often ahead of traditional businesses in looking for opportunities. Most importantly, they also create economic value, instead of only social value (Porter & Kramer, 2011).

Figure 2: Value Triad Concept



Source: Macdivitt and Wilkinson (2012)

It can be a real challenge to incorporate value-based pricing in the business. Macdivitt & Wilkinson (2012) have tried to make the value more tangible, with developing the 'Value Triad'. This concept is chosen to apply in this paper because it measures value in a concrete and tangible way. The Value Triad exist of three components:

- Revenue Gains (RGs): the improvements in revenue that accrue to a customer as a result of the purchase and use of your products and service.

- Cost Reductions (CRs): the ability to help a customer to reduce costs through the use of your product and service.

- Emotional Contribution (EC): this is drawn from the 'feel good factor', such as reduction of "hassle", peace of mind, increased confidence, greater safety, personal gain, trust, self-esteem, the absence of risk and so on. The emotional value has an influence on the improvement in the customer's emotional satisfaction or the avoidance of a reduction of the emotional satisfaction. What is really important is what value it represents to the customer (Macdivitt & Wilkinson, 2012).

Value based companies seek to identify the values created by the product or service they offer. They challenge the status quo and look closely at their market and its customers. They establish a price that is suitable for the customer what will help making a value based pricing strategy successful (Nagle et al. 2011). The winning combination is to manipulate some aspects of the price or performance to mobilize the unique capabilities of an entrepreneur in such a way that no competitor can possibly copy. It also enables to create a special solution to the customer's problem. It is important to have the competitive advantage to other companies (Macdivitt & Wilkinson, 2012).

Pricing strategies

Setting the right price can vary between industries and between customer segments. The impact of pricing on profitability is really high (Hinterhuber, 2003). But only a few managers have received training in making strategic pricing decisions. They are not taught to work proactively with their pricing strategy. They don't look at their customer's willingness to pay for the product or service. Pricing strategies share three principles according to Nagle et.al (2011). The principles of pricing strategy are value based, pro-active and profit driven.

Value based is that there are differences in pricing for customers. For example, if the market demands a price reduction because of an economic crisis, the entrepreneur does not necessarily have to discount the price of the product. The product can still have value to the customer; even when the customer base is declining. It can still provide a better alternative than the competition. A proactive approach means that companies anticipate disruptive events like a crisis and develop strategies in advance to deal with them. For example, when a new competitor enters a market with a low-cost product, the entrepreneur can

anticipate by offering a lower-priced service or loyalty program. Being sensitive to change within the market makes the entrepreneur competitive. A profit-driven approach is that the company evaluates its success of price management by its earnings relative to alternative investments, rather than by the revenue it generates relative to its competitors. For example, entrepreneurs need to be able to make bold decisions regarding their company to stay profitable.

These principles are leading towards choosing a pricing strategy. There are three main categories: *cost-based*, *competitive* and *value-based pricing* that is applied by entrepreneurs. The best pricing strategy is not easily chosen by entrepreneurs. Cost (plus)-based is the easiest strategy. This pricing approach is derived from accounting methods and is the most popular method today. The ways to calculate the cost-based price is by taking the average cost-plus and add a percentage (Macdivitt & Wilkinson, 2012). The entrepreneur can set its own price totally independently from the competition. The reason why entrepreneurs use this pricing strategy is that it seems a fair way to calculate the right price. Another reason is that it ensures profitable sales because all costs are accounted for (Raju et.al. 2010). Doing this, however, creates a gap between price policies, the value proposition, and the customer needs.

Figure 3: Pricing strategies

The second popular pricing strategy is competition (market) based pricing. This is a strategy where we compare the features and specifications of the product with those of the competition. Based on the competition the right price is set. Subsequently, deciding your price on the competition will haven consequence for the positioning of your product or service (Macdivitt & Wilkinson, 2012). This strategy takes into account the market and it therefore seems to be safe. However, relying on the market can get the entrepreneurs in a passive mode. They are able to adjust their price, when the competitor changes its prices. The third

pricing strategy is value-based pricing (VBP). When talking about the other pricing strategies, they fail to incorporate the delivered value of the service and products. VBP is still relatively new and sometimes difficult to understand for customers. Mainly because the prices are primarily based upon perceived or estimated value by the customer (Macdivitt & Wilkinson, 2012). Having a relationship built upon cost-based pricing creates a different dynamic between the buyer and seller. The customer may think that the seller is asking too much for the product, whereas the seller can feel frustrated by the demands of the customer. Both can be locked in a win-lose situation.

Value-based pricing

A great challenge of using VBP is the level of understanding by the customer and the ability to assess the value that is offered. Not every customer will acknowledge the value of the product or service; some will denigrate the offer by challenging the uniqueness and/or performance. To use VPB successfully, the entrepreneur needs customers that are willing to value to offer and recognize the impact. Pricing based upon value creates great challenges because prices can differ between customers and between customer's segments (Macdivitt & Wilkinson, 2012). There are situations, according to Macdivitt & Wilkinson (2012), in which VBP can be successfully used:

- New or enhanced products and services;
- Products incorporating novel technology;
- Products completely new to the world with no viable technology alternatives;
- Existing products and services being introduced into a new geography, whether they represent a major improvement in performance compared with incumbent methods in that geography;
- Where other companies in an industry are already using VBP to price their products and services;
- More complex transactions requiring a customized approach based on clear understanding of the customer's situation and context;

- When we are able to meet a customer's need through our ability to construct a unique package of products and services, even within a highly competitive market.

According to Raju (2010), there are different price methods that can be used. Here is a selection of different value based pricing methods. The social entrepreneurs that were interviewed for this research have used (one of) or more of these methods:

Outside in pricing	Ask the customer upfront how much he/she thinks the solution is worth.
Contingency pricing	This pricing method is used when the customer is unable or unwilling to take all the risk of an unsatisfactory outcome.
Retrospective pricing	Retrospective pricing is used when the eventual outcome cannot be fully predicted
Premium pricing	In premium pricing, the entrepreneur deliberately establishes himself as the supplier of the highest priced product in the market segment that is targeted.
Shared gain	The payment is based on satisfactory outcomes and both parties share all the risk. If successful, both parties share in the gain according to predesigned and agreed upon formula.[48]
Pay as you wish	Let the customer decide what he wants to pay for the service or product.[49]
Free pricing	Don't ask any money for the service or product (see www.google.com).

[48] The first five pricing methods were based upon the book of Macdivitt and Wilkonson (2012)
[49] The definition of free and penny pricing are based upon the definition in the book of J. Raju and Z.J. Zhang (2010)

Penny pricing	Pricing a low price for your service and product (see www.1%club.org).
Name Your Own Price	The buyer specifies a price and a product and/or service and asks sellers to match that combination. NYOP is a special type of reverse auction originally pioneered by Priceline.com.[50]
Subscription pricing	The customer must pay a subscription price to have access to the product/service. The model was pioneered by magazines and newspapers but is now used by many businesses and websites (see Amazon).[51]
Dynamic pricing	Refers to a type offer or contract by a provider of a service or supplier of a commodity, in which the price depends on the time when the service is provided or the commodity is delivered.[52]
Hybrid pricing	Using cost-based pricing or competitive pricing in conjunction with VBP.

3. RESEARCH METHOD

Target population, sample and data collection procedures

A selected group of Dutch 10 social entrepreneurs has been interviewed for approximately 60 minutes each. The social entrepreneurs were all working in the service industry within different sectors. The companies they owned were all B2C companies. The social entrepreneurs were selected based on pre-determined criteria, namely:

[50] http://en.wikipedia.org/wiki/Name_Your_Own_Price
[51] http://en.wikipedia.org/wiki/Subscription_business_model
[52] http://en.wikipedia.org/wiki/Timebased_pricing

- The founders of the company. This is important because in the research the relationship between personal values and values of the company is being examined.

- At least 50% of their income should be generated through VBP. This target is mainly set in order to have valid statements on the application of VBP. This will exclude the entrepreneurs who are experimenting with VBP or who are not taking any risks because they have enough funding through cost-based or competitive pricing.

- They must have been working with VBP for longer than one year. It is important that the entrepreneurs are able to talk from their own experience.

- They should be able to see if they have developed new products or markets or collaborations by using VBP. The feedback they got over the years from customers is important as well.

The first entrepreneur involved in our research was a pioneer in this field of VBP. He mentioned other entrepreneurs for the topic of the research. This approach fits the snowballing method of defining the sample. Other entrepreneurs have been found through the internet and by posting requests for social entrepreneurs on different platforms. We used multiple strategies to find entrepreneurs who matched with all three criteria.

This research is based upon a qualitative approach to research. The interviews were done face-to-face and recorded on tape. The overall objective is to gain more knowledge and insights on social entrepreneurs and their pricing strategy. The six questions (considered as topics) were used for framing the interview. Furthermore, at the end of each question, one open-ended question was asked to get more insights from the social entrepreneur.

Data analysis process

The data analysis has been done through a 'daily interpretive analysis'[53]. The data was assembled; notes and videotapes of the interview were collected. The analysis has been done through evaluating the answers and categorizing them after the

[53] http://www2.uwstout.edu/content/lib/thesis/2010/2010natolik.pdf

respondents confirmed the content of the write-ups. The categorisation has been based on a conceptual model that was generated for the literature review

4. RESULTS

We present some main findings from the interviews to give insights in the type of answers we received in respect to the six questions from our framework and the open-ended questions.

Perception of value based pricing by social entrepreneurs

The answers were not coherent. Some entrepreneurs said that it wasn't a real choice; it was just the logical thing to do when values are central to their organization. Others thought that when you co-create your products, your need prices that reflect that. There were also entrepreneurs who developed their pricing strategy while working. To them it was more a process or experiment that resulted in a value-based pricing strategy. Having an innovative pricing strategy seem to be a good solution to customer's problems.

The personal and companies' values of the social entrepreneurs

There were personal values that the social entrepreneurs share, like integrity, honesty, freedom and being open. Others were more spiritual such as love, peace, passion, unity and trust. In relation to others, many of them were searching for authenticity, respect and bringing hearts together. The company values were almost the same as their personal value. The purpose of their company was mentioned as well. The company values were also about connectivity, making the world a better place; connect to change, solving problems, a transformation of people, delivering high quality, and the human factor. Most of the respondents mentioned freedom as an important company value.

The Value Triad explained

To approach this topic of freedom further we used the Value Triad consisting of three variables: the emotional contribution, the revenue of the customer and the ability of the customer to reduce their costs. The Value Triad helped translating value into a competitive advantage for the entrepreneur. According to the entrepreneurs, the emotional contribution is really high. This is due to the personal relation and focus on customer's need. For most of them, they consider

their customers to be a business partners or prosumers. The growing revenue of the customer by using the product or services of the social entrepreneurs is not easy to connect. This is due to the mission of the entrepreneur, which is mostly not focused on traditional value creation or profit-driven. But when companies are directly linked to the revenue increase of the customer, the revenue is higher, because the companies are focused on solving problems, high-quality products or excel themselves. The social entrepreneurs set high standards for the products and services they provide. The cost reduction, on the other hand, is high with many entrepreneurs. Some create cost reduction because they are cheaper than the competition; others have cost reduction as a goal towards the customer. Yet some are creating cost reduction that is dependent on the needs of the customer.

Unique value proposition

In the value proposition, the values of the organization are reflected and therefore also the values of the entrepreneur. Some entrepreneurs have their values directly translated to their value proposition. For example, when they named the value freedom, they translated it into the decision of using a value-based pricing method. They wanted their customers to feel free and therefore choose to have customers name their own price or have no formal contracts. We have also looked at the use of the values through the concept of consistency, convenience, and customization. In general, the companies were mostly consistent in working from their core values or living their purpose. Also, the way they approach and think about the customer is very consistent. They think of the customer as a prosumer, a customer that co-creates products and services. The entrepreneurs try to reinvent themselves on a regular basis and try to deliver high-quality products or services. Most of them give a lot of convenience to their customer. For example, some entrepreneurs do work for free, to make sure that the result is good. Therefore, the level of customization of every company is scored as high. The customer's need is central to their purpose and every product or service is custom made. Some have some degree of standardization, but most of them will co-create their product with the customer. They want to offer high-quality products and a real solution to the problems of the customer.

Application of value based methods

Almost every social entrepreneur used cost-based or competitive based pricing in combination with value-based pricing. Combining the different strategies is also known as hybrid pricing. Or they used a mix of value based pricing methods for

different products or services. This makes it obviously complex to explain to the customer. Furthermore, they expressed that they were not aware of what this pricing strategy would cost their customers. Other remarks they made were: customers have to think more on what the value is of the service they get. The customers are therefor not certain if people take advantage of them or if they get more value. The remarks were mostly aimed at the more positive effects of value-based pricing, like having a better customer relationship. They valued that higher than the negative effects. They thought that the benefits of using VBP were preparing the customer to a new future. However, there is no best practice of applying it, which can make it difficult for both parties involved. All of the entrepreneurs are pioneers with the use of the mix of pricing strategies. Therefore, they adjust and innovate their prices if it doesn't work.

Challenge & Benefits

The lessons learned among the social entrepreneurs have been very different. There are a few who recognize the difficulties of their pricing strategy towards their customer. Some have experienced that traditional businesses are not ready to work with value-based pricing methods. It therefore takes a lot of extra work to follow the path and stay true to their pricing methods. Also, the customers have different needs and are not always ready to work so closely with the entrepreneur. There are a lot of positive insights that the entrepreneurs have gained. Some think that their unique style has enabled them to be more competitive. They think that the product will be better if there is a willingness to step outside the box. Some entrepreneurs see that the spin-offs of investing in customer relation or co-creating products have translated in monetary value. They see added value in thinking in win-win situations. Another comment was that the more people are really involved; the better a community works and produces new opportunities.

All of the entrepreneurs agreed that value based pricing created new opportunities, new markets, or collaborations. Mostly because they were able to use value-based pricing to co-create new unique products or services for the market. Some of them created new markets themselves. The entrepreneurs feel that they are responding to an actual need and that they also learn from their customers. They came up with new ideas for products or services based on the close interaction with their customer. A few of them are helping their customer (also entrepreneurs) in developing their own business. By helping them to become successful, they will in return come back with their customers. They will introduce them to the services and products of the entrepreneur. This feedback loop works

for both of them, because the success of their customers translates into getting more successful themselves. They are able to sell their products and service to the customer's customer.

5. CONCLUDING

The common denominator of the social entrepreneurs is that they all want to contribute to society. They share the sense of urgency of the failure of the traditional economy and the transformation of the new economy. All of them believe that we are entering a new era where values and what they means for business should have a more prominent place at the business' agendas. In their paths towards transforming business, they like to share their knowledge and views on business innovation. This seems to fuel their entrepreneurial heart.

The social entrepreneurs want to show what the future business should look like and how it can be driven by values and they want to create sustainable solutions where quality products/services and values are the main drivers. The lessons for them lies in the fact that they are paving the way towards a new economy, which results in going through barriers of the traditional economy. At the same time, they are convincing their customer to work in this new style. However, they are taking the risk of losing customers that can't cope or understand this business approach. Still, they believe that value-based pricing delivers better products, results and customer relationship.

Discussion

The answers of the respondents have been very valuable. It gave great insight into their way of thinking and using value based pricing. It also confirmed some assumptions of the theory concerning social entrepreneurship. Especially on a personal level, the entrepreneurs seem to be in line with the description of their drive and purpose. But there are a lot of new factors to explore a contributions of these entrepreneurs to the business world. Are they truly creating change or are they pioneers in a niche market? The effect of their efforts on a large scale has not been researched enough. This would be an interesting topic for more research, for example, to focus on how VBP help them to prevent falling into a Death Valley.

Based on the research we can draw lessons for other social entrepreneurs. The most important lesson is that value based pricing is an expression of who they are as entrepreneurs. It's a reflection of the kind of customer relation they aim for and

what their values are. It also tells how they want to implement and safeguard these values, as part of the essence of the organization. These entrepreneurs can inspire their peers in how they have created value-based businesses that are close to their heart. Furthermore, it is interesting that they consider the value-based perspective for their business as a foundation for their success. It would be interesting to find out how sustainable their businesses are in times of crisis, a topic that can be further explored: are these values based businesses more crisis-proof than other businesses?

Limitations

There are limitations to this research. This research focused on 10 Dutch social entrepreneurs and the results should not be generalized to all social entrepreneurs or entrepreneurs in general. This can be seen as a limitation of the study. However, the qualitative approach helped us to explore the questions that were addressed in this research. In future studies, quantitative approaches may be helpful in exploring the impact of social entrepreneurs on business and society and exploring how VBP is being applied and with what motives by including the customers as respondents. The current study has given ingredients for defining relevant variables for further research. Also, the existing literature on value-based pricing and social entrepreneurship is limited. This means that theory building still is at a developing stage, which leaves room for new insights and interpretation on VBP in the context of social entrepreneurship.

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TRACK IV

CIRCULAR COMMUNICATION IN A CIRCULAR ECONOMY

HOW SOCIAL MEDIA COMMUNICATION SHAPES SUSTAINABLE BUSINESS MODELS

Track IV: Circular Communication in a Circular Economy, How Social Media Communication Shapes Sustainable Business Models

Chairs: Deike Schulz[1], and Niels Faber[2]

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Meaningful communication via social media is circular communication that includes (1) content, (2) dialogue, and (3) engagement (Schulz, 2018). More specifically communications based on the shared social media content, between citizens (and organizations) can influence how citizens perceive organizations (Lyon & Montgomery, 2013; Schulz, Jonker, & Faber, 2018). This process can support or damage ongoing developments in sustainable transition in society. For example, citizens may damage organizations that are in the transition to become 'green' when making (un) justified claims of greenwashing on social media. In addition (new) organizations have to carefully decide on their social media communication strategy. In particular, (1) which content to share and (2) how to engage with citizens through dialogue in order to introduce or support their sustainable business model and to be accepted, trusted and supported by social actors.

This session aims to explore different contexts and relationships between various actors (for example organization and other organizations, organizations and citizen and citizen with other citizens) with regard to the influence of social media communication on the development of sustainable business models. For example, we like to discuss how multi-modal and multi-layered communication approaches through social media influence sustainable business models. Those approaches are content-driven (for example text, images- and audio-visuals shared in social networks), feature dialogue (for example through supportive or harmful feedback provided by other actors – organizations and/or citizens – on the shared content), and support (dis)engagement (for example how actors support each other and become active participants or negatively influence group processes).

By exploring common theoretical ground as well as developing work that challenge our view on how social media-based communication schemes support

or discredit the development of sustainable business models, we welcome theoretical and empirical contributions that discuss how social media communication influences sustainable business models.

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"The Role of Communication in Sustainability Transition Emerging Society: A case study of Dutch-Indonesia New Business Model Setup"

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Short Abstract

This qualitative study explained how communication influences sustainability transition perception of locals on Dutch–Indonesia NBM setup. Process involves cross-country knowledge transfer, "telling" way through local government, local leader, social media as agent and "showing" way of communication. Study suggested communication has different roles and deliverables depending what-how to change.

Short Summary

This paper aims to address the dearth of scientific literature on the communication process of sustainability transition in emerging markets/countries, as well as the newly arising literature on New Business Model (NBM hereafter). NBM Global Partnership can take an essential role in the sustainability transition for developing countries. NBM provides value creating infrastructure for both finance and sustainability, while the Global Partnership can build the bridge for sustainability knowledge transfer. However, IB scholars stress the communication challenge that occurs once any involvement of cross-country partnership is initiated. Sustainability transition needs to be perceived correctly by society as a prerequisite to obtaining the process legitimacy. The study provides an overview of how communication influence sustainability transition perception of local people on Dutch–Indonesia NBM setup. The process involves cross-country

knowledge transfer, “telling” way through local government, local leader, social media as agent and “showing” way of communication. We suggested different communication role and deliverable depending on what-how to change. Further, authors explored multi-channel scenario case, where the most trusted channel and its content can move local initial perception. This research focuses on case study of Dutch – Indonesia NBM to conduct an inductive reasoning for our open research question (qualitative methodology). Authors collected the data by interviewing all represented parties in the conceptual framework and supporting documents. The case is selected based on the Dutch-Indonesia government sustainability priority partnership. Our finding will fill the literature gap as well as explain the practical challenge on sustainability transition mechanism in a developing country.

Keywords

Communication, Global partnership, New Business Model, Sustainability transition, Emerging Society

Main text

1. Background

Sustainability transition becomes an interesting issue to discuss considering its significant impact to develop sustainable production and consumption (Grin et al., 2010). Rapid economic growth accelerates the role developing countries assume with respect to the world’s sustainability. However, some concerns are still addressed to the developing countries where they are still lacking in governance, infrastructure, and society awareness (Bevan 2004; Wood and Gough 2006). Global Partnership NBM can take an essential role in the sustainability transition for developing countries. This model allows sustainability knowledge transfer from an advanced country as well as provides both financial and sustainable value creating a model to a developing country.

Researchers found business transition management can be involved in one country’s sustainability transition (Loorbach and Wijsman, 2013). Furthermore, businesses can explore the potential competitive advantage in running a sustainable business (Elkington, 1998; Porter and Kramer,2006). This salient interest leads to a phenomenon to promote New Business Model where the business will not only focus on the financial performance but also on the

sustainability aspect (Jonker, 2012). The existence of a global partnership can facilitate cross-country knowledge transfer. Hence, authors are interested to conduct a case study of Dutch–Indonesia NBM enterprise contribution in Indonesia sustainability transition. As transition research at the micro level is still lacking (Markard, et al., 2012), the proven concept of Dutch – Indonesia NBM in this research might fill this gap.

However, International Business scholars stress the communication challenge that occurs once any involvement of cross-country partnership is initiated. Sustainability transition needs to be perceived correctly by society as a prerequisite to obtaining the process legitimacy. Communication does not only play a role in cross - country knowledge transfer but also in the involvement of local actor leaders, local government, and social media as communication agents to the society. Indeed, local actors' participation is an imperative step to actualize local development (Pennink, 2016). Therefore, the research question will be formulated as follow, *how does the way of communication influence sustainability transition perception of local people (on the case of Dutch- Indonesia New Business Model setup)?*

2. Methodology

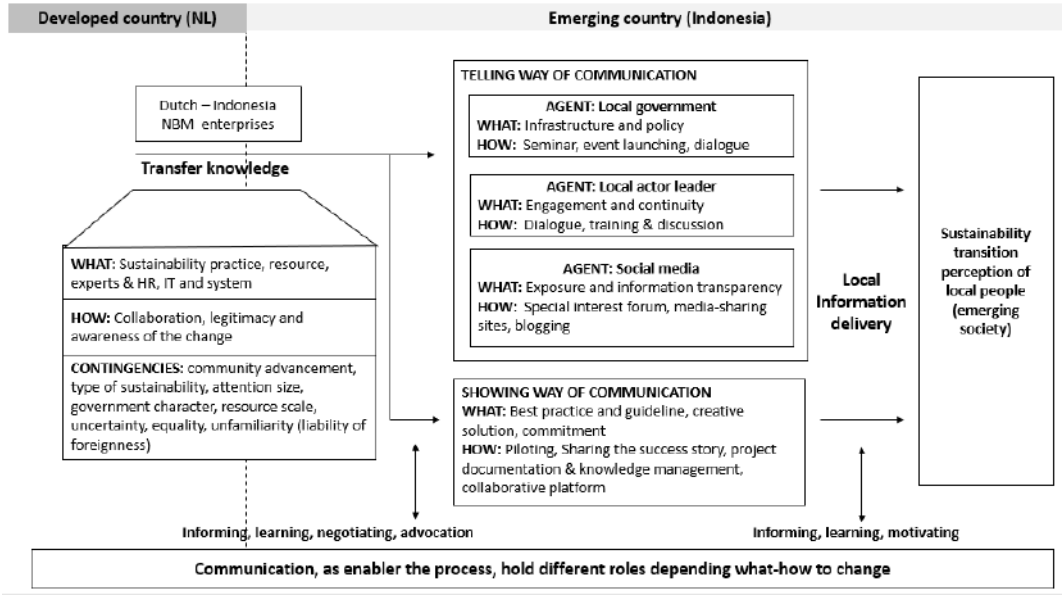
In this research, authors conducted a case study upon inductive reasoning. Qualitative inquiry can be a powerful tool to support the grounded theory that generated in the fieldwork by having an interview and case study in the real world rather than in the laboratory (Patton, 1990).

Dutch–Indonesia has a long-established partnership and target both countries' sustainability issues (Dutch – Indonesia Multiannual Policy Framework, 2017). The case is selected based on this sustainability priority partnership and the access to all representative parties in the framework model. Interviews were conducted with the company's employees (Dutch director in Indonesia and local employees), communication agents (local government, local actor leader, social media writer content), and (targeted) locals. The company's and interviewees' name will be anonymised, but the background details will be given (appendix. table 1). Interview notes and supporting documents are coded to derive support to research framework. In order to strengthen the reliability and validity, authors conducted triangulation, case study database development, and chain of evidence both from interview notes and supporting document analysis (Yin, 2014).

3. Finding and Discussion

The interview and supporting documents derives the finding of communication influence into three main parts as follow, cross-country knowledge transfer within Dutch-Indonesia NBM enterprise, information delivery from NBM enterprise through some local communication channels (local government, local actor leader, social media) to the local people (figure 1), and trusted channel implication (figure 2). Each part in figure 1 will be structured based on what (containing the information and deliverable output) and how (the influence tactic or main activity to support the process), follows Cawsey's (2012) change management framework. The study suggested that communication support all process where each phase has different role depending on the what-how to change.

Figure 1. Framework of how communication influences sustainability transition perception of local people on Dutch – Indonesia NBM setup



3.1 Knowledge transfer within Dutch – Indonesia New Business Model

The potential knowledge that can be transferred from a developed country to an emerging country include sustainability practice, resource, and expert recommendation. Sustainability practice in the Netherlands becomes the knowledge that can be transferred through multiple value creation. Observed NBM enterprise can transfer its water engineering technology from the Netherlands to Indonesia and create an ecological value. The social value is created by involving the community and put Indonesia society empowerment as the main agenda. In the economic aspect, NBM enterprise also introduced and

assisted one of the economic value-added projects to the society. In addition to multiple value creation, cross country partnership can support other resources such as funding, human resource, IT and system, expert recommendation for the sustainability planning and regulation.

Cross–country knowledge transfer allows an opportunity for the emerging country to jump and adopt the latest sustainability technology from the developed country without experiencing previous technology evolution. On other hand, an emerging country's lagging technology can be an opportunity for a developed country to expand the market and obtain exclusive access as a firm advantage. However, this is an ideal case. In addition, the director of NBM enterprise added that the different ways of working (as part of cultural difference) might hinder these opportunities to be realized. Locals might not perceive the importance of sustainability solution suggested because they can still survive in lacking condition. Indeed, unfamiliarity becomes a liability of foreignness within cross-country partnership hampering information flow (Beugelsdijk et al., 2018; Maseland et al., 2018).

Some interviewees (NBM employees) highlighted the role of collaboration to smoothen the knowledge transfer, as this also become key feature of NBM (Jonker, 2012; Pennink, 2016). Collaboration involves local actors and governments who can adopt the knowledge from developed country to local context. Further, the analysis of interviewees and program evaluation documents result in emphasizing locals' awareness of the problem and commitment to change. These also become the key success factor of change management (Cawsey et al., 2012). This communication has a role to inform the possible sustainable strategies, to learn the local context, to advocate the recommendation in regulation or technical aspect, and to negotiate locals' readiness and legitimacy to change. In the case of limited resource and unfamiliarity due to cultural difference, NBM enterprise could not directly to convince wider local people. Interviewees emphasize the role of local government (particularly with its authority to decide the regulation), local leaders, and social media as their communication agents.

3.2.1 Local information delivery: Telling way of communication

Telling way of communication is constructed under Narrative Paradigm Theory ("NPT") where people might comprehend complex information and catch ideas through narrative (Fisher, 1984). This storytelling method can be meaningful in a

cross-cultural context (Barker and Gower, 2010). The study suggested each agent has different narrative depending on its what-how to change.

3.2.1.1 Communication channel: local government

Our interviewees stressed the local government's commitment as key to the country sustainability transition. The government can utilize its authority to decide regulation and manage the budget to build infrastructure. They pointed out that local government should be aware about their community sustainability issue and society involvement before formulating regulation and infrastructure budget. This will involve a tiered or multilevel advocation from NBM and fieldwork employees to ensure the beneficial policy for society. Eventually, new sustainability regulation and infrastructure (as what to change) need to be communicated to the society to make use of it.

Local government's telling way of communication is not only to oblige society to do or make use of the new regulation and/or infrastructure but also to promote the greater its benefits to the community. Policy approval and guideline documents and banners can be silence promotion tools. Seminar or launching event can be an activity to facilitate the discussion if any inquiry from society regarding new infrastructure or policy approval. The communication has a role to inform new regulation and infrastructure as well as to learn society's responses for further command and strategies.

3.2.1.2 Communication channel: local actor leader

Local actor leader will comprehend sustainability transition better than other locals because they have the openness and readiness to change. The feeling of equality between local actor leader and other locals helps to build engagement. Local actor leaders can spread the legitimacy of change to others to ensure the project continuity. It is expected that the society is not only aware of the sustainability issue but also willing to engage and maintain the continuity of the sustainability transition (what to change).

Dialogue is a two-way communication that is able to foster society's openness and to clarify misperception. A personal touch in this telling way of communication is needed to build civic engagement. This can be done by throwing a triggering topic to the society to make them more open, for instance, by constantly emphasizing honesty values or telling small minded consequences based on the real stories to

make society relatable. Regular training and discussion can facilitate the frequent dialogue process. The connection can be built by having a discussion forum with certain topic interest. This communication has role mainly to motivate the society to step into the transition process and to clarify any society's misconception or ambivalence understanding.

3.2.1.3 Communication channel: social media

Social media have a wider media coverage at relatively cheaper cost. For over years, the rise of social media platform utilization rate is shown along the increasing of internet affordability. The type and function of social media become vary such as networking, idea sharing and public discussion. In this case, we define social media encompasses function as special forum interest (e.g. Facebook Group, WhatsApp Group), media-sharing sites (e.g. YouTube, Facebook page), and blogging (e.g. Twitter, BlogSpot, and website). Although each site might have different communication function and deliverable, they still have same focus of what to change in wider information exposure and transparency.

Special interest forum sites tend to focus on one certain issue or similarity. This communication forum will work for the sustainability transition if the members of the group active, close each other, and have the same language (literal -e.g. Indonesian language- and functional – e.g. Fieldwork language). This telling way is relatively similar to dialogue but in an online platform. The forum also works best for civic engagement and collaborative platform based on brief observation of one WhatsApp group forum and discussion with the members. Then, this communication has role to inform the sustainability news and updates, to learn other member reaction, and to motivate any resistance.

Media – sharing sites and blogging have a similar purpose to attract mass or certain attention but different visualization point of information (media sharing sites focus picture and video; blogging focuses on the written case). Interviewee (local actor leader) expressed its telling way in her active posting in these sites to attract others attention, acknowledge her sustainability activities, and expect (material and non-material) support in the future. The sharing activity can be lesson learnt materials for other community. We also observed that media sharing sites can capture the complaints, critics, and resistance of the society and tag the related party to resolve the issue (and build social shamed if the issue still appears). Blogging works better for providing program evaluation notes or uploading the long narratives and story. These attentions can be an indirect

reward and pressure to maintain the transition for community. Thus, this communication has a role to inform the personal opinion or expression and potential sustainable strategies, as well as to learn the responses through the number of likes, viewers, and comments that left in the posted media or blog.

3.2.2 Local information delivery: Showing way of communication

The showing way of communication has a focus on communication strategy with making use of pioneering or piloting project to gain commitment in the transition initiatives, backed by the theory of Seeing first strategy (Cawsey et., 2012; Mintzberg, 2001). Based on the observation in interviewees' answers (NBM employees) and document analysis, the company focuses on the selected nine provincial areas (with 3 – 4 cities as a piloting project). This way of communication will formulate a creative solution and develop best practice that can be the benchmark in the future expansion or project. The company can gain more commitment from people after showing real case visualization.

Observed NBM enterprise had a knowledge management specialist to develop the success stories, project documentations, and technical creative solution. They developed a collaborative platform between the fieldwork facilitators that can inspire and guide them with a new solution. The communication has a role to inform the sustainability real case through the piloting documentation and success story sharing. Prior to the showing process, communication has more roles to learn best practice guideline or success story development from fieldwork employees.

3.3 Coexistence content and trusted channel to locals' perception

Referring the framework in figure 1, we can see that society might be exposed in several ways of communication and agents. After interviewing the representation of community and society, we suggested to derive the implication of the most trusted channel among several channels exposed and it's the content connotation. The overview of this finding is depicted in figure 2 backed by the influence tactics theory in change management (Cawsey et al., 2012).

Trust is defined as the willingness of a party to take a risk (George and Swap, 1982). In this case, the sustainability transition can be categorized as a riskier activity because society need to step out from the comfort zone. Society's personal selection in trusted channel might be varied. Based on interviewees' experience,

some locals consider local actor leader as a trusted channel, some consider their peers. However, initial response from the society can swing following the connotation given by the trusted channels. This result in four possible implications illustrated in figure 2.

Figure 2. Schematic illustration of the coexistence trust and content in communication channel in emerging society's sustainability transition perception

Type of trusted channel content	Society's initial attitude (during awareness stage)	Possible Implication	Emerging society' Transition Perception Description
Support towards the transition (Supportive content)	Support towards the transition	*Smooth Transition*	Very motivated to support the transition
	Opposite towards the transition	*Underdeveloped transition*	Initially opposed but might move to support due to new information offered
Opposite towards the transition (Provocative content)	Support towards the transition	*Potential transition drawback*	Initially rejected but might move to oppose due to confusion
	Opposite towards the transition	*Transition Rejection*	Opposition to support the transition

4. Conclusion

Economic growth accelerates the role developing countries to the world's sustainability. However, some concerns are still addressed to developing countries' sustainability. NBM Global partnership NBM can facilitate sustainability knowledge transfer from the developed country as well as create multiple values to the emerging country. As IB scholars stressed the different culture challenge that hamper the process, communication then holds a critical role to deliver right sustainability transition perception of local people.

The case study is conducted on Dutch – Indonesia NBM. Answering open research question regarding the involvement of communication, it is developed a framework with main parts as follow, cross-country knowledge transfer within NBM, "telling" way through local government, local leader, social media as an agent and "showing" way of communication. The study suggested communication holds different roles given deliverable information and the purpose of each phase (what-how to change). Further, we developed trusted channel implication in moving local perception. Generalization might be issue for this research and

become opportunity for future research to expand this research concept in varied contexts. This research finding is expected to address the dearth of sustainability transition at micro level and to bring insights for policymakers and other global NBM enterprises.

Appendix

Table 1. Detail background from the data resource:

NBM enterprise: Dutch-based company that expands in Indonesia (HO: Jakarta; the fieldwork: Indramayu, West Java)

Business line: water treatment, water supply, flood resilience, waste management, water sanitation, hydropower, land acclimation, sanitation

Dutch – Indonesia sustainability priority: Water management (SDGs: clean water and sanitation)

Type	Role	Interview time
NBM enterprise	Water Director	1:09:54
NBM enterprise	Project manager	44:57
NBM enterprise	Deputy project (Environmental engineer)	1:41:49
NBM enterprise/ social media writer	Knowledge management specialist	
NBM enterprise/ social media writer	Advocacy and communication specialist	
NBM enterprise/ social media writer	Journalist and communication specialist	
NBM enterprise	Provincial Sanitation Advisor (West Java area)	51:28
Local government	Local government – Head of waste management division	1:00:31
Local government	Local government – Head of Environment Institution	15:09
Local actor leader	Anjatan Utara Village leader	48:19
Local actor leader / social media writer	The city of Indramayu	1:45:14
Local actor leader / social media writer	Community leader	1:21:06
Emerging society	Local people	

List of documents:

NBM Enterprise: website, project publication (factsheet, guideline, law regulation, program evaluation documents, training modules, reports video) banner, YouTube (planning and advocation material), Facebook Page (Specific page to discuss sanitation), WhatsApp group (Forum that discuss particular issue), IT system brief notes (collaborative platform)

Local government: website and Facebook page

Local actor leader: leader personal Facebook and community Facebook

Notes: all open resources and already obtained the permission of the owner

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The Role of Community Building for Circular Economy in the Urban Context

Comparative Analysis between Circular Berlin and Circular Economy Rhein-Main

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Extended Abstract

The circular economy (CE) has been discussed as an approach to improve product design and to promote new business models through effective resource use. Products are essential pieces of economic processes, but they are not the only components with the capacity to change the rules of the game. Circular economy means system thinking, which is possible through the engagement of different stakeholders, including diverse communities. Its methodology has the potential to be scaled to an urban level including industrial symbioses, infrastructure development, and community participation. Coherent dialogue, knowledge sharing and interactions between different stakeholders within ecosystems are the keys to close the gap between the circular economy and the current economy.

This article focusses on the comparative analysis of two initiatives, their objectives, communication tools, and community building and its participation: Circular Berlin and Circular Economy Rhein-Main.

Circular Berlin is an open initiative that has been developed from an exploratory study in 2018. Currently, it provides a collective source of Berlin-based circular economy best practices, offers the platform for local community engagement and knowledge exchange, connects local actors and supports their growth through collaboration. The further objective of Circular Berlin is to advocate the circular economy through education and community-building, to co-design projects with local partners that support Berlin towards CE transformation.

Circular Economy Rhein-Main is a community-driven initiative with the goal to foster a CE in Frankfurt and the Rhein-Main region. The objective is to connect individuals and businesses interested or working on a circular economy through events such as meetups, presentations, talks, workshops, conferences, field visits.

Both initiatives had a similar starting point of development and focus on the bottom-up CE community development in the urban context. The authors will explain the selected approach, highlight the interim results in terms of who are the relevant stakeholders and how the focus areas were identified, and cover the role of communication tools, such as diverse social media channels to promote knowledge exchange, connects local actors and support their growth.

Circular Berlin

Circular Berlin started by Dina Padalkina at the beginning of 2018. It took the form of exploratory study and was elaborated in 3 main phases.

The first phase consisted of desk research to identify circular initiatives. The initiatives were validated with local actors through the mapping event, which was jointly organized with Circular Economy Club, during the global Circular Economy Mapping event. As its outcome, around 40 Berlin-based professionals took part in the event, and collectively identified more than 120 CE initiatives in Berlin.

The second phase used interviews and surveys to inform a feasibility study about promoting CE in Berlin, that aimed to identify a possible approach to “anchor” the CE locally and to identify sectors with the highest potential to drive CE in the city. More than 20 interviews were conducted, and 10 online surveys were collected across different CE representatives and city municipalities. The focus of the study was on 4 main industrial areas, such as built environment, food and biomass, textile and fashion, and materials and products. Material flows concept of industrial economy was used for the analysis of input and output resources. It helped to develop industrial value chains at the city level and to link local circular economy initiatives and their core competencies across the value chain.

The third phase organized sector specific multi-stakeholder workshops, that aimed to identify current gaps for implementing CE in each of these sectors and address city challenges. 4 Industry workshops during the third phase brought local CE stakeholders together and provided the opportunity for the gaps’ and next steps’ discussion.

During all 3 phases, close interaction and communication with the Berlin CE community was established. Main channels for communication are Facebook and LinkedIn. Less than in 8 months, Circular Berlin reached via Facebook more than 350 followers, via LinkedIn more than 150 subscribers and more than 30 Berlin projects applied to be listed on the platform with the request to search for collaboration. Throughout these activities, more requests appeared to support the projects for further implementation, which is the key for the circular economy push and information sharing and understanding for. The project gained attention from many Berlin related organization such as Berlin Partner for Business and Technology, TU Berlin, Visit Berlin, etc. and considered as a further partner for Circular Economy implementation on the city level.

Circular Economy Rhein-Main

Starting from 2016 Circular Economy Rhein-Main was driven by its volunteer co-founders, Christina Jäger and Svenja Bickert-Appleby, however, any community member can propose a topic and format and organize an event making it a collaborative platform centred around the interest and needs of its members. The initiative is organized through Meetups as the main communication tool. Since 2018 Christina and Svenja are the representatives for the Circular Economy Club Frankfurt chapter and activities of Circular Economy Rhein-Main are merged and communicated via the Circular Economy Club network as well.

In 2018 Circular Economy Rhein-Main organized mapping event that was joined by 50 members a stakeholder analysis was prepared. The mapping was focused on five industries food, electronics, textiles, cities, and others analysing which circular economy practices at the following levels already exist amongst the different type of stakeholders (Business, Education, Government, Investment, Support) in Frankfurt and the Rhein-Main region:

- Design & Materials
- Manufacturing / Logistics
- Sales / Business Models
- Product life extension
- Recycle

The results have been compiled in a summary and are accessible open source via the Circular Economy Club website. The circular economy scene Frankfurt and Rhein-Main is advancing with SMEs and social start-ups coming forward but is still a rather niche and unknown sector. Since its creation, various topics have been discussed, presented or collaborated on. Circular Economy Rhein Main provides the space to inspire and enable the co-design and start of new projects or initiatives to further advance and create more visibility for a circular economy in the region.

Within the period of 2 years, Circular Economy Rhein-Main has created a community in MeetUp with 300 members today and a core group of 10 members co-hosting activities.

This article collects the results and development steps obtained from both initiatives, including the detailed explanation of the approach for bottom-up CE urban development in Berlin and Frankfurt and the local initiative review. Both concepts are based on an open and transparent approach. It covers the learnings for circular economy implementation through direct work with the local circular economy community and municipalities and covers the role of different communication tools as Facebook, LinkedIn, MeetUp, and developed communication Platform and use of other Circular Economy aggregating platforms. One of the most successful outcomes of 2 projects is that starting from with the data-collective work both initiatives are developing into self-organized and functioning communities in the city and urban area which attracts knowledge creation, volunteers and supporters and diverse projects searching for like-minded people in the area of the circular economy.

Keywords

Circular City, Community Development, Communication for Circular Economy, Bottom-up driven approach.

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The Value of Data in Circular Business Models

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Abstract

In the context of circular economy, innovative business models are needed to slow, close, and narrow resource loops. The value of data can be crucial for these business models and intended circular benefits. The aim of this literature review is to understand the value of data in circular business models.

Introduction

Circular economy aims at solving environmental sustainability challenges by turning linear resource flows into circular loops (Lahti et al. 2017). In the context of circular economy new innovative business models are needed to slow, close, and narrow resource loops by, for example, extended customer experience, long-life goods, product-life extensions, reuse of materials, or resource-efficiency (e.g. Bocken 2016). The goal is to get more value out of resources and to improve the sustainability of production and consumption. At the same time, increasing amount of data is transforming the way businesses operate, and data, when generating knowledge and insight for better decision making, is seen as a potentially powerful source of both economic and social value (Grover et al. 2018).

Traditionally, resource flows have been the primary focus of circular business models. However, data can act as a significant driver and enabler in the circular economy (e.g. Frishammar et al. 2019, Gupta et al. 2018). Interesting examples of data-driven circular business models, such as performance models and digital market places for waste, are emerging (EMF 2019, WEF 2016). However, research on the intersection of data and circular business models is scarce (Bressanelli et al. 2018, Tseng et al. 2018).

The aim of this literature review is to understand the value of data in circular business models by identifying, reviewing, and synthesizing the related literature.

Conceptual background

Circular business models

In circular business models, value is created through slowing, closing, or narrowing resource loops. Slowing resource loops is achieved through the design of long-life goods and extended product-life, closing resource loops through reusing materials through recycling, and narrowing resource loops through resource-efficiency (Bocken et al., 2016). In the context of circular economy, this third approach is seen somehow different from the other two, as it can be applied also in linear resource flows. Circular bioeconomy business models have also been identified at the intersection of circular and bioeconomy (D'Amato et al. 2018). In the context of circular business models, the value includes not only customer and economic value but also societal value (Lüdeke-Freund et al. 2018), and value is created primarily from an environmental value proposition (Manninen et al. 2018). However, it has been argued that circular business models might not always be sustainable (Geissdoerfer 2018).

Business models and related innovations have been increasingly researched in recent years (Foss and Saabi 2017) and turned out to be a helpful tool in understanding how companies do their business and how value is created and captured. As well, there is a growing body of research on circular business models and business model innovations (e.g. Pieroni et al. 2019, Brown et al. 2019), and what kind inherent uncertainties there are (Linder and Willander 2017). Although literature defines data as an enabler of circular economy and business models (e.g. Frishammar et al. 2019, Gupta et al. 2018), the role of data in circular business models has not been specifically considered in any large scale.

Value of data

Increasing amount of data is changing the way businesses operate, and data, when generating insight for better decision making, is seen as a potentially powerful source of customer, economic and social value (Grover et al. 2018). This insight can result in, among others, better asset utilisation, operational efficiency, cost savings and extended customer experience (e.g. Günther et al. 2017, Chen et al. 2015). Data can lead to product, service and business model innovation and transform business (e.g. Hartman et al. 2019, Grover et al. 2018). These potential results and impacts are highly valid in the circular context as well, as they can be seen to relate to slowing, closing, and narrowing resource loops.

While prior research informs us on data-driven business models and on the benefits and value of data, for example, in the context of big data (e.g. Grover et al. 2018, Hartman et al. 2016, Chen et al. 2015), industry 4.0 (e.g. Tseng et al. 2018), smart manufacturing (e.g. Ren et al. 2019) and product-service-systems (e.g. Zheng et al. 2018), the academic research on the role of data in circular business models is relatively scarce, resulting in a gap in our understanding regarding the opportunities of the increasing amount of data in circular business models (e.g. Chen et al. 2015, Günther et al. 2017, Grover 2018, Lim et al. 2018).

Research design

In order to understand the role and value of data for circular business models, related literature was identified, reviewed and synthesized. A literature search to academic databases (Scopus and EBSCO Business Source Complete) was done for circular business model and data related articles in journals[54]. The total number of articles published since year 2000 was 140. Out of these articles, 37 were identified as relevant to understand the value of data in circular business models. This set of studies was expanded through cross-reference techniques to include relevant literature that was left outside the used search terms. More specifically, this was done by identifying further references used by the identified literature that could be useful in answering the research question. This added 5 articles to the relevant literature. In total, 42 articles were included in this literature review. The selected articles were systematically reviewed regarding their theoretical, conceptual, and empirical contribution to answer the research question. The perspective of the articles on data and its value was assessed and the link to

[54]Search terms used included “circular” together with “business model” or “value creation” in the title, abstract, keywords, or subject terms, to focus the articles to the business context (specific search terms used “circular” AND “business model*” OR “value create*”) and “data” in all text.

circular business models and strategies identified. The type and sources of data, management of data, and data-driven activities discussed in the articles were identified. In addition, the expected and realized benefits and impacts of data, pointed out by the articles, were assessed.

Results

Preliminary findings indicate that the state of core literature on the intersection of data and circular business models is fragmented. Data is seen as a driver or enabler of circular economy (e.g. De Mattos and de Albuquerque 2018, Tura et al. 2019) or, on the other hand, lack of data as a barrier for circular business (e.g. Saidani et al. 2018, Vermunt et al. 2019). A variety of circular strategies are covered by the reviewed articles from smart circular systems and product life cycle management to performance services and closed loop supply chains (Table 1). On the other hand, articles cover a variety of technologies including internet of things, embedded intelligence, big data, industry 4.0, and digital technologies.

Table 1. *Examples of the literature on the intersection of data and circular business models*

Perspective of the article	**Specific focus**	**Examples of articles**
Driven by circular economy	Focus on the value of data in the context of slowing resource loops	Alcayaga et al. 2019 Bressanelli et al. 2018 Khan et al. 2018 Rajala et al. 2017 Spring and Araujo 2017 Zhang et al. 2017
	Focus on the value of data in the context of closing resource loops	Aid et al. 2017 Alcayaga et al. 2019 Favi et al. 2019 Jensen et al. 2019 Tseng et al. 2018 Zhang et al. 2017
	Focus on the value of data in the context of ***narrowing*** *resource loops*	Bressanelli et al. 2018 Fisher et al. 2018

Driven by enabling technologies		Gupta et al. 2018 Hopkinson et al. 2018 Lopes de et al. 2018 Rajala et al. 2018 Rajput et al. 2019 Spring and Araujo 2017

Different types of data, including a variety of product, service and system life time data (from design to disposal), can be valuable in the context of circular business models. This includes data on status, condition, location, operation, and use of the products, services, and systems (e.g. Alcayaga et al. 2019, Rajala et al. 2018) and can give insight on, for example, how customers are using products (Bressanelli et al. 2019) or how supply chain logistics can be optimized (Hopkinson et al. 2018). Detailed life time data is not always accessible (Alcayaga et al. 2019) and more general material flow data, for example on waste streams, is used for mapping current state and baseline (Gupta et al. 2018) or identifying circular opportunities (Aid et al. 2017). Type of data and frequency of data collection vary depending on its use and, for example, continuous data flow might be needed for maintenance whereas data needs for other uses might be more irregular (Alcayaga et al. 2019).

In circular business models, data can be used for product design, product life time extensions, product and service innovation, as well as enhancing the customer experience. In product design, both user-generated and product-generated data (Zheng et al. 2018), including insights on usage patterns of customers (Spring and Araujo, 2017), can be used, among others, to extend product life (Bressanelli et al. 2019), evaluate the lifecycle performance of products (Matsumoto et al. 2016), improve the recyclability of products (Favi et al. 2019) and adapt design, operation and disposal strategies along the lifecycle based on this data (Khan et al. 2018). This can lead to product and service innovation including product-service-systems and performance services, where companies keep the ownership of the products and data is used to optimize performance and expand service offering (e.g. Algayaca et al. 2019, Frishammar et al. 2019). Data and data-driven services might enable richer and longer customer relationships (Spring and Araujo, 2017), customization of customer experience and higher user involvement (e.g. Bressanelli et al. 2018, Khan et al. 2018).

In addition, data can be used for operational performance and asset utilization optimization, maintenance, and optimizing end-of-life activities. Smart systems

and embedded intelligence produce data on condition, operation, status, location, use, history and the surrounding systems, which enable, if needed, real-time monitoring and controlling of systems and material flows (e.g. Rajala et al. 2018, Lopes de et al. 2018). This data can be used for process and supply chain optimization (Zhang et al. 2017), reducing waste in production systems across supply chains (Lopes de et al. 2018), finding hidden patterns and correlations to optimize systems (Gupta et al. 2018), and fault diagnosis (Zhang et al. 2017). Data can enable sophisticated maintenance activities including preventive, predictive and prescriptive maintenance and automation of these activities (Alcayaga et al. 2018, Bressanelli et al. 2019) as well as optimising end-of-life activities including reuse, remanufacturing, recycling (Bressanelli et al. 2019). Data can also be used to assess the environmental performance of circular business models and (e.g. Jensen et al. 2019, Manninen et al. 2018), but assessing the impact of large integrated systems can be difficult (Aid et al. 2017).

Collaboration in collecting and sharing data as well as efficient flow of information in the supply chain are seen crucial for capturing the value of data in a networked circular economy context. Existing circular business models have a varying degree of openness (Firshammer et al. 2019) but there seems to be a shift towards more collaborative approach on data sharing (Rajala et al. 2018). However, data discrepancies, gaps, and confidentiality issues are somewhat hampering collaboration (Tseng et al. 2018) and trust is needed to share data (Gupta et al. 2018, Rajala et al. 2018). In circular economy driven collaboration, collecting and sharing data can be the first collaborative step (Brown et al. 2019) and way to integrate the value chain (Lopes de et al. 2018). Companies may also find their data to exceed their own needs and to be more valuable to others (Spring and Araujo 2017).

Discussion and conclusions

In the context of circular business models, data seems to have the potential to act as an input or a key resource, which through a path of data-driven, preferably collaborative, activities could result in positive circular impacts. It is of increasing interest how companies collaboratively can create value propositions that result in new circular value configurations and systemic-level business models (Brown et al. 2019).

In the use of data, we seem to see a more customer-driven path to data-driven business model innovation where data is used for enhancing customer experience

towards circular economy objectives through product design, product life time extensions, higher user involvement, and product-service-systems. On the other hand, we see a performance-driven path where data, including real-time performance and material flow data, is used to optimize the economic and environmental performance of circular systems and supply chains on more technical and operational level. The idea of these two paths is close to what Urbinati et al. (2017) point out to be significant in creating new circular business models, namely a customer value proposition, which involves a higher degree of cooperation with the customers, and the value network, which includes reverse supply chain activities and cooperation with the actors in the supply chain. These two paths overlap and might both result in business models where significant customer, business, and societal value is created and captured out of data. However, there is no certainty that use of data would result in new business models and bring the intended benefits.

The reviewed literature left some of the issues often identified with circular business models uncovered. This applies for example to sharing business models. This research is limited by its scope and the choice of methods. It may not identify all relevant literature or all relevant aspects on the value of data in circular business models. However, despite of these limitations, it aims at giving significant grounded insight and conceptual understanding on the issue.

Keywords

business models, circular economy, data-driven, value of data, sustainability

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TRACK V

NEW BUSINESS MODELS FOR SUSTAINABLE ENTREPRENEURSHIP

Track V: New Business Models for Sustainable Entrepreneurship

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Sustainable entrepreneurship describes the processes of discovery, creation, exploitation and growth of business opportunities leading to sustainability-oriented innovations, value creation and sustainability transformation of markets and societies. From startups to large incumbents, entrepreneurial ventures can contribute to sustainable development via innovative value propositions and core business models aimed at the creative destruction of unsustainable production and consumption patterns (Schaltegger & Wagner, 2011). Sustainable entrepreneurs generate innovative business models, products and services that substantially improve environmental and social performance and overall quality of life, which often necessitates change at the institutional level as well (Pacheco et al., 2010).

Different pathways of sustainable entrepreneurship concentrate on the means-goals relationship. For example, sustainable entrepreneurs may use their given means and own ingenuity to develop business models in line with the theory of effectuation (Sarasvathy, 2001). As innovations are key to sustainable entrepreneurship, new designs like innovative business models, open innovation, stakeholder involvement (Fischer et al., in press), and co-creation become important areas for further research (Schaltegger, Hansen & Lüdeke-Freund, 2016). This goes along with the search for new innovative forms of ecopreneurship as well as social and sustainable entrepreneurship considering factors that make entrepreneurs successful in some industries and national markets whereas they do not or barely exist in other industries and markets.

Based on the classification of sustainable entrepreneurship, research is encouraged to identify processes, paths and factors of success towards achieving sustainable entrepreneurship. Research is also needed to further explore successful and unsuccessful practices and how sustainable entrepreneurship could be supported by innovative business models. While approaches like the planetary boundaries concept (Rockström et al., 2008) and the UN Sustainable

Development Goals (SDGs) can serve as inspiration and reference frameworks (e.g. Schaltegger, Beckmann, & Hockerts, 2018a, b; Fischer et al, 2017), the knowledge and application of certain tools (e.g. business model canvas, in Breuer et al., 2018) may be helpful to support the sustainable entrepreneurship development process.

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Business model innovation at the bottom of the pyramid

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Abstract

The Bottom of the Pyramid (BoP) context differentiate from develop economies because of their limited access to resources, weak legal institutions, market fragmentation and others (Goyal et al. 2016). Nevertheless, they are the ones that require actions that will take people out of poverty. Entrepreneurship and Business Model Innovation (BMI) seems like an alternative for the development of the BoP. The constraints that they have should be used to redesign and innovate in products and business models. This led us to the following research question "How can BMI be used to overcome the challenges of the enterprises at the BoP?". We developed a qualitative study in Bolivia -the poorest country of Latin America based in GDP-. The study was done through a methodological triangulation. It included the analysis of documentation and statistic data, observation, semi-structured interviews and focus groups. As preliminary results, we can say that most of the ventures have products that already exist in the market with a minimal differentiation. More relevant, in most of the cases, their value proposition is very vague, their market segment is too broad, their competitive strategies do not present a real challenge to be replicated and they have problems to successfully reach their markets. All these things can be summarized in weak business models, however we are still analyzing the information.

Keywords

bottom of the pyramid, entrepreneurial ecosystems, business model innovation

Business model innovation for the SDGs: Towards a performance measurement system

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Abstract

Business model innovation can be a key element for realizing the transformation needed to accomplish the Sustainable Development Goals. However, literature on Sustainable Business Models still lacks quantitative-oriented approaches and tools supporting the implementation and assessment of business model innovations for sustainability. This study proposes an eight-phase performance measurement system supporting organisations in implementing, assessing and managing business model innovations aiming at contributing to the Sustainable Development Goals. The performance measurement system builds upon literature on business model innovation for sustainability, performance measurement and management, and sustainable development, and it is developed through a constructive research approach. The proposed performance measurement system considers three sustainable business model dimensions (i.e. sustainable value creation and delivery, value proposition, and value capture), and various sub-dimensions, aiming to inspire different opportunities for advancing business model innovation for the Sustainable Development Goals. This study brings a novel contribution to both performance measurement and sustainable business model literature, by suggesting the use of performance measures for driving the implementation and operationalization of sustainable business model innovations.

Keywords

business model innovation, Sustainable Development Goals (SDGs), sustainability, Performance Measurement System (PMS)

Circular business model innovation tools and approaches: A literature and practice review

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Abstract

In a future circular economy, new business models are needed that are capable of slowing, closing and narrowing resource loops and address key resource and climate challenges. After a phase of excitement and inspiration, there is a need for a 'operationalisation' phase to ensure effective implementation of circular practices and the desired sustainability outcomes. This operationalisation phase will involve the development of business models with significantly improved resource efficiency, environmental and social impacts. To provide guidance in designing circular business models, a broad range of methods and tools has been developed in the recent years. This paper presents an overview of the existing tools and methods developed through a systematic review of academic and practitioner literature. Tools are analysed and presented along four coding dimensions: (1) purpose, (2) characteristics and form, (3) user group, and (4) validation. The overview seeks to provide structure to the landscape of tools, identify synergies between existing tools, and frame the research agenda to facilitate more concerted efforts in the development of tools for circular business model innovation. A comprehensive tool database is provided that presents tools ac-cording to their different purposes and characteristics and enables practitioners to select tools that fit their specific context and objectives. Gaps in the existing tool landscape are highlighted and suggestion for future research provided, including the development of more integrated tools to effectively support practitioners throughout the business model innovation process.

Keywords

circular economy; innovation; circular business model; experimentation; effectuation.

Demand side management and renewable energy business models for energy transition

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Abstract

Recent developments in technology have been considered a critical factor in fighting climate change and accelerating energy transition. These developments are changing the current centralized and fossil fuel-based energy system into a new system with integrated renewable energy resources. The developments also facilitate the emergence of new business models and allow entrepreneurs to propose new products and services. This paper aims to identify the existent energy business models based on a systematic literature review, focusing on two main areas: renewable energy and demand-side management. With that purpose, a framework is described including specific characteristics for energy business models. Based on this framework, 22 different energy business models are presented clustered in eight patterns. The study draws on an exhaustive picture of the emerging business models and provides insights for researchers and for early-stage companies to innovate through business model transformation.

Keywords

business model, energy services, energy entrepreneur, renewable energy, demand-side management

Integrating Circularity Into The Business Model Innovation process

The Importance Of The Process Behind The Tools

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Extended abstract

Since the rise of circular economy as a major policy topic in Europe, interest in the potential of circular business models has increased strongly among companies and entrepreneurs. Despite all this interest, and despite the development of a large body of research literature about opportunities and barriers related to the circular economy (e.g. EEA, 2017; Kirchherr et al., 2018), circular business models are not easily adopted by existing companies, nor do circular start-ups have a high success rate in finding their way to the market (Reike et al., 2018). This should come as no surprise, because 1) companies wanting to implement circular business models, depend on the broader societal changes required to achieve a circular economic system, such as legislation, taxation, consumer behavior, etc. (EEA, 2016); 2) most circular business concepts currently brought to market only target niche markets of environmentally aware consumers (Camacho-Otero et al., 2018); 3) circular business models often coincide with shifting from production company to service company, requiring new competencies, financing solutions, logistics, etc. (Tukker, 2015); and 4) often, economic success goes at the expense of the circularity/sustainability ambition level, or vice versa (EC, 2018).

Companies engaging in a search towards a circular business model are in need of a process and supporting tools that enable them to explore, identify and test potentially viable business models that effectively contribute towards increased circularity, within the context of a vision on long-term systemic change. In recent

years, many tools and frameworks to characterize circular business models have been published (e.g. Bocken et al., 2016; Lewandowski, 2016; Nußholz, 2017; Planing, 2015). One communality among such frameworks and tools, is that they usually make no distinction between strategies that directly affect circularity, such as reuse, repair, or recycling, and strategies that are instrumental to increasing circularity, but are not sufficient by themselves. Examples of the latter are product-service systems, reverse logistics, or branding.

Another observation is that tools to support development of circular business models are usually not embedded in a structured process for innovation. Yet, existing start-up innovation process heuristics such as Lean Start-up (Ries, 2011) could be useful for circular business development (Bocken et al., 2018). Integrating knowledge and values about circular economy and sustainability in such heuristics could greatly spur business innovation in support of a circular economy. The iterative approach to learn fast and validate assumptions could be valuable to convert a long-term vision on sustainability into actionable steps. This could enable entrepreneurs to start experimenting with certain aspects of a possible circular business model, without losing sight of longer-term goals that are currently not achievable yet due to internal or external barriers. The user-centred approach could help to disentangle the goals of a circular business model (to increase circularity of production & consumption) from the means (convincing customers to buy or use a circular product or service).

This paper describes the development and testing of 1) a framework and tool to guide entrepreneurs or business consultants in the selection of circular strategies that fit their specific context, and 2) a support process that integrates circularity and sustainability into a lean start-up based coaching scheme.

The tool described in this paper (Circulator, available online at www.circulator.eu) was designed around a conceptual framework that builds on earlier sustainable/circular business model typologies (Bocken et al., 2016, 2014), and that distinguishes 3 types of strategies: circular value creation strategies (activities that directly contribute to circularity), value proposition strategies (activities to convince the customer), and value network strategies (activities to collaborate with partners in the realization of a circular value network). Within each category, specific strategy examples are included, exemplified with existing business cases implementing these strategies. In this way, the framework and tool help entrepreneurs to understand the difference between business activities that directly contribute to the goal of creating circular impact, and business activities

that are rather supportive by for example generating customer demand, or setting up the right conditions for product take back. The Circulator tool was used in a business development support approach that integrates circularity and sustainability into a lean start-up based coaching scheme. The process was tested in four different case studies. The approach, co-created between sustainability experts and a business accelerator, consists of a stepwise, iterative process to coach the entrepreneur from vision over initial business concept to specific action plan and finally the execution of the plan.

The four companies included in the coaching programme varied in terms of sector, company size as well as innovation stage. The sectors included were professional lighting, powder coating, electronic waste collection and reuse, and building sector. The company size ranged from one-person start-up, very small SME to medium-sized enterprise. In addition to individual coaching, the companies could make use of ad-hoc topical expertise to help validate assumptions related to their business model, on topics such as environmental impact analysis, legislation, financing, or technology. To stimulate peer-to-peer learning between the participating entrepreneurs, three meetings to exchange experiences were organized in the course of the programme.

All four entrepreneurs indicated that they benefited from having access to a coach that structured and accelerated their innovation process. Especially in small SMEs and start-ups, a sounding board and sparring partner often lacks. In addition, the fact that the coaches helped with the identification of the most suitable circular strategies for the context of each company was considered very valuable. This suggests that providing stand-alone tools for circular business development, without further underpinnings, context and support, are not sufficient to address entrepreneurs' needs. Entrepreneurs are typically focussed on the challenges that are directly in front of them, making it difficult to factor in opportunities that haven't materialized yet (e.g. because of lacking legislation). A third benefit of the support approach appeared to be the easy access to a wide variety of topical expertise. In most cases, the necessary topical support was limited to a few hours or days of work. The support programme helped avoiding excessive (administrative) costs compared to the individual companies having to search and contract such a wide variety of expertise separately. Finally, the peer-to-peer learning experience provided considerable added value to the companies. It enabled them to exchange general knowledge and practical solutions, but it also helped them to understand that experimenting with circular business models is a challenge requiring a long term vision and perseverance.

Finally, the lessons learned during this programme were used to identify the different roles that are needed to provide a successful circular business innovation ecosystem. The main needs identified were: a coach/mentor with knowledge of circularity/sustainability, a network of knowledge/solution providers, and peer-to-peer learning networks. For the first, the challenge ahead is to provide business consultants and incubators with the appropriate knowledge about circularity and sustainability. For the second, there is a clear need for solutions (digital and off-line) that bring entrepreneurs in contact with a currently scattered landscape of solution holders related to finance, legal, technology, etc. Peer-to-peer learning among circular entrepreneurs also requires tools and support, which could be set up in business networks. Setting up collaborations between different parties in the innovation ecosystem would greatly help to achieve an innovation ecosystem that contributes to realization of a circular economy.

Keywords

Circular business models, circular strategies, lean start-up, business innovation

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Investigation of Sustainability Aspects in Business Models of Early Phase Start-ups

A Multiple Case Study of Start-up Project Teams in an Academic Start-up Accelerator Program

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Abstract

Business Models are tools that are commonly used by sustainable entrepreneurs to create and develop their ventures. Knowledge about the development of sustainable business models before entrepreneurs launch their ventures is still surprisingly scarce. We address this research gap using data from an academic start-up accelerator program that was developed to support entrepreneurs during the foundation process.

Keywords

Sustainability, Business Models, Sustainable Entrepreneurship, Start-up Accelerator

Introduction and Purpose

The term business model (BM) is widely used in the academic start-up literature and represents a central construct in entrepreneurship research (George and Bock 2011; Trimi and Berbegal-Mirabent, 2012). George and Bock (2011) stated that BMs are major tools that can be used by entrepreneurs to create and develop ventures. Schaltegger and Wagner (2011) argued that entrepreneurial capability can be utilized to address sustainable development. Sustainable entrepreneurs make a voluntary commitment to create social and environmental value beyond the value of conventional business ventures whilst simultaneously creating economic value (Lüdeke-Freund et al., 2017). However, according to Stubbs and Cocklin (2008), sustainability is mostly attributed to single elements of the BM, rather than multiple dimensions of the BM. Boons et al. (2013) argued that companies need to combine several BM elements regarding the three dimensions of sustainability (economic, environmental, and social) to operate sustainably. Nevertheless, entrepreneurs who strive for sustainability face a key challenge when attempting to maintain economic value whilst increasing social or environmental value (Austin et al., 2006). Additionally, entrepreneurs in start-ups often use trial-and-error methods during the initial phases of BM design (Sosna et al., 2010).

The research on sustainability aspects in early phases of BM design in start-ups is still surprisingly scarce. To address this gap, we used data collected in a four-month study on start-up project teams in an academic start-up accelerator. With the full access provided by the academic start-up accelerator, we investigated the BMs of selected start-up project teams. The focus of the investigation was the development of sustainability in elements of the entrepreneurs' BMs. Furthermore, drivers that led to aspects of sustainability in the BMs of start-up project teams were identified as part of this work. We addressed the following research questions:

(a) What BM elements incorporate aspects of sustainability during the early phases of start-up project teams?

(b) What drives the development of sustainability aspects in BMs during the early phases of start-up project teams?

Method

Data selection

In this study, an investigation was carried out of ten start-up project teams that consisted of up to four people who were part of the four-month start-up accelerator program "*Gründungsgarage*" hosted at the Graz University of Technology. All investigated teams participated in the academic start-up accelerator from October 2018 to January 2019. Due to the early dropout of one team, the number of active teams was reduced to nine. In a first step, following the logic of purposive sampling as described by Flick (2005), we screened the application documents of the nine remaining teams for aspects of social as well as ecological sustainability. Based on the findings, we selected three teams that promised to offer valuable insights into the design of early-phase sustainable BMs in start-ups.

Data collection

We investigated the three selected start-up project teams using a multiple case study approach (Eisenhardt, 1989; Yin, 2009; Gioia 2012). The focus of the investigation was the start-up project team's BM both within and outside the start-up accelerator program. We used multiple qualitative methods to triangulate our findings. First, predefined documents required by the start-up accelerator were collected at discrete timepoints over a four-month period. These documents included written applications for the accelerator program that outlined the project teams' initial start-up ideas. Second, the Business Model Canvas (BMC) of each entrepreneurial team was evaluated at discrete timepoints during the four-month period of the investigation (Osterwalder and Pigneur, 2010). Third, over the four-month investigation period, multiple semi-structured interviews were conducted with members of the start-up project teams. The interview guide covered topics regarding the BM components as well as the development of the components over time. We transcribed all interviews in full. In addition, two of the authors communicated with team members throughout their time in the four-month accelerator program. Finally, available information from the websites of the successful founding teams was gathered to complement information in the documents and the interview data. Table 1 provides an overview of the investigated start-up project teams and the collected data.

Data analysis

All written material was evaluated using a qualitative content analysis method as described by Mayring (2010) using the software "QCAmap". We applied inductive codes to paraphrase items. Furthermore, we included timestamps to indicate when the respective data had been collected in our coding system so we could observe changes in the investigated BMs of the start-up project teams. In addition, as proposed by Mayring (2010), "intra-coder reliability" as well as "inter-coder reliability" was checked by two individual researchers. The codes identified were subsequently assigned to main themes, following the clustering logic proposed by Gioia (2012).

Table 1: Overview of investigated cases and empirical data collected.

	Start-up project team	Datapoint 0 (Application Documents)	Datapoint 1 (one month after start) Interview 1 BMC 1	Datapoint 2 (four months after start) Interview 2; BMC 2	Current status of start-up
A	"Alphawood"	A0	A1	A2	Founding in progress
B	"Clean Connect"	B0	B1	B2	Founded (website available)
C	"Mady Pure"	C0	C1	C2	Founded (website available)

Results

In the following section, the results collected from the three investigated teams are presented in detail. The structure of the analysis was partly guided by the main BMI dimensions of value proposition, value creation and value capture (Clauss, 2016). Furthermore, the general aspects of sustainability and their respective drivers are described in detail.

Case 1: Alphawood

General aspects of sustainability in the BM: The start-up project Alphawood provides an upcycling product by transforming wood waste into wall panels for interior use (A0, A1). Thus, Alphawood places an emphasis on local manufacturing as well as local sourcing, indicating the ecological and social aspects of its business plan in its BM.

Value Proposition: Alphawood's initial business plan was to offer easy-to-install wall panels for interior use. Alphawood initially used waste materials as a basic resource but did not explicitly emphasize sustainability aspects in its BM (A0). However, by the time the first interview was held, Alphawood's project leader had decided to include environmental sustainability in his value proposition by communicating an added value through the use of waste materials. In addition, Alphawood contributes to social responsibility by focusing on local production to create and secure local jobs (A1).

Value Creation: In addition to internal activities related to the manufacturing process that uses ecologically sustainable resources, the procurement of local resources was also identified as an essential element influencing its sustainability in the BM. We recognized that Alphawood had a strong commitment towards local value creation and local sourcing (A1, A2). A precondition for all initiatives towards sustainability was the economic sustainability of the venture (A1, A2).

Value Capture: In both interviews (A1, A2), the respondent mentioned the effects of sustainability on pricing. He argued that sustainability led to higher costs for resources and, subsequently, to lower profit margins when initially launching the product on the market (A1, A2).

Drivers for sustainability in the BM: Easy access to waste materials and the subsequent opportunity to create value out of waste were the initial triggers that led Alphawood to offer a sustainable product on the market (A0). However, the sustainability of the product was seen more as a means to support the main value proposition by improving living spaces (A0). Alphawood's team members indicated that the inclusion of sustainability aspects in the BM has been primarily driven by marketing motives to improve sales arguments and that these aspects are actively communicated to customers to differentiate the company from competitors. (A1, A2).

Case 2: Clean Connect

General aspects of sustainability in the BM: The start-up Clean Connect develops a clothing sensor for bedridden people who suffer from incontinence and are in need of incontinence protection. The sensor notifies the nursing staff if the absorbent material needs to be changed. This increases the quality of life for the affected persons (B0, B1). Due to a leasing model, the clothing sensors need to be made of durable and recyclable materials. Clean Connect's BM, therefore, shows aspects of ecological as well as social sustainability (B1, B2).

Value proposition: By using a clothing sensor, the number of nightly routine checks by nursing staff who care for bedridden people can be reduced. On the one hand, this potentially leads to an increase in the labor productivity of the nursing staff and, on the other hand, to an improvement in the life quality of the affected person (B1). Clean Connect addresses mainly hospitals and nursing homes and sees sustainability only as an addition to its main value proposition (B2).

Value creation: The interviews showed that Clean Connect attached particular importance to social responsibility in terms of the company's development regarding human resources (B1, B2). Clean Connect pursues a growth strategy that guarantees long-term jobs and wants to avoid fluctuations in employees (B1, B2). Moreover, the entrepreneurial team mentioned that local production and local sourcing is desired for ecological reasons. However, Clean Connect also referred to reasons other than sustainability which led to the inclusion of ecological aspects in the BM, for example, the local sourcing of manufacturing. In that regard, the reasons were the availability of local supply chain partners and the perceived threat of patent theft when outsourcing to manufacturers abroad (B1, B2).

Value capture: Clean Connect is aware that their customers (hospitals and nursing homes) will not necessarily pay extra for a sustainable product. Therefore, sustainability is more of a side effect of the main value proposition (B1, B2). Nonetheless, Clean Connect decided to follow a durable product design using recyclable materials. The crucial point that influenced their choice to use a product design that conserved resources was the introduction of a leasing model (B2) rather than selling the product as originally planned (B0, B1).

Drivers for sustainability in the BM: Clean Connect indicated that it considered social aspects in that it developed a solution to improve the quality of life of incontinent people. (B0). A driver for ecological sustainability in the BM was the

introduction of a leasing model. Therefore, defective products are returned instead of being discarded (B2), subsequently reducing their environmental impact. Another effect of the leasing model is that it requires durable product designs (B2) and minimizes waste.

Case 3: Mady Pure

General aspects of sustainability in the BM: The start-up Mady Pure provides affordable dog food based on insect-derived protein (C0). Using insects to produce food requires fewer resources and generates less carbon dioxide (C0, C1). Therefore, Mady Pure's BM shows aspects of ecological as well as social sustainability.

Value proposition: Mady Pure initially addressed environmentally aware dog owners who were looking for a long-term dietary solution for dogs with allergies. (C0). Mady Pure considered the environmental sustainability of the developed product to be an additional value that could be offered to a specific type of environmentally aware customer (C1). In that regard, environmental sustainability distinguishes Mady Pure's product from other products on the market. Sustainability in other areas of the BM was initially not a major concern (C1). However, Mady Pure was aware early on that communicating a sustainable value proposition to customers requires transparency (C1). At a later stage, the focus on targeting owners of dogs with allergies was more heavily emphasized (C2). It was interesting to note that the focus on environmentally aware customers was partly dropped (C2) at this later stage of BM-development. Sustainability aspects were seen as by-products of providing dog food for dogs with allergies (C2). However, demonstrating sustainability through transparency drew attention to the BM design, allowing Mady Pure to convey additional value to the customer and increase customer loyalty.

Value Creation: Key manufacturing partners enable the creation of a sustainable value proposition, for example, by supplying insect protein (C1). Producing protein from insects is more efficient than producing protein from animal sources (C1, C2). In addition, insects can potentially be fed on organic waste, enhancing the BMs overall sustainability (C1, C2). Furthermore, Mady Pure attempts to find more local suppliers in Europe despite the fact that alternatives are available in Asia (C1). However, the founder stated at a later point that financial aspects were central to the selection of suppliers, while that environmental sustainability played only a secondary role. Mady Pure further

highlighted the need to increase the transparency of the operations along the start-up's supply chain (C1). At a later stage, Mady Pure also emphasized lean operations (C2). The decision to add sustainability aspects, such as sustainable packaging, is heavily influenced by the respective economic feasibility (C2).

Value Capture: The communication of sustainability was mentioned to justify the higher sale prices of Mady Pure's products (C1, C2). Mady Pure emphasized that its BM has to be economically sustainable above all (C2).

Drivers for sustainability in the BM: Mady Pure's BM was enabled by changes in governmental regulations regarding animal food (C2). The need to address targeted, environmentally aware customers was initially a driver for the inclusion of sustainability aspects in Mady Pure's BM (C1). It was interesting to note that this focus on environmental aware customers shifted towards specifically addressing the needs of particular customers (C2). Therefore, sustainability is more of a side effect of the main value proposition (C2). In the long run, a driver for the inclusion of sustainability in the BM was the need to demonstrate sustainability and justify the higher sale price of Mady Pure's product and differentiate it from competitors (C2).

Discussion and conclusions

We provide evidence from an academic start-up accelerator, which was collected while examining the early development of start-up project teams' BMs towards sustainability. In addition, this work allowed us to identify drivers for the inclusion of sustainability aspects in early developmental phases of start-ups' BMs. Based on our results, our research questions can be addressed as follows:

What BM elements incorporate sustainability aspects in the early phases of entrepreneurial teams?

In the investigated BMs, ecological sustainability was a by-product of the overall value proposition. Ecological sustainability was addressed by using more sustainable resources in the value creation activities (A1, A2, C1, C2) of both Alphawood and Mady Pure. In the case of Clean Connect, ecological sustainability was supported by the development of more durable products and the reuse of products (B1, B2). All three cases show an interdependence of social and economic benefits, for example, by creating social added value (B1, B2) or creating and sustaining local job opportunities (A1, A2). However, the start-up projects did not

holistically include sustainability in their BM, a finding that is consistent with the findings of Heir (2016) and Stubbs and Cocklin (2008).

What drives the development of sustainability aspects in BMs in the early phases of entrepreneurial teams?

Although the approaches differed, similar drivers influenced the investigated entrepreneurial teams, encouraging them to include sustainability aspects in their BMs. In all three cases, the inclusion of aspects of ecological or social sustainability in the BM was not the main focus of the entrepreneurs. However, the inclusion of sustainability aspects was seen as a way they could differentiate themselves from competitors (A1, A2, C2). We discovered that their social and economic benefits were interdependent, which agrees with the findings of Spieth et al. (2018). Furthermore, the need for transparency was mentioned as a way to communicate a BMs sustainability and as a means to justify higher sale prices (A0, A2, C2), which then affected value capture (A1, A2, B1, B2, C1, C2). In that regard, we extended the findings of Davies and Chambers (2018). In addition, Clean Connect's BM, based on a leased product, required the development of durable products that later contributed to the BMs overall sustainability (A2). Other factors that were investigated and that entrepreneurs perceived were changes in regulations (C2) and the possibility to upcycle waste products (A1, C1).

Limitations and further research

Data were included from only three cases of sustainable start-up project teams, which were involved in a time-limited academic start-up accelerator program. Due the qualitative nature of our research, the generalizability of our results is limited. Further research could be carried out to address the development of founded sustainable start-ups and the subsequent development of sustainability aspects of their BM over time.

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Learning-by-playing: the serious game Risk&RACE as a tool to support circular economy business model innovation at a company level

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Extended abstract

Over the past decades, increasing concerns have risen about the long-term viability of our linear economy model, fuelled by increasing resource extraction rates and generation of emissions and waste. Moving towards a Circular Economy is often put forward in policy documents as a strategy to decouple consumption from resource use, without sacrificing economic growth (Ghisellini et al., 2016). Also companies are showing increasing interest in the opportunities circular economy business models have in store. Circular economy targeted business model innovation aims at improving resource efficiency and effectiveness, by adapting product design, material choices and end-of-life management and by changing the way products are put on the market (Bocken et al., 2016; Nußholz, 2017; Pieroni et al., 2019). Recently, a multitude of education programs and online courses have been developed to educate students, entrepreneurs and the wider public about circular economy principles and case studies (Coursera, 2019; Ellen MacArthur Foundation, 2018). Still, knowledge transfer remains mostly theoretical and abstract. Game-based learning tools are gaining attention as effective ways to transfer knowledge on complex topics to a broad audience (Qian and Clark, 2016). Recently, a number of serious games have been developed to improve the understanding of sustainable entrepreneurship and business model innovation (Gatti et al., 2019; La Guardia et al., 2014; Laurischkat and Viertelhausen, 2017). Also in the field of Circular Economy, game-based learning

approaches are emerging for use in education and awareness raising programs (ResCoM, 2019; Whalen et al., 2018). Most of these games focus on the overall resource challenges and sustainability issues that trigger the need for a circular economy, but not on the internal business implications of implementing circular material strategies and business model innovation at a company level.

The business game Risk&RACE was developed to address this need for a hands-on tool that addresses the business perspective of circular economy in a company context. It aims to bridge the gap between theory and practice by offering a hands-on business simulation that lets players experience the operational and financial drivers and drawbacks of investing in circular business strategies (Tura et al., 2019). Also the pressures that companies experience from the external business environment, such as legislation, market fluctuations and supply constraints are mirrored in the game. The game was developed in an iterative way, based on extensive user-testing and feedback. To add to the effectiveness of the gameplay, a workshop approach was developed to embed the game in entrepreneurship courses and business consulting trajectories as a tool to trigger business ideas and raise discussion about circular economy opportunities and challenges.

This paper provides an overview of the game development process and the way circular economy strategies and business models were incorporated in the game mechanics. It also describes the workshop format that was developed and presents the results from a series of testing sessions with different target groups: undergraduate students in engineering, economics and design curricula, entrepreneurs, business consultants, company executives and financial advisors. The immediate impact of the game experience on participants' understanding of circular economy related topics was assessed with pre- and post-workshop questionnaires.

Based on these questionnaires, it can be concluded that students highly appreciated the realistic and hands-on nature of the game, encouraging them to think and act as an entrepreneur. Its experience-based approach was welcomed as a refreshing complement to theoretic lessons about sustainable entrepreneurship. Professional players praised how the game made the complexity of circular strategies tangible and the way in which it stimulated reflection, discussion, strategic thinking and idea-generation. All target groups indicated their knowledge about circular economy concepts and business models had benefited from the gaming experience. Around 60% of respondents reported an improved understanding of business concepts, such as return on investment,

payback time, fixed and variable costs and product-service-systems. Knowledge of circular material management strategies benefited even more from the gaming experience, as between 70-90% of respondents indicated an improved understanding of concepts such as remanufacturing, circular design, substitution, resource efficiency and recycling. These self-evaluation results could be confirmed by analysis of pre- and post-game answers to open questions such as "what are advantages and disadvantages of remanufacturing". During post-game debriefings, players often mentioned the following eye-openers: the importance of design on the potential for remanufacturing and lifetime extension of products, the long-term effect of recycling inefficiencies on material loss and the challenge of upfront investments when applying product-service models.

Furthermore, the paper reports on how the Risk&RACE workshop is used by lecturers in entrepreneurship education and by business consultants in the field of circular business innovation. Finally, the potential of using the Risk&RACE workshop in strategic company planning is discussed. Combined with scenario planning, for example, could be used to make entrepreneurs and business executives experience the effectiveness of linear and circular business strategies in different possible futures.

Keywords

circular economy, business model innovation, serious game, entrepreneurship, education

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Logic Hybridization in Sustainable Entrepreneurship

A Business Model Perspective

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Extended abstract

This original research paper focuses on the concept of logic hybridization in sustainable entrepreneurship, identifying and understanding key processes and outcomes through the lens of sustainable business models. Sustainable entrepreneurship and business models are considered potentially disruptive drivers of sustainable transformations, but there remains a research gap concerning the dynamics of how and why they unfold this disruptive potential, or fail to do so. The business model approach represents a conceptual representation of how sustainable ventures can prioritize environmental, social, and economic logics in business processes and value creation.

The purpose of this paper is to systematically investigate these underlying hybridization processes and thereby explain how sustainable entrepreneurship connects to and translates into sustainable business models. This paper conducts a systematic literature review on sustainable entrepreneurship, hybrid organizations, and business models to understand the role of institutional logics, particularly the hybridization of environmental, social and business logics, in shaping sustainable ventures' behavior and business models. A conceptual, process-based framework is developed that explains how sustainable venture characteristics, mission, business models and disruptive potential are linked

through hybridization processes, and which barriers and enablers arise in the development of a sustainability-oriented enterprise. This framework connects existing research and extends the prior theoretical understanding of logic configurations by providing a novel, synergistic perspective on hybrid logics and an explanation of how hybridization ties sustainable ventures' overall values and guiding missions to key development mechanisms, including organizational form, capabilities, resource acquisition, and inclusion of stakeholders.

Keywords

Business models, sustainable entrepreneurship, hybridization, process-based view, systematic literature review

Introduction

Research interest in both sustainable entrepreneurship (SE) and sustainable business models (SBM) is increasing. However, there remains considerable uncertainty about how sustainability-oriented entrepreneurs are handling challenges related to managing and prioritizing multiple environmental, social and financial goals (Olofsson et al. 2018) and about the practical implementation of SBMs, their functionality and performance (Piscicelli et al. 2018; Yip and Bocken 2018). Recent empirical research on SBMs, particularly explorative single case studies, try to address this by generating in-depth knowledge, but remain rather descriptive and yield limited generalizable insights (Neumeyer and Santos 2018; Olofsson et al. 2018; Rossignoli und Lionzo 2018). Furthermore, dominant industry logics are repeatedly discussed as a hindering factor for SE and a broader adoption of SBMs, particularly in the context of electricity retailing (Olofsson et al. 2018), circular SBMs in the textile sect (Stål and Corvellec 2018), or associative entrepreneurship (Gallo et al. 2018). To enable broad-scale adoption of SBM's there is a need to generate and diffuse research insights on how to successfully prioritize or hybridize environmental, social and financial logics in SBMs (Olofsson et al. 2018).

Taking the perspective of organizational logics, i.e. socially constructed frames of thought that assign legitimacy to specific objectives, values and means (Thornton 2002; York et al. 2016), and thereby shape individuals' cognitions, decisions, behavior and perceptions of reality (Thornton and Ocasio 1999), can provide important insights by uncovering how these two research gaps (first, the prioritization and hybridization of multiple logics in SE, and second, the

functionality and performance of SBMs in implementing this hybridization in practice) are connected. Research on hybrid logics is emerging, but the current view focuses on hybrid logics as conflicting logics and how to control and minimize their negative consequences for the venture, while potential constructive synergies between logics are rarely explored. Since the integration of sustainability dimensions is the defining, differentiating characteristic of both SE and SBMs, the current understanding of hybrid logics seems incomplete and could be misguiding.

This paper, thus, conducts a systematic literature review on hybrid logics in SBMs and sustainability-oriented entrepreneurship in order to produce a more comprehensive understanding of hybridity and its inhibiting or supporting effects on other business aspects. Since the SBM is essentially a representation or concept of how SE integrates hybrid logics into business processes and value creation, combining these strands of research promises novel insights. Regarding the entrepreneurial process in SE it is, for instance, suggested that during opportunity identification, a hybrid organizational logic facilitates a greater awareness and thus identification of opportunities for simultaneous environmental, social and economic value creation compared to other entrepreneurs (Jolink and Niesten 2015; York et al. 2016). Logics define the underlying rationale guiding decision-making in sustainable ventures, and they thus hold the potential to provide substantial insights into implicit processes and to explain and connect prior research findings on SE, SBMs and their disruptive potential.

Method

This paper conducts a systematic literature review on hybrid organizations, sustainability-oriented entrepreneurship and sustainable business models using institutional logics theory as the theoretical lens. A conceptual framework is developed based on the literature review findings on social and environmental entrepreneurship and transferred to the context of SE, addressing a research gap. The conceptual model combines logic configurations and logic hybridization processes identified in the literature review with the entrepreneurial process model (Morris, Kuratko and Schindehutte 2001). The developed framework extends the prior theoretical understanding by conceptualizing SE's hybrid logic configuration and elaborating its interrelations with and implications for the different entrepreneurial process steps and business model aspects.

Initial findings

The hybridization of social, environmental and business logics in SE is structured by an overarching goal, i.e. transformative impact on market sustainability (TIMS), uniting the three (environmental, social and business) sub-logics, and the corresponding guiding principle of maximizing TIMS which structures behavior, decision-making and trade-offs. TIMS' basic understanding as a function of direct sustainability impact, i.e. the product's or service's environmental and social performance, and indirect sustainability impact, i.e. the market reach determining their direct impact's size, creates the characteristic constructive approach to logic conflicts and co-creative approach to stakeholders.

To leverage this potential, it is concluded that sustainable entrepreneurs need to consider three aspects for defining business model components: first, integrate sustainability logics' elements throughout all of them; second, ensure they enable and facilitate co-creation; third, define them in a precise and specific, yet inclusive way to foster self-selection.

Key contributions and implications

By transferring the hybridization logic to SE, this paper addresses the identified research gaps and makes three contributions. First, extending the existing conflict-focused notion of logics in research with a novel perspective of conflicting logics as an asset with synergistic potential, this paper paves the way for a more proactive, constructive approach to logic conflicts in SE and their implications on the business model. Second, conceptualizing the integrative logic configuration of SE as well as its integration process, and reviewing it from an entrepreneurial process perspective, this paper complements prior research on *what* SE is with insights on *why* its characteristics are the way they are and *how* this impact the venture in the course of the entrepreneurial development process. It thereby increases the usefulness and implications of previous findings on SE characteristics or SBM archetypes by providing their connection. Third, by developing a conceptual model linking current logic configurations to SE's unique logic a formal framework is proposed to structure the interface of institutional logics, business models and sustainable, environmental and social entrepreneurship research.

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Poverty Eradication and Political Engagement

A Case of Innovative Business Model of Sustainable Entrepreneurship in China

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Abstract

Facing grand challenges when following the old path of 'business as usual', entrepreneurs are transforming their business practices for sustainable development in various ways. In the literature of sustainable entrepreneurship, scholars paid little attention to entrepreneurs in transition economy, where entrepreneurs have to cope with complex institutional context with multiple, competing institutional logics, such as keeping agile between different institutional logics such as market logic and government logic to create both business values and social values. Informed by the study of entrepreneurship in transition economy, with the characteristics of political embeddedness of firms and entrepreneurs, this study examines how entrepreneurs explore "socially situated opportunities" strategically, i.e., to make sense of social/environmental problems with a strategic thinking and turn those problems into business opportunities through active political engagement. With the rapid development of sustainable business in transition economies, such as renewable energy industry in China, innovative business models are being created by emerging sustainable entrepreneurs to balance both market logic and government logic simultaneously. Through a longitudinal case study of a photo vatic (PV) solar energy company in China, this study illustrates the dynamic process of business model innovation through which poverty reduction project and PV business

opportunities were organically combined. This study contributes the study of sustainable entrepreneurship by introducing the political engagement perspective. It informs future study with more attentions on the impact of CEO activism on business model innovation for sustainability.

Keywords

Sustainable entrepreneurship, political engagement, business model innovation.

Introduction

In the past four decades, entrepreneurship in every industrial sector in China has boomed in the context of rapid transformation of the economy. In this process, however, entrepreneurs are confronted with a complex institutional environment implying both significant opportunities and attendant risks. For the sake of reducing uncertainties caused by these changes, such as industrial policy and regulations on the one hand, and seeking or even creating opportunities from solidifying legitimacy on the other hand, many entrepreneurs try to maintain good relationships with the government. By responding to and engaging in government's initiative to solving certain social problems, such as poverty alleviation, which has been officially announced as a must-do task in China's Five-Year Plan period (2016-2020), some entrepreneurs could explore new opportunities and strengthen the legitimacy of their businesses.

However, in the process of engaging in government-initiated issues, entrepreneurs face great challenges in balancing different institutional logic, i.e., the rules that shape the perception and behaviour of actors in an organization's field. The institutional logic spectrum includes government logic, market logic, religious logic, and family logic (Thornton, 2002). For example, under government logic, entrepreneurs' perception and strategic behaviours are dependent on national policies, so they often attach great importance to the implementation of relevant government policies. Under market logic, entrepreneurs would emphasize more market-oriented behaviours in pursuit of corporate profits. Therefore, it is interesting to observe how entrepreneurs in what is often an incomprehensive institutional context pursue their sustainable business and make balance and switch between different institutional logics.

A sustained path of business operation and competitive advantage would be impossible if business did not influence its surroundings and environment to

achieve co-evolution of the 'relational framework' between business and government institutions (Child et al., 2012). This raises the issue of the ideology-critique of entrepreneur studies by Ogbor. He stated that more studies should be conducted "by questioning how and why particular ideational systems, institutions and belief systems produce and shape the pattern of entrepreneurship in contemporary society" (Ogbor, 2000: 630). A recent study shows that entrepreneurs from publicly-listed private firms in China had a notable increase on getting political appointments, i.e., having closer political connections and more engagement with the political leaders and Party officials between 1995 and 2012 (Li & Liang, 2015).

The increasing pursuit of political appointment of private-entrepreneurs in recent years has its ideological roots in Confucian values. In Confucianism, the ultimate purpose of life is that individuals extend themselves to serve the larger community and to pursue societal harmony. Thus, successful entrepreneurs with a cultural influence from Confucian values have a social orientation, including behaving compassionately to promoting social welfare, having concern for the public good, contributing to greater commonwealth, and finding the ultimate way toward greatness. The pursuit of political appointment of those successful entrepreneurs could allow them to fulfill their ideological aspirations towards business and society, to give back to society and to promote public welfare while sustaining their businesses as well.

This paper investigates a private-firm entrepreneur in western China who entered the solar photovoltaic (PV) business ten years ago and achieved great success both economically and socially. This case illustrates how entrepreneurs can turn some social issues such as poverty alleviation (SDG#1) into sustainable business opportunities through business model innovation. The paper illustrates how an entrepreneur's political engagement can help the transformation towards sustainable entrepreneurship by switching between different institutional logics and balancing "pro-self" (egoism) and "pro-social" (altruism) value creation.

Sustainable Entrepreneurship

Entrepreneurship can help address societal issues such as sustainable development (Pacheco et al., 2010; York & Venkataraman, 2010; Schaltegger & Wagner, 2011; Pinkse & Groot, 2015). Some scholars, however, remain sceptical claiming that "it remains an open question as to whether and, to what extent, entrepreneurs have the potential for creating sustainable economies" (Hall et al.,

2010: 440). Others argue that entrepreneurship has an important role to play in transformation towards a more sustainable future (Dean & McMullen, 2007; Belz & Binder, 2017). Entrepreneurs are expected to balance the triple bottom lines of economic, social and ecological goals (Schaltegger & Wagner, 2011), and thus simultaneously pursue economic viability, social equity and environmental stability by altering or creating institutions (Pacheco et al., 2010).

Sustainable entrepreneurship is understood as "the recognition, development and exploitation of opportunities by individuals to bring into existence future goods and services with economic, social and ecological gains" (Belz & Binder, 2017: 2). This definition acknowledges that some entrepreneurs, "unlike Schumpeterian entrepreneurs [may be] driven by a social instead of an economic motive" (Reinstaller, 2005: 1366). Such entrepreneurs not only wish to capture economic value for themselves, but also find new avenues towards social improvement and creating social value. Sustainable entrepreneurs address the sustainability of their business as well as its ethical and long-term impact on society and on the natural environment, rather than blindly pursuing short-term business profit. They have the potential to contribute to environmental and social development through innovations aimed at the mass market and providing benefit to a larger society (Schaltegger & Wagner, 2011).

Recent studies on entrepreneurs and sustainability reveal that sustainable entrepreneurs sometimes become politically active to overcome market barriers (Pacheco, Dean, & Payne, 2010; Pinkse & Groot, 2015). Prior studies on political strategy focused on how firms use their strategic political resources and capabilities to improve their profitability (McWilliams et al. 2002) in Western contexts. To understand why entrepreneurs engage in sustainability-oriented business and how entrepreneurs secure both 'pro-self' and 'pro-social' interests, we need to develop broader insights beyond the provincial view on getting lucrative economic returns as indicated in Pacheco et al.'s study (2010).

Recently, studies have illustrated that firms do not only have to adapt to institutional change but can actually develop considerable power to influence it even in immature institutional environment of emerging economies (Dieleman and Boddewyn 2012). Entrepreneurial actors are able not only to identify the institutional constraints constructed by the social, political and economic context within which entrepreneurs are embedded, but also to envision and alternate the institutional arrangement (Suddaby et al., 2015; Hardy & Maguire, 2007). The recent observation and studies have found the continuing importance of political

ties and unnecessary decline of governmental influences (Puffer and McCarthy, 2011). Contrary to the previous viewpoint on the relations to government as a cost for or an institutional constraint on firms (Pfeffer & Salancik, 1978), managing political calculations during institutional transition, especially in emerging economies, is being recognized as an important dynamic capability (Li et al., 2013). With the changing ontology from "either/or assertions" (either "governments are in decline" or "not" while markets are clearly on the rise) to "both/and reasoning", scholars are reviewing the twin forces of the paradoxical relation of government and market, embracing the market–political ambidexterity as important dual capabilities to seek long-term success of business (Li et al., 2013). Based on the metaphor of organizational ambidexterity, market–political ambidexterity refers to "the firm's dynamic capabilities to manage influences from both the markets and governments simultaneously" (Li et al., 2013. p. 2).

Li & Liang's study (2015) illustrates the importance of cultural-dependent values that underline successful private-firm entrepreneurs' pro-social motives: with the mind of creating blended values, i.e., both economic value and social value, the pursuit of political appointments is regarded as a means by those entrepreneurs to influence policymaking and contribute to the greater good. This greatly extends the literature on understanding corporate political activity in the non-Western context, despite extant studies narrowly regarded entrepreneurs in the context of institutional transition as morally insensitive monsters, just utilizing their political engagement to bypass institutions to gain more economic interests and triggering harmful results and risks (Lawton et al., 2013; Mantere et al. 2009; Welter & Smallbone, 2011). More recently, studies reveal that in an immature institutional environment of emerging economies, firms can adapt to institutional change and even develop considerable power to influence it (Dieleman & Boddewyn 2012). Managing political calculations during institutional transition, especially in emerging economies, is being recognized as an important capability of firms (Li et al., 2013).

In the process of institutional transition, more and more entrepreneurs have realized that their reliance on seeking speculative opportunities for maximum short-term profits in institutional voids could not sustain their business. The nuts and bolts of entrepreneurial opportunities in a transition economy context is the balance between exploiting business opportunities and creating social values, switching and balancing between different institutional logics, i.e., market logic and government logic. Insightful entrepreneurs could explore opportunities to fill in the institutional void in a market-oriented way, and seek political avenues and

create more opportunities to make their businesses sustainable. On the one hand, entrepreneurs, especially those with political engagement, are pulled to participate in institutional building to gain legitimacy for their business. On the other hand, they are pushed to respond quickly to institutional change by seizing market opportunities. Therefore, it is important for entrepreneurs to develop skills of ambidexterity to pursue both commercial and social values.

The lens of political engagement of entrepreneurs in a transition economy thus could help improve our understanding of how entrepreneurs could be "a significant conduit for a more sustainable society" through pursuing both 'pro-self' and 'pro-social' objectives with their market-political ambidexterity.

Methods and Data

A recent trend of management studies is the transition towards process-based research (Jarzabkowski & Spee, 2009). As Ployhart & Vandenberg (2010) pointed out insightfully, scholars should pay more emphasis on exploring longitudinal study to better understanding many organizational phenomena with change both within a level over time and across level over time. Many scholars have emphasized that the study of sustainable entrepreneurship demands a rich, detailed interpretive analysis of the particular context where it occurs (Berglund et al., 2015). To understand the dynamics of sustainable entrepreneurship, recent studies have suggested to apply process-tracing methodology to check how events are logically connected (Pablo Muñoz & Boyd Cohen, 2018). The recent calls for in-depth qualitative research on the role of entrepreneurship in organization, community and society (Suddaby et al, 2015) give us confidence to utilize the method of historical case study with event driven explanation focusing on individual corporate histories (Van de Ven, 2007). It is acknowledged that historical case studies provide the opportunity to uncover the story behind the institutional evolution of many phenomena (Nasra & Dacin, 2010). We track the historical development and use historical event sequencing method to investigate the process of sustainable entrepreneurship, with a focus on the dynamic interactions of the market and political activities of the company and the entrepreneur.

The Case Study of T Group: Sustainable Entrepreneurship and Poverty Alleviation

Generally, the focus on the solar PV industry stems from three aspects. First, the solar PV industry has been one of the most dynamic industrial branches in recent decades in China. Second, in the rapid development and fluctuation of the solar PV industry, entrepreneurs in this field witnessed intensive interactions with policy makers (central and local government). Third, the solar panels and solar energy in China are mainly installed and developed in the western inland regions where there were still more than 16 million of people living in poverty in 2017. Thus, the solar PV industry is a good example to demonstrate how political engagement by entrepreneurs for business opportunity creation can help mitigate and eradicate poverty in western China.

In the past decade, the solar PV industry in China grew rapidly. Along with ups and downs within a short period of time, numerous entrepreneurs entered this field. Some of them had strong Confucian values, and thus great concerns for the public good and the contribution to greater commonwealth through doing good business. They participated in establishing and improving important institutions for this industry, pursued political appointments to fulfill their values towards business and society, and sustained their businesses to help societal development and to promote public welfare. Thus, the solar PV industry is a suitable research subject in terms of the behaviours and activities of entrepreneurs and their impact on sustainable development.

In October 2014, the National Energy Administration (NEA) and the State Council Leading Group Office of Poverty Alleviation and Development (CPAD) collectively issued a guiding policy to launch a poverty alleviation program through the installation of solar PV panels in poor households. The program was designed to run for a period of six years starting from 2014/2015. In 2015, the PV Poverty Alleviation Project was approved by the State Council as one of the ten targeted poverty alleviation projects.

Through installing rooftop or micro solar energy systems in the poorest villages and counties across China, this program aimed to help the local residents generate electric power for their own use and to make money by selling surplus electric power back to the grid. The scheme was designed to help two million households generate over 3,000 RMB yuan each as extra income every year. In January 2016, NEA issued another policy on promoting renewable energy development to

support poverty alleviation. Through the first six months of 2018, at least 48 policies were released by either the central or local governments in China to further promote the PV approach to poverty alleviation.

In fact, the PV poverty alleviation model was invented and applied by those entrepreneurs in the solar PV industry who deeply understood the importance of maintaining ambidexterity in balancing their economic growth and social value creation. When the first solar PV poverty alleviation model was created and recognized by the government, it was soon adopted and replicated by many other entrepreneurs in this field, such as PV plus vegetable greenhouse model, PV plus sheep-pen model, and others. The practice has been developed into an effective policy tool in China which integrates the social goals of climate change response, low-carbon development and poverty alleviation to promote sustainable development of inland rural regions. According to a rough estimation, these PV poverty alleviation projects could help reduce the nationwide emission of carbon dioxide between 8.4 to 42.0 million tons per year (NEA, 2016). That creates huge ecological and environmental benefits.

With the strong support of government policy and innovative exploitation of entrepreneurial opportunities, companies in the solar PV industry in China could make great contributions to the implementation and achievements of SDGs in many areas, such as in poverty alleviation (SDG #1), affordable and clean energy (SDG #7), and sustainable cities and communities (SDG #11).

Starting on and focusing its core business on aquiculture before 2006, T Group ---a leading private enterprise in the area of feed and aquatic products established in 1984 in Sichuan Province, Western China ---has grown to be the world's largest aquatic feed manufacturer as well as major livestock and poultry feed producer. In 2007, T Group entered the solar PV industry firstly in the upstream producing polyvinyl chloride (PVC), as raw materials for the production of polycrystalline silicon with huge investments. In February 2007, he acquired a chemical factor producing PVC. From then on, T Group marches into solar energy industry, forming the dual core business structure. In the words of Mr. Liu, T Group is a company devoted to provide green energy for society, with aquatic feed as the energy to satisfy the demand for food safety of human being, with solar energy as the energy to satisfy the demand for energy safety of human being. Actually, at the first beginning of getting involved in PVC business, Mr. Liu had planned to construct a comprehensive value chain on the PV power industry. It is hard to say how much he knew chemical industry, but his political connections to CPPCC and CDNCA

could broaden his perspectives and bring valuable information benefiting for his business.

In February 2007, T Group decided to invest in Polycrystalline silicon field making preparations and planning for solar energy industry. Before the coming of financial crisis in September 2008, the first stage of polycrystalline silicon project with 1,000 tons production capability was successfully finished and put into operation, created an astonishing speed from feasibility research to highest standard products. It marked breaking of a new path of T Group and the realization of the Chairman of T Group, Mr. Liu's ambitious dream to explore green gold from new energy industry. Although in the following years the external environment of solar industry suffered serious slump, T Group has been keeping cautious expansion of its solar energy business from southwest to northwest and northeast in many counties in China. In 2009, even in the winter of solar energy industry, T Group still generated net profit of 2.19 million RMB, while many other competitors have been closed. In 2010, T Group increased investment further in its polycrystalline silicon project with 3,000 tons production capability. This laid a good foundation to further reduce the production cost of T Group's polycrystalline silicon. In 2013, T Group acquired a large solar cell maker at the edge of bankruptcy and made huge investment to operate its new production base of Polycrystalline silicon. Although T Group is not the pioneer in PV industry in China, yet, with Mr. Liu's firm commitment and determination into this field and his positive political activities to call for favorable industrial policy for PV industry, T Group has developed quickly into one of the largest PV producer and operator of PV power station in China, with a very comprehensive industrial chain in the solar PV industry. With its own developed techniques and over 100 technical patents on producing polycrystalline silicon, T Group is dominating an important position in Chinese market as one of the largest solar cells producer.

In the process of developing its solar business, due to the positive political engagement and activities of Mr. Liu, including his consistent positive submission of policy proposals and research reports to related central government bodies, T Group has become a company with great impact in the solar industry in China.

Table 1 below illustrates the rapid development of T Group in the solar PV business.

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Insert Table 1 about here

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During T Group's successful growth and development, Mr. Liu, the founder and the Board Chairman of T Group, also realized his political achievements with a great success. Since 1994, Mr. Liu has being a positive member of China Democratic National Construction Association (CDNCA), and later was elected as a member of the Central Standing Committee of CDNCA as well as a member of the Standing Committee of the Chinese People's Political Consultative Conference (CPPCC), let along other numerous received honors, awards and high appreciations from different levels of government and other social organizations and entities.

Table 2 and 3 show the main political appointments and honorary titles and awards of Mr. Liu.

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Insert Table 2 about here

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Insert Table 3 about here

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As indicated in this case, the ambitious and successful development of T Group on exploring sustainable business opportunities in solar energy industry is deeply rooted in the market-political ambidexterity of Mr. Liu. As a successful private-firm entrepreneur, his individual ideation of compassion and value of creating larger good for public enable him get access into positive political engagement, which

help him 'sense, shape and seize' opportunities on developing sustainable business and reinforce his commitment on developing solar PV industry. Though leveraging dynamically his capability of political engagement, T Group could develop successfully innovative business model of PV poverty alleviation model which satisfied both government logic for poverty eradication and market logic for business value.

Far-sighted entrepreneurs seek to balance their business success and positive societal impact to make sure to get the sustained legitimacy and support from government. In T Group's development, Mr. Liu cautiously explored and exploited the business opportunities in the solar PV industry. The donated project of solar PV station in west inland of Sichuan province shows the sophisticated market-political ambidexterity of Mr. Liu. On the one hand, that is a small step to explore the solar PV business in western region of China; on the other hand, that philanthropic donation through his membership of CDNCA improved the legitimacy of his political proposals for developing solar PV industry in a favourable institutional environment. T Group's successful and innovative business model of combining aquatic fishing and solar PV station supports further Mr. Liu's engagement in institutional work, directly or indirectly participating in creating favourable industrial policy for solar PV business. In turn, the institutional work could strengthen and reinforce the business opportunities for T Group's exploitation in solar PV industry. For example, the newly issued policy from NRDC on encouraging developing distributed solar PV stations highly recognized and recommended the "aquatic fishing plus solar PV" model of T Group. With Mr. Liu's further elaborations on the benefits of this model on poverty reduction, NRDC released another policy to support the adoption of the "aquatic fishing plus solar PV" model as an effective policy tool to eradicate poverty.

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Insert Figure 1 about here

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In the T Group's development, Mr. Liu cautiously explored and exploited the business opportunities in the solar PV industry. Along with his political appointments, Mr. Liu could also submit policy proposals and suggestions to CPPCC and other central government bodies, and thus get feedback and confirm whether his judgment on investing in the new energy field is a correct strategic

decision. The following two statements from both an external government official and an internal senior manager of the T Group show the active political engagement and produced influence of Mr. Liu.

"This proposal [Suggestions to Accelerating Poverty Eradication through Developing Solar PV Industry] has critical points on poverty eradication through solar PV. The proposal, with its great successful practices by the T Group, gives us many feasible and valuable suggestions. NEA will push to implement the suggested actions to promote the model of poverty eradication with solar PV" (a senior official in the National Energy Administration).

"Mr. Liu keeps active political engagement due to his responsibility as Standing Member of the Central Committee of CNDCA, Member of Standing Committee of the CPPCC National Committee, as well as the recent appointment of Representative of China People's Congress. Many of his political suggestions and proposals stemmed from his considerations for the public interests and the entire solar PV industry. As an influential opinion leader - from a major company in solar PV industry, Mr. Liu is expected to bring in voices of other companies in this industry to policy makers. He believes that without a healthy industrial environment there would be no growth for The T Group. This helps to develop a long-term commitment of our company to solar PV business development and social and environmental value creation." (A senior manager of the T Group).

As indicated in this case, it should be kept in mind that business model for sustainability could be rooted to a great extent in the close interlinkage and interactions between entrepreneur's individual personal political engagement and market activities which simultaneously seek social values and business values for creating larger legitimacy and business opportunities.

Based on the unique business model innovation of the case company, this paper is expected to illustrate the sustainable entrepreneurship process through bridging the individual entrepreneur's value at micro level and the institutional change at macro level. Considering the few published articles on exploring the development of sustainable entrepreneurship in institutional immature context, this paper might offer new perspectives to understand the strategic innovation of entrepreneurs on solving SDGs and have dialogue with the recent study of Schaltegger et al. (2018).

Discussion

Our study has a number of important implications for theory and research on sustainable entrepreneurship and business model innovation. This paper illustrates the value of dynamic market-political ambidexterity on our understanding of sustainable entrepreneurship and business model innovation.

Our analysis identifies the valuable capability of market-political ambidexterity of sustainable entrepreneurship in the context of institutional transitions. Sustainable entrepreneurship pursues sustainable development out of considerations both from exploring new business opportunities for economic value creation and seeking long-term legitimacy for social and environmental value creation. In the self-reinforcing and interdependent process of developing capability on influencing market competition and leveraging capability on influencing government legislations, sustainable entrepreneurship aligns pursuit of external monetary returns and intrinsic self-actualization, to gain both market success and political legitimacy. Market success from exploring new business opportunities relies on sustainable entrepreneur's political engagement for favourable industry and institutional environment such as favourable industry policy; while the market success in new business area could further reinforce the political legitimacy of the entrepreneur and his political engagement. Although it is widely believed that institutions in transition economies are imperfect and immature, the flexibility and resilience of institutions in transition economies enable the quick adjustment and development of new industries in which private-firm entrepreneurs and government departments are closely intertwined. The latest successful solar PV industry development in China is a good example to show the efforts of those entrepreneurs with sophisticated dynamic capability of market-political ambidexterity in institutional transitions. Therefore, this study implies to further develop comparative studies to understand the value enhancing of dynamic market–political ambidexterity on promoting the transition of sustainable entrepreneurship in different institutional contexts. In complex institutional context with both for-profit and nonprofit institutional logics, the dynamic market-political ambidexterity capability of sustainable entrepreneurship could perfectly explore innovative business models aiming at upscaling both economically and socially as well as environmentally beneficial models. The introduction of this political engagement perspective could help deepen further understanding on the dynamics between sustainable entrepreneurship and business model innovation.

Limitation and future research

In spite of the recognition of the value of inductive qualitative research to generate new insights and to build new theory, the single case in this paper still lacks enough power to generalize the conclusion from this study. In terms of the triangulation of data, this paper still needs to collect especially first-hand data to further track the case entrepreneur's personal values concerning sustainability and political engagement. Thus, it could deepen our understanding on the evolutionary pathways of sustainable entrepreneurship in complex institutional context.

Our paper suggests several lines of future inquiry. First, it is necessary and valuable to extend the study of sustainable entrepreneurship in solar energy industry at broader scope, to include multiple cases to examine how sustainable entrepreneurs in same institutional context could develop various approaches for value creation and innovate business models for sustainability. Second, future studies could investigate from comparative case study how entrepreneurs devoted to sustainable development engage in corporate political activities in different cultural and institutional contexts. Research in this direction could reversely inform us the impact of entrepreneur's activism on business model innovation for sustainability. Third, it is important to further explore the micro-foundations of sustainable entrepreneurship. The emotional and ideological aspects of sustainable entrepreneurs should be further explored to deepen our understanding on the processes of political engagement and societal consequences of sustainable entrepreneurship.

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Table 1: The quick development of T Group in developing solar PV business

Year	Main activities in developing solar PV business
2006	Aimed at entering solar PV industry cautiously.
2007	• Invested a chemical factory to produce PVC with a production capacity of 5,000 tons per year. PVC is the material for producing Polycrystalline silicon. This marks the milestone of T Group making decision to enter into solar PV industry. • Donated 50 million RMB to construct 6 PV power stations in remote western rural areas with a total installed capacity of 1.355 MWp. • Increased investment to expand the production capacity of Polycrystalline silicon to 9,000 ton per year
2008	• Showed in the 2008 Asian Solar PV Exhibition; • Realized quick returns of investment in producing Polycrystalline silicon
2010	• increased investment further in its polycrystalline silicon project with 3,000 tons production capability
2011	• Made investment expansion in Chengdu; • Increased investment for Polycrystalline silicon production base in Jianwei county, with 46.2 billion RMB; • Reached strategic cooperation agreement with Xinjiang autonomous region government to develop 50,000 tons of polycrystalline silicon and 3GW silicon slices, with a total investment of 26 billion RMB.
2012	• Approved by Sichuan Provincial Government to set up the demonstration project of 30MW solar PV grid connection in Yanyuan County with a total installed capacity of 100MW
2013	• Acquired the original PV producer LDK and expanded further investment of PV business in producing PV slice.
2014	• Decided to extend the industrial chain to the construction and operation of decentralized PV power station. • Ranked as one of the largest PV slide producer in China.
2015	• Large investment on 5GW silicon cells in Chengdu, China

Table 2: Mr. Liu's political appointments

Year	Political appointments
1994	member of China Democratic National Construction Association (CDNCA)
1998	• Member of Standing Committee of Sichuan CPPCC Committee • Member of the CPPCC National Committee • Member of Entrepreneurs Committee of CDNCA
2002	Standing member of the Central Committee of CNDCA
2008	Member of Standing Committee of the CPPCC National Committee
2018	Member of National People's Congress

Table 3: Mr. Liu's honour titles awarded from government, industry and society

Year	Honorary titles and awards
2009	• Member of New Energy Chamber of Commerce under the umbrella of All China Federation of Industry and Commerce • Awarded as "Responsible Leadership" of the 1st China Corporate Social Responsibility Summit
2011	• Standing deputy director of New Energy Chamber of Commerce • Awarded as "Global New Energy Business Leadership"
2012	• Recognized as "the No.1 Figure in Solar PV Industry" by National Energy Administration • Awarded as "The Most Civil Responsible Chinese Entrepreneur" • Awarded as "2012 the Most Social Responsible Chinese Entrepreneur"
2013	• Awarded as "HuaRun 100 Riches List of the Most Respected Entrepreneur" • Awarded as "2013 Caijing Figure with Impact"

	• Awarded as “Global New Energy the Figure of the Year”
2014	• Awarded as “Global New Energy Business Leader”

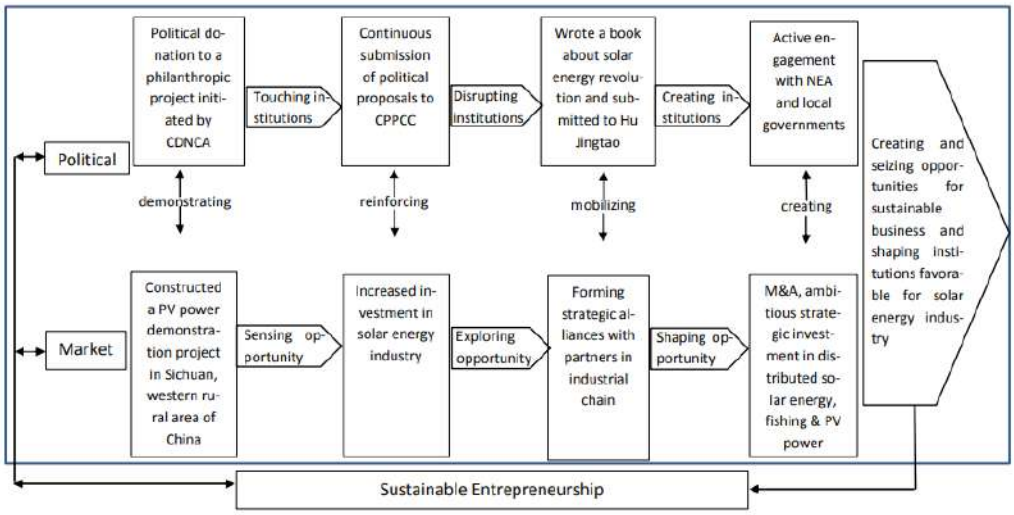

Figure 1: The Market-Political Ambidexterity of Sustainable Entrepreneurship

Redesigning the Entrepreneurial Process of Sustainable Startups

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Extended abstract

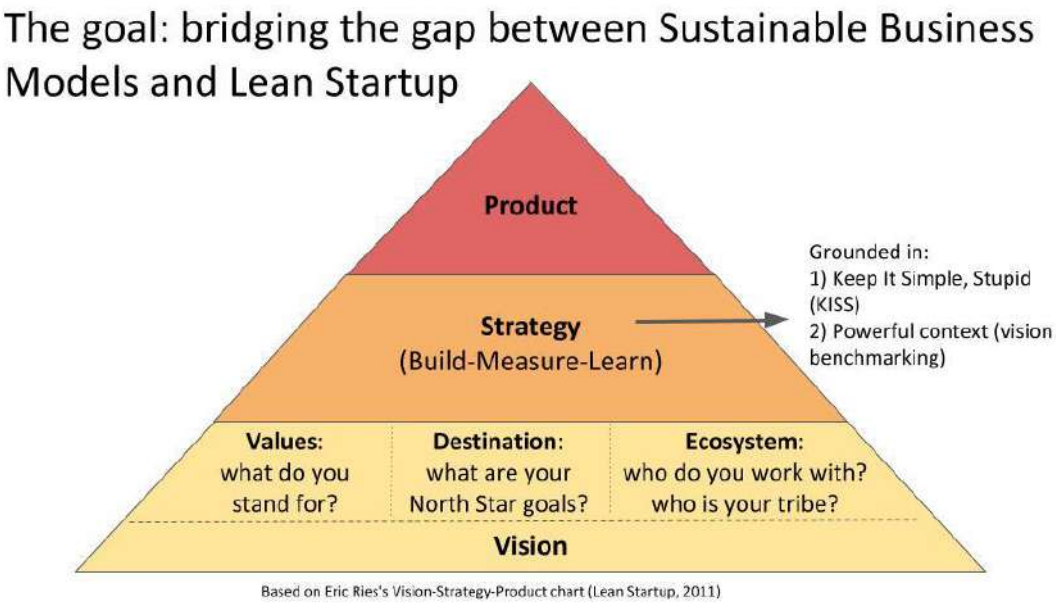
While we have seen a growing interest in sustainable entrepreneurship (SE), it has remained a complex task that only a relatively small number of entrepreneurs are willing to take on themselves. This should come as no surprise given the need to consider multiple types of value created (and destroyed) for different stakeholders (Bocken, Rana and Short, 2015), while operating in an economic system that is still dominated by "business as usual" considerations. These challenges come on the top of the typical trials that are part of every entrepreneurial effort, making "the realization of sustainability innovations aimed at the mass market and providing benefit to the larger part of society" (Schaltegger and Wagner, 2011, p. 225) very difficult.

A growing number of sustainable business model (SBM) tools and frameworks that have emerged in the last couple of years have not succeeded to provide early-stage entrepreneurs interested in creating sustainable value with sufficient support. As a result, we see that even this subset of entrepreneurs still prefers common lean startup tools and methods, which provide them with a clearer roadmap to reach their desired destination: creating a successful enterprise. In a book chapter published earlier this year (Godelnik and van der Meer, 2019) we addressed the adaptability gap between SBM and lean startup approaches, offering a new framework, Lean SBM, which combines a strong SBM context with a clear and effective lean startup content.

The Lean SBM framework's initial structure followed Ries' (2011) vision-strategy-product formulation of the entrepreneurial journey (see Figure 1). It aims to provide entrepreneurs with a clear workflow, starting with articulation of their

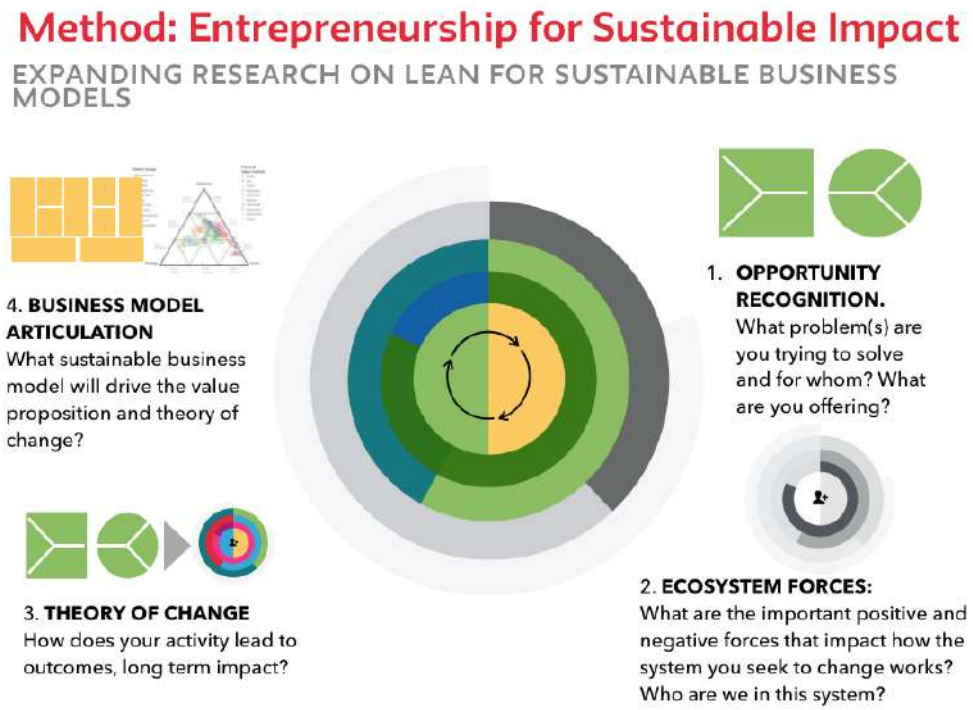
values, destination, and the ecosystem in which they operate, followed by strategy formation that is focusing on a search for a workable business model, and then the product, which is what the entrepreneurs end up building.

Figure 1. Initial Lean SBM framework



While we already see initial examples that provide an indication of the possibilities for this framework, such as platform co-ops, B-Corps, Zebra movement, and Nordic startups (Godelnik and van der Meer, 2019) this was only a starting point. The work we have been doing since the completion of the book chapter both inside and outside the university made us realize there is a need to keep updating and clarifying the framework. Therefore, in this paper we offer a new iteration of our framework, in which we focus on the flow between the vision and the strategy. Within these two parts, we present four key elements helping articulate the entrepreneur's vision and how this vision can be realized: Opportunity recognition, ecosystem forces, theory of change and business model articulation (see Figure 2).

Figure 2. Redesigning the entrepreneurial journey from vision to product



Acknowledging the entrepreneurial journey is "a complex process, involving and interweaving a multitude of elements" (Dimov, 2018, p. 16), we assume the progression from one element to another is dynamic and iterative rather than a static, linear process. The elements utilize both SBM and lean tools, reflecting the Lean SBM framework's emphasis on integrating the practicality of the lean approach with the necessary SBM considerations.

Opportunity recognition: Identifying an opportunity to create value is considered an initial part of the entrepreneurial process (Rosen, 2014), including when it comes to sustainable entrepreneurship (Belz and Binder, 2017). The entrepreneurs begin by articulating the unproven assumptions they have about the opportunity as suggested by the lean method (Blank, 2013). We propose to do so using the Value Proposition Canvas (Osterwalder *et al.*, 2014) in order to better articulate the value that is envisioned to be created and who may benefit from it.

Ecosystem forces: Entrepreneurs need to understand what forces shape the system they want to change, reflecting a growing understanding of the systemic

nature of the innovation process (Edquist, 2006), as well as the value of identifying early in the process important forces that impact how the system works (Omidyar Group, 2017). Founders identify who they are, and whom they know, uncovering strategy through the process of effectuation thinking and action (Sarasvathy, 2008) to identify or create ecosystem value linkages for which stakeholders may not yet be aware.

Theory of change: This stage focuses on explaining the process of a change in a system, by defining the causal links between a specific intervention, short-term outcomes, and long term impact. In the context of social impact venture investing, theory of change requires evaluators to surface implicit theory of action (Chen, 1990), and to define indicators of change by which evaluators will measure progress in short, medium, and long term ranges.

Business model articulation: At this stage the entrepreneurs explore the potential range of sustainable business models best suited for powering the value proposition, connecting to the theory of change, and the ecosystem in which they operate. Typically, this process relies on a canvas-based approach, such as the Business Model Canvas (Osterwalder and Pigneur, 2010) to generate shared language and alignment. While we will build on these accepted existing tools, we also deliberately introduce the Sustainable Business Model Pattern Taxonomy (Lüdeke-Freund *et al.*, 2018) to provide a wide range of business model pattern choices, together with a broader SBM contextualization.

We chose two different environments in order to examine the utility and the usability of the updated Lean SBM framework - a social venture lab university course at The New School in the Spring 2019 semester and a social impact accelerator in Israel. These two settings were chosen because they both focus on supporting the development of mission-driven startups, but at the same time are grounded in different environments and cultures. In the university course, which is taught by one of the authors students work in teams to develop a social venture with an emphasis on critical skills and knowledge needed for it. The Israeli accelerator works with early-stage startups focusing on solving social problems through technological means.

We plan to work with a total of 10 teams in both places to evaluate the effectiveness of current iteration of the Lean Startups framework. It is our intention to investigate the framework as a whole, as well as each of its components separately. In both cases we introduce the teams to the different

components of the framework to learn about their usefulness. Our assumption in general is that more assimilation with our framework will enable the startup teams to realize their vision with greater success. To test our hypothesis we plan to continue following the teams' work for 18 months they graduate from the course/accelerator.

The Lean SBM framework aims to offer a practice-based approach for entrepreneurs interested in creating sustainable value and impact, focusing on making the entrepreneurial process clearer and less challenging for them. The contribution of this paper is in its development and testing of the new iteration of the Lean SBM framework, combining in a novel way SBM and lean design tools, including the new SBM taxonomy. The examination of the framework in different contexts will help understand if the framework is indeed effective in creating useful scaffolds to support sustainability-oriented startups' daily reality of choice-making and experimentation in an uncertain environment.

Keywords:

Entrepreneurship, Lean SBM, sustainable business models, entrepreneurial process, SBM taxonomy

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Reinventing value by integrating stakeholders: exploring business ecosystems for sustainable business model innovation

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Introduction

New business models are needed to contribute to a more sustainable future. In many cases new business models are developed by entrepreneurial firms. Business model innovation (BMI) refers to *a new integrated logic of* how the firm creates value for its customers or users and how it captures value as well as the implementation of a business model that is new to the firm (Björkdahl and Holmén, 2013; Yang et al., 2017). The focus on business model innovation is in changing *how to do business* (rather than *what to do)*, and it goes further than purely innovations in technology, product and process (Amit and Zott, 2012). The business model concept is in close connection with the concept of value. In some studies, the value in business models refers to commercial benefits of the focal firm such as revenue, reputation and market access and customer benefits such as functionality, health, safety, and convenience (Osterwalder and Pigneur, 2010). Some other studies argue that value should not only be offered for customers and the firm, but all stakeholders within the value network (Zott et al., 2011). Furthermore, Lepak et al. (2007) argues that there are different users of value (e.g. individuals, consumers, organizations, government, society) as well as different sources of value creation (e.g. society, organizations, individuals). This view is

becoming more popular as supply chains become more complex, increasing the recognition that more stakeholders are integrated in the value system (Yang et al., 2017). In particular, sustainable business models require the incorporation of sustainable development value logic besides the commercial value logic (Bocken et al., 2014; Boons and Lüdeke-Freund, 2013; Schaltegger et al., 2012; Stubbs and Cocklin, 2008). The core of a sustainable business is creating and delivering value for customers and capturing value for the firm (Osterwalder and Pigneur, 2010; Zott et al., 2011). Developing new business models for sustainability requires an integration of social, environmental and/or cultural goals into a more holistic meaning of value in business models (Schaltegger et al., 2012). Hence, a sustainable business is not only achieved through innovation in technologies, products or services, but also through business model innovation (Girotra and Netessine, 2013).

Sustainable business models (SBM) can solve multitude of today's environmental and social challenges. SBM is "a business model that creates competitive advantage through superior customer value and contributes to a sustainable development of the company and society" (Lüdeke-Freund, 2010, p. 23). SBM enables firms to achieve long-term social and environmental sustainability (Boons and Lüdeke-Feund 2013). Additionally, firms must be proactive and intentionally work towards creating positive societal and environmental value not only for themselves but for a wider network of stakeholders (Bocken et al., 2019).

While traditional BMI focuses on shareholders and on firms' obligations to maximize financial profit, SBM takes a stakeholder focus where the firm must create value, not simply for the benefit of its shareholders but also for the benefit of society and the environment (Schaltegger, 2012). This transition requires radical changes and a long-term perspective on business, which recognizes that other interests are relevant besides those of the original stakeholders such as customers and partners and has a positive effect on society and the environment (Geissdoerfer et al., 2016; Joyce and Paquin, 2016). Additionally, it requires new thinking on competition, collaboration, ownership (rent, share, lease, own), and the role of the various actors (Boons and Lüdeke-Freund, 2013). SBM can therefore be used to initiate long-term collaborations between interdependent actors who share a systems-level goal. Laszlo et al. (2014) as well as Bocken et al. (2019) argue that a successful SBM requires deliberate, collaborative work that addresses mutually reinforcing interdependencies among the stakeholders.

This insight has sparked the academic interest (e.g. Nidumolu et al., 2009; Schaltegger et al., 2012; Bocken et al., 2014) in the field of SBM even more, and a call for a more comprehensive understanding of the value exchange system and approaches to promote sustainable business model innovation creation and development has been made (e.g. Bocken et al., 2019; Yang et al., 2017). One route towards more sustainable economy can lie in a system built on collaboration and sharing (Jackson, 2009), and therefore, previous business model literature has encouraged future studies to adopt an ecosystem and value network perspective (Zott et al., 2011). For example, Bocken et al. (2019) emphaze that SBM innovation requires a multi-stakeholder and value-stream process, where business boundaries are challenged, and new value and partnerships are created in a co-creative manner. Thus, the purpose of this paper is to develop a conceptual model on how the business ecosystem, its embedded heterogenous actors influence the sustainable business model innovation. In the study, we will explore how value gets created in an ecosystem: the ecosystem level linkages (interdependencies and complementarities) between activities, and the roles played by the different actors in sustainable business model innovation.

The current research has not in-depth addressed how the environmental/social/economic value is created in a community, region, ecosystem, and what role different actors play in this. For example, the role of local communities, NGOs/private support institutions, governmental agencies, political decision-makers and financing institutions. Neumeyer & Santos (2018) compared ecosystems of sustainable and conventional businesses and found that sustainable entrepreneurs were more connected than conventional entrepreneurs. They also found that sustainable entrepreneurs are more strongly connected conventional entrepreneurs. In that respect, the following question emerges - in what way the ecosystems of sustainable business differ from those of conventional businesses? Sustainable ventures find it very challenging to acquire funding and financial support of venture capitalists. Investors are reluctant to invest in sustainable businesses, to environmentally sustainable business models, in particular (De Lange, 2017). Due to limited familiarity of what constitutes to a sustainable business model innovation, sustainable firms face legitimacy issues with potential investors, customers and other actors. Therefore, when it comes to SBM innovation firms need to engage in various approaches of collaboration to overcome these issues (Morris et al., 2013; Neumeyer & Santos, 2018).

On this background, we focus on the business ecosystem(s) for sustainable business model innovation. Our view is in line with Sommar (2012) and Bocken et

al. (2019) stating that business model research should adopt an extended network-perspective including wider set of stakeholders who co-innovate and transform the business models. We adopt the definition suggested by Moore (1996), and Iansiti & Levien (2004) of business ecosystem as a complex network of relationships based on service flows and organizational evolution (i.e. an entire ecosystem influencing and interacting with its actors. Moore (1996) emphasizes that over time, the actors in the business ecosystem coevolve their capabilities and roles and tend to align themselves with the directions set by one or more central companies. He emphasizes that over time the leadership roles may change depending on the perception of the actors in the ecosystem on how the actors in the system are enabled to to move toward shared visions to align their investments, and to find mutually supportive roles. For example, previous research has shown that multinational companies consider collaborating with non-profit nongovernmental organizations (NGOs) to help facilitate new modes of value creation especially when entering developing markets (Dahan et al, 2010). This requires a more inclusive approach when it comes to creation of new or redesign of existing SBMs as well as a process of engaging stakeholders (e.g. partners, suppliers, customers, NGOs, governmental institutions) in a joint process of learning and experimentation (Bocken et al., 2019). The sheer complexity of the sustainability-related challenges has pushed firms to the realization that they cannot manage those and create the required impact on their own. As Kiron et al. (2015) explain the current world of mutual reliance and interdependencies among actors from the private and public sector requires collaboration in order to not only address sustainability challenges but also help exploring new market opportunities and mitigate future risks. Therefore, creating SBM is not entirely viable without collaboration that spans and links resources and outcomes across multiple boundaries as well as without identification and understanding of the interdependencies and interactions between the business models within the business ecosystem that the focal firm is undertaking business model innovation for sustainability.

Expected results

In our research we are planning to extend the current research by conceptualizing a co-operative model in the SBM innovation of entrepreneurial firms. Further, we show how the SBM boundaries extend beyond the focal firm, and how the ecosystem and its embedded heterogeneous actors influence on the elements of the firms' SBMs. Drawing upon the extant literature on sustainable business model innovations and ecosystem literature we argue that translating environmental and

social value into economic profit and achieving competitive advantage require collaborative mechanisms together with heterogeneous pool of actors with institutional knowledge and access to different levels of society. Our research will give a starting point for future research trying to investigate if SBMs co-created by integrating stakeholders from the business ecosystem have a better potential to create positive social and environmental value.

Keywords

Sustainable business models; Business ecosystems; Business model innovation, Value network; Value co-creation.

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Stimulating entrepreneurs to make use of waste streams

Business model tools for the residue-driven business model approach

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Extended abstract

Introduction

The transition to a circular economy requires products that are based on circular design principles and on business model strategies, which stimulate efficient and effective resource use and prevent waste (Bocken et al., 2016; Geissdoerfer et al., 2017). In practice however, the products and buildings that are currently in use have not been designed for reuse, repair, refurbishment or remanufacturing. How can sustainable entrepreneurs deal with the challenges and opportunities offered by these waste streams? When recycled, these residues are not considered valuable input materials for mainstream producers, as they often do not comply with standard material requirements. However, they may still contain valuable resources for other purposes (Bocken et al., 2017). With the right business model, these waste streams may be transformed into new products.

Review of the literature

In the typology of sustainable business model archetypes of Bocken, Short, Rana, & Evans (2014), this can be classified in the category 'Create value from waste', which is defined as eliminating the concept of ‘waste’ by turning waste streams into useful and valuable input to other production and making better use of under-

utilized capacity (Bocken et al., 2014). In the business models described in this category, the design of waste streams is an integral part of product design. In contrast, we seek to develop business models using 'externally sourced waste', i.e. products at the end of the life cycle of a 'regular' industry. For this purpose, instead of starting from a product idea or a customer or market as conventional business models do, a 'residue-driven business model' uses residual material as starting point (Kraaijenbrink et al., 2018). This business model is related to the typology of circular economy business model patterns, as identified by Geissdoerfer et al. (2018). When the 'residue' is decomposed to the level of the material, the 'residue-driven business model' can be considered as a Recycling business model. When the 'residue' is being reused at the level of the product or its components, but for a different use it was originally designed for, it can be considered a Cascading and Repurposing business model. There is a need for 'new business modelling tools that can be customized to the needs of CE business developers and product and service designers' (Geissdoerfer et al., 2018, p.20).

To guide entrepreneurs who are motivated to take a waste stream as a starting point a 'residue-driven business model approach' was designed by experts from the field of business modelling, combining insights from the circular and sustainable business model literature (e.g. Bocken et al., 2016; Lüdeke-Freund et al., 2016) with insights from 'material driven design' (Karana et al., 2015) and practice. The aim of the residue-driven business model approach is to help sustainable entrepreneurs transform waste, unused products and other forms of residue into products or services that make a positive contribution to society (Kraaijenbrink et al., 2018). This can be viewed as a firm-centric approach for planned business models (Breuer et al., 2018). The main goal is not primarily profit-making, but to 'contribute to economic viability, environmental benefits, social concerns and preparation for long-term challenges of business associated' (Geissdoerfer et al., 2018, p.714). Breuer et al. (2018) propose four guiding principles for any sustainability oriented business model approach: sustainability-orientation, extended value creation, systemic thinking and stakeholder integration. They further provide four process-related criteria: reframing business model components, context-sensitive modelling, collaborative modelling process, and managing impacts and outcomes (Breuer et al., 2018).

Aim and research method

The aim of this paper is to elaborate how the application of the residue-driven business model approach can support sustainable entrepreneurship processes, creating value from waste, based on the guiding principles and process criteria as developed by Breuer et al., (2018). Our research question is: which existing business model tools can help entrepreneurs to develop a residue-driven business model in each of the four phases of the residue-driven business model approach, and what guidelines can assist entrepreneurs in the business development process?

To answer this question, we present the residue-driven business model approach and explore in an academic setting how teams of university students apply the residue-driven business model approach in 10 company projects in which they take on the viewpoint of entrepreneurs. We use a multi-case study approach (Yin, 2017), analysing for each case which tools were used and what measures were helpful in the process to come from a waste stream to a concept of a residue-driven business model. Next a cross case comparison was conducted through pattern matching to develop insights that are analytically valid for comparable cases and for explanation building (Eisenhardt 1989; Yin 2017). The data we used for this study consisted of observations of the researchers during the business development processes of the teams, and process and reflection reports made by each team. Finally, we relate our findings to the guiding principles and process criteria for sustainability-oriented business model development.

Preliminary results

The residue-driven business model approach consists of four phases (Kraaijenbrink et al., 2018): 1. Defining impact: determining the economic, social or environmental contribution that can be made by transforming a specific residue material. 2. From residue to application: based on the unique characteristics of the residue, one or several modes for application and transformation will be searched. This is based on a combination of market, product idea and technology. 3. Creating a value proposition: the chosen application ideas will be developed into a specific value proposition. 4. Business model generation: The chosen value proposition will be developed into a complete business model. This includes the development of a value system and a revenue model that will at least break-even, and addresses the environmental benefits and social impact. Our preliminary findings in respect to the tools that were considered helpful in these phases are presented in Table 1.

Table 1. Useful tools for each phase of the residue-driven business model approach (based on (Kraaijenbrink et al., 2018).

Phase	*Activities*	*Tools*
1. Defining impact	Define purpose and intended impact of the business model	Impact assessment at three levels (mission, stakeholder, society), milestone setting to evaluate social, financial and environmental impact
2. From residue to application	Explore material and identify options for value creation and potential application areas	resource based analyses, brainstorming techniques, feasibility/suitability/acceptability studies
3. Creating a value proposition	Develop value propositions and market position	value proposition canvas, customer validation and storytelling
4. Business model generation	Design the (collaborative/circular) business models	mapping business activities and customer journey, business model canvas, (3P) business case

Based on a cross-case comparison of the case studies we aim to derive several lessons in respect to the business model development process. First of all, the complexity of a circular business case requires advanced project management and coaching skills and short feedback loops (e.g. 'sprints'), using intermediate deliverables to achieve longer term commitment from stakeholders. Second, commitment of all stakeholders is regarded a key success factor which needs elaborate attention throughout the process. Third, a clear and shared view of potential impact and expected outcome is crucial, hence quantification of (intended) impact should be included both at the start and at the end of the residue-driven business development process.

Keywords

Circular economy; business modelling; business model tools; sustainable entrepreneurship; waste

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Sustainable business model innovation – A tradeoff?

Finding the root-causes of innovation failure, not just curing the symptoms

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Abstract

Sustainable business models have experienced a recent surge in academic research and professional business strategy. In the context of increasingly dynamic environments, firms are faced with the necessity to adapt, re-structure, further develop and even radically change their traditional business models. Against this background, the ability to sustainably innovate one's business model has become a key resource for realizing a competitive advantage and the according long-run business success. Empirical research indicates a failure rate of up to 90% in business model innovation practice, so business model innovation itself is not as sustainable as it should be in order to ensure market competitiveness. The conceptual and qualitative research outlined in this extended abstract provides a 'constitutional' governance framework for sustainable business model innovation by establishing the 'Cube of Sustainable Business Model Innovation (CoSBMI)' as a tool for strategic management. The three-dimensional cube represents a comprehensive framework that covers 27 cases for identifying win-win potentials in business model innovation. It combines (i) three innovation process steps, (ii) three sustainability criteria and (iii) three commitment strategies for improving incentives. The developed 'Cube of Sustainable Business Model Innovation' aims at supporting theoretical and empirical analyses of the business model innovation process in line with sustainability (ESG) criteria, thus gaining a deeper understanding of the value network. The 'major challenge' in sustainable business model innovation can be solved by developing innovative and applicable strategies to overcome social dilemmas in a multi-stakeholder environment, rather than curing only symptoms of failure.

Keywords

cube of sustainable business model innovation, root-causes, stakeholder theory, social dilemmas, ESG criteria

TRACK VI

OPEN INNOVATION ENABLED BY EMERGING TECHNOLOGIES: WHAT ARE THE IMPLICATIONS FOR NEW BUSINESS MODELS?

Track VI: Open Innovation Enabled by Emerging Technologies: What Are the Implications for New Business Models?

Chairs: Maya Hoveskog[1], Emma Incze[2], Fawzi Halila[3], Markus Raatikainen[4], Stephen Davies[5], and Antony Upward[6]

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This session proposal aims to attract papers that shed light on the interplay between new business models and open innovation (OI) enabled by emerging technologies.

The emergence of vertically disintegrated networks of innovation that connect actors into ecosystems (Chesbrough and Vanhaverbeke, 2018) require firms to modify or even radically change their existing innovating methods. As a result, innovation processes are slowly becoming more and more open in order to benefit from collaborative networks and OI. Chesbrough & Bogers (2014) define OI as "a distributed innovation process based on purposively managed knowledge flows across organizational boundaries" (p. 17). They emphasize that through the process of OI firms combine internal and external ideas into products, platforms and systems. And that the role of business models in that OI process is to define requirements for these products, platforms and systems in order to create and capture value. The existing literature on OI and sustainable innovation, as Rauter et al. (2017) revealed, covers nearly all aspects of the firm and has investigated aspects related to firms' innovation processes, firms' internal innovation systems with focus on strategy and culture as well as actors in the firms' external innovation systems including cooperation factors and methods for OI.

OI is particularly relevant to the processes and methods of designing new business models, given the complex nature of this work that requires the inclusion of multiple world-views and perspectives. OI can facilitate the emergence of a diverse ecosystem of people, organizations, and sectors with sufficient trust and understanding of mutual and collective self-interest for co-creation, exploration and exploitation of the firms' innovative potential. OI is well positioned to facilitate an agreement on a set of shared value propositions in the value network and also

systematically uncover the increasingly financially material new opportunities and increasing risks of the mega-forces of change which emerge from the current innovation techniques (de Boer et al., 2012; McDonough, 2002; Ing, 2017).

Globally impactful and new business models are characterized by innovation and collaboration between wider set of stakeholders, taking a long-term perspective, striving towards achieving strong sustainability (Neumayer, 2013). This requires that the processes and outcomes of innovation (e.g. products, services, business models) are aligned with a mixture of ecological and social criteria, here called "design principles" (e.g. the Natural Step's sustainability principles) formulated with help of latest natural science (Broman and Robèrt, 2017; Steffen et. al, 2018).

OI enabled by technologies which are still early in their lifecycle, here labeled as emerging technologies, can be considered as novel means to connect networks of stakeholders and enable them to start wider co-creation for explicitly applying those "design principles". However, there is still scarce evidence and very little is known about how firms use OI in order to fuel sustainable innovations and new business models (Rauter et al., 2017; Bogers Chesbrough and Moedas, 2018).

The session is open to theoretical, conceptual, and empirical research papers (qualitative or quantitative) from a variety of industrial contexts, with a common thread and contribution to inform the interplay between new business models towards the normative goal of flourishing (Broman et al., 2017; Upward & Jones, 2016) and OI enabled by emerging technologies.

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A design method for data driven business models

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Extended abstract

Introduction

The growing availability of data offers plenty of opportunities for data-driven innovation of business models. This certainly applies to interactive media companies. Interactive media companies are engaged in the development, provisioning, and exploitation of interactive media services and applications. Through the service interactions, they may collect large amounts of data which can be used to enhance applications or even define new propositions and business models. According to Lippell (2016), media companies can publish content in more sophisticated ways. They can build a deeper and more engaging customer relationship based on a deeper understanding of their users. Indeed, research from Weill & Woerner (2015) suggests that companies involved in the digital ecosystem that better understand their customers than their average competitor have significantly higher profit margins than their industry averages. Moreover, the same research suggests that businesses need to think more broadly about their position in the ecosystem. Open innovation and collaboration are essential for new growth, for example combining data within and across industries (Parmar et al., 2014). However, according to (Mathis and Köbler, 2016), these opportunities remain largely untapped as especially SMEs lack the knowledge and processes to translate data into attractive propositions and design viable data driven business models (DDBM). In this paper, we investigate how interactive media companies can structurally gain more insight and value from data and how

they can develop DDBM. We define a DDBM as a business model relying on data as a *key* resource (Hartmann et al., 2016).

Background

There exist several generic approaches for developing service propositions and designing BMs like the Business Model Canvas (Osterwalder et al., 2010) or STOF method (De Vos & Haaker, 2008), and there are conceptual models, development approaches and patterns concerning DDBM specifically (Hartmann et al., 2016; Brownlow et al., 2015; Mathis and Köbler, 2016; Schaefer et al., 2017). Hartmann develops a conceptual model, i.e., the DDBM Framework, with typical business model components like an offering, customers and revenue model but adding Data Sources and Key (data) Activities as key components of a DDBM. For each concept, Hartmann also proposes typical solutions or patterns (Remane et al., 2017). Brownlow (2015) builds on Hartmann's conceptual model by adding a development approach based on asking key business model questions. Schaefer (2017) did an analysis of data-driven business models in industry 4.0 and considered common characteristics in a hybrid Business Model Canvas. Mathis and Köbler (2016) developed the Data Canvas and Data-Need Fit to systematically document the available data and a process to match available data with user needs, respectively.

Research goal

The main goal of this research is to design and evaluate a practical method for developing DDBM in the context of interactive media companies. The method builds on the DDBM framework of Hartmann and the process model of Brownlow. Business model patterns and pre-defined solutions are integrated into the method. In the evaluation, the goal is to test the efficacy of the method. In particular, the efficacy of the use of patterns vis-à-vis a method without such patterns, and the contribution to supporting collaborative multi-actor innovation.

Research design

This research is part of a national project on DDBM and involves researchers and students from academia and practitioners from interactive media companies. The development of the DDBM design method follows a design science research (DSR) approach (Gregor & Hevner, 2013), as summarized in Table 1.

Table 1 DSR approach, objectives and research methods (adapted from Gregor & Hevner, 2013).

Steps	*Objectives this paper*	*Research Methods*
(1) Introduction	Problem statement, research objective	Literature review, practitioners' interviews
(2) Background	Theories behind the problem	Literature review
(3) Research design	Description of the DSR approach	Literature review
(4) Results	Development and description of the DDBM design method (the artifact)	Action research; iterative development with practitioners
(5) Evaluation	First evaluation results from pilot with master students	Experimental design, reflection
(6) Discussion	Interpretation of results	Qualitative analysis of data
(7) Conclusions	Communicating main findings so far and collect feedback on future steps	Interpretation, peer review

In the first step ('Introduction') we held interviews with interactive media companies to better understand their needs for developing DDBM. For the second step ('Background') we reviewed literature on DDBM, business model design methods and data driven innovation in the context of media companies. The third step ('Research design') is about the DSR approach that was followed as described in this section. For the fourth step ('Results') we first developed the conceptual basis for our DDBM design method by extending the framework of Hartmann (2016) with concepts from the process model of Brownlow (2015), the concept of value networks, and concepts from business model implementation (De Reuver et al., 2017). Based on this adapted framework, a first version of the method was developed. The method was practically elaborated into a workshop format with accompanying templates and supporting materials. Subsequently, the method was iteratively tested and redesigned in a series of workshops with practitioners from the interactive media companies involved in the project and with students. The formative evaluations have led to a first full version of the DDBM design method, a step-by-step approach for developing a DDBM. Templates and materials were designed together with an external design agency.

For the fifth step ('Evaluation'), we will evaluate the efficacy of the DDBM design method. In particular the efficacy of the use of patterns vis-à-vis a method without such patterns, the contribution to collaborative multi-actor innovation, and the added value of a facilitated use of the method. In the sixth step ('Discussion') we

discuss preliminary results and in the seventh step ('Conclusion') the main contribution and practical implications.

Results

The main result is a six-step method for developing DDBM. It starts with determining the intended business goals and intended data innovation. Consequently, in steps 2 and step 3, the required data sources and data activities are determined, respectively. In step 4 we develop the value network, i.e. the set of business roles and actors fulfilling these roles and value flows between them. Next in step 5, the business model is complemented with the revenue model(s) and the financial flows between the actors. Finally, in step 6, the actions to be taken to implement the (new) business model are prioritized and positioned on a roadmap with desired actions. Table 2 summarizes the approach indicating goals, intended results, and available support materials.

Table 2 Overview of DDBM design method with steps, goals, results and support materials

Step and goal	*Intended results*	*Support materials*
(1) Determine Goals	Company goal, data innovation goal, target group, proposition	Theory card, inspiration cards, goal cards, Goal-Data-Innovation game board
(2) Select Data Sources	Overview of required data and data sources	Theory card, data source cards
(3) Define Data Activities	Overview of required data activities	Theory card, data activity cards, data activity game board
(4) Sketch Business Model	Business model as a value network with actors and value flows	Theory card, actor cards, business model game board
(5) Choose Revenue Model	Business model as a value network with revenue model and financial flows	Theory card, revenue model cards
(6) Develop Roadmap	Overview of actions in roadmap	Priority cards, roadmap template

Each step is supported by a card deck with pre-defined solutions or patterns for inspiration, see Figure 1. In step 1, the method provides inspiration cards highlighting companies with successful data driven business models. At step 2, the method provides cards with typical data sources (customer data, partner data, open data, etc.), and for step 3, typical data activities (data acquisition, data

aggregation, etc.). For each step, users design solutions by selecting appropriate pre-defined cards and/or formulate their solutions on blank cards. Game boards are available to collect and annotate cards. For example, in step 4, users create actor cards for each involved actor. Actor cards describe the key activity and key resource that the actor brings to the network. The game board allows users to arrange cards in a value network and to add the value exchanges and flows between the actors. The end result is a clear overview of a new DDBM. In the final step, users think of practical steps towards implementation of the DDBM and place them on the roadmap game board.

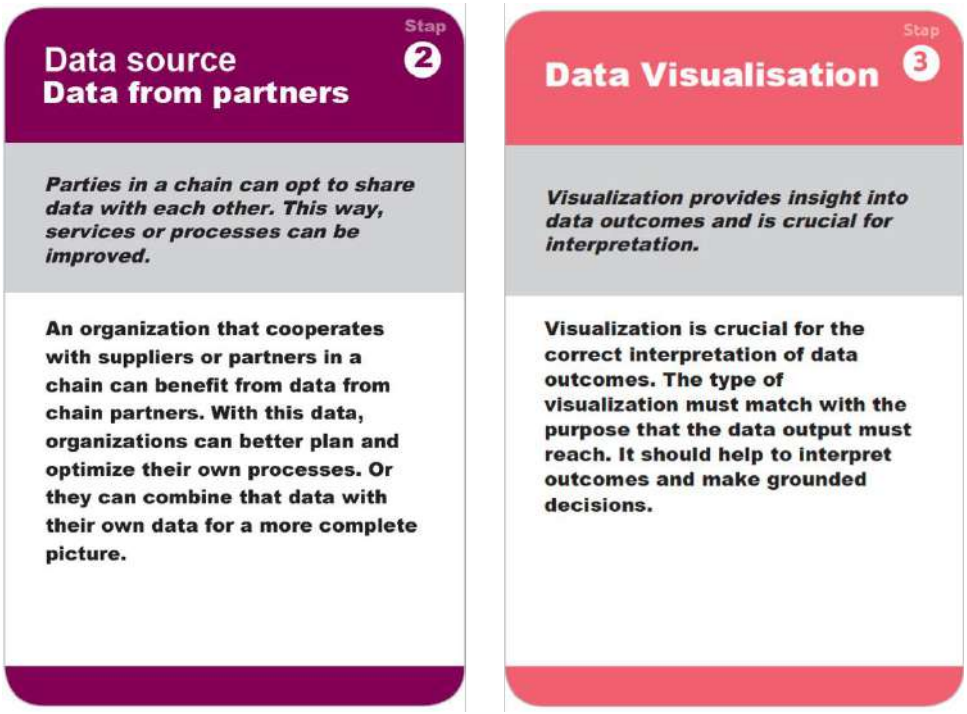

Figure 1 Examples of predefined cards for data source and data activity, respectively.

The six steps are embedded in a format for a facilitated workshop, which we consider the main use case for the method. However, the method with the materials can also be used by practitioners in a self-service setting.

Contribution and practical implication

First, the conceptual model underlying the DDBM design method extends current conceptual models. In particular, the value network view adds a multi-actor perspective to DDBM, and provides insights in the complex value flows within data-ecosystems. Next, as part of the design science approach, design knowledge

regarding data-driven business models will be generated. In particular knowledge about the added value of applying patterns and pre-defined solutions within business model design methods.

The research provides a practical and tested approach for developing DDBM for interactive media companies and the broader community of data-rich service providers. With this method, practitioners will able to develop and test new collaborative DDBM faster.

Keywords

Business Model, Data driven, Design method, Open innovation, Multi actor

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Backcasting for ideal business models and pathways for forest-based sector firms by 2030

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Extended abstract

It is widely agreed in our society that sustainable development cannot be achieved without systemic change in our current production and consumption patterns. Practitioners and academics have started to increasingly emphasize the importance of business models for attaining systemic change (Loorbach and Wijsman, 2013; Bidmon and Knab, 2018). In other words, companies and their strategies and business models are seen to play an important part in achieving the systemic-level transition. It is often brought up that emerging novel business models should be sustainable, circular, renewable, resource efficient, innovative and inclusive (e.g., Boons, 2013; Bocken et al., 2014; Wells, 2016; Hetemäki et al., 2017, Rauter et al., 2017). In Finland, new forest-based businesses are considered important for the transition to more sustainable circular bioeconomy (e.g., Ministry of Economy and Employment of Finland, 2014; Hetemäki et al., 2017, Näyhä, 2019).

The goal of this research is to explore the transition of Finnish forest-based sector companies to new business models. As a starting point, the current position of the companies in the markets, as defined by the companies themselves, is described. More specifically, the main aim is to study how forest-based sector companies define their ideal future states and related roles and business models by 2030 as well as the steps and pathways needed for transition.

The research approach and methodology used here has been described earlier in Näyhä (2019), because the data for these studies were gathered from the same interviews. The data consist of semi-structured thematic interviews with 18 company managers from various forest-based sector firms and companies from interfacing sectors, all of which have operations in Finland. The participating companies were all involved in the development of new products and services from wood-based raw material. The aim was to include as many different types of organizations as possible. The firms varied in business models, product portfolio, maturity, size, growth plans, market orientation and the role of new products versus old products in their portfolio. In addition to traditional FBS products, there were various new wood-based products and services under strategic planning, R&D, commercialization and/or production. The firms varied from large-scale, traditional and mature FBS companies to SMEs and start-up firms. Most of the firms categorized themselves primarily as bioeconomy companies, and many considered themselves as both bioeconomy and circular economy firms. (For more on company views on the bioeconomy and circular economy, see Näyhä, 2019.)

The interviewees were given the main studied topics beforehand during the initial inquiry, so that they could decide if they were likely to possess adequate knowledge about the themes. In the interviews, the key idea of a backcasting approach was loosely followed (e.g. Vergragt and Quist, 2011), that is, company representatives were asked to define desired future states for their own businesses and for the whole Finnish forest-based sector in 2030. The respondents were not given any more specific guidelines for describing these states. During the interviews, the respondents often discussed their future goals in relation to other questions, and these perspectives are also included in the final outcome.

The data were approached mainly inductively (see Patton, 2002, p. 56; Thomas, 2006). This means, for example, that the coding (see also “open coding”, in Strauss and Corbin, 1998; Kovalainen and Eriksson, 1998) was not limited to the predetermined theoretical frameworks. It needs to be mentioned in this context that a purely inductive approach is not possible in any research, because it would require that the researcher does not have any preconceptions on the studied subject (see Patton, 2002; Eriksson and Kovalainen, 2008). The interviews were transcribed and ATLAS.ti was used as an analysis tool. The data were examined applying thematic analysis (Braun and Clarke, 2006; Guest et al., 2006). The analysis loosely followed the step-by-step guide presented by Braun and Clarke (2006). The basic rules for open coding created by Eriksson and Kovalainen (2008, p. 164, modified from Strauss, 1990; Strauss and Corbin, 1998) were also applied.

Even though the companies define themselves as bio-and circular economy actors (see also Näyhä, 2019), many other organizational categories are relevant for them as well. Based on the data, three different ideal future states could be distinguished for the forest based sector companies (Näyhä, 2018). These states can be defined as follows: traditional production as a basis for new businesses; new large-scale production; and SMEs and high value-added products at the core. The respondents highlighted that expanded business and largely increased profits will be based on new products and services, thereby creating more versatile product portfolios. Well-recognized company status with established market position can be attained with strong knowledge, innovations and hard work as well as specialization and a high degree of upgrading. Environmental sustainability, customer needs and partnerships were also emphasized. The ideal future state for the whole of the Finnish forest-based sector was named “green valley of forest-based sector”, meaning that the Finnish forest-based sector is seen as a pioneer that carefully considers environmental perspectives also on a global scale. Overall, the growth in the sector is based on new actors, products and services, which also accelerate the transformation of the traditional businesses.

At this point, reflections and discussions on the findings are largely unfinished. However, the study aims to discuss the findings in terms of both business model and transition research, while also drawing on the literature on organizational categories. It rests on the idea that the studies at the intersection of management studies (firm-level perspective) and transition studies facilitate our understanding of the roles of various organizations and industries in sustainability transitions (see e.g. Boons et al. 2013; Loorbach and Wijsman, 2013; STRN, 2017, Bidmon and Knab, 2018). The core standpoint here is that companies see their new forest-based businesses as a response to urgent global challenges, such as climate change and the need for the utilization of renewable resources, thus facilitating sustainability transition (see also Näyhä, 2019). However, despite how these businesses were believed to produce sustainability benefits for society, there are also many challenges related to how companies can fulfill their own visions or the specific requirements set by their stakeholders. Therefore, this study suggests a range of perspectives on the question of if the desired future states and related perspectives of the forest-based sector firms are in line with societal aims such as the UN’s Sustainable Development Goals (UN General Assembly, 2015). The study also presents reflections on what kind of role these attained business models could possibly have in sustainability transition and what type of stakeholder dialogue and actions would facilitate the process.

Keywords

Forest-based sector, Finnish companies, Transition, Backcasting, Ideal futures

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Business model innovation in niche-regime interaction: The case of demand response in Finland

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Abstract

Demand response (DR) can be an efficient way to add reliability and flexibility into the energy system. As new business models for DR are emerging, this study aims at understanding the drivers behind business model innovation and identifying the existing business model innovation patterns in the DR sector. We study these issues through the lens of the multi-level perspective (MLP) on socio-technical transitions and the emerging strand of research focussing on business model innovation in socio-technical transitions. Our research material consists of 25 semi-structured interviews conducted with experts and representatives of DR companies in Finland. The preliminary results show that there are both internal and external factors that contribute to the rise of new business models. Predominant external divers are EU electricity market harmonisation, digitalization, increased share of renewable energy and EVs. Whereas important internal drivers are environmental values, desire to be part of a possible new Finnish technological success story -"the new Nokia". We identify three business model innovation patterns, which we name: (1) the phoenix rise, (2) business model expansion, and (3) incumbent companies' catch-up. Based on the analysis of these clasters of business models, we conclude that business model innovation seems to trigger a bidirectional niche-regime interaction; from niche to regime as well as from regime to niche.

Keywords

demand response, business model innovation, niche-regime interaction, Finland

Fostering collaborative technology innovation in water treatment

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Abstract

Water scarcity affects 40 per cent of global population. Due to population growth, urban migration, climate change, micro pollutants and agricultural usage, projections set the global demand for water to exceed supply by 40 per cent within the next 5-10 years. Ensuring access to and safety of water as well as reducing pollution of water resources will thus be crucial. At 60 per cent, reverse osmosis (RO) membranes, related processes and infrastructures constitute the globally most widespread water treatment technology. Improving efficiencies and reducing maintenance hours of RO-based water treatment plants and portable devices could hence result in significant environmental and social effects. In view of that, public and private researchers investigate alternative water treatment technologies. However, sustainable entrepreneurship research shows sustainable technology adaption and business model innovation to be of complex interdependencies and high uncertainty. We argue that collaborative, iterative innovation processes such as roadmapping can facilitate creating sustainable solutions and reducing planning uncertainty in sustainable entrepreneurship. We therefore tested roadmapping as a process and a visual tool in course of a case study on graphene-enhanced water desalination and purification technologies. Methods for gathering information involved semi-structured stakeholder interviews, desk research, and a one-day stakeholder workshop. For initially assessing the roadmapping process, we distributed workshop results amongst participants and conducted follow-up interviews with select stakeholders.

Keywords

sustainable entrepreneurship, technology, stakeholder management, roadmapping, water supply

Responsive innovation system for digital energy services

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Keywords

Energy service business models, co-evolution, regulatory sandbox, innovation, peer-to-peer trading

Extended Abstract

Digital innovation and the low carbon agenda have given rise to new energy services business models, offering a range of opportunities for energy service innovation with potential to improve the uptake of renewable and decentralised energy, and the efficiency of energy trading and use, while reducing absolute energy consumption. Digital innovations such as vehicle-to-grid exchanges, peer-to-peer and peer-to-many energy trading, are just a few examples of such innovations fundamentally challenging the way energy is produced, distributed and used, and by whom. These business model innovations involve a multitude of new interfaces between different actors, processes and technologies, involved in the delivery of desirable energy services for energy users and the energy system. These mainly evolve around new sets of values around flexibility, storage and carbon emissions reduction, as well as the more traditional security and affordability of energy. However, there are also innovative energy service business models built around values such as sustainable energy generation, transmission and use, aiming to empower users at the micro level (within a single building).

While the UK Industrial Strategy recognises the need for developing a flexible regulatory framework which enables rather than constrains the development of such business models (such as Ofgem's Regulatory Sandbox), the barriers faced by

innovators are multifaceted, with big differences in experience depending on the type and scale of innovations. Innovative business models struggle to find sound economic and regulatory footing outside of temporary regulatory sandbox trials offered by the UK energy regulator. While often innovations at the microscale are scaled down at conception because of insurmountable technical and regulatory barriers before applying for a trial status.

On one hand the digitalisation of energy services has delivered on its promise of democratisation, by opening up business models of energy generation, delivery and use to new stakeholders. On the other hand, making these technologies work for a broader group of people would mean the creation of a responsive innovation system for digital energy service, with new and greater coordination between the three core elements of digital technologies, business models and regulatory environment. By examining closely the co-evolution of these three elements in the context of UK digital energy services, this paper discusses the factors influencing the lifecycle of innovations from initial ideas to fully-fledged business models and the variety of value chain stakeholders that these include.

The concept of business models has been widely discussed in the context of technological and social innovation, co-creation with customers, sustainability and deregulation (Foxon et al., 2015; Foss and Saebi, 2017; Massa et al, 2017; Hiteva et al., 2018). The paper uses a business model framework, defined here as an assemblage of actors, processes and technologies through which value(s) are created, captured and monetised, to examine the coordination and co-evolution of stakeholders, innovations and regulation. This approach includes a much wider and more diverse range of partners, technologies and processes and presents a specific way of bringing them together, as “a system of interdependent activities that transcend the focal form and span its boundaries” (p. 216). The business model framework is particularly useful in understanding interdependencies, as it tends to bring to light how different external and internal elements are interlinked and weave through value activities. It is these interdependencies between divergent components, which can lead to complementary effects (Demil and Lecocq, 2010; Massa and Tucci, 2014) that are of particular interest for developing sustainable energy futures. Business models also provide a form of “architecture” made up of various components and the relationships between them. We can therefore think of business models as energy service architecture (Heij et al., 2014 and Johnson et al., 2008), made up of external and internal components, including an economic model, internal infrastructure, target market, partner network, and value offering (Morris et al, 2005; Ostewalder and Pigneur, 2009).

The paper unpacks 1) the types of innovative digital energy service models that take place; 2) the values created for energy users and the energy system, and 3) the coordination and discontinuities between the digital technologies, business models and the regulatory environment. It concludes by reflecting on what a responsive innovation system for digital energy services at different scales might look like.

This paper addresses the co-creation of technological, regulatory and business model innovation towards sustainability. It does this through examining the interactions between the actions of stakeholders, including local community initiatives as well as existing energy supply companies, to develop new business models incorporating low carbon and social goals, and the evolution of wider energy technology, regulatory and business systems. Through an Innovation Forum with local energy innovators in the Greater Brighton area to be held in the second part of 2019, initial insights from the research (following projects mapping and semi-structured interviews) will be enhanced by feedback from these innovators, by creating a safe space for interaction between the different value chain stakeholders, using a flexible, non-academic format and content which meets the need of the value chain.

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The challenges of transitions towards a more sustainable business

Introducing THRIVE framework

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Abstract

Several obstacles face enterprises[55] and their leaders during their transformation journey towards sustainability. Shifting from a siloed and comfortable '*Business as Usual*' approach to creatively leveraging on new opportunities requires radical innovation, worldwide integration, institutionalization of processes and the right business strategy.

This study conceptually introduces *The Holistic Regenerative Innovative Value Enterprise* (THRIVE) framework and develops THRIVE platform and *Sustainability Performance Scorecard* (SPS) tool with visualizations in the form of pioneering *ciambella charts*. Operationalized at the meso-level, aided by machine learning and predictive analytics tools, THRIVE SPS tool transparently ranks the corporate sustainability performance of enterprises alongside their strategy or business model.

Rooted in systems thinking, this study develops nascent design theory-knowledge through a design science research (DSR) approach, building on emerging science-based literature and illustrated by exemplary case studies. A holistic analysis of the projected phenomenon informs the kernel theory, building on established

[55] Authors use a range of terms interchangeably when referring to the entity under discussion in their studies. These include company, institution, organization, corporation, business, firm and enterprise. Wherever possible, this study standardizes on the word 'enterprise(s)' to mean the entity itself.

science-based first principles, together with reputable global data sources and purposely selected impact case studies.

THRIVE SPS dashboard provides for the manipulation of engine weights and controls, allowing assessment of performance and forecasted effects of changes in regulations such as taxes or subsidies on carbon credits to be visualized. Contributing to a healthier planet, THRIVE framework and SPS tool aids enterprises transitioning from *disclosure to exposure*, thereby providing the necessary impetus for business leaders to compete with one another and individual consumers to reward enterprises that choose to *do good to do well* for the prosperity of all humankind.

Keywords

business strategy, business transformation, context-based sustainability, corporate sustainability performance, sustainability performance scorecard.

INTRODUCTION

Regarded as interdependent sides of the same coin (Braun et al. 2019), innovative business strategies or business models (Casadesus-Masanell & Ricart 2010) represent our best source for tackling ever increasing systemic planetary crisis (Robèrt et al. 2013; Rockstrom 2009; Steffen et al. 2018). Yet following a comprehensive review, no study nor public tools were found connecting business models with strong sustainability (Neumayer 2010; Pelenc 2015) performance by means of context-based measurements (Haffar & Searcy 2018) and science-based targets (Adams et al. 2015; Bocken et al. 2014; Foss & Saebi 2016; Melkonyan et al. 2017).

Studies reveal that business leaders and innovators report not knowing where to start in making the transition to sustainability (Breuer & Lüdeke-Freund 2017; Kurucz et al. 2017; Schaltegger et al. 2016a). By applying a precautionary principled stance (Costanza & Patten 1995), backcasting (Holmberg & Robèrt 2000; Voros 2003; Willard et al. 2013) emerges as a particularly relevant approach in aiding transition. With this technique, society envisions the future sought, and works backward to the present whilst setting milestones along the way. By defining the framework and tools to evaluate corporate sustainability performance of enterprises, guidance is provided during their transition to becoming sustainable and prompts enterprises to embrace a strive to thrive

philosophy, requiring change at a scale, speed and scope unseen before (Baue & Thurm 2018; SBTi 2018).

From an ecological economist risk minimization perspective (Broman et al. 2017) this study conceptualizes *The Holistic Regenerative Innovative Value Enterprise* (THRIVE) framework; providing the basis for formulating tools which openly rank corporate sustainability performance of enterprises alongside their business strategy. A business strategy is defined as the enactment of a set of business models (Wirtz et al. 2016) across the three pillars of sustainability, being the economic, social and environmental (Elkington 2004). Worthwhile noting is that an enterprise operates a combination or hybridization of business models (BMs)(Laasch 2017). Many attempts to date to report on the corporate sustainability performance of enterprises have amounted to little more than disclosures (Lydenberg et al. 2010; WBCSD 2017a), with several reports plagued by greenwashing (Najam et al. 2000). THRIVE framework and SPS tool delivers the impetus for enterprises to move from disclosure to exposure, ensuring sustainability risks are assessed as business risks (WBCSD 2017a).

Geissdoerfer et al. (2018) highlights how many business modes (BMs) fail and Clauss's (2016) study indicates that a validated business model innovation (BMI) measuring scale is not yet available. Operating at the meso scale (Thurm 2016), THRIVE framework establishes a uniform, integrated and standardized platform (http://www.strive2thrive.earth); which together with THRIVE sustainability performance scorecard (SPS) tool, ranks the sustainability performance of enterprises alongside their business model (BM). Thus THRIVE SPS illuminates the pathway for enterprises to move from statutory to voluntary disclosure in their quest towards sustainability through business model innovation (BMI) (Amit & Zott 2012).

The meso scale is situated at the interface between the micro and macro environment where the greatest opportunity for positive change can occur (Baue & Thurm 2018). This makes THRIVE framework the most useful way forward in addressing Elkington (2018) revised triple bottom line approach. Furthermore, this compares favourably with the Sustainability Assessment of Farming and the Environment (SAFE) (Van Cauwenbergh et al. 2007) hierarchical framework, composed of principles, criteria, indicators and reference values organized in a structured way and used for assessing the sustainability of agro-ecosystems.

The utility of the proposed THRIVE framework and Sustainability Performance Scorecard (SPS) tool encourages disruption (Bansal 2019) through radical innovation, compatible with natural science; driving maximum creativity within natural socio-environmental constraints (Gill & Hevner 2013; Pries-Heje & Baskerville 2014; Upward & Jones 2016). Ecological footprint analysis (Wackernagel et al. 2005) shows that humans are in '*overshoot*' having used 1.7 Earths equivalent in providing the resources needed and absorbing waste (Michael Borucke et al. 2012). Thus the role of sustainability as a long-term corporate strategy and as a common practice (Ioannou & Serafeim 2019) must become mainstream.

This paper firstly discusses the need to develop the THRIVE framework and SPS tool to assist enterprises address the sustainability challenge. It then turns to the adopted approach, emanating from the school of design science. Next it specifically outlines each aspect of the contribution made, building on established literature and impact studies. The conclusion encourages enterprises to use the THRIVE SPS tool to make positive change for the benefit of all humankind.

PURPOSE

As a transformative (Mertens 2007) conceptual study, this paper incorporates a comprehensive thematic analysis of the prevailing literature (theory) (Braun & Clarke 2006; Lapadat 2010; Maguire & Delahunt 2017) informed by several case studies (evidence) (Gomm et al. 2000; Johansson 2007; Perry 1998; Yin 2004). Secondary numerator performance data are derived from publicly published integrated corporate sustainability reports (e.g., Global Reporting Initiative Sustainability Reports, Carbon Disclosure Project datasets) and corporate websites by multinational enterprises worldwide (Szekely & Vom Brocke 2017). Denominator threshold and allocation data is sourced from global footprint initiatives (e.g., Global Footprint Network - GFN) and notable international agencies such as United Nations (UN), World Health Organization (WHO), and World Resources Institute (WRI).

The unit of analysis is the business model (BM) (Teece 2017), although scholars do not uniformly agree on its definition (Zott et al. 2011). Indicators are calculated from material topics selected from the Global Reporting Initiative (GRI) standards (GRI Material Topics) mapped to the United Nations Sustainable Development Goals (UN SDGs) (Linking the SDGs and GRI). Although studies show that GRI-based sustainability reports do not contain sufficient information needed for judging

corporate sustainability performance or how quickly they are approaching sustainability (Barter 2015; Isaksson et al. 2009; McElroy 2017), the use of these material topics alongside the formulae and methods developed in this study allows for answering these questions.

Enterprises recognize that they can only manage what is measured (Bansal & Song 2017), and thus are often accused of not measuring what matters. A Haffar and Searcy (2018) review of 463 environmental indicators found none to be context-based with a prevalence for self-referential indicators without context in many of the most commonly used reporting frameworks, such as the GRI and CDP. This study develops THRIVE framework and SPS tool which allows enterprises to publicly, transparently and accurately self-assess (without self-reference) their business model (BM) and corporate sustainability performance (impact) whilst adopting a context-based and science-based approach (*SBTi Criteria and Recommendations* 2018). This study thus supports enterprises by recognizing that innovations at the business model level (BMI) (Amit & Zott 2012; Foss & Saebi 2016; Kiron et al. 2013) are a precursor to business models for sustainability (Schaltegger et al. 2012; Schaltegger et al. 2016b) i.e., sustainable business models (SBM) (Lüdeke-Freund et al. 2018a).

Whilst some argue that harmonizing measures globally may go against enterprises promoting their own narratives or value creation stories (2013), THRIVE SPS tool provides a sophisticated and standardized, long sought after means of scientifically comparing corporate sustainability performances. The extended version of this study incorporates a discussion on the *theory of change* as it relates to business models (Andriopoulus & Lewis 2009; Upward 2013) to ensure long-term systemic sustainable success by considering business enablers and moderators, such as leadership, culture, globalization, collaboration, risk, and regulation.

APPROACH

The study adopts a Systematic Design Science Research (DSR) approach (Aken 2004; Gregor & Hevner 2013; Hevner 2007; Winter & Aier 2016), integrating a pluralistic interdisciplinary method (Redclift 1998; Shrivastava & Guimarães-Costa 2016; von Bertalanffy 1968), acknowledging the role of societal and natural factors in accounting for sustainability issues (Persson et al. 2018), and the wicked nature of the projected phenomenon under investigation (Kurucz et al. 2017; Lüdeke-Freund & Dembek 2017). Initially, a kernel theory based on first principles is

advanced (Gregor & Hevner 2013; Gregor & Jones 2007), together with illustrative case studies and other public data, to explain and provide justification for the underlying approach (March & Vogus 2010; Winter & Aier 2016). Adopting a high-level systems thinking perspective (Ackoff 1971; Gharajedaghi 2006; Williams et al. 2017), the study investigates corporate business models (BM) at the meso level, illuminating how novel business model design affects performance (Martin 2009; Zott & Amit 2007) and in support of the understanding that business strategy needs design and is about invention and thus requires innovation, as unguided novelty does not necessarily create value (Liedtka 2018).

The flexibility of the holistic DSR approach aids in developing solutions to wicked problems (Foss & Saebi 2018) and best serves the corporate responsibility field (Visser 2012). Credibility is achieved by progressive focusing (Stake 1995) through prolonged engagement (Lincoln & Guba 1985), evaluation of multiple instances (Krefting 1991) and convergence of multiple secondary data sources (triangulation) (Knafl & Breitmayer 1989; Krefting 1991; Morse 1991), explicit documentation of choices made for included truths during discovery and evaluation (Guba 1981), maintenance of chain of evidence (Lincoln & Guba 1985) and narratives/reflexive analysis of records (Ruby 1980) thus improving trustworthiness. Furthermore, this experienced researcher, acting as the instrument, is careful to avoid confirmation bias by ensuring objectivity (Good & Brophy 1985), whilst dictating the framework (Agar 1986), showing expertise in the subject matter (Miles et al. 2014), demonstrating good investigative skills (Miles et al. 2014), strong interest in conceptual/theoretical knowledge (Miles et al. 2014), structural coherence (Guba 1981) and a multi-disciplinary approach (Miles et al. 2014). If possible, and time permitting the final stages involve the peer review by subject domain experts from around the world (Delphi Study) (Lincoln & Guba 1985).

Transferability is improved through thick descriptions of cases (Geertz 1973), using selective maximum variation of nominated samples (Patton 2002), and longitudinal triangulation of data sources (Krefting 1991; Morse 1991) with explicit general research dimensions as indicated in Table 1, to aid in understanding the researcher's worldview and approach (Krefting 1991); and includes an index of case studies reviewed (Krefting 1991).

Design Research Dimensions			
	Worldview		
	Ontology	**Epistemology**	**Paradigm**
	Atheist / Realist	Rationalist	Critical Realist
	Approach		
	Design/Method		**Lens/Framework/Type**
	Systematic Design Science / Thematic Analysis (Literature/Case Studies)		Transformative / Exploratory / Observational
	General		
	Logic	**Outcome**	**Ethics**
	Reductive	Cross-Sectional Basic Applied	Humanist

Table 1. ***Design Research Dimensions used by the Author in this study.***

As a transdisciplinary study, theoretical triangulation of perspectives is explicit (Knafl & Breitmayer 1989; Krefting 1991; Morse 1991). Together with audits, this ensures comparable conclusions, including a detailed step by step description of the thematic analysis (TA) (Braun & Clarke 2006; Fereday & Muir-Cochrane 2006) and case study (CS) (Baxter & Jack 2008; Perry 1998; Yin 2012) methods employed, thus ensuring dependability and confirmability (Kielhofner 1982). By using multiple illustrative example cases (Eisenhardt & Graebner 2007), latent interpreted themes (Ruby 1980) showing coherence (credibility) (Maguire & Delahunt 2017) and consistency (dependability) between the claims and the data (Javadi & Zarea 2016) further aid reflexivity (Hyett et al. 2014) through sense-making and quantification of the thematic analysis (TA) during the creation of the set of patterns (Lapadat 2010).

Thus, rigor and trustworthiness are achieved by way of addressing the above issues of credibility, transferability, dependability, and confirmability (Krefting 1991). Case study construct validity is achieved through the evaluation of multiple data sources (Baxter & Jack 2008; Creswell et al. 2011; Luck et al. 2005) coupled with the maintenance of the chain of evidence (Tranfield et al. 2003); and reliability by development of the thematic analysis (TA) database thereby further enhancing rigor (Healy & Perry 2000; Huberman & Miles 2002). Both theory and method triangulation is sought (Tobi & Kampen 2018). Multiple secondary data sources are included in a codebook for consistency and transparency (Rowley 2002), thus providing triangulation and verification (Hyett et al. 2014), and thereby improving the trustworthiness and credibility of the study. This study contributes to theory, methodology as well as empirically (Gregor & Hevner 2013).

CONTRIBUTION

This study takes a strong sustainability (Bjørn & Røpke 2018; Landrum 2017; Neumayer 2010; Pelenc 2015), deep ecology (Naess 1973), multi-capital (Howitt & Thurm 2018; McElroy & Thomas 2015), values-based (Breuer & Lüdeke-Freund 2017) and science-based stance (SBTi 2018) with material topics evaluated within context (Faber & Hadders 2015; McElroy 2013, 2017; McElroy et al. 2008; UN Environmental Program 2015) i.e., based on inner and outer limits and allocations (Raworth 2012; Reporting 3.0 2018). *The Holistic Regenerative Innovative Value Enterprise* (THRIVE) framework and associated Sustainability Performance Scorecard (SPS) tool (Table 2) resulting from this study, categorically identifies successful sustainable business models (Bocken et al. 2014; Fellmann et al. 2018; Lüdeke-Freund et al. 2018b; Remane et al. 2017) thereby encouraging enterprises to adopt sustainable practices (Evans et al. 2017; Pansera & Randles 2013). A comprehensive literature review reveals this is the first study to envision showcasing a quantitative sustainability performance score alongside categorical business model pattern identifications.

THRIVE framework provides a methodological contribution to a strongly sustainable future (Heikkurinen 2019; Stal 2018) as well as forming the basis of practical practitioner's tools such as the THRIVE SPS. The THRIVE SPS tool assesses the corporate sustainability performance of enterprises at the business model level (Evans et al. 2017) and identifies which category of business models or strategies are more successful than others. THRIVE tools are licensed under creative commons, published in journals and made available to academia, business leaders and the public (Creative Commons Website).

THRIVE	Rank	Enterprise Name	Industry Classification	BM pattern	SP scorecard
Sustainability Performance Scorecard	1	*Enterprise A*	Pharmaceuticals, Biotechnology and Life Sciences	P6.1	***0.503***
	2	*Enterprise B*	Technology Hardware and Equipment	P11.1	***0.625***
	3	*Enterprise C*	Consumer Durables, Household and Personal Products	P8.4	***0.768***
	4	*Enterprise D*	Food and Beverage Processing	P7.4	***0.891***
	5	*Enterprise E*	Electric Utilities and Independent Power Producer	P4.3	***1.106***
	6	*Enterprise F*	Banks, Diverse Financials, Insurance	P7.1	***1.282***

***** For illustration purposes only ***** SPS: 0 <= score <= 1 means **strongly sustainable enterprise**, score > 1 means **NOT a strongly sustainable enterprise**. Context-based Sustainability Performance Scorecard (SPS) values are calculated based on figures from public sources covering a range of material topics. Business model (BM) patterns from Lüdeke-Freund et al. (2018). Industry classification is derived from GRI Business Activity Groups (BAG). Italicized values are masked and anonymized.

Table 2. ***Sustainability Performance Scorecard (SPS). Sample of an instantiation.***

The THRIVE SPS echoes initiatives by the newly formed World Benchmarking Alliance (WBA) (Oppenheim et al. 2017) and their most recent development of the Seafood Stewardship Index (WBA 2018). Their sustainability ranked '*league*' tables aim to closely align performance with the SDGs. There are other initiatives or case studies that report on corporate sustainability performance (Morioka et al. 2016), although not categorizing based on BM. These include Climate Counts (Climate Counts 2013), The Wikirate Project (Wikirate 2018), S&P Global Trucost (Aldhous 2019); the individual ExxonMobil Integrated Report (Eccles & Krzus 2018); and GIIN: Impact Investing in SEA (Global Impact Investing Network 2018) which focuses on a whole country or sector. A plethora of individual self-assessment tools exist, however most notable are the strongly sustainable F2B2 (Kendall & Willard 2015) and the VMDBee tools (Man 2019). In a number of other efforts that rank the sustainability performance of enterprises, there is a lack of methodological transparency or in some cases the source data set may be proprietary (thus subject to bias), as in the case of RobecoSAM (RobecoSAM List of Companies), the '*big 4*' accounting and consulting firms, and Corporate Knights (Corporate Knights 2018 Global 100 Issue). Some, like TruePrice (TruePrice Website) evaluate the specific '*trucost*' of raw materials in set regions only, such as coffee, palm oil, milk, and bananas. And finally, in some cases, sustainability reports simply reflect the level of *disclosure* (e.g., DJSI) (López et al. 2007) without adequately addressing each material topic (UN Environmental Program 2015;

WBCSD 2017a) nor attempting to systematically measure the actual sustainability performance of the enterprises concerned (Lydenberg et al. 2010).

THRIVE SPS assists enterprises and consumers at large with a better understanding of their impact based on its actual footprint (Rees 2000) across all three pillars of sustainability: the economic, social and environmental (Elkington 1997). This is achieved by summation of each quotient based on the enterprise's impact on each material topic, proportional to its allocation (Daly 1992). Each quotient is calculated as the actual impact (numerator) divided by the allotted impact (denominator) multiplied by its weight (***Figure 1***). It is argued by many as to what these weights (Bjørn & Røpke 2018) and normalizations (Huang et al. 2015) ought to be across sectors, industries, and pillars; with some arguing these should be simply omitted and others that they ought to be industry or sector-specific (Eccles 2012; Sironen et al. 2014). THRIVE SPS model supports any and all such variations in its calculation engine, enabling the use of material topic weights as triggers for transition. For example, weights may be employed to model the introduction of a government tax on certain goods or services, or be used as a catalyst to encourage enterprises to switch to more renewable resources by attributing higher weights (Ioannou & Serafeim 2019) to certain material topics. Whilst THRIVE SPS engine supports multiple weights and thus algorithms, the key to its usefulness is consistency of method across material topics in order to effect fair comparisons (IIRC 2013).

$$\text{SP score} = \frac{1}{n} \times \sum_{i=1}^{n} w_i \times \left|\frac{x_i}{e_i}\right| \qquad \text{where } 0 \leq \frac{x_i}{e_i} \leq 1 \text{ for strong sustainability, and}$$

w_i	is the weight applied to each specific material topic i (i.e., usually 1; e.g., set to over 1 to model legislative changes affecting topic)
x_i	actual impact by the Enterprise on material topic i (i.e., measured based on true performance)
e_i	allocated footprint for material topic i (e.g., based on Global Footprint Network datasets)
i	material topic under evaluation (e.g., Diversity and Equal Opportunity)
n	total number of material topics (e.g., 36 for GRI Standard or 17 for SDGs)

Figure 1. ***Formula for the calculation of the sustainability performance score as detailed in this study.***

Numerator values are based on actual performance relative to the inner (threshold) and outer (ceiling) measurement, as espoused by GTAC (Reporting 3.0 2018) and similar groups, being aware of congruency in units of measure and the related issue of normalization across all material topics. In some cases where global data is missing, allocations may be based on gross domestic product (GDP), even though this is not the best method (Faria & Labutong 2015), and subject to refinement based on a more meaningful measure. Denominator data is sourced from the open data and method platform provider Global Footprint Network's (GFN) (*Global Footprint Network Homepage* 2019) '*measure what you treasure*' service, or from other notable and reputable sources: United Nations (UN), World Health Organization (WHO), Organisation for Economic Co-operation and Development (OECD), Carbon Disclosure Project (CDP), World Resources Institute (WRI), Eurostat and others.

The support for granularity within THRIVE framework means that the SPS dashboard may be used to see performance on an international, national or sector by sector basis or even year-on-year within an enterprise or cumulative within a sector. Together with the custom produced '*Ciambella Chart*' (***Figure 2***), it provides a quick and easy direct visualization of an enterprise's sustainable impact across GRI topics or SDGs goals (Linking the SDGs and GRI). Thus, unlike the sustainable value add (SVA) method (Figge & Hahn 2005) based exclusively on GDP which fails to measure the actual sustainability performance of an organization within context (Huang et al. 2015) - much less from a strong sustainability perspective - the THRIVE SPS method is similar to the approach advocated by the multi-capital scorecard (MCS) (McElroy & Thomas 2015) and sustainability quotient for social footprints (McElroy et al. 2008) where a clear absolute binary identification of '*is sustainable'* (green) or '*not sustainable*' (red) is achieved.

Whilst this study advocates the use of the GRI material topics (GRI Material Topics), Bailey and Eccles (2018) argue for using the sustainability factors as identified by the Sustainability Accounting Standards Board (SASB) mapped to the

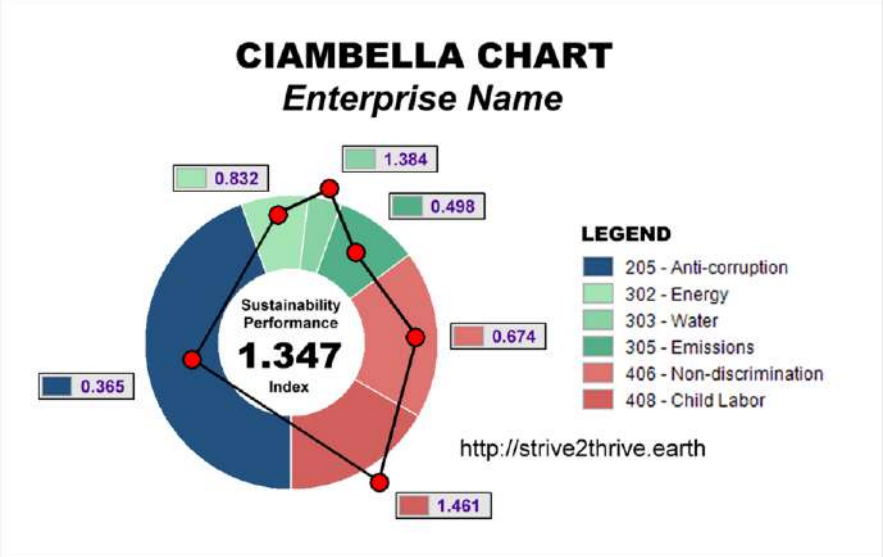

Figure 2. ***Sample Ciambella Chart developed by the Author.***

objectives of the United Nations' Sustainable Development Goals (UN SDGs). Moreover, whilst there are no set metrics specified, the suggested framework agnostic Global Impact Investing Network (GIIN) IRIS+ (IRIS. 2019) metrics provide data clarity and comparability, across the 169 targets, and 230 measurable indicators of the SDGs (2019, 2019). Whilst the specifics of the IRIS+ metrics are outside the scope of this paper, business leaders may use these internally consistent IRIS+ metrics to manage what is measured (Prusak 2019), and moreover ensure they are measuring what matters, within context, using science-based targets (*Assessing Corporate Emissions Performance through the Lens of Climate Science* 2013; *SBTi Criteria and Recommendations* 2018; UN Environmental Program 2015) and uniform units of measure (IIRC 2013) thus ensuring fair comparisons.

CONCLUSION

The strong theoretical basis employed by the framework together with public domain science-based datasets ensures a broadly useful THRIVE platform and SPS tool that can be used by several actors: consumers, business analysts, researchers, government and business leaders. For example, consumers may use the system to decide which enterprise they should transact with; business analysts to guide enterprises in engaging in certain activities or strategies; researchers to analyze trends and effectiveness of business models for sustainability; governments to forecast the effects of legislative actions; and by business leaders pursuing a competitive advantage.

Designed to provoke transformative change, THRIVE SPS ranking tool provides a transparent public platform to encourage enterprises to embrace the circular economy (Geissdoerfer et al. 2017; WBCSD 2017b; Webster 2015) through contributing their fair share. It achieves this by arming business leaders with the knowledge to actively compete and excel among their peers through alignment with the United Nations Sustainable Development Goals (UN Global Compact 2018) in order to *do good to do well.* It also empowers individuals with the ability to actively stimulate competition among enterprises for greater global shared value creation and collaborative peaceful partnerships for people, planet, profit with purpose and prosperity (Kolk et al. 2017).

Future

As tri-impact integrated reporting (<IR>) becomes the norm featuring comprehensive and complex levels of analysis and automation (Lai et al. 2016; Lydenberg et al. 2010), newer technologies like Artificial Intelligence (AI) , Big Data and Analytics (BDA) (Eccles & Krzus 2018) brings us a step closer to the next leap towards dynamic Integrated Report Generator Tools (IRTG). These technologies are ultimately only as good as the underlying frameworks that dictate how data is to be compiled, reports constructed and as accurate and reliable as the source datasets are. This study serves to bridge this gap by contributing to the framework and toolsets necessary to inform these comparisons. Thus, business transformation for sustainability benefits from the more sophisticated THRIVE SPS engine, featuring granular and accurate denominator data and integrated reporting at the global macro level and interactive real-time querying of an enterprise's sustainability performance, truly closing the loop on sustainability and the circular economy.

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The Role of Intellectual Property Rights in Sustainable Business Models

Mapping IP Strategies in Circular Economy Business Models

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Keywords

Intellectual Property Rights, Licensing, IP Strategy, Sustainable Business Models, Circular Economy

Abstract

Sustainability transitions require novel technologies and business models. They rely on collaboration between organizations in the innovation ecosystems. Intellectual Property Rights such as patents encourage collaboration by turning knowledge into tradeable goods. Patents may also block the diffusion of sustainable technologies and business models by fostering periodical monopolies for less sustainable technologies. Given their accelerating and blocking effects, in the context of sustainability and in particular circular economy, this paper presents the range of Intellectual Property strategies and how they match with business models in the circular economy. We found that the majority of business pursue a closed strategy or restricted sharing of IP. Only very few share their IP openly.

Introduction

Sustainability transitions rely on cooperation between organizations in the innovation ecosystems, shaped by technological, regulatory, cultural and psychological, demand and supply factors, as well as infrastructure and maintenance (e.g., Chambers et al., 2013, Elzen et al., 2004; Geels, 2010). Value-chains often span across industries and countries. Accordingly, a shift to sustainable manufacturing and consumption is only possible as a combined effort. With new knowledge being at the core of many sustainable technologies and related business models, we argue that the selection of adequate intellectual property (IP) strategies is an imperative for unlocking innovation and accelerating diffusion processes, thereby encouraging sustainability transitions on a global scale.

Given their accelerating and blocking effects, in the context of sustainability and in particular circular economy, the range of IP strategies remains to be systematically studied, holistically categorized and their impact to be assessed. We contribute to the research on sustainable business models by investigating the following questions:

1) Which IP strategies do exist of relevance for sustainable businesses and how can they be typologized?

2) Which IP strategies are employed by sustainable businesses and how do they match with sustainable business models?

The concept of sharing IP is often proposed to reduce transaction costs. E.g., repair and remanufacturing are an important concept in the circular economy. Many of these activities are carried out by recycling and refurbishing (upcycling) companies (Vogtlander et al., 2017). This requires original equipment manufacturers (OEM) to share their IP, e.g. design specs and materials, which are often kept internally as trade secrets. Lack of access to this IP limits the uptake of remanufacturing. Similar effects prevent effective waste treatment, e.g., in textiles. If the compositions of coatings remain secret, it is hard to predict the outcomes on toxic releases of substances into water and difficult to develop effective water treatment processes (Greenpeace, 2017). Establishing remanufacturing operations also requires the development of innovative tools for disassembly, which some OEMs protect with patents (Wiens, 2014). If shared with remanufacturing firms via licensing contracts these could become very lucrative

assets. We also observe increasing patent filings protecting circular economy innovations (e.g. mushroom protective packaging material, wet-green leather tanning, carpet tile products). Hence, understanding and selecting supportive IP strategies for circular economy activities is of eminent importance.

Based on a review of various IP strategies discussed in literature and case evidences, we provide a typology of IP strategies from closed to completely open, and discuss the framework conditions that enable businesses to select a certain strategy.

IP Strategies from Closed to Open

Currently, sustainability science and the practice community tend to advocate openness and transparency (Kassoy, 2010). For instance, open IP models such as free licensing may facilitate knowledge sharing and technology transfer, enable market entrants, and nurture niches on sustainable innovations (Sternkopf et al., 2016). On the other hand, innovation and entrepreneurship research argues for IPRs (patents, trade secrets, design rights, trademarks and copyright) to spur innovation and growth including economic development in low-income countries, by turning intangible assets into tradable goods and attracting foreign investments by offering protection (Jacobides et al., 2006, Harvey, 2008).

In Vimalnath et al. (2019) we synthesize and propose an IP strategy typology (see Fig. 1) based on four dimensions derived from the conceptual foundations of property rights theory (see also Eppinger, 2015; Eppinger & Tinnemann, 2014). Across the four dimensions we distinguish four IP strategy types based on the four categories of physical goods (private, club, common and public). Below we describe each of the dimension and their degree of openness.

Degree of openness →				
Type of IP strategy	**Private IP strategy**	**Club IP strategy**	**Common IP strategy**	**Public IP strategy**
IP ownership right allocation	Ownership is highly concentrated	Ownership is concentrated or distributed among several owners		No one owns the IP (anymore). IP is in the public domain
Access to not publicly disclosed IP[1]	Owners prevent others from accessing their IP	Only members of the club can access IP. Entry barriers are high for outsiders	Entry barriers are relatively low for outsiders. Almost anyone can access the IP with or without contributing IP	IP is accessible to anyone
Commercial usage of IP[2]	Owners restrict commercial usage by others entirely	Only members of the club are entitled to commercial usage. Non-members are prohibited from commercial usage	Owners allow almost anyone to use the IP with restrictions	Owners cannot/do not restrict commercial usage by anyone

[1]Across all models, owners cannot restrict access to their publicly disclosed IP (eg. in patent documents).
[2]Across all models, owners may not be able to restrict non-commercial under certain exemptions (eg. for research, academic use)

Figure 1: IP strategy typology

Degree of IP ownership rights concentration: This dimension refers to the degree to which legal ownership (e.g. patents, copyrights, and trademarks) is concentrated to one or distributed (fragmented) across many agents for a certain technology, product/ service. At a Private IP Strategy, ownership of IP rights is highly concentrated to a single entity. On the other extreme, at the Public IP Strategy, IP is in the public domain and jointly owned by society (e.g., lapsed patents, published knowledge).

Degree of access to not publicly disclosed IP: This dimension refers to the extent of access provided by owners to those seeking access to IP. Owners can control the level of access to their not publicly disclosed IP (e.g. what is published in the patent document) that complements the protected IP, which may come as a mix of explicit but not disclosed (e.g. technical drawings) and tacit (or sticky) IP of the inventor, training, internal documents etc. (Polanyi, 1962; Von Hippel, 1994). Owners can choose to prevent outside agents completely from accessing their not disclosed IP (Private IP Strategy), allow access only few selected members (Club IP Strategy) or allow anyone to access this IP (Public IP Strategy).

Degree of access to commercial IP usage: This dimension refers to the permission granted by IP owners to outside agents for commercially using their IP in exchange for some form of direct (e.g. monetary returns from royalty payments) or indirect compensation (e.g. benefits derived from strategic positioning, accelerated technology diffusion) as set out in licensing agreements that govern this exchange.

While owners may not be able to restrict non-commercial usage under certain exemptions, such as for research, or compulsory licensing (Beall and Kuhn, 2012) we exclude non-commercial usage from this dimension. Owners can prevent outside agents either (completely) from commercially using their IP as one extreme case (Private IP Strategy), allow only a selected member to commercially use their IP (Club IP Strategy), or can allow (almost) anyone to commercially use their IP (e.g. through patent pledges) on the other extreme (Public IP Strategy). This may happen with certain usage restrictions (Common IP Strategy, e.g. to agree to non assertion terms or share back), but may also come without any restrictions (Public IP Strategy).

Business Models in the Circular Economy

As the circular economy approach supports several Sustainable Development Goals (e.g., affordable and clean energy; climate action; responsible consumption & production) it is seen as a suitable approach for achieving sustainability transitions in both developed and developing countries. Essentially, circular economy is about slowing loops (making products that last long, encouraging reuse, repair and remanufacturing); closing loops (recycling) and narrowing loops (reducing energy consumption, use of renewable energy). Hence, not only the European Union, but also countries like India and China are interested in implementing circular economy principles (Bocken et al., 2016, 2017; Geisdoerfer et al., 2017).

Business models is commonly referred to as the way business is done (Magretta, 2002), covering various aspects of a business. Usually a sustainable business model is presented by a value proposition (what value is provided - product/service offering), value creation and delivery (how value is provided) and value captured (how money and other forms of value are captured) (Richardson, 2008; Bocken & Short, 2016). The combination of these aspects matter and should be considered as parts of a whole, consistent business model. From an analytical perspective it is important that businesses may innovate their business model over time and may include various sets of value propositions and value creations simultaneously, linked to different products and services.

From linear to circular business models: linear business models, dominant in our current economic system, are based on the ‘take-make-dispose’ notion where a product is disposed of after a limited number of uses. In a circular economy, the product is reused multiple times (e.g. enabled by remanufacturing, refurbishing

and reuse) and eventually recycled, supported by innovative business models. Within the circular business model spectrum there are many potential options.

Different types of sustainable business models (SBMs) have emerged within diverse industries and organizations to address circular economy principles. Table 1 describes some SBM types based on literature:

Table 1. Classification of sustainable business models in the circular economy (based on Bocken et al., 2014; Lüdeke-Freund et al., 2016; Ritala et al., 2018)

SBM type	Short description	Possible positive impacts
1. Maximize energy and material efficiency	Solutions to do more with fewer resources; generate less waste, emissions, and pollution, e.g. through a lean approach	• Enhance efficiency and improve resource use (narrowing loops) • Save costs • Narrowing loops
2. Closing resource loops	Solutions to do reuse materials and products and turn waste into feedstocks for other products/ processes.	• Reduce waste • Turn waste into value/new business lines. • Generate new revenue streams
3. Substitute with renewables and natural processes	Use of non-finite materials and renewable energy sources – moving away from fossil fuels	• Reduces use of finite resources, waste, and pollution (narrowing and slowing loops) • Supports long- term energy supply. • Contributes to "green economy"
4. Deliver functionality rather than ownership	Provide services that satisfy users' needs without them having to own physical products	• Can encourage the right behaviours with manufacturers and users (slowing loops). • Can reduce the need for physical goods (narrowing loops)

IP strategies for Business Models in the Circular Economy

We identified 30 cases across various industries based on circular economy and sustainability awards and prizes, research studies, and sustainability indexes that reveal characteristics of one of the four SBM. Cases qualified for further investigation when their environmental sustainability contribution appeared significant and not just incremental, end-of-pipe solutions or "green washing"

approaches. We investigated the IP strategy based on public available data, mainly company information, IPR databases and sustainability reports.

Circular economy businesses employ different IP strategies. While only very few are committed to an open sharing, others pursue a closed strategy. However, the majority exercise a differentiated approach, opening up for some aspects and keeping other knowledge pieces closed, to pertain a competitive advantage. The following table lists examples of cases we identified:

Table 2. Circular Economy SBM and IP Strategies

SBM type	Private IP Strategy	Club IP Strategy	Common and Public IP Strategy
1. Maximize energy and material efficiency	• Werner & Mertz (chemical industry) • TATA Motors (manufacturing)	• Veolia (energy, water & waste) • Signify (energy)	• Jaipur Rugs (textiles) • Fairphone (consumer electronics)
2. Closing resource loops	• Aquafil (textiles) • Hilaturas Ferre (textiles)	• Vegware (food packaging) • TerraCycle (recycling)	
3. Substitute with renewables and natural processes	• Vestas (renewable energy) • Unilever (chemical industry)	• Solarcentury (energy) • Ecotricity (energy)	• Husk Power Systems (Energy)
4. Deliver functionality rather than ownership	• Bluecarsharing (transportation service)		

The majority of cases that we identified fall under the Private (15 cases of 30) and Club IP (12 cases of 30) strategy. Notably, the few examples that pursue a Public IP Strategy are all enterprises that where founded with an environmental mission. They are free of the path dependency of private (or closed) IP strategies.

Outlook

In sustainable business models, IP related issues are rather complex and intertwined. For instance, patents may help start-ups to attract funds and recoup R&D investments. Incumbents, however, are often locked into trajectories (path dependency) due to prior investments (e.g. manufacturing plants) and infrastructure (e.g. oil production, global supply chains). They may use patents and trade secrets to extend the commercial exploitation of their protected, less sustainable technologies, thereby hindering market entrance of actors advocating more sustainable technologies. While we indicate with our preliminary research that also businesses in the circular economy pursue mostly more closed IP strategies, we lack the frameworks for better understanding these complex interactions of IP strategies and sustainable business models. Accordingly, further case research is required to analyze the inhibiting and stimulating role of IP strategies in adopting new business models that contribute to circular economy.

Acknowledgement

The project IPACST is financially supported by the Belmont Forum and NORFACE Joint Research Programme on Transformations to Sustainability, which is co-funded by DLR/BMBF, ESRC, VR, and the European Commission through Horizon 2020.

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The triple top line: How digital technology is transforming sustainability

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Abstract

Digital technologies are changing how companies tackle the sustainable development goals (SDGs), through the deployment of three complementary innovations. Using advanced observations via drones, satellites, IOT devices, and citizen science – *sensing innovations* improve information availability and reliability regarding environmental and social data that can be used to inform decision-making. Better information about humanity's interconnections with society and our environment reduces search costs and monitoring risks, improves organizations' ability to identify areas of greatest need, and helps planners make better predictions about market outcomes. Through digital integration, *structuring innovations* reduce risk and transaction costs as well as enhance the capacity to transfer information by improving the rails that connect market actors. Finally, *sculpting innovations* fulfil previously unmet needs by solving governance problems to create new products and services in blue oceans and open up new markets. This essay provides an introduction to these three innovations that form the core of what we call the triple top line. Sensing, structuring, and sculpting are underpinning a new Sustainable Digital Economy.

Introduction

Limiting global warming to below 2°C as per the Paris Accord, and achieving the 16 other Sustainable Development Goals (SDGs) will require almost US$4 trillion a year (UNCTAD, 2014; Wilson, 2016). With approximately 35% of this sum currently being invested, humanity confronts a US$2.6 trillion investment gap (Gaspar et al 2019). While this may look like an extraordinary amount of money, to put this in context, a recent MIT study estimates it will cost up to US$535 trillion

by 2100 to extract carbon from the atmosphere if we don't start acting soon (Hansen et al., 2017).

Though sustainable development has typically been the prerogative of governments and NGOs, businesses often prove more powerful societal actors. Some firms draw on greater financial resources than small countries, and are often able to act more quickly, efficiently and decisively than states in pursuit of their goals. For these reasons, businesses have been increasingly sought out as essential partners to achieve the United Nations Sustainable Development Goals (SDGs) agenda and prevent catastrophic climate change.

Conversations around narrowing the investment gap reveal three action paths: 1) *increasing the quantum* of private sector capital and the speed with which it is mobilized for sustainable development, 2) *reducing unsustainable investments* in fossil fuels, human trafficking, poaching etcetera, and 3) *increasing efficiencies* with which current investment translates into impacts. Yet while evidence indicates CSR does not erode performance and may improve access to finance (Cheng, Ioannou, & Serafeim, 2014; Margolis & Walsh, 2003), customers (Cohen & Munoz, 2017) and legitimacy (Bansal & Roth, 2000; Maxwell, Lyon, & Hackett, 2000), organizations continue to regularly shirk the full costs of their actions (Lyon et al., 2018) and the global economy remains environmentally and socially unsustainable.

While businesses have long sought to balance a triple bottom line (Elkington, 1997) or create shared value (Porter & Kramer, 2011; Porter, Kramer, & Zadek, 2007), such efforts have generally resolved themselves in a retrenchment of the profit pursuit (Orsato, 2006), attenuated by the need to keep social or environmental externalities low enough to avoid legitimacy crises (Schlusberg, 1969; Sethi, 1975). Perhaps unintentionally, the rise of stakeholder theory appears to have furthered this retrenchment (Freeman, 1984; Freeman & McVea, 2001), leaving fundamental questions about the legitimacy of the capitalist ethos to deep ecology thinkers (Devall & Sessions, 1985; Zsolnai & Ims, 2006). Recently however, Deloitte (2018) has suggested that many firms are entering a new paradigm in which they behave less like a company and more like an institution - integrated within society's social fabric - with far-reaching implications for employees, managers, and corporate missions.

It is against this backdrop that we draw focus on an emerging organizational form, that of the Social and Environmental Premium Organizations (SEPOs), and explore

the ramifications of its emergence for the field of sustainable business and development. Through digital technologies, SEPOs are developing innovative solutions that address targets identified in the SDGs in ways that correlate ever more closely with private economic goals. These businesses move beyond duty-bound corporate social responsibility or the need to give back to society (Garriga & Melé, 2004) by crafting real ventures for which addressing the SDGs constitutes the central business opportunity. By dramatically reducing transaction costs and leveraging unlocking network effects in the production of positive socioecological spill-overs, digital technologies are thus enabling new business models in which the good vs well dichotomy vanishes.

The argument in brief

In the early 21rst century, technological changes promise to increase firms' ability to create positive impacts. Where and when these abilities become profitable, new funding sources are apt to jump at the chance to become part of the larger solution. As these conditions become more common, problems that were once the strict prerogative of the state, the NGO, and international agencies, are increasingly being addressed by what we call Social and Environmental Premium Organizations or SEPOs. These for-profit enterprises provide public goods in private markets, generating positive social and/or environmental spillovers in the process. In our study of pioneering firms working at the interstice of the natural and the digital world, we find entrepreneurial ingenuity increasingly combining with digital technologies – e.g. artificial intelligence and machine learning (AI/ML), distributed ledger technologies (blockchains or hashgraphs), internet of things (IOT), and telemetry devices like satellites and drones - to contribute to the achievement of the SDGs.

We find these SEPOs' primary focus lies in developing new sources of *public value creation*, with *private value appropriation* a secondary goal. To illustrate, an executive at the San Francisco-based Saildrone describes the first question her company asks itself on receipt of a new, potential client request: "what is the scientific value of this project?" If that value is unclear, the company foregoes the contract. Here is a private firm, seeking potential social returns of a new project before designing an economic value proposition around that.

Our research shows *SEPOs* leverage at least one of three "value systems" comprising both internal and external capital (i.e. human, tangible, intangible, and natural resources, skills and capabilities). In the first of these three systems, SEPOs

generate information-based value grounded in the social and environmental world. Innovations within this process of *sensing* generate valuable content within novel business models. Second, SEPOs employ digital tools to restructure that value within existing market transactions. Advances in *structuring* have a multiplicative influence on social and environmental value and improve the efficiencies with which that value is captured and transferred. Third, SEPO employ new tools to solve governance problems within and across value chains, a process of *sculpting* that enables the creation of entirely new markets in which social and environmental premium align with private gains (sculpting).

Innovations in these systems can be orchestrated to produce a *triple top line* that generates and magnifies social and environmental value and enables that value to be captured and transferred among a widening field of stakeholders within the economy.

We hope this trend towards a *triple top line* may herald a disruptive shift in the opportunities and threats of both incumbent corporations and non-corporate organizations.

Decomposing the triple top line

Achieving the Sustainable Development Goals (SDGs) by 2030 requires behavioral change and societal adaptation, major commitments of public and private financial capital, and significant and in all likelihood disruptive innovation. Innovation promises to 1) strengthen the availability and quality of information which is needed to inform capital allocation, 2) reduce the inefficiencies in complex value networks that divert capital away from actual impact, and 3) enable the emergence of market solutions that address unmet needs in sustainable ways. Against this backdrop of challenge and opportunity, more and more organizations are turning to digital technologies to 1) reduce waste and overheads to stretch committed funds, 2) increase the velocity of market exchanges, 3) automate processes to cut costs and improve access, 4) provide reliable data to facilitate risk assessment, and 5) create entirely new markets to meet previously unmet needs.

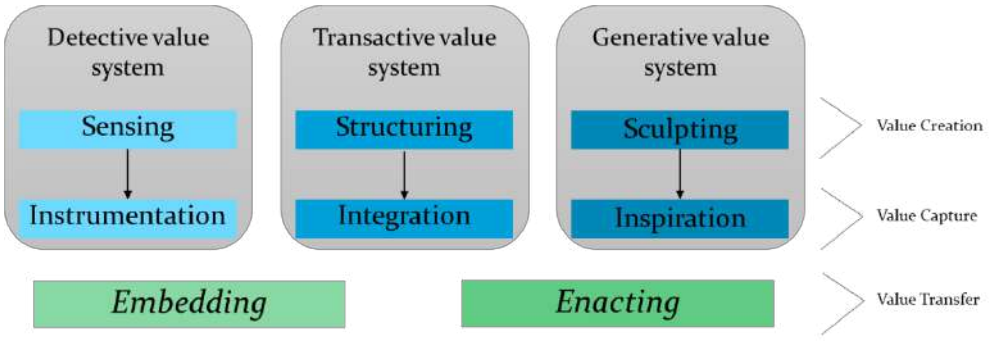
To formalize the emergent capabilities of Social and Environmental Premium Organizations (SEPOs), we borrow from the academic literature on Business Model Design. The business model was popularized in the mid-2000s by Osterwalder and Pigneur (2007), who designed a simple canvas to describe how an organization creates, captures, and transfers value. This value can be measured

in profits, as well as in social and ecological health, depending on the nature of the business. In academia, the foremost thinkers in this field are Raphael Amit and Christoph Zott, who define a business model as "a bundle of specific activities — an activity system — conducted to satisfy the perceived needs of the market, along with the specification of which parties… conduct which activities, and how these activities are linked to each other" (Amit & Zott, 2012: 37).

Our understanding of a business model reflects the work of Zott and Amit (2010) who suggest that business model innovations can focus on content (what?), structure (how?), and governance (by and for whom?). Inspired by their work, we advance a model that consists of ***sensing*** (observation), ***structuring*** (altering market railroads), and ***sculpting*** (new market creation). Successful SEPOs combine these value-creating activities with complementary value-capturing activities that enable them to appropriate part of the social premium they have created. A combination of a value-creating and an associated value-capturing activity forms a value system. Together, the three systems form the triple top line.

Rooted in a triangulation of academic research, field experience, and extensive interview and archival data, Figure 1 presents a graphical summary of our grounded theory approach.

Figure 1: The triple top line: SEPOs' complementary value systems



Sensing innovations digitize the natural world

> *"There is an urgent need to move public finance in the direction of more homogeneous, reproducible, and longitudinal data models" (Tara O'Shea, Planet).*

Sensing and instrumentation together form the **detective value system**. Digital technologies like IOT, sensors, drones, and satellites transform observations about the social or natural world into valuable data to infuse business decisions or policy.

Sensing creates novel observations in the form of raw, unprocessed data. *Instrumentation* transforms this data, through combinations of human and machine sensemaking (Lin, Schillebeeckx, & George, 2019) into indicators and instruments that infuse markets with information.

Envirate is a mobile app and platform built by Finnish start-up Vajrakila Innovations. Envirate empowers decentralized users to evaluate their surroundings - based on vision, hearing, and breathing - in the same way as customers rate hotels. Envirate's goal is to stimulate participation in concrete civic actions to address environmental degradation. Ratings are written to the Ethereum blockchain via an ERC-20 token, whereupon a system of hierarchical verification enables collective monitoring and protection of the biosphere. Users can make new ratings, explore and discuss ratings with other users, and organize pro-nature events like planting trees, clearing wastelands, waterways, beaches, etc. Users rate both urban and rural areas and enjoy infrastructure for creating pro-environmental challenges and incentivizing these challenges with ENV token rewards. Collective action supports belonging to a broader community and enhances awareness.

Sensing can occur through human observation - aided or mediated by technology - or purely via digital devices. The former relies on our five senses, the observations of which can be digitized in photographs, recordings, and subjective assessments of the environment. Platform-based mobile technology can organize these observations to enable so-called "citizen science". Citizen science initiatives like Envirate create a decentralized "hive mind" that harnesses wisdom of crowds to value the livability and attractiveness of urban and natural spaces. Envirate's community promises to radically increase transparency of state changes in the human ecosystem and to serve as an invaluable "fire alarm" for its degradation. Across contexts, such advances will make the scale of the sustainability problem more tractable and facilitate action. On the margin, more accurate, lower cost identification of global hotspots should enable donors and NGOs to target funds to projects based more on maximizing positive impact than political expediency.

Sensing is an antecedent of instrumentation activities that enable an organization to reap benefits from their own or others' sensing activities. Organizations can engage in instrumentation by recombining bespoke observations with public data, to verify, refine, and improve data quality and to triangulate insights. Alternatively, they can collect data within emerging ecosystems and use those to change existing practices.

Planet operates an armada of satellites, continuously circling the earth, consistently and repetitively mapping the entire globe. Planet organizes the value proposition of its sensing work using a 4I framework of data-driven outputs (information provision, insight generation, indicator development, and instrumentation for policy and financial planning). Planet also uses existing data with higher granularity than their own feeds to compensate for the wider aperture of the satellite lens. In doing so, they can extrapolate valuable information and develop low cost dynamic indictors via remote sensing and earth observation. For instance, Planet employs LiDAR data of the Peruvian forests collected by the Carnegie institution in 2014. These very expensive data map Peru's land carbon for a single point in time in a scientifically valid way. Planet is overlaying these data with their much cheaper satellite feeds that identify existing spatial structures (e.g. forests). By training algorithms to correlate the spatial structure of Planet's optical data to the Carnegie's LiDAR data, the team is developing a new low cost tool to map forest carbon globally.

Key activities in the detective value system involve boosting homogeneity of metrics (value creation) and reducing verification costs (value capture). Creating globally shared metrics, indicators, and instruments is akin to developing a shared language for sustainability efforts across markets, a valuable public good (UN Environment, 2018). Metric homogeneity can reduce search costs, provide a foundation for standard developments, facilitate cross-border capital flows, and facilitate the emergence of consistent and comparable regulatory objectives.

A challenge of sensing innovations is that they have to be acknowledged by regulatory agencies before they can really break ground. Even if Planet could effectively and cheaply verify carbon stock evolution in forestry at scale, it will still be regulators that will need to officially recognize that such technological solution can replace expensive consultants and intermediary organizations. Changes are unlikely overnight and ad interim impact investors can play a proactive role in pushing for greater efficiency by recognizing the technological solution before it takes on the role of an accredited "gold standard".

Improved data that becomes dynamically available at scale can also have large impacts on verification processes for sustainability projects. Such innovations will enable investments and development financing to grow more trees, support more livelihoods, and improve more lives. Automated and decentralized data collection at scale can drastically reduce verification costs, increase the impact of existing

funds, and entice more actors to engage in pro-environmental actions. With Planet, automated earth observations, instrumented for example with correlational analysis of changing biomass and forest measures, promise to revolutionize efforts to reduce emissions from deforestation and forest degradation (REDD+).

If SEPOs specializing in the detective value system can address these focal challenges of instrument homogeneity and technological verification, information and transparency can truly empower previously powerless communities, biomes, and countries. In the end, sensing and instrumentation help decision makers make better choices, and to make them faster. Improving information identification (Who? Which problem where?), reducing variety in instruments (How to assess?), increasing variety and dynamics in information inflow (What?), and embedding these improvements at the regulatory and finance levels are essential to achieving the SDGs. Sensing is the first step.

Structuring innovations digitize information in existing markets

Structuring and integration constitute the **transactive value system**, which affects the existing exchange infrastructure within which the firm operates. *Structuring* alters connections among market participants, by reducing transaction costs or by enhancing information flow. *Integration* ensures those gains through improvements in efficiency or effectiveness are partially captured by the SEPO. For example, a blockchain solution lowers transaction costs and improves the verifiability of product and process claims. A policy solution eliminates fossil fuel subsidies and enables demand-side flexibility companies to support expansions of renewable energy[56].

[56] McCormick, M. (2018). Brussels freezes UK back-up power subsidy scheme, 18th of November, 2018; last accessed 26 November, 2018 via https://www.ft.com/content/582e6dec-e8e2-11e8-a34c-663b3f553b35

CarbonGrid is a Vietnamese start-up that is tokenizing carbon emission reduction certificates (CERs) for resale over the blockchain. By tokenizing CERs, CarbonGrid restructures the market by allowing smaller offsets and combinations of high quality projects selected by a network of authority nodes. This may attract new demand for CERs from households, small scale emitters, and companies that can incorporate CarbonGrid's protocol into other blockchain applications. White labelled, the protocol can enable users across ecosystems to offset emissions associated with their transactions. By packetizing and diversifying at the same time, actors can purchase a varied portfolio of small quantity offsets all over the world or focus their contributions in places and projects they prefer. The blockchain's transparency also ensures that a single project is never double-counted or double-sold. For external organizations that need to verify the veracity of offsetting claims (e.g. consultants that provide a stamp of approval on a CSR report in which claims of offsetting are made), CarbonGrid's system also offers easier verification.

Structuring activities imbue existing business processes with addition information about individuals, behaviors, environments, and their dynamics to give rise to enriched patterns of exchange or replace old legacy systems with which economic exchange happens by more advanced digital solutions. Structuring thus involves a span of activities by which firms incorporate data into their business, modify or improve their operations based on newly available tools, and so modify or reshape their value chain interactions to augment value creation. When SEPOs integrate these tools into value propositions that attract market participants, for instance by improving efficiency and lowering costs, they begin capturing a portion of this value for themselves.

DiMuto is a Singaporean start-up seeking to restructure the global fruit and vegetable trade business around the principle of collaborative commerce (c-Commerce™). Using blockchain and digitised trade commerce papers, DiMuto is working to create a transparent track and trace system that runs from farm to fork. By on-chaining trade operations between multiple players on a single immutable ledger, DiMuto produces a digital trace of agreements, contracts, store locations, delivery times, and transfers. This reduces risks of fraudulent data submissions and trade frictions and allows for a faster, reliable identification of problems. Linking IOT data to the blockchain ledger further enhances the reliability and availability of product information during international transit. By linking smart locks and temperature sensors directly with the blockchain, DiMuto's software allows for quasi real time updates about the state of the cold chain during shipping. This information will reduce wastage, improve quality and support a "race to the top" in trade transparency.

Key technologies enabling structuring and integration include blockchain, Big Data, AI/ML, IoT Agents, and Automation. These enable firms to understand and incorporate rich new data inputs within their planning and production processes, and to ensure that the value add of integration is embedded effectively into improved value propositions. Both fully automated and human-directed systems can integrate new data into firm structures, while existing assets, resource configurations, and patterns of management enable or constrain the speed and scale with which firms can integrate new activities into their value chain.

By boosting liquidity and availability of Carbon Reduction Certificates for a more diverse group of actors, CarbonGrid can more effectively price the premium investors place on a carbon-neutral or carbon-positive investment events. When their value goes up, impact investments could be found to perform better as well – either because good businessmen do good or because doing good provides a signal that enhances investor confidence. While CarbonGrid provides an initial step by packetizing CERs, other organizations like Ekofolio (Denmark) are taking steps to reduce verification costs of forestry projects and support green bonds for natural capital. Ekofolio is creating special purpose vehicles that own land and forest that can be tokenized and sold.

The first case highlight innovations that allow participants in existing markets to value planetary resources, like a stable climate or natural biodiversity, when

making discrete business decisions. By creating carbon offsets at the transactional level, CarbonGrid is packetizing risk and invites small-scale contributions. This miniaturization can only be made profitable thanks to digital technological breakthrough technologies. Our second case highlights the possibility of replacing and "thickening" the exchange infrastructure with digital technologies to allow for more information transmission, transparency, reliability, and thus decentralized trust. A partnership between DBS bank and Agrocorp relies on a similar idea as DiMuto and provides "real-time pricing, shared delivery information, and automated trade finance approval, cutting Agrocorp's working capital cycle by 20 days and improving security". In due time, the platform will provide source information about the traded commodities (e.g. water, fertilizer, and pesticide usage) thus "providing improved food traceability and sustainability data to customers and consumers" (Merrill, Schillebeeckx, & Blakstad, 2019: 48).

Fairventures operates in the tropical timber market in Borneo. Their platform integrates information about farming practices, suppliers, buyers, and margins. This enables smallholders, brokers, and investors to better value the ecosystem services preserved and enhanced by sustainable agroforestry, while the collection and integration of better data within a trade platform serves an efficient and streamlined signaling function for the wider investor community to green supply chain for tropical hardwoods. Relatedly, collaborative commerce efforts such as that supported by the DiMuto platform will allow small scale farmers to acquire trustworthy reputations. Partners within such blockchain ecosystems will increasingly trade in bespoke tokens - enhancing trade liquidity, reducing FX costs, and learning to integrate digital ledgers within their operations without taking on the fixed costs of a bespoke system.

Sculpting innovations digitize new markets

Sculpting and inspiration form the **generative value system** that creates new markets where none existed or where existing solutions depended entirely on philanthropy or non-profits. By and large, *sculptors* are creative, entrepreneurial organizations that imagine, envision, and then start building a new market. *Inspiration* involves the process of realizing the potential of this ingenuity by incentivizing previously disconnected actors to enter new fields of exchange in ways that allow the sculpting firm to capture some portion of residual gains from new trade. On the whole, we find many sculpting organizations appear to be solving an informational problem that frustrates market formation by transforming Knightean uncertainty about business and transactional outcomes (and attendant trust problems) into probabilistic risk (Knight, 1921).

For a market to come into being, three complementary factors need to coalesce: (1) a demand for a product or service, (2) a relevant supply, and (3) a variety of institutions that allow buyers and sellers to settle upon a price for exchange. In the context of the SDGs, all three factors can be problematic: demand may exist without sufficient ability to pay or be latent and unknown. Supply may be absent due to information deficits and uncertainty. Even when suppliers could envisage creating a product that meets latent customer needs, it may be very hard to find a suitable time and place to engage in exchange because the social fabric lacks institutionalized market mechanisms or because the infrastructure for exchange is missing. In addition, weak judicial and regulatory institutions, corruption, poor rule of law enforcement, and the possibility of expropriation further exacerbate the above difficulties.

hiveonline is a Danish digital platform using blockchain, social networking, mobile data, and strategic partnerships to develop a holistic digital exchange system (DES) for the unbanked. The DES provides digital contracting and an accounting system for informal, unbanked microbusinesses, reputation building, tokenization of natural capital to underpin creditworthiness, and social network verification using phone records for KYC. A digital currency for transactions is safer and more mobile than cash, cheaper than mobile money, and pegged to a local currency to avoid changes in monetary supply. By enabling the tokenization of natural capital (e.g. a cow) and social capital (e.g. network of mobile contacts), hiveonline digitizes less-fungible forms of collateral essential to the subsistence farmers and livestock breeders who form about 87% of the population and over 50% of households involved in crop production [5]. By enabling low-cost digital finance, farmers can start investing, narrow the yield gap, reduce rain dependence and access more sustainable energy sources and techniques.

Sculpting activities rely on ingenuity and opportunity discovery or enactment to build a digital market where there was none to begin with. While integrators reinforce connections within an existing market, or link together previously disconnected market participants through an improved digital infrastructure, sculpting organizations' value proposition attracts entirely new actors into a market that previously did not exist. While structuring organizations can bring actors into the fold, sculpting organizations need to create the fold before even thinking about bringing actors into it. In more abstract terms, sculpting resembles the design of "a specific institutional arrangement consisting of rules and

conventions that make possible a large number of voluntary transfers of property rights on a regular basis" (Menard, 1995, p. 170 in Sarasvathy & Dew, 2005).

Arbol is pioneering a global, location-specific, peer-to-peer index insurance market using blockchain, smart contracts, and public weather data. This market serves farmers whose livelihoods hinge on local weather events and for whom existing insurance is ill suited due to inflexible terms and prices driven by large US agro firms. Index insurance smart contracts pay out a pre-set amount whenever an agreed-upon weather threshold is reached, replacing output ambiguity (i.e. damage) with input alignment (e.g. more than 125 ml of rainfall in a 3 month period). P2P insurance enables anyone to enter the market and absorb counterparty risk by trading in a new asset class widely uncorrelated to others. The tokenized contracts can be traded on a secondary exchange to ensure underlying capital remains liquid during contract duration. Tokenized contracts (ERC741) are transparent and cost-effective. Arbol contracts self-execute near-instantly on Oracle confirmation of a threshold event, and cannot be reneged or corrupted within an immutable blockchain. Big data and blockchain thus both improve efficiency and connect currently unconnected actors (i.e. a Laos farmer with a Swiss investor betting on weather outcomes).

It is hard to generalize what sculptors do but what appears common across sculpting cases is a process by which innovators take a situation characterized by high levels of uncertainty - that precluded market formation – and transform it into manageable risk. In the digital space, these organizations often cultivate interactions within multisided markets, flourishing in the role of market maker, broker, or platform. Successful sculpting organizations thus excel at convincing people and organizations to engage within a novel and at least semi-formalized market context, and so connecting previously unconnected supply and demand.

To do so successfully, they typically need to both disrupt and co-exist with incumbents and existing institutions. HiveOnline for instance creates a verifiable source of identification using phone records and uses AI to verify whether an entrepreneur's social network reflects her stated occupation. Network analysis of phone records can reveal a person's role in their community, and so facilitate the acquisition of financial services across a digital platform. The guiding principle in this example that inspires the founders and the people who are going to use the platform is financial inclusion. Smart use of digital technologies, in combination with collaboration with local partners, and "socio-mimicry" (i.e. the imitation of

aspects of social structure in digital space, like biomimicry) (e.g. hiveonline creates a multi-signature wallet which mimics current practice of having money held by three elderly women in a village, hiveonline is sculpting out a market niche in one the most difficult environments in the world.

Arbol's sculpting activities focus on turning uncertainty the outcomes of local weather events into probabilistic risk, the quintessential job of the entrepreneur (Kirzner, 1997; Knight, 1921). By creating an open architecture for P2P crop insurance, Arbol is also disrupting the insurance space while simultaneously partnering with incumbents and remaining within established regulatory environments. While such balancing acts are difficult, the opportunity Arbol seeks to address may appeal to large scale insurance companies willing to absorb small counterparty risks that are relatively uncorrelated to their other assets. Arbol tokens reflect idiosyncratic contracts between multiple parties. By making these contracts tradeable, Arbol creates an asset class to interest hedge funds, bankers, and investors seeking to diversify their portfolio.

Discussion

The three value systems and six associated cases we presented address at least three persistent problems in developing market-based solutions for the SDGs. These involve a lack of available, transferable, and transparent information to inform how we should tackle the SDGs and quantify our progress (sensing), inefficiencies in the value chain that reduce the impact of sustainable initiatives, reduce the willingness or ability of people to get involved, and disables SEPOs to justify premium prices (structuring), and uncertainty in the alignment of stakeholders that prevent the formation of markets for sustainable outputs (sculpting). Innovative solutions at the discrete level of the business model and the systemic level of sustainable finance promise to facilitate a flourishing of new markets for sustainability and the preservation and improvement of Earth's natural capital.

Sensing and Obviating Roadblocks: Innovations in the Sustainable Digital Economy are leveraging novel technologies in information processing to obviate the roadblocks of verification and evaluation that have eroded faith and frustrated scaling in green business. Digitizing the natural world enhances static and dynamic visibility of the state of the world and makes that information accessible. This can guide corporate action, pressure governments to change policies, and incite social upheaval. By making the world ostensibly smaller and within reach, people may

also strengthen their connection to the earth which could change consumer behavior in the medium to long run.

Structuring and Scaling Micro-Transactions: A second pattern of innovation involves scaling up small transactions with positive spillovers into larger tranches of exchange to facilitate mass-scale adoption of sustainable finance. These solutions often rely on reducing transaction costs, solving trust problems, enabling wisdom of crowds, and producing shared knowledge assets. Potentially the biggest promise of blockchain technology lies in its ability to create low-cost, high throughput transaction infrastructures uncontrolled by central intermediaries. While this has yet to be achieved technologically to make micro-payments feasible, structuring organizations are already working to enable this.

CarbonGrid's miniaturization facilitates transactional carbon offsets through a blockchain-based protocol, the French company Poseidon allows you to directly offset your emissions from driving your car at the pump, while smart grid company Tempus in the UK envisages a future where smart household appliances autonomously decide when to start running based on real-time electricity prices. Scaling micro-transactions holds enormous promise for facilitating economy-wide adaptation to the vulnerabilities of the Anthropocene era and for increasing the market potential (user base) of sustainable finance initiatives. By shortening the temporal and spatial distance between a consumer action and the compensation for the negative externality, behavioral shifts becomes more likely. If every time we put on the kettle to boil some water for tea, we instantly have the option to offset the energy consumption, global awareness of climate costs and impact would skyrocket, leading hopefully to much-needed changes in consumer attitudes and collective consciousness.

Sculpting Markets for Natural Capital: Hiveonline and Arbol serve as examples of respectively improved financial inclusion and improved tradability. At a more abstract level, the sculpting organizations are engaged in processes we can call customerization and producerization because they enable actors that operated outside of markets to become customers and/or producers. For these sculpting activities, social and environmental premiums for positive spillovers become a key source of competitive advantage.

For all of the SEPOs we introduced, we genuinely believe that their profit incentives are perfectly aligned with their ability to create a public good. Digitizing the natural world, fighting climate change, ensuring food supply transparency,

financial inclusion, and managing weather risk are all public goods that have local and or global positive externalities. Given the youth of all the SEPOs we have presented here and the inevitable liabilities of newness, we cannot be sure these organizations will actually survive and become successful at addressing the SDGs. However, if they would fail, others will fill their shoes and get it right. Tackling the SDGs is the best strategic orientation for any forward-looking company. Everything else will have to wait.

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TRACK VII

NEW BUSINESS MODELS FOR SUSTAINABILITY TRANSITION

Track VII: New Business Models for Sustainability Transition

Chair: Jan Jonker
Nijmegen School of Management & Hanze University of Applied Sciences, Netherlands

The session 'New business models for sustainability transition' is a peculiar one. We do not look at new business models (NBMs) from a theoretical or conceptual perspective, but quite daringly, we will look at them as a tool, an instrument, for a transition. We see a transition as a fundamental change in the social, economic, and institutional arrangements of a specific societal domain (energy, mobility, or health-care). Most transitions are framed by the ambition to contribute to a combination of sustainability, inclusivity, or circularity. In recent years a growing body of conceptual- and empirical-based academic work regarding nature, the concept, and the usefulness of transition-thinking can be observed. Despite these promising emerging investigations, research en reflections into the theoretical nature of transition thinking remain scares. Given this observation, it is more than just essential to see where and how business models can drive the quest for transitions that foster sustainability. What role can they play and what does such a role require when it comes to their design and application? The underlying assumption here Is that conventional organization-centric business model based on value-chains do not stimulate sustainability, or at least, far too little. However, maybe we got it all wrong. So questions we hope to address across the various sessions are: Is it the process of collectively creating models that enable transition, or is it the outcome of applying a particular type NBM? If the latter what then is the nature of these BM's and where can they be observed be it conceptually or empirically? The various sessions around the central theme of transition aim at exploring these kinds of questions. Therefore, purely theoretical and conceptual contributions, as well as contributions driven by empirical observations, are welcome. Our ambition is to mix both approaches into a vibrant and daring session leading to a fruitful debate of a hardly explored academic and empirical territory.

Competitive Constellations As Boundary-Bridging In Socio-Technical Transitions:

An Automotive Industry Case Study

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Abstract

This paper proposes micro-network business model innovation across existing system boundaries as one contributory mechanism in socio-technical transitions. Drawing empirically on secondary data sources that document the creation of inter-corporate networks in the automobility system, we argue that such networks are the manifestation of evolutionary institutionalisation in which the emergent properties of a new socio-technical system may be discerned. The analysis neither excludes the institutional incumbents of the existing regime, not is it confined to them. Rather, the corporate networks or constellations are understood as unstable configurations of multiple agents engaged in a simultaneous collaborative and competitive process while seeking to mitigate risk and uncertainty. Vignette case studies of Mercedes, BMW and VW are used to illustrate the participation of incumbents in the boundary spanning relationships that distinguish this phase of technological uncertainty as the existing regime faces internal contradictions that compel the transition process.

Keywords

Networks; future automobility; cross-sector integration; technological innovation; system evolution; incumbents.

1. Introduction

This paper combines insights from the business model innovation literature with that from socio-technical transitions to argue that boundary spanning in the form of competitive small-scale networks are one mechanism whereby rapid socio-technical transitions are achieved. The paper illustrates the contention by reference to the automotive industry.

Socio-technical transitions are understood as long-term processes of change whereby new technologies may permeate society alongside structural changes in production, consumption, regulatory frameworks and interventions, social behaviours and attitudes, political alliances, and other features leading to the emergence of new dynamically-stable systems (Roberts et al., 2018). Particularly with sustainable transitions, the focus of attention is to understand how changes may be orchestrated to enable desirable outcomes. Current research links immediate and everyday experiences with the abstract notion of socio-technical transition (Greene, 2018).

Business model innovation, alternatively, is generally understood as a short-term process of change whereby new configurations of value creation and capture are enacted. Again, there is a growing body of scholarship seeking to understand and promote business models for sustainability.

The realm of automobility is often seen as a significant domain wherein profound socio-technical transition is an urgent priority. The technologies of the contemporary car, and the mobility practices that they give rise to, are widely acknowledged to result in multiple social, economic and environmental burdens. Emergent new technologies and alternative forms of mobility offer the prospect of greatly reducing those burdens – and potentially herald the demise of the automobility system that has endured more than 120 years.

This paper commences with an analysis of the automotive socio-technical system undergoing transition. At the boundaries of the system, the automotive system is argued to be enmeshing to varying degrees with other systems: electricity and energy production; telecommunications; computing, robotics and artificial intelligence; and even housing. Socio-technical transition in this sense is not defined by the usual processes of niche expansion or even of incumbent-led 'internal' transition. Rather, this paper argues that in the case of automobility transition multi-directional bridging of boundaries between socio-technical systems.

The paper then outlines the ways in which network value constellations can be one means whereby incumbent and new entrant businesses may create competitive portfolios of competence and thereby lay the foundations of the emergent socio-technical system. The competitive constellations may embrace a wide range of activities and scales and be of variable scope and longevity. In the case of the automotive industry we provide, in the fourth section of the paper, the results of a wide-ranging longitudinal survey in which multiple such examples are documented.

2. The automotive socio-technical system under transition

The automotive industry lies at the heart at what may be regarded as a classic socio-technical system. The system is produced and reproduced around the core technology of the passenger car with an all-steel body and internal combustion engine (Wells and Nieuwenhuis, 2012; Geels et al., 2012). As the socio-technical system has developed so further mutually-reinforcing elements have come to reinforce the process of embedding. Such elements include franchised and independent dealerships, rescue and recovery companies, the insurance and finance industries, petroleum suppliers, and the emergency services. As vehicle infrastructures such as roads and parking facilities proliferate, so the assumption of automobility becomes enmeshed in daily life. Cultures, behaviours and beliefs of automobility emerge, often celebrated and idealised through films, books, and dedicated 'fan-clubs'. Institutionalisation creates economic and social inter-dependencies that help stabilize the system. The system has expanded in spatial coverage and in depth, as more societies around the world came to embrace mass motorisation. This expansion is still ongoing, indicating a socio-technical system that is far from moribund. It is recognised in the research literature that there is a vital spatial dimension to the 'unfolding' of a socio-technical regime (see e.g.

Raven et al., 2012; Fontes et al., 2015), particularly for niche emergence. However, there is not the same recognition that just as a new niche may be emergent in a location, so the incumbent socio-technical system may still be expanding overall. Path dependencies and institutional configurations act to reinforce the status quo

Nonetheless, socio-technical systems are not entirely stable, being subject to short-term perturbations and long-term transition. Much research has been concerned with identifying the 'pathways' along which socio-technical transitions may be said to occur, or the conditions under which a system may be destabilised (Geels, 2002). More recently, research has focussed on the scope for incumbents at the regime level to enact transition (Ansari and Krop, 2012; Bergek et al., 2013).

The approach offered in this paper views the socio-technical system as an approximately coherent entity, but with a focus on the ways in which one system is separate from others by boundaries. That is, the socio-technical system becomes destabilised as (some of) the boundaries become more porous and blurred. In turn, transition is then an external process of boundary redefinition. The redefinition of boundaries is likely to be highly contested, especially in socio-technical systems of the scale and reach of that pertaining to automobility. This approach builds on research into the co-evolution of regimes (Konrad et al., 2006; Raven, 2007; Sutherland et al., 2015). The approach also encompasses the insight that other systems may also be undergoing transition processes, including the energy and electricity systems, iron and steel, or housing (Karakaya et al., 2018; Markard, 2018).

In this perspective, socio-technical system change is not reducible to innovation in part of the system alone. An example is that of the use of batteries to provide motive power (Bohnsack et al., 2014; Weiller et al., 2015). While batteries can replace internal combustion engines and can form part of the basis of a new automobility socio-technical system, new powertrain technologies can be readily assimilated into existing production and consumption practices – and indeed much of the efforts of vehicle manufacturers in this regard are intended to achieve precisely this outcome. To attribute socio-technical system transition to new powertrain technologies alone is to provide only a partial explanation.

Similarly, studies on other partial elements of this transition process cannot provide a full explanation even though they greatly assist in understanding the totality of change underway. Hence for example, studies on car-sharing business models are valuable for revealing how technologies may enable or support a wider transition, and how such developments may be further supported by increased vehicle autonomy. Studies on connectivity tools, enabled by apps for example, may show how the management of electric vehicles may be thereby enhanced. In sum, there are a great many mutually supportive inter-dependencies at play in system transition. Equally there will be some contradictory aspects. For example, autonomous cars may result in greater car use, so increasing time lost to congestion (Harper et al., 2016; Wadud et al., 2016).

Just as an entrenched socio-technical system has multiple dimensions through which endurance is obtained, so an emergent socio-technical system has to exhibit the evolution of reinforcement on the path to becoming embedded. That is, the emergent regime goes through a process of institutionalisation in which new vested interest relationships are constructed. In turn there may be resultant effects such as changes in tax rules, regulatory compliance requirements, new physical infrastructures and artefacts and, ultimately, new social behaviours and attitudes that resonate with the emergent regime. The growth and solidification of the emergent regime ultimately will depend upon the ability to generate increasing returns and network effects in order to transcend multiple forms of lock-in (Fouquet, 2016).

There is widespread agreement from participants in the established automotive system, external observers and analysts, and those seeking to participate in the emergent system of the future, that there are indeed profound changes underway that will constitute disruptive change (Gao et al., 2014; Schulze et al., 2015; Daimler, 2016; Viereckl, R. et al., 2016).

3. Incumbents, new entrants, networks and business model innovation at the boundary

Business model innovation research usually is concerned with the single firm level, with a focus on the components of business models (Morris et al., 2005; Rocca and Snehota, 2017). Business models are also an abstraction of a more complex reality

and may be considered a means to communicate – particularly important in creating business models for sustainability when a larger number of more diverse stakeholders than the norm is include in the communications effort. In this respect, business models may act to seek resolution to uncertainty. That is, firms engage in cognitive framing with other social actors or stakeholders whereby a shared understanding of phenomenon may be developed (Druckman and Bolsen, 2011). However, when a multiplicity of such framings is present the result is one of competitive cognitive framing. In this manner, firms seek to exert influence on the future shape of the market.

With the emergence of Internet-enabled 'platform' or intermediary business models, network perspectives have become prominent (Rocca and Snehota, 2017). There is an established body of research into network value creation and capture (Stabell and Fjeldstad, 1998; Fjeldstad and Snow, 2018), in which the core principle is that value expands as the network is enlarged. Business network research is usually concerned with themes such as the morphology of the network and its relation to the position of the firm (Palo and Tähtinen, 2011). The co-evolutionary and emergent property of business model innovation in network value creation has been highlighted in the research (Rocca and Snehota, 2017; Carlborg and Kask, 2018). As important, value creation is shown to be potentially spanning the boundaries of the firm, with other firms or with users (Hienerth et al., 2011; Palo and Tähtinen, 2011; 2013; Bankvall et al., 2017).

Inter-corporate networks can therefore be one understood as a type of business model innovation whereby new forms of value creation and capture are created. However, small-scale networks cannot be said to create value in the short term via network enlargement. Rather, the proposition here is that the focal firm is enabled to create value by combining into a micro-network (portfolio or constellation) several distinct competencies and attributes that allow the core value activity to migrate into a new value activity. The boundary spanning activities may be catalysed by intermediaries (Smink et al., 2015), but in this paper it is the focal firm that is the subject of the analysis. It is possible that as the micro-network enlarges (perhaps to gain economies of scale) so the embedding of an emergent socio-technical system is accelerated.

Significantly, the creation of constellations has a duality in that just as it confers capabilities to those within the constellation, it potentially denies them to others

outside the constellation. That is, constellations of micro-networks have the potential to act in an exclusionary, competitive manner. This attribute may be more significant in periods of rapid technological change when a new market is emergent. In such conditions, competition may have a temporal dimension. Those firms which occupy the embryonic market space earlier may gain significant advantages, ranging from the ability to influence technical standards to shaping consumer expectations over the product or service offered, alongside the financial growth prospects that the new market may offer.

The new industry is often portrayed as an emergent 'ecosystem' of automobility services, as if it is a cohesive entity, but in practice the boundaries of the existing automotive system overlap with a growing number of other systems in electricity generation and distribution, in artificial intelligence, in mobile communications, in big data, mapping and real-time information provision for example (Schulze et al., 2015). Companies facing this uncertainty and turbulence may seek a range of 'protection' strategies; Pinske et al. (2014) identify 'collaboration-integration' as one such strategy, but do not elaborate greatly on how such collaboration-integration is to be achieved. The creation of constellations as discussed here may be one such means to achieve collaboration-integration. Van Waes et al. (2018) argue that business model innovation can be analysed using socio-technical transitions as a contextualisation, and in so doing formulate prospective outcomes for those innovative models. Here we take a different perspective, in that business model innovation and multiple socio-technical systems are co-evolutionary.

Our research proposition is that at the micro (or firm) level, business model innovation in constellation networks is a boundary-spanning activity, reflecting in microcosm the system-wide boundary spanning in processes of sustainable socio-technical system transition. We expect to be able to measure this boundary spanning by reference to new relationships being formed both 'within' the automotive system, and across the boundaries of that system into other systems. Powerful incumbent institutional actors such as vehicle manufacturers, major suppliers of components, and fuel or infrastructure providers are understood as 'new entrants' into the new system, albeit with a privileged point of departure that may enable them to retain significant activities in the new system.

4. Competitive constellations in the automotive industry

In order to test this proposition, the methodological approach has been to accumulate multiple instances whereby firms have engaged in new relationships that span the boundary between the established automobility system and other socio-technical systems. Overall, the methodological approach is one of longitudinal immersion (Wells and Nieuwenhuis, 2017).

A wide range of secondary sources was used to create a robust and representative database of cases. Sources included the specialist press and websites (e.g. Automotive News; Electriv; Fleet News), business press and websites (e.g. Reuters; Bloomberg; Forbes), and corporate press releases and reports. The resulting data cannot be claimed to be comprehensive, but does at least give a sense of the scale, scope and character of inter-corporate relationships being formed. Qualitative insights were gleaned from attendance at key industry conferences (e.g. Electric Vehicle Symposium), visits to factories and other facilities (e.g. test tracks; dealerships; corporate offices) and semi-structured discussions with key corporate personnel, and from a diverse range of academic and non-academic literatures.

The search process involved the definition of key themes in terms of a) inter-corporate relationships and b) relevant technologies or competencies that could in combination contribute to the permeation of system boundaries. In such a fluid and multi-dimensional situation, rather 'static' methodological concepts such as coding are of limited utility. In contrast, critical reflexivity with partial data in an exploratory research mode is the basis for the generation of research propositions and theoretical insights. The creation of distinct inter-corporate relationships can take many forms, ranging from outright merger or acquisition, to equity joint ventures and agreements to collaborate on specific items. Moreover, companies are likely to seek to develop their own competencies internally and seek other partnerships (such as with universities) that might enable crossing of system boundaries. However, this research has a focus on the corporate level.

Data accumulation started with the formal announcement by Google (Alphabet) in May 2014 that it had developed an autonomous car, as this represents a convenient and symbolic start of the transition in automobility. Inevitably, this is an arbitrary judgement and abstraction, but one that has been adopted for analytical clarity for the subsequent narrative. In Table 1 we show in alphabetical

order the number of instances in which a company from 'inside' the automotive system has formed a relationship with a company from outside that system.

Table 1 Company relationships for connected, autonomous, shared and electric vehicles

Company	Number of relations within the System	Number of relations out of the System
Apple		2
Alibaba		4
Amber		6
Audi	6	9
Autoliv		1
Baidu		1
BlaBlaCar		2
BMW	11	16
Bosch		8
BP		3
BYTON	1	1
Continental		1
Daimler	5	14
DidiChuxing		10
Ericsson	3	6
Fiat-Chrysler	1	6
Ford	8	18
Gett		1
GM		5

Google		3
Honda		3
Hyundai	1	11
HERE		4
IBM		3
Intel		8
JLR		3
Lyft	1	
Mercedes		7
Mobileye		8
Nissan	4	9
NVIDIA		6
PSA	1	8
Qualcomm	3	
Renault	4	11
Renault-Nissan	3	5
Siemens		3
Tesla		2
Toyota	2	2
Uber	1	4
Volvo	2	9
VW	2	18
ZF		9

Business model innovation can be seen at multiple points in the system boundary permeation process:

- New entrants with novel business models may act as system disrupters or new intermediaries (e.g. Uber).
- Existing vehicle manufacturers may enact new business models alongside or in parallel with their traditional approach (e.g. BMW-Mercedes with DriveNow), with or without external partners.
- Micro-networks or constellations in effect become new business models as a means for those inside and outside the automotive industry system to access other systems.

There is no single formula for business model innovation in these circumstances. Business managers, whether incumbent or new entrant, are uncertain of the correct business model architecture and subsequent strategies. In the context of constrained resources, even the most powerful businesses are compelled to seek alliances and other forms of co-operation. In January 2019 VW and Ford announced a far-reaching alliance. Justifying this, the joint press release claimed:

"Volkswagen and Ford have signed a memorandum of understanding to investigate collaboration on autonomous vehicles, mobility services and electric vehicles and have started to explore opportunities… Volkswagen and Ford will harness our collective resources, innovation capabilities and complementary market positions to even better serve millions of customers around the world." (Ford PR, 2019)

To illustrate these themes, we present three illustrative cases: Mercedes, BMW, and VW.

4.1 Mercedes

Illustrative relationships for Mercedes are summarised in Table 2. As with all the cases discussed here, the sources for the relationships are listed in Appendix 1.

Table 2 Mercedes: internal and external relationships

Company/Project	Date	Item
Boost	2014/05/12	A ride sharing service for children in Polo Alto, can schedule a place from swimming lesson or school to home
Ericsson and others (Wolde and Wissenbach 2016)	2016/09/27	BMW, Audi with Mercedes form 5G alliances to enable autonomous vehicles. This alliance also including companies from telecommunications like Ericsson, Huawei, Intel, Nokia and Qualcomm.
Smart (Autocar 2016)	2016/9/29	Peer-to-peer car sharing, the same operation style with Airbnb. Online booking with car-free date. Trailed in San Francisco and Cooper with Getaround.
Car2Go	2017/12/5	Car sharing scheme, initially with car rental partners. Merged with BMW car sharing in 2019.
Via (Otto et al. 2017)	2017/9	Joint venture with an investment of $50 m, running on-demand shuttle service in selected cities in America. Via has software while Mercedes offers vans
HERE (Vijayenthiran 2018)	2018/02/23	Strategic partnership in which HERE's HD Live Map is highly integrated with Mercedes's autonomous vehicles. Joint initiative with BMW and Audi.
BASF (Rosenthal 2018)	2018/09/20	Collaborated to have ViaVan on-demand ride sharing scheme

The case of Mercedes illustrates the theme of boundary crossing with the creation of the Car2Go car sharing business. The investments needed, the competences and resources required, and the relationship with customers are all quite different to the traditional 'move the metal' business model of selling new cars. The car becomes an asset used to realise a long-term income stream rather than a short-term sale. Widespread car sharing would significantly reduce demand for new cars, and radically change the income base for vehicle manufacturers. Car sharing demands high connectivity, hence the significance of the 5G alliance enacted with multiple telecoms businesses. In the future, car sharing services may be expanded by offering autonomous cars, and thus the joint investment in HERE (formerly the mapping division of Nokia) enables Mercedes to access important data and integrate the software into their vehicles. These are tentative steps, perhaps exploratory in nature, in which lessons may be learned. The car sharing activity, for example, was merged into the BMW DriveNow car sharing service in 2019. This event may be an indication of how difficult it has been to establish a viable business model for car sharing for Mercedes.

4.2 BMW

Illustrative relationships for BMW are summarised in Table 3.

Table 3 BMW: internal and external relationships

Company	Date	Item
Baidu (Affan 2015)	2015/12/12	Baidu together with BMW 3 series have on road self-driving car test in China
Intel (Rory 2016)	2016/07/01	With Mobileye sign a deal to develop autonomous vehicles of L3-L5, planning in mass production around 2021.
Amazon	2016/09/30	Alexa home wireless voice connectivity will be used in BMW
Ford (McVeigh 2016)	2016/11/29	BMW with Ford and Daimler, VW Group for fast-charging EV network along the major highway of Europe.
IBM (Irwin 2016)	2016/12/15	Partnership with BMW by using artificial intelligence system to improve driver-assist functions. With $200m investment of new Munich Watson Internet of Things project.
Porsche	2017/04/28	Porsche with Daimler, Ford and BMW agreed a joint venture for spreading electric vehicles
Fiat Chrysler (Sage 2017)	2017/08/16	Joint BMW and Intel club, also Delphi and Continental are part of this alliance
Nissan (Gibbs 2017)	2017/10/22	Together with Renault, Volkswagen, Kia and Mitsubishi will fund an Electric Vehicle Experience Centre in Milton Keynes
DriveNow (Manthey 2018)	2018/01/29	BMW purchase DriveNow for €209 m after initial joint venture with Sixt. Precursor to merger with Car2Go.
Ganfeng (Randall 2018a)	2018/09/30	5 years agreement for lithium hydroxide, also have contract with another Chinese battery company CATL

BMW, as with other automotive companies, has been active in acquiring a capability in artificial intelligence, chiefly as a means to introduce autonomous cars. It is expected that the data processing capabilities of cars will grow substantially, and so there is a need to work much more closely with providers of computers and related items. In the case of BMW, this means linking up with Intel. In contrast and as an illustration of the competitive character of some micro-networks, VW Group has worked closely with Nvidia.

4.3 VW Group

Illustrative relationships for VW Group are summarised in Table 4.

Table 4 VW Group: internal and external relationships

Company	Date	Item
LG (Volkswagen Group 2016)	2016/07/06	signed a memorandum of understanding to develop next generation connect car service platform including carmaker battery and audio assistant system
Mobileye (Volkswagen News 2017)	2017/02/13	Road Experience Management from Mobileye and develop new navigation data collection tool for autonomous driving system.
NVIDIA (Sheahan 2017)	2017/01/05	As strategic partner, using AI technology to develop self-assistant self-learning system
Gett (Hetzner 2016)	2016/05	Strategic partnership for ride sharing scheme
KUKA (Volkswagen Group 2017)	2017/01/10	Strategic partnership for future vehicle service and technology support and innovation
MOIA	2016/12/05	New mobility service company under VW umbrella for designing new mobility plan and service
Google (Lambert 2017)	2017/11/07	For quantum computing for new materials, traffic optimization, batteries and AI
Aurora (Werwitzke 2018)	2018/01/05	Partnership for bring autonomous EVs to Mobility-as-a-service fleets
DidiChuxing (Edelstein 2018)	2018/04/30	Collaboration for self-driving cars, also managing vehicles just for ride hailing. Not only Didi with VW, also signed memorandum of understanding with the Renault-Nissan-Mitsubishi Alliance for growing electric vehicle service
Bosch (Krok 2018)	2018/06/26	With NVIDIA, Aquantia and Continental create the NAV alliance for promoting the standardization of data transfer and bring autonomous vehicles to mass market.
GIG Car Sharing (Randall 2018b)	2018/06/14	An EV car sharing (free floating mode) trail project with 260 vehicles within a geo-fenced area Sacramento
FAW Group (Sheahan 2018)	2018/07/10	With Chines Government sign memorandums of understanding for technique cooperation including autonomous driving, connectivity and electric mobilities
Microsoft (Volkswagen Group 2018)	2018/10/02	Strategic partnership for digital transformation, improving its vehicle connectivity service
Elli Group GmbH (Randall 2019)	2019/01/08	As a subsidiary company focus on electric vehicle charging and solutions, operating B2B commercial and operation service and also partial B2C.

A concern for the vehicle manufacturers is that a new entrant or intermediary could disrupt their business model and their market. Hence there is some interest in collaboration with other vehicle manufacturers to bolster the preferred approach, but also a need to collaborate with those posing the external threat (e.g. VW with DidiChuxing).

5. Conclusions

This paper has shown that firms within and without the established automobility system have engaged in a diverse range of business model innovations in micro-networks or constellations in a bid to create new value competencies. While each individual constellation may be of uncertain longevity or success, the collective and cumulative impact of multiple boundary-spanning activities is to give a corporate dimension to socio-technical transition. Just as economists consider that the long run average cost curve is constituted by multiple short run average cost curves, so transitions can be constituted by multiple short run steps.

Clearly, there is more to socio-technical transition than new value creation and capture structures. Moreover, there is no certainty that the transitions so enacted will be sustainable. These emergent socio-technical systems may be differently unsustainable, for example. New contradictions and pressures are likely to emerge, providing the structural impetus for further transition. As the new automobility system evolves, the fit to over-arching concepts such as the circular economy is uncertain. It is notable that the original Daimler CASE concept neglected any mention of recycling, re-use or themes such as product life extension that would be expected in sustainable business model innovation. Constant vigilance is needed to ensure sustainable transitions are created.

Moreover, myriad other boundaries must be crossed by other actors, in other times and places, as these transitionary processes unfold. New patterns of mobility will emerge, some of which will not involve cars at all. New regulatory, governance and policy interventions are necessary (Hall et al., undated; Hopkins and Schwanen, 2018). New behaviours and attitudes may proliferate around shared vehicle ownership and use.

The result is a form of chaotic movement involving contestation, agency, irrationality, purposive policy intervention, chance, and unanticipated events. At the level of business model innovation, the outcomes are equally uncertain. Even if the general 'direction of travel' might be agreed, it is certain that individual businesses with their unique portfolios of competence and resources will take distinct pathways. There is therefore a great deal of 'noise' when grand theoretical constructs such as socio-technical transitions are examined in detail and in 'real time'. In these circumstances, absolute proof of a transition occurring is impossible. Only the lesser judgement of probable cause can be offered.

Acknowledgements

This paper was supported in part by funding from H2020 Call MG-8.5-2017 Single Stage-INEA STARS – Shared mobility opporTunities And challenges foR European citieS, Grant Agreement No. 769513; It was also supported by the Transport Futures Network in Cardiff University.

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Appendix 1: Sources for case studies on Mercedes, BMW and VW

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Corporate agency and socio-technical transitions: business model innovation in transition pathways

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Extended abstract

1. Overview

It is widely, if not universally, recognised that more sustainable societies will necessarily emerge out of processes of transition away from contemporary capitalist structures of production and consumption. In order to understand how corporate agency may contribute to socio-technical transitions we present a theoretical framework that relates business model innovation to transition pathways. With a focus on car sharing practice in Europe, our paper aims to explore how business model innovation leads to the potential transformation of the current automotive systems.

2. Theoretical framework

Several attempts to link business model innovation to sustainability have been made (Bocken and Short, 2016; Upward and Jones, 2016; Wells, 2016), but causal relationships to wider economic and social structures around which greater sustainability could be realised need development (Bolton and Hannon, 2016; Bidmon and Knab, 2018). Business models are abstractions or sense-making frameworks (Skålén et al. 2015) that become modes of communication for business and the social actors with which it engages (Frow et al. 2014; Doganova and Eyquem-Renault, 2009), and from this become the basis of performative actions. Hence, business models describe, communicate and give rise to

"…dynamic assemblages of institutions that, through the performative practices of actors, reciprocally link and influence technological and market innovation and contribute to the viability of these actors and the viability of the service ecosystems of which they are a part." (Wieland et al. 2017). The realisation of different business models through operant and operand resources gives rise to different outcomes as multiple forms of value proposition and the communication of expectations. Only some of the business model innovations will be relevant for sustainability transitions, and it is possible that relevant innovations could occur with new entrants, incumbents, or substantial 'new entrants' from other sectors (termed 'mature entrants').

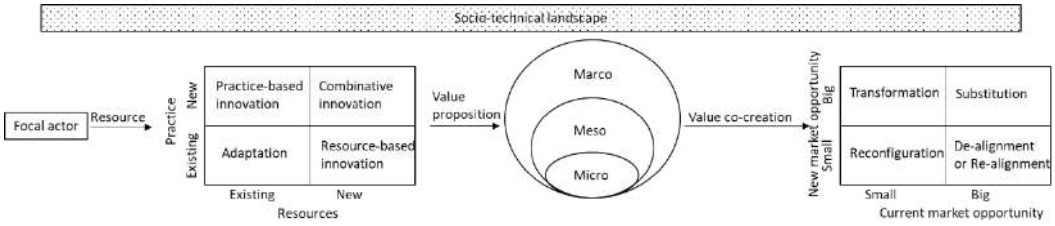

Figure 1. Corporate agency and socio-technical transitions: an overview

Value in all its forms is then co-created through multiple levels in social structures, simplified in Figure 1 into three categories that are somewhat analogous to the expectation levels defined by Van Lente (1993). At the micro level is the firm itself and the actions it takes; at the meso level are networks of organisations, industries, and brand communities; and at the macro level are societal structures and relationships. The co-creation evolutionary processes at the multiple levels can then be understood to offer different degrees of 'fit' with socio-technical transition pathways that unfold over a protracted period of time. Thus, there is a need to shape a more robust theory that allows providing insights into the interrelationships between technologies, business models and markets.

3. Research method

The data has been collected during the EU-funded project STARS (Shared mobility opporTunities And challenges foR European citieS) from 2017 to 2018 in a two-stage process. First, desktop research by the consortium members identified 186 car sharing organisations from 25 countries in Europe. In each case descriptive variables were defined which would allow subsequent categorisation of car sharing models.

This aggregate data was supplemented by secondary data from academic and non-academic sources related to shared mobility in general, and car sharing in particular from both the European Union markets and more widely. In addition, car sharing organisations were surveyed via questionnaire to evaluate operational issues such as how long cars were financed, how long they were retained, and how they were re-sold into the market.

4. Preliminary findings

On the micro level, the research focus is on the interaction between car sharing organisations and (non-)users. A broad desktop research on car sharing organisations in Europe provides detailed information regarding resource integration activities and value proposition offering to the customers. On the other hand, the opportunities and potential barriers for customer value co-creation were seen through in-depth investigation from the car sharing operators.

On the meso level, the key actors have been identified regarding to the involvement of car sharing services, such as car manufacturers, local government, and public transport operators. The analysis on this level is based on their institutionalisation of a service-based industry, that is, the maintenance, disruption and change of the current automotive systems.

The focus on the macro level of analysis includes long term implications and other social impacts on the automotive industry, and actors like car manufacturers, ICT companies, and energy companies can be considered as the pivotal actors in the transition towards automobility. It is concluded that the substantial emergence of car sharing could be triggered by simultaneously actuating around connectivity, autonomy, and electrification of the current automotive regimes.

The current car sharing sales only represent less than 1% of the overall market, the transition pathways thus depend on new market opportunities and possible landscape factors. Based on the multi-level analysis of car sharing business in Europe, the research provides two interchangeable socio-technical transition pathways according to the current situation and the possible market formation of car sharing services:

- Reconfiguration: if new market opportunity is small, the new alliance between car manufacturers and new entrants could be formed in order to provide both products and car sharing services.

- Transformation: if new market opportunity is big, car manufacturers will modify their core competences to cope with the car sharing services.

Author agreement

This paper was supported in part by funding from H2020 Call MG-8.5-2017 Single Stage-INEA STARS – Shared mobility opporTunities And challenges foR European citieS

Grant Agreement No. 769513

Keywords

Business models; socio-technical transitions; service-dominant logic; value co-creation; transition pathways

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Disruption or collaboration?

Antecedents of growth for demand response business models in Finland

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Extended Abstract

The aim of the study

Our aim is to study what collaboration strategies firms adopt to scale up their business models, and especially how they are dealing with the tensions that occur with the incumbent actors of the regime.

Background

In order for novel sustainable technologies to enhance the socio-technical transition towards sustainable production and consumption, they need to be introduced to markets and scaled up. According to socio-technical transition scholars, scaling-up refers broadly to *moving sustainable practices from experimentation to mainstream* (Van den Bosch and Rotmans, 2008, p. 34). Within the transition management literature, the concept of niche upscaling is considered one of the key mechanisms that can promote socio-technical change (Bos and Brown, 2012). Transition management scholars view the scaling-up of niches as the process by which niche innovations are embedded in a socio-technical regime (van den Bosch and Rotmans, 2008).

In this paper, our aim is to study what strategies firms adopt to scale up their business models, and especially how they are dealing with the tensions that occur with the incumbent actors of the regime. We utilise the concepts of business models for sustainability and socio-technical systems to frame our study analytically. Empirically, we study the Finnish demand response (DR) business models. In particular, our research questions are: (1) What kind of DR business models there are?, (2) What degree of collaboration with incumbents the business models adopted imply?, and (3) Are the new business models disrupting the energy regime or adapting to it?

Also in the literature on business models the concept of scaling-up has been widely used. In this literature a scalable business model is typically understood as *a business model that is agile and which provides exponentially increasing returns to scale in terms of growth from additional resources applied* (Nielsen and Lund, 2015, p. 4). Bidmon and Knab (2018) and Waes et al. (2018) bring together insights from business models and socio-technical transitions. Bidmon and Knab (2018) have identified business models as a potential link between the technological niche innovations and the socio-technical regime, so that business models can facilitate the scaling-up of novel technologies to the regime level and thus enhance the transition.

As the new business models are scaling up they can disrupt the regime (Shahzad, Raghu et al. 2016). This causes the newcomers dilemma. Newcomers need to create value networks with other actors to establish their disruptive innovation, and often this means that they need to network also with incumbents with conflicting interests. Thus, the newcomers may need support and cooperation from the same incumbents whose technologies, products or business models they are disrupting. The disruptor needs a set of transactions, rules, and roles governing the arrangements, relationships and interdependencies, especially with established incumbents. The whole regime may be reconfigured dynamically due to the disrupting innovation (Shahzad, Raghu et al. 2016).

Disrupter can succeed by limiting incumbents' hostility and retaliation and by establishing symbiotic relationships with them. The simultaneous cooperation and competition is called coopetition (Shahzad, Raghu et al. 2016). The balance between cooperation and competition changes in time and the disruptor needs to adjust their business model accordingly. The emphasis can be turned dynamically from disruption to cooperation and value creation with the incumbents.

Demand response business models

The fluctuations in the energy systems have traditionally been balanced by changes in the energy production. However, as the share of weather dependable renewable energy (e.g. solar PV, solar thermal and wind power) increases in energy production, the challenges to balance real-time energy supply and demand increase. DR can be a cost-effective, reliable and environmentally sound way to add flexibility into the energy systems. Via DR, energy demand can take part in balancing the markets and this has the potential to change the operations and dynamics of energy regimes in a fundamental way (Rious et al. 2015). DR can be applied to both electricity and district heating markets.

The rapid developments in digitalization have opened up new possibilities for DR business models. For example smart grids, virtual power plants and building energy use optimization and automation can be utilized in DR. The energy regimes and markets are quite traditional, and the power structures between the incumbent firms and decision-makers have caused lock-ins, such as expected revenue of the government taxes and energy sale revenues (Kangas et al. 2018). However, there are important differences between electricity and heat markets. Power can be transmitted cost-efficiently longer distances than heat and therefore the electricity and district heat systems vary e.g. with respect to their market structure, geographical size and actors. District heat markets are always local, and often dominated by one or few actors, whereas electricity markets can cover large geographic areas and wide variety of producers, distributers and other actors.

The rollout of DR can cause conflicts between the DR newcomers and the incumbent energy companies, i.e. energy producers, retailers and distributers. For example, the energy retailers fear that DR can cause imbalances for the energy system (Annala et al. 2018). This might create financial losses for the retailers (Järventausta et al. 2015). However, DR can also bring benefits for the incumbents in the energy regime. For example, DR can substitute the need to use the most costly-to-run power plants during periods of otherwise high energy demand (Järventausta el al. 2015). Thus, DR can contribute to peak shaving during high price periods and shift loads to lower price periods, and this can decrease the costs of the energy producers.

Preliminary results and conclusions

Our empirical data consists of 19 semi-structured qualitative interviews with Finnish DR companies. Interviews were recorded, transcribed verbatim and coded in NVivo 12. We find four main categories of DR business models: *(i) district heating DR, (ii) electricity use optimisation according to market price, (iii) electricity use aggregation in collaboration with electric utilities, and (iv) independent electricity use aggregation.*

According to the preliminary results, the *district heating DR* business models are very adaptive to the needs and requirements of the incumbent energy regime actors. In addition, the district heating DR companies work in very close collaboration with the incumbents. Since the district heating markets are local, the DR companies expand to new geographical areas by first finding a local energy company as a partner, and then by adapting their business model to fit the energy company's needs.

The companies whose DR business model is based on *electricity use optimisation according to market price* are also collaborating with the incumbent companies, but to a lesser extent than the district heating DR business models. According to the preliminary results, there is a tension between the benefits from competition and cooperation with the incumbent energy companies. The energy use optimisation could technically be done independently from the energy companies, but the DR companies are interested of e.g. their customer channels. Thus these DR companies are adapting their business models to the needs of the incumbent companies, when it's mutually beneficial. All the studied companies who are *aggregating energy use in collaboration with electric utilities* also optimise electricity use according to the market price, and their growth strategies seem to align with that of electricity use optimisation.

The *independent electricity use aggregation* business model is, according to the preliminary results, the least collaborative and the most disruptive DR business model in Finland. These companies divide the incumbent energy companies to "old-fashioned grey companies" and "frontrunner renewable energy producers". They are competing with the first and to collaborating with the latter ones. These business models can take the incumbent energy companies needs into consideration in some aspects, but also push for their own agenda and try to change the regime in other aspects.

None of the studied DR companies have very aggressive and disruptive growth strategies and all of them collaborate with the incumbent companies to some extent. The interviewees mentioned that all the companies are still very cautious and they are not willing to cause too much disruption in the markets yet. However, the companies are preparing for a larger scale DR roll-out and they are waiting for one company to start the disruption in the regime so they can follow.

This study offers novel insights into a sustainable technology field that has passed the early stages of a technological niche and is scaling up and entering the regime. It shows that in this stage the DR business models are not very aggressive, but they have the potential and readiness to disrupt the regime. Also, according to this study the less competitive and more local heat markets require very collaborative DR business models and the more competitive electricity markets allow for more competitive and disruptive business models.

Keywords

Disruption, collaboration, niche-regime interaction, business model, demand response

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Local business models in transition

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Abstract

Transitioning towards circular economies has become a dominant paradigm in western societies. Public policies attempt to accelerate transitions, but often the results fall behind expectations or are accompanied with unintended consequences. To improve the governance of transition towards sustainability, we propose a better understanding of barriers and leverages to transitions. This project identifies business models as a relevant unit of analysis, as they describe the dominant logic of an industry. By improving the understanding at the crossroads of public policies and business models, we aim at improving the governance of sustainability transitions.

Building on a case study on the swiss construction material industry, we investigate the dynamics that help understanding the role of business models in industry transitions. We find that resource utilization of linear business models conflicts with the diffusion of business models for circularity. Using a system dynamics approach, we identify central feedback loops of business model dynamics that counteract policies. These feedback mechanisms are captured in qualitative model and contain key decision criteria of several distinct business models. During the workshops with company managers, several lessons have been learned. Firstly, the visualization of dynamics processes helps managers to identify strategic challenges to their business model. Secondly, public policies can be improved by leveraging business models' insights. Improved understanding of dominant, but unsustainable, business model utilization of key resources, enhances the design of effective policies.

This research delivers insights into dynamics forming barriers to circular business models, challenging mental models and stimulating rethinking of current business model practices.

Extended abstract

Problem

Societal concerns over sustainability related issues increasingly manifest in changes to regulations and adjustments in public policies, altering the environment of organizations. Depending on the fit between the organizations business model and the changes in its environment, adaptations to business models can be crucial to a company's survival (Schaltegger et al., 2016). Even though understanding of the dynamics of business model environments appears urgent, most business model analysis is static and dynamics are neglected (Sterman, 2000; Cosenz and Noto, 2018). An isolated view on a business models narrows the focus down to the internal perspective, making them vulnerable to external dynamics. A static view can ignore threats to the long-term survival of a business model. Regarding the strategic development of business models in such a volatile environment, managerial challenges deal with the (1) detection of relevant policy developments and the (2) dynamic implications on their business models. While sustainability is the agenda of most organizations, tools and techniques to incorporate relevant perspectives in business models are rare. Combining a systemic and organizational perspective on the integration of sustainability into business models has been proposed (Stubbs and Cocklin, 2008), but have so far avoided a dynamic perspective. Abdelkafi and Täuscher (2016) provide an account for a dynamic perspective one business model for sustainability, but do not consider the industry wide impact. So far, most studies appear to focus on either a purely business model centred perspective, or a public policy centred. I argue that a systemic understanding of these dimensions is required to accelerate sustainability transitions.

Hypotheses

“A dynamic understanding of business models and their regulatory environment improves governance towards more sustainable production and consumption systems. “

The following research questions are addressed in this research:

1) Which public policy exercise dynamic influence on business models?
2) How can regulatory dynamics accelerate the development of sustainable business models?

Methodology

The system of interest exercises non-linear dynamics, contains multiple feedbacks, exercises time delays and is complex. As a methodology, System Dynamics captures these dynamics features and enables quantitative simulation of potential pathways (Köhler et al., 2018). Since the focus is not only on business models, but also on the dynamics between business models and their environment, relevant policy mechanisms need to be elicited. Research into sustainable business model dynamics has begun to address questions of such multi-level perspectives (Abdelkafi and Täuscher, 2016; Täuscher and Abdelkafi, 2016). In the context of sustainability transitions, System dynamics offers distinct benefits in relation to social learning and systemic understanding (Köhler et al., 2018).

Within the swiss construction material industry, this research focuses on mineral materials along the value chain from extraction to demolition. A case study with 10 companies is used to (1) identify representative business models and (2) understand potential implications of external dynamics on business models. Representative business models conceptualize a set of dominant business, describing prominent logics. I combine these logics with a resource-based view on business models, providing a systemic description of the status quo. Using a resource based view on business models, has been proposed to reduce complexity and capture relevant performance indicators (Steininger et al., 2011).

Data collection

In a series of three workshops, (WS1) the business model was described, (WS2) dynamic environments described and (WS3) individual strategies in relation to individual problems discussed. In WS1, business models were translated into representative business model, with idealtypical characteristics, such as the key resource, value generation and value proposition. Using Upward and Jones (2016) Business model canvas, the workshops identified sustainability dimensions beyond financial value propositions, and captured impacts on wider

communicates of stakeholders. Thereby, sustainability dimensions beyond the traditional perspective of Osterwalder (2010) are identified.

In a second workshop, we discussed problems and challenges that originated from the societal and regulatory environment. These challenges were captured within a Stock and Flow diagram, that present the organizations narrative. This Stock and Flow model characterized a problem relevant to the participating companies. It was used as a boundary object in the discussion with managers, where participants can challenge the model assumptions and run mental simulations (Black, 2013). Since these models were developed iteratively, the visual object worked as a basis for dynamic, qualitative simulation.

Results

Two different business models are identified, based on their value generation mechanisms in relation to their key resource. Essentially, business model “Recycling” competes with business model “Extraction” compete on the same market, but due to the external dynamics there is a dominance of “extraction”.

We ran mental simulations of different scenarios and find that both business models gradually shift towards closed material loops, but the "recycling" business model aims at a higher value creation (upcycling). A persistent dominance of the model extraction is largely based on financially viable access to key resources and relatively low processing costs. “Recycling” on the other hand, appeared as a most cost-intense process, faced with larger regulations, standards and norms. Without favourable policy conditions, “recycling” is not able to compete with “extraction” activities. From a policy perspective, we identified several steering mechanisms. Naturally, the concession of natural resources is a leverage point that currently plays in the factor of traditional business models. The political relevance of access to resources as well as the provision of disposal sites results in continuous access to land and resources. Based upon different reactions to external dynamics, we discuss the utilization of key resource and the business model’s future-fit.

Discussion

To reduce the dependency on external companies to handle the disposal of excavation material, companies are expanding their operations as part of their business model. Construction site logistics and deconstruction services appeared as dominant additions to business model to internalize services. Thereby,

elementary conditions for circular economies are improved, such as quality assurance or recycled goods and improved separation abilities. Key barriers to a transition were found in the long-term access to primary resources, price sensitivities, recycling costs and diverse quality perceptions.

Participants suggested public procurement as a form of market-based policy approach to stimulate the uptake of recycling rates. While such stimulation helps to form a basic demand for products, no impact on business models was achieved. More fundamental stimulation of desirable business model practices emerged from land-use policies and waste management policies emerged as central themes, as limiting access to key resources challenges the value generation mechanism of business model "extraction". Furthermore, the public discourse on circular products appeared to challenge the business model "extraction", pushing for implementation of concepts for more sustainable business models. These sustainable business models are more inclusive by providing value to a greater circle of stakeholders such as the local communities (Stubbs and Cocklin, 2008). Whereas these adjustments increase the benefits to society, we find no fundamental changes to the business models. While the construction industry is quite static and has not developed substantial innovation to either products, nor business models, it is worth mentioning the overarching agreement on more sustainable practices. Here we propose that leadership and willingness to innovate are key to transition towards circularity (Elkington and Upward, 2016). Even though learnings for the managers indicate that the dependency on access to mineral resources forms a long-term bottleneck, the correlation between material flows and profitability has not been challenged by participants. This is a remarkable observation, where most participants stated that material turnover needs to increase to remain profitable. The discussion highlighted that closing material loops is profitable but did not challenge the underlying assumptions on whether the size of the circle matters.

Conclusion

The study paints a clear picture of business models that will face substantial challenges in the future, highlighting the relevance of continuous assessment of current business models and challenging of managerial assumptions. Training the mental models is a key aspect to future fit organizations, as it enhances innovation potential and the ability to assess developments external to organisations. Comparing the managerial time horizons with the long-term developments of a dynamics environment, we found central dissonance. This indicates a central

challenge to most sustainability inactivates, namely the clashing interest between management and consequences on the environment. Challenging value generation mechanisms within organizations appears to be a central stepping stone on the road towards circularity, while at the same time knowledge on the decision-making behind business model provides policy makers with leverage. The theoretical contribution of this study lies within the empirical value of integrating a business model perspective on the realm of sustainability transitions governance.

Keywords

Transition, circularity, barriers, ecosystem, mental model

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Reorganizing systems and delivering sustainable transition: Business models that solve social and environmental problems

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Abstract

Some new sustainable business models open paths for sustainable transition by simultaneously addressing interlinked social and environmental problems. In order to succeed in delivering such transitions, they must reorganize the systems that create and maintain these problems. In this study we take a systemic perspective to explore how business models addressing social and environmental problems use activity system content and structure, and different value creation logics to deliver sustainability transitions. Based on the analysis of eight business models addressing issues related to poverty and environmental degradation we found a three-layer, nested structure with multiple value creation logics. Additionally, we discuss a series of identified success factors that govern the way in which these models operate to deliver sustainability transition.

Keywords

sustainable business models, sustainable transition, problem solving, systems

Specific Challenges of Business Models for Sustainability Solution Ecosystems

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Extended abstract

This paper explores the specific challenges of business models for 'sustainability solution ecosystems' that accelerate sustainability transitions. We coined the term 'sustainability solution ecosystem' to describe innovation ecosystems that provide a sustainability solution, which is often based on a combination of sustainability technologies and services, and offered by collaborating actors. The term is a combination of 'solution ecosystem' and 'sustainability innovation ecosystem'.

A solution ecosystem is an integrated ecosystem “that capitalizes on advances in technology and business practices to deliver novel solutions which tackle societal problems” (Eggers & Macmillan, 2013, p. 198). A sustainability solution aims at solving a sustainability problem, such as climate change, environmental degradation, overuse of resources, or other societal problems. Since these sustainability problems are 'wicked problems' they usually cannot be solved by one public or private actor, but they require the collaboration of many diverse actors (Kemp & Loorbach, 2003; Waddock, 2013).

The term 'innovation ecosystem' describes the ecosystem around a new technology in which it can flourish. The transition literature describes how innovative actors collaborate in innovation ecosystems to implement sustainability innovations and thereby accelerate sustainability transitions. Innovation ecosystems are the relationships of actors such as private firms and public organizations, which are formed with the goal to enable technology development and innovation. These actors include businesses, government actors and NGOs, research institutions, and user groups (Markard and Truffer, 2008;

Jackson, 2011; Oh *et al.*, 2014). They collaborate not only to develop the new sustainability technology, but moreover to change legislation and achieve the socio-cultural changes that enable the new technology to be widely implemented; such as changes in legislation, in user-behavior, in awareness, and in the education system (Musiolik & Markard, 2011; Planko, Cramer, Chappin, & Hekkert, 2016). A healthy innovation ecosystem helps a sustainability solution to succeed in the market, and ultimately contributes to a sustainability transition.

Inter-organizational networks can pro-actively build up a supportive innovation ecosystem, in which their sustainability solution can prosper. To build this innovation ecosystem, they need a lot of resources. In addition to the individual resources they contribute, they also have to create so called 'system-resources'. System-resources are resources that are co-created by ecosystem actors and to which all ecosystem actors have access (Musiolik, Markard, & Hekkert, 2012). This could be for example crucial infrastructure, standardization, legitimacy of the new technology, raised user awareness, or changes in the education system (Planko et al., 2016).

Sustainability solution ecosystems face several specific challenges with regard to their business models, as compared to traditional business models (Osterwalder, Pigneur, & Tucci, 2005; Zott, Amit, & Massa, 2010) or business models for commercial ecosystems (Adner, 2017). Sustainable business models take on a systems perspective and aim to generate value across the value network (Stubbs and Cocklin, 2008; Bocken *et al.*, 2014). While they apply a multi-stakeholder approach with regards to value creation for different stakeholder groups, they are usually centred around a focal firm (Bocken, Rana and Short, 2015). Some authors stress the collaborative element (Rohrbeck, Konnertz and Knab, 2013). We contribute to this field the innovation ecosystem perspective, of a network of actors that collaborates closely to deliver a sustainability solution, often a product-service combination, creating benefits for one or several stakeholder groups.

The aim of this paper is to shed more light on the specific challenges of business models for sustainability solution ecosystems. In the following, we will describe two main challenges: one is related to value creation and value capture, one is related to value distribution.

First, the challenge related to value creation and value capture: As opposed to traditional business models where an individual company or a focal company in a network or supply chain provides a product or service, in sustainability solution

ecosystems, inter-organizational networks of public and private actors co-create and co-provide a solution which often consists of a product-service combination. This sustainability solution provides several forms of value to different stakeholder groups. For example, the solution of intra-city congestion will benefit commuters as they have to spend less time in their cars, it will benefit environmental NGOs as less CO2 is emitted and it will benefit the local inhabitants of the formerly congested road by decreased noise pollution. Solution ecosystems often create different types of value, in the form of commercial products and public goods. Different mechanisms of value capture are necessary to capture value from public goods than from consumer goods (Eggers & Macmillan, 2013). Therefore, business models for sustainability solution ecosystems need to comprise different forms of value capture for the different forms of value they create for different stakeholder groups.

RQ1: How do business models for sustainability solution ecosystems comprise different forms of value capture of the value created for different stakeholder groups?

Second, the challenge related to value distribution: To build a healthy innovation ecosystem for their sustainability solution, and to achieve the systemic changes that are necessary, ecosystem actors have to invest their individual resources not only into the development of the product or service they contribute, but also into the development of system-resources. In order for ecosystem actors to be incentivized to invest their resources into the building of the innovation ecosystem, the creation of system-resources should be incorporated into the business model of the sustainability solution ecosystem. In emerging solution ecosystems, actors provide individual resources to co-create system-resources. Adner (2017, p.29) suggests that with regards to business models, strategy frameworks will change when resources "exist not at the level of the firm, but at the level of the ecosystem". Related to system-resources in innovation ecosystems, we expect that conflicts can arise when some actors are able to capture more value from system-resources than others that had invested the same or a bigger amount of firm resources into building them. We therefore argue that business models for sustainability solution ecosystems should not only address the capturing of value, but also a fair distribution of value captured amongst system actors. This is especially important because value capture and distribution also has an impact on the roles actors take on in an ecosystem, and how they will be connected (Jacobides, Cennamo, & Gawer, 2018).

RQ2: How can ecosystem actors ensure a fair distribution of value captured from system-resources?

To answer these questions, we will explore the empirical cases of two sustainability solution ecosystems in the Netherlands. For each of the cases, we will conduct semi-structured interviews with key actors of the respective solution ecosystem. We will analyse the interviews with focus on system-resources, value capture at the ecosystem level and value distribution. We will then compare our findings to the literature on sustainable business models (e.g. Boons and Lüdeke-Freund, 2013; Rohrbeck, Konnertz and Knab, 2013; Bocken *et al.*, 2014; Jonker, 2015; Schaltegger, Hansen and Lüdeke-Freund, 2016; Geissdoerfer, M., Vladimirova, D., & Evans, 2018; Ritala, P., Huotari, P., Bocken, N., Albareda, L., & Puumalainen, 2018).

We expect that many elements of business models described in the literature will also be relevant for sustainability solution ecosystems. However, we expect to find differences with regards to value capture and value distribution.

To conclude, this paper explored the peculiarities of business models for sustainability solution ecosystems. It contributes to business model literature in connecting the micro-level of managerial decisions with the macro-level perspective of systemic change for sustainability transitions.

Keywords

sustainability solution ecosystems; innovation ecosystems; sustainability transitions; business models

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Systematic Literature Review

Business Models and inter-organizational collaboration

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Extended abstract

Background

The business model has proven to be a valuable concept for understanding not only how different firms do business (Teece, 2010) but also new avenues for innovation (Chesbrough & Rosenbloom, 2002; Martins, Rindova, & Greenbaum, 2015), including innovation for sustainability (Bocken et al., 2014b; Boons & Lüdeke-Freund, 2013). Innovation for sustainability in terms of creating sustainable business models seems central for sustainability transition as implementation of sustainable business models is likely to have an impact beyond the focal firm, by affecting the value-system that a firm is embedded win (Boons & Lüdeke-Freund, 2013). However, most empirical research has explored sustainable business models by focusing on single firms (Hellström, Tsvetkova, Gustafsson, & Wikström, 2015). Thus, we know less about how firms influence each other in the development and implementation of sustainable business models.

However, the conventional business model literature has amassed a significant body of knowledge regarding interplay between firms, for instance collaboration, that should be relevant when seeking to fill this gap. A business model-perspective on collaboration seems a good starting point for understanding better how business models have impacts beyond single firms.

Purpose

Therefore, we conduct a systematic literature review on collaborative dimensions of firms' business models to take stock of the research done in this area. Our synthesis of the field will pave the way for further advances of collaborative dimensions of sustainable business models and their role for sustainability transition. This literature review is a work in progress and in this abstract, we present some tentative findings that are likely to be revised and clarified during the process of the review.

Methods

Methodologically, this study is a systematic literature review. A transparent account of the steps undertaken during the review, as well as a comprehensive and unbiased overview of the field are integral parts of a systematic review as opposed to other types of reviews (Tranfield, Denyer, & Smart, 2003). While conducting this study we follow four reviewing steps prescribed by Rousseau, Manning, and Denyer, (2008) namely: 1 Question Formulation: Reflection, Debate, and Reformulation; 2 Comprehensive Identification of Relevant Research; 3: Organizing and Interpreting; 4 Synthesis. The work on this literature review is ongoing, namely at step 2 where, as a result of initial search, we have identified a total of 1902 peer reviewed articles across the accredited databases ISI Web of Knowledge's Social Sciences Citation Index, SCOPUS, and Ebsco Business Source Premier. To capture relevant works, we, after several rounds of test runs and discussions among the three researchers, settled on the following search terms: "Collaboration", "Ecosystem", "Boundary spanning", "Co-creation", "Coopetition" and "Sharing Economy" (one-by-one combined with "Business Model"). As flexibility is important for conducting a high quality systematic literature review (Rousseau, Manning, & Denyer, 2008) we, after peer comments consequently revised the search terms and added "network", "alliance", and "value chain" to the search terms.

After performing a cursory screening of the articles by reading titles, key words and abstracts, we found that a significant part of the articles treat business model concept in a trivial way or apply it in a superficial way. Therefore, we restricted our search further by following the elimination procedures of two prominent literature reviews on business models conducted by Massa, Tucci and Afuah (2017) and Zott, Amit and Massa (2011). Thus, we restricted our search to leading academic journals in management and other management journals where important business model-research has been published. Further, we also included

those sustainability-journals that have had hosted most of the debate on Sustainable Business Models. This list includes: Academy of Management Journal (AMJ), Academy of Management Review (AMR), Administrative Science Quarterly (ASQ), Journal of Management (JOM), Journal of Management Studies (JMS), Management Science (MS), MIS Quarterly, Organization Science (OS), Strategic Entrepreneurship Journal (SEJ), Strategic Management Journal (SMJ), Industrial and Corporate Change (ICC), Research Policy, Long Range Planning (LRP), Technovation, Journal of Business Ethics (JOBE), Journal of Cleaner Production, Business and Society, Energy Policy.

Furthermore, to be more inclusive we enriched this list with some top journals in Management and Business that are highly ranked in Web of Science and Scopus databases: Academy of management annals, International journal of management reviews, Journal of international business studies, Journal of supply chain management, Tourism management, Annual Review of Organizational Psychology and Organizational Behaviour, Journal of The Academy of Marketing Science, Journal of Marketing, Journal of Service research, Journal of interactive marketing, Entrepreneurship theory and Practice.

Moreover, as we identified during our initial screening that Information Technology related journals often do deal with Business Model in the way we were interested in we also included all IT related journals. The review is currently in progress where we proceed to screen the articles further and conduct initial thematic analysis.

Tentative findings

In the process of screening the articles, were we started with the most cited work, we have so far preliminary identified the following four themes:

Business models in Platforms literature (Rochet & Tirole, 2003;) where business models serve to design connections between different sides of the platform where one or several sides are “courted” and other sides provide revenues for the platform. In this sense collaboration between platform sides are crucial for the overall value creation logic.

Coopetition based business models (Ritala & Sainio, 2014; Ritala, Golnam, & Wegmann, 2014) appear often in conjunction with platforms, and IT related issues and may consequently be more of a sub-theme.

Collaborative consumption and Sharing Economy (Kathan, Matzler, & Veider, 2016; Pedersen, & Netter, 2013) where collaboration and sharing among actors involved in the business model is central for creating value that satisfies mutual needs of those actors.

Open Business Models (Chesbrough, 2007; Weiblen, 2014) where the overall value creation logics depends upon collaborative relationships between a firm and its ecosystem.

Possible research implications

As mentioned, compared to many other approaches to sustainability in business, sustainable business models have a major advantage: implementation of sustainable business models is likely to have an impact beyond the focal firm, by affecting the value system that the firm is embedded in (Boons & Lüdeke-Freund, 2013). This is because changing ones value creation oftentimes also entails changing how one works with partners, suppliers and customers. While the value system can be a barrier to innovation (Tukker, 2015), if innovation succeeds it will likely also change that wider system (Stål, 2018). But the majority of empirical research has so far focused on sustainable business models by focusing on single firms (Hellström, Tsvetkova, Gustafsson, & Wikström, 2015), and also understand business models primarily as *properties* of single firms. Hence, new approaches to designing business models that take into account different dimensions of collaboration have nearly not been investigated at all. We also do not know how innovation can spread in the business system via collaborative activities, via which businesses can influence each other. With this in mind, our review will facilitate further advancement of sustainable business model literature where collaboration plays a crucial role in system level changes, which are necessary for sustainability transition of society.

Keywords

Literature review, Business models, Collaboration, Sustainable business models.

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Taking a business model perspective to establish sustainable urban water management practices on municipal level

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Extended abstract

Keywords

Business model perspective, urban water management, socio-technical infrastructure system, sustainability transition, municipalities

Problem

Humans intervene largely in the natural water cycle and related ecosystems (Haan et al., 2015). Results are global concerns about the availability of water resources and implications for human intervention (Pahl-Wostl et al., 2013; Thomas and Ford, 2005). Partly due to the United Nation's Sustainable Development Goals (UN SDG) on Water (SDG-6), attention to the role of urban water management (UWM) for sustainable development has increased (Larsen et al., 2016). As part of the core urban infrastructure system, UWM plays a key role for sustainable development in urban areas (Truffer et al., 2010). The role of UWM is to provide (drinking) water, treat wastewater, control water pollution, and manage storm water for flood control. Depending on the geographical location, socio-technical UWM systems differ: In OECD countries, the well-established socio-technical system of

UWM relies on "investment-intensive, usually underground, pipe networks that provide single-quality drinking water and evacuate stormwater and wastewater" (Larsen et al., 2016: 928). Current and future challenges emerge e.g. due to climate change (e.g. changing rainfall patterns), rising micro-pollutants in waterbodies, increasing surface sealing, competition among water users, and rapidly aging infrastructures (Fraunhofer ISI, 2012; Hillenbrand et al., 2013; Larsen et al., 2016; OECD, 2015). Coupled with rising societal demands of high water quality and services, these factors lead to an increase of the economic, social and environmental costs of water security (OECD, 2015). Simultaneously, affordable water management systems for municipalities and citizens are of high relevance (Lieberherr and Truffer, 2015). Despite the availability of innovative technologies and knowledge in the water sector (e.g. Larsen et al., 2016), practical implementation remains demanding and slow (Rijke et al., 2013). Key challenges for sustainability transitions of UWM are strong path dependencies and well-established institutional and organizational governance modes (Kiparsky et al., 2013; Thomas and Ford, 2005). For the transition of UWM, technological innovation play a key role, but the institutional context and the social system that control change processes have to be considered equally important (Kiparsky et al., 2013). In the upcoming decades, cities, municipalities, or other investors need to invest massively in the renewal, modernization and adaptation of the infrastructure system (Fraunhofer ISI, 2012). Due to these renovation and reinvestment requirements of the water sewage infrastructure, windows of opportunities are opening to change the status-quo.

With our contribution, we aim to provide insights into the decision-making and implementation process of innovation projects in UWM and related infrastructure systems. Following Axelson et al. (2017) and Foxon et al. (2015), we suggest a business model (BM) perspective for this purpose. "Indeed, the business model perspective holds the potential to facilitate public actors in collective actions for innovating new solutions, their open economy, and value creation." (Axelson et al., 2017: 376). A business model characterizes the way a business or another entity organizes its activities in order to achieve its goals (Teece, 2010; Zott et al., 2011). In the case of UWM, it is key to consider economic, social, and ecological objectives equally (Foxon et al., 2015). The business model framework is helpful to mediate participatory decision making processes by a set of distributed actors (Hacklin and Wallnöfer, 2012).

Methods

UWM systems are complex socio-technical systems that combine a large number of relevant actors and stakeholders. In Germany, UWM is part of the public services and in parts a sovereign task of the municipalities. In order to test the practical relevance and the benefits of the BM concept to manage innovations on municipal level, we conduct an empirical analysis in a municipality in North Rhine-Westphalia. In the case study, a technological innovation is supposed to be implemented to utilize the hitherto unused decentralized waste heat of waste heat producers via existing wastewater infrastructure. The case study is not intended to evaluate individual technical components, but to show how innovations in UWM can be implemented from a governance and multi-stakeholder perspective. For this purpose, the different actors and stakeholders who are relevant in the innovation process for UWM are identified. We (1) aim to design a tool for setting up the innovation project based on the Business Model Canvas (BMC) originally introduced by Osterwalder and Pigneur (2010), (2) collect (qualitative) data in a document analysis and a series of semi-structured expert interviews. We thereby aim to (1) enable and understand the decision-making process on municipal level, (2) provide an overview of the relevant actors and stakeholders for innovation processes on municipal level, and (3) identify new ways of cooperation, risk sharing, and value capturing to allow the implementation of innovative and more sustainable technologies.

Expected Results

We consider the BM perspective appropriate in three aspects: First, to align the strategies and activities of the actively involved key partners; secondly, to illustrate associated values, costs and risks of innovation projects; and thirdly, to integrate the stakeholder's perspective from the beginning to create legitimacy (see e.g. Binz et al., 2016). The original BMC allows for a clear presentation of BMs by outlining nine "building blocks". Adaption of the original framework are expected to be necessary as key characteristics of infrastructure systems diverge from other goods and services that are commonly addressed by the BMC (Foxon et al., 2015). "Infrastructure systems are complex systems in view of their combined social, economic and physical complexity" (Herder et al., 2008). The requirements of a BMC in the context of UWM are inherently more complex than depicted in the original approach. Foxon et al. (2015) provide an adapted BMC concept that captures opportunities for infrastructure investments beyond techno-economic benefits and financial profitability. Instead of maximizing the

return for investors, Foxon et al. (2015) aim to incorporate positive social and environmental externalities in the decision-making process and enable local communities to benefit from the resulting advantages. By using the tool, we hope to identify entry points for transition processes on municipal level. However, the BMC is a static model. For a successful implementation process of innovative UWM approaches, the dynamics of the process have to be taken into account. As a result of our study, we expect to gain insights on the existing structure of actors and stakeholders in the decision-making process for UWM measures on municipal level. Furthermore, we expect to identify bottlenecks for the implementation of innovations in UWM in practice.

Conclusion

Today, there is still an ongoing discussion on the definition and contribution of the BM concept to science and practice (Massa et al., 2017; Zott et al., 2011). Keeping that debate in mind, we argue that the BM perspective can contribute to a sustainable development of UWM by fostering a sustainability transition in various innovation projects on municipal level. For the purpose of (re-) structuring decision-making processes in UWM, we believe the BM perspective can help to translate strategies on higher (state) level to concrete action on municipal level. Besides, it can be used as a framework to mediate distributed actors and the relevant activities for the innovation project.

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The confluence of transformative business models for a post growth economy and organizational evolutionary theory?

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Abstract

Debate surrounding post growth or degrowth economic transitions has focussed heavily on macroeconomic conditions, and has only recently begun to unpack what this means for organising and designing business models at the level of the firm. This recent work has produced a coherent but diverse understanding of desirable business outcomes. This paper offers a new conceptual lens on how to conceive of 'truly transformational' post growth business models, and distills a set of inputs giving rise to these desirable business outcomes, to provide greater clarity on how such outcomes are related, and can be delivered. Firstly, it suggests that to create a more transformative subset of Sustainable Business Models compatible with a 'post growth', 'degrowth' or 'steady state' economy we must blend sustainability and circular economy concepts. Adopting Maclurcan's (2018) terminological framing, 'full circle' business models require circularity across three dimensions: resources, value, and money. Secondly, in seeking insight on how to deliver 'truly transformative' full circle models which concurrently achieve transformation and scale, it extends current work by thematically distilling four key organisational structure/process inputs: alternative ownership structures, collaborative innovation, business model alignment and decentralisation. Finally, in casting a wide disciplinary net to incorporate the element of scale, it uncovers intersection of the identified inputs within Frederic Laloux's (2014) observations and theory of the evolution a new 'teal' organisational form, in his study of 'more soulful' workplaces. If identified post growth/teal commonalities prove to be material, this could broaden the organisation types of interest to post growth

business model scholarship, and more clearly bridge the communities of practice seeking sustainability transformation and better workplaces.

Keywords

business model, post growth, degrowth, collaborative innovation, ownership, decentralisation, open innovation

The role of firm-level business model innovation in inducing a change in a dominant industry logic

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Abstract

The dominant logic of an industry refers to highly stable cognitive templates defining how value is being created, delivered and captured in this industry. This paper investigates how the dominant logic of an industry may change despite pressures towards maintenance. In particular, we investigate the role of business model innovation at the firm-level in changing the dominant logic of an industry. Our paper is a qualitative case study of the change in the dominant logic of the electricity industry in the Netherlands from 2000 to 2016. We find that the ability of business models to induce change in the dominant logic of an industry pertains to three mechanisms: creating an alternative logic, undermining the dominant logic, complementing the creation of an alternative logic. We further integrate these three mechanisms into a dynamic model of how business models induce change in the dominant logic of an industry. Our main contribution is to the business model literature. We contend that when an industry is mature, the creating mechanism is not sufficient to induce change in the dominant industry logic and that this mechanism has to be supplemented by undermining and complementing mechanisms.

Keywords

Business Model Innovation, Dominant Industry Logic, Change, Energy

1. INTRODUCTION

Within many established industries, firms tend to follow a similar 'recipe' regarding the way in which they do business and compete with one another (Charles Baden-Fuller & Morgan, 2010; Sabatier, Mangematin, & Rousselle, 2010), a phenomenon that has been referred to as the industry's dominant logic (Bettis & Prahalad, 1995; Prahalad & Bettis, 1986). But how does the dominant logic of an industry change? More formally, the dominant logic of an industry refers to the shared understanding and collective frameworks that organizational actors use to assess their competitive environment and build their business strategy. It captures a learned behavior of how to do business in a specific industry which is based on organizational actors' past experience. Early research focuses on how the dominant logic of general management shapes firms' strategic decisions and constrains their business relationships (Bettis & Prahalad, 1995; Prahalad & Bettis, 1986). More recently, the dominant logic has been discussed as showing itself in the business models most commonly used in a given industry, as it provides firms with a highly stable rationale for how to best create, deliver and capture value (Bohnsack, Pinkse, & Kolk, 2014; Massa, Tucci, & Afuah, 2017; Sabatier, Craig-Kennard, & Mangematin, 2012). This insight suggests that firms-in-an-industry tend to follow a general template (or 'industry recipe') for how to do business and organize and integrate activities (Charles Baden-Fuller & Morgan, 2010; Sabatier et al., 2010).

However, because the dominant logic provides firms with efficient templates to make strategic decisions, it is hardly challenged (Chesbrough, 2010; Chesbrough & Rosenbloom, 2002). As firms develop business models that instantiate the templates' underlying assumptions, they constantly enact these templates and reinforce their validity with the consequence that the business models form a source of inertia in the industry (Bidmon & Knab, 2018; Chesbrough & Rosenbloom, 2002; Massa et al., 2017). While the dominant industry logic certainly is an enduring, highly structuring element of an industry, it is also, as any social structure, subject to evolution and change. For instance, the low-cost logic is now prevailing in the air travel industry, but when Southwest airlines first introduced its disruptive business model in the 1980s another logic predominated instead (Kim & Mauborgne, 2004). Very little is known, though, about how the

dominant logic of an industry changes. A change in an industry's dominant logic constitutes an important phenomenon to study in as much as it leads to radical change in how firms design and implement their strategies.

The business model literature has investigated how firms break free from the dominant industry logic and design innovative business models (Charles Baden-Fuller & Mangematin, 2013; Chesbrough, 2010; Sabatier et al., 2012). Such deviations from the status quo arise either when a new technology is introduced to an industry and its potential cannot be unlocked through standard business models (Chesbrough, 2010), or when an actor sees an opportunity to introduce a new value proposition in this industry (Kim & Mauborgne, 2004). The general argument is that when a firm successfully modifies a dimension of the dominant industry logic in its business model (i.e., value proposition, value chain and value capture), the alternative business model may spread and lead to more permanent changes in the dominant logic. However, the specific mechanisms whereby firm-level changes in business models induce industry-level changes in the dominant logic are not well understood. In this paper, we therefore aim to investigate the performative role of firm-level business models in changing the dominant industry logic (Doganova & Eyquem-Renault, 2009; Perkmann & Spicer, 2014); that is, how do business model innovations develop, diffuse and scale such that they contribute to a change in an industry's dominant logic.

To investigate the mechanisms whereby business model innovations perform roles that induce permanent changes in the dominant industry logic, we conducted a case study of the electricity industry in the Netherlands. From 2000 to 2016, the electricity industry has been undergoing profound changes in the way in which electricity is produced, transported and consumed. While this change was initiated by the European directive liberalizing the electricity sector, more profound changes in the industry logic were triggered by the massive business model innovation that followed the enactment of the directive. Based on our case study, we find that the performative ability of business model innovation to induce changes in the dominant industry logic pertain to three mechanisms: undermining the dominant logic, creating an alternative logic, and complementing the alternative logic. "Undermining" refers to how business model innovations challenge the dominant industry logic by instantiating divergent hypotheses about how to create, deliver and capture value in the industry. "Creating" refers to the crafting of business models that carry novel hypotheses regarding what value is, as well as how value is being created, delivered and captured in the industry and thus try to establish an alternative industry logic. "Complementing" refers to how

complementary business models may be designed as an infrastructure that is conducive to the spread of novel business models that form the foundation of the alternative industry logic. The paper integrates the three mechanisms and their two reinforcing effects into a dynamic model of how firm-level business models may induce change in the dominant logic of an industry.

2. LITERATURE REVIEW

2.1 Dominant industry logic, firm-level business models and their interaction

There are many different definitions and views of what business models are and what their function is (Charles Baden-Fuller & Morgan, 2010; Massa et al., 2017). By investigating how business model innovation induces a change in a dominant industry logic, we aim to reconcile two different views of the role of business models: business models as a cognitive schema and business models as attributes of real firms (Massa et al., 2017). The first view considers business models as meso-level cognitive structures that create a shared schema reflected in the dominant logic of an industry, while the second view refers to micro-level attributes of real firms which relate to value creation, value chain and value capture, respectively. In this paper, we are interested in the interaction between these two levels and how innovation in the micro-level attributes of business models lead to a change in the meso-level cognitive structure of the dominant industry logic.

While the dominant logic was originally theorized to explain a shared cognitive schema of decision-makers within a diversified firm (Prahalad & Bettis, 1986), it has later been applied to understand the shared mindset of decision-makers on higher levels of analysis including the industry (Sabatier et al., 2012) and the sociotechnical regime (Bidmon & Knab, 2018). Here, we focus on the industry level, where the dominant logic refers to a shared cognitive schema that firms rely on to create and capture value within a given industry (Massa et al., 2017; Prahalad & Bettis, 1986; Sabatier et al., 2012). Firms-in-an-industry rely on the same dominant logic when it comes to defining what customers want, how to deliver what they want to customers and how to monetize their activity, thus creating a collective understanding of what the most efficient business model in the given industry looks like (Sabatier et al., 2012). The more mature the industry, the more firms abide by this dominant logic and design their business in a way that they fit in (Kim & Mauborgne, 2004). The dominant industry logic shapes

organizational actors' interpretations of what a typical business model looks like and the norms of what can be considered a viable business model (Massa et al., 2017).

At the firm level, the notion of business model refers to attributes of real firms (Massa et al., 2017) and managers' strategic choices about how to create, deliver and capture value from a product or service (Casadesus-Masanell & Ricart, 2011; Teece, 2010; Zott & Amit, 2010). A firm's business model is a strategic device developed to commercialize products or services (Charles Baden-Fuller & Haefliger, 2013; Chesbrough & Rosenbloom, 2002; Doganova & Eyquem-Renault, 2009; Teece, 2010; Zott, Amit, & Massa, 2011). It connects seemingly separate units of a firm so that the firm is able to create, deliver and capture value (Demil & Lecocq, 2010). Locally, firms develop business models that mirror the industry's logic about how firms create and capture value within a value context. Here, we focus on three fundamental dimensions to a business model that form attributes of real firms: value creation, value chain and value capture (Charles Baden-Fuller & Mangematin, 2013). These attributes can be observed in a firm's sets of activities, resources and capabilities and strategic choices (Casadesus-Masanell & Ricart, 2011; Massa et al., 2017)(Zott & Amit, 2010).

Research looking into the interaction between the dominant industry logic and firm-level business models has highlighted the inertial force emanating from the dominant logic (Bidmon & Knab, 2018; Bohnsack et al., 2014; Chesbrough & Rosenbloom, 2002; Massa et al., 2017; Tripsas & Gavetti, 2000). An industry's dominant logic tends to restrain diversity and inhibit product and service innovation (Prahalad & Bettis, 1986). Because the dominant logic provides managers with generic templates that 'work well', managers rely on these templates to design and implement their business models (Bidmon & Knab, 2018). Most business models within an industry are local instantiations of the dominant logic and therefore quite similar (Sabatier et al., 2012). As organizational decision-makers enact the dominant logic through their everyday decisions, they, in turn, enact the perceived validity of the dominant logic and reinforce its dominant position. In mature industries, the dominant logic may become so pervasive that it prevents new products and services from arising (Kim & Mauborgne, 2004). Indeed, when decision-makers evaluate market potential for novel products and services they do so through the prism of the dominant logic, which may be ill-suited to evaluate the potential of such radically new products and services.

2.2 Business model innovation and its performative impact on the dominant logic

To theorize the interaction between firm-level business models and the industry-level logic, we concentrate on the performative role of firm-level business model innovation in changing the dominant logic (Doganova & Eyquem-Renault, 2009; Perkmann & Spicer, 2014). As Doganova and Eyquem-Renault (2009, p. 1569) argue, a business model 'is performative in the sense that it shapes not only the specific new venture that it represents, but also, through the process of replication, business models and new ventures to come.' So, how do organizational actors, by innovating their own business model, manage to have an impact beyond their organizational boundaries on the way value is created, delivered and captured within the industry. We focus in particular on business models' performative role in unlocking the latent value of a technology (Perkmann & Spicer, 2014). When radically new products and services arise, business models can help unlock their potential and help them diffuse by reconfiguring one of its three constitutive dimensions or the linkages between them: value proposition, value chain or value capture (Bohnsack et al., 2014; Chesbrough, 2010; Chesbrough & Rosenbloom, 2002).

First, business models can help unlock the market potential of product and service innovations by reconfiguring the value proposition compared to the dominant logic's assumptions. Product and service innovations face important diffusion barriers, as they do not fit the pre-existing assumptions consumers have about what value an industry is going to provide them with. Such barriers are exacerbated in the case of sustainable products and services that seem more desirable from a societal rather than a customer point of view (Gauthier & Gilomen, 2016). Innovating the business model can overcome some of these barriers and accelerate the diffusion of new products and services by increasing their market attractiveness (Bohnsack et al., 2014; Drury et al., 2012; Vernay & Gauthier, 2019). Bohnsack and Pinkse (2017) show that reconfiguring the value proposition of electric vehicles compared to conventional vehicles has been an important factor for this technological innovation to break into mainstream markets. For example, car firms changed the value proposition by highlighting mobility provision instead of car ownership. Hence, business model innovation can induce a change in the notion of value by reinventing it through narratives (Doganova & Eyquem-Renault, 2009; Perkmann & Spicer, 2014) that demonstrate novel customer benefits that go beyond those currently exploited in the market (Kim & Mauborgne, 2004; Massa et al., 2017; Normann & Ramirez, 1993; Priem, 2007).

Second, business models help new products and services diffuse by reshuffling the value chain compared to the dominant logic's template regarding the transactional relations between actors in the industry. Low-cost business models, for instance, have re-organized the entire value chain of air transportation (Kim & Mauborgne, 2004), challenging deeply seated assumptions about how to best deliver value to end-users. Similarly, the business models of the sharing economy disrupt fundamental assumptions about who is involved in fulfilling end-user needs. By promoting peer-to-peer exchanges, these business models are excluding incumbents from traditional value chains (Zervas, Proserpio, & Byers, 2017). Business model innovation can profoundly challenge the distribution of prestige, roles and economic rent among incumbents and new entrants in socio-technical systems (Vernay & Gauthier, 2019).

Third, business models unlock the economic value of product and service innovations by reconfiguring the profit model compared to the dominant logic's assumptions and thus change the value capture (Bolton & Hannon, 2016; Chesbrough & Rosenbloom, 2002). When major firms in the office equipment industry were asked to evaluate the Xerox copier model 914, for example, they did so based on this industry's dominant logic (Chesbrough & Rosenbloom, 2002). At the time, the dominant logic stated the razor-blade business model as the only legitimate way of doing business and making money in this industry. It is only by operating a business model switch from the razor-blade profit model to the leasing profit model that Xerox was able to commercialize its technology and demonstrate its potential (Chesbrough & Rosenbloom, 2002). The case of Polaroid, when facing the disruption of digital photography, shows instead how a failure to move away from the razor-and-blade model and adapt its value capture led to the firm's failure (Tripsas & Gavetti, 2000).

Innovative business models challenge a dominant logic's fundamental assumptions what value is as well as how it is created and captured within an industry (Sabatier et al., 2012). When innovative business models are successful in commercializing new products and services, they may end up modifying the industry's dominant logic. While previous research has focused on how innovative business models reshuffle the dominant logic's assumptions to help technologies diffuse, little is known about how these variations affect and eventually change the dominant logic. In the remainder of the paper, we identify and explain the mechanisms whereby firm-level business model innovations induce change in the dominant logic at the industry-level.

3. DATA AND METHODS

3.1 Empirical Setting

The empirical context for this study is the evolution of the dominant logic of Dutch electricity industry from 2000 to 2016. Since the industry's liberalization, following the adoption of the European Commission's 96/92/CE directive, the Dutch electricity market has been dominated by three large utilities. In 2001, they had 87% market share (ECN, 2001). The dominant logic, shared with other European utilities, has long been to develop vertically integrated firms that produce, distribute and supply electricity to customers. These firms operate large-scale, fossil-fuel-based power plants. It is widely accepted that customers—which are considered captive—think of electricity as a commodity, a low-interest product, and only interact with suppliers on a yearly basis when they receive their electricity bills. The revenue model is based on volumetric tariffs that depend on how much electricity customers use. As Richter (2013) argued, European utilities have a business model that is utility-centered. Since the sector's liberalization, pushed by the Kyoto Protocol, and increasing awareness that the sector needs to decarbonize, it has gone through important changes. In 2000, renewable energy sources represented 2.5% of Dutch electricity consumption (Novem, 2002) and about 70% of electricity was produced centrally or imported from neighboring countries. In 2001, more than half a million Dutch customers had a green electricity contract (Novem, 2002) . By 2017, 69% of Dutch consumers had a green electricity contract (ACM, 2017). In 2018, renewable energy sources represented about 15% of Dutch electricity consumption (CBS, 2018) and there are now more than 50 energy suppliers present in the country (ACM, 2016). The three largest suppliers still own a large part of the market – 77% in 2016 (ACM, 2016) – but this percentage has been decreasing steadily since 2012. This trend may be explained by the fact that more and more people switch energy supplier. In 2018, 16% of Dutch consumers switched energy provider, which is far above the European average of about 6% (ACM, 2018). Even though we cannot claim that a new dominant logic has emerged in the industry, we observed that incumbents are very conscious that the prevailing logic is contested and will have to evolve. This is clearly illustrated by the following quote from the head of smart energy lab at one of the big utilities: "It's clear that the old business model is dying. It's not so clear that a new business model is resurfacing". Besides, the sector is very dynamic with ample business model innovation going on that could eventually nurture the emergence of a new dominant logic. This makes the Dutch electricity industry a

very suitable empirical setting to study the influence of firm-level business model innovation on a change in the dominant industry logic.

3.2 Data collection

Our unit of analysis is firm-level business model innovation. We used four types of data (see Table 1) to understand the political context in which the change in dominant logic is taking place, and to identify the mechanisms through which firm-level business model innovation contributes to a change in the dominant industry logic: 1) archival documents including institutional reports and academic papers that discuss energy policy in the Netherlands and the evolution of the Dutch energy sector; 2) 30 semi-structured interviews; 3) corporate archives including webpages presenting the firms' offers and press releases discussing relevant changes in business strategy regarding decentralization, and 4) other archives from the media including press and blog articles discussing business model innovations.

Interviews were conducted in two rounds. The first round of interviews focused on business model innovations that were based on new definitions of value creation, delivery and/or capture. This round revealed the importance of organizations that provide complementary assets to organizations that develop business models based on an alternative logic. The second round therefore focused both on business model innovations and their complementors. We interviewed representatives of firms and organizations identified as playing a role in the decentralization and decarbonization of the Dutch electricity industry as well as incumbents. The business representatives included founders, managing directors, heads of strategy departments, innovation managers, account managers, and project leaders. When interviewing representatives from organizations involved in business model innovation, we specifically asked them to describe their business model and explain why they chose to define value creation, delivery and/or capture differently from the dominant logic's definitions and why these differences are important to them. We also asked them to reflect on the role of their organization in changing the dominant logic of the industry and to identify and reflect on the role of other potentially important organizations in the ongoing change. When these organizations had been active in the industry for many years, we asked them to explain what their initial intent was, describe how their business model had changed over time, and explain why it had changed. When interviewing incumbents, questions aimed at understanding how they reflected on ongoing changes in the industry, and whether and, if so, how that was

influencing the dominant industry logic. For some organizations, we conducted more than one interview either to get a more complete overview of the ongoing business model innovation or to understand reasons behind important strategic changes. Interviews and company archives provided us with narratives about firm-level business model innovation, what has been driving these innovations and what they mean to those introducing them.

We also interviewed experts to gain additional knowledge about industry specificities and to validate that all the important types of organizations had been interviewed. Table 1 presents these sources in more detail and explains how they contributed to our analysis. Table A1 in the appendix shows which organizations were interviewed, when these organizations were established, the role of the person interviewed and the date of the interview.

Insert Table 1 About here

3.3 Data analysis

To organize and analyze the data that we had collected from archival sources and interviewing business representatives and experts, we followed a three-stage process.

Stage 1. Drawing on longitudinal methodologies for qualitative data analysis (Langley, 1999), we sequenced our data into a timeline of three periods that are analytically comparable. This preliminary stage provided us with a descriptive account of seven pages that capture the main stages in changing the dominant industry logic. The first period (2000-2007) sees small producers, mainly farmers, struggling to find their place in the newly liberalized Dutch electricity system. The second period (2007-2013) sees new entrants starting to destabilize the sector. They propose low-cost electricity offers or try to attribute more decision power to end-users and place them at the heart of the energy socio-technical system. During the third period (2013-2016), the transition starts to accelerate with a number of actors with innovative business models entering and flourishing in the system. This period also sees incumbents experimenting with distributed energy generation and with new forms of social practices around electricity.

Stage 2. We coded our data, both the interviews and the corporate archival data, to identify the mechanisms through which business model innovation changes the dominant logic of the electricity industry in the Netherlands. To identify

mechanisms, we first conducted an open coding of our data (Corbin & Strauss, 2014), focusing on the definitions business model innovations rely on in terms of value creation, value delivery and value capture and on the accompanying narratives arguing for these definitions. The open coding yielded 88 first-order codes which we reduced to 27 codes by tracking similarities among them (Gioia, Corley, & Hamilton, 2013). We kept these codes as close as possible to practitioners' terms. These first-order codes comprise labels such as "coal electricity is bad electricity", "color the electron", "charge a fee to access the platform" and "help create a brand around alternative customer values". Once we agreed that these first-order codes were representative of all the narratives used to legitimize business model innovation and describe how it induces change to the dominant industry logic, all the interviews and archival data were recoded to make sure all the coding was consistent throughout the dataset. In parallel, we engaged in an iterative movement between data and literature (Locke, 2001) to identify mechanisms through which business model innovations can induce change in the dominant industry logic.

We identified three mechanisms through which firm-level business model innovation can induce change in the dominant industry logic: undermining the dominant industry logic by delegitimizing prevailing definitions of how to create, deliver and capture value and the social structures on which they depend; creating an alternative logic of value creation, delivery and/or capture; and complementing business models that form the foundation of the alternative logic and provide the infrastructure that is conducive to their diffusion (see Table 2). First-order codes were grouped into these three mechanisms. Table A2 in the appendix presents selected examples of citations used to develop the first-order codes. Some business model innovations were found to perform a role in relation to various mechanisms that we identified. For instance, some business model innovations create alternative logics of value creation while, at the same time, undermining the logic of existing value chains. Other business model innovations create alternative revenue models while complementing other actors in helping them develop new value propositions.

Insert Table 2 About here

Stage 3. We paralleled our timeline (stage 1) with the coding structure (stage 2) to get a first sense of when each mechanism was generating an outcome in terms of leading to a change in the dominant industry logic. We identified two reinforcing interaction effects that augmented the scope and impact of the three

mechanisms: a self-reinforcing effect and a mutually-reinforcing effect. We then examined the plausibility of these interaction effects by going back to the data. Particularly, we analyzed how our interviewees made sense of the interactions among the three mechanisms. After triangulating our findings with the reports of our interviewees, we derived a dynamic model of thee way in which the three mechanisms interact in inducing change in the dominant logic of an industry (see Figure 2).

4. Findings

From the literature, we know that business model innovation at the firm level has the potential to have a performative role in inducing change in the dominant logic of an industry. We found three mechanisms through which business models can deliver on that potential (see Figure 1). Business models may (1) undermine the dominant industry logic, (2) create an alternative industry logic, or (3) complement the creation of an alternative industry logic. Undermining refers to business model innovations that erode the legitimacy of the dominant logic and the social structures that supports it. Creating refers to business model innovations that propose an alternative logic to create customer value, organize value chains and/or develop revenue models. Complementing refers to business model innovations that provide complementary assets that other organizations need to develop business model innovations that undermine the dominant industry logic or create an alternative logic. While undermining and creating both enable a direct change in the dominant industry logic, complementing only leads to change in the dominant industry logic in an indirect way. That is, it acts as a catalyzer that further reinforces the actions of undermining and creating. Altogether, these three mechanisms provide an empirically grounded and theoretically relevant account of how business model innovations induced change in the dominant logic of the Dutch electricity industry. In the next sections, we first explain how each mechanism contributes to changing the dominant logic individually to then move to elaborating on how they reinforce one another.

Insert Figure 1 About here

4.1 Undermining mechanism

We observed that business model innovations can contribute to the transformation of the dominant industry logic by undermining the prevailing logic.

They contribute by undermining the three components of the dominant industry logic: what is the best way to create value for customers, how value chains are organized to deliver that value, and which revenue model prevails to capture part of the value.

First, business models can contribute to undermining the prevailing definitions about what customers want and thus how to create value for them and eroding their legitimacy. In 2015, the Dutch authority for consumers and markets estimated that 64% of Dutch households had a green electricity contract. However, only a small proportion of this renewable energy is produced domestically. Most of it comes from cheap hydropower imported by the big utilities from Scandinavia and does not contribute to greening the Dutch power system. Some non-governmental organizations have introduced this issue in their value proposition as they rank electricity providers according to the proportion of Dutch green electricity they produce, thereby raising awareness among consumers. They invented the term “sjoemelstroom”, which we translate as “hustle power”. This change in traditional value propositions of ranking firms led consumers to ask critical questions about green energy: “Is it green, is it really green. Is it green from Holland or is it only with certificates?”. Besides undermining current norms and values regarding the quality of the electricity that is consumed, some firms developed value propositions that question the very existence of utilities. An alternative energy supplier, for instance, proposes that customers become co-owners of the means to produce electricity. In a video advertisement, they encourage people to imagine a world free from utilities, where everyone can be their own energy supplier. By pushing consumers to think that not all electrons are equal and that the power sector does not have to be controlled by large utilities, these business model innovations contribute to changing prevailing conceptions about what customers expect from their energy supplier.

Second, business model innovations can contribute to undermining the social structures in the prevailing value chains and especially by eroding the power of incumbent actors. The liberalization of the power sector in the Netherlands pushed many small energy suppliers to merge, resulting in the creation of four big actors: Nuon, Essent, Eneco and Delta (Van Damme, 2005). Even though the retail market opened in the early 2000s, very few customers switched supplier. Between 2013 and 2015, on average, less than 5% of EU households switched supplier (ACER, 2016). In the Netherlands, it is estimated that about 50% of end users never switched supplier, a group that utilities call “the sleepers”. Part of the reason why few people switch energy supplier is their limited understanding of what they

could gain by switching electricity supplier (He & Reiner, 2015). Our data show that some business models try to undermine the power of these incumbents by increasing the volatility of the retail market. A new energy provider for instance, started positioning itself as a price fighter in 2007. They wanted to attract customers by showing them they could have a better deal if they moved away from their historical energy provider. They developed aggressive marketing campaigns, criticizing the big utilities for charging too much for their energy and encouraging people to switch to their offer instead. Many interviewees mentioned this firm's entry as important in "*shaking up the market*" because it showed customers that they could gain from switching power supplier and by stealing customers from big incumbent utilities.

Similarly, firms with comparison websites as their main value proposition increase the volatility of the retail market by decreasing switching costs (Klemperer, 1987). A key aspect of comparison sites' value proposition is to make switching "*hassle-free*" by taking care of all the administration that comes with it. Transposing the model of flight search engines to the energy sector, these comparison sites make the market more transparent by ranking offers according to how well they score on predefined criteria (e.g. price, duration of the contract, type of electricity offered, and cashback reward). As one interviewee explained, "*with suppliers we have a love and hate relationship*." Indeed, as these market places become important sales channels, utilities are also forced to make attractive offers to appear in the top five offers and increase their chance to attract customers. By increasing the volatility of the retail market, though, these business models also increase the bargaining power of customers, thus undermining the power of incumbents.

Third, business model innovations can contribute to undermining the prevailing value capture model by either increasing the costs structure of incumbent actors or by decreasing their revenues. Before the market liberalization, small producers had to sell their electricity to the suppliers operating in the area where they were generating electricity. Once the sector was liberalized, they could negotiate the price with any supplier they would like to sell their electricity to. However, small independent producers had little room for manoeuvre and hardly any say in the price they could get from large incumbent utilities. Incumbents managed very big power plants and did not give much value to small generation capacities. The oldest green energy supplier was the first to say, "*we'll pay you more for your electricity*", and eventually forced other suppliers to do the same. Moreover, incumbents' revenues were also reduced by new entrants. One reason for solar

panels to diffuse slowly in the residential market is that the technology is too costly and firms distributing solar panels are capturing too much value. We observed that some NGOs organize collective buying of solar panels to allow people acquiring renewable energy technologies at a cheaper price. Notable examples are Wij Willen Zon, an initiative from Urgenda which was quickly imitated by others such as Zon zoekt Dak by Natuur en Milieu or 123 Zonne energie by Vereninging Eigen Huis (Huijben and Verbong, 2013). By securing better deals for customers, they managed to reduce potential revenue for technology providers.

To summarize, then, business model innovation can undermine the dominant industry logic by questioning prevailing conceptions of value creation. Business model innovation can delegitimize the way value tends to be created for customers by raising customer awareness about the negative externalities that accompany this value creation. Business model innovation can also undermine the power of incumbent actors in the value chain by fluidifying the retail market, thereby increasing competition between actors. Finally, business model innovation can undermine prevailing value capture models by increasing the bargaining power of both customers and small renewable energy producers.

4.2 Creating mechanism

Some business model innovations contribute to transforming the prevailing industry logic by creating an alternative logic. That is, organizations involved in business model innovation imagine new ways to create value for customers, to organize value chains to deliver the value or to tap into new revenue streams to be able to capture part of the value. Through business model innovation, these organizations try to replace the dominant industry logic with an alternative logic.

First, we observed that some novel business models create new types of customer value. Because it is an invisible commodity which accounts for a small share of a household budget, electricity is often described as a low interest product (Fischer, 2008). The main relation end-customers have to energy is when they receive their electricity bill or when they face technical problems. Firms in our sample regularly complained that the number one criterion for customers is price. We have observed that multiple firms in our sample share the idea that if the energy system is to decarbonize, electricity has to become more than the under-socialized commodity it is now. End-consumers have to take ownership of the system, somehow. These firms have developed business models that push for new forms

of customer value and try to empower consumers. For instance, firms developed value propositions that do not frame electricity only as an impersonal commodity but as a good they can personalize instead. A recently founded energy supplier has, for example, developed a marketplace where producers of renewable electricity can sell their power directly to end customers. Translating the concept of AirBnB to the energy sector, small renewable energy providers have their own page where they can present their farm, explain why they have decided to invest in renewable energy and advertise the price at which they think it is fair to buy their electricity. In this way, this energy supplier allows customers to know precisely where their electricity comes from, or at least which producers will receive money when they pay their electricity bill. That is, they make it possible to *color the electron*. Similarly, some business models create value for customers that are traditionally excluded. Under normal circumstances, only those who possess large pieces of land can own wind turbines. Similarly, many households are excluded from the solar market because they do not own a house or lack a suitable roof. Some business models have been developed to allow these people becoming customers. A firm for instance, enables anyone to invest in wind turbines. The company splits wind turbines in multiple parts (they call these "winddelen") and crowdfunds them to interested customers. Besides becoming co-owners of a wind turbine, customers of this firm can also deduct the electricity produced from their electricity bill, in the same way they would, had they installed solar panels on their roof.

Second, we observed that some firms developed business models that result in the creation of new social structures in the value chain. Traditionally only large electricity producers or suppliers are able to trade on the power market. Small producers have to sell their electricity to an electricity provider that acts as an intermediary. Some firms developed business models where the core value proposition is based on proposing a technical infrastructure that allows new forms of transaction to take place. Platforms have been created that allow residential prosumers to sell their excess electricity to friends, family, neighbors, etc. As the founder stated, they are "*for the crowd from the crowd*". These firms also propose their platform as a white-label to any organization interested in selling its power to customers under their own brand. For example, an ice-skating club like Thialf can sell electricity to its fans or a radio station like Qmusic to do the same with its audience. Moreover, some business models help connect energy technology suppliers and end consumers. A startup initiated in 2014 by one of the DSOs was set up with as initial objective to help neighborhoods initiate their energy transition by investing in renewable electricity generation or energy efficiency.

Part of their revenue model comes from offering a platform where installers and technology providers can market their offers and reach potential customers.

Third, business models can also transform the dominant industry logic by creating new revenue models. Based on the assumption that renewable energy technologies lack market attractiveness because of their price (Strupeit & Palm, 2016; Yang, 2010), start-ups started to lease solar power so that customers do not face up-front investments. One of the alternative energy suppliers also created a new type of revenue model. Traditionally, energy suppliers charge their customer a volumetric tariff, meaning that the more they consume, the more they pay. This suppliers's platform proposes something radically different. They charge customers for two things: the cost of the electricity which they transfer entirely to the small producer chosen by the customers and a monthly subscription that gives customers access to the platform. Their margin only comes from this subscription. They argue that it is *"not in our interest to sell more volume or to sell at a higher price and by that we align our interest with that of the customer."*

In summary, business model innovation contributes to creating an alternative for the current dominant industry logic by proposing new ideas to create value creation, to organize value chains and to generate revenue. Emerging business models try to move away from having customers see electricity as a commodity and instead develop a differentiated value proposition that customers can relate to. Business model innovation also creates new value by allowing new types of transaction to take place, such as peer-to-peer, thus disrupting the traditional functioning of the value chain. Finally, business model innovation creates new revenue streams by charging customers less for electricity as a product and more for electricity-related services.

4.3 Complementing mechanism

Some business model innovations transform the prevailing dominant industry logic by providing the complementary assets (Teece, 1986; Teece, Pisano, & Shuen, 1997) other firms need to develop business models that try to create an alternative logic. Business models can play a complementary role by providing assets needed to develop new value propositions, penetrate existing value chains or increase the total revenue alternative business models generate.

First, we observed that some business models are able to provide the complementary assets necessary for other firms to create alternative value propositions. Recent years have seen the multiplication of citizen-led energy cooperatives. These initiatives are often presented in ways that are too technical and not very appealing. They have difficulties explaining how they create value and why they are important. To help citizen-led energy project gain visibility, cooperative of cooperative have created stories they can use to communicate about their project. Other organizations are trying to help energy cooperatives develop a brand that talks to a broader public and to which people can relate. Relatedly, due to increasing competitive rivalry, incumbent energy suppliers need to find ways to differentiate themselves from the competition by offering innovative and unique value propositions to their customers. However, they do not always have the competences in-house to propose radically new services. That is why they partner with others, usually small start-ups. The oldest green energy supplier, for instance, developed an exclusive relationship with the start-up which crowdfunds wind turbines and allows virtually anyone to become co-owner of a wind turbine and use the electricity it produces to decrease their monthly bill. By supporting other firms in their ecosystem, incumbents are able to diversify their value proposition to their customers, thus increasing their chances to retain old customers and to attract new ones.

Second, we observed that other business models are able to provide the complementary assets necessary to deliver alternative forms of customer value. To operate in the power market, producers need to comply with multiple norms and standards and understand procedures to obtain the required permits and certifications. This administrative work makes it difficult for outsiders to enter the market. Various organizations in our sample have developed a core value proposition which consists of providing knowledge that alternative producers need to navigate through this strictly regulated market. These organizations perform activities that require specific expertise. Based on the observation that organizing the back office is quite complicated and requires high levels of investment, a cooperative of cooperative was created in 2013 to take care of these administrative issues for small energy cooperatives. Later on, they also started performing customer services for the cooperatives. Likewise, crowdfunding platforms give the possibility to energy cooperatives to crowdfund their project which helps cooperatives to become financially sustainable and to meet their objective of local energy production (Elzenga & Schwencke, 2014). Complementors can also be necessary to be able to operate. A special license is

for instance mandatory to supply electricity and small alternative producers often use the license of larger players.

Third, some business model innovations are able to transform the dominant industry logic by providing key complementary assets necessary for business models propagating an alternative logic to capture more value. Some platforms, for instance, give small energy producers direct access to end consumers, thereby helping them increase their revenues. Because they need the renewable energy production of the cooperative, some green energy suppliers pay cooperatives a fee for each member that becomes their customer. This process helps cooperatives diversify their revenues and be more financially sustainable. Besides, as explained above, large oligopolies dominate the industry that benefit from a quasi-monopolistic situation in the region where they originated. This nature of the market, combined with the low switching rate of energy supplier, makes it very difficult for new entrants to penetrate the market. Some organizations provide distribution channels that new players need to capture market share. For instance, a few organizations offer customers the possibility to participate in collective buying of electricity. Our data suggest that only new entrants respond to these types of bids and use this channel to gain customers. An association of home-owners regularly organizes these types of bids and among the winners we find new entrants such as Budget Energie, founded in 2011, or Vandebron, founded in 2013. Even though participating firms have to make a very competitive offer to gain the bid, when they do, they are able to directly capture a share of the market and start generating revenues. Similarly, because they have limited budget for marketing and lack access to the distribution channels, start-ups often have difficulties reaching the mass market. Incumbents can play an important role, thereby acting as an intermediary between their offer and the end-consumers. An incumbent for example, developed a partnership with a start-up that proposes customers to lease – rather than buy – solar panels. In this way, they are able to "*reach two million households, which is the client base of [the incumbent]*". Finally, we also find firms coming from other sectors that start selling renewable energy technologies. A multinational specialized in furniture and home accessories started selling turnkey PV panels in 2014 (de Boer, 2014). By providing an additional sales channel for the technology, this multinational makes solar energy visible for potential customers and contribute to broadening the market segment that is susceptible to buy the technology.

While the first two mechanisms directly contribute to creating an alternative for the dominant industry logic, the complementing mechanism works in an indirect

way by allowing others to undermine the dominant industry logic and create an alternative logic. We found several business models that allow others to develop a more elaborate value proposition. Interestingly, this mechanism was both reflected in assistance provided to under-resourced start-ups and in well-resourced incumbents seeking partnerships with start-ups with unique assets. Such business models also tried to open up the existing market for new entrants by removing entry barriers or by helping to increase the total market for renewable energy sources.

5. The interplay within and between the three mechanisms

In this section, we develop a dynamic model of the performative role of firm-level business model innovations in inducing a change in the dominant industry logic (see Figure 1). In the previous section, we described three mechanisms that play a role in changing the dominant industry logic in isolation: undermining the dominant industry logic, creating an alternative logic, complementing business models that form the foundation of the alternative logic. Building on these three individual mechanisms, our dynamic model describes two types of interaction effects among them: (1) self-reinforcing effects (see *provide a template* in Figure 1) and (2) mutually reinforcing effects (see *increase market opportunities, provide disconfirming evidence* and *trigger a virtuous cycle with business model co-evolution* in Figure 1).

5.1 Self-reinforcing effects

When a business model that fulfils an undermining, creating or complementing role is first released, it may only have limited impact on the dominant industry logic. As a shared cognitive template (Bettis & Prahalad, 1995; Prahalad & Bettis, 1986), the dominant industry logic creates cognitive barriers that filter how firms define what is a good way to create and capture value in a given industry. This dominant industry logic can be very difficult to change, even more so in mature industries (Kim & Mauborgne, 2004), as it becomes ingrained in the organizations (Bohnsack et al., 2014; Chesbrough & Rosenbloom, 2002). Sull (1999) talks about active inertia to highlight the difficulties firms face to change their way of doing business. Moreover, when they are first launched, alternative business models appear unattractive for incumbent actors (McGrath, 2010). Christensen's (1997)

work implies that alternative business models tend to have a value proposition that targets customers currently not served by the incumbents. They also tend to have a revenue model that incumbents consider unattractive and/or build on resources and competences that they do not have. Especially when they require changes in customer preferences, alternative business models can be confined to small niche markets (Johnson & Suskewicz, 2009) and their effectiveness to move beyond these niche markets is surrounded with uncertainty (Andries & Debackere, 2007). This uncertainty can result in firms adopting a strategy of wait-and-see what others are doing and whether that is successful, or not (Parandian, Rip, & Te Kulve, 2012). Consequently, changing the dominant industry logic takes time and requires the consecutive and simultaneous performative action of multiple business model innovations.

Our findings suggest that when multiple business model innovations leverage the same mechanism in trying to change the dominant industry logic, a self-reinforcing mechanism can arise that augments the effect of this mechanism (see *provide a template* in Figure 2). When entrepreneurs develop new ventures, they do not start from scratch but instead search for inspiration from other firms. Baden-Fuller and Winter (2007) argue that business models can be "models" or "templates" for other firms to imitate. They are part of the repertoire entrepreneurs can draw on or refer to when creating new ventures (Doganova & Eyquem-Renault, 2009). There are various reasons why alternative business models, when imitated, induce a self-reinforcing mechanism. Business models are more likely to spread in an industry if they are scalable (Sarasini & Linder, 2018), which means that they have the "ability to increase revenues faster than the corresponding cost base" (Stampfl, Prügl, & Osterloh, 2013, p. 229). As increasingly more firms adopt alternative business models, other firms can gather additional knowledge about the new business model, which also gives it legitimacy and increases customer acceptance (Aldrich & Fiol, 1994). When alternative business models start to erode the competitive position of the incumbents and disrupt the competitive status quo (Ferrier, Smith, & Grimm, 1999), firms with alternative business models start to be perceived as having superior information and become "fashion leaders" (Bikhchandani, Hirshleifer, & Welch, 1998). These reinforcing mechanisms become even stronger as larger firms start adopting these alternative business models as well. Incumbents tend to copy innovative new entrants when they see that the market for alternative products or services is becoming more lucrative and that firms with alternative business models are capturing ever larger parts of this market (Schaltegger, Lüdeke-Freund, & Hansen, 2016). Larger and more profitable firms are often perceived as having better access to information thanks

to their large investments in R&D and marketing (Lieberman & Asaba, 2006) and are therefore more likely to be imitated (Haunschild & Miner, 1997; Haveman, 1993). Besides, having a strong presence on mass markets, incumbents are likely to increase the legitimacy of alternative business models (Hockerts & Wüstenhagen, 2010) and further accelerate a change in the dominant industry logic.

This self-reinforcing mechanism can be illustrated by one example. The Dutch market has seen a real boom in renewable energy offers. The market entry of multiple green electricity suppliers is often mentioned for having forced large incumbents to include renewable power in their offers and revisit what is the best way to meet customer demands. As one interviewee explained, green electricity suppliers "*are growing so fast. I am sure that has caused the traditional players to introduce their own green products. There is a market evolving because of this. That probably wouldn't have evolved if these new players hadn't been there*". Besides, these green electricity suppliers often operated as energy retailers. They showed that it is possible to sell electricity without having to own capital-intensive production assets. The energy retailer became a template imitated by many new entrants that focused on customer value for green electricity. As these new suppliers started capturing part of the market, incumbents felt that their core business model was under threat. In response, they used the business model of these new suppliers as a template to imitate as they enriched their business model portfolio.

Business model innovations can also be self-reinforcing when they affect different dimensions of the dominant industry logic simultaneously. We found that novel business models do not only allow scaling because they act as templates for other firms (Doganova & Eyquem-Renault, 2009), but also because, through their interaction, they are jointly more effective in performing their specific role of undermining, creating or complementing. For example, our data show that business models of comparison sites undermine the power of incumbent actors in the value chain by increasing the volatility of the retailing market and improving market transparency. However, the undermining effect of this business model remained limited in the first years after the business model was released. One comparison site founder explained that when he first launched his platform, "*nothing happened*", people did not visit his website. It was only a few years later, after a price-fighter had entered the industry, that he started to get more visits to his comparison site. This price fighter undermined the well-established structure of prices on the industry and made differences between producers more salient.

It also undermined the prevailing definition of customer value by showing that customers do not have to be held captive by incumbent utilities. This example suggests that different business model innovations can be catalysts for each other in performing a specific role which leads to a self-reinforcing mechanism because each affects a different dimension of the dominant industry logic.

5.2 Mutually-reinforcing effects

Our findings suggest that when multiple business model innovations leverage different mechanisms in trying to change the dominant industry logic, a mutually-reinforcing effect between undermining, creating and complementing can arise that augments the performative impact of each single mechanism (see *increase market opportunities*, *provide disconfirming evidence* and *trigger a virtuous cycle with business model co-evolution* in Figure 1). Our findings suggest, for example, that undermining the dominant industry logic is necessary to create space for a new logic to emerge. Undermining the dominant industry logic helps challenging its legitimacy. Business model innovations can do that by questioning the moral foundation on which these business model elements are based (Ahmadjian & Robinson, 2001). This delegitimization process creates market space for new types of products or services (Tolbert, David, & Sine, 2011) and opens opportunities for organizations to develop alternative business models that are based on different sets of values (Hiatt, Sine, & Tolbert, 2009). Business models can also make the dominant industry logic less effective or ineffective (Oliver, 1992) and make the need to develop alternative business models more salient (Sine & David, 2003). Creating alternative business models and breaking with the prevailing industry logic (Garud, Hardy, & Maguire, 2007) is a way to show that another logic is possible. As these alternative business models start to successfully gain market share, they also provide disconfirming evidence of the viability of the prevailing industry logic (Sine & David, 2003), thereby reinforcing the undermining mechanism. Various interviewees from organizations selling locally-produced renewable electricity explained that the existence of a ranking of energy suppliers was crucial to create market opportunities for them. The ranking undermines prevailing customer values by showing customers that not all green electricity is green in the same way. It delegitimized prevailing conceptions of customer value, thus creating market opportunities for firms that develop an alternative logic of value creation, based on local production, and speeding up their market penetration. Asked about the importance of the ranking, one interviewee

explained: "*It is important. A lot of customers are making the selection on the good companies. So, we are proud to be number one*".

Finally, our data suggests that when the three mechanisms are in place, a virtuous cycle can emerge leading firm-level business models to co-evolve (Schaltegger et al., 2016) and induce deep changes to the dominant industry logic. In the mid-2000s, a cooperative of wind turbine owners launched a business model based on an alternative value proposition: they allowed interested customers to select the wind turbine they wanted to support with their electricity bill –they tried to colour the electron. Each farmer had their own page called "Molenaarspaspoorten" where they could present their farm and renewable energy production. Customers could choose from whom they would like to buy electricity. A few years later, the service had to be abandoned: the offer did not sufficiently appeal to customers and they lacked a complementor willing to organize their back-office. In 2018, though, a plethora of energy suppliers proposes locally produced renewable electricity (Wise Nederland, 2018). These business model innovations managed to reinvent value (Massa et al., 2017; Normann & Ramirez, 1993; Priem, 2007) by creating customer benefits that go well beyond the physical materiality of the basic commodity that electricity is (Bansal & Knox-Hayes, 2013). Organizations were able to create a narrative around locality: electricity is produced "*on Dutch soil*". They gained market share by giving people the possibility to choose and trace their electron and give it a color. As explained in the commercial of an alternative supplier: your electricity can come from "*the PV panels of your energy-conscious aunt Karin or from the wind turbine of the farmer a bit further*".

Value creation has been decoupled from the commodity's physical materiality (Bansal & Knox-Hayes, 2013), as organizations developed narratives to trigger a hedonic emotional response to their value proposition (Straker & Wrigley, 2015). This move towards a more customer-centered business model logic (Richter, 2013) also modifies the composition and structure of the value networks and cause a redistribution of value between actors in the value chain (Sabatier et al., 2012). A different business ecosystem of interdependent organizations seems to be emerging (Adner, 2006). Electricity is a very mature and highly regulated market where new entrants have to compete or sometimes depend on incumbents to access key complementary assets. Some organizations specifically position themselves as intermediaries or facilitators that can provide new entrants these complementary assets and help them gain in autonomy. Besides, incumbents increasingly draw on small entrepreneurial firms to propose innovative services to their customers. We argue that this has been possible

because a virtuous cycle (Casadesus-Masanell & Ricart, 2011) emerged with firms co-evolving their business model (Schaltegger et al., 2016) around the alternative logic of proposing locally produced renewable electricity. Figure 2 illustrates the emergence of this virtuous cycle.

6. DISCUSSION

6.1 Contribution to business model innovation

Our paper makes several contributions to the literature on business model innovation (Charles Baden-Fuller & Mangematin, 2013; Bohnsack et al., 2014; Chesbrough & Rosenbloom, 2002). This literature suggests that business model innovation may have dramatic impacts on the dominant logic of an industry by creating an alternative logic that over time replaces the prevailing logic (Chesbrough & Rosenbloom, 2002). Along these lines, previous studies have further suggested that business models can develop value propositions based on alternative definitions of what customers want (Bohnsack & Pinkse, 2017), put forward new revenue models (Bolton & Hannon, 2016; Chesbrough & Rosenbloom, 2002), or reorganize existing value chains (Chesbrough & Rosenbloom, 2002; Kim & Mauborgne, 2004). Our findings both support and extend these studies in three ways.

First, our findings suggest that business models can have a performative role in reinventing what constitutes value in an industry which is then emulated by other actors in the industry. Over the past two decades, in the Netherlands, organizations have consistently generated variations on existing business models or developed radically new business models, thus suggesting new templates for how value can be created, delivered and captured in the electricity industry. These novel templates are now being adopted by incumbents—that are the traditional custodians of the dominant industry logic—which indicates that a new logic is currently emerging in the Dutch electricity sector. We show that a key part of this process is that business model innovations reinvent value (Kim & Mauborgne, 2004; Massa et al., 2017; Normann & Ramirez, 1993; Priem, 2007) by creating new customer benefits for a basic commodity that go beyond its physical materiality. Organizations have been able to decouple value creation from the commodity's physical materiality (Bansal & Knox-Hayes, 2013), in this case electricity, by developing narratives around locality and environmental sustainability. This

pattern where particularly new entrants propose radically new business models which are then emulated by incumbents has been identified before in the business model literature (Bohnsack et al., 2014; Hockerts & Wüstenhagen, 2010). However, we show how reinventing value, in our case by 'coloring the electron', forms a key part of this emulation process because it is the new added value that makes the alternative business models attractive.

Second, we identify three mechanisms whereby firm-level business model innovations can induce change in a dominant industry logic. The business model literature so far has identified that business models play a performative role in changing a dominant industry logic through a creating mechanism (Chesbrough & Rosenbloom, 2002; Sabatier et al., 2012; Vernay & Gauthier, 2019). For the performative impact of business model innovation to be more profound, it seems that, in addition to the creating mechanism, the two other mechanisms—undermining the dominant logic and complementing of isolated firm-level business model innovations—are of critical importance. The undermining mechanism is key as it creates a window of opportunity for new actors to enter the industry with business models that do not fully comply with the dominant industry logic (Geels, 2002; Verbong & Geels, 2007). We expect this mechanism to be especially important in industries that are mature and where the dominant logic is so deeply engrained that most firms design their business model so as to fit in (Kim & Mauborgne, 2004). Regarding the complementing mechanism, it plays an indirect role in changing the dominant industry logic, therefore acting as a catalyzer of change instead. Indeed, complementors are important to help other organizations that could undermine the dominant industry logic or create a new one to enter and sustain themselves (Brandenburger & Nalebuff, 1996). Complementing takes the form of providing complementary assets that help increase the market value of alternative business models. These complementary assets can be very diverse, ranging from knowledge and expertise to access to distribution channels or connections with end customers, and the provision of services (Teece, 1986). This performative role of complementors highlights a unique feature of business model innovation, that is, demand-side value creation where 'value is being created by someone other than the producer' (Massa et al., 2017, p. 93)

Third, we identify two types of reinforcing effects that augment the power of the undermining, creating and complementing mechanisms and thus develop a dynamic model of how firm-level business model innovations induce change in a dominant industry logic. While Casadesus-Masanell and Ricart (2011) argued for a

self-reinforcing effect between different components of a business model, we extend this insight by moving it to the industry level in the form of reinforcing effects between business models. Such reinforcing occurs when enough firms are implementing business model innovations that create virtuous cycles between them. All three mechanisms can have self-reinforcing effects as well as mutually-reinforcing effects. These reinforcing effects are important because they help induce change in industries that are prone to path-dependency (Liebowitz & Margolis, 1995), such as health-care (Hatchuel et al., 2016), energy (Garud & Karnøe, 2003), urban planning (Couch, Sykes, & Börstinghaus, 2011) and transportation (Åhman & Nilsson, 2008). These industries are also key in ensuring transitions towards more sustainable societies. In such systems, the dominant industry logic leads to increasing returns making alternative business models unattractive (Arthur, 1989). In this case, incumbent firms can also be hindered by behavioral path dependencies, limiting the range of business models that they consider as attractive (Sydow, Schreyögg, & Koch, 2009). In both cases, it is necessary to weaken and delegitimize the dominant logic to create space for an alternative logic to emerge.

6.2 Practical implications

A first practical implication of this paper is to gain a better understanding of the dynamics of the Dutch electricity market. Interestingly, the undermining mechanism in the Dutch electricity market can either be supported by firms that are directly competing with incumbents operating according to the dominant industry logic, by firms that position themselves as intermediary in the value chain (e.g. between customers and suppliers), or by non-governmental organizations. Our case study shows, for instance, that by undermining prevailing definitions about what customers want, the role of NGOs is important in informing customers and raising their awareness. Part of the reason for high NGO involvement, especially in undermining the prevailing dominant logic, is the highly politicized nature of the energy industry. Out of concern about issues like climate change, governments and NGOs are relatively more involved in this market compared to other markets. Nonetheless, the prevalence of the complementing mechanism in our findings also indicates a trend where firms are not necessarily involved in an industry to compete head-on with the incumbent firms but rather create space for themselves by being in the role of complementor instead (Brandenburger & Nalebuff, 1996). This finding suggests that the change in dominant industry logic is not only in a direction where electricity is becoming a highly differentiated value

proposition – that is, a move towards product-service systems (Reim, Parida, & Örtqvist, 2015) – but also one where the vertically integrated value chain evolves into an ecosystem (or platform) of focal firms and complementors (Adner, 2017; Jacobides, Cennamo, & Gawer, 2018). In other words, the alternative logic emerging in the Dutch electricity market reflects a change in the value that is being created and captured as well as a change in transactions occurring in the value chain.

A second practical implication of our study relates to how policymakers may effectively induce change in targeted sectors. When promoting private initiatives and innovation programs to reshuffle the logic of an industry, policymakers can adopt a different support strategy depending on how mature the industry is. The more mature an industry is, the more policymakers should work towards helping firms with complementing and undermining business models. These firms are likely to lack support because they may not seem as innovative as the ones that actually innovate in creating an alternative logic. However, our study emphasizes their importance in inducing change in the dominant industry logic when an industry is mature.

6.3 Limitations and direction for future research

The limitations for this study, as any empirical study, pertain to its research design. First, by focusing on the role of business model innovation in inducing change in the dominant logic of the electricity supply industry, we did not examine the role of energy policies that led to the decarbonation of the sector. These policies, of course, also had an impact on changing the dominant industry logic. Our decision to focus on business model innovation was motivated by (1) existing literature suggesting the impact of business model innovation in changing the dominant industry logic in the electricity sector in the Netherlands and (2) the importance to clearly isolate and conceptualize the mechanisms that specifically pertain to how business model innovation induces change in the dominant industry logic. Future research could investigate the interactions between public policy and business model innovation in inducing change in a dominant industry logic. Second, because of the incompleteness of our data—collecting data on the business model of an entire industry over a sixteen years period necessarily entails to missing data—we cannot have a dynamic account of “when” which mechanism is present the most. We only infer a dynamic model and suggest the presence of interaction effects. Further research could investigate the relative impact of these

three mechanisms on change in the dominant industry logic, as well as their interaction effects.

7. Conclusion

The idea that business model innovation can induce change in the dominant logic of an industry echoes a growing interest in the role of business models in inducing sustainability transitions (Bidmon & Knab, 2018; Bolton & Hannon, 2016; Sarasini & Linder, 2018). While the interest for this phenomenon initially stems from the intellectual tradition of organizations and the natural environment, this paper is an attempt to generalize both the empirical and theoretical scope of this phenomenon. We identify three mechanisms whereby business models induce change in the dominant logic of an industry: undermining a dominant logic, creating an alternative logic, and complementing the alternative logic. We believe that understanding how business model innovation relates to wider industrial dynamics is an exciting avenue for research and that our paper is only a first step in this direction.

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Tables and Figures

Table 1. Details on Data Collection

Source of Data	Type of data	Use in the analysis
Archive	Publications about policy developments and the evolution of the Dutch power sector (ECN, 2001; van Damme 2005; Verbong and Geels, 2007; Huijben and Verbong, 2013; Elzenga and Schwencke, 2014; ACM, 2016; 2017;2018;)	Get a global overview of how the power system evolved over time and how this has been shaped by policy interventions. Contextualize the findings in line with sectorial dynamics. Sequencing - Narrative. Identify relevant firms/organizations to interview.
Interviews	1st round of interviews (Green) electricity provider (1) (Green) electricity retailer (3) Matchmaker (3) Energy cooperative (3) Electricity distribution company (2) Association (1) Energy network operator (1) 2nd round of interviews (green) electricity provider (3) Energy cooperative (2) Matchmaker (1) Associations (3) Crowdfunding platforms (2) Third party renewable energy provider (2) Interview with expert (3)	Identify the different roles of the business models from the perspective of the organizations interviewed Identify when in the transition the business models of each organization played a role. Identify additional firms/organizations to interview, especially the complementors Enrich the analysis of the different roles of the business models from the perspective of the organizations interviewed. Question firms about changes in their business model Verify that data gathering reached saturation. Verify the validity of the results and confirm that data gathering reached saturation (that all business model roles have been identified)
Corporate archives	Websites of the twenty-two organizations interviewed. This included both the main pages presenting the firms offer and press releases discussing relevant changes in business strategy regarding decentralization. Websites of five additional relevant actors. (idem)	Triangulate observations in terms of the role played and temporality. Enrich the analysis of the different roles of the business models and their temporality.
Other archives	Newspaper articles or articles published in blogs or professional magazine (7)	Triangulate observations both in terms of the role played and of their periodicity.

Table 2. Mechanisms how business model innovations change the dominant logic

Undermining	**Undermining prevailing definitions of customers value** - Not all green electrons are green in the same way - Coal electricity is bad electricity - Customers do not have to be captive of large utilities **Undermining social structure in the prevailing value chain** - Make it easy for customers to switch supplier - Raise customer awareness they can gain from switching supplier - Improve market transparency **Undermining prevailing value capture model** - Organize collective buying of renewable energy technologies or electricity - Increase the bargaining power of small producers - Improve the ROI of renewable energy technologies
Creating	Creating new definitions of customer values - Give a color to the electron (traceability) - Create value for previously excluded customers - Develop hassle-free renewable energy offers Creating new social structures in the value chain - Create a market place to connect producers and consumers - Make it possible for (very) small producers and citizens to trade power - Create a market place to connect technology providers and customers Creating new forms of revenue model - Lease solar panels - Charge a fee to access the platform - Sell electricity at the production cost
Complementing	Providing key complementary assets necessary to create alternative customer values - Provide competences needed to better communicate about customer values - Help create a brand around alternative customer values - Help incumbent propose innovative services to their customers Providing key complementary assets necessary to deliver alternative customer values - Provide knowledge about norms and rules in the sector - Perform activities which require specific knowledge or expertise - Provide licenses needed to deliver value Providing key complementary assets necessary for business model with alternative logic to capture more value - Help small producers get access to end-consumers - Allow energy cooperatives to diversify their income - Provide additional sales and distribution channels

Figure 1. Reinforcing mechanisms for how business model innovations induce a change in a dominant industry logic

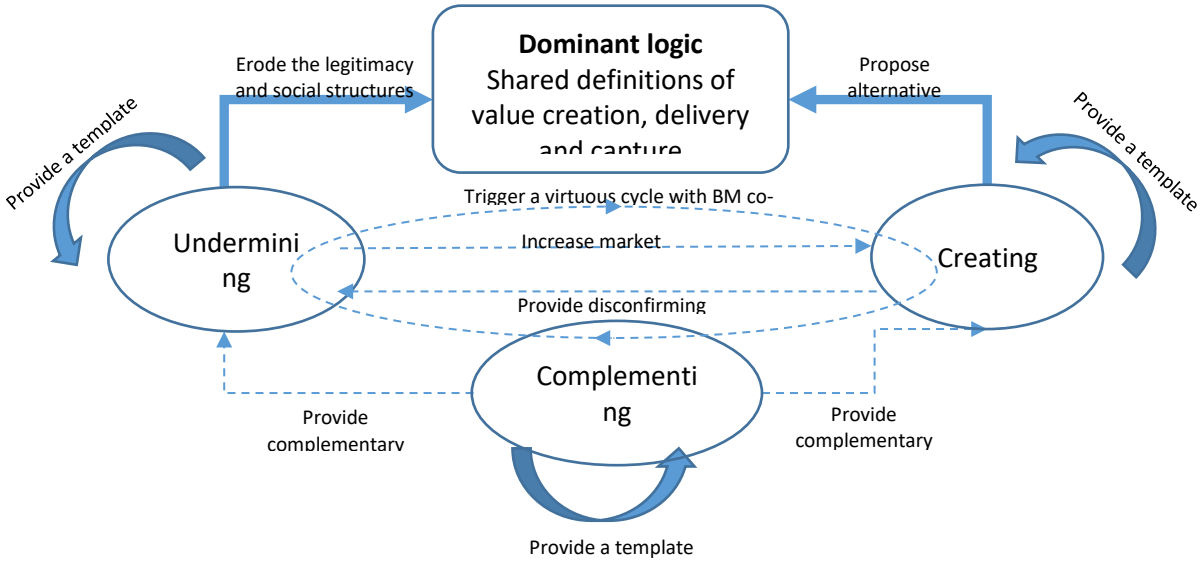
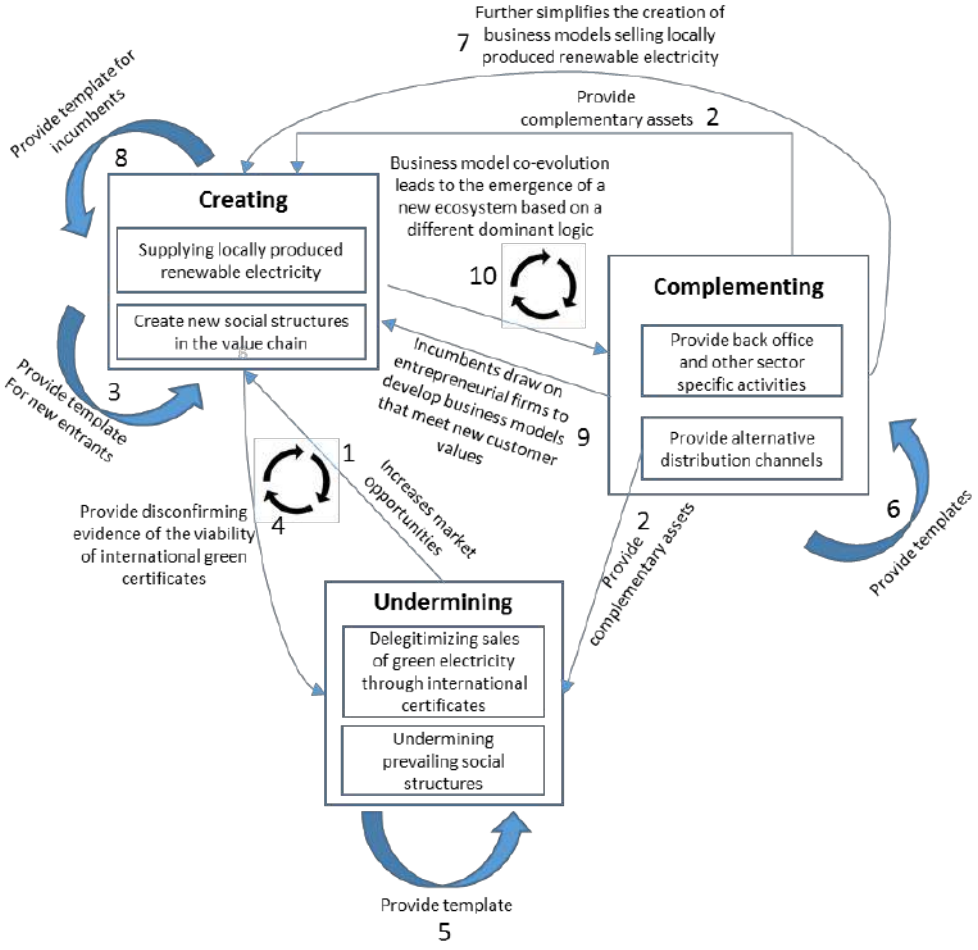


Figure 2. Illustrating the emergence of a virtuous cycle around the supply of locally produced renewable electricity



APPENDIX

Table A1. Organizations interviewed, the year they were established and the role of the persons interviewed

Type of organization	Founded in	Role of interviewee	Date	Duration
		Round 1		
Electricity provider	1999	Senior innovation manager	13/11/15	42 min
(green) electricity retailer	2001	Innovation manager	15/11/2015	55 min
	Idem	Account manager for energy cooperatives	21/07/2016	60 min
	2005	CEO	11/11/2015	50 min
Energy cooperative	2011	Managing director	02/12/2016	36 min
	2014	CEO	18/11/2015	61 min
	2001	Managing director	03/11/2015	45 min
Alternative energy supplier	2013	Founder	17/11/2015	38 min
	2014	Founder	09/12/2015	35 min
	2016	Founder	19/04/2016	60 min
Association	1974	PR in charge of energy issues	08/06/2016	27 min
DSO	2009	CSR manager	17/02/2016	57 min
	2012	communication director	11/12/2015	45 min
Energy network operator	2017	Manager regulatory and government affairs	14/10/2015	67 min
		Round 2		
(Green) electricity provider	1995	Strategic advisor	07/02/2017	35 min
	Idem	Head of smart energy lab	10/03/2017	55 min
	2001	Director Nederland retail	06/04/2017	30 min
Third party renewable energy provider	2011	founder	08/02/2017	25 min
	2010	CEO	23/02/2017	42 min
Crowdfunding platform	2014	Founder	07/04/2017	49 min
	2008	Initiator	14/12/2017	38 min
Comparison site	2004	Founder	02/03/2017	61 min
Association	2016	Director	11/07/2017	30 min
	2016	Operational director	24/03/2017	44 min
	1972	Project leader energy	16/05/2017	43 min
Energy cooperative	2014	CEO	18/04/2019	43 min
	2015	Founder	30/04/2019	64 min
Expert		Independent researcher	22/02/2017	53 min
		Academic researcher	16 and 17/05/2017	75 min
		Independent researcher	26/03/2019	91 min

Table A2. Data Supporting Interpretations of undermining, creating and complementing mechanisms

Data supporting the interpretation of the undermining mechanism	
Mechanism	Representative quotations
	Undermining prevailing definitions of customers value
Not all green electrons are green in the same way	"Many energy suppliers buy electricity for the cheapest price on the electricity spot market and combine this with the cheapest green electricity certificate from abroad. The result can officially be named green electricity but we call it hustle power: there is no incentive to produce more renewable electricity in Netherlands". (wise Nederland) "Traditional energy supplier win a lot of money by producing and selling fossil energy. This old-fashioned dirty energy is often greened with green certificates from abroad and sold as green energy. This means that, on Dutch ground, a lot of electricity is still being produced by coal power plant while people think that they consumed green electricity". (Alternative energy supplier)
Coal electricity is bad electricity	"Our main mission is to speed up the transition, so we will do it in a lot of ways, sometimes by protesting against coal power plants" (NGO) "Coal power plants are producing the dirtiest form of power that is currently used in the Netherlands. Coal power plants in Netherlands are responsible for 26% of our yearly CO2 emissions are therefore an important contributor to climate change." (NGO)
Customers are captive of large utilities	"That was also good for us as a comparison site because what they did is that they created awareness among the consumers".(Comparison site) "Energy is everywhere, always. So why do we need energy suppliers? Forget prevailing norms and come participate to a new movement: a community that produces its own electricity and in which you are the boss". (Energy cooperative) "Cheap and also what helps is that we have a lot of customers that like us because they think that it is anti-establishment". (energy retailer)
	Undermining social structure in the prevailing value chain
Make it easy for customers to switch supplier	"And the value, what I think is important for us is to help people with a smooth switch. That nothing goes wrong. We want to make it easy for them". (Energy cooperative) "We believe that members should have a choice. So we wanted to give them a minimum of two choices and therefore we have two kinds of contracts... So we advise them to take the one-year contract but we want them to choose, to have some more choices". (Comparison site)
Raise customer awareness they can gain from switching supplier	"they shake up the market, they show us that there are new ways to connect production to consumption, Vandebron and Powerpeers are examples of that" (NGO) "They don't like us because we are making it very difficult for them. Because they have to give very cheap tariffs and high cashbacks to be in the top 5 of our comparison site". (Comparison site)
Improve market transparency	"We started with the main components of our concept, which is a web site with a protected environment where in the neighborhood you can upload the offers you get from companies. You can upload it, your neighborhood can upload and you compare them, and you say, "Oh, you got a good price! Really, who is it?" It's a very important function and it's very effective for people". (DSO) "We want to create a transparent market to empower consumers" (Alternative energy supplier)

	"Our mission is to make the market transparent but also the service of the suppliers transparent. How do they help their own customers? Therefore the review platform. We want people to make the best choice. When we started our line was: switch easily, make informed decisions". (Comparison site)
	Undermining prevailing value capture model
Organize collective buying of renewable energy technologies or electricity	"The market, the energy market was open then. So energy suppliers could compete with their prices but they didn't, their prices were high, energy prices. So we thought we can lobby for better prices but that wouldn't work. So we decided to start a collective buying of energy. It was successful because many of our members were interested. But for us it was interesting because they offered global prices". (Association of home owners) "The collective buying of solar panels, we did that I think seven years ago for the first time At that time the market was very volatile, there were a lot of small players which were not always very dependable, so as a consumer you didn't really know, where do I go to, what is a fair price. So we said we will just find a good supplier which we know is good, with one fixed price for a certain set of solar panels. We will communicate it to the consumers and make it clear that this is what you get, we will do all the extra hassle, the installation and making sure the quality is all right. So really targeted to make the market more stable." (NGO)
Increase the bargaining power of small producers	"I would say it does support a more inclusive economy in which we empower consumers and local producers and not the big multinationals". (Alternative energy supplier) "The individual farmers with wind turbines had to negotiate with those utilities their contracts, their power purchase agreements, the PPAs. The farmers in North Holland, the province of North Holland, realized, "Hey, we should not do that individual basis, but do that together." (Energy cooperative)
Improve the ROI of renewable energy technologies	"When the market started you had a small windmill and you went to Essent and said, "I have a small windmill. Will you buy my energy?" And Essent, you know, 1 cent or 0.8 cent and then you have to keep your money, but you couldn't go anywhere. We offered to pay you 1 1/2 cent or 2 cents. We think that's a fair price. That made investments in wind energy much more effective". (Green energy retailer) "We increase the return on investments in renewable energy by 10 to 20 percent". (Alternative energy supplier)
Data supporting the interpretation of the creating mechanism	
	Creating new definitions of customer values
Give a color to the electron (traceability)	"So, we deliver power and gas, but we do that in a transparent way, and also that you can choose your own sources of energy. So you can choose from dedicated sources where your energy is coming from" (Energy provider) "If you get a contract from Vandebron, you can select the source of renewable energy. Literally. Are you going for the wind power from farmer Rens or for the anaerobic digester of farmer Harold? Vandebron leaves the choice to you". (Alternative energy supplier) "It's really about people, it's about you and me, it's our connection, we now have a connection and so we know each other and perhaps we also would like to exchange our electricity, so you are inviting me or perhaps you would like to join me. So it's really about the interpersonal connection". (Alternative energy supplier)

	"It is warm crowdfunding that I do. You know the farmer and you get afterwards his products". (Expert)
Create value for previously excluded customers	"Many people want to have solar and be part of the energy transition but they don't have a rooftop for it. If you put solar on a rooftop nearby you can also apply for some sort of net metering policy. It's called postcode roos. You have the school of your kids nearby, with a group of parents you start a cooperation, and with this cooperation you put solar panels on the rooftop of the school and then [our company] helps to administrate the benefits of this solar production by basically subtracting it from the consumption on your own energy bill as a household". (Energy provider) "The majority of people cannot benefit from their own solar panels because they are renting a home or living in the city center. With [our company] you can also get the advantages of let's say solar power from bigger rooftops on industry parks. There are already thousands solar panels and I can say: those six are mine and I only get what is being produced by six solar panels for my consumption" (Alternative energy supplier)
Develop hassle-free renewable energy offers	"Initially, we thought: we need to help people with the investment, but it has to be hassle free for people. So all the perceived risk needs to be with us as a company instead of with the client. At [our company], we cover the maintenance, the insurance, everything". (Third party renewable energy provider) "Without complications: after registering, Windcentrale takes care of everything". (Third party renewable energy provider) "Our offer includes a Sun & Security guarantee. Imagine that after four years of use your PV panels are hit by thunder, then the system is replaced for free". (Third party renewable energy provider)
	Creating new social structures in the value chain
Create a market place to connect producers and consumers	"We are really an online platform, online marketplace for people that are interested in selling their home-produced electricity or retrieving specific electricity from specific sources of their choice "production". (Alternative energy supplier) "We are a market place so we have demand and supply so we have two customers". (Alternative energy supplier) "We are a marketplace for local energy". (Alternative energy supplier)
Make it possible for (very) small producers and citizens to trade power	"We sell green electricity from individual farmers" (Energy cooperative) "We launched the solar collective. In which not only farmers, well actually no farmers, but only consumers with a small meter". (Alternative energy supplier) "We are doing now a software platform that's trying to coordinate what for you as a consumer is the best balance between the electricity you can buy from the grid, the electricity on your own, the electricity from your neighbor and also to help you with all the transactions". (Alternative energy supplier)
Create a market place to connect technology providers and customers	"We are some kind of intermediary between consumers and installing companies". (Dso) "we have in this model is we also offer third-parties like installation companies or companies that are offering e-management, displace or solar panels, we offer them also the marketplace so they can sell and offer their products and services too". (Alternative energy supplier)
	Creating new forms of revenue model
Lease solar panels	"We offer solar power installation to individuals 'as a service'. Without investment, individual home-owners can user solar panel and directly

	benefit from net savings. Today is the launch of our service 'leasing solar panel to everyone'". (Third party renewable energy provider) "basically, we started to lease solar panel to private households in the Netherlands, a bit like solar city does in the US". (Third party renewable energy provider)
Charge a fee to access the platform	"We have a business model that is based only the latter, so only on posterity subscription model. It's not in our interest to sell more volume or to sell at a higher price and by that we align our interest with that of the customer". (Alternative energy supplier)
Sell electricity at the production cost	"We established the firm that's based on the idea that in the end, all our customers have to be energy neutral, so they use as much energy as they consume and for that we said okay, if that's your mission, that's our mission and we shouldn't earn any money on the consumption of energy" (Energy cooperative) "We sell our energy at a cost price model." (Energy cooperative)
Data supporting the interpretation of the complementing mechanism	
	Providing key complementary assets necessary to create alternative customer values
Provide competences needed to better communicate about customer values	"A total of six stories are available: one general basic story and five more focused stories" (NGO) "I thought with the communication material you have lying around here and the way you are telling this story you won't get people involved. One of my task was to do the marketing and to get people willing to participate" (Energy cooperative)
Help create a brand around alternative customer values	"We help them build a brand which people trust" (Energy cooperative)
Help incumbent propose innovative services to their customers	"I think they decided to join because they talk to their customers and their customers said: could you please help me with producing my own energy? And instead of developing that product line themselves, they thought it was easy to partner with a company like us because we already had an existing product and offer that we could bring to the market straight away". (Third party renewable energy provider) "They can't do it. So that's what Greenchoice wants. They want to give our product to those energy corporations. Hence the white label". (Alternative energy supplier)
	Providing key complementary assets necessary to induce change in existing value chains
Provide knowledge about norms and rules in the sector	"We help them throughout the last year of the realization with knowledge about price you can get per kwh, how the electricity market works, how they can work with the DSO". (Green energy retailer) "We choose for advice, bring people together, give them information, to stimulate them to do something with it" (DSO)
Perform activities which require specific knowledge or expertise	"Provide back-office energy delivery and administration services for local, sustainable energy initiatives". (Energy cooperative) "Thanks to the crowfunding platform we have the means to do all the administration for energy cooperatives" (Crowdfunding platform) "We do environmental impact assessments, permitting issues, all that kind of stuff, regarding large infrastructure and energy projects" (Energy cooperative) "We both collect the data from the turbines, some we get from the DSO some from [our company] itself. We combine that in a data model to see

	how much is produced per year and divide that among customers." (Green energy retailer)
Provide licenses needed to deliver value	"We are too small to do it all by ourselves so we are using the trade floor of [a big incumbent]. You need a license to be program responsible and that is what we are buying from [a big incumbent" (Energy cooperative) "We act as resaler for the cooperative. They do not have the license to deliver electricity to customers. They look for company that can do that for their members" (Green energy retailer)
	Providing key complementary assets necessary for business model with alternative logic to capture more value
Help small producers get access to end-consumers	"On the production side we solve the problem of getting access to the consumer. Because before we launched the independent renewable energy producers that are on our platform, they didn't have access to the consumer. By that they had to well sell it to traditional energy companies that a made a margin on the energy that they sold or that they sell". (Alternative energy supplier)
Allow energy cooperative to diversify their income	For each customer we pay the cooperative a fee. So we created a special sale flow". (Green energy retailer)
Provide additional sales and distribution channels	"We sell solar panels with our service partners". (Energy supplier) "We are selling panels as turnkey solutions". (Energy supplier) "We want to help people generate their own electric. We tried to do it with our PV proposition". (Energy supplier) "Energy suppliers were interested to join because they could get many customers that way. But for example Essent, Nuon and Eneco, they don't join." (Association of home owners)

Transformative Business Models for Dutch AgriFood Transition Pathways

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Abstract

New Dutch agrifood business models are emerging in response to economic, social and ecological pressures: new players arrive, new logistical pathways come to the fore and innovative consumer and farmer relationships – food co-operatives – are forged. How do new business models relate to reconfiguring the Dutch agrifood system? Our research combines future exploration (backcasting) and analysis of new business models. We developed three agrifood transition scenarios with various groups of stakeholders. For each scenario, we then analysed a specific, representative business model to explore the different roles of business models in agrifood transition.

Business models in the "Added value in and with the countryside" already exist and occupy a niche in the market. However, a breakthrough of these business models require large-scale institutional and behavioural change. Business models in the "New products, specific markets" exist but are rare. They usually concern high-value specialist products that could result in widespread market change, but might require little institutional change. The "Sustainable production methods" most resembles the current system. Some associated business models become successful, but they have difficulty distinguishing themselves from conventional produce, which raises questions about whether business models are able to drive a transition in this direction. Thus, our results lend credence to the hypothesis that different transition pathways offer specific potential for and requirements of new business models.

Keywords

Agrifood transition, transformative business models, transition pathways

Introduction

The Dutch agrifood regime is grinding to a halt. International economic pressures force Dutch farmers to further scale up and intensify their businesses, while food scandals and calamities as well as many and varied negative environmental impacts have led to an all-time low societal acceptance of the agrifood regime as well as a host of legislative measures to stifle further growth. Such a situation, in which regime pressures increasingly undermine the regime, represents a strong call for transition of the Dutch agrifood system.

At the same time, new business models emerge: new players arrive, new logistical pathways come to the fore and innovative consumer and farmer relationships – food co-operatives – are forged. In a sense, the transition is already under way (cf. Hermans et al., 2010), with new business models forming an important backbone. However, the way forward is still a matter of great uncertainty and controversy: How do new business models relate to reconfiguring the Dutch agrifood system?

We explore the hypothesis that different transition pathways put specific demands on the role of new business models. We studied various new business models in the Dutch agrifood system and their relations to three different transition pathways. Our research combines future exploration (backcasting) and analysis of new business models.

In this research, we approach this question from two angles. First, we introduce a transition-oriented business model concept, in order to effectively link new business models to transition. Then we shortly touch upon the transition pathway typology introduced by Geels *et al.* (2016) and describe three different transition pathways for the Dutch agrifood system. We report on 2 business models in each of these transition pathways. The paper ends with a discussion of the role of business models for different types of transition pathways.

Transformative agrifood business models

When do new business models lead to transition? Most business models can be seen as business-as-usual, as part of current regimes. For Dutch agriculture and

horticulture, the dominant model consists of cost-price efficiency-driven businesses that produce good quality commodities for international markets. Social and environmental effects are seen as prerequisites rather than part of the value of the product. In recent years, however, more and more scholarly attention is directed towards the development of new business models (Jonker, 2014), sustainable business models (Schaltegger, Hansen, & Lüdeke-Freund, 2016), sufficiency-driven business models (Bocken & Short, 2016), et cetera – in short: business models that might contribute to transition rather than regime optimalisation. What are the conceptual ramifications of this development?

The term "business model" has at least three different meanings. As an *ontology*, a business model is a list of aspects and relations that together constitute a business (Osterwalder, 2004; Osterwalder & Pigneur, 2013; cf. Upward & Jones, 2016). The most famous example of this is the business model ontology by Osterwalder, which forms the basis of the business model canvas. In the form of a *practical operationalisation*, it describes how a (group of) actors together produce products and services that, when transferred to a consumer, provide the consumer with various values, and the producers with a financial return (Boons & Lüdeke-Freund, 2013). It is a description of how a company or companies are able to make money by supplying products and services. Finally, as an *instrument*, a business model is a tool that can be applied to existing companies, to analyse companies or design new business models.

The Osterwalder canvas model (Osterwalder & Peigneur, 2013) is probably the most popular way to describe business models in business theory literature. At its core, there are nine coherent parts: 1) the value proposition, the bundle of products and services expressed in a price. This is offered through 2) relations and 3) channels to one or more 4) customers (or market segments). And this then leads to 5) income. There is also a business process that consists of a series of 6) core activities, using a few 7) resources, and in cooperation with a few 8) key parties. And all this brings with it 9) costs. There may be many more precise elaborations or variations on this model, but it can be justly claimed that, with these nine parts, it is definitely possible to explain a business model (Eppler & Hoffmann, 2012; Upward & Jones, 2016).

At the same time, the amount of criticism of the implementation of the business models in practice is increasing. We begin with three conceptual criticisms. Firstly, many scholars point out that value in terms of financial profit is seen as the most important success criterion (Bocken, Rana, & Short, 2015; Miller, Park, Evans,

Bamford, & Bocken, 2016; Upward & Jones, 2016). This view of value is criticised because it does not include other considerations such as environmental and societal value (People-Planet-Profit, in other words, the triple bottom-line; cf. Ehrenfeld, 1997). Moreover, it only sees value as being something positive, whereas many businesses produce negative values (externalities), produce value for something for which they do not get paid, and value that cannot yet be monetised, but will be in the future (Bocken et al., 2015).

Secondly, various authors state that only a limited number of parties involved are taken into consideration, mainly the company, production partners/supply chain partners and the consumer. From a sustainability perspective, the environment, society and nature should also be included (Bocken et al., 2015; Upward & Jones, 2016).

Thirdly, business theory literature about business models gives little or no attention to the social and physical environment of the business model. The context is not given and, therefore, is as it were implicitly treated as being constant, stagnant (cf. Upward & Jones, 2016). However, from a transition point of view, the context is continuously moving: changing laws and regulations; changing public opinion; emerging new practices and movements, such as local-for-local, foodies. And a context in movement is constantly offering new opportunities and obstacles.

A second set of criticisms concerns the business model canvas as a tool to design new business models. Research about the use of Osterwalder's business model canvas points out that the results with the canvas model are seen by users as being less creative than simply using an empty PowerPoint slide (Eppler & Hoffmann, 2012). Various researchers (Eppler & Hoffmann, 2012; Miller et al., 2016, June) question a number of categories in the business model canvas, and suggest that the canvas is already so complicated to work with that this is at the expense of the result (cf. cognitive overloading, Beers, Boshuizen, Kirschner, Gijselaers, & Westendorp, 2008; cf. overscripting, Dillenbourg, 2002). Upward and Jones (2016) finally concluded that the business-as-usual nature of the business model canvas, together with its popularity, in fact even pose a risk to sustainability.

These collective criticisms suggest that, in the context of transitions, the business model canvas has several shortcomings. Furthermore, extending the business model to alleviate these shortcomings would probably result in severe limitations to its practical usability, given the current cognitive demands of using the model

in practice. Drawing upon these criticisms, we identify some goals for a transition-oriented business model concept. Firstly, as a transition implies a structural change, this means that the context for the business models involved will change in an important and possibly influential way. A business model concept should include changing discourses (e.g. increasing criticism regarding intensive livestock farming), institutional change (e.g. the Paris Agreement), new practices (e.g., in the case of agriculture, home delivery), and changing relationships with relevant stakeholders are changing (e.g. greenhouse cultivators talking to Greenpeace about climate issues). In other words, the business model should be reflexive (cf. Beck, Bonss, & Lau, 2003; Hendriks & Grin, 2007; Beers & Van Mierlo, 2017).

Regarding value, it is necessary to have a broader orientation with respect to value, not only the value that can be described using monetary terms today, but also how that value will change in the future, in terms of value for people and plant, and both positive and negative value. Furthermore, transitions concern functional and/or geographical systems, where ecological and social developments are an inherent aspect. In terms of value, this means that the value is not only economic and positive, but it may also be negative, and social or ecological.

As a first step towards a *transformative business model*, we build on a simplified business model canvas and include a reflexive orientation (see Figure 1). The core of the business model is captured by four aspects:

- *Value:* What are the different types of value (people, planet, profit) supplied by the business model, and to whom?
- *Products / services:* In which products/services is this value evident (including the production process)?
- *Production and chain:* How can I create the product/service and deliver it to the client/consumer (including key parties/partners)?
- *Valuation*: What do I get back for the added value I provide, and how?

We add a reflexive orientation by drawing on Beers and Van Mierlo's operationalisation of reflexivity (2017):

- *Discourses:* The changing way of thinking in society, for example when it comes to animal welfare, climate change, health care, mobility, et cetera, that can represent opportunities and threats for a business model.

- *Relations*: The changing possible relationships with societal actors that can offer opportunities and threats in the form of new clients, new stakeholders and new co-producers.
- *Practices*: Upcoming and disappearing practices that could create possibilities and limitations for new business models, such as with respect to logistics (home delivery) the 'maker' movement (the citizen creates more and more themselves), information and communication technology (production and supply chains are becoming more transparent) and energy supply (more and more citizens and farmers are producing and selling their own energy).
- *Institutions:* Changes in laws and regulations that lead to changing access to the market. For example, the Dutch supermarkets that no longer sell battery eggs.

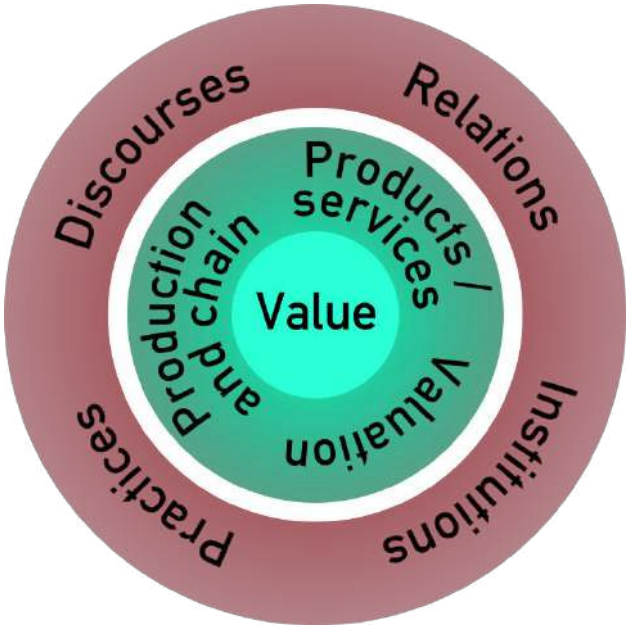

Figure 1: Transformative business model concept

Transition pathways

Geels et al. (2016) distinguish between four different types of transition pathways, which differ in the roles of institutions, actors and technologies. In the *substitution* pathway, transition comes about through new entrants that substitute incumbent firms with new technologies. This process is accommodated by limited institutional change, with some additional support for emerging niches. In the *transformation pathway*, the transition is mainly carried by incumbent actors, with limited (improving dominant technologies) to radical technological (technological

substitution) and institutional change. In the *reconfiguration* pathway, transition is carried by new alliances between new entrants and incumbents, and associated new combinations of technologies. Institutional change may be limited but can include legislation about operations. The *de-alignment and re-alignment* pathway is the most disruptive one, occurring when a regime collapses while alternatives have developed only to a limited extent. In the period that follows, a new regime forms around new actors and technologies, with associated disruption of institutions.

This pathway typology was illustrated by examples from historical research. In our research, we focus on transition in the making. For the Dutch agrifood system, it is, as of yet, not clear what direction and depth future development will have, despite the fact that the agrifood system has given rise to a host of innovative agrifood practices. So, instead of doing an historical analysis, we produced three scenarios for Dutch agrifood transition, based on back-casting exercises in meetings with a broad range of actors from business, higher education, NGOs and lobbying organisations, and governments (cf. Loorbach & Rotmans, 20016; Rotmans & Loorbach, 2009).

Reconfiguration: Added value in and with the countryside

The first scenario, "Added value in and with the countryside" represents a reconfiguration pathway. In this scenario, consumers are increasingly critical about food origins and production. This provides opportunities for entrepreneurs – current farmers and new entrants in logistics and sales – to create added value by sharing their story about their societally responsive production methods and locations. This scenario features relatively small and extensive production of an exclusive product for a demanding consumer. For example, local production (local-for-local), short supply chains, sales using alternative channels such as the internet or pickup points nearby, and more extensive production methods with extra attention to soil, biodiversity and animal welfare. The consumer knows more about the production method, the product and origins, and that their purchase contributes to the local economy. Farmers often combine agricultural production with healthcare or recreation.

Associated new businesses focus on ways of farming and cultivating that strengthen the connection between consumer, food and countryside: Where does my food come from? How is it produced? For example, meat products that contribute to maintaining the diversity of species of farm animals; local products that are not only food, but also culture; and production methods that pay extra

attention to the animal and nature. The extra added value in these types of business models, compared to the conventional set-up, is provided in various ways: transparency about the origin and production methods; connecting the region with the countryside; and the added value for nature and the countryside, to name but a few. And, in some cases, a section of the city where urban agriculture is able to provide a kind of 'countryside' function. It is often about small product flows.

Substitution: New products, specific markets

The second scenario, "New products, specific markets," concerns new technological opportunities for high-value products. It can be seen as a substitution pathway, especially from a market perspective. Technological developments enable new business to move away from the Dutch dominant model of cost leadership with commodities towards producing high-tech, high-value specialties for specific markets, such as salt-tolerant vegetables, meat substitutes and vegetables with exceptional nutritional content. Developments such as climate change, scarcity of raw materials and increasing population levels are generating a demand for products that can change in line with these developments. Technological developments are making new products or cross-overs possible. And this is making it possible to serve specific markets with targeted added value propositions, instead of creating a traditional product for the entire society.

In the transition path of new products and specific markets, it is often about new crops and/or technological adaptations to existing products. For products, examples include saline crops and insects, creating value from waste flows and the extracting components, both for food and for other industries (chemical and medical). And also, the production of high-grade proteins from plant-based sources. The characteristics these business models have in common are that they all use relatively new production technology that is not yet commonplace in the sector today, and that each business model is based on new products for specific markets.

Transformation: Sustainable production methods

The third scenario, "Sustainable production methods," combines technological innovations and societal values by drastically reducing odour pollution, preventing mineral emissions altogether, cutting back antibiotics use and using only renewable sources of energy, while improving animal welfare (transformation pathway). Associated new business models are traditional in the sense that they

are mainly based on existing products. The main difference is that, thanks to technological innovations, they represent a major step towards sustainability.

The latest developments in both intensive and non-intensive livestock farming are making it possible to drastically reduce odour pollution and to almost prevent mineral emissions altogether. Also, the use of antibiotics has been drastically cut back and the attention paid to animal welfare has in the meantime increased (compared to traditional common practice). And more and more farmers are generating their own electricity and/or heat.

We are seeing similar developments in greenhouse horticulture. The use of herbicides, pesticides and insecticides has been dramatically reduced (especially in the cultivation of fruit and vegetables). This is partially as a result of the successes arising from organic agriculture, as well as recent developments in cultivation techniques (Next Generation Growing) and new greenhouse concepts (daylight greenhouse, ID greenhouse). These developments are making it easier to grow products without CO2 emissions from fossil fuels (for example by using geothermal heat, heat pumps, ground water and residual heat).

Methods

We studied three novel agrifood business cases, food forests, green urban solutions, and climate-neutral greenhouse production, as business exemplars for each of the future scenarios. For each business case, we conducted a series of interviews with entrepreneurs and associated stakeholders in the business models. Interview data were either fully transcribed (in the Food forest case) or summarised and offered for correction to the interviewee (in the other cases). We then conducted a qualitative analysis using the eight categories of the transformative business model as analytical categories. For each category, we identified from the data every structurally different way in which it conceptually applied.

Results

We analysed three business models in detail, one for each scenario (see Table 1).

Scenario	Business model
Added value in and with the countryside	Food Forests
New products, specific markets	Green Urban Solutions
Sustainable production methods	Climate-neutral greenhouse production

Table 1: Scenarios and business models

Added value in and with the countryside: Food forests

Permaculture is an agricultural method that aims to produce agriculture products in a system that closely mimics natural ecosystems. The resulting agricultural production systems include up to seven layers of very diverse, mostly perennial production. Cited benefits compared to conventional agriculture include high system resilience, low to non-existent requirements for pesticides, and a very long production season. One common term for / form of permaculture is the food forest. In our study, we encountered to main types of food forests business models:

- A business model that combines production values and social values (e.g., care farming, social entrepreneurship, education, recreation, ...). Incomes is generated more or less evenly from both production and social activities, with additional support from subsidies.
- A production-oriented business model, which predominantly generates income from selling produce. This business model can still be combined with social services, but these only constitute a minor source of income.

Food forest produce has several dominant values, concerning product quality (e.g., being residue-free, transparency about production means, product uniqueness), environmental values such as carbon sequestration, biodiversity, soil

structure / water retention, and social value produced through education activities, recreation activities, and consumer involvement.

Food forest products and services are many and varied, according to the food forest farmer's tastes and preferences. All food forests included in our research produced various fruits and vegetables, up to 400 varieties per food forest. Some food forests also include services such as home delivery, pick-up at the food forest, and preparing meals.

In terms of production systems, the food forests we studied varied a lot. Starting a new food forest takes an initial investment for land and plants, which will take a year up to decades before they start giving a yield. Input costs diminish over time and after about ten years, as the food forest increases its production and matures, it becomes self-sufficient. The production systems share various functions, that each require specific vegetation, such as nitrogen fixation, pest control, unique products (taste, rarity) and cash crop. Customers include restaurants and specialty stores as well as individual consumers.

Revenue streams differed a lot between food forests. Interestingly, our interviewees were largely unable to specify production-associated income estimates. Other revenue streams included subsidies for ecosystem services and revenue from social activities (such as education and recreation).

Our interviewees see food forests as fitting with an increasing societal awareness of the relations between food and sustainability, among specific consumers looking for "responsible produce". This translates into consumer loyalty towards permaculture principles and trust in the food forest farmers. Another emerging discourse concerns the circular economy. While vague, the interviewees see food forests as a very circular example of food production.

When looking for connections with consumers, the rise of online sales in many different sectors is a promising practice for permaculture businesses, allowing channels of sales to specific consumer groups that are hard to reach otherwise. Other new relations include governments, who, currently in The Netherlands, are trying to support food forests, and conventional farmers, who may be interested in experimenting with a couple of hectares for food forests.

In terms of institutions, some interviewees detect a rising government interest in agro-ecological initiatives and shifting responsibilities for land stewardship more

towards the entrepreneurs. That might result in legislation that would be more favourable to food forest production than to conventional production.

Relating the food forest business model to the scenario, several characteristics stand out: relatively small and extensive production of exclusive, localised produce for demanding consumers, combined with social / educational functions and some subsidies. In contrast to conventional agriculture, uniqueness, diversity, multi-functionality and transparency appear to be key selling points. Furthermore, these core values are currently interesting for a small group of highly aware consumers. For a transition to take place, this would either require a widespread increase in consumer awareness (unlikely) or some kind of market protection, since food imports do not need to conform to the same high standards as food forest produce and will likely be cheaper, and therefore more attractive for the average consumer.

A related challenge, for the scenario, resides in the reconfiguration of production systems themselves. The assumption would be that current conventional producers, together with new entrants, would switch to more extensive, local-for-local production systems, of which the food forest is one example. However, given the current small market perspective, no basis exists for a scaling out of such production systems. Further institutional arrangements could provide stronger market incentives. One of these might reside in the formation of 'food co-operatives' of citizens and farmers to ensure adherence to certain production methods and adequate supply and remuneration. Furthermore, this pathway implies a drastic change in diets, since a Dutch localised production would mean eating seasonal produce instead of luxury goods from all over the world, all year long. Finally, logistical networks need to be more fine grained and points of sale more diversified. In sum, it would appear that the reconfiguration scenario in our study may be able to use existing business models that are already successful in niche markets, such as food forests. However, for these business models to results in transition, it would require logistical reconfiguration too, new diets, new institutional arrangements between producers and consumers and some kind of market protection for more "agro-ecological" production systems.

New products, specific markets: Green urban solutions

We conducted an exploratory study of various entrepreneurs and associated stakeholders in the field traditionally associated with tree nursery and gardening

– basically the production of plants for decorative uses in the city. Recently, however, we see the emergence of more functional, specific, and high-value uses of "green in the city", which we have named green urban solutions:

- Plants for urban farming / urban agriculture
- Green roofs and green façades
- Green interiors / living walls

In all these cases, there is a move from generic products with decorative uses to specific products with specific uses.

Green urban solutions, depending on their specific form, can serve a whole range of values, including purely environmental, purely production, and economic values (see Table 2 for an overview). For example, urban farming is associated with production value, but is also suggested to be valuable for mental health and recovery from illness. Furthermore, participating in the maintenance of urban gardens also has social advantages, is said to contribute to social cohesion within neighbourhoods.

Type	Values
Plants for urban farming / urban agriculture	Nutrition, mental health, social cohesion, biodiversity, water retention / flood prevention, knowledge about food / education, liveability
Green roofs and green façades	Water retention, heat reduction / mitigation of heat stress, decoration, liveability, insulation, roof durability
Green interiors / living walls	Liveability, worker productivity, consumer behaviour

Table 2: Types of green urban solutions and their values

The products and services offered go beyond the plants themselves, but now include societal functions and the services needed to keep providing those functions, such as gardening and design. From the plant nursery perspective, this

is not a big role change, but the partners involved in producing green urban solutions are more varied now. When it comes to urban agriculture, for example, production is often carried out by volunteer-participants. When it comes to green roofs and façades, green interiors and living walls, architects play an important role now. Table 3 shows a list of functions and associated production partners of green urban solutions.

Functions	Partners
Care: health care, physical rehabilitation	Primary and ambulatory health care institutions, hospitals
Social cohesion: participation of disadvantaged groups	Municipalities
Recreation: food and drinks	Bars, restaurants, food services
Education	Schools
Shopping	Liveability, worker productivity, consumer behaviour

Table 3: Functions of green urban solutions and associated partners

In terms of generating revenue, this functional breadth poses problems. The initiatives that we studied generated income from government actors (including some subsidies) and from private partners (project developers). The presence of green urban solutions then, in turn has added value for “users” such as care providers and restaurants. However, they do not pay directly for the presence of green urban solutions, they only indirectly factor in, as an advantage to a specific location. A challenge resides in generating income from end users.

Several emerging discourses align pretty well with aspects of green urban solutions. Regarding food, more and more people seem to appreciate full disclosure about where their food is from and how it is produced. Urban farming is an excellent example of how such disclosure can be provided. Similarly, the

emerging societal discourse about climate change was mentioned as important for functions such as heat stress reduction and water retention.

Promising relation might be possible with health insurance companies and municipalities. These are both powerful actors that might benefit from green urban solutions on a more aggregate level.

In terms of institutions, it would be especially beneficial if methods were to develop that enable pricing the value of green urban solutions. Some such experiments were mentioned by the interviewees, but, given the difficulty of generating revenue from end users, more such methods could be promising for further upscaling of green urban solutions.

Finally, the development of green urban solutions seems to coincide with the emergence of bottom-up initiatives and societal participation, which might provide opportunities for their further development.

Relating to our scenario, the first aspect of the green urban solutions that stands out is that it is not an agrifood example, but only agriculture. However, for the purposes of our analysis, perhaps it is more important that the associated products and services are fundamentally different from the traditional arboriculture products that they substitute: the green urban solutions offer more value and are more knowledge intensive. This suggests that they belong to a different market – the system changes from a market based on commodities and cost-price leadership to a market based on quality high-end products and high margins. It may be the case that these changes will cater to different consumers too. New markets need to emerge that connect new consumers with these products. Interestingly, all these changes occur mainly on the production side. In other senses, they do not require so much system reconfiguration, apart from logistics focused on specialties instead of commodities.

Sustainable production methods: Climate-neutral greenhouse production

The Dutch greenhouse sector is responsible for about ten percent of the Dutch yearly natural gas consumption, mainly to heat the greenhouses. Many entrepreneurs are looking to reduce their energy consumption and so increase

their cost-efficiency. The more radical option, however, is to move away from gas completely, and exchange it for geothermal heat combined with specific greenhouse innovations and new production methods that require less heat. Hence the contours of a new business model: climate-neutral greenhouse production.

The main value proposition of climate-neutral greenhouse consumption, compared to conventional agriculture, resides in its relative advantage with regard to CO_2 emissions. Other business values are inherent in the products, such as taste and size, and do not differ from conventional produce. In other words, the climate-neutral greenhouse does not provide specific products or services. In that sense this business model is comparable to organic production, which requires certification of a production method in order to be distinguishable from conventional produce.

Changing to a climate-neutral business requires substantial investments in energy provision, such as installing geothermal heat and/or the use of heat pumps and heat exchangers in combination with seasonal storage in aquifers. Furthermore, some interviewees state that they use specific, innovative greenhouse designs. However, most interviewees still saw these investments as investing in energy efficiency, not in terms of a new business model. Some do you use a label ("Grown with geothermal heat). Sales organisations are enthusiastic, but this label rarely reaches the end consumer, suggesting that traders only focus on security of supply, product quality and safety. In that sense, the question remains whether one may speak of a business model if the end product cannot be bought as such by the consumer. It also means that climate-neutral greenhouse production has no specific valuation method.

For our interviewees, the main value proposition of climate-neutral greenhouse production is well-aligned with the emerging societal discourse about climate change and energy transition. Indeed, one mentioned that climate-neutral production is not an end, but a means to reconnect to society. Climate-neutral production is also seen as related to corporate social responsibility.

Some of our interviewees have taken steps to connect with new, unusual actors such as Greenpeace, to strengthen their position. Other actors, however, appear rather problematic. Concerning the role of the government, interviewees note that it is easier for conventional businesses to acquire building permits, because policy offers are better acquainted with the conventional. Interviewees hope that

banks and lobbying organisations will support climate-neutral greenhouse production, but this was not yet the case at the time we performed our interviews (2016).

In terms of institutions, interviewees have the impression that Dutch rules and regulations favour conventional greenhouse growers. The energy taxation system is 'defensive', that is, tax costs level off with higher consumption, which makes it harder to derive a competitive advantage from investments in one's energy system. Furthermore, no mechanisms currently exist that would result in a higher price for produce with a big climate impact, meaning that the climate neutral producer does not have a market advantage in that regard either.

New practices include the sourcing of sustainable CO_2 as fertiliser for the plants. Currently, many Dutch growers take CO_2 from their combined heat-and-power installations. Climate neutral growers do not have this source available and need to look elsewhere for CO_2.

The business model of climate-neutral greenhouse production fits very well with the transformation scenario. It concerns changes among the incumbents to take into account some sustainability aspects, but does not require new entrants. The products stand out, not because they differ from the conventional, but because they are the same. From a business model perspective, this is especially problematic, because it makes it hard to stand out in the market, while the new modes of production do require investments in production infrastructure. Clearly, such a transition requires legislation that at some points come to enforce the necessary changes. Up until that point, opportunities may exist for new business models based in improved production methods. However, the example that we studied actually shows how hard it is to base a new business model only on added value that is produced during production, and not apparent in the product itself.

In sum – our reconfiguration scenario leads to radically different environmental business value. However, despite some adoption of these technologies, few existing agribusiness have reoriented their underlying business model. For the agrifood system, this actually means very little reconfiguration in terms of food culture and practice. It does require legislation and finances that forces agribusiness to change, but diets and logistical systems can remain largely the same.

Discussion

In this paper, we explored three future scenarios that each exemplified a specific type of transition pathway. Next, for each scenario we studied a business model that might act as a carrier for transition. In this section, we gather hypotheses about the role of new business models in different transition pathways, based on our analyses.

First – the scenarios clearly differ in the kind of transition pathway that they represent as well as the role of new business models. The first, reconfiguration scenario – added value in and with the countryside – appears most far reaching in terms of systemic reconfiguration, requiring changed logistics, food chains, modes of production, diets, and institutional change. However, associated businesses are already successful for a specific consumer group. Innovative entrepreneurs have already shown that they are able to earn a living in their specific niches. The challenge resides in scaling up, since that would require market access to conventional consumers that not share the same level of awareness and preferences as the current consumers. For them, the products should be at least as good as conventional products, and cheaper as well. So, while the business models exist, the challenges for transition are far reaching.

The substitution scenario clearly requires new markets. Again, producers have already shown that they are able to successfully produce for these markets. However, the example of green urban solutions also shows that those markets still need to develop. Who benefits most from new products? And who is the end consumer that pays for them?

The transformation scenario seems the most straightforward in terms of business models. Although are example has not been successful yet from a marketing point of view, the transformative businesses in this case can use the same logistical channels as the conventional producers, since the end product is mostly the same as the current commodities. Perhaps the essential driver in this scenario would be institutional change that enforces certain production methods, while it might be harder for producers to actually derive a business model from specific production methods. In sum – our results lend credence to the hypothesis that different transition pathways offer specific potential for and requirements of new business models.

The current study has shortcomings in the sense that it only included three different business models. In that sense our conclusions are limited to the hypothetical. In future research, we hope to add more business model analyses to our research, to be able to learn more about the role of new business models in different types of scenarios.

With regard to new business models, we opted to introduce a new concept for transformative business, based on the canvas business model but with some simplifications to make it more useful and some additions to make it better fit with transitions. Our analyses suggest that the eight categories in the transformative business model concept are applicable to three very different business models. Furthermore, the categories of discourses, relations, institutions and practices appear important to relate these business models to transition scenarios, which would suggest that the transformative business model concept might be useful for entrepreneurs that hope to contribute to transition. In turn, we hope that our work contributes to the success of these entrepreneurs.

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Transformative incumbents? – The role of the private sector in innovation systems dedicated to sustainability

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Abstract

The paper explores the role of incumbent firms in innovation systems dedicated to a transformation to sustainability. In order to account for the systemic nature of global sustainability challenges, the author adopts a business model perspective which allows to connect individual actors' purpose and activities with systemic performance. Departing from innovation systems theory, sustainability transitions, and corporate sustainability, a systematic literature review discloses previous research on the interrelation of business models and innovation systems. The findings reveal that there are different possibilities for firms to connect their business models to the functioning of innovation systems, including networking with peers and other allies, reconfiguring supply chains, collaboratively aligning existing institutions, educating consumers and suppliers, creating legitimacy and new markets, stakeholder involvement, and open communication of new visions and paradigms. These findings are distilled and incorporated in a proposed model of business model innovation aiming at introducing a dedication to sustainability to an innovation system. As such it contributes to the growing scholarship on business models for sustainability by taking a slightly different stance: Business models for driving DIS are expected to shape innovation trajectories instead of socio-technical system configurations. They do so by introducing a dedication to sustainability in innovation processes across the system, for in-stance by extending the logic of strategic innovation decisions from cost reduction and risk minimization to the creation of societal value. The research is limited by the paucity of relevant literature and yet lacks an empirical substantiation, which is beyond the scope of this conceptual paper.

Keywords

innovation system, dedicated innovation system, leverage points, business model, incumbents

What's in it, and for whom?

Achieving Balanced Value Capture in Collaborative Cross-Sector Business Models for Sustainability

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Extended abstract

In the light of contemporary phenomena such as the circular economy, smart cities, or the sharing economy, the question of how multiple actors manage to set up *Collaborative Cross-Sector Business Models for Sustainability* (CCSBMfS) has attracted increasing interest (Pedersen et al., 2017). How to ensure *balanced value capture* can herein constitute a particular challenge: Configuring a *collaborative* business model is challenging because multiple actors need to work together in a manner that extends a traditional buyer-supplier relationship (e.g. Rohrbeck et al., 2012). Configuring a *cross-sector* business model is challenging because actors from different sectors (e.g. private and public) have different understandings of what actually constitutes 'value' (e.g. Breuer & Lüdeke-Freund, 2017). Lastly, configuring a *sustainable* business model is challenging because of the normative requirement that value must not only be delivered on economic but also ecological and social bottom-lines (e.g., Schaltegger et al., 2016). Given this, it seems important to better understand how the actors involved in configuring a CCSBMfS align the value formulas of their individual business models and ensure they all have sufficient incentives to jointly operate the CCSBMfS.

In this study, we set out to explore the barriers that actors meet in the process of configuring a CCSBMfS and how they manage to overcome them. We conduct an

in-depth single case study (Ridder, Hoon, & McCandless, 2015; Stake, 2000) of a Mobilitity-as-a-Service (MaaS) project in Aarhus Municipality, Denmark. The case is a pilot project which aims at setting-up and testing a digital travel planning platform that integrates public transport as well as private ride-sharing. The project is an ideal setting to investigate the configuration of a CCSBMfS because the MaaS project (i) has the explicit purpose of finding out whether such a MaaS platform can be operated with a sustainable business case, (ii) runs over a clearly defined timeframe of 21 months, and (iii) depends on the collaboration of actors such as the city, various municipalities, private train and bus companies, existing car- and bike-sharing operators, and software companies that each have diverging stakes in setting-up such a platform.

Based on a comprehensive data set consisting of participant observations from project workshops and meetings, documentary data such as status reports and project presentations, as well as interviews with key informants, we highlight which barriers the project partners faced and which practices they used in the process of configuring a CCSBMfS. The findings from our preliminary, inductive data analysis indicate the reliance on a threefold set of practices as helpful for overcoming the barriers to configuring a CCSBMfS:

Practices to overcome non-transparency and non-disclosure: We found that unawareness of the other parties' value formulas as well as uncertainty about the effect of the MaaS platform on the own operations were consistent concerns for the individual actors in the project. Competitive dynamics and ill-informed assumptions about others' rationale for participation further aggravated these concerns. In the paper, we show how the project partners managed to establish an understanding for each other's strategic interests as well as their individual must-haves and deal-breakers for joining the platform, so that they could agree on how an attractive value formula for MaaS in the municipality of Aarhus can look like.

Practices to overcome non-compatibility: Despite differences in the understanding of the potential value of the platform and the 'business case' for themselves, all the actors recognized sustainability as a 'bigger reason' to participate in MaaS. Yet, their collaboration was hampered by different working logics (such as start-ups versus public authorities) or their different planning and return-on-investment horizons. In the paper, we illustrate how actors configured and re-configured responsibilities and resources over the course of testing and prototyping the MaaS platform,

so that they could eventually establish activity systems beneficial for all of them.

Practices to overcome non-practicability: A number of practical challenges made it difficult to keep up momentum and motivation over the course of the project. As typical in such settings, no single actor had formal authority over the others and participants only came together for a limited time in project meetings. In the paper, we carve out how they still managed to build a sense of direction, maintained a joint purpose, and dealt with set-backs and delays. We pay particular attention to the importance of different actor roles in coordinating and governing a seemingly tedious process.

Based on our findings, we reflect on the fragile, iterative nature of the process in which multiple actors move toward configuring a CCSBMfS. We discuss the boundary conditions of our findings and how generalizable they are to other business models. Specifically, we theorize on the interplay and relevance of certain practices in distinct project phases, and we discuss implications on how to facilitate the process of finding balanced value capture against current recommendations in the literature on collaborative business modelling (Rohrbeck et al., 2012; Lüdeke-Freund & Breuer, 2017; Kurucz et al., 2017).

For scholars, our study provides insights into the design of CCSBMfS and the means that help actors to pragmatically move forward with an uncertain endeavor (Ferraro et al., 2015; Linder & Williander, 2017). The findings from launching MaaS in Aarhus also add to the general business model literature, which has often been criticized for its focus on ideation instead of implementation, single organizations instead of multi-party settings, and a rather one-sided perspective on economic value (e.g., Bocken et al., 2016; Joyce & Paquin, 2016).

For practitioners, such as follower-cities, our findings hold practical implications on how to facilitate the set-up of MaaS, or a CCSBMfS, in general. For instance, they highlight the barriers project managers need to take into account, and the necessary skills for facilitating discussions between actors with diverging interests.

CCSBMfS are becoming an ever more important organizing form in our society. Projects such as the MaaS platform in Aarhus are part of many contemporary initiatives to green cities. It is thus important to further understand how the process of designing a CCSBMfS can accommodate actors' individual interests so that they can give way to the imperatives of sustainable development as a larger whole.

Keywords

Sustainable business models, Collaborative Business Modelling, Value Capture, Mobility-as-a-Service, Business Model Validation

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TRACK VIII

INSIGHTS ON BUSINESS MODELS FROM YOUNG ACADEMICS

Track VIII: Insights on New Business Models from Young Academics

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This session focuses on scientific contributions from young academics – including PhD and graduate students. This means, the session provides young academics with the opportunity to present their studies and research results as well as to explain their points of view on research on new business models for sustainability. The presented research must be related to the conference theme or, more precisely, the relevant issues defined in the call for contributions. It is possible to present the research as works-in-progress. In this manner, the session for young academics will contribute and give relevant insights as well as food for thought on students' research on new business models for sustainable entrepreneurship, innovation, and transformation.

An Overlooked Aspect of Sustainable Business Models: Consumption Practices

Insights from the home furnishings sector

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Extended abstract

It is increasingly recognized that addressing sustainability challenges must go beyond efficiency-oriented approaches and include widespread changes to current patterns of consumption (Seyfang, 2009). Sustainable business models hold promise for changing such patterns, whether by seeking to reduce consumer demand, as in the case of sufficiency-based models (Bocken & Short, 2016), shift the focus of companies' offerings from products to services, as with product-service systems (Tukker, 2015), or provide access rather than ownership, such as through sharing (Belk, 2014).

However, if the aim of these and other sustainable business models is to facilitate changes in how people consume, it is important to consider the possible consumption practices they might encourage. For example, as demonstrated by criticism of companies such as Uber and AirBnB (Jericho, 2016), business models that purport to facilitate a particular type of consumption behaviour (in this case, sharing) can result in very different consumer practices – with a similarly wide range of sustainability implications (Curtis & Lehner, 2019).

Literature on sustainable business models tends to focus on how companies can create, deliver and capture value (e.g., Evans et al., 2017; Lüdeke-Freund, Carroux, Joyce, Massa, & Breuer, 2018), but largely neglects to discuss how consumers might respond to these new offerings. Several articles point to a lack of consumer acceptance as one barrier to the success of sustainable business models (e.g., Camacho-Otero, Boks, & Pettersen, 2018; Laukkanen & Patala, 2014) but either do not delve deeply into why such models have not resonated with consumers, or remain on a largely theoretical level. At the same time, a lack of empirical studies of sustainable business models (Evans et al., 2017) makes it difficult to assess consumer responses.

Researchers within the project *Sustainable Consumption: From Niche to Mainstream*, led by several Swedish universities and in collaboration with a range of practitioners, propose taking a different approach. Although recognizing that new business models are essential for furthering sustainable consumption practices, rather than starting with business models, we have sought to first gather and classify desirable consumption practices. Having collected and analysed these data, via a survey of project partners' extended networks and a content analysis, we are now exploring how different business models might be devised to best support them. While this research is currently a work in progress, our aim is to develop a conceptual model for linking desired consumption practices and innovative business model design.

The *Sustainable Consumption* project comprises the areas of food, vacationing and home furnishings; here we focus on the case of home furnishings (furniture and home textiles). Consumption of home furnishings is increasing, driven in part by seasonal trends that result in more frequent replacement (Conlon, 2019). At the same time, the EU discards approximately 10 million tonnes of furniture each year, of which an estimated 80%-90% is either incinerated or sent to landfill – and much before the end of its useful life (Forrest, Hilton, Ballinger, & Whittaker, 2017). In addition to taking up landfill space, replacing discarded items with new ones generates substantial environmental impacts, with the majority of furnishings-related CO_2 emissions coming in the raw materials extraction phase (Donatello, Caldas, & Wolf, 2017). Key to addressing this issue is thus reducing the demand for new home furnishings products.

Based on our research thus far, consumption practices such as upcycling, renting, refurbishing, repairing, sharing, and purchasing second-hand home furnishings

have the potential to reduce the purchase of new items (Lehner, Schoonover, Mont, Bradley, & Svenfelt, 2019). They can do so either by decreasing the volume or frequency of purchases, extending product lifetimes, or keeping products out of the waste stream. At present, most of them are taking place in niches, such as via peer-to-peer platforms or repair cafés (Lehner et al., 2019). Making these practices more widespread requires, in part, developing innovative business models to make them more available to more people.

Companies have started exploring potential ways to extend product life and to devise reuse systems for home furnishing products – such as IKEA's announcement of a leasing program to be piloted in Switzerland (Milne, 2019). In Sweden, ReTuna (https://www.retuna.se/), a shopping mall occupied entirely by retailers offering second hand and upcycled products, and Hemmlis (http://hemmlis.se/), a small company offering furniture rental to students, similarly aspire to drive changes in furnishings consumption practices through innovative business models.

While these efforts have the potential to generate positive sustainability impacts, the actual results depend on the consumption practices of their users. For example, although furniture rental could extend product lifetimes through multiple cycles of use, if a lack of ownership drives people to take poorer care of their furnishings than if they were their own – as has been identified as a risk in leasing arrangements (Tukker, 2015) – it could instead lead to a need for more frequent replacement. Thus, in designing a sustainable business model to facilitate furnishings rental, it is important to consider and address these factors. One such strategy might be to apply the idea of psychological ownership to increase product attachment (Baxter, Aurisicchio, & Childs, 2015), such as by building in the possibility to temporarily customise rental items (Tunn, Fokker, Luijkx, De Jong, & Schoormans, 2019).

Relatedly, if sustainable business models are intended to influence consumption behaviour, it is also important to understand what drives people's consumption decisions. Within sustainable business model literature, there seems to be an assumption, whether explicit or implicit, that the consumers such models aim to reach are themselves motivated by sustainability concerns. Hence, a number of the strategies firms employ to influence consumers include sustainability-related education or awareness-raising (Bocken, 2017). However, a study of consumer attitudes toward second-hand, access-based, and collaborative consumption of

home furnishings found a diversity of drivers for engaging in these sustainable consumption practices – including convenience, desire for uniqueness, and access to community – with environmental concerns ranking quite low (Gullstrand Edbring, Lehner, & Mont, 2016). In addition, cultural theories of consumption posit that people consume as a way to signify meaning, identity, or social standing (Arnould & Thompson, 2005) – factors that have also been found to play a role in the purchase of furniture and home furnishings (Reimer & Leslie, 2004).

Rather than trying to influence consumers to more highly value sustainability, if the goal of sustainable business models is to encourage particular consumption practices, it would seem to make sense for such models to be designed to acknowledge and leverage the diversity of consumption drivers. In other words, if the end practice facilitated by the business model is more sustainable, does it matter whether consumers engage in it out of sustainability concerns or for other reasons?

Better understanding and taking into account the diversity of consumption drivers and practices can help ensure that sustainable business models both resonate with consumers and deliver the desired sustainability results. This research contributes to sustainable business model literature in emphasizing the importance of considering these factors in business model design. It also contributes to literature on sustainable consumption by demonstrating how business models might be used to facilitate sustainable consumption practices. Finally, it can be useful to practitioners for informing how they might innovate in terms of how they create, deliver, and capture value.

Keywords

Sustainable Business Models, Sustainable Consumption, Consumption Practices, Home Furnishings

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Business model co-creation for social value generation in emerging economy tourist destinations

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Abstract

This paper reports on a case study structured as action research in the form of entrepreneur capacity building whereby the academics, social business experts and tourism sector entrepreneurs applied and tested business model innovation method-process called FM+3, for short. It is a business model canvas-based method-process which draws upon social impact and value creation as they are understood by entrepreneurs, namely triple-bottom line within the mission underlying the entrepreneuring practices guided by specific design principles. This study addresses the question of how entrepreneurs situated in emerging economies, such as tourist destinations of Chilean Northern Patagonia, generate social impact-oriented value propositions through BMC innovation? The research reveals that FM+3 method-procedure is a viable practitioner's tool for structuring social purpose business model innovation. The implications for the academia include better understanding of how social business model innovation is implemented in practice, while practical implications include a tool deployable to foster social impact and value generation through business model innovation by entrepreneurs aided by mentors. Finally, public policy implications are in that for entrepreneurship in services to grow stronger service-specific innovation mentoring methods-processes need to be finetuned, custom designed and by themselves, innovative.

Keywords

social entrepreneuring, business model, social impact, value co-creation, emerging economies.

Business models in the development of new materials in the garment industry in and beyond the Netherlands

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Extended abstract

Claimed to be one of the most polluting industries in the world (Strähle & Müller, 2016),

currently, the fashion industry faces enormous environmental as well as societal challenges.

During the 20th century, some key developments have transformed the fashion industry to a great extent, one being the increasing outsourcing of production to low income countries. This allowed for mass-consumption and 'push products' to enter the Western Fashion market, creating a 'race to the bottom' which we know today in the fast fashion industry (Clark, 2008). As a reaction, the "slow fashion" movement started to gain ground, which is based on values like sustainability, social responsibility, and transparency (ibidem). This movement includes various aspects, of which new materialism and up-cycling are vital (Ainamo, 2014). In the niche markets and local production networks of the slow fashion movement, the maker movement is fostering innovation on a local scale with open innovation and knowledge sharing as its core characteristics. This movement has created opportunities for producers-entrepreneurs to introduce their innovations for the making and sharing economy (Browder et al., 2019). Insiders increasingly

acknowledge that a global shift to circular business models would most likely not just address environmental and societal issues but also benefit the industry (Brennan et al. (2015); Ellen MacArthur foundation (2012); Mckinsey & BOF (2018)). Examples of business models that are currently in use include the Blue Economy model established by Pauli (2010), with a focus on local production and increased resource efficiency; and the Cradle-to-Cradle principle by McDonough & Braungart (2002), which is based on the belief that a product is designed to have various life cycles or is biodegradable.

Today still, a gap in both the literature and practice exists regarding the business side of circularity in fashion, with tensions between commercial viewpoint and circular innovations being articulated (Hussain, 2018). The aim of this research is to contribute to the empirical gap in the literature on circular business models in the fashion industry, with a focus on local production in the Netherlands.

Our case study

In this study, the focus is on the local production industry working outside the traditional business models of the current fashion industry. The production process of a new material that can possibly be used by fashion designers to design for a circular economy will be taken into the scope in this research: it is about the journey from cradle- to cradle, where waste is seen as a product.

Our setting is the Netherlands, a country that seeks to be a forerunner in bringing together technology and circularity, for example in the development of bio-based emergent materials. Concurrently, sustainability (particularly in relation to the climate change) and its impact on business models, products, services, technologies, innovation and design, are high on the political agenda. As a case, the Netherlands is interesting, because even if a strong tradition in fashion is lacking and the domestic fashion industry is limited in size, it is characterized by increasingly more small companies that engage with alternative and sustainable fashion design and production, for example in denim (Lavanga, 2019).

Methodology

To foster the shift towards a circular way of doing business, business model and design strategies will need to merge and furthermore case studies are needed to test the strategies of circular economy thinking (Bocken et al., 2016). In this research an ethnographic research is combined with a multiple-case study using

qualitative analysis. The data collection technique of participant observation in the ethnographic component gives the researcher the ability to get an in-depth understanding of the phenomena (Lacono et al., 2009). Such an approach is vital to an unexplored area such as the sustainable innovation business models in the Dutch garment industry. By closely following one project specifically, which brings together a variety of stakeholders ranging from the horticulture industries to the fashion industry, in-depth analysis and rich understanding of the business processes is achieved. This has been done before by for example Antikainen and Valkokaro (2016), who scrutinized circular business models based on remanufacturing and reuse by means of a longitudinal study, and by Sosna et al (2010) who took a similarly dynamic perspective to study the antecedents and drivers of business model innovation in a Spanish healthy food business.

The action research component of the present study consists of the effectuation of a suitable business model, that is inspired by both the literature and practice. For the latter we conduct semi-structured in-depth interviews with a purposive sample of entrepreneurs who are already producing and in business with textile products made from residual and/or post-consumer waste. Concretely, we interviewed at total of four forerunners (in the Netherlands) based on which we purport the action research cycle of planning, acting, observing, and reflecting (Sarah et al, 2002), that jointly fuel the actual development of a novel solution on the one hand, and insight in the possible challenges and shortcomings to the developing local garment industry working with new materials on the other hand.

Expected results and conclusion

In our study, we connect the innovation and entrepreneurship literatures, we account for the stakes of diverse actors in the entrepreneurial ecosystems in the creative and agro-industries, we review business models in circular production, and we apply those to a solution concurrently being developed, all in order to contribute to, first, the academic literature on circular business models focused on local production, and second, the transition of the non-sustainable (Dutch) fashion industry into a more sustainable one.

Hence, next to the academic community that seeks to better understand the antecedents,

processes and outcomes of sustainable innovation initiatives and business models, the

stakeholders of this interdisciplinary project are also cultural entrepreneurs, textile designers and producers, chemists and horticulture producers. To these pioneers in innovative business, our study seeks to present an overview of current and future circular business models, particularly targeted at new material production with a focus of textile. Furthermore, it seeks to evaluate the saliency and effectiveness of a business model, by means of our action-led research of TomatenTextiel as a case. Indeed, within a country such as the Netherlands, where the garment industry has been outsourced for decades, the frontrunners of the new materials face multiple challenges related to the local production network. Their businesses are rather small, with challenges to scale up. At the same time, it is acknowledged that their businesses hold great potential as the fashion industry foresees trends of near-shoring and small businesses that provide a narrative approach and transparency to the consumer (McKinsey & BOF, 2018). Providing this group of pioneers the tools to develop their business that ensures circularity, whilst honoring the sustainable development goals, is vital for the success of a niche market.

We believe this case study contributes to NBM 2019 because it addresses innovation of the Dutch textile industry, taking circular business models as the common thread. Besides the theoretical aspects, the case study and the interview data give an insight in the current practical business way of doing, which provides an unique and highly relevant connection to the themes discussed at the NBM 2019. Furthermore, the study can give sustainable entrepreneurs the ability to contribute to the development of new business models for sustainability.

Keywords: circular business models, slow fashion, maker movement, new material, local production.

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Framework for service business model innovation

An explanatory case study on BMW ConnectedDrive services

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Abstract

Purpose: The purpose is to construct a service business model innovation (BMI) framework with key factor that influences firm's business model development

Design/methodology/approach: The study employs hybrid methodology. First, the literature review is performed to find factors influencing BMI and service BMI framework is constructed. Then empirical data from case firm's website and the press release is collected. In total 52 official documents used in this study.

Findings: The service BMI is constructed, based on factors emerged from literature review. The study categorized these factors as pushers, motivators, and facilitators. The evolution of digital services of BMW is narrated though BMI framework.

Research limitations: The study depends on secondary data from BMW website. The model is validated with only single case study.

Theoretical implication: The developed model could provide new insights into BMI. The study recommends scholars to evaluate this model with empirical data and a different industry context.

Practical Implications: The model provides managers with a clear view of key factors that influence business model development.

Originality/value: As a novel contribution, key factors generated from literature and categorised in to 3 groups such as pushers, motivators, and facilitators. Then service BMI is constructed with these factors and evaluates with a single case firm.

Keywords: Business model innovation, Framework, Automotive industry, Servitization, Service innovation

1. Introduction

Recent technological innovation, market dynamics, change in industrial landscapes, and customer preference paralyzed the traditional business model of manufacturing firms. To sustain in this competitive market, firms are moving to a customer service business. This new trend has escalated in the manufacturing industry, popularized as service-integration in the business world, and is well known as 'Servitization' (Vandermerwe and Rada) in the literature. The service integration re-organizes all business activities and ultimately resulting in business model innovation (BMI) of the firms. This evolution of service BMI has become of increasing attention both in practice and research communities (Chagas, 2016; Adrodegari *et al.*, 2018). The literature has produced extensive knowledge in different dimensions like organisational perspective, competitive advantage, design thinking, sustainability, and transition (Foss and Saebi, 2015, 2017; Sarasini and Langeland, 2015; Brannon and Wiklund, 2016; Liu *et al.*, 2017; Anwar, 2018; Beltagui, 2018b), but still silent on context-specific such as service BMI. Hence, it is appropriate to initiate discussions on conceptual theories backend by empirical evidence of BMI during service integration to enhance the knowledge of BMI in a different context. Accordingly, the purpose of this study is to extend our understanding of BMI for servitization in the automotive industry context. To achieve this, we build a holistic framework for service BMI with themes emerged from the literature and validate them with a case example from the automotive industry.

The BMI is novel and complex in nature, and it connects with various dimensions like corporate strategy, technological capabilities and innovation processes of the firm. The BMI will be more attractive when the firm articulates multidimensionality (Spieth *et al.*, 2014; Foss and Saebi, 2016). Since BMI is aimed at preparing the firm to create, deliver, and capture value (Teece, 2010), is tightly

linked to the idea of entrepreneurial vision, imagination, and judgment of organization. (Foss and Saebi, 2017). Market dynamics such as business trends, and technology innovations severally impacting the firm's business activities. A recent trend in the manufacturing industry, recognized as service integrations (Servitization), completely reconfiguring the business model architecture. This service integration reflects a shift from selling products to selling integrated products and services that deliver value in use (Baines *et al.*, 2009). The shift to service-centric business is considered an important driver of BMI and it changes value propositions from product to services (Witell and Löfgren, 2013). Often BMI is the result of external factors, like competition law, labor market legislation, and environmental legislation. For example, Uber (transportation) or Airbnb (accommodation) BM (business model) is severely suppressed by the country's competition law, as these BMs are considered disruptive to the traditional incumbents in their industries (Foss and Saebi, 2017), vice versa BMI gain support from legislative bodies, for example, BMW's new mobility service in UK[57] and Germany[58] is well supported by the regional authorities, as these services are aligned with the regional authority's vision for sustainable mobility solutions. Periodically, BMs are impacted by technological innovations (Jetter, Satzger and Neus, 2009; Gambardella and McGahan, 2010; Cavalcante, 2013; Bouwman *et al.*, 2018) either by creating an opportunity or taking risk which will result in competitive advantage (Lloyd, 2001) or disruption (Lyytinen and Rose, 2003). The BMI is accelerated by many factors, for example, co-operation, it involves collaboration with external suppliers to acquire knowledge and resources (Foss and Saebi, 2015). In fact, open innovation BMs facilitate the integration and commercialization of external resources (Chesbrough and Crowther, 2006; Laursen and Salter, 2006), and create the new value constellation (Corsaro *et al.*, 2012; Dellyana, Simatupang and Dhewanto, 2018).

In spite of the huge debate on BMI and knowledge, the literature is still selective to define concepts of BMI. With an extensive literature on BMI, Foss and Saebi (2016) called for conceptual clarification, theoretical models, and cumulative empirical work on BMI in order to advance the literature. While much attention

[57] BMW app launches "drive by the minute, park anywhere" car sharing service in Islington, Hackney and Haringey, 05 December 2014
https://www.islingtongazette.co.uk/news/bmw-app-launches-drive-by-the-minute-park-anywhere-car-sharing-service-in-islington-hackney-and-haringey-1-3875453

[58] BMW Group and Hamburg announce strategic partnership to provide electro-mobility options all across the city of Hamburg, BMW Press note 10 May,2017.
https://www.press.bmwgroup.com/global/article/detail/T0270599EN/bmw-group-and-hamburg-announce-strategic-partnership-to-provide-electro-mobility-options-all-across-the-city-of-hamburg?language=en

has been paid from practitioners and research communities on BMI, Foss and Saebi (2016) findings raise a number of crucial theoretical and empirical questions: What are the drivers, facilitators, and hindrances of the innovation of a BM? Such perspectives are not revealed, explored and debated and academic treatment of business models has itself become rather diffuse (Chagas, 2016). More precisely, new knowledge is needed on the drivers of BMI (Foss and Saebi, 2017), dynamic capabilities (Zott *et al*., 2011), customer segments (Peteraf and Barney, 2003), firm-level variables and influence of social institutions (Foss and Saebi, 2017).

Therefore, by capturing the BMI study's conclusions and research calls from scholars, we aspire to contribute knowledge on impacting factors of service BMI. To fulfill this desire, we narrow down our focus on service BMI of BMW Company. To accomplish this, the study framed a research question, *how do car manufacturing firm orchestrate BMI for advanced services?* By answering this research question, the study can contribute knowledge to the BMI and servitization literature.

The paper is structured in 5 sections, after the introduction of the research topic and study purpose (Section 1), we presents and discuss a conceptual framework for service BMI in section 2. The Section 3 provides comprehensive data on the methodology adopted, case selection, data extractions, and analysis steps. After that, in the section 4, we narrate the BMI of the case through the framework. Section 5 summarizes the conclusion, contributions and provides future research directions. The appendix gives complete information about data nature, sources and time period.

2. Conceptual framework

Through the systematic review of BMI antecedents and conceptual framework studies, we have generated a set of themes which influence the BMI, and build a conceptual framework which provides a comprehensive view on BMI (Fig 1).

The business model research has been flourished with contributions from various research communities such as Business Strategy, Management and Accounting, Business model, Economics, Econometrics and Finance, and Decision Sciences and service innovation. The BM literature has ballooned into two perspectives, firm-level and industry level (Hacklin *et al*., 2018). The firm-level variables such as organizational values, organizational culture, organizational design, and dynamic capabilities have been debated extensively in the literature but industry-level

dynamics such as technological innovation, market dynamics, service integration trend (*Servitization*, Vandermerwe, and Rada, 1988) are still unfolded (Hacklin *et al*., 2018).

The organizational perspective of BMI has discussed well by scholars, for example, a recent study by Ammar and Chereau (2018) suggested that SMEs can leverage specific BMI components through their entrepreneurial, engineering and administrative choices. But before changing the business model, firms need to identify specific needs for change (Leih *et al*., 2014). Sometime BMI is an integral part of the organizational response and corresponds with adaptation as a constitutive element of resilience (Sund *et al*., 2014). Gambardella and McGahan (2010) appeal that BMI requires the enterprising insight, entrepreneurial energy and unyielding commitment to implementation that has characterized the breakthrough business models of the past. In continuation with this line, Hock *et al*. (2016) suggest that a significant part of the business model cannot be understood without an investigation of the underlying logic of the firm. In other words, firms' novelty-oriented cultural values and foster capabilities (strategic sensitivity, collective commitment, and resource fluidity) favors the BMI. But firms need to aware of multiple challenges would rise during BMI, which are associated with strategy, organization and enterprise management, contracting, risk, culture, and operations. Hence organizational values can be considered as a prerequisite for BMI but not sufficient to be efficient.

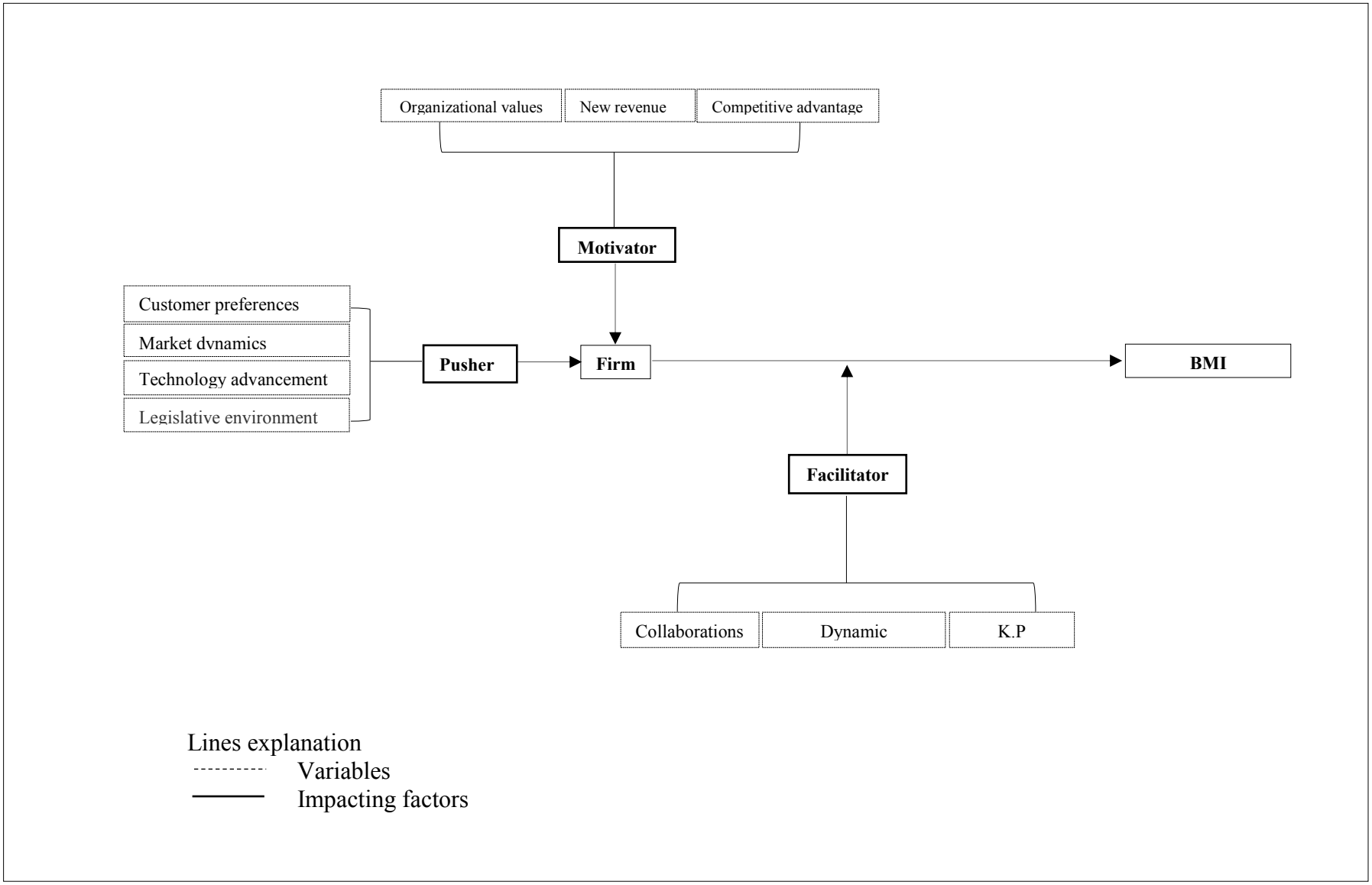

Fig1 Conceptual framework for service business model innovation

Another aspect that influences BMI is firms' dynamic capability. Indeed, these design capabilities are proposed as a facilitator of servitization (Roaldsen, 2014), allowing a manufacturing firm to develop service offerings that build on resources such as knowledge and experience (Beltagui, 2018). Barnett *et al.* (2013) stated that the organizational capabilities necessary for advanced services such as pay-per-use services convert these capabilities into three core competencies (strategizing pay-per-use services, utilizing technologies for pay-per-use services, and de-risking pay-per-use services), in order to achieve competitive advantages (Gebauer *et al.*, 2017). But this transition to service province involves collaboration with informal and formal social institutions for resource acquisitions and service delivery.

In fact, open BMs facilitate the integration and commercialization of external resources (Chesbrough and Crowther, 2006; Laursen and Salter, 2006). Von Stamm (2004) stated that innovation most often happens when some previously unconnected bodies of knowledge converge. He suggested that for an effective BMI, firms need external collaboration with other firms and customers. Customer knowledge in terms of knowledge about the customer, knowledge from customer and knowledge for the customer, contribute to value creation in BMI (Wu *et al*., 2013). To accelerate BMI, the firm should identify and develop capabilities and resources (Chapman *et al*., 2002; Kindström and Kowalkowski, 2014) that helps to achieve desired objectives like new customer segment, extra revenue, and competitive advantage. Some of these are finance, asset, technology, and peoples could significantly enhance the propensity to BMI (Hock *et al*., 2016). Industry level dynamics have a huge impact on BMI. A variable like technological innovations (Guo *et al.*, 2017), legislative environment (Berti and Casprini, 2018), collaborations (Chesbrough and Crowther, 2006; Laursen and Salter, 2006) can leap BMI. The BMI is influenced by the legislative environment, such as Berti and Casprini (2018) to provide an example of how BM of the airport is innovated by legislative force. He concluded that the legislative environment would be an exogenous driver for BMI.

3. Methodology

To answer the study's research question, an illustrative sample of the automotive firm, who is a leader in advanced services in the market was organized by capturing data from publicly available sources (Oliveira and Roth, 2012). This study is qualitative in nature and single case study design. The developed conceptual framework was used to explain firms' BM change.

"Single-case research designs are a diverse and powerful set of procedures useful for demonstrating causal relations among clinical phenomena". (Riddoch and Lennon, 1991)

Single case analysis can be valuable for the testing of theoretical propositions, provided that predictions are relatively precise and measurement error is low (Levy, 2008). Our methodological approach was initiated with generating themes from the literature (Yin 1994), then these themes were translated into a conceptual framework. This conceptual framework was used as a methodological tool to review the evolution of a BMI in the automotive industry.

3.1 Industry background and case selection

We selected the automotive industry as our empirical background. This industry dynamically shifting its core business operations, from pure-product to product-service business. Majority of car manufacturing firms have integrated customer's services in their core business activities at some extent. As for competitiveness rise in the market, firms need to improve activities through excellence and new offers. Manufacturing companies, and more precisely the automotive industry, endeavor to integrate new service offering to sustain competitive advantage (Mahut *et al.*, 2016). European car manufacturers adopting this strategy to differentiate their products, improve customer loyalty, generate extra business and defend financial margins (Verstrepen et.al., 1999).

The study especially focused on one car manufacturing firm, BMW AG (Bayerische Motoren Werke) German multinational company. To validate our conceptual framework, we applied it to firms' digital service known as ''*ConnectedDrive*''. BMW firm one of the leaders in the automotive industry offers premium vehicles but also provides customer services like financial, on-demand services and telematics services to keep its competitive position. The firm radically changed the business model to become a customer-centric business. The firm's transformation toward customer-centric was begun by introducing telematics services in 1997, including the BMW Assist package comprising Concierge Services, as well as the up-to-date traffic information service and Intelligent Emergency Call. For the past 20 years BMW offering telematics services and became dominant in the digital service market. The range available for current BMW models includes a personal telephone information service, the extended emergency call with automatic position finding, Google Local Search, traffic information and internet-based services for navigation, communication, and infotainment. In addition, BMW

Teleservices include roadside assistance and diagnosis function as well as the transmission of all service-related data to the BMW service partner to enable preparation of a service appointment. BMW *'ConnectedDrive'* is currently available in 45 countries and there are already over 10 million connected BMW vehicles on the world's roads[59].

3.2 Data extraction and analysis

The data collection was focused on firms' activities during the design and expansion of digital services, known as *''ConnectedDrive''.* This study depends on archival data, in other words, we have used firms' press notes/or information, releases, media release documents, and annual reports available in the firm's website would represent *''ConnectedDrive'' services*. In total 52 documents were collected for the period from 1999-2018 (See Appendix).

3.3 Data validity

The study relies on publicly available data to narrate firms' BMI. The author believes that these data sources are appropriate and official to track the firm's strategic moments and actions, as these documents generated by the firm to provide information about their advancement, activities, and engagements. The quotes available in these documents are free expressions from firms' representatives and more importantly, these expressions are not aimed to answer any question, so chances for bias is very low. The Literature is also approved to use publicly available data as research data, some of these are:

"One of the advantages of the public document as data is researcher can identify themes that are not visible 'to naked eye'. The publically available data often convey important and useful information that a researcher can effectively use as data." (Bruce 2011, p.214)

"Private records such as unsolicited documents are particularly useful for creating case studies of life history. Typically, owing to the personal nature of private document, the subjects' won definitions of the situation emerge in the private records, along with the way they make sense of their daily living routines. Precisely, these bites of self-disclose allow researchers to draw out of complete

[59] 20 years at the cutting edge: BMW ConnectedDrive. https://www.automotiveworld.com/news-releases/20-years-cutting-edge-bmw-connecteddrive/

picture of the subjects' perceptions of the life experiences." (Bruce 2011, p.220-221).

Hence the authors believe that the data from these sources can be useful to examine the firm's activities. To maintain the richness of the data and authenticity, we carefully choose expressions, talks that are emphasized with quoting mark only. We also noted spokesman, from whom these quotes are generated/or expressed, designations and document number were recorded. In total, 23 key persons (see appendix) are found in these documents.

Atlas ti8 (Computer Assisted/Aided Qualitative Data Analysis Software) was used to analyze the data. The data analysis was accomplished as follows as prescribed by Bruce (2011, p.267)

The analysis sequences were as follows:

- All collected documents were transformed into Atlas ti8 application
- Free quotations were generated and coded (First group codes) – Authors codes
- Second group codes were created with themes synthesized from the literature
- These codes were transformed into factors

As prescribed above, collected data was transformed into Atlas ti8 application. Texts in each document with quote marks, speech marks, inverted commas or talking marks were coded as free quotations. This step generated 73 free quotations from the documents. Each quotation was carefully examined and noted its source, person, job position and time period. Initial codes were prepared on free quotations extracted from the press notes.

The initial coding process was repeated multiple time for better illustration of the content that represents a change in the BM. These codes were named based on the authors understanding of the data and context. This step has produced 47 codes. Then, these codes were grouped with themes (emerged from the literature, discussed in the previous section). We repeated this process multiple times to make sure that codes were truly represented theme context. Then these themes grouped into 3 universal themes as Motivators, Pushers, and Facilitators. We believe this classification is appropriate to justify the context of BMI. Fig 2 illustrates the coding process performed in this study.

- Motivators : Inspire the firm to change the business model
- Pushers : Force the firm to change the business model
- Facilitators : Assist the firm to change the business model

Source: Author's own classification

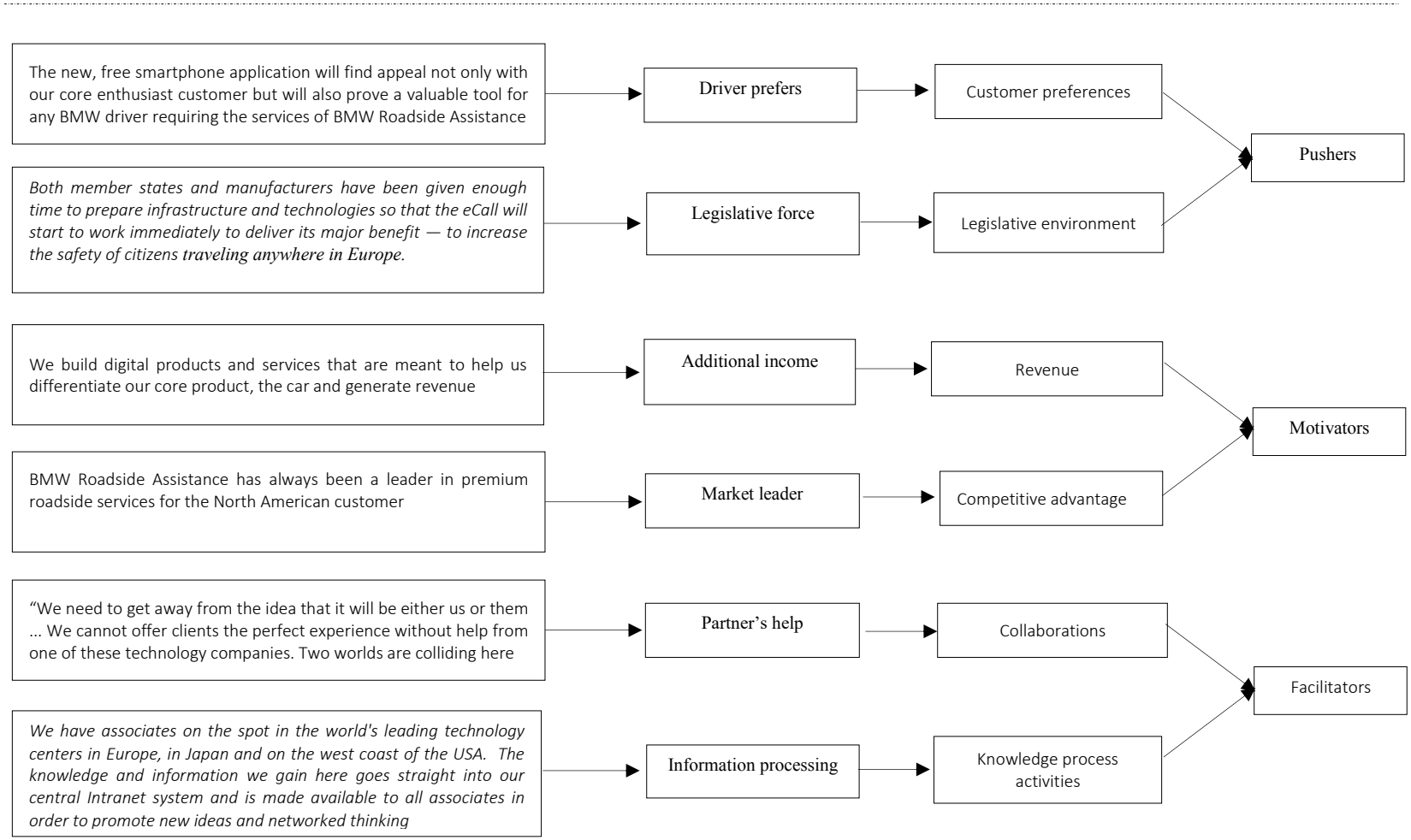

Fig 2 sample coding

4. Findings and discussion

This study developed a conceptual framework for service BMI and validate with the servitised firm in the automotive industry. Our intention was to illustrate BMI process and factors impacting BMI for ConnectedDrive services by BMW. With this view, we analyzed the firm's activities, announcement, key person's expressions and views quoted in the documents related to digital services known as *'ConnectedDrive*". We observed three factors impacting BMW's BMI, namely *motivators, pushers,* and *facilitators*.

4.1 Motivators

Motivators are a set of factors or issues that inspire/motivate the firm to change the current business model. Three motivators emerged from the literature are, *organizational values, additional revenue, and competitive advantage*. Organizational values refer to the commitment, vision and mission, and entrepreneurial culture of the firm. The case firm in our study, who declared themselves as customer-centric business pursued a change in business model by introducing value-added services (Internet services in the car) in 1997. The firm initiated these services as integrated services into the vehicle. The firm declared this service integration is part of the organizational value, in other words, they want to be a pioneer in technology and first mover. We observed that the BMW keep its commitment to offer more customer centric solutions, it has expressed organizational commitment as 'we committed', 'as promised, 'being a first mover', and 'technology pioneer', this kind of expressions revealed firms' strong organizational values and commitment to move to service business province. For example a general manager expressed as:

"What's most important for us ..... but if we don't become a customer-centric company, then we are destined to fail. The number of digital elements in our customers' lives and in the car continues to increase, and if we don't understand that, we've got a problem." - Online source[60]

The company has framed a strategy to transform into a customer-centric company by reinforcing its commitment to bring state-of-the-art technology and content to customers. Organizational structures, capabilities, and culture can influence a

[60] "Why BMW needs to own its customer experience from start to finish" , - Interview by Frederic Lardinois, July 27,2018 https://techcrunch.com/2018/07/15/why-bmw-needs-to-own-its-customer-experience-from-start-to-finish/

firm's ability to innovate in relation to their new business models (Foss and Saebi, 2015).

Competitive advantage in another factor in motivator's category, which strongly impacts a firm's business activities. In the manufacturing industry, competitive advantage through product innovation is no longer valid. Service -integration is becoming a promising strategy to differentiate in the market. Our case firm also adopted this strategy to create a competitive advantage for their vehicle by integrating digital services. Twenty years in telematics services has provide their strategy successful, and BMW became the market leader in the digital service market. The literature strongly argued that integrating service in product dominant business could create a competitive advantage for firms (Matthyssens and Vandenbempt, 1998; Huber, Herrmann and Morgan, 2001; Salonen, 2011). By offering the best technologies and services, the firm continues to extend its leading position in the field of digital services. This approach of integrating proven technology facilitate the firm's innovation and provides a competitive advantage.

Next factor in this category is *additional revenue.* We found that BMW initiated telematics services during late 1998. The traditional automotive business is a saturated and firm struggle to generate revenue during that time. In service integration model firms generates revenue from customer solutions and creates new revenue channels sources (Liu *et al.*, 2017). This could one possible motivation for BMW to move to the service-based firm. A Vice president articulated as:

"We build digital products and services that are meant to help us differentiate our core product, the car and generate revenue."-Dieter May, VP of Digital Products and Services, BMW.

These services have been offering for more than 5 years, but the firm did not reveal exact revenue from these services. Information from the annual reports and bubbling of third-party services in the digital service platform indicate that BMW receiving a substantial amount of revenue through these services. One evidence found in 2017 annual report, phrased as: 'Higher deferred income from Connected Drive and service contracts also had an impact.' (Annual report 2017, p.50). Transition to services-centric business became a trendy strategy in matured economies and create new revenue sources (Baines *et al.*, 2009; Nagy *et al.*, 2018).

4.2 Pushers

Refers as forcing driver for change in business activities. The business activities of firm's are forced by four factors such as *market dynamics, customer preferences, technology advancement, and the legislative environment*. The company keeps tracking market changes and technology advancements in the automotive industry. This profound view on market changes, provide a window to capture the opportunity to change business architecture. During the year 2013, firms' sales were down 1.7% and the lowest in 18 years in history. This condition leads BME to set up personalized digital services called '*'ConnectedDrive*''. This new customized service platform offers a bundle of services.

In our case firm's transformation, we found that the firm's service integration is strongly forced by *customer preferences*. In service-based industry customer turn to a dominant position, in another word, they choose what they want or prefer. Due to the rise of technological applications in the mobile world, connectivity became the central nerve to keep customer relationship. Customers want these services in their vehicles. The firm sense this trend in customer preferences and successful introduced demanded services. For example, firm collaborations with MOG, Stitcher aimed to bring a streaming music application to cars. The changing pattern in customer behavior forces the firm to introduce these services to retain customers. For example, the driver wants a huge list of music or want to connect to social media while driving. In order to sustain in the market, service integration became vital for automotive firms. This transformation is forced by customer demand, OEMs were very much encouraged to move to services by their customers (Baines and Shi, 2014).

The *Legislative environment* is another factor that forces the firm to offer some specific service in some locations. For example, The EU has passed a law in 2015 that demand all automobile manufacturers equip all new car types with eCall, emergency call services. All new models of passenger cars and light commercial vehicles in the EU will have to be equipped with the eCall system as of 31 March 2018. To comply with this legislative force, the BMW integrated emergency call service in their fleets. Literature suggests that BMI is influenced by legislation acts, more specifically sustainable service or customer safety services (Antikainen and Valkokari, 2016; Zhao *et al.*, 2017; Berti and Casprini, 2018).

Recent *technology advancement* has disrupted the traditional business model in the automotive market. Development in software and entry of information

technology firms in the automotive industry intensified the pressure on automotive firms. To sustain in this competitive market and retain its market position, the firm made partnerships with Informations technology firms to access their knowledge. Along with collaborations, BMW set up Virtual Innovation Agency to monitor the latest development in the industry. It is quite an unconventional way to collaborate, but BMW initiates this innovative strategy to attract solutions and ideas for product and services. To become competitive in the market firm have to adopt the latest technology (Foss and Saebi, 2015; Brannon and Wiklund, 2016).

4.3 Facilitators

Act as lubricants for the business model transformation. These factors immensely impact the success or failure of the transformation. These are collaborations, technology integration, dynamic capabilities, and knowledge process. From the past few years, Information technology firms have entered the automotive industry business and offering invoice and out-vehicle service. With their dominant technological knowledge and market power, they disrupt BM of the automotive industry. So, in this competitive situation, instead of competing for each other, the company teamed up with these firms. A board member comment as:

“We need to get away from the idea that it will be either us or them ... We cannot offer clients the perfect experience without help from one of these technology companies. Two worlds are colliding here. Our world focused on hardware and our experience in making complex products, and the world of information technology which is intruding more and more into our life." - Peter Schwarzenbauer, Member of the Board of Management of BMW AG, MINI, Rolls-Royce, BMW Motorrad, Customer Engagement and Digital Business Innovation BMW Group

As telematics service business seemed to take off, the company started expanding service integration through collaborations with technological firms, telecommunication providers. For example, the firm has been developing central engine control units through cooperation with partners such as Bosch and Siemens, but also in-house, creating the control units for the BMW M3 and M5. Majority of partners are technological firms, who are quite unusual partners in the automotive industry landscape. Instead of developing technology by itself, the company opted a collaborative strategy to access partner’s service or provide an opportunity to integrate services as third party service suppliers. The key

motivation for these collaborations is not just integrated partner's services, but firms chose only innovative technology and widely accepted solution such as on-demand music, navigation services in the market. The firm *collaborates* with other firms for various objects such as market entry, customer knowledge, technology, assets (Foss and Saebi, 2015; Sarasini and Langeland, 2015; Ayala *et al.*, 2017). As demand for this service rises from the customers, the company became a service provider to meet this mart demand. The company set up a venture called *Projekthaus* in 2004, to welcome ideas for products and services. This unconventional collaboration with various universities and research centers and individuals contributes a huge amount of ideas through an internet portal called Virtual Innovation Agency.

Firm's *dynamic capability* refers to the firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments (Teece et al., 2014). They orchestrate BMI through effective utilization of firms' resources. Being a proactive and leader in technology adaptation, BMW maintains its leadership in the market. BMW responds rapidly to market changes and adopts these changes. Vice President of MINI USA and Product Manager of BMW Group Apps Platform pointed out that the firm keeps the focus on apps developments and listen to customer's voice. This approach provides an opportunity to be competitive in the market. The real competitive strengths of a firm lie in dynamic capabilities and strategy formulation, underpinned by value-enhancing "signature" processes and other VRIN resources that the firm and its management can command. High-performance signature processes embody positive elements of a company's unique history, experience, culture, and creativity. This makes them relatively hard for rivals to imitate (Ghoshal and Gratton, 2002).

Knowledge process refers to knowledge-related activities such as creation, capture, transformation, and use of knowledge and its role is to plan, implement, operate and monitor the knowledge-related activities needed for effective intellectual capital management (Wiig, 1997a). BMW generating a huge amount of data about vehicle condition, driver's behavior and user services preferences through the digital service platform. This data is processed by the firm and/ or supply chain partners to design and develop new services. These (Data collecting) processing activities serve the legitimate interests of BMW to comply with the high standards placed by customers on existing products and services and to be capable

of satisfying customers' future wishes through the development of new products and services (Data protection, BMW)[61]

"We have associates on the spot in the world's leading technology centers in Europe, in Japan and on the west coast of the USA. The knowledge and information we gain here goes straight into our central Intranet system and is made available to all associates in order to promote new ideas and networked thinking." -Burkhard Göschel[62]

This kind of proactive nature would create an opportunity for new services and leads firms as the front runner. This knowledge management became a major driving force behind the economics of ideas, it will improve firm performance (Wiig, 1997b).

Conclusion

In conclusion, the study intention is to portray an illustration that represents BMI framework with influencing factors and validate with empirical data. We achieved this goal by presenting a conceptual framework and applied it as an analytical tool to describe BMW's business model development. This study employs BMW *'ConnectedDrive'* services as an empirical setting. The study discloses how BMW orchestrates BMI for digital services. BMW's BMI process reveals that in the order effective implication of changes in BM, the first firm should clearly understand what motives this transformation, how this motivates rises whether internal or external sources. But motivation is sufficient to change BM, the firm should keep its commitment through the transformation. Second, the firm should focus on market dynamics and other external force that influence business landscapes and adopt these changes. But the firm should aware that these forces can create advantage or risk. Finally, to create efficient BM, the firm should have supported by facilitators, as discussed above, market dynamics are dramatically changed, and the firm need develop dynamic capabilities to configure business activities according to the demand. Firms alone can't create value through their product or service, they need to collaborate to create a value constellation. By adopting the

[61] Assuran ce of product quality and development of new products (Art. 6(1)(f) GDPR, BMW ConnectedDrive Services – Information/Data Protection. https://www.bmw.gr/content/dam/bmw/marketGR/bmw_gr/topics/fascination-bmw/Connected%20Drive/Legal_BMW_BMWi_GR_en_5-18.pdf

[62] "Electronics in Automobile Development – a Challenge". Keynote address at the Opening Ceremony of ELECTRONICA 2002, p.6, Munich-Riem Fairgrounds, 11 November 2002.

latest technology, constant service-integration and customer knowledge could transform business activities to more efficient and effective.

This paper no exception for limitations. This study developed a conceptual framework with themes emerged from the literature and validate with signal case study only, this is the first limitation. The second limitation is, the study depends on secondary data only. Regarding future research directions, this study recommends the research communities to validate this framework in a different context and with multiple case studies. The key element's category presented in this study should expand further through the empirical analysis.

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Appendix

Summary of data sources and year

Data source (BMW Group)	**Released year**	**Number**
Press releases/ Information Archives	1999	1
	2000	3
	2001	3
	2002	2
	2003	1
	2006	1
	2009	2
	2010	4
	2011	5
	2012	2
	2013	4
	2015	2
	2016	4
	2017	1
	2018	3
Media release	2018	1
	2008	1
Keynote address at ELECTRONICA[63]	2002	1
Media information	2002	2
	2009	1
	2010	2
	2011	2
	2015	1
Annual report	2017	1
	2000	1
Total		52

63 [63] Dr. Burkhard Göschel , BMW Group Board Member Development and Purchasing- "Electronics in Automobile Development – a Challenge" - Keynote address at the Opening Ceremony of ELECTRONICA 2002, Munich-Riem Fairgrounds, 11 November 2002

Summary of job roles and location

S.NO	JOB TITLE	FIRM/LOCATION
1	Board member for Development and Procurement	BMW
2	Board member in charge of the Mini brand and digital services	BMW
3	CEO	MOG
4	CEO	Stitcher
5	CEO and President	ATX Technologies
6	CEO and President of Cross-Country Automotive Services	BMW
7	Department Manager – Product Requirements and Development	BMW North America
8	Director	BMW Group Vehicle Research
9	Director	BMW Group Technology Office
10	Director	William Lehman Injury Research Centre, Miami
11	Executive Vice President of Business Development	Pandora
12	Head of the BMW AppCenter	BMW
13	Head of the International BMW	BMW
14	Head of Traffic Technology and Traffic Management	BMW Group
15	Member for the BMW Group in	Steering committee of the Ko-FAS initiative
16	Product Manager	BMW Group Apps
17	Senior development engineer	BMW Group Technology Office USA
18	Senior Vice President Digital Services and Business Models	BMW Group
19	SVP of Business Development at	MOG
20	Vice President	MINI USA
21	Vice President & General manager	Motorola Telematics Communications Group
22	Vice President of digital services	BMW
23	Vice President of Engineering and Aftersales	BMW North America

Summary of Documents

S.No	Document title	Released data

1	BMW IS FIRST TO OFFER PRACTICAL AUTOMOBILE INTERNET CONNECTION	28.09.1999
2	BMW IS FIRST TO OFFER FULLY INTEGRATED DIGITAL PORTABLE PHONE AS STANDARD	19.04.2000
3	BMW Group to Introduce Digital Satellite Radio	06.01.2000
4	The Focus Remains on the Driver: BMW Group Presents Telematics Strategies for Today and Tomorrow	08.11.2000
5	BMW and Motorola Launch Integrated Dual Band, Tri-Mode Digital Phone System Now Standard on Model Year 2001 BMW 7 Series	18.01.2001
6	BMW Telematics Offensive: Networking of individual mobility through partnership with Vodafone Passo	13.02.2001
7	BMW OF NORTH AMERICA TO LAUNCH NEXT GENERATION TELEMATICS SERVICES	14.08.2001
8	BMW ADDS CONCIERGE SERVICES TO TELEMATICS PORTFOLIO	01.11.2002
9	ConnectedDrive: The virtual co-driver with a seventh sense	14.10.2002
10	Seeing More at the Wheel: BMW Presents Solutions for Extra Safety and Comfort	14.10.2002
11	Electronics in Automobile Development – a Challenge	11.11.2002
12	BMW Group Presents Intelligent Driver Assistance Systems ConnectedDrive Concept maintains the driver's responsibility	15.11.2002
13	TALKING CARS FOR LESS CONGESTION – THE FUTURE OF TELEMATICS	25..09.2003
14	BMW LEADS THE INDUSTRY IN HIGH-TECH AUTO FEATURES ACCORDING TO THE TELEMATICS RESEARCH GROUP	21.06.2006
15	BMW presents open source Telematics Protocol.	08.01.2008
16	BMW OFFERS REAL-TIME FUEL PRICES, WEATHER AND BLOOMBERG STOCK INDICES.	30.06.2009
17	One step closer to accident-free mobility	18.09.2009
18	BMW ASSISTTM EXTENDS AUTOMATIC COLLISION NOTIFICATION TO INCLUDE “RISK OF SEVERE INJURY” ALGORITHM.	11.01.2009
19	Pathfinder from BMW	15.06.2010

20	BMW extends office functions to include incoming e-mail with voice output	24.06.2010
21	BMW Group supports new iPod Out feature for iPhone and iPod touch	07.07.2010
22	A LINK TO THE FUTURE: MINI CONNECTED	07.10.2010
23	BMW Roadside Assistance Introduces Smartphone Application Advanced functionality enables customized experience	08.04.2010
24	BMW WINS THREE "TELEMATICS UPDATE" AWARDS BMW ConnectedDrive receives critical acclaim for enhancements to safety, convenience	10.06.2010
25	BMW Online Gets Updated User Experience	01.12.2011
26	BMW Vision ConnectedDrive	16.02.2011
27	Pandora® Now Available for Model Year 2011 BMW Vehicles	28.04.2011
28	MINI USA PARTNERS WITH MOG TO DEVELOP A NEW MINI CONNECTED APPROVED APP	10.03.2011
29	BMW Head-Up Display: Precision as featured in a fighter jet.	28.10.2011
30	MINI LAUNCHES THE NEXT WAVE OF IN-CAR ENTERTAINMENT WITH MOG	11.11.2011
31	BMW Announces MOG App	15.11.11
32	THE NEWEST PERSONALIZED RADIO APP FOR BMW AND MINI DRIVERS: ON-DEMAND ENTERTAINMENT WITH STITCHER SMART RADIO.	06.08.2012
33	BMW ConnectedDrive 2012 A new milestone in networked mobility	13.07.2012
34	BMW Group Partners with Stitcher	12.03.12
35	BMW Announces Four New App Integrations	27.03.2013
36	BMW ConnectedDrive In touch with your world	27.03.2013
37	BMW ConnectedDrive for 2014 Model Year	05.06.2013
38	BMW ConnectedDrive Wins 2013 Telematics Update Award	11.06.2013
39	The New My BMW ConnectedDrive Portal and ConnectedDrive Store1. The exclusive portal for BMW ConnectedDrive customers.	19.02.2015
40	BMW ConnectedDrive develops intelligent parking search solutions.	03.06.2015
41	BMW ConnectedDrive and BMW i Remote app	24.04.2015
42	BMW Announces First App Integrations For Android Devices	22.03.2016

43	BMW Connected North America – Your Personal Mobility Companion makes world debut at Microsoft Build 2016, powered by Open Mobility Cloud built on Microsoft Azure	31.03.2016
44	GoPro Integration for BMW M Laptimer App	14.04.2016
45	BMW Connected – Your Personal Mobility Companion gets an important update, plus availability for Alexa and Android devices starting in October	06.10.2016
46	Digital lifestyle at the BMW Group: Seamless in-car integration of Amazon Alexa	27.09.2017
47	BMW ConnectedDrive Services – Information/Data Protection	01.05.2018
48	Hey BMW, now we're talking!- BMWs Are About To Get a Personality with Introduction of New Sophisticated In-Car Intelligent Personal Assistant	06.06.2018
49	BMW Brings Spotify Into the Car	14.11.2018
50	BMW Unveils the ConnectedDrive Store, Allowing U.S. Customers to Purchase Services through BMW Vehicles	14.12.2018
51	Annual report	2017
52	Annual report	2008

Impact of Values on Strategic Decision-Making with Respect to Business Model Design

The Case of Ecosia

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Abstract

This paper aims at exploring the role that explicit corporate values have in directing a company's strategic decision-making (SDM) with respect to managing its business model design. To inquire about this relationship, it focuses on the German Internet start-up, Ecosia, using an exploratory case study method and interpreting qualitative data from two expert interviews. The empirical data is analysed and compared in relation with the theoretical framework of values-based innovation management (Breuer & Lüdeke-Freund, 2017), which offers a recently developed foundation for understanding the directive role of values for strategic management and business model innovation. The interpretation of the obtained results indicated that the corporate values of Ecosia influence the company's SDM when it comes to business model design, particularly in terms of management of partnerships, product development and promotion strategies, the use of physical resources and HR management. Thus, the case of Ecosia exemplifies the assumptions of the values-based management framework and contributes to exploring their validity in practice.

Keywords

values, business model, strategic decision-making

1. Introduction

The importance of values for decision-making and as determinants of behaviour has been investigated and widely discussed in the literature (e.g. Fritzsche & Oz, 2007; Poortinga et al., 2004; Verplanken & Holland, 2002). Their role in business has also been recognized in various publications and empirical studies (e.g. Bart & Pujari, 2007; Freeman & Auster, 2015; Lee, Fabish & McGaw, 2005). Consequently, "financial leaders have come further in understanding the relationships between values and performance, that they are doing a better job of exploiting them, and that their more comprehensive approach to values is associated with superior financial performance" (Lee, Fabish & McGaw, 2005: p.14). But while companies may recognize the importance of values for avoiding risks, their potential for unfolding opportunities has yet to be acknowledged (ibid). Although the determining potential of a company's values for its strategic decision-making (SDM) and performance is considered as a state-of-the-art topic, still there is a scarcity of studies that inquire about it. The present paper aims at addressing this gap in the literature by exploring the role that explicit values developed by an organization have for its SDM with respect to managing business model de- sign. To investigate this relationship, it explores the case of the Berlin based Internet start-up Ecosia and its six core values.

The case of Ecosia provides an example of a successful start-up company, which introduces an innovative business model based on values, and thus serves as a role model for entrepreneurs. The values of sustainability and integrity upon which Ecoisa builds its business are of increasing importance in the context of today's social and environmental challenges. As we are losing 18.7 million acres of forests annually, equivalent to 27 soccer fields every minute, forest and land- scape restoration become one of the cheapest and most effective ways to mitigate and even reverse the progression of global warming (WWF, 2018). In addition, reforestation can prevent erosion, create a stable microclimate for other crops, restore the water systems and provide new means of income for local communities (Ecosia Knowledge Base, 2018a). Ecosia's investments capitalize on these opportunities for action towards sustainable development, addressing major concerns for the Earth's ecological stability as well as the pressing needs of people living in areas where deforestation is widely spread.

The present study applies the theoretical perspective of the values-based innovation management framework (Breuer & Lüdeke-Freund, 2017), which offers a recently developed foundation for understanding the directive role of values for strategic management and business model innovation. It employs

qualitative methods within an exploratory case study methodology (Yin, 2017), as a preferred method for investigating contemporary phenomenon, when there is little control over the research environment and a lack of detailed preliminary research (ibid). The two expert interviews that served as main sources of empirical data were transcribed and analysed using an evaluation strategy proposed by Meuser and Nagel (2009). The processes of open and axial coding, derived from grounded theory (Strauss & Corbin, 1990) were used to support the interview analyses. The collected empirical data was then analysed and compared in relation with the theoretical framework of values-based management.

The interpretation of the obtained results indicated that the corporate values of Ecosia influence the company's SDM when it comes to business model design, particularly in terms of management of partnerships, product development and promotion strategies, the use of physical resources and HR management.

2. Ecosia - the search engine that plants trees

Ecosia is an Internet start-up company that helps to finance forest restoration projects around the world. Founded in 2009, Ecosia was not the first search engine that supports tree planting initiatives. For instance, Treehoo (Heimbuch, 2018) and EcoSearch (Bright Hub, 2010) were already putting this idea into practice. But while the former two platforms have not managed to establish a strong user base and achieve a steady environmental impact, Ecosia, with its over 7 million active users, is on the verge to become a worldwide trend.

Like most search engines, Ecosia displays so-called EcoAds along with regular search results. Those ads as well as Ecosia's search results are provided by Bing, a search engine that holds one of the largest market shares in the industry. When users click on the ads supplied by Bing, Ecosia generates income paid out by Bing's advertisers. With the accumulated profit Ecosia sustains the company's resources and capabilities, pays out salaries and promotes its market presence. The green search engine then invests a 100% of its surplus income to finance reforestation projects (Ecosia Knowledge Base, 2018b). To keep its users informed about the company's earnings and expenditures, Ecosia follows a policy of full financial transparency and publishes a monthly business report.

The German start-up is driven by the vision to "cultivate a world where all humans live together compassionately and in balance with nature". The mission statement of Ecosia affirms that the company creates solutions which enable users to

"behave in a way that is good for all people and the planet", it reaches "massive amounts of people in order to cultivate positive change on a global scale" and it uses its profits to "restore entire landscapes and enable impoverished communities to live a good life in balance with nature" (Ecosia's Vision & Mission, 2019). As an extension of its vision and mission statements the organization has set the ambitious goal to plant 1 billion trees until 2020.

3. Theoretical background

Values-based innovation management is a theoretical framework developed by Breuer and Lüdeke-Freund (2017) to address the potential of values in guiding business innovation and its management. It explores the directive role of values, defined as notions of the desirable, as core drivers of corporate value creation and renewal. According to the values-based view on management, values or normative orientations, that underly an organization's attitudes and behaviours, are pursued by all companies engaged in business activities. But while some companies explicitly define the values they strive for as part of their mission, vision or purpose statements, others omit them as only implicitly present within their corporate operations and practices. By setting up values-based goals and visions at the base of their commercial undertakings, entrepreneurs can go beyond mere economic interests and obsessive efforts to achieve competitive advantage. This allows the development of businesses that are simultaneously financially effective and strongly committed to societal progress, by addressing social or environmental goals.

In its essence the values-based framework differs from other mainstream approaches to creating social and environmental value, such as corporate social responsibility or creating shared value (Porter & Kramer, 2011). While these prominent concepts consider addressing values of relevant stakeholders and the society for either ethical or strategic purposes, values-based innovation management incorporates values into the company's core objectives.

The framework elaborates upon the Integrated Management Concept (IMC) (Bleicher, 1994) "a system-theoretical perspective that sees organisations as complex systems consisting of sub-systems, interrelations, and functions" (Breuer & Lüdeke-Freund, 2017: p.39). By adopting the outlook of IMC, values-based management differentiates between three major dimensions of management: normative, strategic and instrumental.

Values-based normative management defines the "overarching values, identity and aspirations of an organisation and codifies the norms, principles and strategies for their realisation" (ibid, p.150). According to the IMC "because of its constitutive role, normative management functions as the basis for all activities of management" (Bleicher, 1994: p.141). By exploring, identifying and codifying the values of internal and external stakeholders, values-based normative management aims at establishing the company's corresponding identity and aspirations. Furthermore, it motivates inter-organizational collaboration through the formation of values-based networks, which focus on overarching goals, such as sustainability.

Values-based strategic management "deals with identifying, achieving, and exploiting competitive market positions; it translates visions and missions from the normative dimension into strategic programmes and orientation for valuecreating activities in the instrumental dimension" (Breuer & Lüdeke-Freund, 2017: p.123). In other words, while normative management functions as a foundation for activities, it is the task of strategic management to direct them accordingly (Bleicher, 1994: p.143).

The instrumental management dimension is characterized by the processes and tasks that apply in practice the realisation of organizational norms and strategies. Its main focus is the optimization of process efficiency and social cooperation in order to enhance performance, both within the organisation and with external stakeholders (Breuer & Lüdeke-Freund, 2017: p.42).

3.1 Research questions

The values-based view on management suggests that values have a directive potential that determines an organization's objectives and thus drives its SDM. The theory argues that explicit corporate values (e.g. defined by the organization's normative statements) as well as implicit values (e.g. originating within its organizational culture) can both be integrated on the level of strategic management and guide SDM and business model innovation.

By combining its search engine product with tree planting Ecosia's business pursues values of sustainability and social responsibility. Since a company's business model design constitutes of various components that can be addressed through values-based management this paper aims to explore the impact of Ecosia's corporate values on the company's SDM with respect to managing specific and most fundamental components of its business model design (i.e. partners,

capabilities and touchpoints). Due to time and resource limitations a broader inquiry that incorporates all components of Ecosia's business model was beyond the scope of this study. To differentiate the three specified components, mentioned above, the study adopted a component model presented in the Business Innovation Kit (Breuer, 2014), a toolkit which aims to facilitate exploration and evaluation of values-based business models. For a detailed overview of the individual components presented in the Business Innovation Kit the reader is referred to Breuer (2014) and Breuer & Lüdeke-Freund (2017).

Based on the theoretical discussion presented above, the following research questions were derived for the purpose of this exploratory study:

Research question #1. How do Ecosia's values impact the company's SDM with respect to managing partner relations?

Research question #2. How do Ecosia's values impact the company's SDM with respect to managing corporate capabilities?

Research question #3. How do Ecosia's values impact the company's SDM with respect to managing customer touchpoints?

4. Method

4.1 Research design

The research design employed in this paper uses qualitative methods and is based on the case study methodology (Yin, 2017). It explores the impact of values within a single organization, without formulating a predefined hypothesis, thus the exploratory case study method is found as most suitable. To conduct a case study, it is required to define its units of analysis. The units of analysis stem from the propositions and research questions that determine the purpose of the research. They represent the specific information being sought for, i.e. "the case in a case study" (ibid, 241). Furthermore, embedded units of analysis are lesser components of the main units of analysis. In this study the main units of analysis are: (1) Ecosia's corporate values and the (2) SDM of the company with respect to (3) business model design. Further embedded units of analysis correspond to the core values explicitly defined by the company and its decision-making with respect to specific business model components (i.e. partners, capabilities and touchpoints). The following paragraphs provide a description of the main units of analysis along with a corresponding theoretical discourse.

4.1.1 Corporate values

In recent years, definitions of formal statements, that outline corporate values, have become a widely adopted practice by companies around the world. Increasingly, business leaders put an emphasis on ethical behaviour, honesty, integrity and social concerns as top issues on their companies' agendas (Lee, Fabish & McGaw, 2005: p.1). Companies start to realize the essential role of values as definitions of what they care about and strive for in their everyday activities. In cases when leaders are faced with difficult decisions "where they have to choose between multiple courses of action that each seem right from a certain perspective", corporate values can be used to make choices that are "maximally beneficial to all stakeholders" (Mackey & Sisodia, 2015) Thus, values-driven management is emerging as a notion of guiding corporate action and SDM.

Ecosia has defined six core values that represent its corporate identity. These six values are specified as follows:

"**Impact:** *Think big and prioritize what will have the greatest impact*."

"**Integrity:** *Be honest, authentic and open.*"

"**Sustainability:** *Seek long term, sustainable solutions.*"

"**Leadership:** *Lead the way to a sustainable future.*"

"**User focus:** *Honour the user.*"

"**Happiness:** *Make it an enjoyable ride.*"

For a more comprehensive description of Ecosia's values the reader is referred to the company's Mission & Core Values statement (Ecosia's Core Values, 2019).

4.1.2 Corporate SDM

Management theorists agree that decision-making has crucial significance as one of the most important management activities (Drucker, 2010; Mintzberg, 2008). SDM refers to chosen alternatives "that affect key factors which determine the success of an organization's strategy" (BusinessDictionary.com, 2019). Strategic decisions are viewed as a component of strategic management which can be

defined as “the process of specifying the organization’s objectives, developing policies and plans to achieve these objectives, and allocating resources to implement the policies and plans to achieve the organization's objectives” (Ayitey, 2010: p.7). Furthermore, strategic management “deals with the development of the potential resources and capabilities a company needs to successfully engage with its environment and differentiate itself from its competitors” (Breuer & Lüdeke-Freund, 2017: p.65). In order to implement these objectives of strategic management, managers strive to align strategic decisions with their company’s goals.

4.1.3 SDM with respect to business model design

The literature provides numerous definitions of the business model concept. In general terms a business model describes “how people and organisations do what they consider worth being done, and how they intend to receive something in return, i.e. business models are about the creation, delivery, and capture of value” (ibid, p.121). The values-based management framework emphasizes that business models serve as a major lever of guiding innovation activities on the dimension of strategic management (ibid, p.122). Other scholars have also investigated and emphasised the relatedness between business models and corporate strategy (e.g. Morris et al., 2005; Casadesus-Masanell & Ricart, 2010; Teece, 2010). Hacklin and Wallnöfer (2012: pp.167-168) argue that on a macro-level, the business model can be described as a simplified description or reflection of a firm’s strategy describing its overall value creation and capturing logic. In this sense, business models can be regarded as cognitive frameworks or tools, that offer a template for integrating and organizing strategically relevant elements, in order to create sustainable competitive advantage (ibid).

4.2 Procedure

The study employed qualitative methods, such as expert interviews as well as analysis of secondary material, such as internal documents, publications, previous studies and observations. Two semi-structured expert interviews were conducted at Ecosia’s Berlin office, in January and July 2018. Different interview guides were developed in order to address the specific competences of the two respondents. Both interviews were fully transcribed.

The expert interview approach was chosen with the purpose of gaining a better understanding of the topic and its context, collecting specific examples and stories that serve to illustrate the logic underlying Ecosia’s SDM (with regard to the

research questions) and finding indications for follow-up research activities. According to Yin (2014) interviews are one of the most important sources of case study information. Furthermore, the expert interview is a distinct method of qualitative empirical research designed to explore expert knowledge with regard to reconstructing social situations or processes (Meuser & Nagel, 2009).

The first interviewee selected to participate in the research was P. Baumann, head of product at Ecosia. The head of product is responsible for the development and management of the product based on the organizational strategies and vision and in close, cross-functional collaboration with all relevant departments (Cleverism, 2018). As one of the main responsible persons for the development and market presence of Ecosia as a product, Baumann is significantly involved in the company's SDM with regard to the management of business model components, such as touchpoints, stakeholder segments and capabilities. Therefore, his expertise in relation to the research question can be regarded as subject matter know-how (cf. Froschauer & Lueger, 2009), i.e. "based primarily on experience drawn from participating in activities in the field of research" (ibid, p.221).

The second interview was conducted with A. Bainger, holding the position of happiness officer at Ecosia. Her position has a strong focus on analysing and managing employees' happiness in parallel with traditional HR management activities. Since Ecosia's organizational structure does not have a dedicated HR role, Bainger holds many of the responsibilities related to employee management. For this reason, she was selected as the most relevant (expert) interviewee, possessing subject matter know-how, concerned with Ecosia's management of HR, as part of the company's capabilities business model component.

In order to ensure its quality, validity and scholarly value, the research aimed at complying with core criteria for conducting qualitative research defined by Steinke (2004). Furthermore, to operationalize the procedure of interpreting the collected empirical data, an evaluation strategy approach to expert interview analysis, proposed by Meuser and Nagel (2009) was applied. The approach is focused on specifying thematic units, i.e. reappearing and comparable topics found throughout the interview data (ibid, p.35). The identified thematic units and the connections between them form the basis for empirical generalizations that can be further interpreted through theoretically inspired perspectives. This corresponds with elements of the methodology of grounded theory (Strauss & Corbin, 1990), namely the processes of open and axial coding, which were also used to support the analysis of empirical data.

5. Analysis

5.1 Ecosia's values and the company's SDM with respect to managing partner relations

Baumann (2018) provides two examples of Ecosia interrupting partnerships due to partners diverging from the company's values. Describing the case of a "big petrol corporation" that approached the search engine company with an offer to use its product, he concludes:

"…one of our core values is "Integrity" which also means not just being transparent about what we think and do, but also making sure that people can trust us…, because maybe if you have a partner and that allows you to reach 5 million people that would be a lot of trees…, but on the other hand, if you compromise too much then you start losing integrity. And so, this is really a challenging balance to find sometimes and, in that case, we were also like: No, the cost for our integrity would be too high." (ibid, p.4)

Apparently, the consideration of the trade-offs between loosing integrity and establishing beneficial partnerships from a purely strategic perspective plays an important role for Ecosia's decision-making. Baumann suggests that the reason behind this prudence lies in the "risk of greenwashing" which comes from the image of Ecosia as a brand. As he points out, this includes careful consideration, to avoid partnership deals that undermine the search engine's credibility in front of its customers.

Since 2016 Ecosia established several strategical partnerships with Internet browsers that included its services as the default search engine for their platforms. Some of the contracted companies were Brave, Pale Moon, Waterfox, Vivaldi and Polarity. Reflecting upon these recent deals Baumann (2018, p.4) states:

"…the thing we all have in common, like all these browsers and we, is that we all value an openly decentralized web, where really there is space, and there are alternatives, and there is choice."

In an interview for Forbes magazine, Jon von Tetzchner, the CEO of Vivaldi, one of the browsers Ecosia is partnering with, also affirms the common values shared by the two IT ventures:

"We believe in putting people in charge of their browsing experience, and by including Ecosia, we give our eco-conscious users easy access to a greener search engine option," (Kite-Powell, 2017).

The goal of offering Internet users alternative and sustainable services, shared between Ecosia and its browser partners, suggests that their shared values serve as a common ground for collaboration.

5.2 Ecosia's values and the company's SDM with respect to managing corporate capabilities

The capabilities component represents the main resources that a company needs in order to create value and realize its value proposition. Corporate values may influence the SDM related to the capabilities that a company aims to secure. For instance, companies that pursue values of sustainability and care for the environment have reportedly switched to renewable energy policies, in order to reduce the environmental footprint of their electricity and fuel consumption. Baumann (2018: p.3) affirms that Ecosia has also switched to the use of solely renewable energy by investing some of its capital in a solar panel project.

As an IT firm that mainly uses the server infrastructure of its partner Bing, Ecosia's human resources are its main asset for developing and delivering the company's product. Thus, Ecosia needs a workforce that is dedicated to its vision and mission as expressions of its normative orientation and strategy. To cultivate such commitment Ecosia aims at establishing an organizational culture based on its core values, and the "Sustainability" value in particular. One level on which the green search engine directs its efforts in developing a corporate culture of sustainability is the selection of candidates. In this regard Bainger (2018: p.4) points out:

"When we are employing for a new role then we kind of understand how our culture and values are, so preferably we are also looking for people who we can see through their experience and what they like doing, etc., that they are fitting in with these values..."

Baumann (2018: p.1) adds on by emphasizing on the rejection of candidates that are identified as neglecting the topic of sustainability:

"In the interview process we usually ask: Why do you care about trees or the environment? And then see what people say… And I think if someone really wouldn't care at all… we would probably not hire a person like that. I think for us it's quite important to have at least some basic awareness of the topic."

Since hiring is just one aspect of HR management, it cannot suffice for the development of an organizational culture that caters to the company's goals and values. Therefore, Ecosia needs to direct efforts towards the preservation of values within its organizational context. Baumann comments that there two main ways of doing that:

"Everyone, but especially people in leadership positions regularly reflect on their behaviour and how it is in line with our core values and then try to be a positive example for others in that sense… I think that's the biggest thing you can do and then also clearly pointing out when you think that there was a violation of core values. Being very honest, and open, and specific about that and not shying away of putting a finger there when it happens…" (ibid, p.6)

5.3 Ecosia's values and the company's SDM with respect to managing customer touchpoints

Ecosia's monthly income and subsequently its monthly tree planting investments have been growing exponentially in the last 2 years. Baumann (2018: p.1) attributes "the biggest driver of that growth" to a "shift in mindset" from "just waiting for people to discover us to actually going out there and talk about Ecosia in different kinds of ways". The company altered its passive attitude and began promoting its product through different channels, such as "PR, Social Media, paid and unpaid marketing" as well as "offline and online press" (ibid, p.1f). Baumann refers to partnerships with schools, universities and public organizations that adopt Ecosia as their search engine as an additional and important channel for promoting Ecosia's services. He also outlines the different social media channels used by Ecosia, namely Facebook, Twitter, Instagram and YouTube, and stresses that videos are becoming "more and more important as a medium" (ibid, p.2). In relation to that he gives the example of using influencer marketing in order to reach potential users. Influencer marketing refers to a promotion strategy in which the focus is placed on specific individuals that mediate the company's publicity rather than on the target market as a whole. In recent years influencer marketing has become a prominent approach to advertising products and services on social media websites (Woods, 2016). Baumann suggests that such collaboration with individuals popular on social media and related to topics, such as "health, lifestyle,

and sustainability" can turn to be a "very efficient and targeted way to reach people".

Furthermore, Baumann outlines two core messages that Ecosia proclaims when promoting its product. The first one is related to protecting user privacy. Baumann (2018, p.3) argues that as a result of its efforts to improve the way it treats user data, Ecosia can claim to offer better privacy for its consumers than the market leader – Google. In a 2013 interview, Piotr Drozd, Ecosia's Head of Growth and Analytics at that time, further affirms the importance for the green search engine to protect its users' privacy. He states:

"…we take the privacy of our users very seriously and don't store any data or employ personalization algorithms, virtually each and every data point we collect is either aggregated or cookie-based…" (Smith, 2013).

The second core message that Ecosia brings to its potential users when promoting its product is described by Baumann (2018) as follows:

"You can use it very easily… And the real added value is that you search, you find results, but you can contribute to something big, something great, you can plant trees, you can really make a difference as an individual… it's not just like: OK, I do a donation… but really on an ongoing basis you can see that …these trees are actually going in the ground somewhere, they are making a difference for the climate, for the people, for the environment, for biodiversity." (ibid, p.3).

The above statement suggests that Ecosia's strategy to attract and retain users is based on establishing a link between its sustainable value proposition and the user's affinity towards environmental protection and positive social impact. As claimed by Baumann (ibid, p.7), the two strategic challenges for Ecosia as a product and with regard to its customer outreach are on the one hand, developing platforms in order to be more "accessible to the user" and on the other hand, increasing its users' engagement. The green search engine strives to connect each of its users "on a personal level and emotional level" to the positive impact that tree planting projects create. A proposed future outlook on how to establish such "intimate, close connection to the positive impact" of searches is for users to have accounts that allow them to track the trees that they have "planted" in a local project or "follow someone who is working and living there and get regular updates from this person". Ecosia's efforts towards establishing a connection between users and the positive impact they are creating is also expressed in the

tree counter, which is available for each user, and calculates the average amount of trees planted due to activity on the website. Additionally, Ecosia advertises the achievement of milestones on its way to planting a billion trees by 2020.

In order to obtain feedback from users about how they experience its offering, Ecosia focuses on applying user-centred research. The search engine collects and analyses its consumers' data to closely monitor the user lifecycle, "starting with acquisition through activation, retention, referral and finally - the bottom line – revenue" (Smith, 2013). In the following quote Baumann (2018) highlights the importance of user-centred research for Ecosia:

"The more you really know your users and you ask them regularly the more certain you can be that you actually are building, and working, and providing things they actually need and want. So, this is really one of our core values is "User focus" and that is what it means. In order to sort of focus on the user and honour the needs, and the problems, and the things they want you have to understand them first." (ibid, p.4)

According to Baumann (ibid, p.3f) Ecosia has carried out quantitative and qualitative research of its user base to identify 5 personas, which represent the company's customer segments and their needs and preferences. Baumann describes three of the main personas identified by Ecosia. One core user group consists of people characterized as young students that are motivated and have an awareness "for the challenges… their generation is facing with climate change". Second, are users over 45 years of age, who have been using Ecosia and have built a habit towards it. Third, Baumann refers to the group of "young professionals" using Ecosia who "have a pain when sometimes the relevancy and the quality of search results is not as good for some searches".

6. Discussion

The analytical part of this paper begins with an exploration Ecosia's SDM with respect to its partner relationships. As claimed by Baumann, Ecosia is particularly careful when considering new partnerships due to the risk of greenwashing, which can undermine the reputation of its brand. Greenwashing refers to the act of "combining poor environmental performance with positive communication about environmental performance" (Delmas & Burbano, 2011: p.84). The term is closely related with branding, which is in turn used by companies as a strategic tool to achieve differentiation from competitors. Breuer and Lüdeke-Freund (2017) argue

that strategic management can use values-based branding in order to translate corporate values into brand values that appeal to customers. Ecosia's case exemplifies such strategic approach, as the company aims to differentiate itself from competitors by adhering to its core values and promoting them as an inseparable aspect of its product brand.

Furthermore, the interview results suggest that the shared values of Ecosia and its browser partners (i.e. to provide alternative and sustainable web services) serve as a basis for their collaboration. According to Breuer and Lüdeke-Freund values shared across organizations, can serve as a basis for establishing partnerships and triggering the formation of values-based networks. The authors reinterpret the notion of value networks (Lindgren et al., 2010), which provides an alternative to the traditional value chain concept, as more apt to the conditions of today's highly complex market environment. Breuer and Lüdeke-Freund (2017) argue that while value networks emerge based on an "expected outcome (e.g. access to complementary resources, revenue opportunities, or the pleasure of working together)" (ibid, p.162), values-based networks aim at fulfilling the subjective notions of the desirable that underlie organizational decisions and evaluations. Thus, by adopting a values-based view of management companies can form partnerships in which their business model components interact in a way that contributes to their joint pursuit of common values. Accordingly, Ecosia's partnerships with other companies from the IT sector, which share its purpose of providing alternative Internet services serve as an example of a values-based network.

The data analysis with respect to the capabilities business model component generated two distinct findings about its interrelation with Ecosia's core values. First, the core value of "Sustainability" is represented in the company's use of exclusively renewable energy resources for powering its operations. Second, in order to motivate its employees in pursuing the company's vision and mission, Ecosia develops an organizational culture based on its six core values. Candidates are being screened for their congruency with the "Sustainability" value while employees in leadership positions ensure that a culture in accordance with the core values remains intact. Thus, Ecosia serves as an example of a company that develops a corporate culture of sustainability. Based on a matched sample of 180 companies, Eccles et al. (2011) found that companies adopting such corporate culture are more likely to organize procedures for stakeholder engagement, to be more long-term oriented, and to have executives that are more committed to sustainability. Moreover, the study suggests that companies adopting a corporate

culture of sustainability "significantly outperform their counterparts over the long-term, both in terms of stock market and accounting performance" (ibid, p.1). Thus, it can be argued that Ecosia's values-based approach to HR management brings advantages to the company's business model and strategic objectives.

Baumann suggests that the use of influencer marketing in collaboration with people popular on social media is an approach applied by Ecosia to promote its product. Similar to the notion of values-based networks discussed above, such implementation of influencer marketing refers to a collaboration based on shared values. By reaching out to potential users that are already interested in the topics of sustainability and environmental protection (e.g. through engagement in the social media context) Ecosia establishes a link between their values and the purpose of its business, and thus expands its user base. Furthermore, in accordance with its core value of "User focus", which aims to "empower people to do good" and "protect the needs of our users and act in their best interests" (Ecosia's Core Values, 2019), Ecosia promotes itself by emphasizing on the positive environmental impact of its business and its concern with protecting user privacy. Thus, it acknowledges two customer values that gain increasing importance and prominence in the context of today's industrialized and digitalized world. This suggests that Ecosia's promotion strategy, as a key element of the touchpoints business model component, is influenced by the company's normative orientation and core values.

Another aspect of the touchpoints component is the customer journey, characterized along its seven touchpoints, namely, become aware, inform, acquire, start up, use, modify and dispose or renew (Breuer et al., 2009). One of the findings of the present study is that Ecosia's core value of "User focus" finds expression in the company's emphasis on employing user-centred research. The analysis of its users' lifecycle and the identification of personas allows the green search engine to understand and specify the needs and values of its consumers with respect to their customer journey. By doing so Ecosia can identify potentials for values-based innovation in its value proposition in order to attract and retain more users.

7. Conclusion

The case of Ecosia enriches the understanding about the directive role of values for strategic management, particularly with respect to designing and managing business models that are simultaneously financially viable and sustainability-

oriented. Thus, it exemplifies the assumptions of the values-based management theoretical framework and contributes with an additional case study to validate them in practice. The interpretation of the obtained results indicated that the corporate values of Ecosia influence the company's SDM when it comes to business model design, particularly in terms of management of partnerships, product development and promotion strategies, the use of physical resources and HR management (see fig. 1 below).

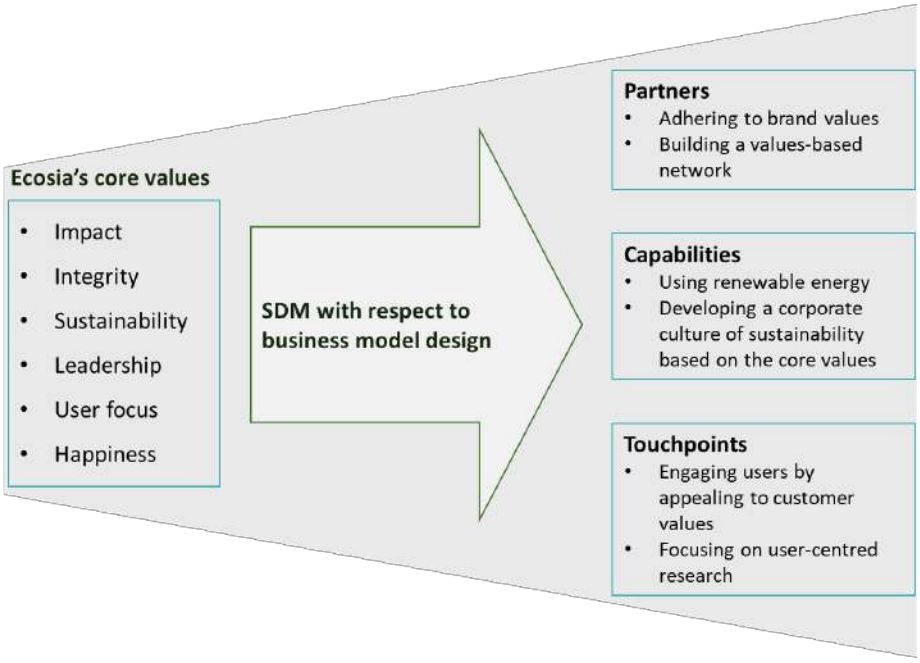

Fig. 1. Summary of key findings

Considering the single case element of this study, further research is required to enhance the generalizability of findings. The small size and the start-up status of Ecosia as an organization are additional factors that hinder generalizability. Due to time and resource limitations, the study focused on the interplay between corporate values and SDM only with respect to selected components of business model design (i.e. partners, capabilities and touchpoints). Although the findings presented here suggest that corporate values play an important role for strategic and business model management, more studies are needed to validate this assumption and provide a more comprehensive analysis that incorporates further business model components.

While strategic objectives traditionally aim at differentiation based on competitive advantage and financial success, Ecosia's main objective in developing its product is to sensitize users about the topics of sustainability and environmental

awareness. Even through the green search engine does not neglect the goals of profit maximization and improvement of its offering's quality, these efforts are not defined as independent from the company's values, vision and mission, but as subordinate to them. Although Ecosia is ran by a small team and operates in the search engine market, which is immensely dominated by Google, thanks to its business model, ambitious vision and dedication to the prominent values of environmentalism and sustainability, it has reached market success and creates substantial ecological and social impact throughout the world. As its popularity is growing and more and more people become active users of the platform it is transforming the Internet into a place where the small contributions of many users can lead to a significant positive impact for the environment.

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Implementation of Sustainable Business Models in Technology-Dominant Innovation Projects

Embedding Sustainable Business Models in Business Processes

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Extended abstract

Problem and current understanding - Technology is a driver for innovation, in economy as well as in research projects. The focus, in such projects, is often on technological and economic aspects only, whereas social and environmental aspects are only considered in a minimal way to comply with law (e.g.: ethical approvals and tests in medical areas, compliance with standards, …). This behaviour is described by Schaltegger, Lüdeke-Freund and Hansen (2011) as defensive sustainability strategy. As a consequence, potential benefits are missed. Furthermore, new possibilities for solution design, resulting in additional benefits, may open up if social and environmental aspects are considered more closely during research and innovation projects (Jirotka et al., 2017). Various frameworks, that foster sustainable business model innovation, and therefore include social and environmental aspects, exist (Bocken et al., 2013; Joyce & Paquin, 2016; Breuer & Lüdeke-Freund, 2016). As indicated in Figure 1, these frameworks focus on the architectural level. Frameworks, that describe and support the transfer of sustainable business models to the implementation level (see Figure 1), are rare.

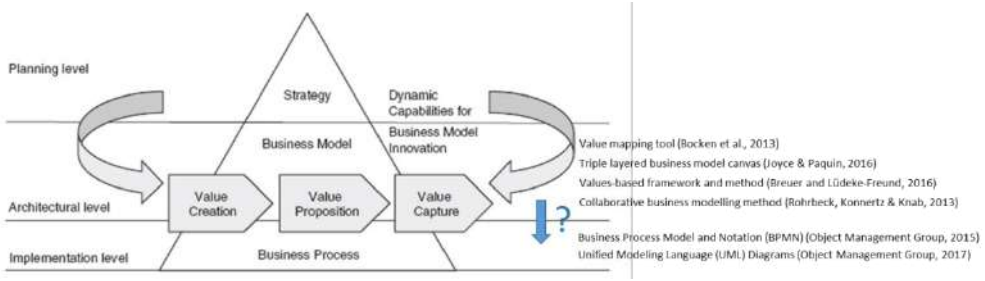

Figure 1: Business logic triangle including examples for sustainable business model frameworks and business process modelling tools. (Illustration modified from Rachinger et al., (2018) based on data in Osterwalder and Pigneur (2002), Mezger (2014) and Teece (2018))

Research gap - Existing frameworks describe very well how to initially consider sustainability in business models. It is still a challenge to implement the newly defined business model in technology-dominant research projects on a process level. Generating the link to the business processes and ensuring that defined values are lived in the business is not fulfilled by only defining the business model. First concepts already exist in this area (Solaimani & Bouwman, 2012). It is not clear how and to which extend existing frameworks and tools, such as the "value mapping tool" by Bocken et al., (2013) or the "triple layered business model canvas" by Joyce & Paquin (2016), do support the implementation of business models.

Additionally, it is difficult to know which framework is the most appropriate for a particular situation as it is still required to apply existing frameworks in additional settings to gain more insights on their applicability e.g. Values-based framework and method by Breuer and Lüdeke-Freund (2016) and collaborative business modelling method by Rohrbeck, Konnertz and Knab (2013) were applied in the energy sector solely. Transferability to other industries is still an open question.

Research question - From this following research question arises: How to ensure and implement sustainability in technology-dominant innovation projects?

Case study - The research question is going to be investigated in the following case study in the healthcare sector. In this particular project, recent improvements in the area of additive manufacturing (AM) open up the possibilities to manufacture implants for patients directly in the clinic.

As a consequence, medical processes may speed up, the number of required surgeries may be reduced. This may result in better fitting implants with improved properties enabled by AM and new materials.

Many stakeholders are involved and new tasks appear in establishing and finally integrating a new process chain in the daily operation of a healthcare provider. Stakeholders such as patients, including sensitive data that needs to be handled properly, doctors and many industry partners, who provide 3D printers, printing material and know how, are involved. New roles might be required to fulfil those new tasks, for example a technical and medical skilled person that is able to model and prepare the implant for 3D printing with the help of a computer aided design software. To be able to print the implant at the healthcare provider new infrastructure, an AM center where 3D printers are located, needs to established. This also needs to be considered in the business model. Additional new tasks for healthcare providers, such as the operation and maintenance of 3D printers and 3D printing material, have to be managed.

In this project it will be very important to consider social aspects concerning patients, employees, and society in general. Also from business perspective it is crucial to ensure that the operation of new processes will be economically feasible. Environmental benefits are expected due to indirect effects achieved by less transportation of implants and less surgeries as implants are planned to be available right away.

Based on the guiding research questions additional interesting aspects appear: How to develop new or adapt existing business models in this particular field of application? How to ensure sustainability of the newly developed process chain? How to proceed with the implementation of the defined business model?

Research Method - The applied research method is guided by the Design Science Research Paradigm of (Hevner et al., 2004). The relevant problem space is investigated based on detailed literature research and application domain specific process analysis. Based on this investigation an argumentative deductive analysis (Wilde & Hess, 2007) will be applied to identify new concepts and design new technical artefacts such as frameworks to fill the research gap (Hevner, vom Brocke & Maedche, 2018). The above mentioned project will serve as a platform for conducting case studies, including workshops and surveys with key stakeholders to validate identified concepts. Additional case studies in other fields of application are also planned for further validation of the results.

Expected contributions and practical implications - The expected contribution is to develop new or enhance existing frameworks, such as described by Solaimani and Bouwman (2012), to generate procedures that support the creation of sustainable business models in technology-dominant research projects and to ensure that those values, defined in the business model, are transferred to the business processes.

Funding information: This work was supported by CAMed (COMET K-Project 871132) which is funded by the Austrian Federal Ministry of Transport, Innovation and Technology (BMVIT) and the Austrian Federal Ministry for Digital and Economic Affairs (BMDW) and the Styrian Business Promotion Agency (SFG)

Keywords

Business model innovation, business process management, design science, additive manufacturing, sustainable business models.

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Industrial symbiosis guide for identifying opportunities & conceptualising business relations

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Abstract

Industrial symbiosis (IS) is a promising concept that consists in valorising underutilised resources from an entity as a substitute for another entity's new resources (e.g. material, combustible, energy) or by mutualising their use (e.g. equipment, knowledge, social tactics). Although literature indicates the relevance of IS, it is not yet fully implemented on the field. The business model concept is foreseen to be useful for IS implementation, but no guideline assists companies in this respect. This paper proposes a framework that supports the identification of IS opportunities, their assessment according to an extended range of values (economic, social, ecological, territorial) for the whole stakeholders ecosystem, their business conceptualisation through a dedicated sustainable business model canvas and the creation of preliminary business cases to trigger interest of each organisation's decision-maker. This methodology was developed with five process industries within the Horizon 2020 project EPOS. First results indicate that the framework can provide researchers, IS facilitators and companies with a useful tool for operational and research purposes. Unusual created or destroyed values can be assessed and integrated in the synergy business model which may foster synergies concretisation. It also gives a systematic method to evaluate the global synergy viability for society. Main research contributions are: (1) include process industries in the sustainable business models research field, (2) propose an innovative approach and a dedicated business model canvas focused on value co-

creation through a specific project rather than focused on a single organisation and (3) include territorial values in the considered value spectrum.

Keywords

Industrial Symbiosis, Business Model, Guide, Sustainability, Decision-making

Main text

Introduction

Industrial symbiosis (IS) is considered fundamental for the transition towards a sustainable process industry in the European Union (EU) (A.SPIRE, 2018). It consists in valorising underutilised resources from an entity as a substitute for another entity's new resources (e.g. material, combustible, energy) or by mutualising their use (e.g. equipment, knowledge, social tactics) (Adoue and Chambers, 2011; Deutz, 2014). IS enables cooperative management of resources between traditionally separate actors (process industries, SMEs, public organisations, associations, etc.), at different scales (Maqbool *et al.*, 2017). By working together, stakeholders can pursue greater benefits than the sum of individual benefits that each entity could get by optimising its individual performance only (Chertow, 2000). IS is a lever triggering the creation of value networks as defined by Jonker (2016).

The EU dedicated more than €130 million since 2006 in R&D&I projects to fill IS implementation gaps and facilitate its uptake thanks to IT tools, methodologies and networks. Most existing or underdevelopment IT tools are mainly focused on identifying synergies, using a technical approach, even though they struggle in being widely operationalised due to limitations such as geographic and sector scope restriction, unviable business models, lack of industries' feedbacks integration or failure in making it user-friendly and widely accessible (Grant *et al.*, 2010; Benedict and Kosmol, 2018; Maqbool, Mendez Alva and Van Eetvelde, 2019). Other tools exist and are dedicated to improve existing symbioses in terms of financial, technical or even environmental performance (Kastner, Lau and Kraft, 2015) or to assess their benefits using LCA, MFA, multi-criteria analysis, among other methods (Huang, Wang and Chen, 2019). By contrast, literature review revealed very few IS dedicated methodologies that not only help identifying synergy opportunities of any type and for any sector, but also guide their global assessment in order to facilitate decision-making processes of industrial managers. MAESTRI project provides guidelines to make a first resources valuation

(Holgado, Evans and Benedetti, 2017), but the methodology is limited to the single economic value. The COMETHE project created a set of generic methods for techno-economic, regulatory, environmental and risk evaluation for synergy implementation, but they remain difficult to use and, do not address business model (BM) and business case (BC) issues (*Module 2 - Comethe*, 2011).

In this paper, an easy-to-use non-IT tool is introduced and aims at filling some of the above-mentioned gaps. In particular, it consists in a 6-steps guide for practitioners helping to identify IS opportunities, but also to quickly assess a wide range of values (economic, social, environmental, territorial) synergies can create or destroy for an extended stakeholders' ecosystem and to conceptualise these new business relations thanks to a dedicated sustainable business model canvas (BMC). This guide emerges from ongoing work carried out within the EU funded project EPOS (*Enhanced energy and resource Efficiency and Performance in process industry Operations via onsite and cross-sectorial Symbiosis*) and was developed with industries in the perspective of being widely applicable and accessible. It has been designed to respond to two operational issues: (1) how to foster and trigger IS implementation and (2) how to help companies integrate the whole positive and negative impacts of their industrial projects in decision-making processes. From a research perspective, the developed methodology provides elements to analyse whether IS is a viable model for both individual industries and for the global system of stakeholders.

Approach

This empirical methodology has been iteratively developed in EPOS through synergy analyses and the conceptualisation of 15 business opportunities in 5 demonstration clusters across Europe. It merges well-known existing methodologies such as SWOTs and the BM canvas, and original and innovative modules specifically developed within EPOS. Based on industries' feedbacks, it has been designed to be generic and realistically usable by limiting spent time and data collection efforts. Its final outcome is not a detailed assessment of a synergy but a preliminary analysis that aims at triggering interest of stakeholders' decision-makers who could then decide to engage in the project development. This guide is considered as an IS accelerator enabling a quick relevant opportunities identification and analysis.

Similar to (Barquet *et al.*, 2013)'s approach for PSS, this research investigates IS using the BM concept prism. The BM is an excellent unit of analysis for studying

managerial and entrepreneurial approaches as well as stimulating and revitalising business philosophies (Schaltegger, Hanse and Lüdeke-Freund, 2016). In this paper, the BM is considered as a tool, and not as a practical reality in businesses as defined by (Galper, 2001; Judith and Mark, 2003). It describes organisation's principles to create, deliver and capture value (Osterwalder and Pigneur, 2011). Literature review on BM for IS showed a paucity of guidelines assisting companies to use this concept for synergies implementation. This paper provides some elements to fill this gap.

In addition, as IS creates a sophisticated conglomerate of environmental, economic, social and territorial values (Chertow and Lombardi, 2005; Chopra and Khanna, 2014; Maillefert and Robert, 2015), the guide proposes guidelines to integrate this whole in the synergy value proposition definition. It builds on the Sustainable Business Model (SBM) concept (Schaltegger, Hanse and Lüdeke-Freund 2016) adapted to the IS context, completed with territorial values and conceptualised within a usable canvas for practitioners. The SBM field generally focuses on SMEs or service organisations but this guide extends the perimeter to process industries and provides thoughts on how to bring these innovative paradigms to such actors. These economic sectors, as they are characterised by the SPIRE Association[64], differ significantly from the former because they are part of very competitive and global markets. They have high financial pressures, substantial ecological footprints, BM orientation on product selling and are part of well-established value chains. Consequently, the guide not only contributes in tackling IS implementation issues and integrating more values in decision-making processes, but it helps process industries evolve their traditional BM to more SBM thanks to the IS lever.

Proposed guide

The proposed methodology is translated into a 6-step guide for company decision-makers and IS facilitators (ISF). ISF are cluster managers, consulting companies, public bodies, associations, academics. The six steps illustrated in Figure 1 are:

1. LESTS analysis: cluster context analysis, definition of relations among cluster stakeholders and first identification of synergy opportunities;
2. SWOT analysis: refinement of opportunities analyses, shortlist of prioritised synergies and definition of IS cluster strategy;

[64] https://www.spire2030.eu/spire/the-association

3. Scope definition: analytical scope definition of one specific synergy, i.e. build the ecosystem of stakeholders directly and indirectly involved, collect data and define synergy scenarios;
4. Value mapping: identification and assessment of a wide range of values – economic, environmental, social, territorial – for each stakeholder and for the different scenarios;
5. Business Model: clarification of the (co-)created values in a synergy-specific sustainable BMC and definition of delivery and capture processes, including private and public (non-)financing schemes;
6. Business Case: summary of information needed for decision-making by each stakeholder to further engage in the project, or not.

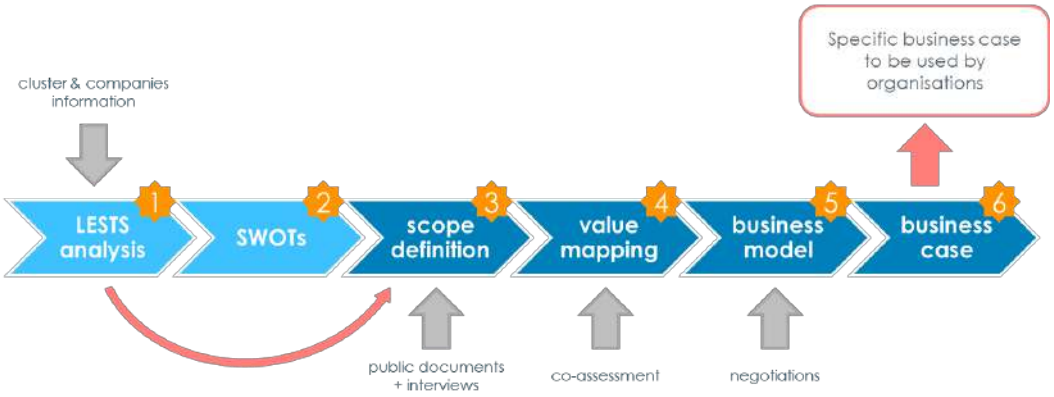

Figure 1: IS guide scheme

The methodology follows a chronological process in which each step provides outcomes that feed one or several following steps. It is divided in two main blocks represented in light and dark blue. The former aims at identifying and prioritising synergy opportunities in a specific area which are then individually analysed in the latter block. This second block gathers the central elements to conceptualise business relations and is the focus of this paper. External sources of information – mainly technical, contextual documents and exchanges with stakeholders – are required to initiate step 1 and complete step 3 and 4 (cf. grey arrows). The outcome is a synergy specific BC dedicated to each involved stakeholder in the synergy creation process. The 6 steps' goals and progress are provided below.

Step 1 – Cluster and synergy opportunities overview: LESTS analysis

The first stage of an IS project is the identification of underused resources that can lead to a synergy (Grant et al., 2010). To achieve this goal, it is proposed to use the

LESTS methodology, originally tailored to evaluate the collaboration degree within a specific cluster. Its approach is to scan cluster characteristics, identify relevant actors and assess their relations regarding 5 different dimensions introduced in Figure 2: Legal, Economical, Spatial, Technological and Social (Van Eetvelde et al., 2007). It is particularly relevant for IS and is applied at two scales in this guide: cluster and synergy. A local ISF knowing the context (e.g. association, consular chamber, cluster manager, etc.) is recommended to lead this step for a more efficient process while non-local facilitators or influent local companies are also credible leaders.

Figure 2: Detail of LESTS dimensions (Maqbool *et al.*, 2017)

At cluster level, three methodology stages are required: (1) research publicly available information about the cluster, its actors and analyse it according to the five LESTS angles; (2) send an extensive questionnaire detailed in (Maqbool, 2016) to the key actors previously identified; (3) make a complementary literature review to identify potential synergetic opportunities for cluster's resources. Information sources are MAESTRI's library of case studies (Benedetti, Holgado and Evans, 2017) and the ISDATA web platform (ISDATA, 2013) among others. If reported cases involve similar sectors and/or resources as in the cluster, cases could be replicated. Outcomes are thus a longlist of synergetic opportunities in the cluster, but also a better understanding of the local context and the identification of key actors and the characterisation of their relationships.

At synergy level, foreseen implementation barriers of each opportunity are assessed by the user of the guide and translated into specific LESTS scores. Scores are provided through the qualitative evaluation of 15 indicators corresponding to IS success factors (Albuquerque *et al.*, 2017) – 3 per LESTS dimension respectively covering policy, company, and resource level issues. Based on its knowledge, the guide user must assess the synergy opportunity "barrier level" for each indicator according to a Likert scale from 1 to 5 (5 being a situation without any identified barrier). Figure 3 provides the analysis grid and the final score in a pentagon shape.

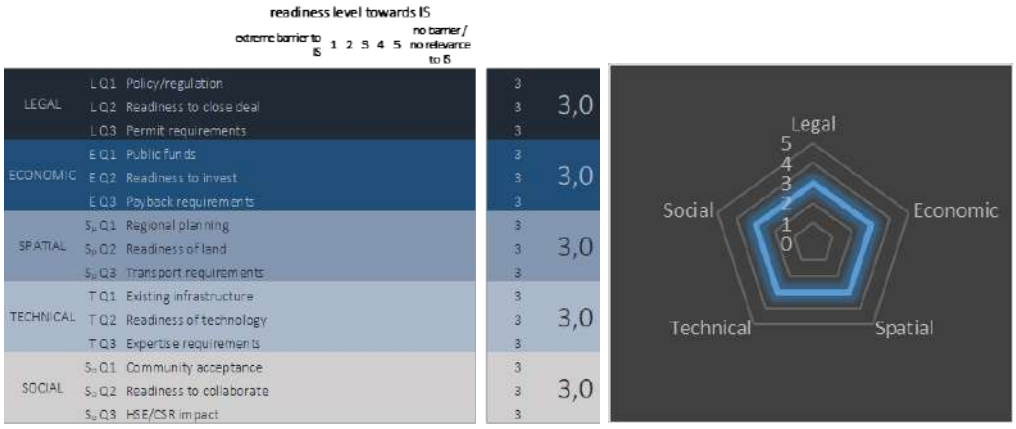

Figure 3: LESTS scores showing foreseen barriers of potential synergies

Based on EPOS experience, if all individual scores are higher than 2 and the total average score above 3, the opportunity has an implementation potential. When criteria are not met, it is recommended to exclude the opportunities until new elements in the business environment would facilitate their implementation. Thanks to this scoring, opportunities from the long-list can be sorted out and prioritised. The most relevant ones are further investigated in the next steps.

Step 2 – Cluster and synergy opportunities characterisation: SWOT analysis

The most relevant information from Step 1 is presented in the well-known SWOT framework (Hill and Westbrook, 1997). SWOT is integrated into this guide due to its broad popularity and because it is an easy way to communicate analysis outcomes to relevant stakeholders. Such step should be led by any organisation directly involved in the synergy, with a broad context understanding.

At cluster level, the objective is to scan the current collaboration status among all the actors and characterise some opportunities. Strengths, weaknesses, opportunities and threats are thus listed for each of the 5 LESTS cluster dimensions. The SWOT information display provides a qualitative grasp of the collaborations' potential and enables the drafting of territorial or cluster IS strategies. High-level strategies fix global goals and might direct towards the implementation of a certain type of synergy opportunities. For example, if the global goal is to increase cluster's renewable and recovery energy rate, synergy valorising waste heat and fuels would be of high priority. By defining such global strategies, synergy implementation decisions are facilitated and accurate monitoring of implemented synergy according to appropriate indicators are ensured.

In a similar way, SWOTs are carried out for individual companies to characterise the synergy opportunities identified in step 1. By properly analysing organisations through the SWOT framework, duties, needs, or desires that could trigger synergies are clarified. Synergies must capitalise on actors' strengths and opportunities while managing weaknesses and threats. SWOTs are based on LESTS scores of the prioritised synergy and provide a qualitative understanding of each specific synergy, their feasibility potential, and suspected main issues. Depending on global strategies and first analysis elements, it leads to a first Go/No Go decision.

Step 3 – Synergy pre-assessment: Scope definition & Ecosystem creation

From this stage, the guide is focused on one single synergy. It is the core added value of the paper as the 4 steps provide guidelines for the assessment of synergy opportunities while giving a new analysis paradigm to be adopted by guide users. The specific goals of the third step are to: (1) identify and federate a stakeholders' ecosystem associated to the synergy and (2) characterise the analysis scope, and especially the business-as-usual and synergy scenarios. Steps 1 and 2 gave some rough pathways and context elements, but the challenge of this step is to refine these elements in the perspective of making accurate preliminary analyses.

To achieve the first specific goal, a typology of actor profiles that should be considered in the synergy assessment process is proposed in Figure 4. Actors are characterised by their roles and involvement degree in the synergy. The *Central* actors are directly involved in the synergy and are those without which a synergy cannot exist, i.e. organisation requiring/sending/sharing a resource. *Peripheral* actors are more indirectly involved but still necessary for the synergy implementation (e.g. transporters, treatment service providers, funding bodies, ISF, etc). E*xternal* actors are not direct synergy stakeholders, but they are impacted positively or negatively (e.g. traditional raw material suppliers, local to national public authorities, nature, citizens, associations, etc.). Geographically speaking, such actor diversity is split at micro, meso or macro levels depending on the synergy nature, needs and impacts. The use of this reading grid is recommended to globally understand the synergy and its potential wide impacts in terms of stakeholders and geographic scale.

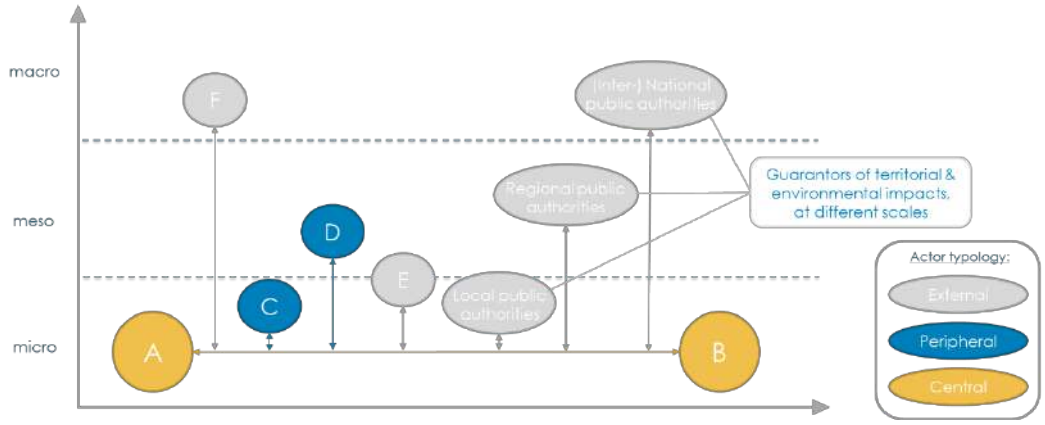

Figure 4: Synergy stakeholders ecosystem model

Next, EPOS' experience reveals that at least four chronological actions are necessary to correctly characterise the analysis scope. Figure 5 illustrates this iterative process alternating information research in publicly available sources and exchanges with relevant organisations to collect additional data and validate understanding and hypotheses. As it requires data collection and engagement of several actors with potentially diverging motivations and goals, it is recommended that step 3 be led by a neutral actor such as an ISF. To collect valuable data, it must guaranty confidentiality and may set up NDAs (Non-Disclosure Agreement) depending on organisations and expected data.

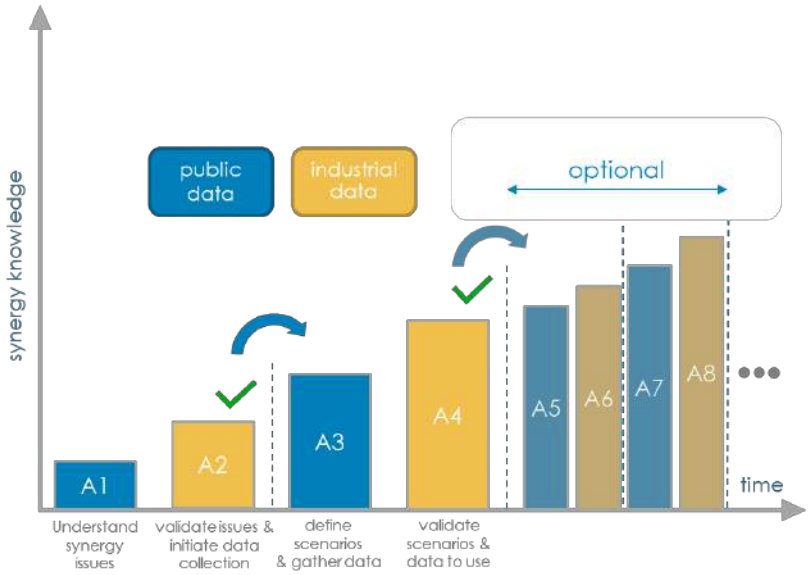

Figure 5: Sequence of actions in step 3

The first action (A1) consists in deepening the issues related to the synergy creation, mainly technical and regulatory, but eventually cultural and financial. A non-exhaustive list of key questions that should be answered is provided below:

- What are the main characteristics of the synergy resource?

- Which resource(s) is substituted or replaced and what are its main characteristics?
- What are the productive and external factors influencing the resource qualitative and quantitative characteristics? (E.g. seasonal/production cycles variations; market dependency, etc.)
- Which stakeholders might be involved?

These questions can be answered using documents such as: BREFs (*Best available techniques REFerence document*), professional technical documents (e.g. *Technique de l'ingénieur*), academic literature (e.g. *Industrial & Engineering Chemistry Research; Journal of Cleaner Production; Journal of Hazardous Materials)*, local information or IS repositories (e.g. *ISDATA, MAESTRI's Library of case studies*). It leads to a list of detailed technical and organisational assumptions that must be validated or disproved through exchanges with all relevant synergy stakeholders in the second action (A2). A short survey of 30 questions (as a maximum) is sent to these targeted actors. A semi-directive interview is then organised to answer the questions, ensuring a certain flexibility to cover unanticipated topics and issues. Some typical questions are:

- Can you detail the resource production process?
- In which unit the resource will be used and how will it be introduced?
- What are the specifications of resources to be used in your process?
- What is the current resource disposal process and how much do you pay for (range)?
- Will the synergy creation affect your organisation (handling, storage, etc.)?

Cited questions are relevant indications but they are non-exhaustive. Surveys must be designed on a case-by-case basis to better integrate synergy specificities. Based on interviews outcomes, the guide user can validate the resource technical match between central actors. It must have a clear understanding of the processes generating/recovering the resource, the exchanged and impacted resources, their associated technical issues as well as organisational, regulatory, economic, environmental, and social impact insights.

The third action (A3) initiates the second process iteration. The current level of knowledge allows for several synergy implementation scenarios, depending on several variables (e.g. type of transport; required intermediary treatment; resources use, etc.). These scenarios give the possibility to explore and assess the impact of several parameters which may direct decision-making towards more sustainable solutions. Nevertheless, additional information must be researched to

build and reinforce these scenarios by using sources such as: resource market prices platforms, transport costs, LCI (Life Cycle Inventory) databases, local subsidies, taxes, and regulations trends, technologies quotes, industrial partners expertise, etc. A new review of technical sources (cf. action 1) might also be considered.

Finally, the fourth action (A4) aims to validate and update the analysis framework. Feedbacks from central actors are needed and could be completed with peripheral and external ones. A survey is set up and sent to these actors, including visual diagrams for synergy scenarios to facilitate common understanding. An interview is then organised. Questions must validate all technical, economic, organisational, regulatory and risk assumptions, as well as the reference (business as usual) and alternative synergy scenarios. Some typical questions are provided below:

- Could you validate the market price range of the resource?
- What is the emission composition when you burn the resource?
- Do you have the final composition of the resource?
- How would the synergy be set up on your plant?
- Where is your current raw material provider located?

After the fourth action, it can be deemed necessary to set up other action iterations to clarify some issues, refine the scenarios or collect more data. This must be decided by the guide user.

Step 3 is crucial for a rigorous analysis. It provides a significant improvement of the synergy understanding and forms the analysis framework to assess the value creation/destruction processes in step 4. Scenarios and scopes are characterised, and the useful information is gathered and made available. An exhaustive mapping of the organisations involved, implied or impacted by the specific synergy is made. This whole stakeholders ecosystem will be considered in the BM construction process as the synergy could create or destroy value for each of them, and thus influence its global sustainability and viability.

Step 4 – Synergy assessment: Value mapping

For each of the reference and synergy scenarios, created and/or destroyed values must be identified, qualified and quantified when possible. Values can be positive (creation) or negative (destruction). Specific analyses involving a wide range of actors are required to assess all value forms (economic, environmental, social, territorial), and more importantly the ones generally not considered (Bocken, Rana and Short, 2015). Guide's approach is inspired from Bocken et al. who proposed a *value mapping tool* (2013) and adapted to IS conditions. Identified

stakeholders are invited to define and assess the synergy value propositions. It is not needed to imply each stakeholder, but it is recommended to consider values for all of them to ensure an accurate value analysis. This step should be led by a neutral actor such as an ISF for the same reasons as in step 3. Based on field experience and literature review, the guide proposes guidelines to assess the different value typologies.

First, pure economic values must be assessed as they are the main decision-making indicators for private companies and to a lesser extent, public organisations. Several typologies of value created (new revenues & costs avoided) or destroyed (costs created & foregone incomes) exist. New revenues are generated by selling underutilised resources. Their value depends on their use (as heat, combustible or material), the type of substituted resource and their quality. They must be compared to equivalent resources from the market. It can significantly change and requires a detailed investigation by the guide user. Costs avoided can be generated for several actors and emerge from the reduction of expenses to public bodies (e.g. EU-ETS for CO_2), external private entities (e.g. disposal or depollution treatments) or internal, if part of the waste management is done by the organisation. These costs are highly dependent on the business, context, and resource type among other indicators and should be identified from interviews with stakeholders. By contrast, a synergy generates additional fixed (CAPEX) and variable (OPEX) costs that might be a significant barrier for IS implementation. They are inherent (transport, organisational changes or transaction costs) or conditional and appear whenever new infrastructure, additional treatment or decommissioning of existing equipment are required. Such values can be assessed through quotes, literature review, interviews or using EPOS' database of 39 IS technologies (Krese *et al.*, 2017). Finally, foregone incomes appear when extending the analysis scope to peripheral and external actors. Some typical stakeholders who lose revenues are from upstream value chain of the resource substituted (e.g. traditional raw material provider) or from downstream value chain of the exchanged resource (e.g. actors currently taking care of the resource). It is recommended to consider these four types of value for all the mapped stakeholders to ensure a holistic and complete analysis and thus position on the synergy global viability, characterised by:

$$\sum(new\ revenues + avoided\ costs - additional\ costs - foregone\ impacts) > 0$$

Second, environmental values must be analysed for three main reasons: (1) check the synergy global environmental performance, (2) mobilise impacted external

stakeholders, such as public authorities or citizens, who could (un-)lock the synergy viability thanks to adapted value transfer mechanisms, (3) provide industries with the environmental footprint of their projects in the perspective of anticipating constraints (from regulations, societal pressure) or to develop new form of competitive advantage. The environmental value analysis is made through a preliminary life cycle assessment (LCA) comparing the environmental performance of the reference (business-as-usual) and synergy scenarios to produce the same amount of goods (functional unit). Results can be provided according to 15[65] midpoints indicators, 4[66] aggregated endpoints or even in euros, using the monetisation methodology StepWise2006 (Pizzol *et al.*, 2015). The guide user defines the required aggregation level, expressing the outcomes in a way that is appropriate for stakeholders. The more aggregated are the results, the more understandable they are for a large public, but more underlying choices and assumptions are not visible to decision-makers. For instance, monetisation methods are based on a utilitarian vision of nature assuming a perfect substitution of economic and natural capitals which is highly controversial. However, their principle benefit is to facilitate the internalisation of non-economic values in synergy BM and to induce organisations' behaviour changes toward ecologically and socially optimal production (Prud'homme, 2001). LCA is a science based on a certain number of hypotheses that each guide user should be aware of and consider when using the results.

Third, the guide user is provided with a set of 20 indicators helping the assessment of the social values created by the synergy. These values emerge from the generated social capital, i.e. an accumulation of resources collectively built through the relational network involving various and diverse actors (Nahapiet and Ghoshal, 1998; Dussuc and Geindre, 2012). Values are created based on the strength and frequency of new inter- and intra-companies' relations. Examples of values are improved company performance and innovation; improved people/employee well-being; facilitated future business opportunities; initiated innovation strategies; improved brand image and relations with local communities. They are more likely subjective and should be collectively assessed by the stakeholders themselves through workshops. Stakeholders are best positioned to judge whether these values can have an impact in synergy implementation decision-making and to what extent. The proposed 20 indicators

[65] Carcinogens, Non-carcinogens, Respiratory inorganics, Ionizing radiation, Ozone layer depletion, Respiratory organics, Aquatic ecotoxicity, Terrestrial ecotoxicity, Terrestrial acidification, Land occupation, Aquatic acidification, Aquatic eutrophication, Global warming, Non-renewable energy, Mineral extraction

[66] Human health, Ecosystems impact, Global warming, Resource depletion

(cf. Annexe 1: Social value indicators) are related to 5 issues (governance, actors, relationships, motivations and effort) and are supposed to help and guide the value assessment. They are selected based on an extensive literature review and aim at widening stakeholders' perspective of the synergy impacts and to foster discussion and co-assessment.

Similarly, a set of 32 indicators is proposed to foster the assessment of territorial values. The principal difference is that these values are mainly destined to public authorities, considered as guarantor of territorial values. Representative from authorities should gather to collectively assess the indicators. Territorial values arise from the concept of territorial capital, i.e. a system of territorial goods of different natures: economic, cultural, social and natural that enables the potential development of a certain territory (OECD, 2001; Lacquement and Chevalier, 2016). This multidimensional capital is a collective construction that determines the territorial competitiveness (Camagni, 2006, 2009) and its level of integration in the global economy (Peyrache-Gadeau and Pecqueur, 2004). Values result from the creation of territorial externalities which generally cannot be made private, nor restricted to a good provision (Maillefert and Robert, 2017). Proposed indicators (cf. Annexe 2: Territorial value indicators) ad dress key territorial issues: attractiveness, economy development/preservation, social & environmental impacts, planning, innovation and autonomy. They are not exhaustive but should help the consortium consider and integrate more values in their synergy BM.

The outcome of stage 4 is a wide range of synergy value propositions, which are for the most part generally not considered in traditional decision-making processes. It also considers a wider group of stakeholders that are affected, positively or negatively, by the synergy creation. This approach aims at capturing not only individual stakeholder's values but also the so called "co-created" values through collective assessment. It will enable the integration of more values into the synergy BM and it is a lever to change the decision-making paradigm through more systemic, holistic and likely, fairer processes.

Step 5 – Synergy business conceptualisation: IS sustainable business canvas

Step 5 focuses on the synergy BM set up and provides the guide user with a framework – the IS sustainable BMC – that enables the crystallisation of all the information collected and analysed during the previous steps. Osterwalder and Pigneur's canvas is selected as a conceptual basis due to its efficiency and wide

dissemination. However, their BMC only focuses on economic values which is inappropriate to the IS concept. It is thus completed with other value typologies to create a sustainable BMC for synergies that brings competitive advantage through a value proposition contributing to sustainable development of the company and the society (Lüdeke-Freund, 2010). The proposed IS SBMC draws from existing frameworks:

- The *Triple layer Business Model Canvas* (Joyce and Paquin, 2016) that integrates 2 additional layers: 1 environmental, based on a life cycle perspective, and 1 social, based on a social perspective. It efficiently helps organisations to clarify how they generate multiple types of values.
- *Value Mapping Tool* (Bocken *et al.*, 2013) combined to the *Service/Product Value Analysis* and *Business Model Design*[67]. It goes one step further by helping organisations assessing and implementing new value opportunities.
- IS sustainable BMs archetypes (Luca, Magno and Albino, 2016).

While inspiring, these tools have also some limitations as the first two are not applied to IS and all three focus on the value creation by one company. An alternative approach is proposed in Figure 6. It is not only an IS dedicated SBMC, but it is also an innovative approach that emphasises that value propositions are co-created within the synergy stakeholders' ecosystem and not simply by a single organisation. It is foreseen to help organisations think out of the box, integrate all identified values, and more importantly, design collaborative value-capture and transfer processes.

Value propositions are central and divided in four independent blocks corresponding to the value typologies assessed in step 4. The guide user must summarise the values created and destroyed and their associated stakeholder (e.g. "Company A - improve material efficiency"; "Biodiversity - lose 7 BAHY"). Cost structure and revenue streams boxes are kept to define how economic value propositions are traduced in terms of additional CAPEX, OPEX, foregone incomes, new revenues, avoided costs and for which stakeholder (e.g. "Company A – 2,5 M€ CAPEX"; "Company A – 700 k€ raw material savings). Private (non-)financial mechanisms boxes refer to mechanisms that capture the social value. They can be monetary (e.g. "Company A – 10k€ for further resource analysis to replicate the synergy with intermediary 1") or non-commercial (e.g. "Company B – label 100% local raw material"). Similarly, public (non-)financial mechanisms are dedicated to territorial value capture mechanisms. They can be financial (e.g. "Local

[67] Tools designed by the Centre for Industrial Sustainability (University of Cambridge)

municipality – synergy fosters energy security of 50 000 people on long-run, municipality subsidies by 20 M€") or not (e.g. "National authority – based on the example of the values provided by this synergy, public contracts should only be granted to companies with a circular material rate of 50%).

<table>
<tr><td colspan="2">Consortium
Central stakeholders
Peripheral stakeholders
External stakeholders</td><td>Key resources</td><td>Key activities</td></tr>
<tr><td colspan="2" rowspan="2"></td><td colspan="2">Partner relationships</td></tr>
<tr><td colspan="4">Value propositions</td></tr>
<tr><td>Economic</td><td>Social</td><td>Environmental</td><td>Territorial</td></tr>
<tr><td>Cost structure</td><td>Private financial mechanisms</td><td>Organisation footprint balance
Local footprint balance</td><td>Public financial mechanisms</td></tr>
<tr><td>Revenue Streams</td><td>Private non-financial mechanisms</td><td>Regional footprint balance
National footprint balance</td><td>Public non-financial mechanisms</td></tr>
</table>

Figure 6: Synergy Sustainable BMC

Organisational/Local/Regional/National footprint balance boxes should be filled with adequate environmental value mechanisms for each geographic scale such as: "Company A – CO_2 emission reduction of 30%"; "Local Community – local air quality improvement led to 5 additional QALY"; "Region – reduction by 5% of regional material extraction"; "EU – system reduced by 30% its contribution to global warming". Thanks to monetisation, values can be expressed in euros and could facilitate negotiations between industries and public authorities, leading to economic benefits such as tax reduction or subsidies. The consortium block corresponds to the 3 layers from Figure 4 and should be filled accordingly with organisations' name and role. Key resources and activities summarise technical and organisational relevant elements for the synergy running. Partners relationships detail the nature of consortium members relations thanks to the synergy (e.g. competition, cooperation, coopetition). It can be seen the *Customer segments, Channels and Customer Relationships* from the BM Canvas have been

removed. This important choice is explained by the nature of IS which is a cooperative process, with clearly identified partners and no customers.

The recommended actor profile to lead this step is an ISF with legal, financial and mediation expertise. After filling the framework alone based on its understanding, it should then be submitted to all the stakeholders, individually or through a workshop, for content validation. Fair value-sharing between stakeholders would increase the chances of synergy implementation and long-term perpetuation. In addition, the use of this tool could lead to innovative value transfer mechanisms such as public subsidies based on environmental, social and/or territorial expected performance. In that way, stakeholders will engage to respect their initial goals and monitor real impacts after implementation.

Step 6 – Synergy triggering: Business cases

The last step corresponds to the creation of BCs providing each individual stakeholder decision-maker with the elements to position, favourably or negatively, on the synergy implementation project. Based on the IS SBMC, relevant information for each stakeholder must be summarised in a concise and short document. A generic BC framework is provided to the guide user (cf. Annexe 3: Generic BC framework) with 7 sections: organisation key context elements; stakeholder's needs clarification; synergy advantages/disadvantages compared to business as usual or other projects in competition; synergy's value propositions for this specific stakeholder; impacts on the organisation; financing needs and schemes; risks.

Preliminary results

This guide has been developed through the analysis of existing and potential new synergy opportunities. Systematic LESTS and SWOT analyses were carried out in the 5 EPOS demonstration clusters at Lavéra (FR), Dunkirk (FR), Hull (UK), Rudniki (PL), Visp (CH) (Maqbool, 2016). It clarified both clusters' contexts and stakeholders and provided a long-list of existing and potential synergies among them. A total of 15 synergies were studied in detail between companies from five sectors of the process industry (petrochemicals, steel, cement, waste management and minerals). Their value assessment is heterogeneous, from only economics to the four types of values. BM and BCs of four synergies were submitted to companies and taken over by industries. To this day, one BC clearly inspired a company's decision-maker. A detailed feasibility study has been carried out, validating the BC trends, and the synergy should be implemented in the

following months. Some elements detailing the use of this guide for this synergy are given below.

In step 1, the LESTS analysis at cluster level in Hull revealed that low social and economic collaborations were existing between EPOS industries. However, numerous potential synergies were identified. One of them concern a liquid waste stream from a Petrochemical Company (PC) which is currently sent to a boiler owned by a third party. It could be burnt in a local Cement Factory (CF), actively looking for alternative fuels. Synergy's LESTS score is described in Figure 7. The main identified barrier is legal, due to the need to change the waste status of the resource.

Figure 7: Hull synergy LESTS score

In step 2, the SWOT analysis reveals that the synergy should be relatively easy to implement, with finally no extra permits as CF is authorised to burn wastes. It should generate economic benefits for both parties, and it is compatible with their core activities. Synergy weaknesses correspond to the low quantity produced and possible additional investments. The main opportunity is the presence of a waste manager in the near area that could manage the waste between both sites. In addition, both companies could improve their environmental performance in the perspective of future regulations. The main threat is the competition with other fuel providers.

Step 3 starts with a literature review on cement and chemical sectors to better understand the origin and the use of the waste fuel, the production parameters, risks, etc. Initially, foreseen actors were PC and CF (central), the waste manager (peripheral), the primary fuel supplier and the third party currently using the liquid (external). Interviews with central stakeholders enabled to check information gathered, get additional technical, organisational data and clarify regulatory

issues. From these interviews emerged the need to separate the stream in different fractions (acid and organic) to avoid any risk when blending fuels before use in the CF. A second peripheral stakeholder has been integrated in the analysis for the distillation of the liquid into fractions. Further analyses enabled the establishment of reference and synergy scenarios according to the variables: transport (truck or boat), waste production flow rate evolution in the future (or +40%), intermediary treatment. These scenarios were validated during the second interview wave and provided the required data for further analysis.

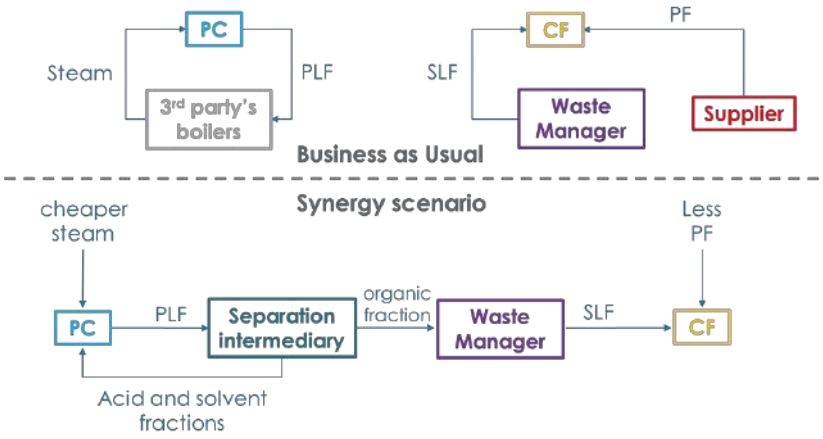

Figure 8: Reference and one synergy scenario diagrams

In step 4, the economic analysis considered two values related to the resource valorisation: the heat value (revenues from the sale of the organic fraction for PC and reduced costs compared to conventional fuels for CF) and the intrinsic value (avoided costs due to the internal reuse of the acid fraction in PC). An avoided cost is observed because PC stopped paying for the current disposal solution. However, the synergy implementation implies three additional costs for treatment (distillation), management (blending before use) and transport. The analysis revealed that all the costs and revenues are negligible in comparison with the internal reuse of the acid and solvent fractions in PC. It is important to note that most of the value is not generated by the synergy itself but through an internal optimisation at PC scale. These values unlocked the synergy viability, which otherwise would unlikely have been relevant. The LCA has been carried out. Indicators were monetised and compared to economic values. Results show that 45% of the total economic value (TEV) is generated through environmental values. It is thus highly necessary to consider these values. While in this specific case, the synergy viability is ensured by pure economic values, in other contexts, assessing environmental values might enable the generation of additional revenues from public authorities (e.g. subsidies). Socially, the synergy created additional links between local stakeholders and created a new relation between PC and the

distillation intermediary. It might lead to further cooperation to valorise additional residues. To that extent, it can be associated to a positive social value. From a territorial perspective, the synergy increases the circularity rate of the industrial system, fosters 0,5 jobs creation and saves the equivalent of 7 years of "healthy life".

The IS SBMC was then completed (Step 5) and individual business cases (Step 6) drafted and targeted to each organisation decision-maker. Results cannot be shared due to confidentiality issues as the synergy is under implementation. Nevertheless, this case study pointed out (1) the absolute necessity to exchange with stakeholders as some issues cannot be anticipated with publicly available information, (2) the relevance to consider a wide range of values for IS assessment (cf. environmental values are 45% of TEV) and (3) the fact that IS does not always create high value but it can be a lever to trigger further value creation processes (cf. internal reuse in PC).

Discussion and Conclusion

This guide has proven to be useful for both operational and research purposes. First results indicate that it can provide organisations with a valuable IS implementation tool, helping the investigation of different synergy opportunities and triggering interest for the most promising ones. It clearly contributes to raise sustainability awareness among process industries by showing viable projects than can link competitiveness gains with higher social and ecological performance as well as territorial development. By identifying various and varied values and integrating them within the synergy BM, the methodology provides additional levers for synergy setup or more broadly for the implementation of industrial sustainable projects. From a research point of view, this work contributes to knowledge creation on SBM by providing a methodology that (1) extends the traditional research perimeter to process industries, (2) includes territorial values in the value spectrum, and (3) proposes an original approach, focused on value co-creation through a specific project rather than thinking at the single organisation level. A tailored version of the BM canvas is proposed to deal with specific IS challenges, and especially its collaborative nature. Finally, the proposed analysis paradigm offers the means to assess on the global viability of the project.

Several limitations to the guide are identified. First, it relies on the direct use by companies or facilitators while in EPOS it was used by academics as a research tool to systematically study IS cases. Future research should focus on enabling a full

and easy use by practitioners, clarifying how each step must be conducted especially the assessment of social and territorial values. Second, the guide does not cover the final stages in the synergy creation process (e.g. detailed feasibility study, implementation, monitoring, follow up). Authors consider that these stages are generally taken by the involved companies themselves and may not need any additional tool as pointed out by Grant (2010). Third, while considered as a utopia by some academics (Capron and Quairel, 2006), authors tried to give some methods to qualify and even quantify externalities of various natures. The methods need improvements (e.g. values redundancies, assessment), but they have the benefit of helping SBM implementation in the field and raising awareness. Finally, Tanev et al. stated that value co-creation is not efficient when using a traditional value-creation process and requires a complete reconsideration of how a company operates (2009). In this guide, although it extends the SBM notion to heavy industries through IS projects, it does not aim at reconsidering completely how companies operate. Nevertheless, IS implementation might be a significant lever for radical change in industries' BM. Authors suggest using this methodology in future research projects to test its applicability in other contexts and for a wider number of synergies and then better understand the IS potential to create or unlock significant sustainable values in process industries.

Acknowledgement

The research leading to these results has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement no. 679386, EPOS project (Enhanced energy and resource Efficiency and Performance in process industry Operations via onsite and cross-sectorial Symbiosis). The sole responsibility of this publication lies with the authors. The European Union is not responsible for any use that may be made of the information contained therein.

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Annexe 1: Social value indicators

Issues	Indicator	Metrics	Description
G	Actor governing type	Public/Private/PPP	Indicates the stakeholder typology governing the synergy creation process
	Leading actors	Natural Number (n° of actors in the steering committee)	This indicator gives the number of actors (person/organisation) managing, leading, coordinating the synergy creation.
	Facilitation	Yes, No	Answer Yes if the synergy is facilitated by a third party
A	Central actors	Natural Number (n° of actors directly involved)	Number of actors (person or organisation) centrally involved in the synergy, i.e. all actors actively participating (meeting, data, etc.)
	Peripheric actors	Natural Number (n° of actors indirectly involved)	Number of actors (person or organisation) indirectly involved in the synergy, i.e. all actors actively participating (meeting, data, etc.)
	External actors	Natural Number (n° of actor groups impacted)	Number of actors (person or organisation) impacted by the synergy, i.e. actors concerned by externalities
R	Actors' Links	Natural Number (n° of links)	This indicator gives the whole number of additional structured links (material or immaterial) created in the territory through the synergy creation process
	Informal Links	% (n° informal links/n° additional links)	Formal links are purely professional while informal are outside of the professional sphere. They might be intra or inter-company.
	Trust	% (n° trusted links/ additional links)	This indicator is the part of the new links created thanks to the synergy, that can be defined as trusted, i.e. no fear, long-lasting perspective.
	Actors' interdependencies	Natural Number (n° of inter-organisational links per org.)	This indicator is an average of the inter-organisational links

			created for each of the stakeholders directly involved in the ITE initiative.
	Interconnections	% (n° exchanged resources/n° resources ==> after/before)	Variation of the organisations' resources interconnectivity in the territory thanks to the synergy creation process.
	Geographic Scale	km separating organisations	This indicator statistically characterises the geographic scale of the synergy
	Relations' frequency	n° emails exchanged/month n° phone calls/months n° physical meeting/months	This indicator clarifies exchanges frequency between partners involved in the synergy.
	Relations' intensity	Natural Number (n° physical meeting / n° total exchanges)	Intensity of people exchanges inter or intra-organisation.
	Employees Engagement	Natural Number (n° hours spent in dialogue/consultation)	This indicator traduces the level of engagement of employees in the synergy creation process.
	Social Engagement	Natural Number (n° hours spent in dialogue/consultation)	This indicator traduces the inclusion level of parties from the society in the synergy creation process.
	Social Acceptability	Natural Number (n° complaints)	This indicator traduces the social acceptability of this synergy, which inherently creates several organisational changes and impacts.
M	Charismatic support	Yes, No	Answer Yes if the synergy is supported by a legitimate or powerful or charismatic local political or industrial actor
	Initial motivation	Environmental, Regulatory, Cost reduction, Image, Industrial performance, Additional benefits, Innovation, Risk reduction, Long-lasting relationships, individual willingness, Awards, Knowledge sharing, preserve activity	This indicator must clarify each stakeholder's main motivations to be part of the synergy. For each stakeholder, it is important to detail the motivations for each cited element and a statistical characterisation can give the global synergy motivations.

E	Initial time consuming	Natural Number (n° total hours)	This indicator traduces the effort, in terms of time, dedicated to initialise the synergy creation process by the steering committee.

Annexe 2: Territorial value indicators

Issues	Indicator	Metrics	Description
At	General Territorial Attractiveness	% (n° companies interested in setting up / n° companies surveyed)	This indicator shows the level of interest that companies might have to set up a plant in this territory and be part of the synergy.
	Saved activities	Natural number (n° saved activities)	Expected saved activities (that might have shut down otherwise) on the territory thanks to the synergy implementation.
	New products	Natural number (t/y, m3/y, n°/y)	Expected volume of new products from (new or existing) firms on the territory thanks to the synergy creation. If physical product: t or m3; if service, it can be the volume of these services.
	Total investment	€	Additional investments made on the territory thanks to the synergy.
	Private funding	% (€ private investment / € total investment)	Part of the total investments funded by private organisations.
Ec	GDP	€	This indicator gives the absolute territorial wealth variation thanks to the synergy creation.
	GDP Growth	% (€ GDP after ITE / € GDP before ITE)	This indicator traduces the yearly territory (industrial system) wealth variation thanks to the synergy creation.
	Public Benefits	€	This indicator shows the real economic benefits for public organisations on the territory generated thanks to the synergy creation.

	Private Benefits	€	The real benefits generated by industries thanks to the synergy
	Reinvestment	Ecological, Production, Employees, Innovation, Additional services, Social Economy	This qualitative indicator clarifies the reinvestment strategy of the different synergy beneficiaries (company, public authorities, etc.). Additionally, it should detail the amount and the goal.
	Economic Weight	% of territorial turnover (1) % of territorial added value (2) % of territorial jobs (3)	This indicator assesses the relative significance/weight of the synergy in the territorial economy.
	Economic Performance	€/t	This indicator traduces the economic added value (avoided costs + additional benefits) created by the synergy, for each tonne of final product
	Surface Area performance	€/ha (€/ha after synergy - €/ha before)	This indicator gives the synergy additional value. It can also be an absolute indicator representing the territory ground efficiency.
S	Employment balance	Natural number (n° jobs created - n° jobs destroyed)	The indicator evaluates the net synergy impact on direct and undirect employment.
En	Air quality	kg PM2.5 (Respiratory inorganic after - Respiratory inorganic before)	This indicator from IMPACT 2002+ compares the air quality, and especially the impact for human health (fines particle, ammonia, CO, NOx, SOx)
	Diverted Waste Volume	t/y	Sum of all the wastes diverted thanks to the synergy.
	End of life management	% (tonne diverted/ (tonne diverted+ tonne wasted))	This indicator shows the industrial system capacity to manage its materials' end of life thanks to the synergy.
	Material performance	t/t	This indicator defines the gains in terms of material uses for the production of each tonne of final

			product thanks to the synergy.
	Energy performance	MWh/t	This indicator defines the gains in terms of energy uses for the production of each tonne of final product thanks to the synergy.
	RRE	%(MWh RRE/MWh consumed after / MWh RRE/MWh consumed before)	This indicator shows the variation of the use of Renewable and Recuperation Energy compared to the whole energy consumption thanks to the synergy creation.
P	Regional Scheme	Yes, No	Answer yes if this synergy fosters outcomes defined in the local Agenda 21, SRDEII, PRPGD, PRAEC, SRADDET, S3, or other regional schemes.
I	New technologies	Natural number (n° of new technologies)	Additional technologies and/or infrastructures implemented thanks to the synergy (not on the territory beforehand).
	New competencies	Natural number (n° of people with new competencies)	Additional people with skills that were not (or under-) represented on the territory and who are hired thanks to the synergy.
	New training program	Natural number (n° of new training program)	Additional training programs created thanks to the synergy.
	Normalisation	Natural Number (n° of new ISO norms)	n° of ISO norms (social, health, environmental) collaboratively set up between partners of the synergy.
	Replicable Synergy	Yes, No	Answer Yes if the implemented synergy can be duplicated on the territory or replicated on other territories.
	Synergy replication potential	Natural number (n° of replicated synergies)	Synergies that can be implemented across a wider territory thanks to the synergy dissemination.

Au	Energy Dependency	% (energy imported/used energy ==> after / before)	Variation of the energy dependency of the industrial system before and after the synergy implementation.
	Material Diversification	% (specific material use/total material use ==> after/before)	Variation of the territorial economy dependency regarding one specific material in comparison to the whole material consumption.
	Material Dependency	% (material imported/used material ==> after / before)	Variation of the material dependency of the industrial system before and after the synergy implementation.
	Circularity	% (secondary raw material/total raw material ==> after / before)	Variation of the part of reused, revalorised or secondary raw material used as raw material in the industrial system.
	Long-term Material Autonomy	% (material use/material deposit ==> after/before)	Variation of the long-term territory autonomy by comparing the resources currently consumed vs. the amount of identified resources on the field.

Annexe 3: Generic BC framework

Sections	Content
General context	**Political, legal, cultural, regulatory, environmental, economic context of the organisation**, the local territory, the state, the EU **Risks and trends** associated to organisation's activities Employees' perception of the organisation Organisation dynamism (projects, innovation, research) Current relations with the territory, neighbourhood actors
Need	Main problem/pains carried by the organisation **To what extent the organisation needs the synergy creation** Existing **problems solved by the synergy** To what extend the synergy **support the organisation's strategy**
Competition	Define the business as usual (competition with no action)

	Define other considered solutions solving the same problem **Compare advantages/disadvantages of competitors**
Synergy values Propositions	**Project and its boundaries** (resource considered, uses, organisational changes, key activities, etc?) Detail **how the synergy satisfies organisation's needs** Synergy legal issues Detail **all values created (positive) and destroyed (negative)** for the organisation in comparison with best competitor and how they should be captured
Impacts on the organisation	Project **partners** and their associated role Identify whether existing partnership might disappear or evolve **Logistic, human resource, competence and infrastructure requirements** **Additional responsibilities and engagements** **Next steps** in terms of additional studies or implementation and their timeline Expected synergy duration
Financing	**Potential investment needs** and if so, potential sources Detail all **financing schemes**
Risk	**Project risks** and associated potential impacts New interdependencies and their impact How future organisation modification can impact the synergy Risk management plan

Sustainable business model archetypes for the electric vehicle battery second use industry

Towards a conceptual framework

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Abstract

This study examines the necessity and contributes towards the development of a sustainable business model (SBM) for the emerging battery second use (B2U) market within the electric vehicle (EV) industry. Previous work identified that SBMs and EV B2U are emerging as major research streams but there is seems to be paucity among literature to deliver an overarching framework or a holistic view between these fields and highlight fresh areas for future research. We intend to unearth new knowledge through comprehending how B2U stakeholders undertake their business-related activities. These are not only focused on economic profitability but more importantly address wider social and environmental stakeholder value as part of prospective SBMs. We are using the SBM archetypes as the major lens for our data analysis to study multiple cases of B2U stakeholder roles and understand further the scope and ultimate purpose of their operations. Preliminary results indicate that the SBM archetypes lead

towards sustainability innovation strategies that create a new conception of business models for sustainability in the EV B2U market. Additionally, although profitability is a major priority, it does not seem to be number one anymore. This is an element that confirms a new market perspective towards a sustainable circular economy. In turn, this creates shared sustainable value for multiple stakeholders through cross-sectoral collaborations. Ultimately, we aim to conceptualise a sustainable innovation business model (SIBM) framework for the B2U industry. The particular model includes such shared sustainable value creations which in turn drive forward business performance and sustainability at the same time.

Keywords

sustainable business models, sustainable business model archetypes, sustainable value, electric vehicles, battery second use

Introduction

A mass-market uptake of EVs is still limited as a result of the high costs of installed lithium-ion battery packs (LIBs), which represent the single largest cost item in the vehicle (Ahmadian et al., 2018). In fact, Jiao & Evans (2016a) found current practices in the EV industry to be unsustainable from the economical (e.g. high battery costs), societal (e.g. 'range anxiety' and limited charging infrastructure) and environmental perspective (e.g. unsustainable charging sources and lack of environmentally-sound end-of-life disposal mechanisms). Through reusing retired EV batteries, the concept of Battery Second Use (B2U) significantly reduces resource cycles by increasing total LIB service life in less demanding applications in the stationary energy storage market (e.g. renewable energy integration), which in turn can help to build smart grid technologies (Podias et al., 2018; Neubauer & Pesaran, 2011).

B2U is a major cost-effective solution that could result in additional revenues for EV manufacturers (Jiao & Evans, 2016b). This leads to EV companies being able to lower their vehicle prices, consequently making EVs more competitive and attractive towards the mass market. Simultaneously, there is a growing trend towards renewable energy production and decentralized generation, which underline that more attention must be given to grid integration issues such as establish suitable electrical storage capacities in upcoming years as addressed in the Paris Agreement for Climate Change and United Nations Sustainable

Development Goal 7: “ensure access to affordable, reliable, sustainable and modern energy for all” (United Nations Secretariat, 2018).

However, there seems to be a frustrating contradiction. The much-needed integration and storage of renewables is still impeded due to the lack of cost-effective large-scale energy storage systems (i.e. industries desire augmentation of battery capacity and power, increased lifetime and reduced costs (Reinhardt et al., 2019; Heymans et al., 2014). Therefore, the concept of B2U could facilitate to unlock hidden value and utilities. For example, the energy storage market will be boosted as used batteries can be procured at low cost and in a sustainable perspective, indicating new businesses opportunities (Reinhardt et al., 2017). To this end this would mean that the emerging B2U industry has the potential to disrupt and revolutionise current landscapes of the automotive and energy sectors as reusing LIB batteries through the concept of B2U embodies the most cost-effective electricity storage solution available today.

A variety of EV companies have started initiating B2U pilot projects in collaboration with energy companies, recyclers, service providers and other stakeholders to comprehend the economic feasibilities and development of viable innovative business models (Jiao & Evans, 2018). The B2U projects, of which some have moved to early commercialisation stages, offer evidence that innovative multi-stakeholder cross-sector relationships between previously isolated industries are forming (Gur et al., 2018). But it remains to be unearthed how the participating stakeholders in the nascent B2U industry can innovate their novel product life extension strategies into innovative business models that contribute towards functional sustainability.

In this regard, the evolving research field of sustainable business models (SBMs) seem to be able to bridge these concerns as they have been identified to be a useful framework to create and push a ‘systems change’ towards ‘true’ sustainability in organisations (Bocken et al., 2015). SBMs use a firm-level and wider systems perspectives, with the triple bottom line at its core in order to measure performances and purposes of firms through including environment and society as key stakeholders (Stubbs & Cocklin 2008). SBMs have been defined as “…business models that incorporate pro-active multi-stakeholder management, the creation of monetary and non-monetary value for a broad range of stakeholders, and hold a long-term perspective” (Geissdoerfer et al., 2018, p403). Thus, SBMs will go beyond focusing on one sustainability innovation such as the circular economy, which has been found to usually prioritise economic and

environmental sustainability where the social dimensions typically are absent (Geissdoerfer et al., 2017; Murray et al., 2017; Sauvé et al., 2016).

The literature on SBMs further describes sub-categories, sub-types and generic strategies such as product service systems or base of the pyramid, which were examined in an extensive review by Bocken et al. (2014) and synthesized as the 'SBM Archetypes' in order to advance towards a unifying research agenda. Follow-up studies by Bocken et al. (2016) and Lüdeke-Freund et al. (2016) have further refined the concept by harmonising nine archetypes, divided into environmental, social and economic major innovation types. But, despite the widely acknowledged potential of the archetypes to develop SBMs in theory and practice coupled with pressing global societal issues such as pollution and the need to address global scarcity of resources, they have not been accepted by industries (Despeisse et al., 2017). This highlights the urgent need of empirical case study research in order to provide firms with frameworks and methods that include a more holistic view of how to include the three metrics of sustainability into the business innovation processes.

Methodology

As a result of the explorative nature and uncertainty of the research context, we make use of a qualitative research method, which is useful to study complex phenomena and new theory (Eisenhardt, 1989). As this research focuses on an area of knowledge where little is understood, an analytic inductive theory development approach is most suitable (Saunders, 2017). As a first step and due to the emerging major research field of SBMs, we reviewed relevant literature on the developing field of SBMs with a major focus on the SBM archetypes. We applied previously identified inclusion and exclusion criteria for our literature search such as to include peer reviewed studies with a distinct focus on SBMs and to exclude studies that have a primary research focus on sub-categories and sub-fields of SBMs such as circular business models or the circular economy. Data were collected from peer-reviewed literature on SBMs through searching academic databases (e.g. Science Direct and Scopus) with a combination of keywords such as "sustainable business models", "sustainable business model innovation" and "business models for sustainability".

The main part of this study is adopting a multiple-case study approach where the focus is within and across cases, which is a superior technique compare to single case studies as it allows to produce more replicable, robust and generalizable

findings (Yin, 2003). The application of the multiple-case study research strategy fits particularly well for this study to comprehend the context and the activities taking place in the context of the different stakeholders involved and innovative business models deployed. This study applies the sampling technique of 'critical cases' that include those stakeholders (*i.e.* companies) that are participating in the evolving B2U industry through adapting (innovative) business model (Lee and Saunders, 2017). Data were collected from a variety of stakeholder roles such as EV manufactures, energy companies/B2U service & system providers, B2U start-ups and battery recyclers. Fourteen semi-structured interviews were carried out with stakeholders in the EV industry to identify their current practices, views and experiences on the emerging B2U sector.

Following the methodological procedure as set out by Leising et al. (2018), the stakeholder cases were analysed thematically through a document study as well as qualitative content analysis of all interview transcripts. To this end, we mainly integrated knowledge from the field of sustainable business models (SBMs), namely the previously discussed SBM archetypes (in the form of a qualitative content analysis) are adopted as a lens for data analysis to classify B2U stakeholder business sustainability-related activities into an suitable set of SBM archetypes and resulting (cross-case) sustainable value analysis. We used the most recently updated SBM archetypes (Yip and Bocken, 2018; Ritala et al., 2018; Lüdeke-Freund et al., 2016; Bocken et al. 2014) to investigate and structure current and prospective (sustainable) business models in our samples. Consequently, we based our analysis on the criteria and categories developed from the literature review on sustainable business models (SBMs), in particular the SBM archetypes. First, the SBM archetypes are defined and their occurrence in relation to B2U stakeholder sustainability business-related activities are identified and discussed. This will be followed by a first conceptualisation of a sustainable innovation business model (SIBM) framework in order to facilitate participating B2U stakeholders to maximise shared sustainable value of degraded EV batteries through identifying major sustainable innovation strategies as part of innovative and more effective SBMs.

Preliminary Results & Conclusions

This is the seminal part of an ongoing study that offers major implications to scholars, managers, and policy makers by opening up a fresh discussion on SBM adoption in practice. This is confirmed through rich in-depth interview data from EV B2U stakeholders. Through reporting first SBM behavioural patterns in the B2U industry, this study facilitates practitioners and managers in moving from

theoretical to practical industrial sustainability as part of novel SBM approaches. The key contribution will be the conceptualisation of a sustainable innovation business model (SIBM) framework.

In synthesising preliminary results from the set of multiple interviews, there is evidence that participating stakeholders in the emerging B2U market have started to engage in some form of sustainable value creation activities as part of their innovative sustainable business processes (i.e. SBM archetypes). Namely in applying degraded EV batteries at low cost in less demanding stationary storage systems in the energy markets. Further proof from our data demonstrates surprising differences in SBM archetype identification and occurrence among B2U stakeholder activities, which has a direct impact on the overall contribution to functional sustainable development. This has been echoed by Lüdeke-Freund et al. (2016) stating, "…indeed, every single archetype can contribute to sustainable development, but their potential effects will be more powerful if they are combined" (p57).

Our case samples provide key insights that there appears to be the existence of either none of the SBM archetype(s), a combination within one sustainable innovation archetype (e.g. environmental innovation) or sustainable innovations at all three sustainability parameters (environmental, social and economic). For example, it was unearthed that EV companies and energy storage/B2U service & system providers appear to innovate at all three SBM archetype levels. Both stakeholders have an immense interest in the success of a potential B2U market as cheap batteries are becoming available for the energy markets while EV companies can generate additional revenues that in turn could lower total vehicle prices and overall sustainability performance. On the other hand, we found that in the case of recycling companies, it seems that none of the SBM archetypes can be related and identified. Recyclers indicated no strong interest in the direct participation of an emerging B2U market but highlighted their interest for battery recycling (after 2nd or even 3rd life) to produce battery active materials. At this point, we argue that such business activities can be related to the entire business eco-system and conclude that there appears to be a lack of willingness towards functional corporate sustainable development in the EV sector.

Secondly and building upon discussed relevant literature in the field and key results from this study, we aim to go a step further and conceptualise a sustainable innovation business model (SIBM) framework for the B2U industry. This includes the impact of the macro environment of the EV industry (Reinhardt et al., 2016)

as well as the SBM archetypes as major sustainability innovations towards the micro level (business model), which could ultimately transform into a business case for sustainability. We believe that this is an interdisciplinary effort that will revolutionise a whole business and its practises towards a sustainable future. Managerial implications reshape the way managers view strategies and tactics in this market, whereas we challenge current theoretical perspectives with fresh insights and new research streams on sustainable business model (SBM) adoption in the rapidly emerging electric vehicle battery second use (EV B2U) industry.

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Sustainable business models and sustainable supply chain management - Establishing linkages

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Abstract

Sustainable business models (SBM) and sustainable supply chain management (SSCM) are considered promising approaches for managing sustainability issues. Although the relevance of supply chains has been acknowledged for business models, there is a lack of clarity about the interdependencies between an SBM and the management of supply chains. This conceptual paper links the two concepts by examining the intersections between SBMs and supply chain aspects. The analysis provides arguments as to why supply chains and their actors need to be considered in SBMs. Current SBM conceptions neither reflect the complexity sufficiently well that results from the dispersion of relevant stakeholders across multiple tiers of the supply chain nor their contribution to value creation of the focal company. To remedy this, an integrated conceptual framework is proposed structuring the SBM concept's value exchanges and stakeholder relationships across multiple tiers. One implication from this is that some stakeholders are engaged indirectly through intermediaries such as first-tier and lower-tier suppliers. By introducing the special role first-tier suppliers take in engaging stakeholders beyond the focal firm's direct reach into the SBM discourse, the paper provides answers as to how the SC could be considered by a focal firm. Here, the focal firm needs to weigh possible strategies and arrangements carefully based on contingency factors prevalent in its SC. While the framework is generic and parsimonious, it can and needs to be adapted to the specific focal firm's context when used for the analysis of its SBM.

Keywords

sustainable business model, sustainable supply chain management, conceptual article

Towards a new business model from aid to social entrepreneurship

Rethinking the role of business in development cooperation in Sub-Saharan Africa

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[+]This short paper is part of an on-going PhD research project. I am grateful for the insights and expertise provided by Dr. Karl Kirschner and Mrs Regina Brautlacht (Bonn-Rhein-Sieg University of Applied Sciences)

Abstract

What can non-governmental development organizations (NGDOs) do to improve how aid is used and the resulting outcome within Sub-Saharan Africa?

Poverty, rapid population growth and slow economic growth remain big challenges in Sub-Saharan Africa despite receiving substantial foreign aid in the last six decades. In the same period diverse poverty-reduction policies and strategies were implemented, yet Sub-Saharan Africa remains one of the world's poorest regions.

For NGDOs to achieve their goals in Sub-Saharan Africa, they need to understand the interplay between drivers of poverty and the contextual dimensions. Herein, we focus on the business models used by NGDOs and their effectiveness. The international development landscape is transforming due to lower aid volumes, increased competition for funds and new actors such as firms and philanthropists. Therefore NGDOs are facing the challenge to explore and pursue alternative development models that enable them to realise their goals. As social

entrepreneurship pursues triple bottom line approach (economic, social and ecological goals), it has emerged as a promising comprehensive development model for Sub-Saharan Africa.

As a work in progress, this paper seeks to evaluate selected entrepreneurial projects supported by donors in Kenya. We explore if social entrepreneurship can be used as a business model for NGDOs and identify possible success factors that contribute to financially viable projects. NGDOs need a shift from the old 'redistribution' paradigm" (Fowler, 2000, p. 637) to a market-based paradigm. Social entrepreneurships would be a fundamental different approach for reducing poverty, empowering communities being served and improving Africa's economy.

Keywords

Sustainable economic development, social entrepreneurship, NGDOs, Sub-Saharan Africa, aid effectiveness

Introduction

Sub-Saharan Africa continues to face major challenges (e.g. extreme poverty, conflicts) despite fifty decades of noteworthy progress and adoption of poverty alleviation measures.

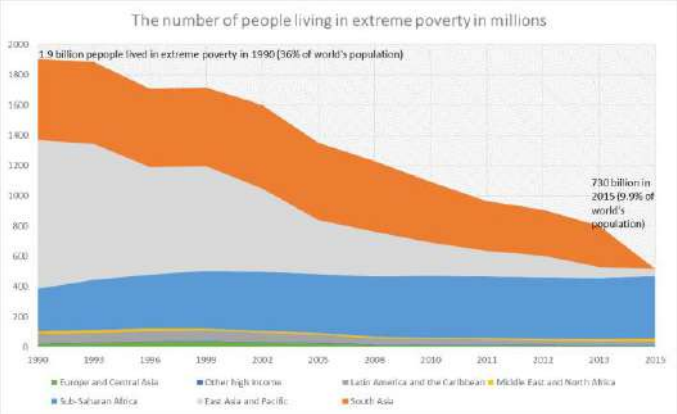

Figure 1: Number of population living in extreme poverty (i.e less than USD 1.90 per day) by world region, own compilation, data: (online analysis tool [PovcalNet], 2019)

According to the World Bank, Sub-Saharan Africa accounts for the largest share of foreign assistance. The region received an estimated USD 9.5 billion in aid in 2005. In the same year Asia and the remaining collective regions each received USD 6.8 billion and USD 5.2 billion, respectively (Hertog & Cohen, 2015). There is a

discrepancy in Sub-Saharan Africa which leads to the question if more aid in the region also means high levels of poverty as illustrated on Figure 1.

In the last three decades, there have been diversified approaches for poverty alleviation through the introduction of integrated global objectives such as the Sustainable Development Goals (SDGs). The SDGs form a collective a blueprint for fighting poverty and achieving sustainable development globally. As such the SDGs recognise social entrepreneurship approach as an enabling and empowering instrument that can attain sustainable development in the long-term (Division for Sustainable Development, 2017).

Social entrepreneurship is an innovative entity that is either run for-profit or non-profit and can also be organised as a hybrid venture that uses profitability to advance social and environmental objectives (Cho & Sultana, 2015; Navarrete Moreno & Agapitova, 2017). Some benefits of social entrepreneurships include having a strong presence by engaging communities. Due to their flexible and innovative business models, social entrepreneurships challenge traditional businesses by introducing new products and services, therefore increasing competitiveness (Navarrete Moreno & Agapitova, 2017).

From our analysis we propose that NGDOs that want to achieve significant development impact and create value in Sub-Saharan Africa should support and implement profit-generating (i.e. social entrepreneurial) activities. This way they would achieve both their social, economic and environmental goals.

Social entrepreneurships vary according to the approach and strategy they follow. Accordingly, NGDOs should consider the unique and diverse factors of the African environment to achieve sustainable and financially viable entrepreneurial activities (Mair, 2010; Navarrete Moreno & Agapitova, 2017).

Social entrepreneurships differ across countries as they reflect the complex political and social-economic structure of each country (Warnecke, 2018). The paper focuses on social entrepreneurship and NGDOs in Kenya. As of 2017 Kenya had a total population of 50 million inhabitants with an annual population growth of 2.5%. GDP (The World Bank, 2019). Around 37 per cent of the population lives on less than USD 1.9 per day and the employment and inequality levels are relatively high. Kenya has a dynamic private sector, highly skilled workforce, high potential for development (4.9 per cent GDP annual growth rate in 2017) which are some of the enabling factors of the local social entrepreneurial community

(Navarrete Moreno & Agapitova, 2017; The World Bank, 2019). Given the combination of these factors, Kenya presents a unique context for social entrepreneurship. The results of these paper are helpful in identifying generalities of social entrepreneurships in Southern Africa.

Purpose

The purpose of this research project is to explore to which extent NGDOs can implement social entrepreneurship as a tool to promote sustainable development Sub-Saharan Africa and justify their purpose.

The research question is: "Which are the critical success factors that contribute to sustainable/viable projects in the beyond aid period." The paper analyses the Kenyan social entrepreneurial eco-system with on support programmes by foreign institutions and examines the factors that determine the survival of a social entrepreneurial without external means. Furthermore, the paper assesses which steps need to be taken at each level of development for an entrepreneurial venture to be self-sustaining and eventually make donor support redundant.

In this context support include programmes that empower entrepreneurial communities and individuals by providing financial and intangible activities such as trainings, access to advisory and networking services (Cho, 2015; Darko & Koranteng, 2015).

State of research in the field

Social entrepreneurships as a driver of sustainable development

Over the last 30 years, social entrepreneurships have become a global phenomenon. Despite the lack of a single definition, there is rather a distinctive consensus in literature that social entrepreneurs promote individual development by integrating profitability with social or environmental aspects (Bacq & Janssen, 2011; Rivera-Santos, Holt, Littlewood, & Kolk, 2015; Santos, 2012; Zahra, Gedajlovic, Neubaum, & Shulman, 2009).

Even though, the terms social enterprises and social entrepreneurship are used interchangeably in literature and practice, this paper recognises innovation and risk as key drivers of entrepreneurship (Luke & Chu, 2013; Schoar, 2010). In Sub-Saharan Africa the informal sector contributes to the great share of the

subsistence or "necessity entrepreneurs " (Schoar, 2010, pp. 58–59) in Sub-Saharan Africa. This micro-operations serve as an alternative employment opportunity to the owner and are not founded with the intention of scaling up. The paper investigates "transitional social entrepreneurs" who create business opportunities that exceed subsistence needs and provide jobs and income for others (de Mel, McKenzie, & Woodruff, 2010; Schoar, 2010).

By combining financial and social objectives, social entrepreneurships have the potential to stimulate local socio-economic status and self-reliance at both individual and societal level. They contribute to achieving multiple SDGs 1, 2, 3 4 and 10 (Le Goff & Dupré, 2017).

Figure 2 Sustainable Development Goals
Source: (Division for Sustainable Development, 2017).

According to estimates by the World Bank, the relative population among youth (i.e. 15-24 year olds) is expected to increase by 44 percent between 2015 and 2030. This means that social entrepreneurial endeavours are led by young people, it contributes to youth development and empowerment (Hertog & Cohen, 2015). These arguments suggest that social entrepreneurships are models with the potential to provide solutions and address service delivery gaps in novel ways for different target groups (Navarrete Moreno & Agapitova, 2017).

Social entrepreneurship as an innovative business model for NGDOs in Sub-Saharan Africa

The classic form of granting foreign aid to developing countries has faced fierce debates from within and out of the sector for its ineffectiveness. This is "the extent to which foreign aid dollars actually achieve their goals of reducing poverty, malnutrition, disease, and death" (Easterly & Pfutze, 2008, p. 29).

Social entrepreneurial activities in Sub-Saharan Africa are currently not fully exploiting their potentials with 23 countries being classified among the 30 worst within the World Bank's Ease of Doing Business index. Social entrepreneurs face major challenges such as lack of regulation and recognition, weak infrastructure, high cost of capital (Navarrete Moreno & Agapitova, 2017; Rivera-Santos et al., 2015). This research project seeks to present social entrepreneurial as an alternative multi-dimensional business model for that NGDOs in Africa.

Contextual and environmental influence of the Sub-Saharan African environment on social entrepreneurship

Researchers have identified the influence of geography on social entrepreneurship which is relevant to understand issues such as impact, characteristics and drivers (Bacq & Janssen, 2011; Littlewood & Holt, 2018; Mair & Martí, 2006; Rivera-Santos et al., 2015; Zahra et al., 2009). In their review, Bacq and Janssen (2011) accentuate that the characteristics of the operating environment are important for social entrepreneurs. There is, therefore, a definite need for research on social entrepreneurship in Sub-Saharan Africa as this is relatively sparse.

Sub-Saharan Africa exhibits interesting characteristics and dimensions, such as extreme poverty, institutional voids, vulnerable environmental resources, and marginalised communities (Rivera-Santos et al., 2015). Thus, exploring the relationship between the specificities of the Sub-Saharan African environment and social entrepreneurship is likely to provide novel insights for researchers and practitioners.

Motivation

Interventions to promote entrepreneurial activities in developing countries are increasingly being implemented. Nevertheless, evidence on the effectiveness of entrepreneurship programs is still thin and the findings of impact evaluations differ widely (Cho, 2015).

Secondly, previous research has paid limited attention to the particularities of the African environment and its influence on the success of the entrepreneurial activity. Hence, this paper responds and builds on the work of Rivera-Santos et al. (2015) . It pays greater attention to the environment and contextual dimensions of social entrepreneurship across Sub-Saharan Africa. Finally, the project responds to calls to incorporate African insights into the academic debate in management (Rivera-Santos et al., 2015).

Design, methodology and approach

Based on the knowledge that social entrepreneurships are complex depending on social experiences and environmental context (Bacq & Janssen, 2011; Luke & Chu, 2013; Rivera-Santos et al., 2015; Zahra et al., 2009) this research project draws upon a multiple case studies.

The paper examines the impact of different entrepreneurship programs. It also assesses the effects of design factors from those of context and study characteristics. Finally, it draws together existing knowledge and approaches across projects (and phases) to define and explore social-entrepreneurial projects within the African entrepreneurial eco-system. By using multiple cases studies, the research project highlights differences and similarities between the selected projects and at the same time enables to analyse the data both within each situation and across situations.

Social entrepreneurship projects are diverse and vary among others, by objectives, type of intervention (e.g. training, financing, counselling), target groups (women, youth) and implementation arrangements (Cho & Honorati, 2014; de Mel et al., 2010). Hence, the first level of the research will be to select a number of entrepreneurial projects and create a library of case studies in Kenya according to the following criteria. 1) Formal qualification: They are formal and vary in age (as of six months), sizes and mission, economic foundation 2) Funding schemes: This will differentiate between supporting programmes such as capacity development, mentoring, and facilitating funding or access to funding (Le Goff & Dupré, 2017). Foreign support is offered by NGDOs or networks and accelerators such as the SEED initiative, Ashoka Foundation or the Schwab Foundation.

Further, secondary sources, such as existing project documentation, annual, and monitoring and evaluation reports will be used to supplement and substantiate gathered information.

Research limitations

The results are limited to pre-selected projects with foreign funding, thus findings will not be fully representative and cannot be generalised in different contexts e.g. geographical location, source of funding and mission.

Cultural and structural barriers (language and security) will limit data collection to selected parts of the country. There might be difficulties to access data as they are dependent on the project managers' readiness to collaborate.

Implications

Given Africa's diversity and problems – poverty, government and market failures, large informal economy – this research project contributes to entrepreneurship studies and development economics in Sub-Saharan Africa in at least three ways.

Firstly, the project acknowledges and highlights Sub-Saharan Africa as an interesting research environment from economic and entrepreneurial perspectives. It adds to understanding social entrepreneurship from a non-Western context and underscores the added value of incorporating African data into management literature. The findings will contribute to discussions and provide novel insights on NGDOs, social entrepreneurship, and their relationship within the African context.

A further contribution of this project lies in the coverage of entrepreneurial projects in Sub-Saharan Africa and the multiple case study methodology. There are several foreign-funded entrepreneurship programs that are being implemented in Sub-Saharan Africa. However, only a few attempts have been made to review the impacts of such interventions to synthesize emerging lessons and develop encompassing strategies for the period after aid has been provided. By using multiple cases, the project will contributes to the external validity of given approaches in social entrepreneurship programs, which would otherwise be difficult assess within a single study (Cho & Honorati, 2014).

Understanding the social entrepreneurship landscape in Sub-Saharan Africa will provide valuable information for policy makers, NDGOs, investors and future social entrepreneurs, thus providing a fresh approach to poverty alleviation. The research will underline the individuality of social entrepreneurships which are based on the uniqueness of circumstances - resources, geographic location, or culture.

To Conclude

Social entrepreneurship might not be the panacea to poverty in Sub-Saharan Africa but it is a driver of Africa's economic development. While NGDOs are facing a dynamic and competitive environment in Sub-Saharan Africa, they need to modify and re-adjust their objectives and business approach in order to perish (Aldaba, Antezana, Valderrama, & Fowler, 2000; Easterly & Pfutze, 2008).

The social entrepreneurship model is a promising model for NGDOS which so far have been cautious in utilising business management tools and concepts. To be able to use social entrepreneurship as a model, NGDOs need to understand its interplay with the underlying social, economic, political and institutional factors of a country (Mair, 2010).

This research project seeks to provide a broader perspective on the landscape of social entrepreneurship in Sub-Saharan Africa presenting some opportunities, and gaps in understanding the as-is situation. With this contribution, with this paper the author wishes to fuel such future theoretical and research in the field of sustainable entrepreneurship and the development of sustainable business models for NGDOs in Sub-Saharan Africa.

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The Value of "Enough"

Sufficiency-based Consumer Practices and Value Creation in Business Models

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Abstract

This conceptual paper explores a new theoretical framework of how value creation in business models can address sufficiency-based consumer practices. Applying social practice theory reveals levers in terms of materials, competences and meanings to support sufficiency-based lifestyles. The key challenge is to include consumers as active contributors, prosumers, in the value creation process.

Keywords

sustainability, sufficiency, business model, value creation, social practice theory

Introduction

As green consumption and eco-modernism so far have failed to significantly reduce the ecological impact of consumption, new approaches are needed to meet sustainability criteria. Next to technology-focused efficiency (relative reduction of energy and material use) and consistency (cradle-to-cradle design) approaches, sufficiency is a specific kind of behavior-based sustainability strategy that addresses how to make do with less (Reichel, 2013, 2018a; Rockström et al., 2009; Seidl & Zahrnt, 2013; Spangenberg & Lorek, 2019; Wilts & von Gries, 2015).

Sufficiency-based businesses can reduce negative impacts on the ecosystem, while at the same time deliver more prosperity with less need for economic and material growth (Sachs, 2015; Schneidewind & Palzkill, 2012; Stengel, 2011). They focus on demand-side moderation by attempting to reduce end-user consumption (Bocken & Short, 2016; Griese, Wawer, & Böcher, 2016). As consumption is tied to everyday practices of consumers, it is essential to understand what constitutes viable sufficiency-based consumer practices and what part the business model of a company plays in order to facilitate them.

So far, the role of business models in the dissemination of sufficiency-based consumer practices has for the most part remained unexplored. A deeper analysis of how elements of a business model have to be reconsidered when it incorporates and addresses sufficiency is needed to design, adapt and change business models to support a social transition towards strong sustainability. Value creation is not only the centerpiece of business model research, but together with value proposition especially related to influencing and interacting with consumer practices, as will be elaborated below (Freudenreich, Lüdeke-Freund, Schaltegger, 2019). As a starting point, this paper will therefore focus on the implications of a sufficiency-based approach in business models for its value proposition and creation. Drawing on literature on sustainable business models, value creation, sufficiency and social practice theory, this conceptional paper explores a new theoretical framework of how sufficiency-focused value creation can support sufficiency-based consumer practices and which challenges a reorientation towards such practices poses for the business model.

Theoretical Background

Sufficiency-based Consumption and Lifestyles

Sufficiency derives from the Latin word *sufficere*, meaning to suffice or to be enough. In the sustainability discourse it is generally understood as changes in consumption patterns that help to stay within the ecological capacity of the planet, while the benefit aspects of consumption change (Fischer & Grießhammer, 2013). For some, the benefit in terms of practical utility or symbolic meaning might increase, for others this perceived benefit will decrease. Sufficiency-based consumption can be viewed from two different angles: firstly, as refraining from consumption without substitution and reducing resource-use at all costs; secondly as a lifestyle where resources are used in a sustainable and regeneratable manner. The second view allows for substitutions of practices and qualitative modifications

of consumption levels and is therefore seen as the more realistic one in nowadays economy and society (Lütge, 2013; Paech, 2007; Speck, 2016).

Lifestyles represent the way we prefer to live, spend our time, interact with others, indicate where we live, where we shop, and what we consume (Backhaus et al., 2012). They are the "integration of social practices but also […] the story which the actor tells about it." (Spaargaren & Van Vliet, 2018, p. 55) Sufficiency lifestyles are found in research on consumer behavior as frugal consumption, abnegation, the simple life movement and other lifestyles that live independently from the market (Linz et al., 2002; Sachs, 1993; Spangenberg & Lorek, 2019). Although there is not one definition for a sufficiency-based lifestyle, for the purpose of this paper, the following understanding is adapted: A sufficiency-based lifestyle is characterized by simultaneously reducing energy and resource-use as well as increasing life satisfaction. It is defined by values such as humility, consistency of one's own behavior, self-responsibility, justice and the conviction that less consumption means more life quality (Kleinhückelkotten, 2005). A sufficiency-based lifestyle aims at voluntarily changing, restricting, or replacing resource-intensive practices and reducing the demand for resource-intensive goods and services (Leng, Schild, & Hofmann, 2018; Stengel, 2011). Such sufficiency-based practices may include exchanging, repairing, sharing, renting, and gifting (Fischer & Grießhammer, 2013; Speck, 2016).

The Ecological Impact of Sufficiency-based Consumer Lifestyles

Sufficiency on a household level means implementing modified consumption practices in various household-related activities, such as mobility, food, grocery shopping, building, living, and leisure (Lukas, 2015). Consumers attempt to reduce negative ecological and social impacts of these household practices within established social structures (Speck, 2016). This can for example involve commuting by bike or public transportation instead of using the car, living in co-housing facilities and reducing the consumption of pollutive food such as processed meat and dairy products (Leitner & Littig, 2015; Profijt, 2018; Stengel, 2011).

Lukas (2015) showed that sufficiency-oriented households have a significantly lower material foot-print per year[68] than conventional households. This applies

[68] according to MIPS = life-cycle wide material input per unit of service to estimate the input oriented environmental impact potential of a product (Lettenmeier, Rohn, Liedtke, & Schmidt-Bleek, 2009)

especially for mobility, nutrition and leisure, although their total footprint still ranges above the recommended level for a truly sustainable consumption (Lettenmeier, Liedtke, & Rohn, 2014). A conventional one-person-household has a material footprint of 2,666 tons per year, while the maximum for a sustainable footprint lies at around seven to eight tons per year per person (Lettenmeier et al., 2014). A sufficiency-oriented household's footprint ranges around 36 tons per year. Lifestyles of voluntary simplicity, as an anticonsumption lifestyle aiming at reducing one's clutter in life and obtain life satisfaction by cultivating nonmaterialistic values, even showed an overall lower ecological impact than environmentally concerned consumers (Iwata, 1999; Kropfeld, Nepomuceno, & Dantas, 2018). This supports the assumption that sufficiency-related lifestyles are more sustainable concerning their resource consumption than common, and presumably even 'green' consumer lifestyles.

Sufficiency-based Business Models

Companies can support lifestyles striving towards strong sustainability, such as sufficiency-based lifestyles, by offering suitable products and services (cf. Profijt, 2018). For that they will have to adjust their business model accordingly. A sustainable business model "helps describing, analyzing, managing, and communicating (i) a company's sustainable value proposition to its customers, and all other stakeholders, (ii) how it creates and delivers this value, (iii) and how it captures economic value while maintaining or regenerating natural, social, and economic capital beyond its organizational boundaries." (Schaltegger, Hansen, & Lüdeke-Freund, 2016, p. 6). *Encouraging sufficiency* can be understood as one of the sustainable business model archetypes, next to e.g. maximizing material and energy efficiency or creating value from waste (Bocken, Short, Rana, & Evans, 2014). Further types of sufficiency-based business model approaches according to Bocken et al. (2014) are for example consumer education, demand management, and premium branding.

Sufficiency as a business strategy aims not only at reducing resource consumption on a corporate level, but foremost at providing products and services that moderate end-user consumption to encourage consumers to do more with less (Bocken & Short, 2016; Gossen & Schrader, 2018; Reichel, 2013). This includes reducing consumers' absolute material and energy use, while avoiding sufficiency-related rebound effects (Reichel, 2018b). In our current market economy, sufficiency-based business models are best understood as business architectures that allow putting a sufficiency strategy into operation. For that, sufficiency-based

business models strive towards sufficiency while they act within a certain corridor that is framed by a minimum of financial stability and social justice, and a maximum of sustainable ecological impact (Reichel, 2013; Reichel & Seeberg, 2011).

Empirically observable sufficiency-based business model initiatives focus on decluttering, slow movement, de-commercialization (or subsistence), and unbundling towards more regionalization (Sachs, 2015; Schneidewind & Zahrnt, 2014, based on Sachs, 1993). This includes for example sharing, contracting, extending products' lives, slow streaming, slow travel, re-learning skills, open-source initiatives, volunteering and a local supply chain and products (Gossen & Schrader, 2018; Paech, 2007; Schneidewind & Palzkill, 2012). Another sufficiency-oriented strategy is the *dematerialization* and *tertiarization*, i.e. substituting products with service offers (Reichel, 2018b).

According to Griese, Wawer and Böcher (2016, based on Bocken et al., 2014), the three main elements of business models focusing on sufficiency are characterized as follows:

(i) Value proposition based on a reduction of consumption, which is approached by longevity and modular expandability of its products and by consumer education.

(ii) Value creation has to ensure that all activities of the business, its partners and customers contribute to this reduction of consumption, along with a reduction of waste and longer use of the product(s).

(iii) Value capture results from long-term customer loyalty, growing market shares because of reliable quality and a higher price level. Furthermore, social and ecological value can be created and attributed to the business and its customers, such as consumer education, reduced resource use and increased reuse and recycling of products.

In line with Breuer, Fichter, Lüdeke-Freund, & Tiemann's (2018, p. 278) understanding of sustainable business models as "boundary-spanning and interactive systems", the focus of the value proposition and creation of sufficiency-based business models is on the customer relationship and on influencing consumption behavior. It underlines the importance of the organization's relationship to the consumer, who increasingly acts as a prosumer

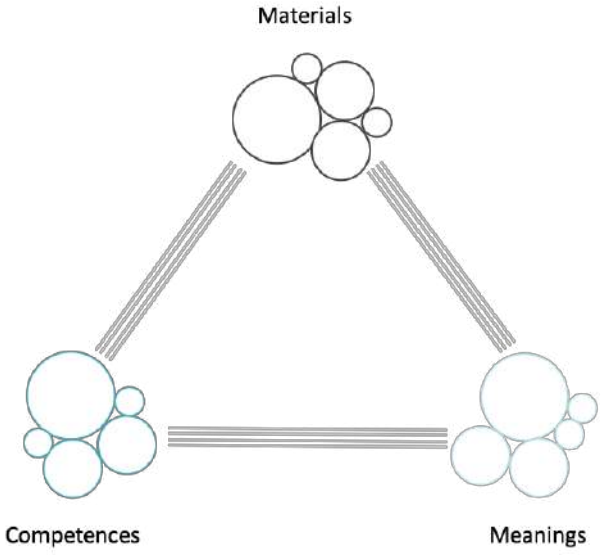
by becoming part of the value creating activities (Toffler, 1980). This will change the way the organization interacts with consumers, thereby changing the way value is created and also changing the prosumers' life world (Hankammer & Kleer, 2017; Reichel, 2013, 2017; Toffler, 1980).

Social Practice Theory Perspective on Sufficiency

If sufficiency-based business models are to support sufficiency-oriented lifestyles, while at the same time creating novel, more sustainable value for companies, we need to understand how consumer practices are constituted and how they can be transformed. Recognizing the shortcomings of purely behavioral approaches, social practice theory offers a societal and contextual view on consumption (Hampton & Adams, 2018, Spangenberg & Lorek, 2019): according to social practice theory, more or less sustainable patterns of consumption are embedded within and occurring as part of social practices (Spaargaren, 2003; Warde, 2005). Pro-environmental patterns of consumption can therefore not be triggered by educating consumers to change their attitude or beliefs alone, but rather by offering more sustainable alternatives to their usual daily practices (Spangenberg & Lorek, 2019).

A practice is a "routinized type of behavior which consists of several elements, interconnected to one other" (Reckwitz, 2002, p. 249). The three central elements of a practice are (cf. Figure 1; Reckwitz, 2002; Shove & Pantzar, 2005; Shove, Pantzar, & Watson, 2012):

Figure 1: Elements of a social practice, own illustration



(i) Materials, including the body itself, objects, tools and infrastructures;

(ii) Competences, know-how, practical knowledge, skills and a shared understanding of appropriate performance (e.g. rules, social norms);

(iii) Meanings, images, emotions, motivational knowledge or mental patterns connected to the practices.

Comparing various sufficiency-oriented consumer practices found in the relevant literature on sufficiency and consumption practices, some commonalities regarding the necessary materials, competences, and meanings can be observed (cf. Table 1). Recurring materials across many sufficiency-based practices are for example open (public) spaces and tools for subsistence-connected practices such as gardening. Especially for sharing practices, a (digital) platform and communication technology are vital to plan and coordinate the sharing of cars, tools, or meals. Food and waste containers can support the avoidance of plastic waste, food waste and the collection of organic waste for reuse (Daly, 2015; Schröder, 2013).

Practice	Materials	Competences	Meanings
Repairing	Repairing tools	Creativity; repairing skills	Environmental concern; saving money
Sharing	(Digital) communication platforms	Communication skills; planning skills; adaptability	
Reducing food waste	Food & waste containers	Planning skills; creativity	

Table 1: Examples for elements of sufficiency-based consumer practices

While providing customers with the materials they need to perform sufficiency-based practices, the education of customers to equip them with relevant competences and know-how, is even more important. Of course, communication and planning skills are required to participate in sharing and communal living practices. Being able to plan one's daily life more carefully and with respect to others' needs also implicates questioning one's own consumption desires and might in itself lead to restraining from unnecessary or impulsive consumption practices. Adaptability and creativity in finding new solutions are just as important for sufficiency-oriented practices. Downsizing, reducing and shifting from product to service-based consumption often requires doing things differently and

consumers are challenged to adapt their practices to new circumstances. For all subsistence-related practices, in the sense of self-sufficiency and independence from the market place, do-it-yourself skills such as repairing are central (Daly, 2015; Hole, 2014; Krasny et al. 2015; Latouche, 2010; Reichel, 2018b; Trainer, 2012).

Finally, appealing to recurring meanings connected to sufficiency-based practices, will be the challenge for sufficiency-oriented businesses' value propositions. Central meanings attached to sufficiency throughout various practices is of course a high concern for the environment. Some consumers are willing to change their consumption practices to use less resources, decrease their emissions and to avoid waste. For others, health concerns for themselves and their family might lead to reducing the consumption of processed foods or cycling to work. Saving money and time are meanings many consumers value and which can be a valuable argumentation in the 'less is more' narrative. An important aspect is also the wish for social integrity and communal living, which can support the establishment of sharing practices (Daly, 2015; Schäfer et al., 2018; Scholl, 2009).

Value Creation for Sufficiency

As introduced above, value proposition and value creation are key points in a businesses' relation to sufficiency-based practices. In the following, it will be elaborated from a social practice theory perspective, how the value proposition and especially the value creation process of a business change with a focus on sufficiency.

All practices of the business and its stakeholders will be directed towards using less resources, avoiding waste and producing made-to-last products (Bocken et al., 2014; Griese, Wawer, & Böcher, 2016). More radical approaches include a shift from selling goods to selling performances and aiming at substituting customers' needs towards more sufficient ones (Paech, 2007; Stahel, 2001). This involves a close relationship with both consumers and the value-chain and a change towards an *extended value creation* towards including environmental and societal aspects beyond the firms' boundaries (Bocken & Short, 2016; Breuer et al., 2018, Schaltegger, Hansen, & Lüdeke-Freund, 2016).

A business model's value proposition for sufficiency should revolve around the materials, skills and meanings connected to sufficiency-based consumer practices, as introduced above. It has to target its products and services, selection of

customer segments and relationships and the proposed value to fit sufficiency-based practices (Short et al., 2014). It can provide the consumer with the material and skills needed for a specific practice. Customer segments to be addressed would value sufficiency-connected meanings, such as ecological concern or sociality as inherent part of their lifestyles. The rather diverse and individual meanings connected to sufficiency-related practices are both a challenge and an opportunity for a business. It has to carefully frame the proposed value of a product or service not only in terms of value to the customer, such as saving time and money, but also to the environment, the local community, or society at large (Boons & Lüdeke-Freund, 2013).

While the value proposition of a business can be framed by the company itself, the value creation processes will have to include the consumers, as a close relationship to and education of customers are essential for sufficiency-based business approaches. This supports the understanding of a business model as "not just a rationale of organizational value creation […] but also as an approach to building and maintaining relationships." (Freudenreich, Lüdeke-Freund, & Schaltegger, 2019) A company will have to open up to a higher consumer integration in its innovation and production process to create products and services that not only reduce resource consumption and waste production, but also meet its customers true needs to offer alternative, sufficiency-based practices that increase their life satisfaction. For that a company has to offer room for participation, be willing to share information and knowledge and frame the collaboration process with meanings appealing to sufficiency-oriented consumers. The customers' role then will change from a passive consumer of ready-made products and services towards an active prosumer that is integrated into the value creation of a company (Reichel, 2018a; Toffler, 1980).

Focusing on sufficiency-oriented consumer practices by providing the right materials, competences and meanings to consumers while integrating them into the value creation process will impact a company's business model (Osterwalder, Pigneur, & Tucci, 2005). The following section will outline these impacts from a social practice theory perspective and give examples for sufficiency-related business practices (cf.Table 2).

Providing the appropriate materials includes lowering the amount of resources and energy used for production, designing products to last longer (in a physical and aesthetic sense), and an effort to regionalize the supply-chain; but it also requires a company to reconsider the value creation process as a whole. Does it

sell finished products that might help consumers do more with less? Does it focus on providing the right resources and tools for consumers to create the final product themselves? Or does it move towards dematerialization by substituting the product with a service offer? The identified commonalities between sufficiency-based consumer practices point towards a need to provide the space, platform, communication means and tools for consumers to take up subsistence-related, sharing and repairing practices. In that sense, the business' contribution to value creation focuses on facilitating the creation of sufficiency-related products and services, while consumers adopt the role of prosumers by actively engaging in the value creation process. Examples for sufficiency-related materials that can be provided by companies are repairing tools, sharing platforms, and co-housing facilitations. Products such as repairing tools would have to be accompanied with consumer education services such as (virtual) workshops on how to use the tools for the intended practice (Fuentes, 2015; Paech, 2007; Schneidewind & Palzkill-Vorbeck, 2011).

Facilitating consumers to do more with less and creating value themselves also relates to the competence-aspect of social practices. A company has to provide its customers with the right know-how and skills to engage in the intended practice. Many sufficiency-oriented practices require for example a certain amount of adaption and creativity to find innovative solutions in substituting common consumer practices with more sufficient ones. This also relates back to materials: the product or service design in itself would have to be as intuitive and easy-to-use as possible to lower the hurdle for adapting the new practice. A company can support the adaptation of new practices by providing accompanying services teaching consumers how to use their product or service, and by sharing stories of successful practitioners or providing the means for consumers themselves to share their stories with one another. Collaborative innovation also offers the opportunity for a business to understand its consumers needs and to jointly come up with new solutions and practices, engaging both the company and the consumers in a mutual learning relationship (Reichel, 2019). A focus on consumer education and collaborative innovation puts an even stronger emphasis on a well-designed customer relationship management (Posse, 2015; Schneidewind & Palzkill-Vorbeck, 2011).

Not only materials and competences would be created together by companies and consumers, also the meanings connected to sufficiency-based practices can be developed in a joint process. As a first step, companies can recruit sufficiency-affine consumers by framing marketing and communication to correspond with

the set of meanings attached to their practices or certain enabling products and services. Ecological concern still is one of the central meanings attached to sufficiency practices. This includes motivations to reduce resource and energy consumption, avoid waste, reuse and recycle items, seeing waste as a valuable resource. Recycled products or services to reduce resource consumption and reuse waste would appeal to this meaning complex. Another meaning that has many connections to sufficiency, as it particularly enables sharing practices, is the desire for being part of a community and a rich social life. A company can design products and services that enable this kind of community, and it can actively support the creation of a sense of community amongst its consumers. Again, this requires a close collaboration between the company and consumers, in which not only the functions of a product or service are developed together, but also a common understanding of the meaning behind this product and service. It implies not only a communication from the company to the customer, but a dialogue between the two parties (and other stakeholders as well) that shapes the value creation process, but also impacts and possibly changes the value proposition of a business (Fuentes, 2015; Gossen & Schrader, 2018; Griese & Halstrup, 2013; Reichel, 2018a).

	Materials	Competences	Meanings
Value Creation	Lowering resources and energy use for production Long lasting, intuitive product design Regionalization of supply-chain Dematerialization by offering services instead of products Providing space, platform, communication means & tools	Providing sufficiency-related know-how & skills Supporting adaptation & creativity of customers by sharing user stories Facilitating exchange of experiences among customers Engaging in collaborative innovation	Framing marketing & communication around sufficiency-related meanings Focusing on ecological concern, incl. resource & energy use, waste avoidance and re-use Creating sense of community among customers
Examples	Repairing tools, sharing platforms, co-housing facilitations	Repairing skills, communication skills, planning skills	Reducing CO2 emissions, saving money, being part of a community

Table 2: Value creation for sufficiency-related practices

Conclusion

This conceptual paper contributes to our understanding of how businesses can support a social transition towards strong sustainability by reflecting on perspectives for value creation for business models addressing sufficiency-based consumer practices. These first insights support the proposed shift of consumer roles from consumers to prosumers. It could be shown that the need for customer integration and collaborative innovation increases for sufficiency-based value creation. Sufficiency-based consumer practices' influence on a business' value proposition and their active involvement in the value creation forces companies to carefully (re-)consider their processes and especially their customer and stakeholder relationship management. Applying social practice theory reveals several levers on the level of materials, competences and meanings, which companies can serve to support sufficiency-oriented consumer lifestyles.

As this short paper has only looked into the impacts on value proposition and value creation between a company and its customers, further research could expand the proposed framework by looking into other elements of sufficiency-based business models, such as value delivery and capture. Digital marketing as a communication channel for sufficiency-based practices bears potential for further exploration (Gossen & Schrader, 2018). The impact of value creation for sufficiency on other stakeholders should also be taken into consideration (Freudenreich, Lüdeke-Freund, & Schaltegger, 2019). Also, there is a need for more empirical studies in the field of sufficiency-based consumer practices and sufficiency-oriented business models on their actual ecological and social impacts. Research in this field will facilitate transformations towards business models that support sufficiency-based consumer practices in a transformation towards more sustainable production and consumption.

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TRACK IX

SUSTAINABLE BUSINESS MODELS FOR A SHARING ECONOMY

Track IX: Sustainable Business Models for A Sharing Economy

Chair: Frederik Plewnia
TU Dresden, Germany

Over the last decade, numerous organizations summarized under the umbrella term of a "sharing economy" have emerged and rapidly gained traction (Botsman and Rogers, 2010). A key feature of these sharing economy organizations is the employment of digital platforms to mediate the shared use of under-utilized resources between companies and individuals (Munoz and Cohen, 2017). Uber and Airbnb are well-known examples, but many other organizations, facilitating activities such as car sharing, crowdsourcing or community gardening, are also being associated with the sharing economy (Codagnone et al., 2016). Consequently, researchers are still debating about which companies should be labeled as sharing economy and which should not (Belk, 2014). Furthermore, contradictions arise when arguing about the impacts of the sharing economy on sustainable development. While sharing organizations might be able to make better use of idle resources and spur social interactions, they may also undermine regulatory standards and lead to significant rebounds effects (Acquier et al., 2017; Martin, 2016). However, instead of trying to regard the sharing economy as one coherent phenomenon, differences between the individual manifestations of sharing business models should be acknowledged and investigated for their sustainability implications (Plewnia and Guenther, 2018). To address this issue, this session examines how the design of business models within the sharing economy can influence its sustainability impacts. Conceptual as well as empirical papers will advance the discussion by presenting frameworks and case studies to assess the economic, ecological and social consequences of sharing economy business models.

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Narratives of Sharing

How do companies translate sharing into their Business Model?

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Abstract

Also in Transition research, sharing is discussed as a way of reducing emissions and resource use by radically changing the way we produce and consume. But sharing is diverse and not clearly defined as a term. Therefore, the research question addressed here is how successful sharing companies (e.g. AirBnB, Uber), established companies that try to integrate sharing in "traditional" business models (e.g. Tchibo) and smaller, more sustainability-oriented sharing companies (e.g. Cambio) translate sharing for themselves? By linking the business model concept with a narrative research approach, the paper aims to help create orientation among different types of sharing and its potential for sustainable societal transitions.

Keywords

sharing economy; narratives; corporate narratives; sustainable business model; societal transition.

Sharing economy business models as drivers for a more sustainable energy system

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Abstract

Under the umbrella term of a sharing economy, platform based organizations have used digital technologies to coordinate decentralized value creation and innovative business models in the entertainment, mobility, and hospitality industry. At the same time, ambitions to transition the energy sector towards more sustainability have significantly increased the shares of decentralized renewable energy technologies. At the interface of these two topics, this paper investigates how business models of the sharing economy might be employed within the energy sector in order to foster a transition towards a more sustainable energy system. In a multiple case study design, interviews, company workshops, and secondary data documents were used to examine business models of companies which already implement ideas of the sharing economy in the energy sector. It is found that, in an energy sector transitioning towards renewable energies, sharing economy business models may offer a wide variety of possible applications due to the numerous characteristics both fields have in common. These common characteristics include: the reliance on digital technologies, the in-crease of consumer-to-consumer interactions, the rising importance of plat-form companies, and the focus on social and ecological values. Furthermore, the results show that sharing economy business models may drive the energy transition through technological change, (e.g. through the dissemination of smart meter technologies), economic change (e.g. by opening new market opportunities for

renewable energies), and behavioral change (e.g. by rising transparency on energy consumption patterns).

Keywords

sharing economy, new business models, energy transition, renewable energies, sustainability transition

Towards a Prescriptive Framework of Sharing Platform Models

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Abstract

Departing from a normative definition of the sharing economy for sustainability, we prescribe a sharing platform model framework to describe these practices. Furthermore, we seek to contribute to business model literature describing triadic business models, in particular, processes of value co-creation as a result of practices mediated by a platform.

Keywords

Sharing Economy, Platform Models, Business Models, Value Co-Creation, Sustainability

Introduction

Growing attention has been paid to the sharing economy as a phenomenon, from societal actors and academia. In part, this attention is due to the purported sustainability potential of the sharing economy to facilitate access over ownership, leading to more sustainable consumption practices (Ertz and Leblanc-Proulx, 2018; Light and Miskelly, 2015; Martin, 2016). However, much of the focus of past academic research and media attention has been on unicorns such as Airbnb and Uber (Muñoz and Cohen, 2018; Ritter and Schanz, 2019), which do not illuminate the diverse permutations of "business models" within the sharing economy domain (Chasin et al., 2018). Furthermore, several streams of research explore the sharing economy from diverse disciplines, which leads to conflicting and

competing conceptualisations (Lobbers et al., 2017). Semantic confusion persists in defining the sharing economy (Belk, 2014; Richardson, 2015), which results in disparate practices being included under the 'sharing economy' umbrella (Habibi et al., 2017).

An emerging stream of literature explores business models within the sharing economy. Recent studies have developed conflicting typologies (Plewnia and Guenther, 2018), classifications (Täuscher and Laudien, 2018), taxonomies (Chasin et al., 2018), frameworks (Lobbers et al., 2017; Ritter and Schanz, 2019) and tools (Muñoz and Cohen, 2018). These studies are descriptive of those business models increasingly attributed to the sharing economy, analysing literature, interviews, and cases. As such, these conceptualisations tend to be inclusive of the wide variety of models and practices, which may or may not fulfil the promise of the sharing economy as a mode for sustainable consumption.

In contrast to previous descriptive studies, which examine disparate practices attributed to the sharing economy, our approach is prescriptive. A prescriptive approach to research seeks to develop recommendations to solve practical problems as a result of an interpretive research process (Ahlemann et al., 2013). In this case, we suggest a gap between literature describing business models in the sharing economy and its purported sustainability potential. Quite simply, we suggest that access cannot be the only condition to demarcate practices in the sharing economy, as market competition among business-to-consumer companies can lead to an under-utilised stock of new goods (e.g. bikesharing graveyards in China). Therefore, our previous research sought to define the sharing economy for sustainability, demarcating those practices that are more likely to lead to more sustainable consumption. We define the sharing economy as a socio-economic system that leverages technology to mediate two- or multi-sided markets, which facilitate temporary access to goods that are under-utilised, tangible, and rivalrous (Curtis & Lehner, 2019).

Our definition as such excludes business-to-consumer models as there is no platform mediation present; furthermore, the definition suggests that sharing economy business models cannot create a new stock of goods, but facilitates access to an already existing stock of under-utilised goods. We suggest platform mediation and leveraging idling capacity of an already existing stock of goods is more likely to contribute to more sustainable consumption. While this helps to delineate more sustainable consumption practices, this is at odds with many of the conceptualisations of the sharing economy at present.

Whereas previous research has sought to examine existing sharing economy business models to develop business model frameworks, our interpretative research process builds from business model literature and logic to prescribe business model configurations that are more likely to contribute to sustainable consumption.

Approach

While literature has focused on the design of business models attributed to the sharing economy, less attention has been paid to the practices facilitated by platforms and their subsequent sustainability implications. Our contribution departs from two postulations: 1) there is a need to expand research beyond the traditional business model perspective to be inclusive of non-traditional organisational models and grassroots initiatives in the sharing economy; and 2) there is a need to consider the mediated practice of the platform, as value is co-created by the sharing practice between a resource owner and resource user through the platform. Furthermore, many of these practices may not be considered part of the sharing economy.

Firstly, we suggest adopting the terminology *platform model* instead of *business model* when describing the design of entities engaging in the sharing economy. Platform models as a term is more consistent with the growing body of literature pertaining to the platform economy, which is inclusive of sharing economy platforms (Kenney and Zysman, 2016). Furthermore, this terminology is more in line with recent academic literature framing the sharing economy as creating two- or multi-sided markets, operated as platforms, which are mediated by information and communication technology (ICT) (Chasin et al., 2018; Curtis and Lehner, 2019; Muñoz and Cohen, 2018; Ritter and Schanz, 2019). Finally, platform models are more inclusive of non-traditional organisational models and grassroots initiatives, which do not operate as traditional businesses but meet the criteria provided by our prescriptive definition.

Secondly, research examining the design of sharing economy business models has often excluded the practice facilitated by the platform as part of any analysis. We define the practice to be the sharing exchange between a resource owner and a resource user as mediated by the platform. Our postulation suggests that research of sharing economy platform models must also consider this mediated practice between a resource owner and resource user. This is important in order to distinguish between “all activities currently uncomfortably corralled under the

term 'sharing economy'" (Davies et al., 2017, p. 210) and those practices that may promote more sustainable consumption.

To illuminate this point, consider Airbnb. Airbnb operates as a two-sided market, which leverages ICT to mediate accommodation rental via an online platform. The platform model may facilitate access to spare rooms in providers' homes or entire apartments when providers are away. However, the same platform model may also facilitate access to entire apartments rented by commercial real estate and property management companies for solely money-making purposes, which does not leverage idling capacity. While the platform model remains the same, the first practice belongs to the sharing economy and the second does not (Curtis and Lehner, 2019; Ranjbari et al., 2018). Similar logic can be applied to other platform models and practices. Thus, this distinction has implications on potential sustainability impacts that platforms may give rise to.

To support our development of a prescriptive framework of sharing economy platforms linked to the practices facilitated by the platform, we are conducting a literature review of relevant extant literature. We performed a Scopus database search using the search query "*sharing economy*"" AND {"business models" " OR "platform models"}. The returned results included 104 academic articles in English. We reviewed the titles and abstracts to assess the relevance of each article to study sharing economy platform models; our review resulted in 71 relevant articles, of which, we were able to attain full PDF access to 68 articles. NVivo is facilitating our storage, reading, analysis, and interpretation of these texts. We use this literature to inform the development of the prescriptive framework of sharing platform models.

Insights

Literature in our sample acknowledges the lack of definitional clarity of the sharing economy. Furthermore, Plewnia & Guenther (2018) suggests that implications for sustainable consumption cannot be studied as long as there exist no clear understanding of the practices comprised in the sharing economy. Even when a definition is provided, the subsequent frameworks describing business models do not always align with the authors' stated definition. For example, Muñoz & Cohen (2018, p. 115) state that the sharing economy shall aim to increase efficiency AND optimise under-utilised resources. However, their framework includes optimising the use of new resources and they use Etsy and InstaCart as examples of sharing economy organisations. Etsy is an e-commerce website that facilitates distribution

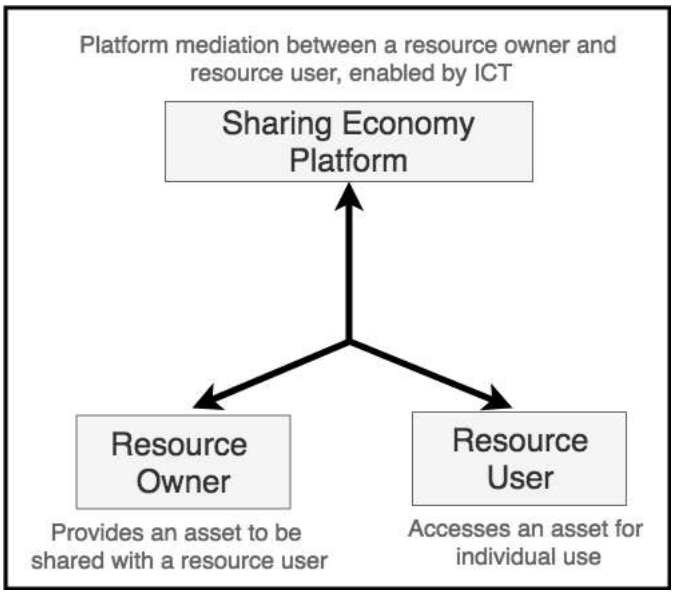
of hand-made, vintage or unique small-scale manufactured products for sale. InstaCart is an online grocery delivery platform facilitating home deliveries between local grocery stores and shoppers. Both are not examples of optimising under-utilised resources, a condition of their own definition. In contrast to this and others, our framework departs from our prescriptive definition of the sharing economy for sustainability.

We seek to contribute to existing business model literature describing T- or triadic business models, in particular, when describing value creation. In a triadic business model, such as those considered by our definition of the sharing economy, the platform facilitates interactions and transactions between a supplier and customer, co-creating value with and through the platform (Andreassen et al., 2018). Value co-creation in web-based multi-sided platforms is a process facilitated by the platform, which involves multiple actors engaging in key activities and processes of interaction and integration (de Oliveira and Cortimiglia, 2017). A limited but growing body of literature considers value co-creation among actors in the sharing economy, from the perspective of specific examples or geographies (Camilleri and Neuhofer, 2017; Johnson and Neuhofer, 2017; Lan et al., 2017; Zhang et al., 2018).

In contrast to traditional business models, with value being unidirectional from a supplier to a consumer, platform models in the sharing economy see multi-directional value creation, delivery, and capture through the process of value co-creation. For example, sharing platform models see a resource owner and resource user engage in key activities that are enabled by the platform model, which contribute to value co-creation. The value proposition of the platform is largely mediation and matchmaking; however, the value proposition for the resource owner and resource user is realised through their own key activities (Figure 1).

Value co-creation is only one aspect in considering platform models in the sharing economy. In developing our framework, we chose to depart from the work conducted by Täuscher & Laudien (2018) in understanding platform models by using morphological analysis (MA) to illustrate platform model dimensions, parameters and conditions. MA is a non-quantitative modelling method useful for concept

Figure 1. Key Activities by Actors Contributing to Value Co-Creation



generation as well as structuring and analysing "…complex cases where expertise on several areas is required" (Im and Cho, 2013, p. 4464). MA allows for the representation of business models across several dimensions of analysis (Im and Cho, 2013). Parameters are used to describe these dimensions and denote further the attributes of a business model (Im and Cho, 2013). Finally, conditions reflect all the possible alternatives as comprehensively and as detailed as possible with respect to their parameter (Im and Cho, 2013).

The framework is built abductively through discussions among researchers as well as in consultation of academic literature. After several iterations, we developed an initial prescriptive framework of sharing economy platform models (Figure 2). Drawing on business model literature (Osterwalder and Pigneur, 2010; Teece, 2010), the dimensions include *value creation*, *value delivery*, and *value capture*. The parameters, or attributes, of the platform model are developed in relation to each dimension. Then, for each parameter, a nearly exhaustive list of alternative conditions is proposed to describe all of the possible permutations of platform model design. Several parameters and their subsequent conditions are retained from Täucher & Laudien's (2018) original morphological analysis of platform model attributes (e.g. price discovery, pricing mechanism, pricing discrimination). However, we also integrated other parameters from literature and our own work including *governance model* (Muñoz and Cohen, 2018), *revenue streams* (Ritter and Schanz, 2019) as well as *platform type* and *transaction content* (Curtis and Lehner, 2019), among others.

Figure 2. Prescriptive Framework of Sharing Economy Platform Models

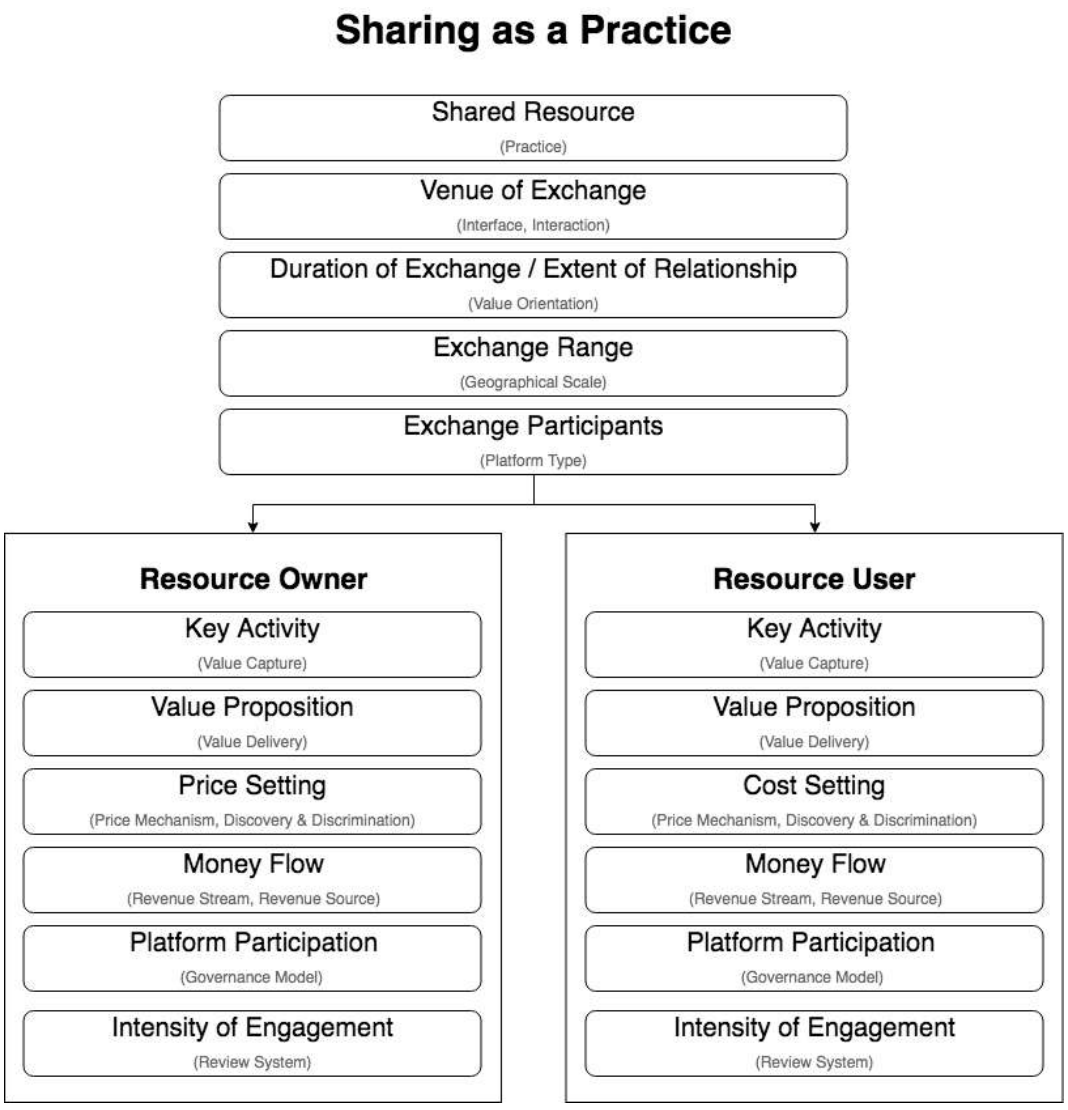
Dimension	Parameter	Alternate Conditions							
Value Creation	Key Activity	Platform mediation/matchmaking facilitating access to under-utilised assets							
	Practice	Shared Space	Shared Mobility	Shared Goods	Shared Con-sumables	Shared Resources			
	Mediating Interface	Smartphone App	Website (In-house)	Website (Integrated)	3rd-Party Platform (e.g. Facebook)				
	Governance Model	Corporate	Collaborative	Cooperative					
	Intellectual Property	Proprietary/Commercial	Communal	Open Source					
	Price Discovery	Set by Platform (Fixed)	Set by Resource Owner	Set by Resource User	Auction	Negotia-tion	Pay What You Can	Free	
	Review System	User Reviews	Provider Reviews	Platform Reviews	None				
Value Delivery	Key Value Proposition	Reduction of transaction costs in sharing with strangers							
	Platform Type	Peer-to-Peer	Business-to-Business	Business-to-Peer	Crowd				
	Interaction	Online	Offline	Hybrid					
	Geograph-ical Scale	Community / Neighbourhood	Local	Regional	National	International			
Value Capture	Value Orientation	Commercial	Social	Environmental	Societal				
	Revenue Streams	Transac-tion Fee	Com-mission	Sub-scription Fee	Mem-bership	Adver-tise-ments	Data Mining	Spon-sorship	Dona-tions	Public or Private Funding
	Pricing Mechanisms	Static Pricing	Dynamic Pricing	Differential Pricing					
	Price Discrimina-tion	Feature-based	Location-based	Quantity-based	None	Other			
	Revenue Source	Resource Owner	Resource User	3rd-Party	Volunteer	None	Other		

Platforms may possess multiple conditions within a given parameter, depending on the sharing practice experienced by the resource owner and resource user. For example, the platform may utilise multiple *interfaces* to mediate the sharing practice; in addition, the platform may open up their review system to all participants in the value chain or rely on multiple revenue streams to support their activities. However, we attempted to develop our framework to the same level of abstraction in a way that each condition was mutually exclusive.

Next, because value is co-created between a resource owner and resource user through a platform, we sought to illustrate sharing as a practice to capture the processes of value co-creation (Figure 3). The first tier describes the overall sharing practice - e.g. what is shared, how it is shared, and between whom it is shared - whereas the second tier describes the sharing practice as experienced by the resource owner and resource user in relation to their key activity in the process of

value co-creation. For each aspect of the sharing practice, we have suggested parameters of the platform model design that may influence how the resource owner and resource user experience the sharing practice.

Figure 3. Schematic of Sharing as a Practice



Discussion

Our framework is prescriptive in that it is the result of an interpretive research process to prescribe potential platform model configurations, which depart from our prescriptive definition. Our framework is not intended to describe all practices attributed widely to the sharing economy. Instead, we seek to illustrate platform attributes and sharing practices that may contribute to more sustainable consumption. We suggest that our prescriptive framework may be used as a tool among entrepreneurs who aspire to develop social enterprises or ICT-enabled

platforms that support sustainable consumption. Furthermore, this framework might especially be of interest for municipal and national governments, which have the sharing economy on their agenda for similar reasons and are interested in distinguishing sharing practices that support social and environmental sustainability. Furthermore, we hope to contribute to business model literature in describing and understanding value co-creation in triadic business models.

Future Research

Morphological analysis requires several iterations of development, testing, evaluation and refinement. This conference paper serves as an opportunity to receive feedback on the suggested parameters and conditions contained within our prescriptive framework of sharing platform models. With this input, we will define each parameter and condition within the framework and seek to test it using cases in several cities across the world as part of the ERC project *Urban Sharing: Sustainability and Institutionalisation Pathways*. We also intend to continue to develop the schematic detailing sharing as a practice and use this as a means to study value co-creation among actors contributing to sharing economy platforms. Furthermore, the schematic can be used like a worksheet with resource owners and users to investigate perceived experience and consumer behaviour associated with the mediated practice.

This research has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (Grant Agreement No. 771872).

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Towards a sustainability assessment framework for the sharing economy

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Extended abstract

The businesses of the sharing economy have rapidly gained a foothold in many sectors of the economy. However, the sustainability implications of the sharing economy have not been fully explored yet. Relevant publications make an effort to account for the various environmental and social impacts of such businesses, but systematic sustainability assessments of such operations are not available yet.

Our research aims at uncovering the environmental and social implications of sharing economy businesses through the analysis of a ride share company and using the results to set up an assessment framework to allow of a more comprehensive analysis of the sustainability impacts of sharing economy businesses.

We analyse the usage patterns and growth dynamics of a regional ride share company in Hungary with several million trips connecting settlements inside and outside of the country. Apart from analysing data received from the company, a questionnaire based survey is currently being prepared and conducted in order to reveal the changes in user behaviour and its implications on the environmental and social impacts of the transportation sector.

Based on our analysis we can demonstrate the most important features of the regional ride share company and we can use these results to present the outlines of a general sustainability assessment framework for sharing economy businesses.

We believe that this is a very timely effort since the fast rise of sharing economy businesses leaves policy makers without the appropriate tools to assess their impacts and influence their future development.

Research problem

The businesses of the sharing economy have rapidly gained a foothold in many sectors of the economy. Aside from tourism and transportation, innovative business models sprung up in many other sectors as well and are posing a challenge to incumbent businesses. Many of the businesses following new models of operations have grown exponentially over the last few years reaching or surpassing the market value of their traditional counterparts (Guttentag 2013, Dogru et al., 2019, Vivoda et al., 2018).

However, the sustainability implications of the sharing economy have not been fully explored yet. Relevant publications make an effort to account for the various environmental and social impacts of such businesses, but systematic sustainability assessments of such operations are not available yet. Frenken (2017) analysed the environmental impacts of the sharing economy and came to the conclusion that peer to peer ride sharing causes rebound effects and policy makers should focus on these implications to ensure that sharing economy businesses do not have negative effects on the environment and foster sustainable consumption. Shaheen et al. (2012) found that car sharing has negative impacts on the environment and it is difficult to identify the tipping point where car sharing brings benefits over the traditional use of a private car. Hawlitschek et al. (2018) came to the conclusion that the motivation of the users of peer to peer sharing economy services to foster sustainable development plays a positive role in choosing these platforms instead of traditional means of transportation. Dreyer et. al (2017) developed a model for the evaluation of the stakeholder value of businesses using the business model of collaborative consumption and point at the importance of context, especially the differences between developed and developing countries.

Our research aims at uncovering the environmental and social implications of sharing economy businesses through the analysis of a concrete ride share company and using the results to set up an assessment framework to allow of a more comprehensive analysis of the sustainability impacts of sharing economy businesses.

The creation of an assessment framework is hindered by several factors, including the lack of detailed data describing the operation of sharing economy businesses and the limitations of available methodologies. Services offered by sharing economy businesses substitute services provided by traditional organisations, but the behaviour of the consumers and its implication for environmental and social impact has not been fully explored yet. Also, while sharing economy platforms may have significant sustainability impacts, platform providers have only limited control over the impacts of the whole platform.

Apart from a better scientific understanding of the phenomena, a suitable assessment framework can serve a number of practical objectives, including improved decision making by both corporations and policy makers at the different levels.

Approach and research methods

On-going research at the Budapest University of Technology and Economics explores the usage patterns and growth dynamics of a regional ride share company with several million trips connecting settlements inside and outside of Hungary.

The first phase of the research concentrated on analysing data provided by the company regarding the trips taken through the platform. This made it possible to analyse the basic features of the network: the composition of the users, the departure and destination settlements and their evolution over time and some aspects of the behaviour of the users – both drivers and passengers. In line with recent literature on networks, we came to the conclusion that taking settlements as nodes of the network created by the platform, the network can be understood as a scale free network (Barabasi, 1999).

This first phase of the research, however, provided only limited results regarding the sustainability implications of the network since the database provided by the company was not designed with such purposes in mind and contained only basic information about reservations and trips.

For this reason, the current second phase of the research utilises a survey methodology to uncover usage patterns of individuals registered on the platform. Whether the users of the platform travel more or less, whether by using the platform they substitute driving a car or travel by train/bus and other changes in

user behaviour are surveyed. While this methodology is still not able to provide exact measures of possible rebound effects in the environmental domain, it can highlight tendencies as well as point at the focus areas which should be dealt with by the evaluation framework to be set up as a result.

Results

Such a combination of platform data with a survey of user behaviour can contribute to a better understanding of the environmental and social impacts of sharing economy businesses in many different ways. Based on our analysis we can demonstrate the most important features of the regional ride share company based in Hungary and we will use these results to present the outlines of a general sustainability assessment framework for sharing economy businesses.

Our data analysis will also help us understand the motives of users of ride sharing company services, which is important in order to understand the transferability of our results to other sharing economy businesses.

We believe that this is a very timely effort since the fast rise of sharing economy businesses leaves policy makers without the appropriate tools to assess their impacts and influence their future development. This is reflected in the widely differing reactions of governments to services provided by fast growing platforms (see e.g. Uber and Airbnb and the differences in local regulations regarding their operations).

In our view a suitable assessment framework can answer whether a particular sharing economy business can provide a step towards sustainability in a certain region and what are the conditions under which a transition to a more sustainable society can be guaranteed.

Keywords

sustainable consumption, sharing economy, environmental impact, social impact, rebound effect

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TRACK X

PRACTITIONER SESSIONS

THE SMART BUSINESS MODELER – USING BUSINESS MODEL PATTERNS

Chair: René Bohnsack, Smart Business Modeler Initiative, Católica Lisbon School of Business & Economics, Portugal

This is an interactive session on the use of business model patterns for online business modeling.

In this session we will address the use of business model patterns for sustainable innovation and entrepreneurship education. We present the online platform "Smart Business Modeler" (https://smartbusinessmodeler.com/) and how it makes use of business model patterns at the example of the Sustainable Business Model Pattern Pack of Lüdeke-Freund et al. (2018). Furthermore we show the potential for gamification of business modelling with the business model game Pitch! Last, we explore the potential for collaborative research based online business modelling and discuss the way forward.

CLIMBING MOUNT THRIVEABILITY

Chair: Ralph Thurm, Reporting 3.0 (a flagship program of Oncommons gGmbH), Berlin, Germany

With the clock ticking, the design of our economic system needs to change drastically. A green, inclusive and open economy will only come to life through the sustainable and just distribution of vital resources. But if we are to realize new business models that follow a regenerative and redistributive approach to business, we must also develop ways to observe, measure and assess our progress. This poses exciting opportunities for academic research, something that the Academic Alliance of Reporting 3.0 is focusing at.

Reporting 3.0 was formed in 2013 to tackle the challenges that were going unmet within the transition towards a better, fairer, more sustainable economy. Join them on an overview of the collective journey that will transform the greatest challenges in human history into opportunities to survive and thrive. Invoking Interface Founder Ray Anderson's metaphor of 'Mount Sustainability', this workshop invites you to join in a climb of several stages.

Your host for this session will be Ralph Thurm, MD of Reporting 3.0. He will be citing examples of successfully finished Transformation Journey Programs and offer opportunities for academics to join.

Instead of an Epilogue

Dear Friends,

Instead of an academic reflection on some of the most remarkable lessons we have learned while preparing the conference and reviewing the many submissions we received, we want to say thank-you to the many people without whom this conference would not have been possible:

Our deepest gratitude goes to …

- Jan Jonker, for launching the NBM movement and the NBM conference series.
- Romana Rauter, Nikolay Dentchev, Niels Faber, Jan Jonker and Korneel Hogendoorn for organising three excellent conferences in 2016, 2017, and 2018. We learned a lot from you.
- Andreas Kaplan and ESCP Europe for supporting us in so many ways and allowing us to host NBM@Berlin 2019.
- Danièle Le Roux, Tien Quynh Duong, Claudia Rudisch, Miriam Pirolo, Susanne Rasum and many more ESCP colleagues.
- Romana Rauter, Thomas Wunder, and Henning Breuer for their discussion panels, and Nancy Bocken, Lorenzo Massa, and Stefan Schaltegger for their great and inspiring keynotes.
- And all the voluntary session chairs, authors, presenters, and reviewers who contributed to NBM@Berlin 2019.

You are a great community!

The Conference Team

And finally,

My personal thank-you goes to …

- Tobias Froese, simply for making this event possible. NBM@Berlin 2019 is mainly the result of Tobias' invaluable project management skills, patience, and constant oversight. Well done!
- Astrid Tröster, Claire Eckmann, and Harris Azhar, for the uncounted organisational issues and details they worked on. This includes the pre-event, proceedings, setting up the campus, ordering food … and many, many more things.

You are a great team!

Florian

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ISBN: 978-3-96705-001-1