



Delft University of Technology

Strategic Design of Sustainable Business Models

Baldassarre, Brian; Bocken, Nancy; Calabretta, Giulia; Diehl, Jan-Carel; Duygu, Keskin

DOI

[10.33114/adim.2019.4f](https://doi.org/10.33114/adim.2019.4f)

Publication date

2019

Document Version

Final published version

Published in

Conference proceedings of the Academy for Design Innovation Management 2019

Citation (APA)

Baldassarre, B., Bocken, N., Calabretta, G., Diehl, J.-C., & Duygu, K. (2019). Strategic Design of Sustainable Business Models. In E. Bohemia, G. Gemser, C. de Bont, N. Fain, & R. Assoreira Almendra (Eds.), *Conference proceedings of the Academy for Design Innovation Management 2019: Research Perspectives in the era of Transformations* (Vol. 2, pp. 803-806) <https://doi.org/10.33114/adim.2019.4f>

Important note

To cite this publication, please use the final published version (if applicable).
Please check the document version above.

Copyright

Other than for strictly personal use, it is not permitted to download, forward or distribute the text or part of it, without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license such as Creative Commons.

Takedown policy

Please contact us and provide details if you believe this document breaches copyrights.
We will remove access to the work immediately and investigate your claim.



Track 4.f Introduction: Strategic Design of Sustainable Business Models

BALDASSARRE Brian^a; BOCKEN Nancy^{ab}; CALABRETTA Giulia^a; DIEHL Jan-Carel^a and KESKIN Duygu^c

^a Delft University of Technology, The Netherlands

^b Lund University, Sweden

^c Eindhoven University of Technology, The Netherlands

doi: 10.33114/adim.2019.4f

Introduction

Concerns about the societal and environmental impact of how companies operate have generated increasing interest in more sustainable ways of doing business (Porter & Kramer, 2011). Research and practice from the past decade show that a Sustainable Business Model Innovation lens is suitable to embed sustainability into firms' objectives and operations (Bocken et al., 2014; Schaltegger, Lüdeke-Freund, & Hansen, 2012). Consequently, Sustainable Business Model Innovation has been emerging rapidly as a research field (Lüdeke-Freund & Dembek, 2017). Recent developments in this field build upon seminal work on Design for Sustainability from the past two decades to establish a connection with Strategic Design (Baldassarre et al., 2019; Geissdoerfer et al., 2016; Manzini, 1999; Tukker, 2004). Strategic Design is a research stream that studies how to leverage the discipline of Design in the context of Strategy and Innovation Management (Calabretta et al., 2016; Karpen, Gemser, & Calabretta, 2017). More specifically, it focuses on the application of design practices, principles and methods to the formulation and implementation of innovation strategies that benefit people and organizations alike (Calabretta et al., 2016). The connection between Sustainable Business Model Innovation and Strategic Design is mainly supported by the argument that the strategic and experimental nature of design enables the integration of stakeholders' objectives including sustainability concerns, while also providing the process dimension needed to move away from theory towards concrete practice and tangible impact (Baldassarre et al., 2017; Bocken, Schuit, & Kraaijenhagen, 2018). However, research on the role and contribution of Strategic Design to Sustainable Business Modeling is still in its infancy. Consequently, within this track of the 2019 edition of the Academy for Design Innovation Management Conference, we collected four research contributions at the intersection between Strategic Design and Sustainable Business Model Innovation. These contributions are summarized in the paragraphs below, followed by a reflection on all of them and potential directions for future research.

The first contribution from Baldassarre, Calabretta, Bocken, Diehl and Keskin reviews how the concept of Design for Sustainable Development has been evolving since its origins in the 1960s, gradually broadening its scope from the design of products to the design of product-service systems (PSS), business models and wider ecosystems. By taking a business perspective on this evolution, the review shows how designers have shifted their focus from designing products to designing solutions for business problems, thus assuming an increasingly strategic role within the organizations they operate in. This review is summarized into a visual framework, which is used as an input for a discussion with eight international academic experts on how the role of sustainable designers has evolved over time across these four nested levels of design. The findings point out that the role of Designers for Sustainable Development can be framed around five topics: strategic objective and its related perspective, language, key activities and main challenge. The strategic objective refers to the focus of designers in steering strategic decisions in organizations, the perspective they adopt in approaching business problems and developing solutions, the language they use in communicating with



This work is licensed under a Creative Commons Attribution-NonCommercial-Share Alike 4.0 International License.

<https://creativecommons.org/licenses/by-nc-sa/4.0/>

different stakeholders, the key activities they engage during the design process, and the main challenges they face within this process. On a product design level, the strategic objective of design is to push organizations to think beyond the “form and function” of their products, and steer decisions towards changing their life cycle. This entails, for instance, adopting a technical language aligned with the R&D department, analyzing the life cycle of products and redesigning them accordingly. The main challenge is related to the reduction of material and energy flows associated with products. On a PSS-level, the strategic objective is to push organizations to think beyond the life cycle of products, and steer decisions towards changing tangible and intangible stakeholder exchanges such as knowledge, materials, energy and money. This entails bridging the perspectives and languages of different departments in order to analyze the stakeholders involved in the innovation process and design not only new sustainable products but also new services around them. The main challenge at this level is the implementing of sustainable product-service innovations. On a business model level, the strategic objective is to push organizations to think beyond products and services, and steer decisions towards (re)defining their purpose, how they function from an economic and operational standpoint, in order to pursue sustainability goals while making profit. This entails adopting a firm centric perspective and a strategy language in order to experiment with new business models. The main challenge is to ensure the financial viability of business models and scaling them up. On an ecosystem level, the strategic objective is to push organizations to think beyond their individual business, and partner with others in order to (re)define (un)sustainable market practices. This entails adopting a cross organizational perspective and speaking a policy language in order to analyze entire industries end ensuring cross sector alignments. The main challenge of this level is turning these initiatives and joint projects into new business entities.

The second contribution from Pinheiro and Jugend explores a knowledge gap on how to design new sustainable business models by linking Strategic Design with Circular Economy principles and a Product Portfolio Management logic. In the context of this study, the circular economy is referred to as a system aimed at minimising waste and making the most of resources through intentional design by reusing and refurbishing products, as well as through material recycling. Product portfolio management is referred to as the structured decision making process through which organizations choose to focus on and bringing to market specific projects, products and services. This study links these notions with Strategic Design and integrates them into a conceptual framework. Consequently, the framework is used as a conceptual lens to analyze the case of Brazilian company with one hundred employees operating in the wood industry. The product portfolio of the company is based on several products derived from wood and vegetable fibres, including gymnastics apparel, indoor and outdoor furniture. Some of the products within the portfolio are derived from recycled and reforestation wood. Using the lens of the framework, the study analyzes the drivers and barriers related to the Strategic Design of a Sustainable Business Models around such products with a specific focus on circular economy aspects. A first identified driver is the commitment of top management to prioritize circular products within the portfolio. A second identified driver is the dissemination of circular principles and sustainability goals across the company. A third driver relates to the compliance of the company with local legislation, which has recently started to promote the reuse of raw materials in the wood sector in order to preserve biodiversity in the country. Conversely, a main barrier for the design of a sustainable business model around circular wooden products is the lack of a wide range of technological possibilities to recycle the raw material in different ways that are functional to further diversify them and expand the product in this direction. Another barrier relates to difficulty in selecting suitable partners and suppliers across the supply chain to foster a business model that is fully Circular.

The third contribution from Ballie is a feasibility study focusing on how Strategic Design may support the development of circular / sustainable business model strategies. Specifically, the study looks at how Makerspaces might be used as educational hubs to experiment with new tools, skills, techniques and technology to develop circular design strategies for micro-manufacturing within the Scottish textile sector. The assumption is that Makerspaces might support the repurposing of textile waste within a redistributed manufacturing system (RDM). The research argues that design can play a strategic role in supporting the adoption of new mindsets, methods and models to enhance awareness and understanding of the need to design for a circular economy. The research activities comprised of field research and factory visits to engage with large Manufacturers to deeper understand systemic issues around textile waste. This was followed by hosting two Make-a-thon workshops within Makerspaces in both rural and urban environments – this provided an opportunity to connect with different stakeholders from across the supply chain and to invite them to input to make recommendations for conceptualizing Circular Fashion and Textile Archetypes. The insights drawn from this research act as a starting point for future work, reflecting on the implications of the methods applied, concluding the circular economy is the same imperative whether people are focusing on

ecology, economy or just their own business. In this research, she further demonstrates that connecting different stakeholders from across the supply chain is instrumental in supporting circular practices. However, the research unearths many contradictions in the current narrative about circularity in Makerspaces. For instance, the business focus of the CE, and the required Sustainable design strategies will require intensive resource management to implement a RDM system for local textile economies. Last but not least, the Makerspace as facilitator in this process has several advantages like a neutral place for stakeholders to meet and to prototype directly generated ideas. The other side of the coin is the business model of the Makerspaces as well as the sustainability (in the sense of long lasting) of the Makerspaces themselves: during the research, one of the two Makerspaces had to close down.

The fourth contribution from Cheung and Kuzimina focuses on the sustainability impact of service-based sustainable business models. In recent years, service-based sustainable business model innovations have been gaining increasing attention in design research. A prominent example of this research is the mobility services based on collaborative consumption. However, it is unclear how the implementation of such service-based business models, and related activities and practices, impact the sustainability and experience of the proposed service offering. In this study, Cheung and Kuzimina draw on the literature on service design, product-service system and sustainable innovation, and propose a design-driven framework to evaluate the sustainability impact of service-based business model innovations. This framework, referred to as 'sustainability evaluation service blueprint', provides visibility to the complex multi-actor service operations, creates an understanding of the existing structure of stakeholder interactions during service operation, and gathers insights into the captured and uncaptured triple bottom line values within the existing product-service lifecycle. The authors test and validate this framework through six expert interviews, and conduct a desk research to generate two case studies in the mobility sector. The results of this study reveal that sustainable value creation is a collaborative effort and require the knowledge and expertise of various interdependent actors. Moreover, the results show that public and private actors hold diverse perspectives and viewpoints on the collaboration process; as such, the development of shared guidelines for the design and development of service-based innovations is crucial for the emergence of trust and prevention of collusive dynamics. Finally, this study show that engaging stakeholders in sustainable value creation requires a simple language. Accordingly, the authors suggest to use the word 'benefits' instead of 'values' in communicating sustainability impact of service-based innovations. This paper offers a springboard for practitioners and researchers to uncover compelling insights, discuss latest service design developments, and envision future directions for integrating sustainability into service-based business model innovations.

In conclusion, the contributions summarized within this editorial provide a step forward in advancing emerging theory and practice at the intersection between Strategic Design and Sustainable Business Model Innovation. Specifically, the Sustainable Business Model lens may help Strategic Designers embed sustainability associated with newly designed products and services into wider firms' objectives and operations. First, the sustainable business model lens provides a holistic perspective on the way in which business is done, by highlighting the value proposition (what value is provided to whom?), value creation and delivery mechanisms (how is value provided?), and value capture mechanisms (how money and other forms of value are captured) associated with products and services (Bocken et al., 2014). Second, a business model perspective allows sustainable design (e.g. long-lasting design, modular design) to be more impactful and commercially viable. For example, 'Philips Light as a Service' allows longer-lasting LED lights to be sold as part of a service-contract, allows for longer term financial value from a longer lasting product, while reducing environmental impact by including maintenance, repair, and replacement services into the business model (Kramer et al., 2019). The Strategic Design lens allows business model researchers to develop and employ valuable tools and methods to put sustainable business models into practice. For example, the creative approach of design thinking can be used to stimulate new ideas and allow researchers and designers to focus on implementation (Guldmann et al., 2019). Second, the action-oriented, stakeholder focus of strategic design is highly compatible with the needs of sustainable business model innovation, especially as it provides the necessary tools and approaches for enacting the related transformation (Baldassarre et al., 2017). Finally, experimentation as a concept emerging in design and business model research is a way to support internal transitions towards sustainability as well as starting to test which new business models in practice (Bocken et al., 2018). The research argues that design can play a strategic role in supporting the adoption of new mindsets, methods and models to enhance awareness and understanding of the need to design for a circular economy. Ultimately, we encourage future research along four main trajectories. In line with the first contribution of this editorial, we suggest to investigate deeper into the connections between sustainable design and sustainable business through a systematic literature review across these two domains. In line with the second and third contributions, we

propose to further explore how Strategic Design practices can be leveraged to bridge the knowledge gap on how to conceptualize and implement Sustainable Business Models and to support the transition towards a circular economy with a major focus on feasibility and viability aspects. Additionally, we encourage researchers to explore the role that designers can play in this transition, as suggested by the first contribution. Finally, as stressed by the fourth and last contribution of this editorial, evaluating the sustainability impact of new business model innovations is an aspect of crucial importance, and we accordingly encourage future research to focus on it.

References

- Baldassarre, B., Calabretta, G., Bocken, N., & Jaskiewicz, T. (2017). Bridging sustainable business model innovation and user-driven innovation: A process for sustainable value proposition design. *Journal of Cleaner Production*, 147, 175–186. <https://doi.org/10.1016/j.jclepro.2017.01.081>
- Baldassarre, B., Schepers, M., Bocken, N., Cuppen, E., Korevaar, G., & Calabretta, G. (2019). Industrial Symbiosis: towards a design process for eco-industrial clusters by integrating Circular Economy and Industrial Ecology perspectives. *Journal of Cleaner Production*, 216, 446–460. <https://doi.org/10.1016/j.jclepro.2019.01.091>
- Bocken, N., Schuit, C., & Kraaijenhagen, C. (2018). Experimenting with a circular business model: Lessons from eight cases. *Environmental Innovation and Societal Transitions*. <https://doi.org/10.1016/j.eist.2018.02.001>
- Bocken, N., Short, S. W., Rana, P., & Evans, S. (2014). A literature and practice review to develop sustainable business model archetypes. *Journal of Cleaner Production*, 65, 42–56. <https://doi.org/10.1016/j.jclepro.2013.11.039>
- Brown, T. (2008). Design thinking. *Harvard Business Review*, 86(6), 84-92+141. <https://doi.org/10.1145/2535915>
- Calabretta, G., Gemser, G., & Karpen, I. (2016). *Strategic design: eight essential practices every strategic designer must master*. BIS Publishers.
- Geissdoerfer, M., Bocken, N., & Hultink, E. J. (2016). Design thinking to enhance the sustainable business modelling process: A workshop based on a value mapping process. *Journal of Cleaner Production*, 135, 1218–1232. <https://doi.org/10.1016/j.jclepro.2016.07.020>
- Guldman, E., Bocken, N. M., & Brezet, H. (2019). A Design Thinking Framework for Circular Business Model Innovation. *Journal of Business Models*, 7(1), 39-70.
- Karpen, I. O., Gemser, G., & Calabretta, G. (2017). A multilevel consideration of service design conditions. *Journal of Service Theory and Practice*, 27(2), 384–407. <https://doi.org/10.1108/JSTP-05-2015-0121>
- Kramer, M. R., Geradts, T., & Nadella, B. (2019). Philips Lighting: Light-as-a-Service. Harvard Business School Case 719-446, March 2019.
- Lüdeke-Freund, F., & Dembek, K. (2017). Sustainable business model research and practice: Emerging field or passing fancy? *Journal of Cleaner Production*, 168, 1668–1678. <https://doi.org/10.1016/j.jclepro.2017.08.093>
- Manzini, E. (1999). Strategic design for sustainability: towards a new mix of products and services. *Proceedings First International Symposium on Environmentally Conscious Design and Inverse Manufacturing*, 434–437. <https://doi.org/10.1109/ECODIM.1999.747651>
- Porter, M., & Kramer, M. R. (2011). Creating shared value. *Harvard Business Review*, 89(1–2).
- Schaltegger, S., Lüdeke-Freund, F., & Hansen, E. G. (2012). Business cases for sustainability: The role of business model innovation for corporate sustainability. *International Journal of Innovation and Sustainable Development*, 6(2), 95–119. <https://doi.org/10.1504/IJISD.2012.046944>
- Tukker, A. (2004). Eight types of product-service system: Eight ways to sustainability? Experiences from Suspronet. *Business Strategy and the Environment*, 260, 246–260.