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Sustainable Trajectories for Business Model Innovation: Insights from Visual Thinking

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Abstract

This paper introduces a visual approach to sustainable business model innovation that helps business model designers conceptualise how sustainability can be integrated in business models. Drawings are used to illustrate four sustainable trajectories for business model innovation. The visualisation of trajectories helps to open the “black box” of sustainable value creation by enabling different understandings of value creation from a business model perspective. The paper also introduces and exemplifies the concept of “multi-lens” thinking for sustainable business model innovation, which entails combining insights from several perspectives.

Introduction

Business models describe how an organisation creates value. Given the increasing focus on sustainability concerns, new approaches to doing business are necessary to ensure that business models support planetary and social value as well as financial value (Bocken *et al.*, 2014). Business model innovation is thus a critical activity that supports sustainable development going forward. Business model redesign is particularly important when it comes to making fundamental changes to business models to

achieve sustainable outcomes (Guldmann, Bocken and Brezet, 2019).

Visualisation can be used to systematise the design process by providing a shared picture for the designers to work on together (Spence, 2014). In addition, visual thinking has the power to engage an audience through holistic and immediate impressions of key information (Meyer *et al.*, 2013). This makes visualisations particularly useful in collaborative settings where they illustrate and facilitate a shared

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understanding among participants (Sibbet, 2008). Accordingly, prior studies have recognised the immense potential of visualisation for business model innovation activities (Täuscher and Abdelkafi, 2017; Havemo, 2018; Massa and Hacklin, 2021). For example, visual tools can be used to clarify design goals and guide dialogues among key stakeholders in each stage of the business model innovation process (Guldmann, Bocken and Brezet, 2019). Incumbent firms in particular may benefit from visual enhancements as they face the cognitive challenge of overcoming current business model logics and reducing path dependency during the design phase of business model innovation (Daood, Calluso and Giustiniano, 2021; Massa and Hacklin, 2021). To accomplish this, it is important to identify and question the current cognitive model and identify relevant alternatives.

However, at present, the visual perspective on business models is fragmented, as evidenced by the wide range of different approaches to business model visualisation currently used (Täuscher and Abdelkafi, 2017; Henike, Kamprath and Hölzle, 2020). There is thus an opportunity to contribute to the visualisation perspective on business models.

Another challenge associated with sustainable business model innovation is that many of the current design methodologies do not specifically include sustainability (Evans *et al.*, 2017). Some recent studies do include tools and frameworks for sustainable design (e.g., Guldmann, Bocken and Brezet, 2019; Vladimirova, 2019), but given the scarcity of such models there is still a gap when it comes to harnessing the potential of visual principles to improve sustainable business model innovation.

Against this background, the aim of this paper is to draw on visual theory to develop tools to improve the sustainable business model innovation process. This is achieved through a framework of sustainable trajectories for business model innovation. A cognitive view on business models is adopted since this is often linked to the visual perspective (Massa and Hacklin, 2021). According to this view, business model innovation is the activity of (re)imagining the firm's value creation logics by following visual design

principles to update the cognitive map of the business model.

The paper is organised as follows. First, the methodological approach is described, which involved using visual theory and linking it to the sustainable business model literature. Next, the key insights are introduced, focusing on how to use visual thinking to support sustainable business model innovation. Finally, the concluding section describes the theoretical contribution, namely the opening of the "black box" of sustainable value creation (Lüdeke-Freund *et al.*, 2020) by visualising different business model value creation trajectories, and the practical contribution of guidelines for visual business model design and a multi-lens design approach to combine sustainable trajectories.

Methodological Approach

The paper adds to the typology of value creation logics in business model visualisations found in my previous article (Havemo, 2018). In that paper, over 200 business model diagrams from firms' annual reports and websites were analysed to identify patterns and styles of communication. I found that business model illustrations could be sorted into four basic value creation logics based on how they visually depicted value, where each logic presented a different cognitive lens describing the business model. As a result, a visualisation logic may guide interpretations and discussions of the business model according to the cognitive potentials and limitations of that particular visual illustration. For example, a visualisation showing activities and links (the transactive logic) will centre discussions around the network of exchanges and relationships between actors and activities, whereas a process illustration will emphasise the inputs and outputs of a value creation process.

Because mental and visual models guide how we think and interact with others (Tversky, 1997; Sibbet, 2008), they can be used to support the business model design process. The methodological approach in this paper was therefore to use the visual value creation logics described in Havemo (2018) as

a starting point to develop four sustainable trajectories for business model innovation. The first step was to conduct a literature survey of sustainable business models to identify theoretical concepts and approaches linked to each visual logic. Next, empirical examples (for example, H&M's circular business strategy) were used together with visual theory to populate each trajectory with content. For example, the visual grammar described by Kress and van Leeuwen (2006) was used to determine the design affordances of different types of diagrams, such as classification and process diagrams. This grammar was combined with the work of Barbara Tversky (1997), which describes different visual modes such as "spatial metaphors" and the communicative role of shapes and lines in diagrams, to develop the illustrations of the trajectories according to visual design recommendations. Finally, a second literature search was conducted to find case studies in the literature that illustrate the thinking within each trajectory.

Key Insights: Sustainable Business Model Trajectories

To imagine what it takes to be more sustainable, the concept of pathways has been used to identify steps that support increased business model sustainability in prior research. For instance, Endregat and Penink (2021) describe pathways for managing business model complexity and Bocken et al. (2014) outline eight archetypes of sustainable value creation and value capture (e.g., maximising resource efficiency and encourage sufficiency) that can lead to higher sustainability performance of the business model. Drawing on concepts like pathways and archetypes, this paper develops four trajectories for sustainable business model innovation based on visual thinking.

The four logics of value creation (from Havemo, 2018) and the resulting sustainable trajectories are shown in Figure 1 in the top and bottom row, respectively. The illustrations of business models are examples of types based on the findings by Havemo (2018). The trajectories are also summarised in Table 1, which names advantages and disadvantages of each logic and lists examples of related cases.

Classification trajectories

Classification diagrams conceive of the business model as a set of components that are crucial for value creation. This logic is common among practitioners' business model diagrams (Havemo, 2018) as it conveys key dimensions of value creation (for example, business units, products, or activities) in a clear manner. Using the classification visualisation as the basis of sustainable innovation invites questions about the role of the existing components and whether any elements should be added or removed to increase sustainability. A theoretical proposition in line with this idea is the sustainable canvas adapted from the original Business Model Canvas to include people and planet as part of the value proposition (Bocken, Schuit and Kraaijenhagen, 2018). The classification design is, however, limited to the static nature of these diagrams (Kress and van Leeuwen, 2006), such that changes will focus mainly on the presence or absence of elements rather than the role of links, relationships, and transformations.

An example of a classification-based approach is the business model innovation displayed by the owner of a sustainable pizzeria, as described by Franceschelli et al. (2018). The business model of "Pizza" was developed by changing the components of the "traditional" pizzeria business model by including, for example, bike or e-scooter delivery (instead of car), the use of electric ovens, biodegradable cutlery (instead of plastic), and locally sourced and "zero kilometre" ingredients to ensure a low environmental impact as well as high quality products (as opposed to a low-cost model). Each change from the traditional restaurant model involved exchanging a component for a sustainable alternative. The innovation process thus included the activity of defining the characteristics of an original business model and making replacements in line with sustainable goals.

Transactive trajectories

The transactive logic stipulates that value is created through interaction between, or within, firms (Havemo, 2018). This corresponds to a network perspective on the business model, for example, the activity systems view that conceptualises the business model as the sum of activities carried out by the firm and its network (Zott and Amit, 2010; Massa and

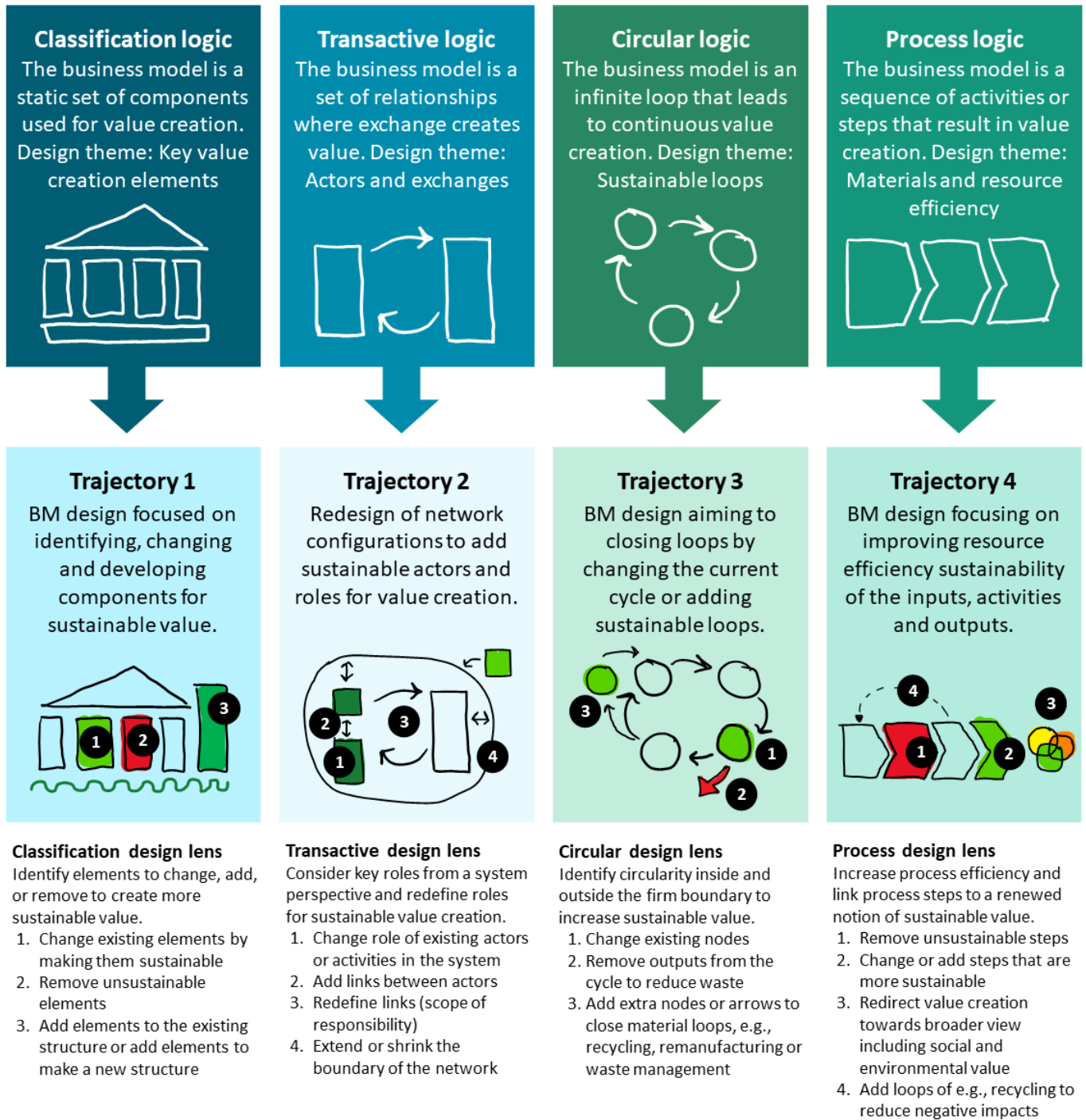


Figure 1: Framework of sustainable business model trajectories

Hacklin, 2021). From a visual perspective, changing a transactive logic involves adding new nodes (e.g., actors) to a network, changing links between nodes, or reorganising nodes as insiders or outsiders. Relatedly, the sustainability literature emphasises that the boundary of control needs to be expanded to support strong sustainability where firms take

more responsibility (Antonini and Larrinaga, 2017); this could be visually illustrated by the extending or shrinking of the line marking the boundary of the business model network.

Several studies stress the importance of collaboration for sustainability, which from the transactive

perspective can be supported by changing how actors are linked in the business model's network. For example, Brennan and Tennant (2018) describe business model network innovation in a case study of a commodities supply chain in the UK. The initial configuration of the business model network was strictly market-based, where a brewery accessed their resources through a maltster and its supply chain, buying products through yearly spot contracts. The brewery then conducted a reconfiguration at the network level by changing the links between actors to include direct links with each tier of its supply chain, which influenced the actors' sustainability responsibility through new pathways for learning and innovation. This illustrates the trajectory of changing links between existing actors to increase the influence regarding sustainability concerns in the firm's business model, a change which can be illustrated visually by adding new lines that link actors in the network.

Circular trajectories

The circular trajectory reflects the lifecycle thinking of circular business models, whereby value is created through a circular process with the aim of narrowing or closing resource loops (Bocken, Schuit and Kraaijenhagen, 2018). For example, prior studies have used the cycle logic to illustrate causal loops between decisions and outcomes (Casadesus-Masanell and Ricart, 2010). Visually, changes can be illustrated based on the concept of directionality. According to Tversky (1997), directionality is the sense of transformation or change conveyed through the order of elements (left-to-right) and the use of arrows to indicate a direction of change. Thus, the circular diagram lends itself to visualising recycling or remanufacturing by adding new activities to the current loops or by adding new arrows to indicate the closing of loops. What this logic fails to illustrate clearly, however, is the role of specific actors and the inputs and outputs that are inevitably part of a resource loop. This could be addressed by adding inputs and outputs to each step of the loop, although this runs the risk of increasing the visual complexity to the point that it lowers the usefulness of the illustration.

An example of business model redesign guided by life-cycle thinking is the case of Norwegian office chair manufacturer HÅG (Høgevoid, 2011). HÅG's

sustainability journey began in the 1990s when they started to reframe the business model in terms of a lifecycle logic, which guided the firm's design process. For instance, concepts like cradle-to-cradle were adopted when adding recycled materials to the production loop in order to reduce the product's negative environmental impacts over its entire lifespan.

Process trajectories

The process logic identifies the value chain as the focal point of value creation, which is tied to an understanding of the firm as a rationally organised and bureaucratic entity (as opposed to the nature-oriented view of the circular logic). Treating the business model as a process visually emphasises the value proposition (input), value creation (process steps) and value delivery (output) as a set of sequentially organised elements. Process visualisation therefore supports design discussions focusing on inputs and outputs, i.e., the key material flows and outcomes of the business model, which are crucial topics from a resource efficiency perspective.

The office chair case (see above) contains several examples of a process-oriented redesign of a manufacturing business model. Since life-cycle analyses showed that it was largely the supply chain that contributed to the firm's product's environmental impact, the conceptualisation of the process was expanded to include inputs from the supply chain in order to show the total impact of the firm's business model. This illustrates how process-oriented thinking invites questions regarding the flows of the supply chain as well as the roles of suppliers and customers in the business model process.

Combining lenses

Most firms use only one business model visualisation logic at a time (Havemo, 2018). However, it has been suggested that multiple design principles can be combined to achieve a fruitful design process (Täuscher and Abdelkafi, 2017), especially when it comes to sustainable business models (Young and Gerard, 2021). For example, the office chair case (HÅG) shows that business model innovation can be guided by both circular and process thinking, which suggests synergistic outcomes from using these perspectives together. Accordingly, it would be possible to treat

Table 1.

| | Classification | Transactive | Circular | Process |
|-----------------------------------|---|---|--|--|
| Focal point | <i>Key value creation elements</i> | <i>Actors and exchanges</i> | <i>Sustainable loops</i> | <i>Materials and resource efficiency</i> |
| Goal of the visual design process | Identify elements to change, add, or remove to create more sustainable value. | Consider key roles from a system perspective and redefine roles for value creation. | Identify circularity inside and outside the firm boundary to increase sustainable value. | Increase process efficiency and link process steps to a renewed notion of sustainable value. |
| Advantages | Simple to use when identifying key BM elements. | Highlights actors' co-creation and collaboration. | Emphasises circular thinking and closing loops. | Shows material flows (inputs and outputs). |
| Disadvantages | Static; does not illustrate the process of value creation. | Hides the sustainability impact of each actor's activities. | Ignores inputs and outputs. | Ignores the role of network actors and circular loops. |
| Illustrative case | <i>Pizzeria case</i> (Franceschelli, Santoro and Candelo, 2018) | <i>Brewery case</i> (Brennan and Tennant, 2018) | <i>Office chair case</i> (HÅG) – lifecycle perspective (Høgevold, 2011) | <i>Office chair case</i> (HÅG) – supply chain perspective (Høgevold, 2011) |

Table 1: Design trajectories for sustainable business models

the visual trajectories as complementary 'design lenses' in order to cast light on different aspects during the business model innovation process. Such a multi-lens approach could cycle through each of the design lenses, either iteratively or sequentially. An example of a sequential design process is shown in Figure 2.

A first step is to use the process lens to describe the intended outputs of the value creation process. Here, designers need to define the purpose of the business model that takes sustainable value into

account, as discussed by, for example, Bocken et al. (2014). Second, the classification logic guides designers to think about which elements are needed to deliver more sustainable value. Inspired by the Pizzeria case, a favourable design outcome could involve identifying which existing practices to replace in order to enable more sustainable value creation across all the elements of the business model. Third, the cycle perspective invites consideration of whether there are any loops to close to reduce waste, which in turn feeds into transactive-oriented considerations about the key business model

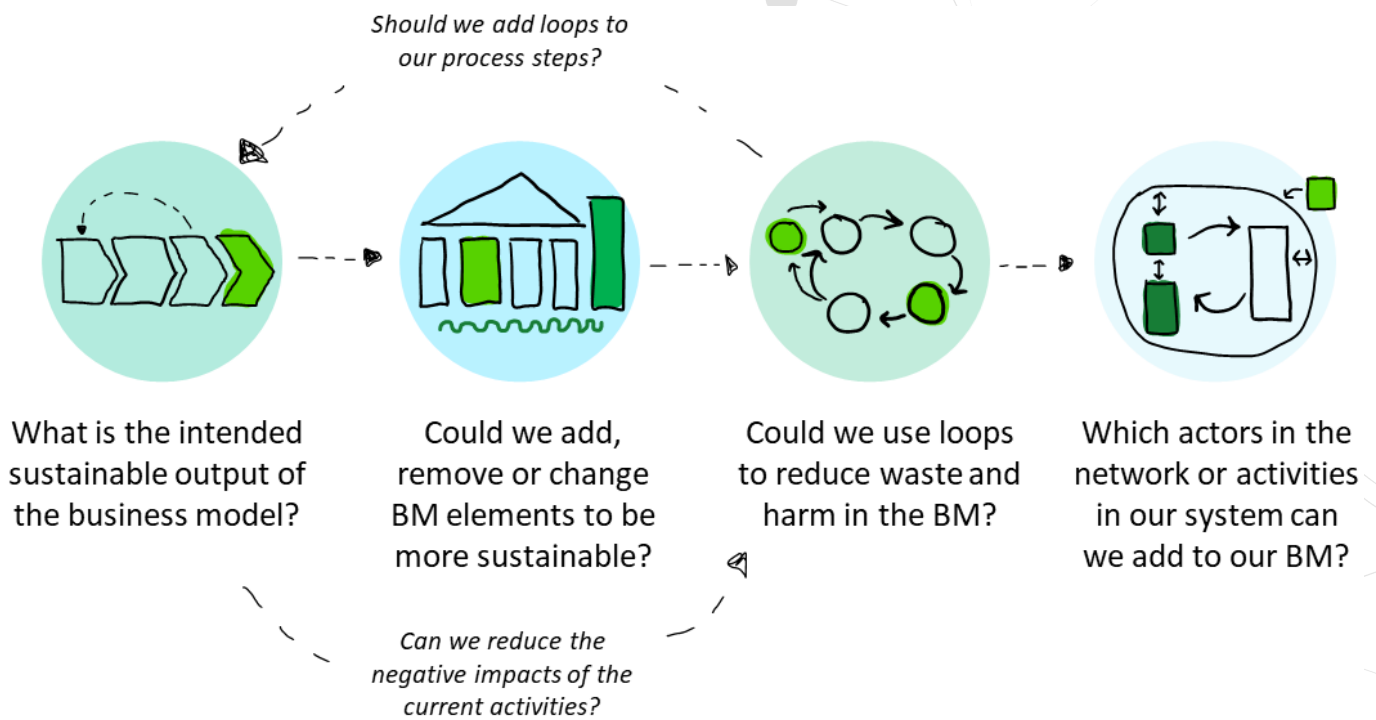


Figure 2: The sustainable trajectories used as business model (BM) design lenses

actors, what links between them are needed inside the activity system to enable the sustainable loops, and whether the firm boundary needs to shrink or expand to enable sustainable value creation. Taken together, these questions support the combination of multiple perspectives in the business model innovation process.

Conclusions

By conceptualising how sustainability can be integrated into the business model through four different sustainable trajectories that guide the innovation process, this paper contributes to the literature on sustainable business models and business model innovation. The paper also provides a novel visualisation to the growing list of sustainable business model visualisations, such as the Circular Business Experiment Cycle (Bocken, Schuit and Kraaijenhagen, 2018) and the sustainable value proposition model (Vladimirova, 2019). A further contribution is the multi-lens perspective, that is, the combined use of multiple business model logics to support sustainable business model innovation. Since sustainability is a complex matter involving numerous

business model changes, multi-lens methodologies are potentially important tools to manage complexities and consider multiple, sometimes conflicting, perspectives in the design process.

Moreover, the four trajectories illustrate that value creation can be understood in fundamentally different ways, as each logic frames value differently and emphasises different focal points, such as actors, loops, resources, and outputs. This in turn affords different interpretations of the key design goals in the sustainable business model innovation process. Thus, the paper responds to the concern that sustainable value creation is often treated as a “black box” in the literature (Lüdeke-Freund *et al.*, 2020) by extending and nuancing sustainable value creation through visual drawings that illustrate different interpretations of value creation.

The practical contribution of the paper is the “toolbox” of visual business model trajectories. Firms can use this toolbox to identify the current value creation logic of their business model and then use the sustainable trajectory of this logic as a design lens to discuss avenues for innovation. A second option is to employ all the business model lenses interactively

or sequentially during the innovation process to identify multiple opportunities for designing a sustainable business model.

The practical toolbox can be used at any level of the organisation where the current and future state of the business model are discussed. For instance, Doganova and Eyquem-Renault (2009) describe business modelling involving visualisations as a way to represent a new venture's future value creation potential to key investors. Although business model design is often linked to the domain of decision makers – indeed, it has been suggested that it can be useful to start with a small team of key roles in the early stages of business model innovation and to gradually engage more stakeholders (Bocken, Schuit and Kraaijenhagen, 2018) – there is a potential to extend the scope of business model design by using visualisations to support dialogue with a range of internal and external stakeholders during the design process.

In terms of limitations, the sustainable trajectories are theoretically derived based on visual theory and the sustainable business model literature but not yet empirically verified. Although empirical examples were mapped according to the trajectories, it is conceivable that firms would not follow the trajectories as strictly as the current framework suggests. There is therefore an opportunity for future studies to use case-based approaches to dive deeper into each of the trajectories to identify critical success factors as well as find additional trajectories. Finally, there is an opportunity to conduct action research to develop new visual business model innovation methodologies for sustainability based on these, and other, sustainable trajectories.

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