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The role of networks in business model innovation: three shaping processes supporting cognitive shifts

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Stakeholders and in particular customers are an important source for business model innovation. Especially for sustainable business models, stakeholder integration may radically change the business logic and help to revise the business model. In this process cognition plays a central role, challenging basic assumptions and changing the dominant logic. In this paper we explore how interactions with the network contribute to making a cognitive shift in development of a sustainable business model. We build on three cases and closely look at the commercialisation stage in which a change of cognition and redesign of the business model take place.

Our findings show that network interaction changes the dominant logic in business model innovation in two ways: by triggering a cognitive shift and by contributing to business model redesign. Our main contribution is the conceptualization of three interrelated shaping processes: market approach shaping, product/service offering shaping and credibility shaping. They provide a fine-grained perspective on value creation through collaborative networks and add to the business model literature by providing a framework to study the role of networks and cognition in business model innovation. For practitioners the shaping processes may support business model redesign and building relationships to advance commercialisation of sustainability-oriented innovations.

1. Introduction

Scholars regard the implementation of sustainability-oriented innovations as a business model challenge (Boons, Montalvo, Quist and Wagner, 2013; Schaltegger, Lüdeke-Freund and Hansen, 2012), and it is clear that networks play an important role in development of new business models (e.g. Zott, Amit and Massa, 2011; Elfring and Hulsink, 2003). To create a viable business case for sustainability, companies may need to make substantial changes to the business model (Schaltegger et al., 2012; Boons and Lüdeke-Freund, 2013). When these changes lead to a completely new value proposition, this can be considered a business model redesign (Schaltegger et al., 2012) or business model innovation (Mitchell and Coles, 2003) and in practice may imply a shift in business model thinking. In this study we focus on the cognitive shift that occurs during the commercialisation of sustainability-

oriented innovations, altering the course in which the business model is developed. The goal of this study is to gain insight in how interaction with the network contributes to making a cognitive shift and to redesigning the business model

Business model literature sheds light on the strategic and boundary-spanning function of the business model concept (e.g. Chesbrough and Roosenbloom, 2002; Spieth, Schneckenberg and Ricart, 2014; Zott, et al., 2011), and on the role of cognition (e.g. Calvalcante, Kesting and Uhoi, 2011; Doz and Kosonen, 2010). However, it is not clear, which networks are involved in the creation of business models for sustainability and how network partners and stakeholders influence business model redesign and innovation on a micro level (Schaltegger, Hansen and Lüdeke-Freund, 2016). The research question we seek to answer is: *How do interactions with the network contribute to making a cognitive shift in development of a sustainable business model?*

In this study we focus on interfirm-level collaboration of actors in business model innovation (Spieth, Schneckeborg and Matzler, 2016), and aim to unravel the interaction with network partners into its constituent micro-level mechanisms that cause business models to develop one way or another. Building on three case studies that show a cognitive shift in their business model thinking, we aim to develop a clear understanding of how business networks contribute to making cognitive shifts and business model redesigns, in order to advance successful commercialisation of sustainability-oriented innovations.

This paper is structured as follows: In section 2 we present the theoretical background for this study, exploring the business model concept, the strategic and boundary-spanning function of business models and the role of cognition in business model innovation. In section 3, we explain the case study method, the replication logic and the data acquisition and data analysis approach. In section 4, we present the findings by reporting first the cognitive shifts that occurred in the individual case studies, followed by three shaping processes found through a cross-case analysis. In section 5, we confront these results to current literature and end in section 6 with conclusions and implications for practitioners.

2. Theoretical background

In recent years a growing, but diffuse, contribution has been made by scholars from different research streams to the business model literature (e.g. Foss and Saebi, 2017; Massa, Tucci and Afuah, 2016; Zott et al., 2011). There are no clear and widely accepted definitions for the terms business models and business model innovation (e.g. Foss and Saebi, 2017; Schneider and Spieth, 2013; Zott et al., 2011). Spieth et al. (2014) point out that “business models tend to be complex, as they represent boundary-spanning entities that link dimensions of corporate strategy, technological capabilities and innovation processes of the firm” (p.44). For the purpose of this paper we first propose a definition for the business model concept, building on sustainable business model literature, and define business model innovation. Next we focus on the strategic and boundary-spanning function of business models and explain the viewpoints we use for this study. Finally we explore the role of cognition in relation to business model innovation.

2.1 Sustainable business models

Successful implementation of sustainable innovations, increasingly is regarded by scholars as a business model challenge (Boons and Ludeke-Freund, 2013; Boons et al., 2013; Schaltegger et al., 2012). This challenge confronts companies with both internal barriers (e.g. resistance to change the current business model) and external barriers (e.g. user acceptance, supply-chain dependencies, locked-in infrastructures) (e.g. Chesbrough, 2010; Boons and Ludeke-Freund, 2013; Teece, 2010; and Schaltegger et al., 2012) also mention ‘missing clarity about the ‘right’

business model’ as an obstacle for sustainability-oriented innovations.

According to Stubbs and Cocklin (2008) realisation of a sustainable business model includes collaboration with stakeholders such as organizations from the supply chain, competitors, industry bodies, government agencies, NGOs, communities, the media, and nature. Sustainable business models do not only address economic issues, but consider a wide range of stakeholder interests, including environment and society, by combining ecological value with economic and soci(et)al value (Bocken, Short, Rena and Evans, 2014).

To incorporate this broad notion of value and multi-stakeholder perspective, we combine Schaltegger et al. (2016) and Yunus, Moingeon and Lehmann-Ortega (2010) and propose the sustainable business model consists of: (i) a “value proposition” providing ecological and/or social value next to economic value to its customers and other stakeholders, (ii) “value creation and delivery”, explaining how the value is created and delivered by the company and its partners for all stakeholders, and (iii) “value capture” maintaining or regenerating natural, social and economic capital beyond its organizational boundaries.

2.2 Business model innovation

Business models are not static but are subject to change and the result of significant trial and error (Chesbrough, 2010). We therefore take a dynamic perspective on business models and regard business model innovation as a process that comprises reshaping one or several components of the business model (Spieth et al., 2016).

When this process leads to a completely new value proposition, this can be considered a business model redesign (Schaltegger et al., 2012), by Mitchell and Coles (2003) called business model innovation, providing product or service offerings to customers and end users that were not previously available. Cavalcante et al. (2011) call this a business model revision, fundamentally changing existing working practices and involving fundamental challenges such as uncertainty and ambiguity, lack of knowledge and skills, path dependency, cognitive manifestations and resistance to change.

The redesign of an existing business model is the outcome of strategic maneuvering, and may be triggered by external events such as new processes developed by competitors, new entrants with completely new ways of meeting demands and new commercial opportunities requiring new ways of doing business (Cavalcante et al., 2011). Next we explore both the strategic and boundary-spanning function of the business model and the role of cognition in business model innovation.

2.3 The strategic and boundary-spanning function of business models

According to Spieth et al. (2014), business models serve one of three major roles in business model research: explaining the business, running the business and developing the business. For the purpose of this paper we

regard a business model's function as *developing the business*, defined as 'supporting management in defining and developing the firm's strategy' (Spieth et al., 2014).

Business model innovation is considered a task for both new and existing firms (Chesbrough, 2010). It is regarded as an important instrument for commercializing new ideas and emerging technologies (Chesbrough, 2010; Spieth et al., 2014), for innovative technologies do not in itself have economic value, but incorporate latent value that may be commercialised by the business model (Chesbrough and Roosenbloom, 2002). Chesbrough and Roosenbloom (2002) state that: "The initial business model is more of a proto-strategy, an initial hypothesis for how to deliver value to the customers, than it is a fully elaborated and defined plan of action. It results less from carefully calculated choices from a diverse menu of well understood alternatives and more from a process of sequential adaptation to new information and possibilities" (p.550),

Doganova and Eyquem-Renault (2009) add a boundary-spanning perspective by describing business models as devices for collective exploration "to explore a market and to bring their innovation – a new product, a new venture and the network that supports it – onto existence" (p.1560). They view business models as a scale model of the new venture that is aimed "at demonstrating its feasibility and worth to the partners whose enrolment is needed" (Doganova and Eyquem-Renault, 2009, p.1568). This way the business model is developed through creating encounters with potential users and possible partners (Boons and Lüdeke-Freund, 2013; Doganova and Eyquem-Renault, 2009). Stakeholders and in particular (potential) customers are an important source for business model innovation (Spieth et al., 2014), and especially for sustainable business models, stakeholder integration is a proactive strategies that may radically change the business logic and help to revise the business model (Schaltegger et al., 2012).

How stakeholders are integrated into business model innovation (Massa et al., 2014; Spieth et al., 2016) and what the mechanisms are that underpin the value creation process with network partners need further research (Della Corte and Del Gaudio, 2014). Lepak, Smith and Taylor (2007) propose to examine value creation on intermediate levels of analysis. Della Corte and Del Gaudio (2014) narrow this down to analysing the value creation process between the firm and the network, providing an overlapping perspective "since the source of value creation can be spread through people, firm or networks" (p.338). A sustainable business model is in this respect a suitable unit of analysis while it encompasses a systems perspective as well as a firm-level perspective (Stubbs and Cocklin, 2008).

2.4 The role of cognition in business model innovation

The role of managerial and organizational cognition is of particular interest in respect to strategic decisions and adaptation of business models to new information and possibilities (Foss and Saebi, 2017; Spieth et al., 2016). "In terms of cognitive change, there may be a 'turning point'

where the agent breaks with existing routines and switches to an active search for new alternatives" (Cavalcante et al., 2011, p.1337). Cognition plays a central role in the dynamics of a business model, challenging basic assumptions, including the belief system, and changing the dominant logic (Cavalcante et al., 2011; Doz and Kosonen, 2010; Tikkanen, Lamberg, Parvinen and Kallunki, 2005).

Business model dynamics is driven by the firm's ability to transform and renew business models, also called strategic agility (Doz and Kosonen, 2010; Cavalcante et al., 2011). According to Doz and Kosonen (2010), an important ingredient of strategic agility is strategic sensitivity, allowing firms "to identify opportunities for new business models and also to be sensitive to the timely need for the renewal and transformation of their existing business models" (p.371). They propose strategic sensitivity consist of five leadership actions: 'anticipating' to explore future usage concepts, 'experimenting' to gain insights that might be useful to adapt business models, 'distancing' to gain an outside-in perspective through a rich network of external contacts and hearing the voice of the periphery, 'abstracting' to gain generality by restating business models in conceptual terms, and 'reframing' to see the need for business model renewal by engaging in dialogues around strategic issues.

Pertaining to the cognitive belief system, Tikkanen et al. (2005) identify four conceptual levels of managerial cognition that determine firm's actions related to business model innovation: industry recipe (i.e. beliefs related to the logic of the sector and the effect on the firm), reputational rankings (i.e. beliefs related to its social position in relation to competitors), boundary beliefs (i.e. beliefs related to the firms' identification with a certain interorganizational community), and product ontologies (i.e. beliefs related to a definition of a superior offering for the target group).

In relation to the network Tikkanen et al. (2005) for example propose that "the higher the cognition of a firm's own reputational ranking, the higher the reputational rankings the firm seeks and expects from its customers and suppliers" (p.798) and that "the targets of a firm's marketing efforts are constrained by the firm's boundary beliefs about who it can pursue as a customer or serve as a supplier" (p.#). Tikkanen et al. (2005) further propose that cognitions of current and future product ontologies can both prevent and strengthen changes in the product/service offerings.

Although the role of cognition is clearly acknowledged in the literature, the cognitive change that reframes the dominant logic in business model innovation could benefit from further research (Cavalcante et al., 2011; Spieth et al., 2016). We do so by exploring in this paper how interaction with the firm's network contributes to making cognitive changes and a redesign of the business model.

3. Research design

The study is explorative of nature and aims to contribute to initial theory-building. We therefor use a case study method to capture as much detail as possible and create an in-depth insight in the phenomena (Eisenhardt, 1989;

Huberman and Miles, 1994; Yin, 2013), the unit of analysis being the business model of sustainability-oriented innovations.

The case study design is a multiple case study, enabling within-case analysis and a cross-case synthesis, using pattern matching logic for explanation building (Yin, 2013). This research design is a first step in developing insights that are analytically valid for comparable cases and to explain the phenomenon (Eisenhardt and Graebner, 2007; Yin, 2013).

3.1 Case selection

We build on three cases concerning sustainability-oriented innovations, that are successfully introduced in the market by fundamentally redesigning the business model in interaction with the network.

Following a purposeful sampling strategy seeking phenomenal variation (Sandelowski, 1995), we selected three cases that show different variations of the phenomenon. Each case constitutes a cognitive shift that resulted in a redesign of the business model, including a significant, but different, change in the value proposition. Table 1 shows the variations in value proposition redesigns, by describing how the structure of the product-service offering changes in each case, as well as its target group. While significant changes in the structure of the offering requires major changes in the resource base and process architecture (Tikkanen et al., 2005), we also expect fundamental changes in the value constellation and a large involvement of network partners and other stakeholders.

The Natural Plastics (NP) case concerns the introduction of a biobased and soil degradable product for the landscaping market by an entrepreneurial firm. The D-Grade case concerns a biobased and compostable product offering for the horticulture market from an incumbent

firm, Desch Plantpak. Both cases are examples of the sustainable business model archetype ‘substitute with renewables and natural processes’ (Bocken et al., 2014). The WeGo case concerns the introduction of a new car sharing service by an entrepreneurial firm, being an example of the sustainable business model archetype ‘deliver functionality, rather than ownership’ (Bocken et al., 2014).

3.2 Data collection and analysis

The data for this study consists of 12 semi-structured interviews, 6 with representatives of the companies, responsible for the sustainable innovation trajectory, and 6 with key collaboration partners (e.g. key customers and complementary partners). For triangulation purposes 82 additional data sources are studied, consisting of external publications, news items on websites, company publications (e.g. company websites and brochures) and other data (e.g. videos, presentations, blogs).

An inductive research approach is followed, starting with an open coding process. We closely look at the commercialisation stage in which a change of cognition and redesign of the business model take place, and create codes for value creation activities and the roles different partners play in these activities, prior and after the change occurs. Software for qualitative data analysis (Atlas.ti) is used to manage the volume and variation of the data material, and to make data displays. Next a search for cross-case patterns is conducted and concepts emerged around the central question of how interactions with partners shape redesign of the business model and the shift of cognition that is related to this change. This results in three different shaping processes supporting cognitive change in business model innovation.

Table 1. Changes in the value proposition per case

<i>Case</i>	<i>Initial value proposition</i>	>	<i>New value proposition</i>
Natural Plastics			
Product/service offering:	Product system (<i>sustainable tree anchoring system</i>)	>	Service plus accompanying products (<i>advice/training on bio-based economy plus bio-based product portfolio</i>)
Target group:	Direct customers (<i>gardener</i>)	>	Decision makers (<i>municipalities</i>)
D-Grade			
Product/service offering:	Single product (<i>biodegradable pot</i>)	>	Combination of products (<i>e.g. pack consisting of tray, biopot, aquapad and sheet</i>)
Target group:	Direct customers (<i>grower</i>)	>	End customers (<i>retailer</i>)
WeGo			
Product/service offering:	Product-service system (<i>smartbox and reservation management platform and community for peer-to-peer car sharing</i>)	>	Service, incl. technology (<i>fleet management solution, incl. smartbox, and reservation, planning and administration tools</i>)
Target group:	End users (b2c market) (<i>car owners / open communities</i>)	>	Organisations/companies (b2b market) (<i>fleet owners/managers / closed communities</i>)

4. Findings

First we describe how interaction with the network triggers a cognitive shift in each individual case. Next we describe interaction with the network found in the actual redesign of the business model, consisting of various collaborative activities we conceptualised in three shaping processes.

4.1 Cognitive shifts in three cases

For each case we first describe the initial sustainable business model, by focussing on the value proposition and its target group. Next we explain the cognitive shift that changes the dominant logic and how this shift is triggered through interaction with the network.

4.1.1 Natural Plastics

Natural Plastics was initiated in 2009 by an entrepreneur in civil contracting who saw how plastics used around roads polluted the soil. He developed the 'Keeper system' for underground tree anchoring, a set of products made of bio-based plastic that will degrade in the soil after it has served its purpose, as an alternative for the wooden poles that are traditionally used to support newly planted trees that need to be maintained and ultimately removed. After a pilot with a launching customer, the product was introduced in the market directed at gardeners.

The dominant logic in business model thinking in this case was a classic sales model, based on the premise that a sustainable product sells itself. Although the innovation was received favourably and got a lot of media attention, the channel and potential direct customers proved to be reluctant. Natural Plastics: *"We were confounded, we'd developed a really impressive product, but why wasn't it being applied? It was better for people, planet and profit, you name it. Only it wasn't being used."*

In consultation with an intermediary organisation and other network partners, the firm created a concept around the product system and realised they target decision makers. Natural Plastics: *"At a certain point, we came to the conclusion, that when you're just selling products, when your products is standing somewhere, you are nothing. You have to turn it into a concept. ... You have to get into the heads of the municipal purchasers and in their perception of the environment."*

4.1.2 D-Grade

Desch Plantpak, founded in 1988, is producer of thermoform pots, containers and trays for professional horticulturalists, and introduced a sustainable product line in 2009. This product line, called D-Grade, contains a range of thermoform pots, packs, and trays that are 100% biodegradable and compostable and are made of biopolymer, that is completely free from oil components and is 100% renewable.

Initially the value proposition (i.e. products that can be disposed of through composting), is aimed at direct customers, the dominant logic being that this product can be put in the market with the same business model as the traditional products, and that the somewhat higher price will be compensated by the sustainability of the product.

Nevertheless this is not the case. Desch Plantpak: *"The alacrity of the channel to pay a little bit more, continues to be a stumbling-block, because our product comes with a surcharge."*

Through many encounters with reluctant potential direct customers a cognitive shift is made towards the end client. Desch Plantpak: *"We were very proactive in approaching everyone. And when we started, we didn't exactly know how to do it. Yeah, because it went out to the growers and they all reacted enthusiastically but they didn't want it because it was too expensive. Up until we came up with the idea, that we shouldn't be approaching the grower; we should go to the grower's customer. And they'll, let's say, increase the demand. If you do that, then yeah, that grower will show up and say, hey, now I need that."* An important role was played by a new hire by the company who came with the idea to express the value-added of the proposition to retail by creating combinations of products *"that have some sort of synergetic effect"*.

4.1.3 WeGo

WeGo, a startup founded in 2011, started with offering automated peer-to-peer car sharing that allowed car owners to rent their unused car to people in their neighbourhood. A unique part of their offering was the installation of a 'smart box' in the car, a technical solution enabling renters to lock and unlock the car with a smartphone, eliminating the problem of exchanging keys.

During a pilot in an Amsterdam neighbourhood some technical problems arisen with the use of the system. At the same time competitors offered solutions that were less sophisticated, but also cheaper and better suited for peer-to-peer sharing. Considerable investments were needed for community building and further development of the offering, investments WeGo was able to attract investors for.

Nevertheless, after interaction with customers showed that the lack of physical contact between owner and renter made the solution vulnerable for malicious intent, WeGo realised that, although technologically superior, their solution was not particularly suited for open communities. WeGo: *"In a closed community where people are friends of each other, or colleagues, it is completely different. That's why we started looking where to find that, and realised: shouldn't we go to business-to-business?"*

A new manager, hired for fresh insights, played a major role in making this cognitive shift. WeGo decided to target their solution at business markets enabling organizations to realise the same mobility performance with less vehicles, whilst saving costs and reducing CO2 emissions.

4.2 Three shaping processes for business model redesign

Based on an analysis of the encounters with the firm's network, the partners' roles and the activities collaboratively undertaken, we find that the cognitive shift is supported by three shaping processes that contribute to the actual redesign of the business model. Each type of shaping consists of different activities involving different types of partners and is explained in Table 2.

Table 2. Three shaping processes supporting cognitive shifts in business model innovation

<i>Shaping process</i>	<i>From ...</i>	<i>To ...</i>
<p>Market approach shaping</p> <p>Definition: (re)definition of the market interface and go-to-market strategy in collaboration with strategic partners</p>	<p>From technology push</p> <p>e.g. - creating publicity and visibility - persuading direct customers - expanding the network with potential (direct) customers</p>	<p>to market pull</p> <p>e.g. - creating awareness for environmental and social issues - enticing end customers or decision makers to prescribe - partnering with allies with additional networks - focussed market development</p>
<p>Product/service offering shaping</p> <p>Definition: (Re)shaping the product/service offerings through interaction with (potential) end customers and complementary partners</p>	<p>From functionality</p> <p>e.g. - seeking functional and ecologic value for the whole value chain - focussing on total cost of ownership/life</p>	<p>to solutions</p> <p>e.g. - understanding the needs of end customers and/or drivers of influencers - focussing on the effect of the solution - creating superior offerings through collaboration with partners for horizontal and/or vertical complementarities</p>
<p>Credibility shaping</p> <p>Definition: Employing and expanding the company's network to enhance the credibility of the value proposition</p>	<p>From evidence</p> <p>e.g. through - proving functionality (e.g. field test, acceptance test) - proving sustainability (e.g. certification of material or CO2 reduction)</p>	<p>to legitimacy</p> <p>e.g. through - endorsement by influencers (e.g. independent bodies; awards) - endorsement by key (end) customers with a high reputation for references - building extra-business relationships (e.g. independent bodies, consultants, investors)</p>

4.2.1 Market approach shaping

Based on the data we find a process we call market approach shaping and define this as (re)definition of the market interface and go-to-market strategy in collaboration with strategic partners. The three cases show a change of the market approach, from primarily focussed on selling the functionality of the new sustainable technology (technology push), towards an approach primarily focussed on creating market pull. Several activities are found that contribute to this shift.

In the Natural Plastics case, creating awareness for environmental and social issues played an important role. Instead of approaching potential customers one-by-one, Natural Plastics started giving trainings and presentations about biodegradable plastics to governmental officials and city councils, showing how products made of this material could be a sustainable solution for landscaping and gardening. By approaching decision makers and convincing them of the potential of the solution to contribute to reaching CO₂ emissions reduction goals, the system ended up in specifications.

Also the D-Grade case shows a shift from trying to persuade direct customers, to enticing end customers to prescribe the solution to their suppliers. By selecting and approaching retailers that fit into the philosophy of the solution and that have impact on the market, a demand for the offering is created in the D-Grade case. This focussed market development activity is also found in the NP and WeGo cases.

Another important element in market approach shaping is partnering with key market players that have additional networks. In the WeGO case a collaboration is set up with partners with high reputations and large commercial networks, enabling cross selling of the solution. In the NP case the entrepreneur partners with a company with a geographically different network.

4.2.2 Product/service offering shaping

The second process we find supporting the cognitive shift is (re)shaping the product/service offering. The cases show that through interaction with (potential) end customers and complementary partners the product/service offering is (re)shaped to ascertain optimal customer value creation, e.g. changing from delivering functionality oriented product and service concepts towards creating total solutions.

In this particular shaping process interaction with potential end customers is found to be important to gain a deep understanding of their underlying needs and problems. The WeGo case shows how intensive collaboration with a key customer, increases the awareness for the requirements and service level the client needs. In the D-grade case, through interaction with potential end customers, the company realizes that retailers are not interested in their initial offering consisting of a single biopot, but desire a total solution in which this product is integrated.

In all cases this added value is created through providing complementarities, for example to create a bundle of goods that together provide more customer value (e.g. lower costs or better performance) than the total value of each good delivered separately (Amit and Zott, 2001). In the D-Grade case the company collaborates with partners that offer complementary goods (e.g. plants, aquapads, packaging) of similar quality and reputation. By doing so, they collaboratively create total solutions that have a synergetic effect, and provide the convenience of one-stop-shopping (horizontal complementarities). In the WeGo case the company collaborates with partners, extending the car sharing solution for company fleet management with for example software for planning and monitoring software, automatic administration. Partners combine the

technological solution with services as car lease, all examples of vertical complementarities. In the NP case collaboration for both horizontal and vertical complementarities is found, e.g. many different biobased products for gardening and landscaping to create a wide portfolio of possible solutions and advice services.

The cases also demonstrate that it is the primarily the end effect of the solution that is important in maximizing the value of the product or service offering, in contrast with for example an initial focus on stressing total cost of ownership to make a higher product price acceptable.

4.2.3 Credibility shaping

The third type of shaping that emerged from the data is credibility shaping. We define this as employing and expanding the company's network to enhance the credibility of the value proposition, e.g. changing from collecting evidence to prove the functionality and sustainability of the innovation, towards gaining legitimacy. Three activities are found to be relevant for credibility shaping.

Each case demonstrates that endorsement by key (end)customers is vital for credibility shaping. Key customers act as ambassadors of the sustainable innovation and provide the firms with new leads. In the D-Grade case key customers were actively selected for this purpose, based on their approach of sustainability and market impact. In the NP case municipal officers were asked to endorse the anchoring system to colleagues from neighbouring municipalities. For WeGo the Amsterdam Municipality created a lot of positive exposure, as lead customer of the solution.

Endorsement by partners and influencers (e.g. independent bodies) is equally important. Based on the high reputation of WeGo's partners, doors at new customers were easily opened. Partners of in the NP and D-Grade case played similar roles. In the NP and WeGo case awards of independent bodies further increased the credibility of the solutions offered.

Building extra-business relationships with for example consultants and knowledge institutes proved to be beneficial in each case, gaining legitimacy through being related with influential and renown actors in the field.

4.3 Relationships between the three shaping processes

Analysis of the relationships between the concepts shows that market approach shaping, product/service offering shaping and credibility shaping are interrelated and mutually contribute to the cognitive shift in business model thinking (see Fig. 1). Each shaping process appears to be a vital element in the redesign of the business model, fundamentally changing both the value proposition as well as the constellation creating and delivering that value.

The cases indicate a priority for market approach shaping, prior to product/service offering shaping, but there is no clear evidence for this sequencing. Further

research with more case studies may shed light on this issue.

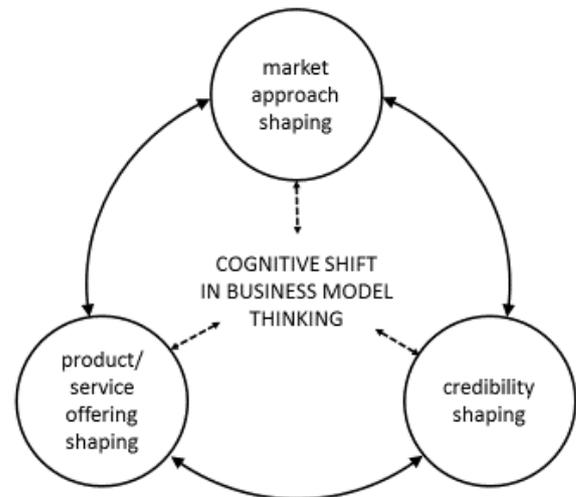


Figure 1. Three types of shaping and their interrelations.

5. Discussion and conclusion

There is a need for more insight in the cognitive change that reframes the dominant logic in business model innovation (Cavalcante et al., 2011; Spieth et al., 2016) and the role of networks in value creation and business model innovation (Massa et al., 2014; Della Corte and Del Gaudio, 2014). This study responds to the call by Lepak et al. (2007) and Della Corte and Del Gaudio, (2014) to examine the value creation process on an intermediate level of analysis: between the firm and the network.

Based on empirical evidence the findings of this study provide a fine grained perspective on how interaction with network partners and other stakeholders contribute to making cognitive shifts in development of a sustainable business model. The case studies reveal that interaction with the network contributes to cognitive changes in business model innovation in two ways: by triggering a cognitive shift and by contributing to the actual redesign of the business model.

5.1 A cognitive shift instigated by network interaction

From the cases studied in this paper, we find that interaction with the network triggers a shift in thinking that alters the course of development of the business model. This network induced shift in business model thinking mainly concerns who the main beneficiaries are of the value that the sustainability-oriented innovations incorporate.

The changes in cognition we found, are instigated by encounters with different stakeholders. In all cases encounters with (potential) customers reveal reluctance of the market to adopt the initial value proposition, whereas encounters with other stakeholders reveal enthusiasm for the new sustainable solution. In the D-

Grade case, the biopot is received favourably by potential direct customers, but these customers fail to sell the added value of the product concept to their end-clients. In the NP case, the biodegradable anchoring system is applauded by the media as an example for the biobased economy, but gardeners are reluctant to adopt the solution even though no extra costs are involved. In the WeGo case peer-to-peer car sharing platforms gain a lot of interest, but the particular solution of WeGo encounters resistance in the market. In this particular case the cognitive shift is also triggered by an external event (Cavalcante et al., 2011), as a new entrant introduces a solution that is better suited for the initial target group. Another network induced factor is found in the cases of D-Grade and WeGo, where new hires play an important role in seeing the need for reframing the value proposition and the group it is targeted at.

The network-induced cognitive shift we found, is related to the concept of strategic sensitivity, as proposed by Doz and Kosonen (2010). Although the actions ‘anticipating’ and ‘experimentation’ are not found to change the dominant logic, the findings do provide evidence for the process of ‘distancing’ as proposed by Doz and Kosonen (2010) by showing how the interaction with potential customers and other stakeholders, as well as new hires (in the WeGo and D-Grade case) and collaboration with consultants (in the NP case), provide an outside-in perspective and trigger a cognitive shift. Also ‘abstracting’ and ‘reframing’ as parts of strategic sensitivity (Doz and Kosonen, 2010) are noticed in the case studies, while reconsidering the main beneficiaries of the value potential requires a certain critical distance to and reflection on the business model in conceptual terms through dialogues with the network. Although Doz and Kosonen (2010) suggest a sequencing of ‘distancing’, ‘abstracting’ and ‘reframing’, we rather see the cognitive shift in business model thinking in our case studies as an outcome of an iterative process involving many encounters with different stakeholders

The findings prove that a broader stakeholder perspective is vital to take full advantage of value potential of the sustainability-oriented innovation (e.g. Schaltegger et al., 2016; Stubbs and Cocklin, 2008; Yunus et al., 2010). It involves considering who the main beneficiaries are of the value potential and changing the target group accordingly. In terms of the business model, this means the value proposition needs fundamental redesign, including its target group, but also involves a broader notion of value and changing the way the value is created and delivered.

5.2 Business model redesign through three shaping processes

The findings make clear that the actual redesign of the business model is an interplay of many different partners, including new partners as well as existing partners in new roles. This is in contrast with the concept of strategic agility of Doz and Kosonen (2010), who see strategic sensitivity mainly supported by internal actions

that improve the ability and capability to promote and implement such a change.

The case studies reveal three shaping processes, each describing on a micro-level how different network partners contribute to redesigning the business model, supporting the change of cognition in business model thinking.

‘Product/service offerings shaping’ shows how the offering can be redefined and reshaped by interaction with new (potential) customers and complementary partners. In all three cases this type of shaping involves the ‘bundling of goods’, stressing the importance of complementarities and a perspective beyond vertical relationships. In ‘product/service offerings shaping’ complementary partners play an important role, providing empirical evidence of how firms can co-create business models as suggested by Spieth et al. (2016). In ‘credibility shaping’ gaining legitimacy through endorsement plays an important role, by key customers, but also by network partners independent bodies, consultants, stressing the importance of building extra-business relationships when commercialising sustainability-oriented innovations.

From our case studies we find evidence for two of the conceptual levels of cognitive beliefs, found by Tikkanen et al (2005). High ‘reputational rankings’, is proven to be important in all three shaping processes: for selecting partners for complementarities in product/service offering shaping, for choosing key (end) customers for endorsement, and for partnering with allies and focussed market development in market approach shaping. Boundary beliefs play a role in market approach shaping, especially in relation to who it can pursue as a customer (Tikkanen et al., 2005), guiding the direction of the focussed market development we found in the cases.

6. Conclusions

The main contribution of this paper is the conceptualisation of three interrelated shaping processes that provide a fine-grained perspective on value creation through collaborative networks, specifically on what type of partners are involved (Schaltegger et al., 2016) and how their involvement may lead to business model innovation. This interplay takes place in three interrelated shaping processes supporting the cognitive change in business model thinking.

The results add to the business model literature by providing a fine-grained perspective of the cognitive change that reframes the dominant logic in business model innovation (Cavalcante et al., 2011; Spieth et al., 2016). The three shaping processes support the role of business model innovation in exploitation of emerging opportunities (Spieth et al., 2014), helping to find the right business model (Teece, 2010; Schaltegger et al., 2012). They confirm that value creation and delivery is a process involving a number of different actors (Della Corte and Del Gaudio, 2014), and make clear how the network may contribute to business model redesign.

To the sustainable business model literature the results add by showing which networks are involved in the creation of business models for sustainability (Schaltegger et al., 2016). The three shaping processes extend our knowledge of the considerations that may be relevant when introducing a new sustainability-oriented innovation into the market and show how pro-active sustainability strategies, as suggested by Schaltegger et al. (2012), may actually be build. They provide a deeper understanding of what is necessary to be able to create and deliver value to a new target group and demonstrate what type of activities and kind of partnerships may contribute to redesign business models to advance commercialisation of these sustainability-oriented innovations.

The results further contribute to academics by providing a conceptual framework to study the transformation of business models and the role of cognition and networks, as suggested by Cavalcante et al. (2011), Doz and Kosonen (2010) and Spieth et al. (2016). Further research may focus on the requisite of each process to enable business model innovation, the roles specific parts of the network play in each process, and how entrepreneurs can organise the activation of the three shaping processes.

For practitioners involved in developing sustainability-oriented innovations and sustainable business models, the study shows in detail how interaction with potential customers and other stakeholders helps to shape the value proposition to increase the chance of adoption by the market. It also shows how new roles of existing partners and building new relationships may support business model redesign to overcome external barriers when developing and introducing sustainability-oriented innovations.

Limitations of the study can be found in the limited number of cases and the fact that the cases concern sustainability-oriented innovations. The results would benefit from additional cases studies to verify the generalisability of the shaping processes found. For example, shaping credibility, changing from providing evidence towards gaining legitimacy, may be a process that is especially relevant for the introduction of sustainability-oriented innovation and development of sustainable business models. Whether this process also applies for the development of generic business models needs further study.

7. References

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