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Business Model Innovation for Sustainability: The Role of Stakeholder Interaction and Managerial Cognitive Change

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Abstract

Business model innovations emerge over time and are influenced by managerial interaction with stakeholders. Especially with regard to business model innovation for sustainability, manager-stakeholder interaction can radically change a company's business model and underlying logic. However, the majority of the literature shows how manager-stakeholder interaction may limit business model innovation when stakeholders reinforce existing managerial cognitions. In this chapter we study how stakeholders can also stimulate business model innovation by affecting managerial cognitive change. Through three case studies, we find that this can occur through three shaping processes: market approach shaping, product/service offering shaping, and credibility shaping. We also find that the impact of new or latent stakeholders is greater than that of existing stakeholders. We end the chapter by

sketching a research agenda to further unravel the role of stakeholders affecting managerial cognition around business model innovation for sustainability.

Keywords: sustainable business model, stakeholder, managerial cognition, value proposition, business model innovation, sustainability.

1 INTRODUCTION

In order for a company to create a viable business case for sustainability, it may need to make substantial changes to its business model (Schaltegger, Lüdeke-Freund and Hansen, 2012; Boons and Lüdeke-Freund, 2013). The literature indicates that stakeholders play an important role in business model innovation (Boons and Lüdeke-Freund, 2013, Doganova & Eyquem-Renault, 2009; Stubbs & Cocklin, 2008; Zott, Amit & Massa, 2011). Although stakeholder interaction is considered a proactive strategy that can radically change a business logic (Dmitriev, Simmons, Truong, Palmer & Schneckenberg, 2014; Schaltegger et al., 2012), it remains unclear exactly how interaction with stakeholders influences business model innovation (Aspara, Lamberg, Laukia, & Tikkanen, 2011; Della Corte & Del Gaudio, 2014; Spieth, Schneckenberg & Matzler, 2016).

Building on recent insights about the role of managerial cognitive change in business model innovation (Cavalcante Kesting & Ulhøi, 2011; Tikkanen, Lamberg, Parvinen & Kallunki, 2005; Spieth et al., 2016), we propose that stakeholders affect managerial cognition and hence business model innovation. Following Barr, Stimpert and Huff (1992), we define managerial cognitive change as an adjustment of the manager's 'mental models', 'cognitive maps' or 'beliefs'. Most extant research has studied how stakeholders reinforce existing managerial cognitions and hence constrain business model innovation (for example, Aspara et

al., 2011; Saebi, 2015; Tikkanen et al., 2005). The way in which manager–stakeholder interaction may also trigger managerial cognitive change, and thus stimulate business model innovation, has been understudied (Aspara et al., 2011; Spieth et al., 2016). This possible effect is especially relevant when developing business models for sustainability, as these confront managers with new technological possibilities and require the involvement of various (new) stakeholder groups. Through three case studies of business model innovations for sustainability, we aim to gain insights into stakeholder-induced managerial cognitive change in business model innovation for sustainability and identify processes that trigger and support this managerial cognitive change.

This chapter proceeds with a review of the existing literature on the connection between the three elements of our study: business model innovation, stakeholder interaction, and managerial cognition. We then analyse three empirical cases of business model innovation for sustainability, focusing on stakeholder-induced changes in managers' cognitions. Our findings propose that stakeholders affect managerial cognitive change, and subsequently business model innovation, via three shaping processes.

2 THEORETICAL BACKGROUND

2.1 Core concepts of this study

We start this section by defining sustainable business model innovation, and then explore the role of stakeholder interaction and the role of managerial cognition in business model innovation. We then review the literature on the connection between the role of stakeholders, managerial cognitive change and business model innovation in order to identify the research gap.

2.1.1 Sustainable business model innovation

Scholars are increasingly regarding the successful implementation of sustainable innovations as a business model challenge (Boons & Lüdeke-Freund, 2013; Boons, Montalvo, Quist & Wagner, 2013; Schaltegger et al., 2012). For the purposes of this chapter, we regard a business model as a conceptual representation of a business comprising a value proposition offering products and/or services to customers and describing how this value is created and delivered, including the value capture mechanisms it employs (Teece, 2010). However, business models are rarely perfect from the start. Instead, they develop over time (Spieth, Schneckenberg & Ricart, 2014), often following an iterative process (Dmitriev et al., 2014). The outcome of this innovation process involves changing one or several components of the business model (Cavalcante et al., 2011; Schaltegger et al., 2012; Spieth et al., 2016). When this process leads to a completely new value proposition, this can be considered a business model innovation (Schaltegger et al., 2012), providing customers and end users with product or service offerings that were not previously available (Mitchell & Coles, 2003). This business model innovation process can be defined as ‘the search for new business logics of the firm and new ways to create and capture value for its stakeholders’ (Casadesus-Masanell & Zhu, 2013, p.464), and is especially relevant for a firm’s strategy when commercialising new ideas such as technological innovations for sustainability (Chesbrough, 2010; Evans et al, 2017; Spieth et al., 2014). In contrast with generic business models, a sustainable business model not only creates economic value for customers and end users, but also considers the needs of a broader variety stakeholders, including stakeholders with soc(iet)al and environmental wishes and demands (for example, Evans et al., 2017; Schaltegger, Hansen & Lüdeke-Freund, 2016; Stubbs & Cocklin, 2008). Such a model captures ‘economic value while maintaining or regenerating natural, social, and economic capital beyond its organizational boundaries’ (Schaltegger et al., 2016, p.6).

2.1.2 Stakeholder interaction

Stakeholders are an important trigger for business model innovation for sustainability (Evans et al., 2017; Oskam, Bossink and de Man, 2018; Schaltegger et al., 2012; Stubbs and Cocklin, 2008). Following Freeman (1984), we define stakeholders as those groups that ‘can affect or are affected by’ a manager’s decisions or actions (Freeman, 1984, p.46). We use this broad view on stakeholders as it explicitly includes ‘latent’ stakeholders, given that ‘the potential relationship can be as relevant as the actual one’ (Mitchell, Agle & Wood, 1997, p.859). A firm’s stakeholders include classic primary stakeholder groups such as employees, customers, suppliers and financiers (Clarkson, 1995; Freeman, 1984). In the case of sustainable innovations, a broader range of more or less latent stakeholders is considered critical (Schlange, 2009; Buysse & Verbeke, 2003) and may include stakeholder groups such as academia, industry bodies, regulators and policy-makers, environmental non-governmental organisations, local communities, the media, and nature (Azzone et al., 1997; Evans et al., 2017; Stubbs & Cocklin, 2008). Which of these latent stakeholders are perceived as salient depends on the type of sustainable innovation and on the context in which the firm operates (Buysse & Verbeke, 2003) and changes over time (Dentchev & Heene, 2004; Mitchell et al., 1997). According to Mitchell et al. (1997), the degree of stakeholder salience is determined by the impact of three attributes: power, urgency and legitimacy. Schlange (2009) proposed that, in the case of sustainable innovations, these attributes should be changed to philosophy, impact and legitimacy. Dependent on the perceived salience, a latent stakeholder may become an active partner; managers should thus observe and adapt to changes in stakeholder importance (Dentchev & Heene, 2004). A firm’s business model is about how these stakeholders and managers interact and create value (Freeman, 2010), stressing the reciprocal relationships between managers and stakeholders. Especially for commercialising sustainable and technological innovations, stakeholder interaction in the business model innovation process is

considered a proactive strategy that may radically change the business logic and help reconceptualise value (Dmitriev et al., 2014; Evans et al., 2017; Schaltegger et al., 2012).

2.1.3 Managerial cognition

The role of managerial cognition in business model innovation is of particular interest when managers are confronted with new information and new technological possibilities (Foss & Saebi, 2017; Spieth et al., 2016) as, in that case, ‘managers must expand their perspectives to find an appropriate business model in order to be able to capture value from that technology’ (Teece, 2010, p.355). One characteristic of business models is that, in the minds of managers, they can be manipulated (Baden-Fuller & Mangematin, 2013; Doz & Kosonen, 2010; Hadida & Paris, 2014). Consequently, managerial cognition should play a central role in understanding business model innovation (Foss & Saebi, 2017; Martins, Rindova & Greenbaum, 2015). However, research into the conditions under which it has either an impeding or a stimulating effect remains in a developmental stage (for example, Baden-Fuller & Mangematin, 2013; Hadida & Paris, 2014; Nadkarni and Barr, 2008). The literature argues that cognitive blindness may impede business model innovation when managers are not receptive to other ways of thinking about their business model (Baden-Fuller & Mangematin, 2013). However, other authors have proposed that externally induced changes in managerial cognition can stimulate business model innovation (Cavalcante et al., 2011; Chesbrough, 2010; Hadida & Paris, 2014; Martins et al., 2015; Nadkarni & Barr, 2008; Spieth et al., 2016). It is clearly important to analyse managerial cognition in order to gain a better understanding of its effect on business model innovation.

2.2 Identifying the research gap

In short, even though the literature agrees on the importance of both stakeholders and

managerial cognition in business model innovation, only a few authors have considered these three elements together. There is little clarity regarding how stakeholders can change managerial cognition in a way that leads to business model innovation. Further research is needed to identify nuanced insights regarding when, how and why stakeholders induce managerial cognitive change that leads to business model innovation. For example, Aspara et al. (2011) were explicit about the connection between these three elements, finding that the understandings of the role of the firm that are shared by the manager and its stakeholders have a considerable influence on business model innovation. However, Saebi (2015) stated that external drivers for change are no guarantee that business model innovation can occur, because managerial cognition may stand in the way. ‘On a cognitive level, management might be unable or unwilling to perceive the need for change’ (Saebi, 2015, p.159).

This view of managerial cognition as being limited in how it allows manager–stakeholder interaction to influence business model innovation is further explored in the literature. Porac, Ventresca and Mishina (2002) proposed a distinction among four types of managerial cognition that may influence a firm’s actions related to business model innovation: industry or corporate recipe, reputational rankings, boundary beliefs, and product ontologies. Aspara et al. (2011) and Tikkanen et al. (2005) used this operationalisation of managerial cognition to explore how managerial cognition may limit business model innovation. They found that the stronger the ‘industry recipe’, the more uniform the business model will be across competing firms and the narrower the alternatives for change. Regarding existing ‘reputational rankings’, decisions related to business model innovation reinforce existing rather than prospective reputational rankings, leading to more uniform business models. ‘Boundary beliefs’ about who the firm can pursue as a customer or serve as a supplier tend to constrain the firm’s marketing efforts. Finally, cognitions of current ‘product ontologies’ constrain the redesign of product/service offerings (Aspara et al., 2011; Tikkanen et al., 2005; Porac et al.,

2002). These four types of managerial cognition are a useful operationalisation to research the effects of managerial cognitive processes (Porac et al., 2002) on new business modelling (Aspara et al., 2011; Tikkanen et al., 2005). However, these have focused exclusively on how stakeholders constrain business model innovation.

Other research has also dealt only marginally with the question of how manager-stakeholder interaction may trigger cognitive change and spur business model innovation, despite the fact that an outside perspective may play an important role in business model innovation by increasing an organisation's strategic sensitivity (Doz and Kosonen, 2010). The literature only shows that managerial cognition changes through negotiating with stakeholders (Aspara et al., 2011), and by experimenting in emerging markets, which brings a different set of stakeholders (Chesbrough, 2010). The business model literature also has a tendency to lump all stakeholders together (Schaltegger et al., 2016; Evans et al., 2017) and to assume that the set of stakeholders a firm faces is static, whereas, in practice, they may change.

In summary, existing contributions make it clear that a promising avenue for further research lies in the study of (1) managerial cognitions as an ingredient of business model innovation, (2) the role of stakeholders in changing these cognitions and, (3) the influence of managerial cognitive change on business modelling. How exactly managers' interaction with stakeholders contributes to managerial cognitive change, and thus influences business model innovation, remains unclear (Aspara et al., 2011; Spieth et al., 2016). Our research aims to take a step toward answering this question.

3 RESEARCH DESIGN

The objective of this study is to gain insight into how managers' interactions with stakeholders contribute to managerial cognitive change that induces business model innovation for

sustainability and unravel its constituent processes. We use a qualitative research approach to provide in-depth insights into this phenomenon – an insight that can potentially be generalised to theory (Eisenhardt, 1989; Yin, 2017). The research design consists of multiple case studies and is a first step towards developing insights that are analytically valid for comparable cases (Eisenhardt & Graebner, 2007; Yin, 2017).

3.1 Case selection

We build on three cases following a replication logic that enables within-case and cross-case analysis, as well as pattern matching (Eisenhardt, 1989). We have selected three cases in which a manager interacts with stakeholders and, based on that interaction, develops a new understanding of the role of his/her business and consequently decides to adapt the appropriate business model. The cases are comparable because each case concerns an emerging sustainable technology that has been successfully introduced by a firm into the market by innovating its business model, including the value proposition (Schaltegger et al., 2012). Table 1 provides a description of the cases and shows that, in each case, the change of the value proposition includes a change of both the product/service offering and the target group. The cases are recent Dutch examples of environmental or social sustainable innovations.

[INSERT TABLE 1]

3.2 Data acquisition and analysis

The main data sources for this study consist of semi-structured interviews and archival data sources (see Table 2). Interviews were conducted with the managers who are directly responsible for the sustainable innovation and commercialisation trajectory and with key partners involved. These interviews covered all of the main players, as our studies concern small firms. The interviews pertained to the inter-firm-level value creation processes and

focused on changes in the managers' understanding of the role of the firm in its business, and the influence of manager-stakeholder interactions therein, as well as on forthcoming strategic actions. All interviews were recorded and transcribed verbatim. For the preparation of the interviews and for triangulation purposes, we gathered and studied archival data sources, consisting of internal and external data sources covering a prolonged period prior to and after the innovation of the business model. The archival data were especially helpful in validating the changes in managerial cognition and business model that were found in the interview data through expression of the role and offering by the firm prior and after the changes had occurred. Those changes are documented in archival data of the companies involved (for example, in company reports, websites, presentations and press releases) but there is also recognition of these changes by the media (in magazine articles and media coverage, for instance) and the market (such as in case study reports). Therefore, the role of the secondary data is, on one hand, to document the business model changes, but on the other hand to act as an independent source that confirms changes in the business model are recognised in the outside world.

[INSERT TABLE 2]

The analytical process consisted of three stages, constituting open coding, axial coding, and selective coding (Strauss & Corbin, 1990). Software for qualitative data analysis (Atlas.ti) was used to manage the volume and variation of the data and to make data displays. In the first stage, open codes were created for changes in the manager's understanding of the business in each case and the interactions with stakeholders that contributed to this change. In line with Aspara et al. (2011), Barr et al. (1992), Martins et al. (2015), and Tripsas and Gavetti (2000), we looked for instances in our data where managers explicitly mentioned that stakeholder interaction had changed their understanding of the role their business plays, stimulating them to look for new value propositions. Additionally, text segments related to value creation activities, both prior to and after the innovation of the business model occurred, were coded in

both interviews and secondary data sources. In the second stage, a process of sorting and grouping took place, identifying sequences and differences between value creation activities and types of stakeholders involved, before and after the manager's change of business understanding occurred. In this stage, categories were created by reducing, comparing and clustering the more than 100 open codes that were initially found and by looking at similarities and differences among cases through a process of cross-case pattern matching. In the third and final stage, we explored the relationships between the categories and defined concepts around the central research question. An overview of the final coding scheme is provided in the Appendix.

4 FINDINGS

4.1 A stakeholder-induced managerial cognitive change

For each case, we describe the initial business model for sustainability, focusing on the value proposition and its dominant logic, and explain the change that occurred in the manager's cognition and the stakeholder interactions that led to this change.

4.1.1 NP case

Natural Plastics was initiated by a civil contractor who saw how plastics used around roads pollute the soil. He developed a system for underground tree anchoring made of soil-degradable bio-based plastic. After a successful pilot period, the system was introduced to direct customers (gardeners and contractors), with the dominant logic in business model being that a sound, sustainable product sells itself. Although the system was received as 'a bio-based economy best-practice', the distribution channel and gardeners appeared reluctant to adopt the solution, even though it did not involve any extra costs.

Increased interaction with potential direct customers did not mitigate this reluctance. A consultant from an intermediary organisation that guided the manager during the commercialisation stage encouraged the manager to rethink the role the firm should play in the market. The manager realised he had to reframe the value of the system he was offering and needed to target municipal decision-makers instead of direct customers. Through interaction with academic researchers and a new product partner, the manager's understanding of the firm's role changed from that of supplier toward that of a change agent in the bio-based economy, giving presentations and offering advice to municipalities centred on a variety of bio-based solutions for landscaping. About this change the manager said: 'We came to the conclusion that when you're just selling products, when your product is just standing somewhere [one-off], you are nowhere. 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 case

Desch Plantpak, a producer of thermoform pots, containers and trays for the horticultural market, introduced a sustainable product line made of 100 per cent biodegradable and renewable material called D-Grade. Initially, the value proposition (products that can be disposed of through composting) was aimed at professional horticulturalists. The dominant logic was that this line could be commercialised with the same business model as that for traditional products and the product's sustainable quality would compensate for the somewhat higher price. Although the D-Grade line was received well by market parties, the higher price proved to be a stumbling block with potential direct customers (such as growers).

Following numerous encounters with reluctant direct customers, the manager developed a new line of thinking. He stated: 'We approached the growers, and they all reacted enthusiastically, but eventually they didn't want it because it was too expensive. We then came

up with the idea that we shouldn't be approaching the grower; we should go to the grower's customer [the retailers] and they will increase the demand.' This changed perception spurred the manager to start enticing the retailers to prescribe the bio-pot to the growers. Following interactions with retailers, the manager realised that they were not interested in a single bio-pot and instead sought a solution into which this product is integrated. A new employee, hired to approach retailers, decided to express the value-added feature by collaborating with partners with complementary goods, offering total solutions that made the price of its components less relevant.

4.1.3 WeGo case

WeGo started its business by offering an automated peer-to-peer car sharing service that allowed car owners to rent their unused cars to people in their neighbourhood. A unique part of the offering was the installation of a 'smart box' – a technical solution that enabled renters to lock and unlock the car with a smartphone, eliminating the logistical problem of exchanging keys. During a pilot period in an Amsterdam neighbourhood, interaction with users revealed that the lack of physical contact between owner and renter made the smart box vulnerable to malicious intent.

A new manager, intentionally hired by WeGo to bring in fresh insights, realised that although the smart box was technologically superior, it was not particularly suited for open communities: 'In a closed community where people are friends of each other, or colleagues working for the same firm, it is completely different. That's why we started looking where to find that [closed community] and realised: shouldn't we go to business-to-business?' WeGo decided to target their service at business markets, changing the firm's role fundamentally. WeGo's role changed from that of a technology provider and open community builder toward that of a business partner, enabling organisations to realise the same mobility performance for

their closed community with fewer vehicles whilst saving on costs and reducing CO2 emissions. This change in the manager's understanding of the business was triggered by a combination of different manager–stakeholder interactions, including interactions with users, but also with product partners and financiers.

4.2 Three shaping processes

Based on cross-case analysis of patterns in manager–stakeholder interactions, we observed that managerial cognitive change is triggered and supported by three ‘shaping’ processes that contribute to the actual innovation of the business model for sustainability: market approach shaping, product and/or service offering shaping, and credibility shaping. Table 3 presents an overview of the managerial activities and the stakeholder groups involved in the three shaping processes. Quotes provide examples of the managerial activities.

[INSERT TABLE 3]

4.2.1 Market approach shaping

The first process, ‘market approach shaping’, relates to a redefinition of the market interface and go-to-market strategy through managerial interaction with both existing and new stakeholders. This shaping process contributes to a change in managerial understanding of the situation the business is in, from primarily being focused on technology-push toward being actively concentrated on creating market-pull. Several activities are found to contribute to this process, each involving different stakeholder groups (see also Table 3).

First, the case studies show that creation of awareness of environmental and social issues is vital for market approach shaping. This is especially apparent in the NP case, in which, instead of approaching potential customers one-by-one, the manager started providing training sessions and presentations to civil servants to pitch NP's new sustainable approach. Second,

we saw a shift from trying to attract direct customers to enticing the customers of these customers (that is, end customers) to prescribe the sustainable product to the direct customers. For example, the NP case did this by convincing decision-makers at municipalities that the new sustainable product contributes to reaching CO2 emissions reduction goals. Third, we traced a focused market development activity that includes partnering with key market players with additional networks. In the D-Grade case, demand for the offering is created by approaching influential retailers whose vision fits the offering's philosophy. In the WeGo and D-Grade cases, collaboration with reputable complementary partners with large commercial networks enabled cross-selling activities. In the NP case, the manager joined forces with a company with a geographically complementary network.

4.2.2 Product and/or service offering shaping

The second process is 'product and/or service offering shaping'. Central in this shaping process is managerial interaction with (potential) end customers and complementary partners. Through this interaction, the offering is (re)shaped to realise and/or improve customer value creation. In the shaping process, the understanding of the role of the business changes from delivering functionality-oriented products and/or services toward creating total solutions that combine several of these products/services into one concept. Product and/or service offering shaping can comprise three activities each involving different stakeholder groups (see also Table 3).

First, managerial interaction with potential end customers is important in order to gain a deep understanding of underlying needs and problems. The WeGo case shows how intensive collaboration with a key customer increases awareness of requirements and desired service levels. In the D-Grade case, by interacting with retailers, the manager realised that the market is not interested in single products but rather desires total solutions into which this product is integrated. Second, in all cases, a superior offering is created by providing complementarities.

Collaboration is set up with partners offering complementary services and products of similar quality and reputation, thereby creating offerings that have a synergetic effect and providing the convenience of one-stop shopping (horizontal complementarities). Vertical complementarities are also found. For example, in the WeGo case, the offering is extended with planning and monitoring software and services through partnering. Third, the cases demonstrate that, for creating customer value, the end effect of the offering is more important than just cost issues. Managerial interaction with end customers is an important driver here.

4.2.3 Credibility shaping

The third type of shaping emerging from the data is ‘credibility shaping’, which we define as employing and expanding the firm’s network to enhance the credibility of the value proposition. The managerial understanding of the business triggered by this shaping process has changed, from proving the functionality and sustainability of the innovation toward gaining legitimacy for the innovation. Each of the three activities that are relevant for credibility shaping involves different stakeholder groups (see also Table 3).

First, the case studies demonstrate that endorsement by reputable key (end) customers is vital for credibility shaping. Key customers act as ambassadors of the sustainable innovation and provide firms with new leads. In the D-Grade case, key customers were actively selected for this purpose based on their sustainability approach and market impact. In the NP case, municipalities created positive exposure and endorsed the solutions, recommending them to colleagues from neighbouring municipalities. Second, we found that endorsement by partners and influencers (such as independent bodies) were equally important. In all cases, the reputation of partners opened doors to new customers. In the NP and WeGo cases, awards from independent bodies further increased the credibility of the offerings. Third, building extra-business relationships with parties such as consultants, financiers, and academic researchers

proved to be beneficial in all three cases, leading to stronger legitimacy through relationships with influential and renowned actors in the field.

5 DISCUSSION

5.1 The role of manager–stakeholder interaction in enabling managerial cognitive change

Our findings indicate that, in each case, a manager's changed understanding of the value potential of his/her firm's offering preceded a change of the business model. This change in understanding can be considered a change in managerial cognition (Aspara et al., 2011; Barr et al., 1992; Martins et al., 2015; Tripsas & Gavetti, 2000). The case studies reveal that this cognitive change is instigated by managerial interaction with stakeholders.

First, the stakeholder set may include customers, suppliers, employees, financiers, academics, governmental organisations, product partners and independent bodies (such as environmental NGOs, intermediary organisations, consultants and certifiers). Our findings confirm the view that many different stakeholder groups may be relevant (for example, Azzone et al., 1997; Evans et al., 2017; Stubbs & Cocklin, 2008). We add what kind of stakeholders, in particular, contribute to managerial cognitive change in the case of business model innovation for sustainability. Table 2 shows in more detail which stakeholder types may be involved in each shaping process and indicates how these stakeholders contribute; for example, through a role as influencer, decision maker or endorser. In our cases, interactions with end customers appear to be the most important among these factors, as end customers contribute to all three shaping processes and related cognitive changes. End customers appear to be more perceptive to the sustainability of a product/service offering and are able to express the desired effect of a sustainable solution. Therefore, they can play a major role in the decision making around adopting sustainable innovations. Other notable stakeholder groups are governmental

agencies, product partners and independent bodies, which contribute to market approach shaping, product and/or service offering shaping and credibility shaping, respectively. Our case studies show that interactions with these stakeholder groups provide new perspectives on the value potential of the sustainable innovation and help to find and effectuate the right business model for the sustainable innovation. In addition to these stakeholder groups, new employees played a major role in the WeGo and D-grade cases, as did interaction with a consultant of an intermediary organisation in the NP case.

A second observation is that it is primarily managerial interaction with new stakeholders – as in new-to-the-firm – that influences the direction of change in the managers' cognition and, consequently, the innovation of the business model. In all cases, the number of quotes indicating that a manager's understanding of the business was induced by new stakeholders exceeded the number of quotes related to existing stakeholders. The interactions with new stakeholders emphasise the importance of taking an outside-in perspective to stimulate business model innovation (Doz & Kosonen, 2010). Our findings show that, in the case of business model innovation for sustainability, new stakeholders, or 'latent' stakeholders in the view of Mitchell et al. (1997), may be more important than existing ones.

This implies an interesting avenue for further research. The literature on business model innovation points toward the idea that managers' interaction with stakeholders may drive innovation in business models through managerial cognitive change (Doz & Kosonen, 2010). However, as we have shown in Section 2.1, the literature mainly studies how stakeholders constrain managerial cognitive change (for example, Aspara et al., 2011; Tikkanen et al., 2005). Our cases find the opposite, which leads to the question of how these findings relate to each other. One possible explanation may be that interaction with existing stakeholders reinforces existing managerial cognitions and hence leads to the maintenance of an existing business model. New or latent stakeholders may have the opposite effect. They appear to be more

important for the development of new business models for sustainable innovations than for generic business models. This raises questions around how latent stakeholders can be identified and involved to spur sustainable business model innovation. Latent stakeholders may be difficult to identify. They may also be less amenable to participate in the process of sustainable business model innovation, because they perceive this as being less relevant to them. Therefore, we suggest the following research agenda. First, the identification of latent stakeholders needs more scholarly attention. Future empirical analysis could study how managers can identify and select latent stakeholders of sustainable innovations; for example, by building on the stakeholder attributes philosophy, impact and legitimacy, as proposed by Schlange (2009). Further research could also study which stakeholder groups may be relevant for different types of business models for sustainability. Second, further research is necessary to explore how deliberate interaction with these stakeholders may be activated and managed in a way that contributes to managerial cognitive change and advances the sustainable business model innovation process. For example, future research could study how a process of stakeholder motivation that includes attention to the distribution of value among the stakeholders (Dentchev & Heene, 2004) can drive active involvement of latent stakeholders in the process.

5.2 Three shaping processes and related types of managerial cognition

We find that the influence of stakeholders on managers' understanding about their businesses runs via three shaping processes, which can be related to the four types of restricting managerial cognitions: industry recipe, boundary beliefs, reputational rankings, and product ontologies (Tikkanen et al., 2005; Aspara et al., 2011). Overcoming restrictions related to three of these types enables managers to innovate their business model for sustainability. We found boundary beliefs to be important in market approach shaping, as changes occur in who the manager thought they could pursue as a customer (Tikkanen et al., 2005). Our case studies indicate that

stretching these boundaries – for example, from direct customer to end customer and other decision makers – was indispensable for finding the right business model for the sustainable innovations. Product ontologies appeared to be related to product/service offering shaping as the manager’s belief related to a superior offering for the target group changed in all cases from the original functionality-oriented offering toward a total solution that unburdens the customer, as the mere sustainability of the solution was not enough for adoption by the market. Reputational rankings also played a significant role in all shaping processes in the cases; for example, in relation to the reputation of the partners, the managers’ chose to collaborate with reputable product partners and customers that fit the sustainability philosophy of the firm and independent bodies that are able to legitimise the sustainability of the solution. However, in our cases we did not find a relation of shaping processes to industry recipe, perhaps because the cases concern an emerging sustainable technology and a sector-logic has yet to emerge.

The strategic relevance of the shaping processes for changing these cognitions can be explored further in the future. A relevant question could be whether the relative strength of the described shaping processes and the four managerial cognitions is a predictor of the outcome of the sustainable business model innovation process. Hence, our concepts may enable us to get a better understanding about why some manager–stakeholder interactions ultimately lead to sustainable business model innovation in one situation, whereas similar interactions do not lead to sustainable business model innovation in another.

Based on an analysis of the relationships among the concepts, we further propose that market approach shaping, product and/or service offering shaping, and credibility shaping are interrelated. We found that the processes are not sequential and linear, but actually run in parallel and are iterative. They mutually contribute to the change in a manager’s cognition and, subsequently, for business model innovation for sustainability. This parallel and iterative aspect may be caused by the possibility that interaction with some stakeholders contribute to

more than one shaping process, as well as that each shaping process delivers different information to the manager. First, this indicates that some stakeholders may play multiple roles. Second, insights gained in one shaping process may not necessarily align with insights gained in another. They need to be reconciled in order to build a coherent business model for sustainability, which requires another iteration with the respective stakeholders. Further research could provide a fine-grained perspective on this iterative process and could explore the different roles that each stakeholder group may play in inducing cognitive change and finding a viable sustainable business model.

Even though the shaping processes are found to be iterative in our cases, all three cases indicate a priority for market approach shaping. This may be related to the observation that the stakeholder-induced managerial cognitive changes we identified in our case studies all started by (re)considering what the main beneficiaries of the value potential of the sustainable technology were. The starting point may be different in other cases, which may lead to another order of the shaping processes. Further research could explore the conditions that determine which shaping process is dominant in which situation.

5.3 Limitations and further research

The setup of this study has certain limitations, which also provide opportunities for research. First, the empirical part of our study was restricted to three cases involving relatively small firms. The analytical generalisability of the results to firms with other characteristics could benefit from research among larger firms, from other sectors, and with other types of sustainable business models. Second, we only examined the influence of stakeholders on managers as if this is a one-directional process. It is likely that the cognitive beliefs of stakeholders are also influenced by managers or by being exposed to the new sustainable technologies and the new business models for sustainability. In that situation, there would not

only be an influence of stakeholders on a manager's cognitive beliefs but also vice versa. Third, and relatedly, the present study focused on a change in managerial cognition by stakeholder interaction triggering and supporting business model innovation and omitted other strategic actions and influences. Future research could concentrate on how a change in managerial cognition relates to other causes of business model innovation for sustainability.

6 CONCLUSIONS

Although research assigns a central role to both stakeholder interaction and managerial cognition in business model innovation for sustainability, the connection between the two has not been studied. This chapter aims to respond to the call to search for processes that may trigger and support this managerial cognitive change. We propose that managerial cognitive change is triggered by manager-stakeholder interaction, in which latent stakeholders have a relatively prominent role, and is supported by three stakeholder-driven shaping processes (market approach shaping, product and/or service offering shaping, and credibility shaping), adding to a further understanding of business model innovation dynamics for sustainability, and specifically the role of manager-stakeholder interactions therein.

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Table 1. Description of cases and changes in the value proposition.

Characteristics	Case study		
	Natural Plastics	D-Grade	WeGo
Innovation	Bio-based and soil degradable products for landscaping	Bio-based and compostable products for horticulture	Car sharing service for consumer market
Business idea	2009	2004	2011
Market launch	2011	2009	2014
Initial value proposition	Product system (sustainable tree anchoring system), aimed at direct customers (gardener)	Single product (biodegradable pot), aimed at direct customers (grower)	Product-service system (smart box and car sharing platform), aimed at consumer market (car owners)
New value proposition	Service plus accompanying products (advice/training and bio-based product portfolio), aimed at decision makers (municipalities)	Combination of products (e.g., pack consisting of tray, biopot, aquapad and sheet), aimed at end customers (retailer)	Service plus technology (fleet management solution, incl. smartbox, and software tools), aimed at business-to-business market (fleet owners/managers)

Table 2. Overview of interviewees and archival data sources.

Characteristics	Case study		
	Natural Plastics (NP)	D-Grade	WeGo
Interviews			
Nr. of interviews	5	3	4
Manager case	Manager/entrepreneur (2x)	Marketing & sales manager (2x)	Manager/entrepreneur (2x)
Key partners and their roles	Launching customer (co-creator and sales partner), consultant (consultant), partner (co-developer and reseller)	Knowledge provider (research and development partner, representing three launching customers)	Launching customer (co-creator), partner (co-developer, reseller and financier)
Year conducted	2015	2015	2016
Archival data			
Nr. of archival data	29	30	23
Company data	1 website, 3 videos, 3 presentations, 4 company documents	2 websites, 6 press releases, 1 presentation, 2 company documents	1 website, 1 company blog, 2 company documents
External data	14 news items on external websites, 4 magazine articles,	10 news items on external websites, 5 magazine articles, 1 presentation, 1 case study report	12 news items on external websites, 6 magazine articles, 1 case study report
Other		2 memos of company visit and informal interview with manager	
Period covered	2010–2015	2007–2015	2012–2016

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Table 3. Three shaping processes and its stakeholder-integrating activities.

Shaping process and dominant change	Activities	Stakeholders	Examples from the case studies
Market approach shaping From <i>technology push</i> to <i>market pull</i>	Creating awareness for environmental and social issues	Both existing and new stakeholders (direct/end customers, environmental NGOs, governmental agencies, researchers)	A political party invited WeGo to give a presentation to create enthusiasm among politicians for car-sharing solutions and to show what role the government could play (from archival data WeGo). 'Natural Plastics started giving training seminars and presentations about biodegradable plastics and how that could be a sustainable solution for trees.' (NP case, product partner)
	Enticing end customers or decision makers to prescribe	New stakeholders (end customers, governmental agencies)	'What he did was involve the whole market in his product instead of approaching them one-by-one. What happened is that the product started showing up in specifications.' (NP case, consultant)
	Focused market development with allies with additional networks	Predominantly new stakeholders (new employees, product partners, service providers, financiers, channel)	'What are firms that fit our philosophy, and have also impact on the market? Who, let's say, can realise volume? And you have to make a choice in that, upfront.' (D-Grade case, manager) 'The good thing is that next to being an investor, they also have an enormous commercial network for us.' (WeGo Case, entrepreneur)
Product and/or service offering shaping From <i>delivering functionality</i> to <i>creating total solutions</i>	Understanding needs and motives of end customers and decision makers	New stakeholders (end customers, product partners, service providers, financiers)	'Those applications are not finished and WeGo is not able to finish that themselves. They need a market for that. And our salesmen know exactly what our clients are looking for.' (WeGo, partner) 'Of course I am influenced by the things I hear from them [financier]' (WeGo case, manager)
	Creating superior offerings with horizontal and/or vertical complementarities	Predominantly new stakeholders (end customers, product partners, service providers, suppliers)	Through stakeholder interaction the entrepreneur understood they needed to collaborate to create a superior offering: 'We started working with other companies ... so you can apply the whole spectrum of products around these trees, give advice.' (NP case, manager)
	Focusing on the effect of the solution	Predominantly new stakeholders (end customers, product partners, service providers, suppliers)	When talking to one of the first potential end customers, it was understood that 'They do not only sell a pot, they want to establish something ready-to-use ... We are just one component in that, so we have to search for partners.' (D-Grade, manager)
Credibility shaping	Endorsement by reputable key customers	Both existing and new stakeholders (direct customers, end customers, channel, researchers)	'This client acts as a sort of ambassador for us. Because he has the connection with retail, we don't have to go to retail ourselves. He just makes sure that new points of reference keep coming.' (D-Grade case, manager)

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<i>From providing evidence to gaining legitimacy</i>	Endorsement by influencers (e.g., awards)	Predominantly new stakeholders (media, consultants, independent bodies)	‘Our first contacts were environmentally-conscious civil servants ... These civil servants work as an ambassador for your system.’ (NP case, manager)
	Building extra-business relationships	Predominantly new stakeholders (independent bodies, consultants, financiers)	‘We came into contact with a partner that wanted to invest in us ... When you have the back-up of such a partner, then your entry [i.e., with potential customers] is very different.’ (WeGo case, manager)

Appendix. Coding scheme.

<i>Examples of open codes</i>	<i>1st Order codes</i>	<i>2nd Order codes</i>	<i>Categories</i>
Broadcasting Participating in fairs Persuading potential direct customers Market exploration Active networking	Creating publicity and visibility Persuading direct customers Expanding the network with potential customers	Technology push (prior to change)	
Changing the target group Changing the message	Changing the go-to-market-strategy		Market approach shaping
Shift to end clients and influencers Understanding drivers of influencers Listening to end clients Message shift towards emotion Hiring new manager Gaining market access Organising the value network	Creating awareness for environmental and social issues Enticing end customers or decision makers to prescribe Focussed market development with allies with additional networks	Market pull (after change)	
Providing value for the chain Providing functional value Providing ecological value Acceptance added value versus costs	Seeking value for the whole value chain Focusing on total cost of ownership	Delivering functionality (prior to change)	
Changing the product/service offering with partners	Changing what the firm has to offer		Product and/or service offering shaping
Listening to needs of end customers Co-creation with customers Creating added value for end customers Meeting complementors Providing complementary products Adding services Providing convenience Unburdening the client Making price less relevant	Understanding needs and motives of end customers and decision makers Creating superior offerings through collaboration Focussing on effect of end solution	Providing solutions (after change)	

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Technology testing with R&D partner Field testing with chain Acceptance testing with launching customer Certification for sustainability Quantifying CO2 reduction	Proving functionality Proving sustainability	Providing evidence (prior to change)	
Collaboration for enhancing credibility and legitimacy	Changing how the firm builds credibility		
Endorsement by key customers High reputation Reselling by partner Legitimation by independent bodies Acquainted through awards Endorsement by the channel Using experience of partners with other markets	Endorsement by reputable key customers Endorsement by influencers Building extra-business relationships	Gaining legitimacy (after change)	Credibility shaping