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The Interaction Between Network Ties and Business Modeling: Case Studies of Sustainability-Oriented Innovations

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ABSTRACT

A stream of literature is emerging where network development and business modeling intersect. Various authors emphasize that networks influence business models. This paper extends this stream of literature by studying two cases in which we analyze how business modeling and networking interact over time. We propose the concept 'value shaping' to describe this interaction. Value shaping refers to the mutually constitutive process in which on the one hand networking helps to refine and improve the overall business model and on the other hand an improved business model spurs expansion of the network. We identify five micro-level processes through which value shaping occurs. Value shaping is particularly relevant for sustainability-oriented innovations, to help clarify all the types of financial, social and environmental value to which a business model may contribute.

Keywords: sustainable business model, business modeling, network ties, value creation, sustainability-oriented innovation, case study

1. Introduction

In the past decade, the development of sustainability-oriented innovations that integrate ecological and social aspects next to economic criteria has confronted academics and practitioners with various value creation challenges (for example, Klewitz and Hansen, 2014). Sustainability-oriented innovations need fundamental business model redesigns (for example, Boons and Lüdeke-Freund, 2013; Boons, Montalvo, Quist, and Wagner, 2013; Schaltegger, Lüdeke-Freund, and Hansen, 2012) and require multiple new perspectives on value and stakeholders (for example Lüdeke-Freund and Dembek, 2017; Schaltegger, Hansen, and Lüdeke-Freund, 2016; Yunus, Moingeon, and Lehmann-Ortega, 2010). The business model literature acknowledges that network partners play important roles in (re)designing the business model (for example, Boons and Lüdeke-Freund, 2013; Doganova and Eyquem-Renault, 2009; Zott and Amit, 2010). However, the question how network ties influence business models is still open for further research (Zott, Amit, and Massa, 2011). It remains to be explored which network ties are involved in the creation of sustainability-oriented business models (Schaltegger et al., 2016) and what their implications are for the value created (Evans, Vladimirova, Holgado, van Fossen, Yang, Silva, and Barlow, 2017). Research into how business models are transformed over time may help successful adoption of sustainable business models (Evans et al., 2017; Stubbs and Cocklin, 2008).

To contribute to the emerging field of sustainable business model research, this paper views the business model as a boundary-spanning activity system (Zott and Amit, 2010) and aims to explore the interaction between business modeling and networking. We define networking as the development of the network by means of changing the type, purpose and/or strength of ties. For the purpose of this paper we define business modeling as a transformation process in which the business model is repeatedly adjusted and improved. An advantage of the activity system perspective is that it embodies rich possibilities for further theoretical development and refinement and can help researchers to gain a better understanding of the micro-mechanisms of business modeling (Zott and Amit, 2010). The research question we seek to answer is: *How do networking and business modeling interact during the development of a sustainability-oriented innovation?* We answer this by studying two cases of small and medium-sized enterprises (SMEs) that develop new applications of bio-based plastics.

This paper is structured as follows: In section 2, we explore the concepts of (sustainable) business models, business modeling, value creation, and network ties that are valuable for studying the interaction between networking and business modeling. In section 3, we introduce the case study methods adopted in our research design. In section 4, we present the results of our study, and develop a stage model for value shaping, derived from the results. In section 5, we discuss the results in comparison with current (sustainable) business modeling research. The paper ends with conclusions in section 6, containing limitations of this research, and implications for practice.

2. Literature review

In this section, we first introduce and explain the sustainable business model concept (2.1). Next, we explore business modeling as a boundary-spanning activity system (2.2). We then further explore the concept of value

(2.3), and end this section with an exploration of literature that may provide valuable insights into the interaction between networking and business modeling (2.4).

2.1. The concept of a sustainable business model

A business model can be defined as a conceptual representation of the organizational and financial "architecture" of a business (Teece, 2010). Business model innovation is regarded as an important instrument for commercializing new ideas and technologies (Chesbrough, 2010) and is seen as crucial to create viable business cases for sustainable innovations (Boons and Lüdeke-Freund, 2013; Schaltegger et al., 2012). The generic business model consists of a "value proposition", explaining what a firm delivers to its customers, embedded in the product or service; a "supply chain"; a "customer interface", explaining how the upstream and downstream relationships are managed and structured; and a "revenue model", explaining how value is captured and costs and benefits are distributed (for example, Boons and Lüdeke-Freund, 2013; Osterwalder, Pigneur, and Tucci, 2005; Richardson, 2008).

Although this generic business model concept is firm-centric, scholars agree that business models are not limited to the internal organization, but can include suppliers, distribution channels, and other partners that extend the company's resources (Doganova and Eyquem-Renault, 2009; Zott and Amit, 2010; Zott et al., 2011). Involving networks is especially important for sustainable business models to generate value beyond the organizational boundaries, including all stakeholders and not just customers (Evans et al., 2017; Lüdeke-Freund and Dembek, 2017; Schaltegger et al., 2016). A sustainable business model therefore asks for a redefinition that includes multiple values (social, ecological, and economic) and stakeholders (inside, outside, and societal). Combining Schaltegger et al. (2016) and Yunus et al. (2010), we propose the sustainable business model consists of:

- a "value proposition", providing ecological and/or social value next to economic value to its customers and other stakeholders;
- "value creation and delivery", explaining how value is created and delivered by the company and its partners for all stakeholders; and
- "value capture", maintaining or regenerating natural, social, and economic capital beyond its organizational boundaries.

By using the combined perspective of "value creation and delivery", instead of a distinction between "supply chain" and "customer intimacy", we overcome the disadvantage of focusing solely on the firm's value chain (Allee, 2009), and facilitate the inclusion of other stakeholders as this is a necessary condition for a sustainable business model (Stubbs and Cocklin, 2008). This makes it possible to explore the impact of new technology on all stakeholders of the sustainability-oriented innovation (Massa, Tucci, and Afuah, 2016).

2.2. Business modeling as a boundary-spanning activity system

The generic business model innovation process as described by Schallmo (2013), consists of five consecutive steps, i.e. ideation, concept design, detailed design, prototyping and implementation. This classically structured innovation process is followed by an iterative step of adjustment and diversification but may also involve different feedback and iteration loops (Schallmo, 2013). Many scholars agree that business model innovation is not a linear process, but involves an iterative design process in which business models are developed, selected,

adjusted, and/or improved (Doganova and Eyquem-Renault, 2009; Teece, 2010; Zott and Amit, 2010). A rare example of research studying this transformation process is the study by Ziaee Bigdeli, Li and Shi (2016), who show how the business model of university spinouts developing technological innovations evolves from establishing value creation and delivery towards composition of the value proposition and finally value network extension.

Doganova and Eyquem-Renault (2009) added a network perspective by stressing the creative activities needed to develop the business model and simultaneously create encounters with possible partners to gradually build the network of the new venture. In accordance with this view, Zott and Amit (2010) conceptualized a firm's business model as a boundary-spanning activity system and define this as "a set of interdependent organizational activities centered on a focal firm, including those conducted by the focal firm, its partners, vendors or customers, etc." (p.217). Especially sustainable business models require "a systemic consideration of stakeholders interests and responsibilities for mutual value creation" and "a value network with a new purpose, design and governance" as proposed by Evans et al (2017, p.602). For business modeling, the literature describes some interesting approaches and tools that take a network perspective. An example is the "value mapping tool" by Bocken, Short, Rana, and Evans (2013), aimed at creating a better understanding of the value proposition taking into account all relevant stakeholders. This tool is particularly helpful in the ideation phase of sustainable business model innovation (Geissdoerfer, Bocken and Hultink, 2016). Other approaches include "collaborative business modeling" by Rohrbeck, Konnertz, and Knab (2013), "network-level business model" by Lindgren, Taran, and Boer (2010), and a framework and facilitation method for values-based network and business model innovation by Breuer and Lüdeke-Freund (2017). These approaches all facilitate business model innovation by a group of partners, in their search for a joint business model. Although Rohrbeck et al. (2013) described that new networks may emerge from the process, until now, the emerging literature has primarily studied business modeling as a process *within existing networks* and at a specific moment in time, mostly in the ideation or development stage. We build on these valuable insights by adding a dynamic perspective, studying the interaction between business modeling and networking over time (Zott et al., 2011). In other words, we study business modeling *through* networking. Our study focuses on firms that develop the business model using their network ties, on the encounters that take place with new partners, and on the value proposition, creation, delivery, and capture that emerges throughout the whole process of business modeling.

2.3. Value outcome, value creation, and value networks

Research on value creation can be divided into two streams: "value creation processes" that consider the parties, activities, and resources involved, and "value outcomes" that consider how the value is perceived by the beneficiaries (Gummerus, 2013). Both concepts are relevant for this study. This literature analyzes the value creation process on multiple levels (Lepak, Smith, and Taylor, 2007). From an organizational perspective, value creation involves innovation, through which product and service offerings are established that increase the customer's valuation of the benefits or provide new value (Bowman and Ambrosini, 2000; Lepak et al., 2007; Priem, 2007). For value outcomes, Allee (2009) distinguished three currencies: (i) goods, services, and revenue; (ii) knowledge that supports the core product and service value chain; and (iii) intangible benefits. For sustainability-oriented innovations, this may encompass economic, social, and environmental value (Bocken, Short, Rana and Evans, 2014; Evans et al, 2017; Klewitz and Hansen, 2014; Stubbs and Cocklin, 2008). The

value creation literature further shows that both suppliers and customers can be contributors to, as well as beneficiaries of, the value created (Gummerus, 2013; Holm, Eriksson, and Johanson, 1999; Walter, Ritter, and Gemünden, 2001). From the perspective of sustainability-oriented innovations, the value outcome may also concern other stakeholders as beneficiaries, while it combines economic value with benefits for society (for example, Schaltegger et al., 2016; Yunus et al., 2010), also known as shared value (Porter and Kramer, 2011). Stakeholders interests are inherently tied together and firms should accommodate all stakeholders interests, aimed at creating as much value for each (Freeman, 2010).

The literature further shows that networks facilitate the value creation process (Lepak et al., 2007; Tsai and Ghoshal, 1998; Holm et al., 1999; Chesbrough and Rosenbloom, 2002). In this respect, the notion of value networks is useful. Allee (2009) defined a value network as a "purposeful group of people or organizations creating social and economic good through complex dynamic exchanges of tangible and intangible value" (p. 429). Allee (2009) distinguished between an internal value network (that is, a network that includes individuals and groups within an organization), and an external value network (that is, a network that includes the organization's business partners, suppliers, investors, and customers), with the latter being the prime focus of this paper. This is in line with the view that value creation through business modeling involves complex exchange relationships among multiple players (Evans et al., 2017; Zott et al., 2011) and it is the entrepreneur's job to manage and shape these relationships (Freeman, 2010). Specific relationships may become a firm's value network when the organizations collaboratively create value (Allee, 2009). We follow this approach by studying the networking activities that the focal firm undertakes and the network ties and value network that result from this.

2.4. Network ties development in relation to business modeling and value creation

In this paper, we take a more detailed look at the network tie development process using a qualitative longitudinal approach, which can develop an in-depth understanding of how entrepreneurs use their network and the ties they are composed of (Jack, Dodd, and Anderson, 2008). In this study we focus on three characteristics of ties: strength, purpose, and type. Tie strength is a combination of the amount of time put into the contact, the emotional intensity of the contact, the intimacy, and the reciprocal commitments between the partners involved (Granovetter, 1973). Ties within a network can either be weak or strong, weak ties being important for access to novel information and especially useful for exploration purposes, and strong ties considered relevant for exchanging fine-grained information for exploitation purposes (Elfring and Hulsink, 2007; Granovetter, 1973; Rowley, Behrens, and Krackhardt, 2000). The value of strong and weak ties strongly depends on the type of learning or purpose (Dittrich, Duysters, and de Man, 2007; Rowley et al., 2000) and may vary for different stakeholder types (Freeman, 2010). Companies engaged in radical innovations benefit from a mix of strong and weak ties (Elfring and Hulsink, 2007).

For the purpose of ties, we build on the classification of Lechner, Dowling, and Welpe (2006), who distinguished ties accessing social, reputational, "co-opetition", marketing, and knowledge, technology, and innovation benefits. Here also a mix of ties for different purposes, as well as changes in this mix, are considered important for firm development (Lechner et al., 2006).

For the type of inter-organizational ties, we distinguish three categories: horizontal ties with companies with similar products in the same market, vertical ties with the supply chain (that is, upstream relationships) and

partners for marketing and distribution (that is, downstream relationships), and lateral ties with firms from other industries (Nooteboom, 2004). Vertical relationships gain a lot of attention in the literature (for example, Gummerus, 2013; Holm et al., 1999), but horizontal and lateral ties may also be beneficial for learning and innovation (Nooteboom, 2004). By looking at tie strength, type of ties, and purpose of ties, we are able to study the exchange relationships among the focal firm and its partners and their influence on business modeling.

3. Research design

3.1. Case study method

For this research, we use a case study method to capture as much detail as possible and create in-depth insights (Eisenhardt, 1989; Huberman and Miles, 1994; Yin, 2013). We build on two cases involving the introduction of a new technology that improved the environmental performance of the cases' focal firms and created new market needs, and can therefore be considered a sustainability-oriented innovation (Klewitz and Hansen, 2014). The new technology in both cases concerns bio-based and biodegradable plastics, successfully applied in a sustainable product and commercialized in the market. According to Bocken et al. (2014), the cases are examples of the sustainable business model archetype "substitute with renewables and natural processes". This multiple case study enables a within-case analysis and a cross-case analysis of findings, using a pattern-matching logic, that is, the evaluation (within-case analysis) and comparison (cross-case analysis) of patterns of events that are found, for explanation building (Yin, 2013). This research design is a first step in developing an insight that is analytically valid for comparable cases and to "explain" the phenomenon (Eisenhardt and Graebner, 2007; Yin, 2013).

3.2. Case selection

In recent years, fundamental and applied research into bio-based plastics has increased because of this material's potential to contribute to a circular economy. Larger plastics companies focus their research on so-called "drop-ins", bio-based equivalents of conventional petroleum-based plastics with identical characteristics (Iles and Martin, 2013). New bio-based plastics may substitute existing plastics, but can also provide new applications based on unique material characteristics. Examples are "thermoplastic starch" (TPS), a bio-based plastic that dissolves in water and is suitable for applications such as drug delivery and mulch films, and "polylactic acid" (PLA), which is compostable and, because of its excellent barrier properties, suitable for packaging (Babu, O'Connor, and Seeram, 2013). These materials are relatively new and their application needs further research and development. Especially the biodegradability of these materials offers opportunities to create functional and sustainable value that is not previously available and opens up a range of new application possibilities. This asks for the development of application niches, a type of innovation that can be unattractive for larger companies that target direct large-scale commercialization (Iles and Martin, 2013).

In recent years, some successful niche applications of new bio-based plastics have been developed by small and medium-sized enterprises (SMEs) collaborating in inter-firm networks. Using a theoretical sampling strategy, we selected two comparable Dutch cases as the basis of this study (Eisenhardt and Graebner, 2007). Both cases are known in the Netherlands as successful innovative examples in the transition to a bio-based and circular economy, are in an advanced stage of development, and provide access to different stakeholders and secondary data. The cases are comparable for the following aspects: sustainable technology (bio-plastics), firm

type (SMEs), commercial environment (business-to-business), and geographical environment (the Netherlands). This supports the possibility for literal replication (Yin, 2013). Since variation in the initial conditions influences network development (Elfring and Hulsink, 2007), we selected two contrasting cases in this respect, one started by an existing firm, the other by a new company. Analysis of two cases supports pattern matching and explanation building on the level of the individual cases (within-case analysis) and on the level of both cases (cross-case analysis) (Yin, 2013).

3.2.1. The Keeper system case: an underground tree anchoring system

The "Keeper system" is a patented system for underground tree anchoring, supplemented with additional bio-based plastic products, for venting, watering, and lawn-mowing protection. The products that are part of the Keeper system are made of Cradonyl and are 100% biodegradable. An entrepreneur with a background in civil contracting, saw how plastics that are used around roads polluted the soil and became motivated to find a sustainable solution using bio-based and biodegradable plastics. He developed the Keeper system in 2009. The entrepreneur started a new company, Natural Plastics, to develop and market the Keeper system and other products for sustainable gardening and landscaping. Its mission is to develop biodegradable products.

3.2.2. The D-Grade case: biodegradable horticultural products

"D-Grade" is a product line containing a range of thermoform pots, packs, and trays that are 100% biodegradable and compostable. The products are made of Ingeo, a biopolymer based on corn. They are completely free of oil components. The idea for this innovation originates from the mid-1990s, when attention for sustainable solutions grew. Desch Plantpak, producer of thermoform pots, containers, and trays for professional horticulturalists, started its development in 2004 when new bio-based plastics became increasingly available and demand for bio-pots grew. The product line was introduced in 2009, fitting the sustainable mission of Desch Plantpak, visible in their efforts to consume less material and energy, use recycled materials, and improve the wellbeing of employees.

3.3. Data collection and analysis

The empirical research is based on two different sources: semi-structured interviews and archival data. Eight in-depth retrospective interviews, covering the whole development process, are conducted with each company representative responsible for the sustainable innovation trajectory, and with key partners. A topic list and some examples of interview questions used for the semi-structured interviews is provided in Appendix A. For data triangulation purposes, 60 secondary data sources are gathered and studied, consisting of documents (for example, news bulletins, professional publications, presentations), videos, websites, field notes, and analytical memos. Table 1 shows the data sources included per case. An overview of the data collection and analysis process is provided in Appendix B.

Table 1 Data sources per case

Data	Type	Case: Keeper system	Case: D-Grade	Total
Interviews	With company representative responsible for the innovation	2 (entrepreneur)	2 (marketing manager)	4

	With key collaboration partners	3 (customer, consultant, product partner)	1 (knowledge partner)	4
	Total interviews	5	3	8
Secondary data	Professional publications (report, case description)	5	8	13
	News bulletins	14	14	28
	Presentations	3	2	5
	Videos	3	0	3
	Websites	1	2	3
	Field notes and analytical memos	4	4	8
	Total secondary data	30	30	60

The research approach started from raw data. Units of observation for this study are "activities", following Zott and Amit (2010). A coding strategy is applied, using software for qualitative data analysis (Atlas.ti) to manage the data volume and variation.

First, the data are coded for the different ties the network consists of, their purpose and strength, for the three business model activities (value proposition, -creation and delivery, and -capture) and their interaction. The analytical process starts with creating a timeline for each case, by positioning activities and events in the sustainability-oriented innovation development trajectory, a process that starts with an idea and moves towards growth of the business. A cross-case comparison looks for co-occurring codes and patterns and changes in both network ties and business model are described. Based on the changes that occur, five successive stages are distinguished, resulting in a detailed description of the network ties and business model development processes.

Next, we study the emerging patterns in the interaction between networking and business modeling activities, and the influence of network ties on the business model, and vice versa. Different coding techniques are used, such as writing analytical memos and making data displays and tables in iterative cycles, gradually building explanations from the emergent patterns in the data (Gioia and Chittipeddi, 1991). From the data, different forms of interaction emerge, revolving around a central phenomenon of network-structured, sustainable business model innovation. Finally, first-order and second-order concepts are created that describe what takes place in each stage of the development process and what the trigger is for a stage shift (see appendix C for an overview of final codes and concepts). This results in a stage model explaining the phenomenon of network-structured, sustainable business model innovation.

4. Findings

This section starts with the results from the within-case analysis, focusing on the interactive development of business model and network ties. In both cases, this analysis identifies five successive stages (ideation, conception, business start-up, early growth, and continued growth) of network tie (4.1) and business model (4.2) development. Based on a cross-case analysis, the similarities and contrasts between the two cases are addressed, and the interaction between business modeling and networking activities described (4.3).

4.1. Development of network ties

The starting network conditions for both cases are different. In the D-Grade case, the already existing firm has an extensive network, consisting of suppliers, distributors, and knowledge partners, both nationally and internationally. In the Keeper system case, the initial network originates primarily from the social network of the entrepreneur who is starting this business. This initial network is based on his civil contracting business, mainly consisting of downstream relationships in the supply chain. How the network ties of both firms evolve through all stages, from ideation (stage I) to a continued growth of the business (stage V), is shown in Table 2. The table describes for each stage what changes are found with regard to the type of the relationships and the purpose and strength of these ties, showing both similarities and differences between cases. Although the specific partner type differs for each case, several similarities and differences are found in respect to type, purpose, and strength of ties.

Table 2 Development of network ties

Stage	**Type of ties**	**Purpose of ties**	**Strength of ties**
Stage I Ideation	Involving existing network ties:		
	Lateral relationships *D-Grade: material developer and knowledge institution* *Keeper system: partner company in plastics industry*	Technology & innovation	Strong
Stage II Conception	Extending (the involvement of existing) network ties:		
	Lateral relationships *D-Grade: knowledge institution* *Keeper system: intermediary organization*	Technology & innovation	Strong
	Upstream relationships *D-Grade: material providers* *Keeper system: material providers and production partners*	Supply	Weak
	Downstream relationships (direct customers) *D-Grade: end client + direct customer (grower), during this stage substituted by other direct customers (with end client)* *Keeper system: two direct customers (gardeners)*	Technology & innovation	Strong
Stage III Business start-up	Expanding the network with:		
	Downstream relationships (direct customers) *D-Grade: growers* *Keeper system: gardeners*	Marketing	Growing number of weak ties
	Lateral relationships *D-Grade: certification bodies* *Keeper system: consultants, NGOs, government*	Reputation	Some strong, some weak
Stage IV Early growth	Expanding the network with:		
	Downstream relationships (channel) *D-Grade: not applicable* *Keeper system: agents for international market*	Marketing	Strong

	Downstream relationships (end clients and decision makers) *D-Grade: retailers* *Keeper system: city councils*	Marketing	Weak, some changing into strong

Stage V Continued growth	Expanding the network (focused expansion) with:		
	Downstream relationships (end clients and decision makers) *D-Grade: key market players in retail* *Keeper system: city councils and authorities*	Reputation	Mainly strong
	Lateral and horizontal relationships *D-Grade: partners with additional products* *Keeper system: partner with similar products and expertise centers*	Marketing	Mainly strong

Ideation stage (I): Both cases show that lateral relationships are important in the ideation stage for technology and innovation purposes, as well as some downstream relationships. The network primarily consists of strong ties and is based on the existing network of the entrepreneur in the case of the Keeper system, and of the initiating company in the case of D-Grade.

Conception stage (II): In this stage, other network ties are involved from the existing network, and some new relationships are built: intensive downstream (potential customers) and lateral relationships for technology, and innovation purposes and upstream relationships (for example, material suppliers and production partners) for supply purposes. Ties are primarily strong, although those with upstream partners are considered weak because both companies do not depend on a specific material provider or production partner.

Business start-up stage (III): In the business start-up stage, the network in both cases is actively expanded with many new (weak) ties, focusing on potential direct customers (downstream relationships). In this stage, some lateral relationships are also established for reputation purposes (for example, certification and advice). Differences between cases are found with regard to organizing the distribution channel. In the case of D-Grade, a distribution channel is in place that is deployed for marketing and distribution. For the Keeper system, the channel is newly developed. In this latter case, the two potential customers from the social network of the entrepreneur, involved as co-creators in the conception stage, are now involved in selling the product. Also, some lateral relationships are built.

Early growth stage (IV): In this stage, the network that is already established during earlier stages is expanded with downstream relationships, especially with end clients and decision makers, in contrast with the direct customers in the previous stage, and constitutes a focused expansion of weak ties, mainly for marketing purposes. In the case of D-Grade, the newly built relationships concern retailers that appraise sustainability and appreciate the added value of a bio-based product and can demand the use of the product by their supply chain. For the Keeper system, the network is expanded with decision makers, such as municipal officers that can prescribe the product to be used by gardeners and contractors. In both cases, some of these ties strengthen and play an important role in product promotion. In the case of the Keeper system, the network is additionally expanded with downstream relationships in order to develop an international distribution network.

Continued growth stage (V): In this stage, the network in both cases is actively expanded with key market players (end clients) who, by endorsing the solution, build its reputation. Also, some horizontal and lateral relationships are built for joint market development. In the case of D-Grade, the company establishes some strong relationships with several other product companies. In the case of the Keeper system, the entrepreneur builds a strong relationship with a fellow entrepreneur who is also active in developing bio-based products.

4.2. Business model development

During the interactive and network-structured innovation process, the business model is altered several times. How the three activities (value proposition, -creation and delivery, and -capture) of a sustainable business model change from the ideation stage (I) to the stage of continued growth of the business (V) is shown in Table 3, describing case similarities and differences.

Table 3 Development of the business model

Stage	**Value proposition**	**Value creation and delivery**	**Value capture**
Stage I Ideation	Exploring the functional benefits of a new sustainable material.	Material development.	Capturing sustainable revenues. *D-Grade: bio-based and compostable* *Keeper system: bio-based and soil degradable*
Stage II Conception	Creating a functional product concept, targeted at direct customers, and focusing on technical feasibility (material, product and production).	Upstream organization for value creation (organizing the supply chain).	Gaining sales revenues; focusing on economic (for example, price-per-unit) and sustainable benefits for both supplier and customer.
Stage III Business start-up	Providing added value for the whole value chain, targeted at direct customers; focusing on persuasion of end clients by direct customers.	Downstream organization for value delivery. *D-Grade: extending network of potential customers* *Keeper system: organizing distribution channel*	Gaining sales revenues by emphasizing total-cost-of-life for the whole value chain, both economically (for example, reducing waste and maintenance costs) and environmentally (for example, reducing CO_2 emissions, energy consumption).
Stage IV Early growth	Targeting the value concept at the end client. *D-Grade: full story, incl. CO_2 reduction, recycling, sustainable energy, etc.* *Keeper system: CO_2 reduction of system use*	Developing value network for creating market pull.	Providing conceptual solution by stressing the sustainable revenues. *D-Grade: making higher price of sustainable value acceptable* *Keeper system: show contribution to bio-based economy*
Stage V Continued growth	Creating a total solution, consisting of goods and services, targeted at the end client. *D-Grade: combinations with complementary products* *Keeper system: services with complete product portfolio*	Developing value network for joint market development.	Providing a total solution, with sustainable revenues and intangible benefits (for example, convenience, market value). *D-Grade: making price less relevant* *Keeper system: creating awareness for bio-based economy*

Ideation stage (I): In both cases, the initiators of the new sustainable product start with the idea to substitute an existing product, currently made with oil-derived plastics, with a sustainable alternative using bio-based and biodegradable plastics. In this stage, this sustainable technology is explored, focusing on whether the desired functionality is met by the new technology.

Conception stage (II): Based on the idea, a functional concept is developed by adapting the sustainable technology to the product and its envisioned end-of-life scenario. For both cases, a dedicated material recipe is developed and the sustainability of the product proved, focusing on bio-based content and biodegradability (that is, compostability for D-Grade, and soil degradability for the Keeper system). The value proposition is aimed at the direct customers (that is, growers for D-Grade, and gardeners for the Keeper system). Value capture is focused on gaining economic revenues from product sales, based on price-per-unit, while adding the sustainable quality aspect that the material is bio-based and biodegradable.

Business start-up stage (III): In this stage, the value proposition is still providing a product concept targeted at direct customers, but it stresses the added value for the whole chain in order to help direct the firms' business customers to persuade their clients. Instead of price-per-unit, the costs and revenues throughout the lifecycle of the product are emphasized, both economically and environmentally.

Early growth stage (IV): In early growth, a considerable change in the business model takes place. The value proposition is redirected from the direct customers of the firms towards the end clients of the products. This asks for changes in the way value is being delivered and captured as well. The value delivery is aimed at creating a pull-effect from the end client by improving credibility and visibility. Value capture is changing towards providing a conceptual solution by stressing its sustainable revenues in terms of CO_2 reduction and contribution to a bio-based economy.

Continued growth stage (V): Being a solution provider is, in both cases, taken a step further by co-creating with product partners total solutions that consist of combined goods and services with sustainable revenues and intangible benefits, such as convenience and market value. Creating awareness for the intangible benefits is an important part of value-capture.

4.3. Interaction between business modeling and networking: value shaping

Looking closely at the networking and business modeling activities undertaken by the focal firm and its partners reveals a central phenomenon that is apparent in all stages and that we call "value shaping". We define this phenomenon as, "the process of identifying new types of value that can be delivered by a business model, through interaction with the network". The network 'shapes' the value delivered by pointing to benefits the network partners see, that were as yet unidentified by the entrepreneur in the existing business model. On the other hand an improved business model spurs expansion of the network with specific ties. Below are examples of this phenomenon in each of the five successive stages of development of the network and the sustainability-oriented business model. Each stage shows a specific form of value shaping taking place.

4.3.1. Value shaping in the ideation stage: exploring value

In this stage, the focal firm explores the value of the technology by means of strong lateral ties, primarily from the existing network of the firm or the social network of the entrepreneur. In the case of D-Grade, the lateral

partner is a material supplier from the existing network of the firm. A characteristic quote from Desch Plantpak of the D-Grade case regarding this is: *"At a certain point contact was made with a materials supplier, and a test was conducted. Yes, and then nothing happened for years because the material wasn't available and it wasn't possible to make it in large volumes."* In the case of the Keeper system, the knowledge partner is an informal tie from the social network of the entrepreneur who is active in the production, application, and sales of plastic products and intermediate products. A remarkable quote from Natural Plastics of the Keeper system case is: *"I once ran into someone from a plastics processing company, and we started talking about the plastic soup; what a situation that is, really. At some point he had access to some bio-based plastics, and then we started experimenting."*

4.3.2. Value shaping in the conception stage: developing value

In this stage, the R&D effort is aimed at translating the sustainable technology to fit the functional product requirements, and to realize reproducible production parameters. In the D-Grade case, a potential customer is initially involved from the network of the knowledge partner. When this customer decides not to proceed with the project, the firm continues the development and seeks other potential customers. The customer involved at the end of the conception stage is a grower with a large retailer as end client expressing the demand for the product. In the case of the Keeper system, the customers are two gardeners originating from the social network of the entrepreneur, one from the business market and one from the consumer market. Both customers are involved in developing and testing the product and are potential customers. Regarding this, a Keeper system customer said: *"We conducted tests with it; we planted some trees here and there, also coordinated with city councils here in Amsterdam. And they monitored what's happening with that material. We then made some changes to that, until we said, 'Hey, I've actually got a product.'"* For both cases, a lateral partner is important as well, although for different purposes. In the D-grade case, this is a reputable knowledge institute that helps develop the material and field-test the products. As the knowledge partner in the D-Grade case said: *"There was a test at a large violet grower wherein we literally made thousands of pots because one of the first things that you want to know is: well, I put a violet in it, but imagine that it gets going and the violet dies because the pot degrades. So that has to be tested first."* In the case of the Keeper system, this is an intermediary organization assisting the entrepreneur in building up the network for upstream organization.

4.3.3. Value shaping in the business start-up stage: reframing value

Through encounters with potential direct customers, the innovators in both cases realize the need to reframe the value of their sustainable innovations. The new value proposition in this stage is still a product concept targeted at direct customers, but it stresses the added value for the whole value chain in order to help direct the firm's business customers to persuade their clients. Instead of price-per-unit, the focus is transposed to the economic and environmental costs and revenues throughout the product lifecycle. In the D-Grade case, for example, the higher product costs are made more acceptable by stressing the lower costs for waste disposal and the potential for CO_2 reduction. Desch Plantpak: *"It's important that we inform our customers about these products, both the wholesalers and the individual users, for example, about the reduced CO_2 emissions and the lower energy usage that's required for production.* To support this reframing of value, in both cases, the network is extended with new lateral ties, for example, with certifying bodies and consultancy firms. These ties are involved to prove

sustainability and added value for the whole chain and help to build credibility and reputation. In this stage, though, the adoption of the product by the market still lags; the channel is reluctant, and potential direct customers find it difficult to sell the proposed added value to their client. Natural Plastics in the Keeper system case said: *"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."*

4.3.4. Value shaping in the early growth stage: redirecting value

In the early growth stage, the companies realize they need to shift the focus of the value towards the end client, who determines what solution is used or prescribed. Desch Plantpak from the D-Grade case: *"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 nursery will show up and say, hey, now I need that."* This shift constitutes a considerable change in mind-set in both firms. The value is redirected from the direct customers of the firms towards the end clients of the products. As a consultant in the Keeper system case stated: *"Instead of going door-to-door, Natural Plastics gave training seminars and presentations about biodegradable plastics and how that could be a different solution for trees, which meant that you'd come up with a sustainable solution. He presented that proposition to administrators at the Ministry of Infrastructure and the Environment, at the Provinces, and at city councils. 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."*

4.3.5. Value shaping in the continued growth stage: extending value

At the time of data analysis, both cases found themselves at the continued growth stage. In this stage, in both cases, the value being delivered is extended by creating combined goods and services in collaboration with horizontal and lateral partners, thereby creating total solutions for the end client that provide multiple forms of value. In the D-Grade case, the initiator collaborates with other companies in developing total retail solutions by making and offering product combinations. Desch Plantpak: *"What our sales manager mostly does is that he tries to express our value-added, but not by saying, 'Hey, look at this great product', but by finding companies who, together with us, make something, that has a sort of synergy effect."* In the Keeper system case, the entrepreneur joins forces with a fellow developer to create a service in which a wide portfolio of bio-based products is offered to the end client, consisting of products from not only their own companies, but also from other suppliers. Natural Plastics: *"We started working with other companies so that we could offer 30 different things, from fundamental improvements to all sorts of other things. So you can apply the whole spectrum of products around these trees, give advice."*

In Table 4 for each form of value shaping as described above, a definition is given, as well as the trigger for the transformation to the next stage and successive form of value shaping.

Table 4 Value shaping in five successive stages: definitions and triggers

Stage	Form of value shaping	**Definition** and ***Trigger for shift*** to the next stage and form of value shaping
I.	**Exploring value**	Exploring the functionality and readiness of the sustainable techology through collaboration with existing ties.
		Trigger for shift: Technology readiness and actual market demand for the value added by the sustainable technology.
II.	**Developing value**	Translating the sustainable technology into a viable product concept through collaboration with potential customers and other research partners.
		Trigger for shift: Proven product concept ready to be introduced in the market.
III.	**Reframing value**	Adapting the message towards stressing the value for the whole value chain, for example, to help direct customers persuade their clients.
		Trigger for shift: Reluctance of the market to adopt the sustainable technology.
IV.	**Redirecting value**	Changing the target group at which the value is aimed, for example, from direct customers towards end clients and decision makers.
		Trigger for shift: Apprehension of the needs of multiple stakeholders.
V.	**Extending value**	Creating total solutions that provide mutual value for multiple stakeholders (for example, end client and decision makers) through collaboration with horizontal and lateral partners.

Based on the changes found in both network ties and business model, and on the interaction between business modeling and networking, a stage model for value shaping is created. Based on the above, Figure 1 visualizes for each successive stage how the business model develops, what type of network ties are involved for each form of value shaping, and where in the value-shaping process a shift in business model thinking occurs.

The stage model shows that in the first two stages, value shaping evolves from exploring value that can be delivered with existing ties, to actual development of value with one or two potential customers. In the business start-up stage, the value is reframed towards providing added value for the whole chain. Up to this stage, the original business model and the network are transformed gradually. After the business start-up stage a change in business model thinking takes place when the market proves to be reluctant towards the sustainable technology. The companies realize that they should redirect the value concept towards other target groups, and extend the value to create total solutions for multiple stakeholders, by strategically building a value network.

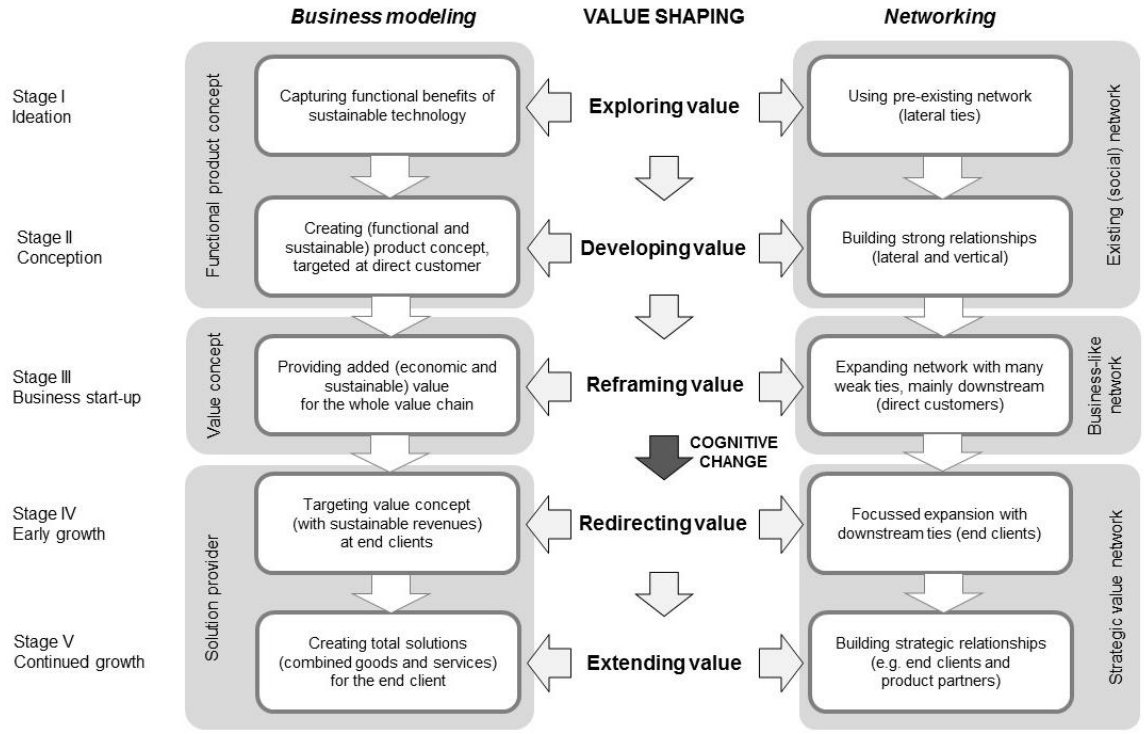

Figure 1. A stage model for value shaping

5. Discussion

This study proposes value shaping as the operative mechanism for the interaction between networking and business modeling. The stage model of value shaping (Figure 1) demonstrates that it continually develops, even after start-up and up to the continued growth stage. The five forms of value shaping are the micro-level processes constituting the interaction between business modelling and networking. Value shaping therefore changes form over time: with changes in the business model and the network, value shaping evolves from exploring to extending value.

In this section, we discuss how the results add to the (sustainable) business model literature, by first looking at how value shaping as operative mechanism for business modeling between networking and business modelling contributes to existing business model approaches and tools (5.1). Next we zoom in on how interaction with new and existing network ties triggers business model innovation (5.2), and in return how business modelling induces new networking activities (5.3). Finally, we present avenues for further research (5.4).

5.1. Value shaping in five successive forms

Combining an activity perspective (Zott and Amit, 2010) with a longitudinal approach (Jack et al., 2008), the concept of value shaping adds to existing approaches and tools for business model innovation in various ways. When compared with the generic business model innovation process as described by Schallmo (2013), the processes of reframing, redirecting and extending value show that adjustments of the business model may take

place already during implementation and are not solely confined to adjustments of the business model later on. To business model approaches and tools that incorporate a network perspective (for example Bocken et al., 2013; Breuer and Lüdeke-Freund, 2017; Geissdoerfer et al., 2016; Lindgren et al., 2010; Rohrbeck et al., 2013) the five successive forms of value shaping show how stakeholder interaction may be included throughout the whole innovation process: business modeling *through* networking. Finally, the processes of reframing and redirecting value resemble business model changes found by Ziaee Bigdeli et al. (2016) during the reorientation phase of University spinouts, but add in which direction the value proposition is redefined in the case of sustainability-oriented innovations and how this is actually triggered by network interactions.

5.2. Business model development, triggered by network interaction

The business model development process (Table 3) and the stage model (Figure 1) show that, induced by interaction with network ties the business model is changed several times. Each change can be considered a redesign or innovation, while it constitutes a new value proposition providing new product or service offerings to customers and end clients (Mitchell and Coles, 2003; Schaltegger et al., 2012). The results show that networking facilitates changing the value proposition, including the group it targets (Chesbrough, 2010), but may also change the revenue model involving an appropriate distribution of costs and benefits (Boons and Lüdeke-Freund, 2013). After the value is explored and developed into a functional product concept together with the existing network (*exploring value* and *developing value*), the business model is substantially changed by creating a value concept for the whole. This process, called *reframing value*, is instigated by encounters with new ties (mainly potential direct customers). After continuing market reluctance, the value proposition is redirected towards another target group (*reframing value*), again changing the business model substantially, and finally the business model is transformed towards being a total solution provider consisting of a new value network and value capturing mechanism, based on apprehension of the needs of multiple stakeholders and collaborating with horizontal partners (*extending value*).

Redirecting value and *extending value* are inflicted by network interaction, and can be considered an important step towards creating value for multiple stakeholders, as is suggested by various scholars (for example Evans et al., 2017; Lüdeke-Freund and Dembek, 2017; Schaltegger et al., 2016). Especially in the case of sustainability-oriented innovations, business model innovation is stimulated by creating encounters with multiple stakeholders, for example with downstream relationships varying from direct customers to end clients and decision makers. Interaction with multiple stakeholders creates a better understanding of which stakeholders can become possible beneficiaries of the sustainable technology, and what tangible and intangible benefits they may desire in terms of economic, social, and environmental value. This way value shaping assists in pointing to new or extended value propositions or target groups, thus creating value for all stakeholders (Freeman, 2010).

5.3. Development of network ties, triggered by changes in the business model

The network ties development process (Table 2) and the stage model (Figure 1) show that changes in the business model in return make clear what other network ties are needed, demonstrating how the boundary-spanning function of business models (Doganova and Eyquem-Renault, 2009; Zott and Amit, 2010) spurs firms to expand and strengthen the network. This is especially the case from the business start-up stage onwards.

In the business start-up stage the message is adapted towards stressing the value for the whole value chain (*reframing value*), for example in order to help direct the firm's business customers persuade their clients. The subsequent change in the business model triggers a search for new partners that can support the firm's message, for example by proving the environmental value of the proposition, next to its economic benefits. In the growth stage of the two cases studied, a change in business model thinking occurs after reluctance of the market to adopt the sustainable technology, redirecting the value proposition for example beyond the direct customer. The new target group for the value proposition (*redirecting value*) first steers the firm's networking activities towards expanding the network with other downstream relationships, for example end clients and decision makers. Apprehension of the needs of these stakeholders, activates a focused expansion of the network with strong ties with a variety of strategic partners (key downstream partners, product partners, lateral partners) to collaboratively create total solutions (*extending value*), both actively as well as passively as interesting partners also announce themselves.

Redirecting value and *extending value* changes the entrepreneurs' value chain perspective towards a notion of creating value networks (Allee, 2009; Evans et al, 2017) in which strategic relationships are being built for mutual value creation with a variety of stakeholders for commercialization of a sustainable technology. In the case of sustainability-oriented innovations value networks are strategically built to collaboratively develop radically new value propositions and extend the market for the new solution, a notion that was also found by Ziaee Bigdeli et al. (2016) in the scale up phase of university spinouts.

5.4. Limitations and future research

We acknowledge several limitations to this research. This qualitative study is based on two cases, limiting the analytical generalizability of the results. Both cases concern a sustainability-oriented innovation aimed at business-to-business markets with direct customers buying and using the products, and end clients or decision makers with a large influence on what products are used. Another specific characteristic of the cases studied is the sustainability-oriented innovations concerning introduction of a bio-based and biodegradable material. To what extent the concept of value shaping, the proposed stage model, and the change in business model thinking hold for other situations and innovation types needs further exploration.

The empirical results in this study suggest it is fruitful to further study the intersection of business modeling and networking. The strategic development of value networks for sustainable business models provides an important avenue for further research as it shows to be a key factor in capturing the commercial potential of new sustainable technology. The important work that has been done in studying the relation between networks and business models at one point in time (for example by Lindgren et al., 2010; Rohrbeck et al., 2013) may be integrated with a more dynamic time- and process- oriented perspective. The successive forms of value shaping demonstrate what kind of cognitive changes may be necessary to "find the right business model", an important barrier found by Chesbrough and Rosenbloom (2002) when capturing value from technological innovations. This cognitive change appears to be essential for the market's adoption of the sustainability-oriented innovation and could benefit from further research. Value shaping and the stage model could further benefit from further empirical research exploring how the process takes place in cases with other sustainable or even non-sustainable technologies. Additional research may also shed more light on other factors affecting value shaping such as political, social, or psychological elements.

6. Conclusions

The main contribution of this paper to the business model literature is the identification of value shaping as an operative mechanism describing the relation between networks and business modeling, from ideation to growth of the business in five micro-level processes. Value shaping refers to the mutually constitutive process in which on the one hand networking helps to refine and improve the overall business model and on the other hand an improved business model spurs expansion of the network. The concept of value shaping contributes to the emerging sustainable business model research by showing how interaction with network ties can help to clarify the types of financial, social and environmental value that a sustainable technology can deliver and hence help building the value networks to let the sustainability-oriented innovation succeed. The stage model for value shaping may serve as an analytical tool to study sustainable business model innovation from a longitudinal and boundary-spanning network activity perspective. To existing approaches and tools for business modeling, the concept of value shaping contributes by providing a stage model for business modeling *through* networking, revealing how SMEs/entrepreneurs use their network in business modeling over time. For practitioners the five successive forms of value shaping may serve as a guideline to pro-actively build their network and use specific network ties to evaluate and (re)design the business model, and enable the successful implementation of sustainability-oriented innovations.

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Appendix A. Interview topics and questions

Interview topics

A. Starting conditions
   - Initial network conditions (existing ties, strategic collaboration partners)
   - Initial business model (existing value propositions, customer profiles, value creation and delivery, value capture)
   - Purpose of innovation (cause, motivation of initiator)

B. Business model change
   - Development of the business model (activities)
   - Types of changes (in value proposition, creation and delivery, and capture)
   - Cause and purpose of changes in the network ties

C. Changes in network ties
   - Development of the network ties (activities)
   - Types of changes (number, type, purpose and strength of ties)
   - Cause and purpose of changes in the business model

D. Interaction between network development and business modelling
   - Influence of the business model change on network ties development
   - Influence of changes in the business model on business model development

Topics B, C and D were repeated for three phases: I. Opportunity exploration (pre start-up), II. Commercialization (business start-up), III. Growth.

Examples of interview questions

Interview questions for the Commercialisation stage (similar questions were asked for the other two stages Opportunity and Growth):

- When was decided to bring the innovation to the market?
- Who or what was leading in the decision?

Business model development:

- What kind of activities were undertaken in respect to the business model? Why?
- What worked / what didn't work? Why? What were important decision? Why?
- How did this change the original innovation idea / business model?
- What was the influence of these changes on network tie development?

Network tie development:

- What kind of activities were undertaken in this change in respect to the network? Why?
- Who were important partners in this stage? Why? What was their purpose?
- How did the strength and purpose of the relationships with these partners change?
- Who were new partners in this stage? Whom did you part from? Why?

Interaction:

- What where pivot points in the development during this stage? How did they come about?
- How did changes in the business model influence the development of the network and the relationships?

– How did interaction with network ties influence the development of the business model?

Appendix B. Data collection and analysis process

Date	*Activities*	*Specifics*
March-Jun 2015	Initial data collection	Archival data
July 2015	Conduction of interviews	With company representatives
Aug-Sep 2015	Conduction of interviews	With key partners
Sep-Oct 2015	Initial analysis of raw data	Drawing up additional interview questions
Oct-Nov 2015	Collection of additional data	Additional archival data
Oct-Nov 2015	Conduction of extra interviews	Revisiting company representatives
Nov-Dec 2015	Coding of the raw data (open coding)	Focused on network ties, business model activities and their interaction
Jan 2015	Creating a timeline for each case (within-case analysis)	Activities and events in innovation process from idea stage to date
Jan-Feb 2015	Cross-case comparison and analysis of activities (cross-case analysis)	Sorting, clustering and comparing codes leading to a description of the network ties and business modelling process, distinguishing five stages
Feb-Mar 2016	Coding of different forms of interactions (axial coding)	Exploring (sub)concepts, relationships, connections, focused on the influence of networking on business modeling and v.v.
April 2016	Selective coding	Creating final coding schemes and a stage model

Appendix C. Codes and concepts

Final coding scheme for network ties and business model development processes

1. Development of network ties
    1.1. Tie strength
        1.1.1. Weak tie
        1.1.2. Strong tie / intensive collaboration
    1.2. Purpose of tie
        1.2.1. Technology and innovation
        1.2.2. Marketing
        1.2.3. Supply
        1.2.4. Reputation
        1.2.5. Co-opetition

1.3. Type of tie
    1.3.1. Vertical relationship
        1.3.1.1. Upstream relationship
            1.3.1.1.1. Material provider
            1.3.1.1.2. Production partner
        1.3.1.2. Downstream relationship
            1.3.1.2.1. Distribution channel
            1.3.1.2.2. Direct customer
            1.3.1.2.3. End client
    1.3.2. Horizontal relationship
        1.3.2.1. Complementary products provider
    1.3.3. Lateral relationship
        1.3.3.1. Consultant, certification body
        1.3.3.2. Decision maker (e.g. governmental organization)
        1.3.3.3. Intermediary organization
        1.3.3.4. Knowledge institution
2. Development of the business model
    2.1. Value proposition
        2.1.1. Exploring functional benefits of sustainable material
        2.1.2. Creating functional and sustainable product concept
        2.1.3. Providing value concept for the whole value chain
            2.1.3.1. Targeting direct customers
            2.1.3.2. Targeting end clients
        2.1.4. Creating total solutions
            2.1.4.1. Combining with complementary products
            2.1.4.2. Combining with services
    2.2. Value creation and delivery
        2.2.1. Material development
        2.2.2. Upstream organization for value creation (supply chain)
        2.2.3. Downstream organization for value delivery
            2.2.3.1. Organizing the distribution channel for sales
            2.2.3.2. Extending network of potential (direct) customers
        2.2.4. Developing value network
            2.2.4.1. Creating market pull from end clients
            2.2.4.2. Joint market development
    2.3. Value capture
        2.3.1. Gaining sales revenues (economic value)
            2.3.1.1. Product costs (price-per-unit)
            2.3.1.2. Reducing total cost of life (waste and maintenance costs)
        2.3.2. Stressing sustainable value

2.3.2.1. Reducing CO2 emissions

2.3.2.2. Reducing energy consumption

2.3.2.3. Creating awareness for biobased economy

2.3.3. Stressing intangible benefits (e.g. convenience, marketing value)

First-order and second-order concepts for value shaping

I. Exploring value
   a. Exploring potential functional benefits of sustainable technology
   b. Collaborating with existing ties for material development
   c. *Trigger for shift*: technology readiness and market demand

II. Developing value
   a. Creating functional and sustainable product concept
   b. Proving functionality and sustainability of technology with research partners
   c. Testing product usability and acceptance with potential customers
   d. *Trigger for shift*: proven product concept ready for market introduction

III. Reframing value
   a. Adapting the message towards added value for whole value chain,
   b. Stressing economic and sustainable value
   c. Expanding network with potential (direct) customers
   d. *Trigger for shift*: reluctance of the market to adopt sustainable technology

IV. Redirecting value
   a. Changing the target group (towards end clients and decision makers)
   b. Stressing sustainable revenues for end clients
   c. Focused expansion of the network (end clients and decision makers)
   d. *Trigger for shift*: apprehension of needs end clients and decision makers

V. Extending value
   a. Creating total solutions, combining goods and services, with product partners
   b. Providing multiple value with sustainable revenues and intangible benefits
   c. Building strategic relationships with partners with complementary networks