



# The interaction between network ties and business modeling: Case studies of sustainability-oriented innovations

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## ARTICLE INFO

### Article history:

Available online 28 December 2017

### Keywords:

Sustainable business model  
Business modeling  
Network ties  
Value creation  
Sustainability-oriented innovation  
Case study

## 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.

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## 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 et al., 2013; Schaltegger et al., 2012) and require multiple new perspectives on value and stakeholders (for example Lüdeke-Freund and Dembek, 2017; Schaltegger et al., 2016; Yunus et al., 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 et al., 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 et al., 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.

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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 et al., 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 et al., 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 et al. (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 et al. (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 et al., 2016). Other approaches include “collaborative business modeling” by Rohrbeck et al. (2013), “network-level business model” by Lindgren et al. (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 et al., 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

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