

# Interdependencies between Business Model Components — A Literature Analysis

*Completed Research Paper*

**Julian Krumeich**

Institute for Information Systems

German Research Center for Artificial Intelligence

Julian.Krumeich@dfki.de

**Dirk Werth**

Institute for Information Systems

German Research Center for Artificial Intelligence

Dirk.Werth@dfki.de

**Peter Loos**

Institute for Information Systems

German Research Center for Artificial Intelligence

Peter.Loos@dfki.de

## ABSTRACT

The growing commercial use of modern information and communication technology with the simultaneous transition of traditional to digital businesses led to the realization of many innovative business ideas forming a new digital competitive landscape. As an appropriate means to analyze this new competitive landscape, the business model concept has prevailed in research and business practice for almost two decades. To describe business models, they are typically broken down into single business model components. Recent business model research criticizes a lack of knowledge of the structural relations between them. Without knowledge of their internal behavior, it is difficult to transform and innovate them in a successful manner. Thus, this paper tackles this research gap by conducting a comprehensive analysis of business model literature with the objective of discovering structural relations between business model components and mapping them on a unifying business model component framework which was developed prior to this study.

## Keywords

Business Models, Business Model Components, Interdependencies, Literature Analysis .

## MOTIVATION AND RESEARCH CONTRIBUTION

The raising commercial use of modern Information and Communication Technologies (ICT) has significantly changed companies' business practices since the mid-nineteen nineties (Ghaziani and Ventresca, 2005; Sampler, 1998). Competitive situations have to be considered increasingly from a global perspective and far beyond traditional industry borders (Bieger and Krys, 2011). Even small Internet start-ups were quickly able to act globally and bring real competition to long-established companies. ICT function frequently as an enabler for entirely new business activities besides just supporting them leading to the realization of many innovative business ideas forming a new digital competitive landscape (Bettis and Hitt, 1995; Stähler, 2001). For almost two decades, the business model concept has prevailed as an appropriate means to analyze this new competitive landscape (Burkhart, Krumeich, Werth and Loos, 2011).

To describe business models, they are typically broken down into single business model components. Recent business model research however criticizes the lack of bundled knowledge of the relations between business model components (Bucherer, 2010; Burkhart et al., 2011; de Reuver and Haaker, 2009). Hence, the transformation and innovation of business models still remain a heavy task without having such knowledge of internal behaviors.

Thus, the objective of this paper is to tackle this research gap resulting from the lack of knowledge of the structural relations between business model components (Bucherer, 2010; Burkhart et al., 2011; de Reuver and Haaker, 2009; Krumeich, Burkhart, Werth and Loos, 2012). To be more specific, the research question is: *which dependencies and interdependencies exist between business model components?* In doing so, this paper outlines the first approach of bundling the implicitly existing knowledge of the internal structure of business models in literature.

## APPLIED RESEARCH METHODOLOGY AND PAPER STRUCTURE

To tackle the research question, an extensive literature analysis following the methodology proposed by vom Brocke, Simons, Niehaves, Riemer, Plattfaut and Cleven (2009) was conducted, which allows for a rigorous study. In this regard, a broad foundation of scientific publications was built up in the first place based on search terms like “business model”, “business engineering”, “value modeling”, “business model components and relations”, “business model dynamics” as well as related ones.

With the aim of considering the most significant ones, the final selection met some criteria. In detail, the literature had to be:

- of high-quality, which was guaranteed by selecting sources from highly-ranked (ISI impact factor > 1.5 and/or an “A” according to the Australian Research Council) journals (e.g. European Journal of Information Systems or Strategic Management Journal) and conferences; and
- highly-considered among scientists, which is reflected in the citation frequency on Thomson Reuters Web of Knowledge and Google Scholar.

In addition, few publications from lower-ranked journals and conferences as well as not-ranked textbooks have been chosen, since they provided promising insights on structural relations and thus should be included in a comprehensive analysis. As a result, 35 relevant publications have been selected and analyzed in detail.

Afterwards, the existing knowledge of interdependencies between business model components identified in these publications was mapped onto a unifying business model component framework which was developed prior to this study (please consider the succeeding section for more details). The mapping was achieved by gradually integrating all identified relations into the framework and labeling each relation with a corresponding literature source number for verification issues. This also allows an easy locating of details about the respective relation. Since the chosen literature considers some business examples, the practical impact is to some extent validated as well. Even though these examples stem from different industries, the derived dependencies are still general enough to attest them a general applicability.

The remainder of this paper is organized as follows. Section 2 comprises a brief discussion on business model research. Section 3 provides a concise analysis and illustration of the identified dependencies and interdependencies between business model components. Finally, section 4 summarizes the paper and gives an outlook on future business model research.

## DISCUSSION ON BUSINESS MODELS

Porter’s (2001) frequently quoted statement “The definition of business model is murky at best” points out that a multitude of definitions exist in literature (Al-Debei and Avison, 2010; Zott, Amit and Massa, 2010). This concern can be attributed to several causes of which Bieger and Reinhold (2011) identified three major ones. First, the term emerged in several scientific disciplines concurrently. Second, the concept embodies diverse theories. Third, starting with the “New Economy”, i.e. the transformation of traditional to digital business, business models are a rather young field of research.

Apart from textual definitions, the concept of business models is frequently also defined by its constituent components, which for themselves do not form a whole business model, but only specific parts of it (Osterwalder et al., 2005). While there have been several discussions pointing out dissent on the constituent components of business models since the beginning of business model research (Burkhart et al., 2011), recent attempts on developing general business model frameworks, which bundle the proposed components in literature, demonstrate progress in research. In this regard, the authors developed a general and unifying component framework based on an extensive literature analysis prior to the present study (cf. Krumeich et al., 2012). This Business Model Component Framework serves as a basis for the current undertaking, since it allows for mapping identified relations between the multitudes of proposed components and frameworks onto a unifying framework. To provide a common understanding, the framework consisting of twenty components grouped into five categories is briefly described in Figure 1 (due to space limitations please refer to the original source for more details).

The fact that business model components have structural relations between each other is undisputed; however, in business model literature these relations have not been explicitly discussed and analyzed resulting in a significant research gap (Burkhart et al., 2011). From a theoretical perspective, relations between components can exist in the form of dependencies or influences on other components. The case of a component being dependent on another, but also influencing this other component is called interdependency (Al-Debei and Avison, 2010), i.e. a mutual dependency (Wetzel, 2004). In particular, these (mutual) dependencies highlight the inherent dynamic of business models.

Several aspects emphasize the importance of knowledge of business model structure. Based on the close connections between components, changes resulting from external influencing factors can induce changes of other components (Stähler, 2001).

Thus, even small changes can call for various adaptations of related components (Bieger and Reinhold, 2011). These dependencies essentially affect the structure of business models and emphasize the dynamic of the concept (Demil and Lecocq, 2010). When updating a business model architecture, it is therefore important to consider and maintain an equilibrium of the components (Al-Debei and Avison, 2010; de Reuver and Haaker, 2009), i.e. no single component should be regarded or changed in isolation (Haaker, Faber and Bouwman, 2006; Kindström, 2010).

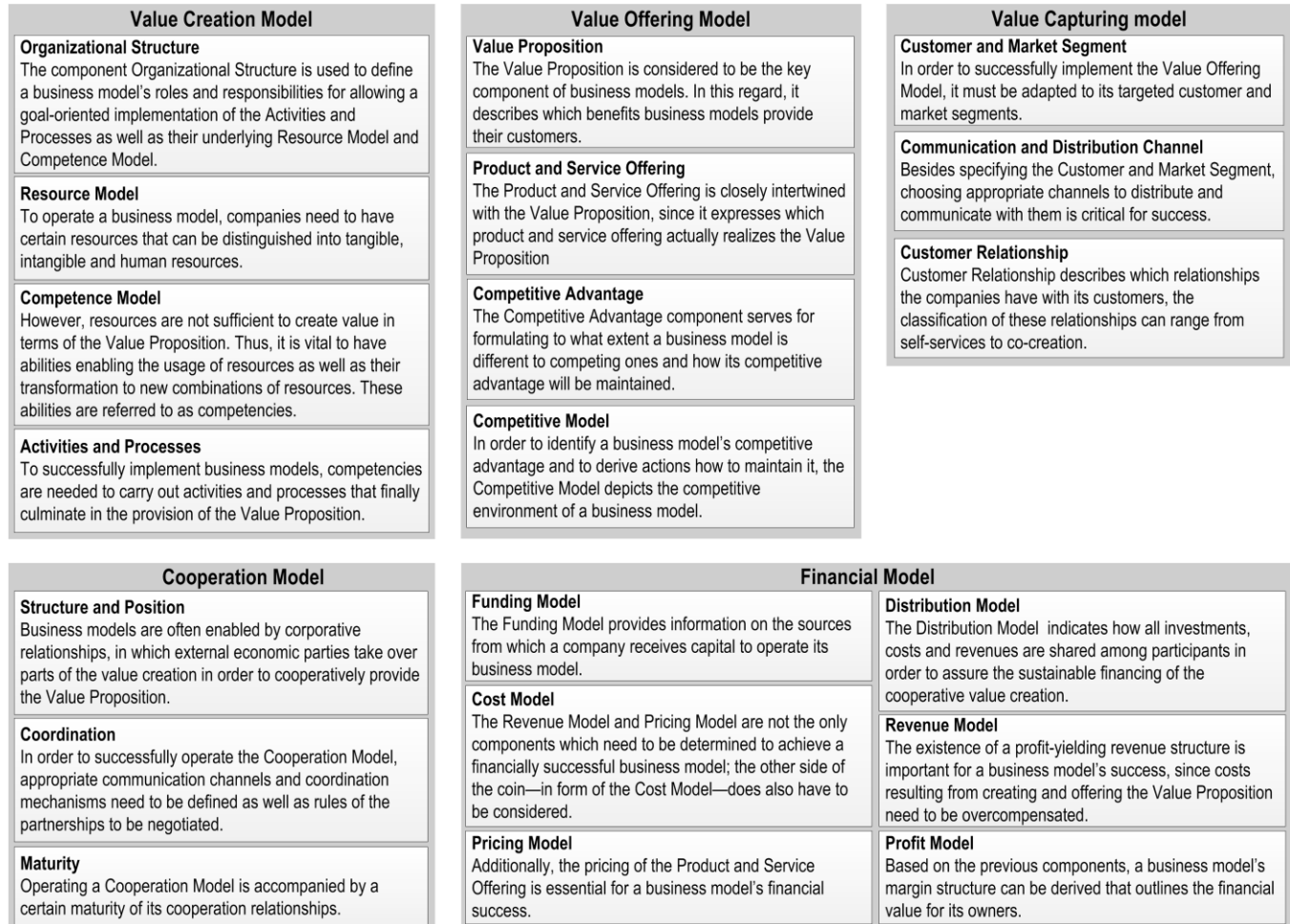


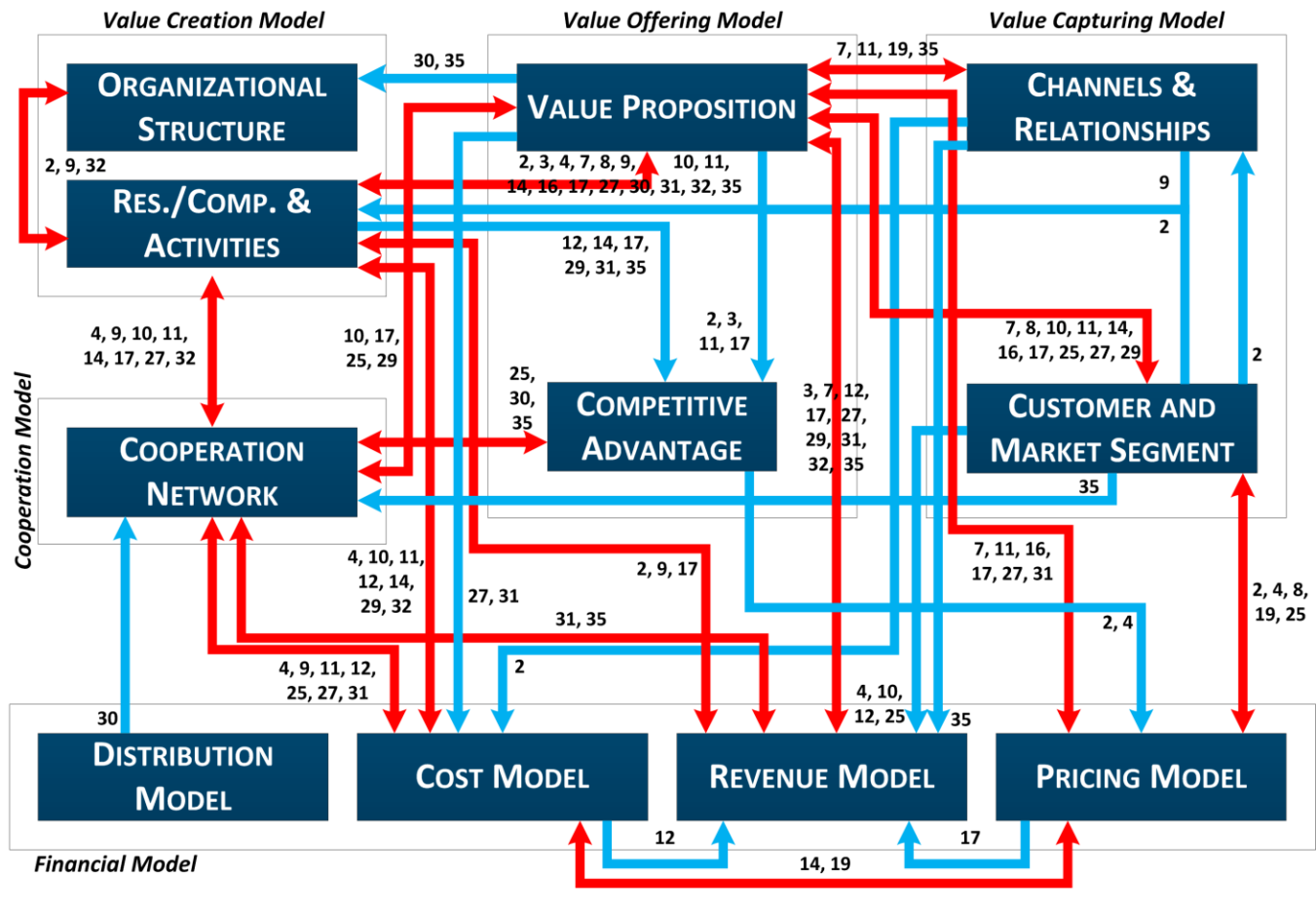
Figure 1. Business Model Component Framework (cf. Krumeich et al. (2012))

**INTERDEPENDENCIES BETWEEN BUSINESS MODEL COMPONENTS**

**Results of the Analysis**

Due to complexity of the analysis results, we reduced the Business Model Component Framework by combining structural coherent components and excluding those ones that have no structural significance. In the course of this, the components *resources*, *competencies* and *activities and processes* have been combined to the component bundle *Res./Comp. & Activities*. These components establish almost identical relations to other components and concurrently influence each other. The same applies for the components within the bundle *cooperation model*; the components *value proposition* and *product and service offering* within the *value offering model* and last but not least the components *channel* and *relationship* in the *value capturing model*. Finally, the components *profit model* and *funding model* have been omitted, since they do not add significant structural value.

Figure 2 shows the discovered dependencies between business model components. In the following, the most significant relations will be concisely illustrated. To clarify the figure in more detail, it should be noted that interdependencies are depicted in red color (resp. dark grey in black and white mode) while one-way dependencies are depicted in blue color (resp. light grey). Besides, the differentiation is symbolized by the directed arrow heads, which indicate the direction of influence.



**Literature Sources:**

- 1 Slywotzky (1996) 2 Linder and Cantrell (2000) 3 Mahadevan (2000) 4 Afuah and Tucci (2001) 5 Alt and Zimmermann (2001) 6 Petrovic et al. (2001) 7 Stähler (2001) 8 Wirtz (2001) 9 Bieger et al. (2002) 10 Chesbrough and Rosenbloom (2002) 11 Dubosson-Torbay et al. (2002) 12 Zu Knyphausen- and Meinhardt (2002) 13 Bouwman (2003) 14 Hedman and Kalling (2003) 15 Pateli and Giaglis (2003) 16 Haaker et al. (2004) 17 Wetzel (2004) 18 Yip (2004) 19 Morris et al. (2005) 20 Osterwalder et al. (2005) 21 Schweizer (2005) 22 Shafer et al. (2005) 23 Girmscheid (2006) 24 Kallio et al. (2006) 25 Aziz et al. (2008) 26 Ballon (2007) 27 Johnson et al. (2008) 28 Lambert (2008) 29 Richardson (2008) 30 Shi and Manning (2009) 31 Al-Debei and Avison (2010) 32 Demil and Lecocq (2010) 33 Onetti et al. (2010) 34 Osterwalder and Pigneur (2010) 35 Bieger and Reinhold (2011)

**Figure 2. Interdependencies between Business Model Components**

**Analysis on the Value Creation Model**

A value proposition including innovative product and service offerings needs a flexible organizational structure and flexible decision-making processes as a basis (Shi and Manning, 2009). Not only value propositions focusing innovation require a certain organizational structure, but also those focusing low costs. Bieger and Reinhold (2011) refer to EasyJet as an example. Their organizational structures are intentionally flat to keep costs low. Only by this, the cost-focused value proposition is feasible. The arrangement of the value proposition decides about the required resources resp. competencies and the activities for their production and execution. On the other hand, their quality has a significant impact on the design and feasibility of the value proposition yielding an interdependency (Hedman and Kalling, 2003; Johnson et al., 2008; Shi and Manning, 2009).

Particular core competencies are necessary to realize the choices regarding the design of marketing and distribution channels as well as the customer relationships (Bieger et al., 2002). The selection of channels and relationships influences the required competencies. The configuration of value activities depends upon the customer and market segment, e.g. if a large customer base is addressed, the net product can be maintained at a high level—supposing a corresponding sales and transaction volume (Linder and Cantrell, 2000).

An interdependency is exhibited between the supply chain configuration, i.e. the configuration of activities, and the revenue mechanisms (Wetzel, 2004). This is manifested by the fact that enterprises endeavor to execute those activities that are linked to high revenue expectations (Linder and Cantrell, 2000). Beyond that, Bieger et al. (2002) observe that particular core competencies are required to realize the revenue model. This closes the depend circle and yields an interdependency between

both components. The arrangement of the supply chain, novel combinations of existing resources and also the creation of new resources can lead to competitive advantages (Al-Debei and Avison, 2010; Hedman and Kalling, 2003; Wetzel, 2004).

Costs are caused by the procurement and production of resources as well as the transformation process with its value adding activities. Therefore, the cost model is influenced by resources and activities (Demil and Lecocq, 2010); an optimal implementation of the value adding processes can keep the arising costs at a reasonable level (Afuah and Tucci, 2003). Vice versa, the concrete implementation of the cost model (e.g. a low-cost strategy) must be reflected within the activities (Richardson, 2008) showing an interdependency between both components.

Resources within a company and especially competencies impact the decision which activities are executed within the company and which are outsourced to the cooperation network (Chesbrough and Rosenbloom, 2002), e.g. those activities that can be performed cheaper externally should be outsourced (Wetzel, 2004)—as long as no risks arise from the external dependency or from potential quality decreases (Aziz et al., 2008; Shi and Manning, 2009). Thus, the selection of a cooperation network, especially of supply companies, depends upon the own resources and competencies (Wetzel, 2004). The applicable resources also depend upon the supply of the cooperation network. If the quality of resources provided by the network decreases, the value-added process is affected, which may lead to insourcing them again (Hedman and Kalling, 2003).

### **Analysis on the Cooperation Model**

The cooperation network has indirect, but also direct influence on the value proposition. This can be exemplified by the quality of delivered resources that flow into the value proposition during the value adding activities. In contrast, providers of complementary goods or involved customers themselves—which can also be subsumed under the cooperation network—have direct impact on the actually realized value proposition, even if they do not enter the direct value-added process (Chesbrough and Rosenbloom, 2002; Wetzel, 2004). Additionally, the chosen value proposition influences the cooperation network because different actors have to fit in with the value proposition (Richardson, 2008).

The cooperation network can impact the competitive advantage. The quality of general partners or the number of involved customers in the sense of cooperation partners directly determines the competitive advantages of the own company (Aziz et al., 2008; Shi and Manning, 2009). In contrast to that, competitive advantages can change the own position within the cooperation network (Bieger and Reinhold, 2011).

The addressed customer and market segment can influence the cooperation network. If a business model targets for instance a large customer base, higher negotiating power is present and the own position can be improved, which is exemplified based on budget airlines by Bieger and Reinhold (2011).

The cooperation network can exert influence on the revenue model, since revenue mechanisms can become ineffective. This can be due to the cooperation partners' reactions to a company's technical innovations changing the company's position within the network (Bieger and Reinhold, 2011). The chosen revenue model might affect the cooperation with certain payment partners.

Besides the indirect cost generation of the cooperation network, for instance when acquiring commodities, direct effects can be assessed as well. Transaction costs and especially coordination costs arise between the focal company and its cooperation partners (Bieger et al., 2002; Johnson et al., 2008). The interaction of both components also becomes evident when considering cost savings via outsourcing. Partners might be able to execute activities more efficiently while the value proposition for the customer stays the same (Aziz et al., 2008). Decreasing transaction costs encourage the network building process and lead to a higher vertical disintegration (Dubosson-Torbay et al., 2002).

The distribution model also affects the cooperation model. If a change is performed or scheduled herein, like allocating cooperation companies a lower share of profit or revenue, this can lead some actors to switch into a competing cooperation network (Shi and Manning, 2009).

### **Analysis on the Value Offering Model**

Communication and distribution channels impact the value proposition; moreover, they sometimes enable them in the first place, which is often exemplified by eBay (Stähler, 2001). The channels are also important for establishing customer relationships based on a targeted value proposition (Dubosson-Torbay et al., 2002). The closer the customer relationships, the better a sense for their needs evolves, leading to aimed adaptations of the value proposition (Dubosson-Torbay et al., 2002). On the contrary, the design of the value proposition influences the selection of channels and customer relationships (Bieger and Reinhold, 2011; Morris et al., 2005). Especially those value propositions having customers pay high prices often underlie a long-term customer relationship instead of a transactional one.

In order to be perceived as intentioned and to generate the promised benefit, the value proposition and its realizing product and service offerings have to be adjusted to the needs of the customers and markets (Johnson et al., 2008; Richardson, 2008). A change of customer needs has the potential to compromise the value proposition (Stähler, 2001). The value proposition

should not only be adapted to the customer and market segment, the segment also has to be chosen accordingly to the value proposition (Chesbrough and Rosenbloom, 2002; Haaker et al., 2004). However, the value proposition does not only determine the selection of segments, it can also exert a direct influence on customer and market segments, e.g. if a new offering is highly innovative and triggers a market breakthrough.

The product and service offering has an effect on the price fixings (Dubosson-Torbay et al., 2002). This relation mainly results from the customers' willingness to pay, which is determined by the desired benefit (Johnson et al., 2008). A particular pricing model can on the other hand influence the value proposition, which is again exemplified by Stähler (2001) based on eBay. Their innovative pricing model resulted in a novel value proposition.

In addition, the arrangement of the revenue model can influence the value proposition (Richardson, 2008; Stähler, 2001). In case of an innovative revenue structure even new value propositions can be created (Johnson et al., 2008)—refer for instance to prepaid models of mobile communications providers. However, the design of the product and service offering also induces a certain revenue mechanism (Bieger and Reinhold, 2011). It is often considered as a rule of the industry which revenue models are used for which products (zu Knyphausen-Aufseß and Meinhardt, 2002). Apart from that, the product and service offering determines to a high degree which revenues resp. profits are generated. At this point, it is illustrated how business model innovation can take place: traditional dependencies, i.e. the rules of an industry or market, are abandoned and new compositions are realized (Stähler, 2001).

The value proposition and product and service offering strongly determine the competitive advantage if they for example provide (technical) superiority. Furthermore, competitive advantages can result from an adequately customer-focused value proposition as long as it matches the customers' preferences (Dubosson-Torbay et al., 2002), take the computer manufacturer Dell as an appropriate example. The more robust a value proposition, i.e. regarding the barriers to entry for potential competitors, the longer competitive advantages can be maintained (Mahadevan, 2000).

Johnson et al. (2008) point out the value proposition's impact on the cost model, since it incurs costs to realize it. However, this impact is rather indirect because these costs incur due to the usage of resources as well as the implementation of activities. Nevertheless, costs can also be caused from the product and service offering while not directly linked to value creating activities, e.g. costs for guarantees and warranties.

Competitive advantages can be used to obtain higher prices for the corresponding value proposition, e.g. if underlying product or service offerings provide additional value compared to competitors resulting in a higher willingness to pay (Afuah and Tucci, 2003). Moreover, competitive advantages stemming from a very efficient value creation or a market dominance can also be used to offer very competitive prices.

### **Analysis on the Value Capturing Model**

The selection and arrangement of distribution and marketing channels as well as relations to customers depend significantly on the customer and market segment that is actually addressed (Linder and Cantrell, 2000).

The arrangement of customer relations can in turn influence the revenue model. In this regard, long-term customer relations often result in increased share-of-wallet; on the other hand, transactional relations often allow higher overall revenues volumes regardless of specific customers. However, this is accompanied by a lower quality in terms of the product and service offering prices (Bieger and Reinhold, 2011).

The arrangement and selection of channels have direct impact on the cost model. Consequently, an existing business model that is unprofitable in terms of costs can become very profitable when aligned to new channels, e.g. the Internet, since the cost structure will be noticeably optimized (Linder and Cantrell, 2000).

Obviously, the price model directly impacts the customer and market segments (Linder and Cantrell, 2000). For example, if a market penetration price policy is followed, i.e. the prices are kept very low, a large group of customers is addressed. On the other hand, following a high price policy, only a small selection of customers will be addressed (Morris et al., 2005). Accordingly, the price model needs to be aligned to the chosen customer and market segment, since they only have a specific willingness to pay (Afuah and Tucci, 2003).

The greater the size of a chosen customer segment, the more likely the probability to generate a higher quantity of revenues (Afuah and Tucci, 2003). Hence, the selection of the customer segment has a direct impact on the revenue model (Chesbrough and Rosenbloom, 2002).

### **Analysis on the Financial Model**

According to zu Knyphausen-Aufseß (2002), the revenue model is dependent on a company's cost structure. As a result, costs that are independent from value creating activities should be compensated by usage-independent revenues.

Moreover, the cost model impacts the price model, since for example a low price strategy requires a low cost strategy in general (Hedman and Kalling, 2003). The opposite relation is stated by Morris et al. (2005); however, it should be pointed out that a low cost strategy does not necessarily imply a low price strategy.

The pricing of the product and service offering influences the revenue mechanisms, since customers with a low willingness to pay are more willingly to make transactional independent payments (Wetzel, 2004).

### Limitations of the Study

The aim of this study was to bundle the existing, but heterogeneous and implicitly given knowledge of the internal structure of business models in literature and to depict it in an abstract manner. It was not the objective to outline actual recommendations regarding which changes to the internal structure of business models should be done in order to increase a business model's success. This is incumbent on subjective decisions made by executives. Nevertheless, based on the knowledge gained and formalized through this study, these decisions can be influenced in a positive way, since the obtained insights on the internal structure of business models help to figure out which implications exist to other components due to changing or influencing one component.

Another limitation of the study is that the discovered dependencies and interdependencies make no claim to be exhaustive. Since the structural relations were discovered based on a literature analysis in an exploratory manner, they should also be empirically underpinned, refined and extended in future works. This could be achieved by means of expert interviews.

### CONCLUSION AND FUTURE RESEARCH

This paper has provided a comprehensive analysis of business model literature with the objective of discovering structural relations between business model components. The identified dependencies and interdependencies could be mapped on the Business Model Component Framework, which was developed prior to the current analysis by the authors. The analysis clearly revealed that there is indeed knowledge of the structural relations between business model components in literature; it concurrently confirmed that this knowledge is only hardly applied and described in an explicit manner. Hence, this paper outlines the first approach of bundling this implicit given knowledge and depicting it on an abstract level.

Future research will include the empirically underpinning of the findings of this paper, since they mainly stem from theoretical studies given in literature. This will be conducted through expert interviews. Additionally, analysis regarding industry-specific structural relations will be carried out based on the general results and insights revealed through this paper.

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