

**Opening Up the Business Model:
Business Model Innovation through Collaboration**

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ABSTRACT

In recent years, market entrants with innovative business models have radically changed entire industries. Increasingly, established firms realize that product and process innovations alone are not sufficient to stay competitive in today's fast-moving economy. Innovation must also be applied to a firm's core logic of doing business, its business model. As a topic in research, business model innovation has emerged over the past few years and its empirical foundations are still weak. This is particularly true for research on open business models, in which a focal firm incorporates capabilities and resources of independent partners into the logic of its own value creation and capturing. Opening up the business model for partners is a managerial task which has hardly been studied. Extant research falls short in providing relevant insights into the antecedents, processes, design practices, and implementation issues of open business models.

This paper-based dissertation aims to contribute to the knowledge on achieving business model openness in established firms. It is structured into an introduction to the topic, followed by five independent research articles. The first two articles serve to establish a foundation by clarifying two issues in the underlying streams of research: the exact meaning of the open business model as a concept and the process of innovating the business model in established firms. The remaining three articles then combine the two streams and use the process structure developed to study key issues of opening up the business model: (1) Initiation – What are the specific antecedents which promote an opening-up of business models in established firms?; (2) Integration – What are causal relationships in the design of partner networks underlying open business models and how can they be explained?; (3) Implementation – How can a focal firm be supported in the implementation of a business model which commercializes its ecosystem?

By studying the above research questions, the articles compiled in this thesis contribute to the knowledge on managing business model innovation in established firms, with a particular focus on openness and collaboration. The thesis thereby contributes highly relevant empirical findings to a nascent research area. Its results and recommendations are intended to improve managerial practices of achieving business model innovation in an increasingly interconnected business reality.

ZUSAMMENFASSUNG

In den letzten Jahren haben neue Marktteilnehmer mit innovativen Geschäftsmodellen ganze Industrien umgewälzt. Etablierte Unternehmen erkennen zunehmend, dass Produkt- und Prozessinnovationen nicht mehr ausreichen um in der schnelllebigen Wirtschaftswelt wettbewerbsfähig zu bleiben. Innovation muss auch an der Kernlogik der Geschäftstätigkeit, dem Geschäftsmodell, ansetzen. In der Forschung hat sich das Thema Geschäftsmodellinnovation erst in den vergangenen Jahren herausgebildet und seine empirischen Wurzeln sind noch schwach. Dies betrifft insbesondere die Forschung zu offenen Geschäftsmodellen, in denen ein fokales Unternehmen Fähigkeiten und Ressourcen unabhängiger Partner in die Logik seiner Wertschöpfung und Wertabschöpfung integriert. Das Geschäftsmodell für Partner zu öffnen ist eine Managementaufgabe, die bislang nur unzureichend untersucht wurde. Bestehende Arbeiten bieten nur wenige relevante Einblicke in Auslöser, Prozesse, Designpraktiken und Umsetzungsschwierigkeiten offener Geschäftsmodelle.

Diese kumulative Dissertation zielt darauf ab Wissen über das Erreichen von Offenheit im Geschäftsmodell etablierter Firmen zu generieren. Sie gliedert sich in eine thematische Einführung, gefolgt von fünf unabhängigen Forschungsartikeln. Die ersten beiden Artikel bilden das Fundament indem sie zwei Fragestellungen in den zugrunde liegenden Forschungsströmen klären: Die exakte Bedeutung des Konzepts des offenen Geschäftsmodells und den Prozess der Geschäftsmodellinnovation in etablierten Firmen. Die übrigen drei Artikel kombinieren die beiden Strömungen auf Basis der zuvor entwickelten Prozessstruktur und untersuchen drei Kernfragestellungen: (1) Initiierung – Welche Faktoren begünstigen die Öffnung des Geschäftsmodells in etablierten Firmen?; (2) Integration – Welche kausalen Zusammenhänge gelten bei der Gestaltung von Partnernetzwerken für offene Geschäftsmodelle und wie sind sie erklärbar?; (3) Implementierung – Wie kann eine fokale Firma in der Umsetzung eines Geschäftsmodells, das ihr Ökosystem kommerzialisiert, unterstützt werden?

Durch das Studium dieser Forschungsfragen tragen die in dieser Dissertation zusammengestellten Artikel zum Wissen über das Management von Geschäftsmodellinnovationen in etablierten Firmen bei, insbesondere solche durch Zusammenarbeit mit Partnern. Die Arbeit erzielt hochrelevante empirische Erkenntnisse in einem noch jungen Forschungsgebiet. Ihre Resultate und Empfehlungen sollen helfen die Managementpraxis im Hinblick auf das Erreichen von Geschäftsmodellinnovation in einer immer stärker verflochtenen Geschäftswelt zu verbessern.

Chapter 1

Introduction

Abstract

This introductory chapter to my paper-based dissertation provides the overall background and framing for the compilation of articles that follows. It starts out by exploring why opening up for collaboration and partnerships is a promising option for established firms to innovate their business model and to thereby realize the positive outcomes generally linked to this new form of innovation. Subsequently, the existing bodies of knowledge behind (open) business models and business model innovation are concisely summarized. Contrasting practical relevance and existing knowledge, a general need for research is identified at the intersection of both fields: how can established firms open up their business model to utilize partnerships and collaboration in creating and capturing new value?

The second half of this chapter then serves to break down this broad main research question into a set of five sub-research questions, which are investigated independently within the five articles compiled in this thesis. These five articles are briefly summarized and related to each other, before a brief outlook concludes this introductory chapter.

1 THE CASE FOR OPENING UP THE BUSINESS MODEL

A business model describes “how a firm organizes itself to create and distribute value in a profitable manner” (Baden-Fuller & Morgan, 2010, p. 157). Consciously or not, every firm has (at least) one business model (Casadesus-Masanell & Ricart, 2010; Chesbrough, 2007a). This business model was taken as a given for a long time, as it represented the ‘dominant logic’ of doing business in the firm’s industry (Gassmann, Frankenberger, & Csik, 2013; Lehoux, Daudelin, Williams-Jones, Denis, & Longo, 2014; Prahalad & Bettis, 1986). Stable business models based on integrated manufacturing, in-house research & development, direct sales, and per-unit prices were the norm for the largest part of the 20th century (Massa & Tucci, 2014; Slywotzky, 1996, p. 27/28). In recent years, however, disruptive market entrants have demonstrated the power of innovative business models and turned the dominant logic of entire industries upside down. Apple’s invasion into the music industry or Ikea’s conquest of furniture retail are frequently cited examples (Giesen, Berman, Bell, & Blitz, 2007). As a result, the business model has changed its place in executives’ attention: increasingly, established firms realize that product and process innovation alone are not sufficient to stay competitive in today’s fast-moving economy (Massa & Tucci, 2014). Instead, innovation efforts must also be applied to a firm’s core logic of doing business, its business model.

Business model innovation is today recognized as an important lever to achieve competitive advantage (Amit & Zott, 2012; Economist Intelligence Unit, 2005). Practitioner studies attribute higher profitability to firms undertaking business model innovations (BCG, 2008) and locate the topic high up on CEOs’ agendas (IBM Global Business Services, 2008). Business model innovation is described as decisive for sustained firm success (Amit & Zott, 2012) and a key ingredient for the successful commercialization of technology (Chesbrough & Rosenbloom, 2002; Chesbrough, 2010).

There are numerous generic strategies and directions which firms can follow to innovate their business model (e.g., Amit & Zott, 2001, 2012; Giesen et al., 2007; Markides & Oyon, 2010; Mitchell & Coles, 2004a). None of these directions is a panacea which works in all contexts or industries. One particular direction, however, stands out as a characteristic found in many successful business model innovations across industries: the companies portrayed have adopted ‘open’ business models, in which novel ways of collaborating with partners play a pivotal role. It is, for instance, hard to imagine the

success of Apple's iPhone without the armada of independent software developers who ensure a constant flow of new 'apps' to Apple's demanding customers (Amit & Zott, 2012). Similarly, enterprise software vendor SAP could hardly have become Europe's largest software company without its partners who account for one third of product sales and deliver the vast majority of SAP-related services (Antero, Hedman, & Henningsson, 2013; Frankenberger, Weiblen, & Gassmann, 2013). Lastly, consumer goods giant Procter&Gamble would hardly be as innovative as it is without its Connect+Develop program which is the source of about half of its new products (Huston & Sakkab, 2006).

Empirical evidence suggests that opening up their business model for collaboration with partners is a promising route for established firms to stay successful. IBM's CEO Survey 2012 reveals that achieving innovation is the strongest motive for top executives to seek collaboration with partners and that the group of companies which are financially most successful partner more extensively. Overall, 69% of the surveyed CEOs in 2012 responded that they were planning to 'partner extensively' – up 14% from a survey four years earlier (IBM Global Business Services, 2012). A study based on a similar survey by Giesen et al. (2007) shows that 'network plays' (i.e., new partnerships and collaboration) are the most common form of business model innovation in established firms and that they are particularly effective for older companies, as they allow to leverage existing assets in a new context. Lastly, Chesbrough (2006, 2007b) argues based on a collection of prominent cases that established firms which want to survive in the long run must embrace the opportunities which openness holds for them and adapt their traditionally closed business models.

Business model research has largely identified two obstacles on the way to an open business model. First, unlike new ventures, established firms face considerable rigidities and other challenges when innovating their business model (Chesbrough, 2010; Frankenberger, Weiblen, Csik, & Gassmann, 2013). Innovation management research has only started to examine the process behind business model innovation and to provide tools and guidance to support this task (Björkdahl & Holmén, 2013; Eurich, Weiblen, & Breitenmoser, 2014; Schneider & Spieth, 2013). Second, many open questions remain around the design of successful open business models, their ideal setup and implementation. Although Venkatraman and Henderson (2008, p. 262) postulate that "business model innovation is to be framed in network-centric (rather than firm-centric) terms with greater recognition of co-creation of value", research concerning this exact co-creation of value in open business models is still in its infancy (Coombes & Nicholson, 2013).

The compilation of research articles in this thesis aims to contribute to the body of knowledge on open business models and to the management of related business model innovation efforts in established firms. The following two sections provide a state-of-the-art overview of the literature in the (open) business model and business model innovation fields. Subsequently, this theoretical basis is used to substantiate the research questions underlying this thesis. Lastly, section four presents the structure of the thesis in context before an outlook concludes this introductory chapter.

2 LITERATURE REVIEW

Research on the business model and its innovation is a young, but nonetheless very active, field, which is characterized by ambiguities and ongoing conceptual discussions (DaSilva & Trkman, 2014). The following sections aim to find a balance between providing a general foundation and detailing those aspects which are relevant for the remaining chapters of the thesis.

2.1 BUSINESS MODELS AND OPENNESS

The business model, as a concept in research, emerged with the dot.com boom (DaSilva & Trkman, 2014; Magretta, 2002) to describe “how a firm organizes itself to create and distribute value in a profitable manner” (Baden-Fuller & Morgan, 2010, p. 157). Due to its origin in practice and its ubiquity in the popular press, research still struggles in providing a unified and generally accepted definition of the concept (DaSilva & Trkman, 2014; George & Bock, 2011). Researchers from different domains (namely e-business and information technology, strategy, and innovation and technology management) have independently used and developed the concept in silos (Zott, Amit, & Massa, 2011). For my work, I assume the business model definition by David Teece, which is sufficiently broad to capture most research conducted in the business model domain:

“A business model describes the design or architecture of the value creation, delivery and capture mechanisms employed [by a particular business].” (Teece, 2010, p. 191)

Some researchers explicitly consider boundary-spanning activities (e.g., Shafer, Smith, & Linder, 2005; Zott & Amit, 2007, 2010) or collaboration with partners (Al-Debei & Avison, 2010; Osterwalder, Pigneur, & Tucci, 2005; Teece, 2010) an integral part of business models, whereas others don't (e.g., Afuah & Tucci, 2001; Linder & Cantrell,

2001; Morris, Schindehutte, & Allen, 2005). Chesbrough (2006) introduced a distinction between two types of business models by coining the term “open business model”. Originally, it was used to describe value creation in the context of open innovation (Chesbrough, 2007b), later more broadly to describe openness in “all the aspects of [the] business model” (Sandulli & Chesbrough, 2009, p. 20). Open business models can be seen as a subclass of business models in which collaboration of the focal firm with its partner ecosystem is a central element of value creation and capturing (see Chapter 2 for a detailed derivation and discussion). Extending the above definition, the open business model can hence be defined as follows:

“An open business model describes the design or architecture of the value creation and value capturing of a focal firm, in which collaborative relationships with the ecosystem are central to explaining the overall logic.” (Weiblen, 2014, p. 57)

Owing to its newness as a concept in research and its mixed origins in different domains, a huge part of (open) business model literature is concerned with conceptual topics such as finding a definition, enumerating components which make up a business model, developing representational forms, clarifying relations to the strategy domain, or discussing the role of openness and partnerships. Empirical work, which is mainly qualitative in nature, studies specific instances of business models (e.g., non-profit or social business models, e-commerce business models), the role of technology for business models, or performance implications of certain business model configurations. Table 1 provides an overview of these major literature streams in the (open) business model field.

Table 1: Literature review on (open) business models

Conceptual	Definitions, components	(Afuah & Tucci, 2001; Arend, 2013; DaSilva & Trkman, 2014; George & Bock, 2011; Hedman & Kalling, 2003; Johnson, Christensen, & Kagermann, 2008; Klang, Wallnöfer, & Hacklin, 2014; Magretta, 2002; Morris et al., 2005; Osterwalder et al., 2005; Pateli & Giaglis, 2004; Perkmann & Spicer, 2010; Shafer et al., 2005; Teece, 2010; Zott et al., 2011)
	Representations	(Al-Debei & Avison, 2010; Casadesus-Masanell & Ricart, 2011; Kiani, Gholamian, Hamzehei, & Hosseini, 2009; Osterwalder & Pigneur, 2010; Osterwalder, 2004; Pateli & Giaglis, 2004; Samavi, Yu, & Topaloglou, 2009)
	Relations to strategy	(Abraham, 2013; Al-Debei & Avison, 2010; Casadesus-Masanell & Ricart, 2010; DaSilva & Trkman, 2014; Richardson, 2008; Shafer et al., 2005)
	Role of openness	(Chesbrough, 2006, 2007b; Coombes & Nicholson, 2013; Mason & Spring, 2011; Sandulli & Chesbrough, 2009; Weiblen, 2014; Zott & Amit, 2009)
Empirical	Non-profit	(Seelos & Mair, 2007; Thompson & MacMillan, 2010; Yunus, Moingeon, & Lehmann-Ortega, 2010)
	E-business and IT	(Isckia & Lescop, 2009; Rappa, 2001, 2004; Tapscott, Ticoll, & Lowy, 2000; Timmers, 1998; Weill & Vitale, 2001; Wirtz, Schilke, & Ullrich, 2010)
	Technology	(Björkdahl, 2009; Calia, Guerrini, & Moura, 2007; Chesbrough & Rosenbloom, 2002; Chesbrough, 2007a; Desyllas & Sako, 2013; Doganova & Eyquem-Renault, 2009; Gambardella & McGahan, 2010; Holm, Günzel, & Ulhøi, 2013; Lehoux et al., 2014; Pateli & Giaglis, 2005)
	Performance	(Alexy & George, 2011; Amit & Zott, 2001; Frankenberger, Weiblen, & Gassmann, 2013; Malone et al., 2006; Weill, Malone, & Apel, 2011; Zott & Amit, 2007)

Table 2 gives a tabular overview of selected publications in the (open) business model domain and summarizes the key findings which are particularly relevant for this thesis.

Table 2: Selected literature on (open) business models

Article	Title	Research type / sample	Key findings
(Al-Debei & Avison, 2010)	Developing a unified framework of the business model concept	conceptual	<ul style="list-style-type: none"> the BM concept provides a link between the strategy and operational layers of an enterprise the BM can be used to align strategy and the process level / IT
(Amit & Zott, 2001)	Value creation in E-business	case study / 59 cases	<ul style="list-style-type: none"> existing research fields hold important implications for e-business model research: virtual markets, value chain analysis, innovation, resource-based view, strategic networks, transaction cost economics locus of value creation often is the network, not the single firm

Article	Title	Research type / sample	Key findings
(Baden-Fuller & Haefliger, 2013)	Business models and technological innovation	conceptual	<ul style="list-style-type: none"> interactions between technology and BM are complex, particularly in two-sided BMs BM openness and user engagement are two most important choices which influence technological and firm development
(Chesbrough & Rosenbloom, 2002)	The role of the business model in capturing value from innovation	case study / 7 cases	<ul style="list-style-type: none"> the BM acts as a mediating construct between technology and economic value only the right BM can unlock the economic potential of a technology
(Coombes & Nicholson, 2013)	Business models and their relationship with marketing: A systematic literature review	review	<ul style="list-style-type: none"> BM so far understudied in marketing domain but has great potential for theory and practice OBM is a valuable concept to study value co-creation for and with the customer
(Holm et al., 2013)	Openness in innovation and business models: lessons from the newspaper industry	case study / 2 cases	<ul style="list-style-type: none"> the term ‘openness’ in innovation is different from its use in BM BM openness can be categorized on the inward/outward and broad/deep dimensions BM openness induces dependency on other firms’ capabilities and assets; potential ‘pro-bias’ in existing literature
(Mason & Spring, 2011)	The sites and practices of business models	conceptual / 1 case	<ul style="list-style-type: none"> 3 core elements of BM: technology, network architecture, market offering new BMs cause other players’ BMs to change; BMs are interlinked entities
(Morris et al., 2005)	The entrepreneur's business model: toward a unified perspective	conceptual	<ul style="list-style-type: none"> a BM links economic, strategic, and operational choices choices to be made on three levels: foundation, proprietary, rules internal fit between BM components is important
(Osterwalder & Pigneur, 2010)	Business Model Generation	conceptual / illustrative cases	<ul style="list-style-type: none"> graphical representation of BMs is important for joint BM development and communication BM patterns occur in BMs across different industries
(Purdy, Robinson, & Wei, 2012)	Three new business models for “the open firm”	conceptual / illustrative cases	<ul style="list-style-type: none"> OBM occurs in typical patterns economic benefits and increased complexity need to be balanced openness requires specific management decisions and skills
(Storbacka, Frow, Nenonen, & Payne, 2012)	Designing business models for value co-creation	conceptual	<ul style="list-style-type: none"> BM as important unit of analysis of value co-creation in networks a focal network actor needs to develop value proposition for its partners OBM fit needs to be achieved intra-actor and inter-actor

Article	Title	Research type / sample	Key findings
(Weill et al., 2011)	The business models investors prefer	quantitative / N=10'000	<ul style="list-style-type: none"> business models can be assigned to one of 14 types the stock market particularly values business models based on innovation and IP
(Zott & Amit, 2009)	The business model as the engine of network-based strategies	conceptual	<ul style="list-style-type: none"> the BM in a networked world explains how a focal firm is embedded into its network with other firms design of boundary-spanning activities and governance are central management tasks
(Zott & Amit, 2013)	The business model: A theoretically anchored robust construct for strategic analysis	conceptual	<ul style="list-style-type: none"> value chain concept does not suffice to study today's value creation processes literature streams of BM and business ecosystems are related as both go beyond firm boundaries BM concept is anchored on a focal firm

Fostered by factors such as globalization, technological progress, or industry convergence, the way in which firms create and capture value has changed over recent years. New and more collaborative forms of doing business, such as collaborative networks (Romero & Molina, 2011), business ecosystems (Moore, 1993, 1996), or multisided platforms (Hagiu & Yoffie, 2009) have emerged. Leading scholars in the field of business models have argued that these more open forms of value creation and capturing profit from using the business model as an analytical device (Baden-Fuller & Mangematin, 2013; Zott & Amit, 2013). Zott and Amit highlight that the business model “[...] is centered on a firm, yet spans focal firm boundaries by including stakeholders with which the firm interacts when it produces and delivers value” (2013, p. 405). Baden-Fuller and Haefliger (2013, p. 424) underline the relevance and innovation potential of these new types of business models when they state: “For managers, the ecosystems perspective holds the promise of opening up the wider entrepreneurial and collaborative space that a new technology affords – and provides room for novel business models to succeed.”

While, overall, the empirical foundations of business model research are characterized as rather thin (Coombes & Nicholson, 2013), this is particularly true for research on open business models. In this subfield, anecdotal evidence is at the basis of seminal works (Chesbrough, 2006, 2007b; Mason & Spring, 2011). Specific challenges of openness, such as aligning the business models of all actors (Lindgren, Taran, & Boer, 2010; Solaimani, Bouwman, & Itälä, 2013), creating separate value propositions for customers and potential partners (Storbacka et al., 2012), or managing the dependency

on third-party assets (Holm et al., 2013) have been identified and described, but not solved. Despite the relevance and potential of firm openness in today's networked economy, the majority of extant business model research is firm centric (Storbacka et al., 2012; Klang et al., 2014) and aspects and effects of openness are not sufficiently understood (Holm et al., 2013). Contributing to closing this gap through empirical research is a goal of my work.

2.2 BUSINESS MODEL INNOVATION

An innovative business model can be a source of superior performance and competitive advantage even in mature industries (Amit & Zott, 2012). In the context of established firms, understanding the managerial process of developing and implementing a novel business model is hence of particular relevance. The research field of business model innovation studies the purposeful process of changing a firm's business model. Two of the few formal definitions in the literature shall define the term for this thesis:

“[...] designing a new, or modifying the firm's extant activity system – a process which we refer to as business model innovation [...]” (Amit & Zott, 2010, p. 2)

“Business-model innovation is the discovery of a fundamentally different business model in an existing business.” (Markides, 2006, p. 20)

The notion that the business model itself can be the subject of an organization's systematic innovation efforts has aroused increasing interest from theory and practice over recent years (Amit & Zott, 2012; Schneider & Spieth, 2013). At root, a business model innovation in an established firm can be described as the process of reconfiguring its value creation and capture mechanisms, resulting in a novel or even unique way of doing business (Björkdahl & Holmén, 2013; Massa & Tucci, 2014). Technically, business model innovation is achieved by changing at least one of the constituting elements of a business model (Abdelkafi, Makhotin, & Posselt, 2013; Demil & Lecocq, 2010; Lindgardt, Reeves, Stalk, & Deimler, 2009). Scholars in the field do not agree in the meaning of 'novelty' in this context, i.e., whether the newness relates to the firm (e.g., Amit & Zott, 2012; Björkdahl & Holmén, 2013), to the industry (e.g., Johnson et al., 2008; Snihur & Zott, 2013), or even to the world (e.g., Thompson & MacMillan, 2010). For the purpose of this thesis, which is most interested in the ways openness can be introduced into a business model, an agnostic view of the form of newness is assumed.

Similar equivocality of perceptions exists concerning the question whether business model innovation implies changing or replacing the firm's current business model (e.g., Massa & Tucci, 2014; Santos, Spector, & Van Der Heyden, 2009). Prominent examples from the literature base suggest that there is a wider array of options to take new business models to market, such as launching spin-offs (Chesbrough & Rosenbloom, 2002) or running several business models in parallel (Markides & Charitou, 2004; Markides & Oyon, 2010). The latter option is often found in large corporations, where the overall corporation and its business units have different business models (Aspara, Lamberg, Laukia, & Tikkanen, 2013; Trapp, 2014). To stay generic and unbiased by organization specifics, this thesis does not consider or investigate the organizational form of new business model implementation.

Overall, there is a wide consensus among innovation management scholars that business model innovation must be seen as a new class of innovation which is different from other forms, such as product- or process innovation (Baden-Fuller & Haefliger, 2013; Björkdahl & Holmén, 2013; Massa & Tucci, 2014). Business model innovation is characterized as being both more complex to achieve and potentially more rewarding than other forms of innovation (Lindgardt et al., 2009; Schallmo & Brecht, 2010; Snihur & Zott, 2013). Other scholars have termed the subject as business model evolution (Demil & Lecocq, 2010) or business model renewal (Doz & Kosonen, 2010). Literature in the area is, overall, mostly empirically driven and deals with organizational and managerial issues of innovating the business model. It is mainly centered on three themes: prerequisites and challenges, process and elements, and effects and results of business model innovation (Schneider & Spieth, 2013). Table 3 provides an overview of the literature base along these themes.

Table 3: Literature review on business model innovation

Prerequisites and challenges	(Amit & Zott, 2013; Berglund & Sandström, 2013; Chesbrough, 2010; Desyllas & Sako, 2013; Doz & Kosonen, 2010; Frankenberger, Weiblen, Csik, et al., 2013; Linder & Cantrell, 2001; Sinfield, Calder, McConnell, & Colson, 2012)
Process and Elements	(Bucherer, Eisert, & Gassmann, 2012; Chesbrough, 2007a; de Reuver, Bouwman, & Haaker, 2013; Demil & Lecocq, 2010; Enkel & Gassmann, 2010; Eurich et al., 2014; Frankenberger, Weiblen, Csik, et al., 2013; McGrath, 2010; Mitchell & Coles, 2004b; Rohrbeck, Konnertz, & Knab, 2013; Santos et al., 2009; Smith, Binns, & Tushman, 2010; Sosna, Trevinyo-Rodríguez, & Velamuri, 2010)
Effects and results	(Bock, Opsahl, George, & Gann, 2012; Casadesus-Masanell & Zhu, 2013; Desyllas & Sako, 2013; Gambardella & McGahan, 2010; Massa & Tucci, 2014; Matzler, Bailom, von den Eichen, & Kohler, 2013; Mitchell & Coles, 2003; Sabatier, Mangematin, & Rousselle, 2010)

Table 4 provides a tabular overview of those articles which are particularly relevant for this thesis.

Table 4: Selected literature on business model innovation

Article	Title	Research type / sample	Key findings
(Amit & Zott, 2012)	Creating Value through Business Model Innovation	conceptual / illustrative cases	<ul style="list-style-type: none"> • four drivers of BMI: novelty, lock-in, complementarities, efficiency • designing partner networks and ecosystems is an important part of BMI • holistic and systemic thinking is required to achieve BM consistency
(Berglund & Sandström, 2013)	Business model innovation from an open systems perspective: structural challenges and managerial solutions	conceptual	<ul style="list-style-type: none"> • although BM is acknowledged as a boundary-spanning concept, BMI research is usually firm-centric • the likelihood of BMI success depends on a multitude of factors in managing and incentivizing partners
(Bucherer et al., 2012)	Towards systematic business model innovation: Lessons from product innovation management	case study / 11 cases	<ul style="list-style-type: none"> • similarities exist in between product innovation and BMI, but also differences • BMI currently lacks normative process models and tools • scope and implications of BMI larger than that of technology/product innovation
(Calia et al., 2007)	Innovation networks: from technological development to business model reconfiguration	case study / 1 case	<ul style="list-style-type: none"> • openness in R&D can lead to new opportunities and thus trigger radical BMI • networks of partners not only provide resources and technology but – by incorporating them into the new BM – help in BMI
(Chesbrough, 2007b)	Why companies should have open business models	conceptual / illustrative cases	<ul style="list-style-type: none"> • opening up the BM has helped established firms like IBM and P&G survive • new and open BMs require a phase of experimentation and take time to pay off • the transition from closed to open BM requires strong (change) management capabilities
(Chesbrough, 2010)	Business model innovation: Opportunities and barriers	conceptual / illustrative cases	<ul style="list-style-type: none"> • new technology is an important trigger of BMI • barriers to BMI exist in companies: dominant logic, resistance, lack of leadership
(Enkel & Mezger, 2013)	Imitation processes and their application for business model innovation: an explorative study	case study / 9 cases	<ul style="list-style-type: none"> • BM analogies can be transferred cross industries and thus stimulate innovation • analogies start from single BM elements • BMI team members should have broad experience

Article	Title	Research type / sample	Key findings
(Johnson et al., 2008)	Reinventing your business model	conceptual / illustrative cases	<ul style="list-style-type: none"> the existing BM must be constantly analyzed for change need existing orthodoxies must be challenged the new customer value proposition drives innovation in the other BM elements
(Lindgren et al., 2010)	From single firm to network-based business model innovation	case study / 3 cases	<ul style="list-style-type: none"> BMI in partner networks requires coordinated change of all partners' BMs the leading firm(s) in the network typically change their BM less, small ones adjust more overall, a network of firms can offer disruptive innovations with limited change of the single firms' BMs
(Massa & Tucci, 2014)	Business model innovation	conceptual	<ul style="list-style-type: none"> BM is a source of innovation in and of itself BMI in established firms requires specific processes, tools, and capabilities BMI is particularly relevant in mature markets
(Smith, Cavalcante, Kesting, & Ulhøi, 2010)	Opening up the business model: A multi-dimensional view of firms' inter-organizational innovation activities	case study / 3 cases	<ul style="list-style-type: none"> successful open innovation requires BM changes opening up the BM is difficult for firms which are not used to collaboration BMI requires organizational support on strategy level

Despite the fact that scholars from the innovation management domain are very active in business model research (Zott et al., 2011), many questions on its innovation are still open. Methodically, a general lack of systematic and large-scale studies is diagnosed (Bock et al., 2012; Schneider & Spieth, 2013). Thematically, among others, a lack of insights for the management of business model innovation in established firms, their implementation, and their alignment with the ecosystem are highlighted (Björkdahl & Holmén, 2013). Berglund and Sandström (2013, p. 275) add to the last point by observing that “existing research on Business Model Innovation (BMI) challenges focus[es] almost exclusively on intra-firm factors such as capabilities, cognition and leadership.” Challenges of introducing openness, such as aligning the business model of a focal firm with those of its partners, have hardly been studied (Lindgren et al., 2010). Research into opening up, however, is highly relevant for practice, as the authors of the IBM CEO study point out: “The organizational changes required to be open and collaborative with partners are even more extensive than for internal openness.” (IBM Global Business Services, 2012, p. 45).

Open innovation (Chesbrough, 2003; Gassmann, Enkel, & Chesbrough, 2010; Lichtenthaler, 2011), which is concerned with opening up a firm's research & development activities for collaboration, is an established stream in innovation management research. It has produced highly relevant results which might be transferable to business model innovation. Despite emphasizing the need to align open innovation mechanisms with the implementing organization's business model (West, Salter, Vanhaverbeke, & Chesbrough, 2014), most extant research in open innovation tends to neglect the business model aspect (West & Bogers, 2013). More importantly, it is to be noted that "the openness to innovations and openness of business models needs to be adequately recognised, understood, and treated as separate phenomena" (Holm et al., 2013, p. 342). Therefore, a simple transfer of knowledge from open innovation to the opening up of business models is not possible. The very active field of open innovation, however, demonstrates that studying openness in innovation processes clearly benefits from a separate scholarly treatment. Similar to research on business models, the field of business model innovation has not yet sufficiently considered openness as a distinct subclass which requires specific attention. Adding new empirical insights to the sparse literature base in this field is one goal of my research work.

3 GOAL AND RESEARCH QUESTIONS

3.1 MAIN RESEARCH QUESTION

As illustrated in the previous sections, (open) business models and business model innovation are still rather nascent fields of research which are characterized by unclear perceptions and a general lack of relevant empirical knowledge. This is particularly true for the intersection of both fields, which describes the process of using openness in innovating the business model of established firms. Following the notion that research should produce results which are relevant and useful for practice (Hevner, March, Park, & Ram, 2004; Ulrich, 1984, p. 180), the overall goal of this thesis is to create knowledge which supports firms in the management of opening up their business model. The overall research question can hence be stated as:

How can established firms open up their business model to utilize partnerships and collaboration in creating and capturing new value?

To contribute to an answer to this governing question and to adhere to the nature of a paper-based dissertation, the research question is further subdivided into five sub-

research questions which fall into two groups. The first group, containing two questions, serves to clarify the concept of the open business model and the nature of the business model innovation process in isolation to provide further clarity of the fields underlying the main research question. The second group, containing three questions, then addresses relevant issues at the intersection of both fields. These three questions take up a challenge for future research stated by Arana and Castellano (2010, p. 109): “The development of general conceptual frameworks, methodologies and ICT tools that support a continuous process of *opportunity discovery*, *innovation* and *implementation* of new business models based on the collaboration among partners [...]” (emphasis added). Figure 1 illustrates this split of research questions, which are detailed in the following section.

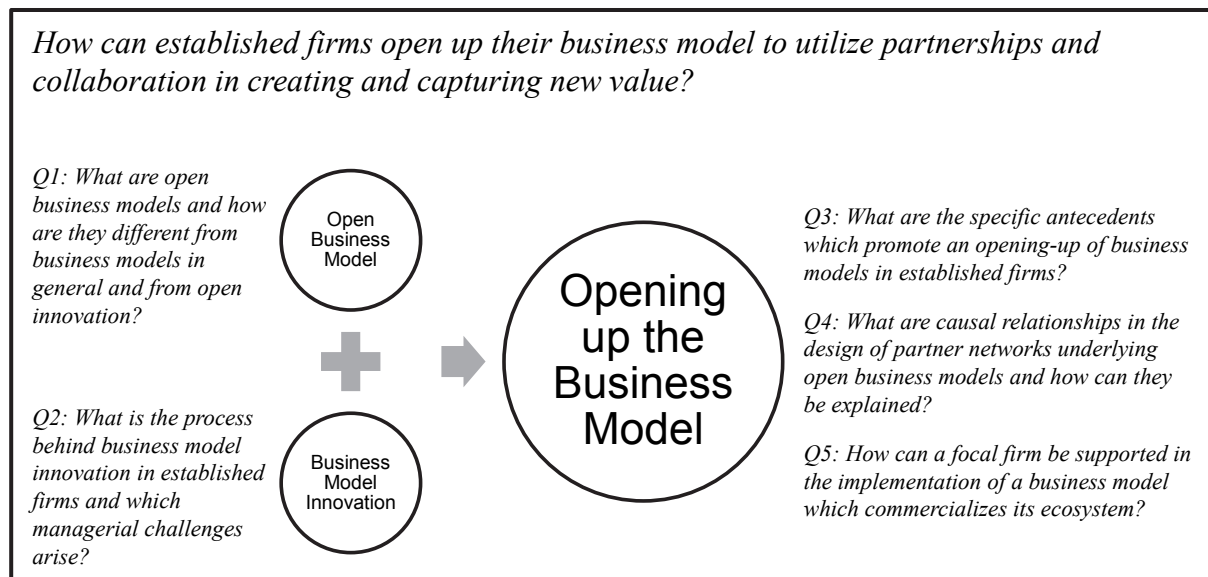


Figure 1: Main research question and sub-research questions in context of the research fields.

3.2 SUB-RESEARCH QUESTIONS

The ‘open business model’, which represents the end state of a business model innovation in the context of this thesis, is a term that has been widely used in the literature. However, the use of the term is unanimous and its clarity suffers from its closeness to open innovation and business models in general. It seems desirable to achieve conceptual clarity of the goal of the innovation efforts, the open business model, before exploring the way to the goal. Hence, sub-research question Q1 intends to clarify the conceptual meaning of the open business model:

Q1: What are open business models and how are they different from business models in general and from open innovation?

The second sub-research question addresses a research gap in the field of business model innovation. Compared to more established forms of innovation, it becomes obvious that not much is known about business model innovation as a process in established firms. The literature base is dispersed and findings are hard to locate and relate. Product and technology innovation, in contrast, is a field of research which has put a large emphasis on process studies (e.g., Cheng & Van de Ven, 1996) and provided process frameworks which help researchers locate their contributions and support practitioners in managing the process (e.g., Cooper, 1990). Business model innovation research has not achieved this level of maturity yet. While prescriptive and checklist-style ‘steps to business model innovation’ are frequently proposed at a rather high level and with unclear derivation (e.g., de Reuver et al., 2013; Johnson et al., 2008; Teece, 2010), only few scholars have studied the process empirically. Extant works focus on a new venture context (Sosna et al., 2010) or a comparison to the management of product innovations (Bucherer et al., 2012). In sum, there is no consistent picture of how the process of a business model innovation happens in an established firm and, more importantly, which managerial challenges occur during that process. Clearly, such a view is beneficial before studying specific issues of introducing openness. Therefore, sub-research question Q2 aims to develop a unified view of the business model innovation process and its challenges in established firms:

Q2: What is the process behind business model innovation in established firms and which managerial challenges arise?

Sub-research questions three to five, then, bring both research fields together and study several issues along the process of opening up the business model. They roughly follow the process phases identified in the 4I-framework (Frankenberger, Weiblen, Csik, et al., 2013) and used by the St. Gallen Business Model Navigator™ (Gassmann et al., 2013): initiation, ideation, integration, and implementation. Q3 relates to the ‘initiation’ phase in that it complements current attempts to identify the antecedents of business model innovation (e.g., Amit & Zott, 2013; Hartmann, Oriani, & Bateman, 2013) by studying this question in the context of introducing openness:

Q3: What are the specific antecedents which promote an opening-up of business models in established firms?

Omitting the ‘ideation’ phase of the 4I-framework, where specific issues of openness are not eminent, the fourth sub-research question targets the ‘integration’ phase. In this phase, the design of the novel business model is created at the drawing board, prior to

its implementation. While the design of a business model, in general, is described as “[the] purposeful weaving together of interdependent activities” (Zott & Amit, 2010, p. 218), the integration of openness might hold specific challenges as not every aspect is under the focal firm’s control. Relations to external partners can have different characteristics which lead to different outcomes, as social network theory has repeatedly illustrated (e.g., Schilling & Phelps, 2007; Uzzi, 1997). Q4 aims to shed more light on this important design parameter in the context of open business model design:

Q4: What are causal relationships in the design of partner networks underlying open business models and how can they be explained?

The ‘implementation’ phase, finally, is addressed by sub-research question five. It is not hard to see that activities and challenges in this phase are very specific to the organization implementing a new business model and need to be determined based on its design (de Reuver et al., 2013). One challenge, however, is common to most business model innovations: the new model must yield profits to be perceived a success. This value capture aspect of the business model has been termed as under-explored (Desyllas & Sako, 2013) and provides an interesting backdrop to look into the implementation of an open business model in an established firm. Focusing on the value capture side of an ecosystem, Q5 asks:

Q5: How can a focal firm be supported in the implementation of a business model which commercializes its ecosystem?

Overall, the five sub-research questions are formulated to cover the full breadth of the main research question. It lies in the nature of the broad main research question and the nascent state of the current literature that this approach cannot answer the main research question in full, but needs to focus on specific issues. These issues were identified with the desire to close the most urging gaps in current literature, while – at the same time – contributing relevant insights to practice.

4 STRUCTURE OF THE THESIS

4.1 OVERALL STRUCTURE

Following the logic of a paper-based dissertation, the above stated sub-research questions are answered in self-standing research articles which are reproduced in the subsequent chapters of this thesis.¹ The thesis is hence structured into six chapters: this introduction followed by five scientific articles, one for each research question. Table 5 matches questions and articles, along with their research design, key findings, publication outlet, and publication status. The articles follow the sequence and logic of the sub-research questions presented above. That is, the first two articles investigate the open business model and the process of business model innovation in established firms in isolation. The remaining three articles investigate specific issues of opening up the business model in established firms following the initiation – integration – implementation structure of the process. Figure 2 provides an overview of the overall thesis structure before the next section provides a brief outline of the single chapters.

Thesis Structure				
Chapter 1	Introduction	State of the art in (open) business model and business model innovation literature, thesis framework and structure		
Chapter 2	Article Q1	The open business model: Understanding an emerging concept	Open business model	Foundation
Chapter 3	Article Q2	The 4I-framework of business model innovation: A structured view on process phases and challenges	Business model innovation	
Chapter 4	Article Q3	The antecedents of open business models: An exploratory study of incumbent firms	Initiation	Opening up the business model
Chapter 5	Article Q4	Network configuration, customer centricity, and performance of open business models: A solution provider perspective	Integration	
Chapter 6	Article Q5	Commercializing the software ecosystem: A taxonomy-based approach to marketplace business model design and implementation	Implementation	

Figure 2: Overall thesis structure

¹ It is to be noted that the five sub-research questions stated in the previous section have been summarized and reduced to their core for the purpose of this introduction. The research questions stated in the research articles deviate in that they are more specific and detailed.

Table 5: Overview of research articles and assignment to research questions (Q)

Q	Title	Authors	Status / Publication Outlet	Method	Key Findings
Q1	The open business model: Understanding an emerging concept	Weiblen, T.	<i>Published in Journal of Multi Business Model Innovation and Technology</i> (SSCI: -; VHB: -; ABDC: -) ¹	Conceptual, illustrative cases	<ul style="list-style-type: none"> • Research on open business models splits into two streams • A proposed harmonized definition and conceptualization synthesizes existing work • The relationship of the construct to open innovation and business models is clarified
Q2	The 4I-framework of business model innovation: A structured view on process phases and challenges	Frankenberger, K.; Weiblen, T.; Csik, M.; Gassmann, O.	<i>Published in International Journal of Product Development</i> (SSCI: -; VHB: C; ABDC: -)	Case Studies (14 cases)	<ul style="list-style-type: none"> • A structured process with frequent iterations between four phases underlies business model innovations in established firms • Managerial challenges differ per phase • Current research falls short in providing insights and methods to overcome many of the identified challenges
Q3	The antecedents of open business models: An exploratory study of incumbent firms	Frankenberger, K.; Weiblen, T.; Gassmann, O.	<i>Published in R&D Management</i> (SSCI: 2.635; VHB: C; ABDC: B)	Case Studies (8 cases)	<ul style="list-style-type: none"> • Five antecedents of opening up the business model in established identified • Different antecedents are more likely to produce certain types of open business models
Q4	Network configuration, customer centrality, and performance of open business models: A solution provider perspective	Frankenberger, K.; Weiblen, T.; Gassmann, O.	<i>Published in Industrial Marketing Management</i> (SSCI: 2.366; VHB: C; ABDC: A)	Case Studies (3 cases)	<ul style="list-style-type: none"> • The setup of partner networks determines the performance of open business models • Customer centrality plays a moderating role in determining characteristics of the partner network • Three ideal network configurations are identified and explained theoretically
Q5	Commercializing the software ecosystem: A taxonomy-based approach to marketplace business model design and implementation	Weiblen, T.; Giessmann, A.; Bonakdar, A.; Eisert, U.	<i>Revised version under review at Information Systems Journal</i> (SSCI: 2.786; VHB: A; ABDC: A*)	Action Design Research (1 case)	<ul style="list-style-type: none"> • An e-marketplace to sell partner-provided offerings must handle different similar open business models in parallel • A taxonomy-based framework based on the parameters of openness and product/service standardization helps managers detail an implementation-level business model

¹ Journal characterizations provided from three sources:

SSCI (Social Sciences Citation Index 2013, 5-year impact factor); VHB (VHB Journal Ranking 2008); ABDC (Australian Business Deans Council Journal Ranking 2010)

4.2 THESIS OUTLINE

In chapter 2, the article “The open business model: Understanding an emerging concept” addresses Q1 by examining what the open business model is conceptually and how it is different from business models in general and from open innovation. It follows a systematic literature review approach (Webster & Watson, 2002). Based on a set of 24 articles using the open business model, the paper carves out the respective authors’ perception of the concept and how they relate it to the other two concepts. An inconsistent use of the term is diagnosed, which is reconciled in the second part of the article. This conceptual part results in the proposition of a framework which clarifies the relationships between business models, their open variant, and open innovation using illustrative cases from the literature base. A definition of the open business model is proposed as a basis for future research in this domain. The main contribution of the article is hence to contribute to the conceptual clarity of the open business model as an emerging concept.

In chapter 3, the article “The 4I-framework of business model innovation: A structured view on process phases and challenges” addresses Q2 by providing empirical insights into the process and challenges of business model innovation in established firms. Following a multiple case study approach (Yin, 2009) and drawing from extant literature on innovation processes, it develops a four-stage model of the business model innovation process. As is shown based on case evidence, established firms from different industries face similar challenges when innovating their business models. These challenges are specific for each of the four stages, namely initiation, ideation, integration, and implementation. The process is found to be of iterative nature. The resulting framework helps practitioners structure the process and provides a generic list of business model innovation challenges which need to be considered per phase. To research, the framework contributes a structuring device to relate and integrate existing and future findings systematically.

In chapter 4, the article “The antecedents of open business models: An exploratory study of incumbent firms” addresses Q3 and therewith the initiation phase of opening up the business model of an established firm. Based on evidence from eight cases studied (Yin, 2009), it identifies the specific antecedents of opening up the business model in established firms. Five antecedents are identified, namely (1) business model inconsistency, (2) the need to create and capture new value, (3) previous experience with collaboration, (4) open business model patterns, and (5) industry convergence. These antecedents are further related to different forms of business model openness, which

reveals that different antecedents are linked to the adoption of different types of openness. Practitioners thereby gain a valuable heuristic which tells them when they should think of opening up the business model and in which way. To business model research, the article contributes the first insights into antecedents of adopting business model openness and thus contributes to a young and lively debate in the field of business model innovation.

In chapter 5, the article “Network configuration, customer centricity, and performance of open business models: A solution provider perspective” addresses Q4 by generating insights which are relevant for the integration phase, i.e. open business model design. It is situated in the specific context of three case companies (Yin, 2009) which have transformed their business models from plain product manufacturers to solution providers by cooperating with partners for the service part of solution delivery. An analysis framework drawing from network theory is used to study the characteristics of these partner networks in detail and to identify dependencies and causalities between different network dimensions. The resulting typology shows three practical ways of designing a partner network and identifies customer centricity – the attention that the focal firm gives to the solution customer – as the central strategic parameter which governs model choice. Thereby, it is highlighted that internal aspects and the design of external networks both need to be aligned in order to succeed with a consistently designed open business model. To research, the study’s approach to use network theory in studying open business model design and performance is a key contribution. Practitioners profit from a set of archetypes which they can use as templates for their own companies’ future business model designs.

In chapter 6, the article “Commercializing the software ecosystem: A taxonomy-based approach to marketplace business model design and implementation” addresses Q5 by studying an established company which is in the process of implementing an open business model in the form of an electronic marketplace to commercialize partner-provided products and services. An action design research approach (Sein, Henfridsson, Purao, Rossi, & Lindgren, 2011) is applied to come to a framework which supports managers in deciding on the right mode to commercialize a specific class of partner offerings. It is shown that the degree of standardization of the product/service to be commercialized and the desired openness of the underlying business model are the two decisive parameters to guide the detailed design and technical implementation of the electronic marketplace. The practical application of the framework illustrates the usefulness of a template approach for implementation, in which existing examples serve

as models to clarify implementation details. To business model innovation literature, these results provide important insights into the steps to come from an open business model design, which typically is still on a rather high level, to its actual low-level implementation.

5 OUTLOOK

There are many developments in today's economy which challenge existing business models and might, in response, lead to the adoption of more openness in established firms. One of them is the increasing digitization and IT enablement of the business world, which eases collaboration between firms and paves the way for promising novel business models (Arend, 2013; Rai & Tang, 2014; Sandulli, Rodríguez-Duarte, & Sánchez-Fernández, 2014; Veit et al., 2014). Industry convergence, such as between the telecommunications and IT industry, is a second factor. As previously distinct industries move closer together and eventually merge, incumbents need to reach out to partners to get access to missing capabilities and gain in size and power (Bröring, Cloutier, & Leker, 2006; Hacklin, Battistini, & von Krogh, 2013).

These developments, combined with a general history of business model openness, appear particularly obvious in the software- and high-tech industries. In these industries it is hard to find a major vendor which does not at least try to establish a platform or build up a partner ecosystem. Ecosystem management in these enterprises is a dedicated function which drives and integrates collaboration with partners along the entire value chain, from research to sales. But business model openness is by no means bound to the ICT industry. Scholars have found openness to shape novel business models in nascent areas such as electric vehicles (Massa & Tucci, 2014; Weiller & Neely, 2013) or 3D printing (Cautela, Pisano, & Pironti, 2014). In the more conservative environment of aerospace and defense, Ritala et al. (2013, p. 262) observe that “[...] the whole industry (including the leading firm) is transforming towards open collaborative structures [...].” Recent news include an announcement of Panasonic to build up a partner ecosystem for energy services on top of its power storage batteries and a statistic of online-retail giant Amazon shows that 40% of its deliveries in Q2 2012 were made on behalf of partners who sell through its marketplace. Clearly, the rise of open business models does not stop at industry boundaries.

A startup CEO, when asked about his venture's competitors in one of my recent interviews, jokingly replied: "We don't have competitors, we only differentiate between customers and partners." This statement might be exaggerated, but at its core it reveals a major challenge for research resulting from the aforementioned move to more openness: in the new world of increased collaboration, firm networks, and business ecosystems, traditional concepts such as the firm, competitive advantage, and the industry lose their explanatory power. Consequently, new analytical devices are required and previous findings need to be reviewed in the light of the new business reality. It is obvious that this review process does not stop at analytical devices in research, but includes tools which research has previously produced for managerial practice. The same way in which open innovation has challenged the closed innovation model and led to a shift in innovation management practices, business model openness requires new models to understand and manage collaborative ways of value creation and capturing. Popular management tools, such as Porter's five forces and the value chain, require rework or replacement.

The articles which follow hint at the open business model and its innovation as a promising lens to study emerging forms of collaborative value creation. The open business model might have the potential to fill the diagnosed gap in research and produce relevant results for managerial practice. It is to be noted, however, that the concept is still in its infancy. It lacks clarity and consistency and it might be too coarse to capture and describe the full bandwidth of openness phenomena. There are many opportunities for future research until scholars will have produced an arsenal of instruments to study openness that is comparable to what is currently available to study more traditional and closed ways of doing business. Interesting times are ahead.

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Chapter 2

The Open Business Model Understanding an emerging concept

Single-authored²

Abstract

Along with the emergence of phenomena such as value co-creation, firm networks, and open innovation, open business models have achieved growing attention in research. Scholars from different fields use the open business model, largely without providing a definition. This has led to an overall lack of clarity of the concept itself. Based on a comprehensive review of scholarly literature in the field, commonalities and differences in the perceived nature of the open business model are carved out. Consulting additional literature and cases on open innovation and business models, the tensions found are resolved, putting a special focus on the relationships between open business models, open innovation, and business models in general. The resulting definition and conceptual framework structure the three fields and provide a set of differentiation criteria that should lead to a more consistent and deliberate use of the open business model concept in the future.

Key words: open business model, open innovation, business model, inter-firm collaboration, openness

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1 INTRODUCTION

Since Chesbrough's (2006a) seminal book on the topic, the “open business model” has become a frequently used term in literature. It filled a gap in management research by linking the open innovation phenomenon (Chesbrough, 2003) to the increasingly popular business model concept (Zott, Amit, & Massa, 2011). Combining a young and vibrant field of innovation research with an emerging concept that itself lacks a clear definition (cp. George & Bock, 2011; Morris, Schindehutte, & Allen, 2005; Shafer, Smith, & Linder, 2005), however, came at a price. To date, perceptions of what the open business model actually is differ considerably among scholars. Neither is the concept clearly defined, nor is it clearly delineated from the closely related business model and open innovation fields. One might even pose the heretical question whether the open business model is of any theoretical or practical value at all, given that it is so hard to distinguish.

Within a research domain, a common language based on clarity of terms and concepts is an important prerequisite for cross-fertilization and the development of complementary knowledge. This paper hence tries to contribute to the understanding of the open business model by providing a comprehensive overview of the literature dealing with the concept. Based on a review of 24 scholarly articles, commonalities and diverging perceptions are outlined and reflected against the state of research in the business model and open innovation fields. Assuming a static view of the business model, this extended theoretical background serves as the basis to develop an argument which defines and locates the open business model conceptually. The achieved clarification of the relationships between open innovation, business model, and open business model concepts is sharpened by incorporating real-world cases from the extant literature in the three fields. The resulting framework, along with differentiation criteria separating the concepts, leads to a clearer picture of the open business model itself and of its practical relevance. The contribution hence lies in structuring the field of research and in preventing its premature divergence and fragmentation, laying the grounds for future research on the open business model. The paper concludes identifying future directions into which open business model research could develop to strengthen the field's profile as an emerging and relevant part of business model research.

2 METHOD

The literature review focuses on the understanding of the open business model in literature by synthesizing how different authors use the concept and how they delineate it from related fields. Based on the recommendations of vom Brocke et al. (2009) and Webster & Watson (2002), a systematic literature search approach is used and detailed record thereof is provided (see Appendix for additional details). The initial search was conducted with the search string “open business model*” in title, abstract, or key words of scholarly (i.e., peer reviewed) journals. Possible alternative search terms, such as “collaborative business model” or “networked business model“, were excluded purposefully since the open business model’s perception was the subject of interest in the first place³. To find matching articles the EBSCOhost Discovery Service meta search was employed. It compiles its results from a broad set of scholarly databases such as JSTOR, SSCI, and ScienceDirect. All available catalogs were queried, including the comprehensive Business Source Complete database used, for instance, in (Zott, Amit, & Massa, 2011). The resulting set of 35 articles was reduced manually by sorting out obvious duplicates, non-English articles, non-scholarly articles, and book reviews (Search A).

Due to the low number of 18 remaining hits, of which some hardly elaborated on the open business model despite its mentioning in abstract or key words, it was decided to conduct a second search on a broader basis. For this, the Google Scholar search engine (excluding patents and citations) with an unrestricted search on the same search string was employed, screening the displayed excerpts of all 515 hits (Search B). This second search allowed to also consider relevant forthcoming journal articles, conference proceedings, and book chapters not covered by Search A. Six papers from the search B set were selected based on the fit of their abstracts with the research interest, i.e. the papers had to promise insightful research on the open business model as a concept and preferably on its relation to open innovation and business models in general.

³ NB: The term “open business model” has the highest usage in scientific literature according to Google Scholar search. In January 2014, the term’s 728 hits are more than the sum of “collaborative business model” (480 hits) and “networked business model” (160 hits). Given the open business model’s unclear definition and nature, it seems appropriate to exclusively focus this paper on the clarification of this single concept. Exploring commonalities and differences with similar business model types marks an interesting route for future research.

The final set of 24 papers (see Appendix for an overview) was read and understood in detail, with a particular focus on the authors' use and understanding of the open business model concept. More precisely, answers to the following questions were sought:

- How do the authors define (or at least use) the term “open business model”?
- How do they delineate the concept from the “open innovation” and “business model” domains?
- Which common themes emerge and which concepts are seen as related?

The next section provides a detailed overview of the answers found – and not found – in the reviewed literature.

3 THE OPEN BUSINESS MODEL IN LITERATURE

3.1 EMERGENCE

As Figure 1 illustrates, the open business model has seen a strong increase in scholarly attention over the past years. Judging from the comparably low number of hits in Search A (peer-reviewed scholarly journals), however, it seems legitimate to conclude that the concept has not yet made its way into the world of top-class research. As per the author's impression, most contributions on the topic stay within the levels of conference- or working papers. Apart from the open business model's newness as a concept, its lack of definition and clarity as outlined below might be a reason for this second-class status.

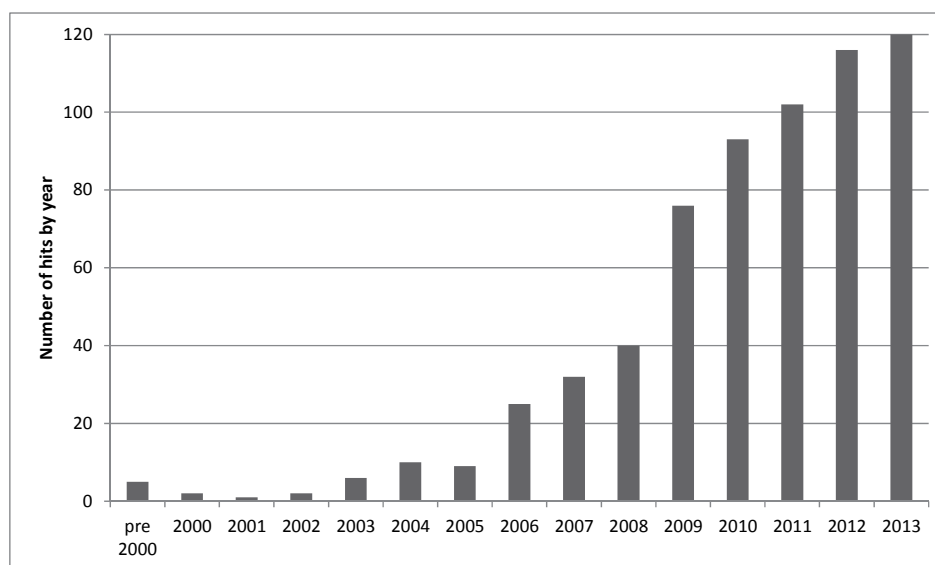


Figure 1: Publications containing the term “open business model” by year, according to Google Scholar search (Search B)

Most of the reviewed papers locate the origin of the open business model concept in Chesbrough (2006a). Historically, earlier occurrences of the term can be spotted in the context of telecommunication networks. Without providing a definition, scholars in this field use it to describe network architectures which allow new network peers to join (Dijkstra et al., 2005) or new players to offer their contents and services on top of a network (Bougant, Delmond, & Pageot-Millet, 2003; Pereira, 2001). Chesbrough (2006a, 2007) deserves the credit for bringing the open business model to management scholars' attention and for stimulating research in the field. Given the high number of citations of his work, a large portion of the visible post-2006 increase in Figure 1 can be assumed to go back to his seminal book.

With respect to the research designs employed, the reviewed set of papers shows a clear tendency towards conceptual (13 papers) and qualitative empirical (9 papers) approaches (see Appendix for a detailed per-paper overview). Only two papers in the set are of quantitative empirical nature (Alexy & George, 2011; Cheng, 2011). This distribution might hint at the open business model's newness as a concept in research.

3.2 DEFINITION AND MEANING

Since the vast majority of the reviewed papers are in line with Chesbrough (2006a) in not providing a clear definition of the concept, approaching the term "open business model" from the words' semantics seems advisable. The term can be split into two components: an adjective – "open" – describing the noun "business model". It is interesting to see that, in the sample of 24 core articles, authors share a more common understanding of the term "open" than of the term "business model". Open is generally seen as referring to a firm's boundaries and its collaboration with the outside world across these boundaries – be it with other firms, communities, or customers⁴. With regards to the business model, a variety of conceptions becomes obvious. Authors see it as description of generic roles in a network (Vetter, Fredricx, Rajan, & Oberle, 2008), as a collaboration model (Luo & Chang, 2011), the principles of core repeated processes (Smith, Cavalcante, Kesting, & Ulhøi, 2010), a mediating construct between technology innovation and economic value (Wang, Jaring, & Arto, 2009), or a set of building blocks (Chanal & Caron-Fasan, 2010; Holm, Günzel, & Ulhøi, 2013). Most authors, however, resort to or include the least common denominator in business model research, which is that a business model describes the logic of value creation and value capturing of a firm

⁴ A noteworthy exception here are Soloviev, Kurochkin, Rendiuk, & Zazuk (2010), who explicitly equate "open" and "free" (in its free-of-charge meaning).

(Teece, 2010; Zott et al., 2011). The definition provided by Teece (2010, p. 191) is used for this study: “A business model describes the design or architecture of the value creation, delivery and capture mechanisms employed [by a particular business].”

So, in combination of the terms, does the open business model describe “doing business” across firm boundaries or is there a special meaning behind it? Given the aforementioned diverging perceptions and the ongoing debate as to what a business model actually is (George & Bock, 2011; Zott et al., 2011), a common understanding of the open business model across the set of articles is not to be expected. Definitions and perceptions of the open business model can, however, be clustered into two broad streams: the open innovation view and the business model view. In the following sections, both views are presented separately.

3.2.1 Open innovation view of the open business model

In Chesbrough's view, the open business model is closely related to the open innovation concept (Chesbrough, 2006a). Open innovation is defined as “the use of purposive inflows and outflows of knowledge to accelerate internal innovation and to expand the markets for external use of innovation, respectively” (Chesbrough, 2006b, p.1). It is a generic term that captures recent phenomena such as IP commercialization, user and customer integration, and collaborative R&D processes (Gassmann, Enkel, & Chesbrough, 2010). Not providing a comparably concise definition of the open business model, Chesbrough (2006a, p.107) argues that “companies must develop open business models if they are to make the most of the opportunities offered by open innovation”. “To get the most out of this new system of innovation, companies must open their business models by actively searching for and exploiting outside ideas and by allowing unused internal technologies to flow to the outside, where other firms can unlock their latent economic potential” (Chesbrough, 2007, p. 22). With his focus on technology, innovation, and ideas, Chesbrough clearly ties the open business model to openness with regards to a firm's research and development (R&D) activities. In this view of the concept, an open business model is always accompanied by open innovation principles successfully implemented in a firm's R&D.

The R&D-centric perception of the open business model reflects in the overall themes of the papers assuming this open innovation view (cp. Table 1). All of the 13 papers that fall into the category directly reference Chesbrough (2006a) to explain the open business model. Table 1 gives an overview of the different flavors that the authors give to their

perceptions of the concept (in case no quotable perception is provided in the source, its essence is summarized by the author).

Table 1: Papers following the open innovation (OI) view of the open business model (OBM)

Paper	Theme	OBM Perception	OBM/OI Relation
(Luo & Chang, 2011)	By utilizing open business models that lead to the division of labor, SMEs in Taiwan's original device manufacturer industry can share R&D costs and stay profitable despite global competitive pressure.	"The OBM transforms innovation and technology into economic results. Using a combination of innovative strategies and continuously integrating internal and external resources, the OBM promotes corporate competitiveness, establishes a network of collaboration relationships, and forms intercommunication platform models [...]"	Same (OI not mentioned)
(Chesbrough & Schwartz, 2007)	Co-development partnerships improve innovation effectiveness. To achieve such open business models, the various R&D activities need to be categorized and the business models of both partners aligned.	Open business models are a prerequisite for successful co-development partnerships.	OBM = BM adjusted to OI
(Chu & Chen, 2011)	Increased complexity of system-on-chip R&D leads to the emergence of a new intermediary: the design foundry. Its open business model is analyzed.	"As an extension of open innovation, open business models underscore a concept of industry ecosystem."	OBM = BM based on OI
(Davey, Brennan, Meenan, & McAdam, 2010, 2011)	Incorporating input of external stakeholders (engineers, clinicians, patients) into R&D allows medical devices manufacturers to innovate more effectively.	"A successful open business model creates heuristic logic that connects technical potential with the realization of economic value."	Same (OBM also called "open innovation business model")
(Chesbrough, 2007)	Innovation effectiveness can be improved by migrating from closed to open business models.	"Open business models enable an organization to be more effective in creating as well as capturing value. They help create value by leveraging many more ideas because of their inclusion of a variety of external concepts. They also allow greater value capture by utilizing a firm's key asset, resource or position not only in that organization's own operations but also in other companies' businesses."	OBM = BM adjusted to OI

Paper	Theme	OBM Perception	OBM/OI Relation
(Chanal & Caron-Fasan, 2010)	Web platforms around idea communities can lead to tensions around IP ownership, usage, and incentives. Adjusting the business model of such platforms is an ongoing process.	Open business models can include external communities as valuable resources.	Same
(Wang & Zhou, 2012)	The appropriateness of the open innovation approach for latecomer firms in emerging countries is analyzed and found to be inappropriate.	"[...] open innovation players select a proper business model to unlock the value of technology, which could be called as the open-innovation-based business model."	Same
(Soloviev, Kurochkin, Rendiuk, & Zazuk, 2010)	New open business models give away products for free, the challenge is to make profit. Different options can be the right choice depending on the context.	"The main advantage of the open business model is that this model involves the value creation by the efforts of a large community of developers."	Same (OI not mentioned)
(Gassmann, Enkel, et al., 2010)	Open innovation has developed into its own field of research. Different perspectives shed more light on the phenomenon.	none (only mentioned in abstract)	Same
(Wang et al., 2009)	The role of the business model and of business model innovation in an open innovation context is analyzed.	"The so called 'open business model' is different from the current business model a company has constructed and allows internal and external knowledge to penetrate in the operations of companies."	OBM = BM adjusted to OI
(Alexy & George, 2011)	The effects on firm market value that the announcement of open source activities has are analyzed. Among others, they depend on the engagement model.	"The structures and mechanisms by which firms access knowledge outside their organizational boundaries to create value for the firm, sometimes by ceding control of product development pathways and its own intellectual property rights, are referred to as 'open business models'."	OBM = BM based on OI (OBM also called 'open and distributed innovation business model')
(Smith et al., 2010)	Open innovation occurs on an operational level. It is only successful, if - on a more strategic level - the business model is adjusted accordingly. This adjustment process is analyzed.	"The business model plays a central role in the open-innovation paradigm, some authors argue that firms are more innovative when they adopt open business models."	OBM = BM adjusted to OI

Despite the common grounding of the concept in open innovation, some confusion concerning the relation between open innovation and open business models can be observed. As the last column of Table 1 illustrates, the set of articles falls into three groups:

- *Same*: for seven of the papers, it was not possible to spot a notable difference between open innovation and open business model. The concepts are used almost synonymously.
- *OBM = BM based on OI*: in two of the papers, the authors see a firm using open innovation principles as one that implements an open business model but the differentiation is made.
- *OBM = BM adjusted to OI*: four papers adopt a slightly different standpoint. Here, certain adjustments to the firm's business model have to be made to accommodate for the incorporation of open innovation into R&D.

As the last two groups show, there is a slight difference in meaning, but the border between open innovation and the open business model concept is hard to draw. Before taking up this point in the discussion of the results, the remaining papers of the literature base, which take a broader perspective on the open business model, are presented.

3.2.2 Business model view of the open business model

A set of eleven papers takes a broader view on the open business model. Although frequently referencing Chesbrough (six of the papers), the authors do not follow his original perception that an open business model is built around openness in the R&D activities of a firm. Table 2 provides an overview of these papers, along with their perception of the open business model and the firm activities that they characterize as being open in their studies' contexts.

Table 2: Papers following the business model view of the open business model (OBM)

Paper	Theme	OBM Perception	Open Activities
(Romero & Molina, 2011)	Value creation is more and more performed in collaborative firm networks and can include customer communities. A framework to analyze these networks is developed.	Seen as equivalent to a "collaborative business model" in value networks and value co-creation with customers.	All value creation activities (not detailed)
(Vetter et al., 2008)	Broadband networks can be used for a multitude of services. Different players jointly utilize the infrastructure; different role-based scenarios are presented as (open) "business models".	Open business models are roles that emerge around a shared technical infrastructure.	Network operations and content delivery

Paper	Theme	OBM Perception	Open Activities
(Kakaletris, Varoutas, Katsianis, Sphicopoulos, & Kouvas, 2004)	Tourism-related location-based services are becoming viable on mobile devices. An open business model is required to integrate content providers into such joint offerings.	An open business model integrates different providers into a joint service offering.	Mobile service provisioning, sale, and delivery
(Jagoda, Maheshwari, & Gutowski, 2012)	A small real-estate business is analyzed that successfully operates an open business model, which helps master changes and competitive pressure. It sources key activities from partners and offers some of its own core capabilities in non-core contexts.	"[...] firms can better negotiate competitive pressures by making the boundaries of an organization open and more permeable to a bidirectional flow of innovative ideas. According to Chesbrough, there are two types of openness: 'outside in' and 'inside out.'"	Production (e.g., fencing and stone work sourced externally; landscaping provided for existing properties)
(Cheng, 2011)	A quantitative study on radical service innovations is conducted. It is shown that open business models increase the positive effect that the dynamic service innovation capability has on these innovations.	"[...] an open business model serves as an organising principle for structuring and coordinating various resources and functional units [...]"	New service development and delivery
(Sandulli & Chesbrough, 2009a) ⁵	Open business models integrate external resources or share internal resources with others. The characteristics of the resources determine the type of open business model that is appropriate.	"Following this new approach, companies are beginning to share their internal resources with a third party to create value, or the reverse, companies are beginning to incorporate external resources in their own business model. These new business models have been defined by Chesbrough as open business models."	All activities
(Purdy, Robinson, & Wei, 2012)	Network-based open firm models and business ecosystems are on the rise. Three models are proposed that allow to profit from the emerging opportunities.	"[...] open business models enable firms to maximize the benefits of openness while limiting the risks." Synonymous use with „open firm business model“	"Production, consumption or innovation"
(Sheets & Crawford, 2012)	New technologies allow improving the performance of higher education by unbundling the existing business model. Economies of scale can be achieved and the learning experience can be improved.	"Open business models involve the organizational use of external as well as internal ideas and resources, and of external as well as internal pathways for deploying them to create and capture value."	Curriculum development, delivery services, infrastructure management

⁵ This Spanish language paper is considered based on Search A since an English version is available as a working paper (Sandulli & Chesbrough, 2009b). The English version was used for the analysis.

Paper	Theme	OBM Perception	Open Activities
(Holm et al., 2013)	The effects of opening business models in the Danish newspaper industry are examined. There are downsides of open business models (e.g., increased dependency on partners); a framework for classifying the type of openness is proposed.	Open business models are explicitly defined in a broad sense: "Although based in part on innovation management research [...], here we expand [the concept of openness] to the more generic concept of a business model."	Value creation, delivery and capture
(Storbacka, Frow, Nenonen, & Payne, 2012)	In today's economy, different actors jointly create value by integrating their resources. To be successful, the business model of a focal actor needs not only be aligned internally but also with the business models of external partners.	"Business models are typically designed around over-riding design themes [...]. We suggest that one over-riding theme can be 'co-creation' and argue that a focal actor wishing to engage in co-creation needs to design an 'open' business model that permits other actors to influence specific design elements."	All value creation activities (not detailed)
(Frankenberger, Weiblen, & Gassmann, 2013)	Product companies can become solution providers through complementing their products with services provided by partner firms. The customer centricity of the focal firm's business model and the characteristics of the partner network have to match to achieve firm success. Three successful constellations are presented.	"Researchers on open business models outline even more explicitly the need for external collaboration by arguing that open business models lead to value creation and capturing by 'systematically collaborating with outside partners' (Osterwalder and Pigneur 2010: 109)."	Solution production and delivery

As becomes obvious from Table 2, the authors assuming the business model view of open business models see basically all firm activities as potential candidates for collaboration and thus openness. While some authors seem unaware of the open innovation view, others, such as Holm et al. (2013), explicitly state their differing perception. A quote from (Sandulli & Chesbrough, 2009b, p.20) nicely illustrates the move away from just ideas and technologies that cross R&D boundaries to generic resources that are shared in many areas: "In the past, those few firms with open business models were usually open in a specific function of their business model such as product development, internationalization or distribution, while the rest of the business model remained close. Today, firms are in the process of redesigning all the aspects of their business models under the new open prism."

3.3 COMMONALITIES BETWEEN BOTH VIEWS

To conclude the review of open business model literature and to take a first step towards reconciling both views, it makes sense to carve out the commonalities between them.

The literature base was analyzed for related concepts mentioned, the units of analysis chosen, the attention given to business model innovation, and further common themes.

3.3.1 Concepts related to open business models

The concepts that multiple authors refer to in connection with open business models contribute to the understanding of the open business model itself. Apart from typical open innovation themes such as open source (mentioned by eight papers), co-development/crowdsourcing (six papers), or innovation systems (five papers), a number of further concepts are present in both views of the open business model.

One very central notion herein is the concept of the ecosystem (nine papers). A (business/industry) ecosystem describes the surroundings of a focal firm, into which it is embedded. It contains the stakeholders of a company, which are first and foremost its customers and suppliers (Sandulli & Chesbrough, 2009b), but also its industry peers (Chu & Chen, 2011), as well as managers, innovators, and workers (Purdy et al., 2012). The contribution of the open business model here is to explicitly consider the ecosystem as a new source of value creation and capturing by developing symbiotic relationships (Romero & Molina, 2011) and emphasizing inter-organizational activities (Chu & Chen, 2011). The notion of opening a firm's borders to the outside world is prominently found in the reviewed literature.

Another prominent concept is that of value- or partner networks (nine papers). Holm et al. (2013, p.327) define a partner network as a “network of cooperative agreements with other companies needed to efficiently offer and commercialize value”. Similarly, a value network is seen as a new and flexible setup of value co-creation that replaces the linear value chain logic (Romero & Molina, 2011; Storbacka et al., 2012). Setting up a beneficial value network is found to be a critical part of an open business model (Davey et al., 2011), just as partner network characteristics can determine open business model performance (Frankenberger et al., 2013). Overall, the notion that value creation happens together with partners in a value network seems to be a central feature of an open business model.

Two further terms are frequently mentioned in the context of open business models: platforms (nine papers, not counting four that mean web platforms for collaboration purposes) and alliances (ten papers). Platforms are based on technology assets which the platform owner or “sponsor” (Sandulli & Chesbrough, 2009b) opens up for typically smaller partners (Purdy et al., 2012), enabling them to create additional value on top and connect with customers (Luo & Chang, 2011). This type of open business model allows

the platform owner to influence its entire industry (Chu & Chen, 2011; Sandulli & Chesbrough, 2009b). The second concept, alliances, is used twofold. On the one hand, it relates to the inter-organizational legal manifestation of partnerships in the form of strategic alliances, joint ventures, or consortia (Wang & Zhou, 2012). On the other hand, it is used in relation to the generic challenges and logic of managing partnerships (Enkel, Gassmann, & Chesbrough, 2009). Both usages mark interesting aspects that are core considerations in open business model implementation.

3.3.2 Unit of analysis in open business model research

Despite the literature base's explicit consideration of networks and ecosystems, there is a strong commonality between all papers across both streams: the unit of analysis for the authors is the firm. As part of an open business model, no paper analyzes the joint value proposition of the value network or its common value capturing mechanism – rather, a focal firm is at the center of the analysis (Alexy & George, 2011; Frankenberger et al., 2013; Holm et al., 2013), which even needs to provide a separate value proposition to every partner that it collaborates with (Storbacka et al., 2012). The focal firm and its relationships with the ecosystem are what open business model scholars are interested in. Even if all firms within a value network are analyzed (Smith et al., 2010), they are perceived as independent units with their individual agendas and activities. What is to be considered by the focal firm in designing its open business model, however, is its fit with the business models of the other actors in its value network (Chesbrough & Schwartz, 2007; Storbacka et al., 2012).

3.3.3 Business model innovation – “opening” the business model

A very common theme in the analyzed literature base is the notion of “opening” the business model. More or less implicitly, most authors assume a closed business model as the starting point and an open business model as the desirable end state of firm transformation. This change process of implementing adjustments to an existing business model falls into the field of business model innovation, which sees innovation to the business model as a different task than product and process innovation (Amit & Zott, 2012; Schneider & Spieth, 2013). With eleven of the 24 papers explicitly bringing up business model innovation and five of them doing so implicitly, the idea that the business model itself can be subject to innovation seems to be more prominent in open business model research than in “normal” business model research (Smith et al., 2010). The move from a closed to an open business model is seen as particularly challenging and requiring more research insights (Storbacka et al., 2012). Due to the lack of a

knowledge base in this field, Chesbrough (2007) openly encourages practitioners to experiment with open business models to determine the best solution.

3.3.4 Further common themes

Closing the analysis of open business model literature, two further observations are worth mentioning. First, partially in supporting the move towards open business models, scholars pay special attention to challenges that are specific to firms implementing these models. Apart from technical challenges (Kakalettris et al., 2004), this field includes diverse managerial issues such as leadership (Smith et al., 2010), incentivisation (Chanal & Caron-Fasan, 2010), absorptive capacity (Sandulli & Chesbrough, 2009b), local cultural issues (Purdy et al., 2012), or trust (Romero & Molina, 2011). Second, a number of authors develop classification schemes and frameworks which further subdivide the open business model into different archetypes. These accommodate for observed differences in real-world cases (Alexy & George, 2011; Purdy et al., 2012; Sheets & Crawford, 2012; Wang et al., 2009) or are based on different degrees of openness (Frankenberger et al., 2013; Holm et al., 2013; Sandulli & Chesbrough, 2009b).

4 CLARIFYING THE OPEN BUSINESS MODEL

Based on the extensive review of literature, three issues can be identified which affect the conceptual clarity of the open business model: (1) its unclear definition that breaks up into two streams; (2) its similarity to open innovation; and (3) its similarity to the business model concept itself. In this section, these points are resolved to arrive at a clearer picture of the open business model's nature. To do so, additional literature and real-world cases from the literature base are used to illustrate the points made. The resulting framework allows drawing the lines between the overlapping concepts and clarifies their relationships.

4.1 RECONCILING BOTH VIEWS OF THE OPEN BUSINESS MODEL

Based on the extensive review of literature, three issues can be identified which affect the conceptual clarity of the open business model: (1) its unclear definition that breaks up into two streams; (2) its similarity to open innovation; and (3) its similarity to the business model concept itself. In this section, these points are resolved to arrive at a clearer picture of the open business model's nature. To do so, additional literature and real-world cases from the literature base are used to illustrate the points made. The

resulting framework allows drawing the lines between the overlapping concepts and clarifies their relationships.

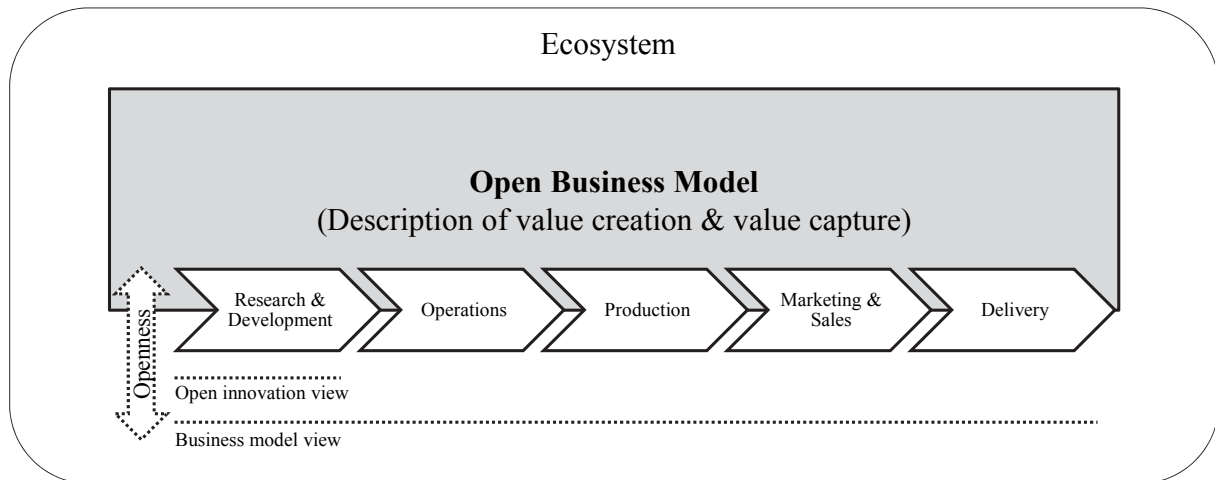


Figure 2: Openness with regard to value creation activities in the open innovation and business model views of the open business model.

It becomes clear from the above that both views of the open business model are not directly opposing. Rather, the more narrow open innovation view is contained within the broader business model view. Recollecting the common themes, what would speak for either view? The reviewed literature reveals that an open business model is seen as an ecosystem-aware way of value creation and capturing. Focal firms collaborate with the *ecosystem* by building up *value- or partner networks, platforms, or alliances* and *innovate their business model* to make use of the emerging opportunities.

The narrow view might owe its prominence to the fact that R&D activities of a firm are typically internally focused and closed (Chesbrough, 2007). Introducing openness in this area might lead to more surprising and innovative results, and thus scholarly attention. But would a company like 3M Services, which builds up a network of service delivery partners to enter the market for solutions (Frankenberger et al., 2013), not face similar challenges with regards to its business model as Procter&Gamble, which builds up a network of R&D partnerships to discover interesting product ideas (Chesbrough, 2007)? I do not see a special role of R&D activities in the overall story and, in the light of the common themes identified, feel that results of open business model research could benefit firms in opening up any activity for collaboration. Hence, I argue in favor of adopting the broader view and to consider openness in any value creation or capturing activity as a necessary condition for an open business model.

***Assertion 1:** An open business model includes external resources in at least one of its value creation and capturing activities.*

4.2 THE ‘OPEN BUSINESS MODEL - OPEN INNOVATION’ RELATIONSHIP

Opting for the business model view of the open business model implies that there are open business models not implementing open innovation principles, which some of the reviewed papers seem to suggest differently. Cases such as the 29 Costa Rican textile companies, which partner in their marketing and branding efforts (Sandulli & Chesbrough, 2009b), or the aforementioned 3M Services case, where service partners enable solution delivery (Frankenberger et al., 2013), are just two examples of open business models not directly based on open innovation principles. The other way round, however, is not clear yet: does a firm that follows the open innovation concept automatically possess an open business model? To clarify this relationship, a closer look at open innovation is required.

Based on the idea of opening R&D to the purposive inflow and outflow of ideas (Chesbrough, 2006b), a number of different phenomena have been filed under the open innovation umbrella and the concept has developed into an established field of research (Gassmann, Enkel, et al., 2010). Structuring the field, scholars typically differentiate between outbound and inbound innovation, depending on the direction of idea flow. Dahlander & Gann (2010) add an additional dimension, the pecuniary aspect, when reviewing the extant literature base. In the context of open business models and value capturing mechanisms that they include, the Dahlander & Gann (2010) framework might prove helpful in structuring open innovation phenomena and ensuring completeness.

Firms revealing their ideas or knowledge to the outside world without a direct financial reward (“outbound-revealing” as per Dahlander & Gann, 2010) can do so, for example, to attract complementors whose offerings make their own product more attractive. Computer game producer Valve, which allows others to develop games based on its own technology, is an example here (Jeppesen & Molin, 2003). In Valve’s case, openness is clearly a cornerstone of the business model’s value creation and capturing logic and ensures the firm’s sustained success. In other cases, however, the business model relationship is not so obvious. Not any open innovation move constitutes an open business model and value capturing is a major problem in this class of open innovations (Dahlander & Gann, 2010). When Netscape, for example, released the source code of its Navigator web browser, this was more a strategic one-time move against Microsoft’s

dominance (Alexy & George, 2011) than the basis of a sustainable new business model. Sustainability is a common theme of many business model definitions (Zott et al., 2011) and, together with the value capturing argument, might serve as a distinguishing feature. Formally:

Assertion 2: Open innovation only constitutes an open business model if it contributes to the firm's sustained value creation and capturing.

Selling or otherwise commercializing ideas (“outbound-selling” as per Dahlander & Gann, 2010) ensures value capturing and is a classic theme in business model literature (e.g., Chesbrough & Rosenbloom, 2002). But are all intellectual property-based business models examples for open business models? As soon as a firm’s purpose is in creating intellectual property for licensing or sale, ideas become a product – and selling products is not what constitutes an open business model as per the previous findings. The chip design house ARM, for example, develops microprocessor architectures and licenses them to chip manufacturers. Its business model would not fall into the open business model category due to a lack of external resources used (cp. Assertion 1) – if not, in developing the technology, “close interaction with co-producers” would be a “central feature of ARM’s business model” (Garnsey, Lorenzoni, & Ferriani, 2008, p. 220).

A major share of open innovation scholars studies the inbound direction of idea flow (Enkel et al., 2009), both pecuniary and non-pecuniary. In both categories (“inbound-sourcing” and “inbound-acquiring” as per Dahlander & Gann, 2010), external ideas are sourced from suppliers, customers, competitors, intermediaries, universities or, more broadly, the ecosystem. These relationships of the focal firm with the idea source can form the basis of long-lasting and vital partnerships (Dyer & Singh, 1998), leading to joint value creation and thus open business models. Yet, open innovation literature on the inbound direction also provides opposing examples. In the case of Hilti’s fleet management, for instance, the tool manufacturer transferred the idea for its fleet management concept from the automotive industry (Enkel & Gassmann, 2010). Despite clearly resulting in an innovative business model (Johnson, Christensen, & Kagermann, 2008), openness in terms of relationships or resource exchange with external partners was not part of the new logic. Many of the 24 other open innovation cases described by Enkel & Gassmann (2010) demonstrate the power of inbound open innovation in creating new products and solving technical challenges – only a few of them could, however, be considered open business models in the spirit of joint value creation and

capturing. This notion is confirmed by Chu & Chen (2011), who separate the concepts as follows: “Excluding the external R&D viewpoint of open innovation, open business models emphasize the inter-organizational activities” (Chu & Chen, 2011, p. 8538).

***Assertion 3:** Open innovation only constitutes an open business model if it leads to collaboration in the firm’s value creation and capturing activities.*

As the above examples illustrate, incorporating open innovation into research and development does not necessarily establish an open business model. Although open innovation often necessitates business model changes to reap its benefits (Chesbrough, 2007; Smith et al., 2010), the result is not always an open business model. The underlying reason for this paradox is the different meaning of openness in both concepts: open innovation looks at the permeability of a firm’s research and development for ideas, whereas open business models look at collaborative value creation and capturing. The openness required is not always the same or, as Holm et al. (2013, p. 341) put it, “openness to innovations and openness of business models needs to be adequately recognized, understood, and treated as separate phenomena.”

4.3 THE ‘OPEN BUSINESS MODEL - BUSINESS MODEL’ RELATIONSHIP

As the literature review and discussion so far revealed, an open business model can be open in its every aspect, whereby the term “open” relates to joint value capturing and creation with partners in the ecosystem. This notion of openness is not new to the business model concept. In fact, it is so deeply engrained that some of the leading scholars in the field have included it into their business model definitions (Osterwalder, Pigneur, & Tucci, 2005; Weill & Vitale, 2001; Zott et al., 2011). Shafer, Smith, & Linder (2005, p. 202), for instance, define the business model as “a representation of a firm’s underlying core logic and strategic choices for creating and capturing value within a value network.” This section hence tries to clarify the relation between the business model and its open variant, as well as the benefits that a separate open concept could have.

The main difference that comes to mind is the obligation for openness in the open business model. While the generic term “business model” allows for collaborative and non-collaborative ways of value creation and capturing, “open” explicitly calls for the inclusion of partners. The role of the open business model might hence be to explain those business models which include partnerships and to focus on those aspects that are of particular relevance in such types of business models. Potentially this is what

Storbacka et al. (2012, p. 72) have in mind when they state that “most of the extant research on business models has been firm-centric, whereas this research adopts a network-centric view.” Might this perception prove useful in describing business reality?

There is reason to believe that, in today’s networked economy, there is hardly any firm that does not collaborate with its ecosystem in one way or another. Classifying a closed business model as one that does not permit collaboration – and all others as open – would result in a world of open business models and hence not differentiate both concepts. Considering openness as a continuum (Dahlander & Gann, 2010; Sandulli & Chesbrough, 2009b), a way to decide if an observed degree of openness is sufficient to characterize a business model as “open” is needed. The business model concept itself might provide such a mechanism, as it is seen as an “abstraction” (Casadesus-Masanell & Ricart, 2010; Osterwalder et al., 2005) or “high-level representation” (Bock, Opsahl, George, & Gann, 2012) of the firm. As is the case with all abstractions, certain levels of detail are lost during the process. The criterion could hence be: Is the openness required to explain the firm’s value creation and capturing logic on a business model level? If so, the business model is open. If the collaborative aspect gets lost during abstraction, the label “open” should be omitted. Openness and collaboration with the ecosystem should, in this context, be seen as going beyond simple interactions such as sourcing from suppliers or selling to customers.

The case of BMW might illustrate this idea. In a case frequently cited in open innovation literature, the company collaborated with a high-tech company in the early development of its iDrive onboard control system (Gassmann, Zeschky, Wolff, & Stahl, 2010). The collaborative aspect is clearly fulfilled here – yet, I suspect that the partnership would not appear in any description of BMW’s overall business model. Consequently, the business model would not be called open. Considering BMW’s business as an automotive OEM, however, a huge amount of collaboration with its value network of suppliers and development partners can be expected to occur – typically, these partners account for more than 70% of a car’s value (Quesada, Syamil, & Doll, 2006). Considering this context, one might well term BMW’s business model “open”, since its overall network of partners would surely be included in the description of its business model. Hence, another requirement for the open business model concept is proposed.

Assertion 4: *In an open business model, openness in terms of collaboration is so central to the firm's current logic of value creation and capturing that it could not be explained without it.*

With this criterion, a guideline exists for a user of the concept to classify a business model as open or not – although it admittedly does not differentiate clearly and objectively. Two reasons can be given for this. First, the aforementioned nature of openness as a continuum impedes differentiation without a reference point – a relative “more open than” is easier to determine than an absolute “open”. Second, the level of abstraction in a business model is not clear either, and it is thus in the eyes of the beholder to judge whether the observed openness is required to explain value creation and capturing in a concrete setting. Further contextual arguments might be considered in this judgment, such as the degree of openness of prevalent business models in the firm's industry. The previous remarks also imply that “not open” in the sense of an open business model does not equal to “closed”. The border between “open” and “closed” is broad and there are many shades of grey, whereby the open business model captures those clear cases in which openness is a distinctive feature of a business model.

Another point to be discussed is the use which a separate open business model concept has for research. Despite (or due to) the holistic picture of the firm that the business model provides, scholars using the concept tend to focus on the set of aspects that is relevant in their particular context (George & Bock, 2011). The common themes identified in the reviewed literature base, such as the challenges involved in establishing partnerships and in achieving fit between business models, show that there are many aspects particular to open business models. These mark a separate area of business model research which might require special theoretical lenses of analysis, such as absorptive capacity (Sandulli & Chesbrough, 2009b), network theory (Frankenberger et al., 2013), or transaction costs (Chu & Chen, 2011). Bundling these specifics into a subclass of business model research would, as per my perception, help focus and advance research in this field. In line with the authors in the literature base, who have used the concept for a purpose, the open business model should be seen and used as a self-contained subclass of business models.

4.4 CONCEPTUAL FRAMEWORK OF THE OPEN BUSINESS MODEL

Viewing the previous sections and the four assertions made in context allows to draw up a conceptual framework that can be used to illustrate the relationships of open innovation, business models, and open business models. In summary:

- *Open innovation* describes purposeful openness of a firm’s research & development activities.
- *Business models* describe the sustained value creation and capturing of a firm, independent of openness.
- *Open business models* are a subclass of business models in which collaboration plays a central role in explaining value creation and capturing of a focal firm.

Since the three constructs overlap, the case base established above shall illustrate the overlapping areas. Figure 3 presents the illustration of the argument.

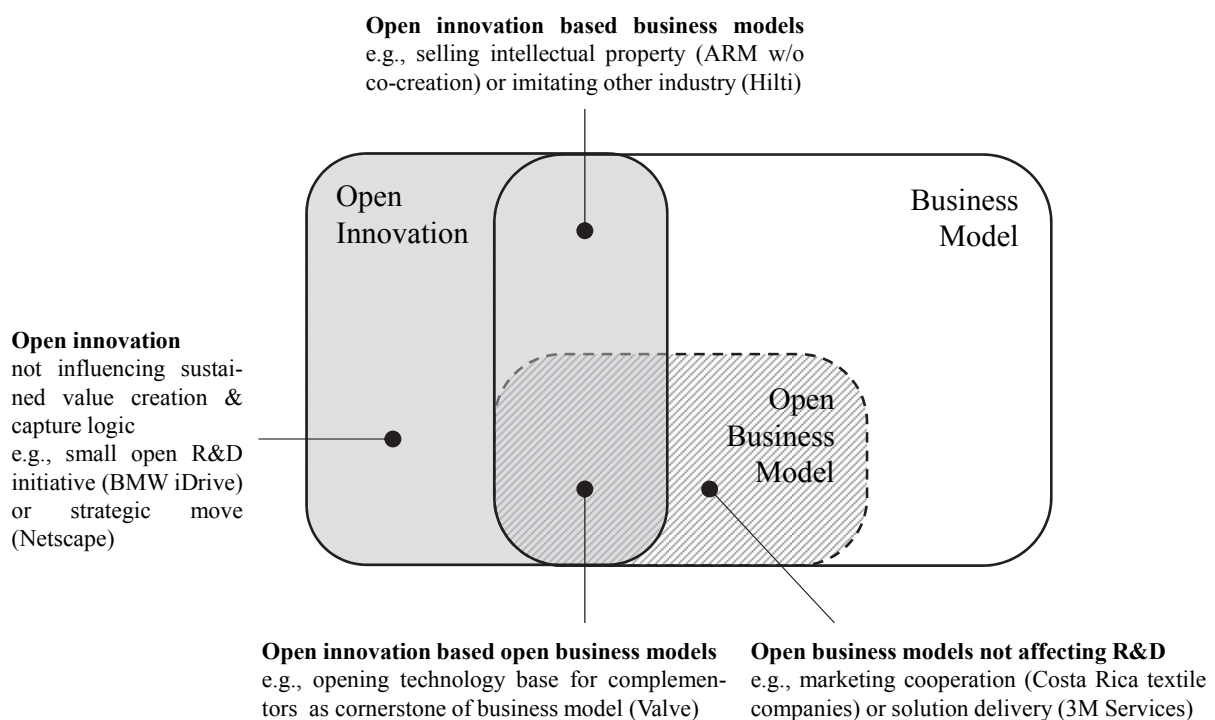


Figure 3: Conceptual framework of separation and overlap between open innovation, business model, and open business model concepts

The framework builds upon the main differentiation criteria and assertions that were elaborated in the earlier discussion of the concepts. Re-stating and summarizing them here shall help consolidate the findings:

- Open innovation only falls together with the business model concept if it contributes to a firm’s sustained value creation and value capturing.
- Open innovation only falls together with the open business model concept if it leads to collaboration as a central part of the business model.

- A business model is open only if the aspect of collaboration (i.e., joint value creation and capturing with partners) is central in explaining the overall logic of value creation and capturing.

Building on the prior definition of Teece (Teece, 2010, p. 191), this section concludes with a proposed definition of the open business model in line with the above findings: *An open business model describes the design or architecture of the value creation and value capturing of a focal firm, in which collaborative relationships with the ecosystem are central to explaining the overall logic.*

5 SUMMARY AND CONCLUSIONS

In line with the purpose of this paper to investigate and clarify the nature of the open business model, the concept has been approached based on an extensive review of scholarly literature. Despite a large overlap in many common themes (such as collaboration, partnerships, business model innovation, and challenges of openness), the concept's definition and usage in the literature base was found unclear and inconsistent. In this respect, the open business model suffers from similar deficiencies as the business model concept itself (George & Bock, 2011; Zott et al., 2011). The lack of conceptual clarity of the open business model can be traced back to three root causes: (1) its unclear definition that breaks up into two streams; (2) its similarity to open innovation; and (3) its similarity to the business model concept itself. The attempt to resolve these tensions by consulting additional literature from the open innovation and business model fields results in a framework that illustrates the relationships of the three overlapping concepts. A set of differentiation criteria is provided which helps in relating real-world cases to the three constructs. In essence, the findings suggest considering the open business model as a subclass of the business model concept in which collaboration plays a central role in the value creation and capturing activities of a focal firm.

The presented study is the first to conduct a systematic review of prior literature on the open business model specifically. Although the base of high-class scholarly work on the topic is still limited at this point of time, the field shows first signs of fragmentation. Many scholars use the concept without clear definition, resulting in divergence of perception and overlap with existing concepts. This paper's comprehensive perspective helps in sharpening the perception and future usage of the open business model in the research community. The achieved clarity in meaning and relations to the open

innovation and business model fields should lead to a more focused and deliberate use in future work. The remaining – now clearly defined – overlap with open innovation and business model research should not be seen as a weakness of the open business model concept. Rather, findings in these more established fields can serve as the base on which open business model research can grow and develop. Its strength lies in integrating these perspectives into a new concept of its own right.

It is a noteworthy limitation of this paper to not have included potentially similar concepts, such as collaborative and networked business models, into the analysis. While this approach proved helpful in unraveling the core of the “open business model”, literature under similar labels might hold valuable insights which have been missed. Future research could take the achieved understanding of the open business model as the basis for an exploration of commonalities and differences with those similar business model concepts.

With regards to the practical use of the open business model, the reviewed literature suggests two conclusions. First, there definitely are a growing number of business models in the real world that are built upon novel ways of interaction with the business ecosystem and partnerships with other entities. These business models currently lack a systematic means of description and analysis, which the open business model could provide. Second, there is a lack of guidance for managers as to how these open business models can be achieved in newly founded or established firms. The field of business model innovation in the context of open business models describes the innovation processes, organizational implications, and managerial challenges of opening up a firm’s business model and making collaboration a central part of its value creation and capturing logic. It presents a promising route for future research which has high relevance for practice (see Lindgren & Jørgensen, 2012; Lindgren, Taran, & Boer, 2010).

More insights are also needed in studying the open business model’s consequences for the focal firm – under which circumstances is it advisable to adopt an open business model at all? Holm et al. (2013) make this important point, suspecting a “pro-bias” in current literature. More quantitative research on performance aspects (such as Cheng, 2011) and financial implications (such as Alexy & George, 2011) would help with these topics. Considering an open business model’s task of explaining collaborative value creation and capturing, the value capturing aspect is rarely covered in the reviewed literature (Chanal & Caron-Fasan, 2010 are an exception here). Different modes of value

appropriation and partner motivation in network-centric business models hence mark another avenue for research in which the open business model could prove its use as an analytical device. The research field might also benefit from a stronger use of existing theories to explain the observed phenomena; scholars in the reviewed literature mention dynamic capabilities (Cheng, 2011), absorptive capacity (Sandulli & Chesbrough, 2009b), or network theory (Frankenberger et al., 2013) as being valuable. Future contributions in the open business model field should observe these proposals and assess their applicability.

Clearly, the increasingly networked economy (Ehret & Wirtz, 2010; IBM Global Business Services, 2012) provides many more real-world phenomena and topics than mentioned here which would be worth studying, categorizing, and classifying from an open business model perspective. Research on open business models has just begun and, provided consistency in the concept's usage, has the potential of developing into a vibrant research field of high practical relevance.

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APPENDIX

OVERVIEW OF LITERATURE SEARCH RESULTS AND RESEARCH DESIGN

The literature search was conducted in the October/November 2012 timeframe, with additional rounds in December 2012 and January 2013 to accommodate for newly published contributions. The aim was to capture the available literature as per the end of 2012.

Search A: EBSCO Discovery Service

Search for „open business model*“ in title, abstract, or keywords of peer-reviewed journals. Obvious duplicates, non-English articles, non-scholarly articles, and book reviews excluded. Result set:

Paper	Research type	Research design / Data base
(Chanal & Caron-Fasan, 2010)	Qualitative empirical	Single-case study (longitudinal): crowdsourcing platform
(Cheng, 2011)	Quantitative empirical	209 responses from top-1000 Taiwanese service firms
(Chesbrough & Schwartz, 2007)	Conceptual	Illustrative cases from pharma, high-tech, software, consumer products
(Chesbrough, 2007)	Conceptual	Illustrative cases from pharma, high-tech, consumer products
(Chu & Chen, 2011)	Qualitative empirical	Case of chip design foundries in Taiwan
(Davey et al., 2010)	Qualitative empirical	Four UK-based medical devices SMEs
(Davey et al., 2011)	Qualitative empirical	Seven UK-based medical devices SMEs
(Gassmann, Enkel, et al., 2010)	Conceptual	(Introduction to special issue)
(Jagoda et al., 2012)	Qualitative empirical	Single-case study: small land-development company
(Kakalettris et al., 2004)	Conceptual	(Research project report)
(Luo & Chang, 2011)	Qualitative empirical	Single-case study: research institute and high-tech firm
(Purdy et al., 2012)	Conceptual	Illustrative cases from high tech, venture capital, e-business
(Romero & Molina, 2011)	Conceptual	Literature review on value co-creation and co-innovation
(Sandulli & Chesbrough, 2009a)	Conceptual	Illustrative cases from pharma, high-tech, software, consumer products, gastronomy
(Sheets & Crawford, 2012)	Conceptual	Illustrative cases from higher education
(Soloviev et al., 2010)	Conceptual	Illustrative cases from software

Paper	Research type	Research design / Data base
(Vetter et al., 2008)	Conceptual	(Research project report)
(Wang & Zhou, 2012)	Conceptual	National innovation system of emerging countries

Search B: Google Scholar

Search for „Open business model*“ anywhere in the publication. Manual screening of excerpts and (subsequently) abstracts of the 515 results. Selected publications:

Paper	Research type	Research design / Data base
(Alexy & George, 2011)	Quantitative empirical	52 US-exchange listed firms; 77 announcement events
(Frankenberger et al., 2012)	Qualitative empirical	Cases of three solution providers
(Holm et al., 2013)	Qualitative empirical	Cases of two Danish newspapers
(Wang et al., 2009)	Conceptual	Literature review on open innovation, business model, business model innovation
(Smith et al., 2010)	Qualitative empirical	Case of research consortium, comprising six companies
(Storbacka et al., 2012)	Conceptual	Literature on value co-creation and business models reviewed

Chapter 3

The 4I-framework of business model innovation A structured view on process phases and challenges

Co-authored by Karolin Frankenberger, Michaela Csik, and Oliver Gassmann⁶

Abstract

Business model innovation has received rising attention as a means for firms to achieve superior performance. Yet, as we argue based on a review of related literature, the research field so far lacks a comprehensive framework that supports managers in their endeavour to innovative their firms' business models. Based on process models from innovation management literature and insights from 14 cases of past business model innovations, we develop the 4I-framework that structures the business model innovation process and highlights the specific challenges which managers face during the initiation, ideation, integration and implementation of new business models. Through our study, we also provide a conceptual framework to organise existing literature in the business model innovation field and identify promising areas for future research.

Key words: business model; business model innovation; business model innovation process; process phases; challenges; incumbent firms.

⁶ This paper has been published in: Frankenberger, K., Weiblen, T., Csik, M., & Gassmann, O. (2013). The 4I-framework of business model innovation: A structured view on process phases and challenges. *International Journal of Product Development*, 18(3/4), 249–273.

1 INTRODUCTION

Firms like Apple, Southwest Airlines, or IBM are well-known examples of incumbent firms which have successfully innovated their business models. Their renewed success in the market cannot be explained by the mere introduction of new products or services alone but rather by their novel way of doing business as a whole. The companies have managed to develop distinct innovative business models that set them apart from other firms and create additional value for their customers and partners. As the examples illustrate, business model innovation is a powerful tool for a firm to achieve superior performance and, as such, a desirable goal.

While contributions in the field of business models have increased significantly over the last years (Zott, Amit, and Massa, 2011), the majority of research has taken a rather static view on the business model (e.g., Amit and Zott, 2001; Chesbrough and Rosenbloom, 2002; Morris, Schindehutte, and Allen, 2005). The question as to how business model innovations are achieved is thereby widely neglected. Articles dealing with business model innovations tend to focus on widely diverse aspects such as the strategic change antecedents (Doz and Kosonen, 2010), barriers that prevent companies from tackling the challenge of business model innovation (Bouchikhi and Kimberly, 2003; Chesbrough, 2010), or risks underlying the realisation of novel business models (Girotra and Netessine, 2011).

We aim at strengthening the understanding of business model dynamics by exploring the structure and the challenges associated with the business model innovation process. The purpose of our study is to develop a framework which describes the process stages of business model innovation and the key challenges in each phase in order to support managers in innovating their firms' business models. Building on prior research on innovation processes, we identify four process phases which characterise the business model innovation process: initiation, which focuses on the analysis of the ecosystem; ideation, which refers to the generation of new ideas; integration, which deals with the building of a new business model; and implementation, which focuses on the realisation of the new business model. We employ a multiple case study approach based on 14 business model innovation projects within six multinational companies. By analysing the cases through the lens of the four process stages, we identify a comprehensive list of nine key challenges that characterise the specific phases.

The contribution of this paper to the field of business model literature is twofold: First, we add new theory by developing a process framework for business model innovation

which has not been existent so far. Second, we build on and extend the initial contributions on various challenges associated with business model innovation by providing a comprehensive list of key challenges structured along the four process phases. We also provide managers with a useful framework to structure their business model innovation process and better master the typical challenges and pitfalls in each of its phases.

Our paper is organised as follows. First, we give an overview of relevant work in the business model, business model innovation, and innovation process model fields. As part of this review, we derive a four-component business model representation and an innovation process framework that guide our study. We identify the lack of an integrative business model innovation framework, which we aim at closing through a qualitative case study approach. We condense our results into the 4I-framework, which we present and subsequently discuss by reflecting the findings against additional insights from related literature streams. Finally, we conclude the paper by stating the managerial and scientific implications of our work.

2 THEORETICAL BACKGROUND

2.1 BUSINESS MODELS

Before elaborating on business model innovation, it is worthwhile to develop a basic understanding of the business model concept itself. Historically, the business model has its roots in the late 1990s when it emerged as a buzzword in the popular press. Ever since, it has raised significant attention from both practitioners and scholars and nowadays forms a distinct feature in multiple research streams. In general, the business model can be defined as a unit of analysis to describe how the business of a firm works. More specifically, the business model is often depicted as an overarching concept that takes notice of the different components a business is constituted of and puts them together as a whole (Amit and Zott, 2001; Chesbrough and Rosenbloom, 2002; Demil and Lecocq, 2010; Johnson, Christensen, and Kagermann, 2008; McGrath, 2010; Morris, Schindehutte, and Allen, 2005; Osterwalder and Pigneur, 2010) - a notion nicely formulated by Magretta (2002, p.91): "*Business models describe, as a system, how the pieces of a business fit together*".

Business model literature has not yet converged to a common opinion as to which components exactly make up a business model. To describe the business models

throughout our study, we employ a conceptualisation that consists of four central dimensions: the Who, the What, the How, and the Why. Due to the reduction on four dimensions it is easy to use but, at the same time, exhaustive enough to provide a clear picture of the business model architecture.

Who: Every business model serves a certain customer group (Afuah and Tucci, 2001; Chesbrough and Rosenbloom, 2002; Hamel, 2000; Teece, 2010). Thus, it should answer the question *"Who is the customer?"* (Magretta, 2002, p.87). Drawing on the argument from Morris, Schindehutte, and Allen (2005, p.730) that the *"failure to adequately define the market is a key factor associated with venture failure"*, we identify the definition of the target customer as one central dimension in designing a new business model.

What: The second dimension describes what is offered to the target customer, or, put differently, what the customer values. This notion is commonly referred to as the customer value proposition (Johnson, Christensen, and Kagermann, 2008), or, more simply, the value proposition (Chesbrough and Rosenbloom, 2002; Chesbrough, 2010; Morris, Schindehutte, and Allen, 2005; Teece, 2010). According to Osterwalder (2004, p.43) it can be defined as an *"overall view of a company's bundle of products and services that are of value to the customer."*

How: To build and distribute the value proposition, a firm has to master several processes and activities. Those processes and activities, along with the involved resources (Chesbrough and Rosenbloom, 2002; Hedman and Kalling, 2003; Johnson, Christensen, and Kagermann, 2008; Osterwalder, 2004) and capabilities (Morris, Schindehutte, and Allen, 2005), plus their orchestration in the focal firm's internal value chain, form the third dimensions within the design of a new business model.

Why: The fourth dimension explains why the business model is financially viable, thus it relates to the revenue model. Its inclusion into our business model conceptualization is supported by the work of various authors such as Chesbrough and Rosenbloom (2002), Johnson, Kagermann, and Christensen (2008), Mahadevan (2000), Magretta (2002), Morris, Schindehutte, and Allen (2005), and Teece (2010). In essence, it unifies aspects such as, for example, the cost structure and the applied revenue mechanisms and points to the elementary question of any firm, namely how to make money in the business.

A central virtue of the business model is that it allows for a holistic picture of the business by combining factors located inside and outside the firm (Teece, 2010; Zott,

Amit, and Massa, 2011). In this regard, it is often referred to as a boundary-spanning concept that explains how the focal firm is embedded in and transacts with its surrounding ecosystem (Shafer, Smith, and Linder, 2005; Teece, 2010; Zott and Amit, 2008, 2009). The task most commonly attributed to the business model is to explain how the focal firm creates and captures value for itself and its various stakeholders within this ecosystem.

Considering the vast scope that is subsumed under the business model umbrella, it becomes clear that, in the real world, a firm's business model is a complex system full of interdependencies and side effects. Changing - or innovating - the business model can hence be assumed to be a major undertaking that can quickly become more complex than innovating an isolated product or process.

2.2 BUSINESS MODEL INNOVATION

Although the idea that a firm's business model can be innovated is kind of self-evident, it has only recently been incorporated as a topic in research. Most of the extant literature has adopted a static view, disregarding that business models may be subject to change and must be thus treated as dynamic concepts (Demil and Lecocq, 2010; McGrath, 2010; Morris, Schindehutte, and Allen, 2005; Sosna, Trevinyo-Rodríguez, and Velamuri, 2010).

At root, a business model innovation can be defined as a novel way of how to create and capture value, which is achieved through a change of one or multiple components in the business model (Amit and Zott, 2001; Chesbrough, 2010; Demil and Lecocq, 2010; Mitchell and Coles, 2003; Teece, 2010). Business model innovations exceed the scope of the mere introduction of a new product or service offering and thus open up completely new opportunities of how to engage in economic exchanges (Hamel, 2000; Mendelson, 2000; Mitchell and Coles, 2003).

Scholars in research have widely acknowledged that business model innovation is a key source of competitive advantage (Baden-Fuller and Morgan, 2010; Björkdahl, 2009; Chesbrough and Rosenbloom, 2002; Chesbrough, 2007; Comes and Berniker, 2008; Hamel, 2000; McGrath, 2010; Mitchell and Coles, 2003; Teece, 2010; Venkatraman and Henderson, 2008). Also, practitioner studies underline its growing importance. Business model innovators have been found to be on average 6% more profitable over five years than pure product or process innovators (BCG, 2008). Consequently, managers consider business model innovation to be more important for achieving competitive advantage

than product or service innovation (Economist Intelligence Unit, 2005) and 98% of the surveyed CEOs in a study by IBM (2008) plan to innovate their company's business model in the next three years; more than two thirds of them envisage extensive innovations.

However, despite the perceived importance of business model innovation, the research base in that field is thin. Most scholars so far have solely focused on the importance of business model innovation itself but failed to operationalize this finding by explaining how to systematically innovate the business model. Articles, if any, dealing with this question tend to focus on particular, widely diverge aspects such as the strategic change antecedents (Doz and Kosonen, 2010), the cognitive and asset-related barriers that prevent companies from tackling the challenge of business model innovation (Bouchikhi and Kimberly, 2003; Chesbrough, 2010), or risks (Girotra and Netessine, 2011) underlying to the realisation of novel business models.

In their recent review of business model innovation literature Schneider and Spieth (2012, p.19) conclude that *"business model innovation's core elements and the process of their identification, design, and evaluation remain largely unknown."* What is missing so far is an integrative framework that comprises the stages that companies go through to come to an innovative business model and helps managers design and implement new business models by identifying the key challenges involved at each stage.

2.3 INNOVATION PROCESS MODELS

A prerequisite for providing systematic guidance on business model innovation is to analyse the process that companies innovating their business model follow. First, the phases of the innovation process need to be clearly defined, along with their specific challenges. Hartley (2006, p.38) stresses this point since *"the articulation of processes helps to identify particular barriers and facilitators at particular stages, and this may be of practical help to policy-makers and managers."* Only few business model scholars so far have spent attention to business model innovations as a process that is composed of phases or process steps. Teece (2010) provides a high-level list of steps that firms should follow to achieve sustainable business models. Mitchell and Bruckner Coles (2004) describe business model innovation as a continuous process and present learnings from successful companies. Osterwalder and Pigneur (2010), finally, propose five subsequent steps to generate new business models. None of them, however, has the ambition of describing the business model's innovation process as a whole and in the form of an integrative framework.

The discipline of innovation management, in contrast, has a long tradition of analyzing and structuring innovation processes. First concepts - assuming a linear “technology push” of innovations - emerged in the middle of the 20th century, followed by a period of “market pull”-based innovation process models in the late 1960s (Rothwell, 1994). Later studies, however, revealed that innovation processes in reality are seldom linear in nature: they are characterised by discontinuities (Tushman and Anderson, 1986) and are even described as being chaotic (Cheng and Van de Ven, 1996; Van de Ven et al., 1999). Nonetheless, managers and organisations rely on structured schemes to coherently manage their innovation efforts. To accommodate this fact, linear models over the past years have been enhanced to incorporate feedback loops and alternative paths (Gassmann and von Zedtwitz, 2003).

Bucherer, Eisert and Gassmann (2012, p.190) identify “*a similarity between product and business model innovations in regard to the high-level process steps*” but, at the same time, hint at “*significant deviations for the concrete activities performed in these phases.*” We observe these findings in the setup of our study. For the purpose of structuring the high-level framework that captures the essential stages of business model innovations, it seems appropriate to derive a basis from innovation management literature. The concrete details and challenges of the single phases, as well as their interrelation (linear vs. iterative), in contrast, shall be derived empirically.

The models found in innovation management literature describe the innovation process on different levels of granularity and are often tailored to specific innovation types, such as product, process, or strategic innovation (Hartley, 2006). At heart, however, the process models feature a set of common characteristics. In his extensive review of innovation process models in literature Eveleens (2010) concludes that most models presented consist of four “*phases, stages, components, or main activities.*” Based on his work and literature base, we analysed the top six articles (as per their average number of citations per year since publication, according to the Google Scholar search engine) to derive a generic process model that can be applied to describe business model innovations (see Table 1). The first phase, which is often termed initiation, is concerned with the discovery of the need for innovation. That is, the capturing of the initial event, idea, or decision that initiates the entire innovation process. It is followed by a phase of generating innovative ideas as to how to react to the impulse. This ideation phase aims at opening up the solution space and at generating a set of possible alternatives. The third phase, in contrast, takes up one of the promising possibilities and focuses on its elaboration and development – or, as Eveleens (2010) puts it: “*to turn the (selected)*

idea into some tangible product, process, or service.” We coin it as the integration phase since the idea is embedded into and integrated with a broader context. The fourth and final phase of the innovation process typically is the one in which the innovation is implemented and brought to the market. These four generic phases – namely initiation, ideation, integration, and implementation – shall guide our further analysis and framework construction.

Table 1: Synthesis of innovation process phases from literature

Source	Cooper (1990)	Rothwell (1994)	Van de Ven et al. (1999)	Cormican and O’Sullivan (2004)	Tidd and Bessant (2005)	Hansen and Birkinshaw (2007)
Process Model Name	Stage-Gate	Third-generation model	Innovation process patterns	Basic model of product innovation management	Innovation as a core business process	Innovation value chain
Phase Arrangement	Linear	Iterative	Iterative	Linear	Linear	Linear
Innovation Process Phases	Initiation	Preliminary assessment	New need New tech	Initiation period	Analyse environment and identify opportunities	Searching Selecting
	Ideation	(for Cooper, the entire process is triggered by an idea)	Idea generation		Generate innovations and investigate	Acquiring Idea generation
	Integration	Detailed investigation Business case preparation Development	Research, design, and development	Developmental period	Plan project and select sponsor	Executing Idea conversion
	Implementation	Testing and validation Full production and market launch	Prototype production Manufacturing Marketing and sales	Implementation/Termination period	Prioritise project and assign teams Implement product implementation plan	Launching Sustaining Learning

Although business model scholars so far have rarely taken a process perspective on business model innovations, some of their contributions fit well into this generic four-stage model and thus support its application. The discovery-driven approach proposed

by McGrath (2010), for example, is concerned with developing new business models through experimentation in the real world. In the model, her approach can be located in the implementation phase of a business model innovation, with occasional iterations into integration phase to adjust the new business model. A similar learning process is described in a case study by Sosna, Trevinyo-Rodríguez, and Velamuri (2010). The wheel of business model reinvention put forward by Voelpel, Leibold, and Tekie (2004), in contrast, helps managers sense change drivers from the ecosystem surrounding a focal firm and supports the decision if a business model change is a necessary reaction. It hence deals exclusively with the initiation phase of the generic model. Girotra and Netessine (2011), finally, support the ideation phase by demonstrating how thinking about risk can guide a company towards an innovative business model. We will come back to the possibility of using the four generic innovation phases as a means of organizing existing literature during the discussion of our results.

3 METHODOLOGY

The intention of our study is to shed light into the structure and challenges associated with business model innovations in order to construct a framework that supports managers in innovating their firms' business models. Due to the lack of empirical insights into these aspects, a qualitative case study approach is employed (Eisenhardt, 1989; Yin, 2009). In line with our aim to develop a generalizable framework, we choose a multiple case study design to increase the breadth of observations and to obtain richer insights into the common themes.

3.1 SAMPLE DESCRIPTION

Our unit of analysis are past business model innovation projects in established companies. The sample contains 14 cases of past business model innovations and was collected as part of a two-year research project. The cases originate from six multinational firms of different industries, which are headquartered in Switzerland and Germany and involved in the research project:

- MachineCo is a manufacturer of machines for the food industry.
- ToolsCo produces construction tools and related equipment.
- MetersCo manufactures electric meters and smart meters.
- SoftwareCo is a producer of enterprise software.
- TelCo provides telecommunication services (mobile and land-line).

- EngineCo makes turbines and propulsion systems.

Table 2 provides an overview of the selected cases and the business model impact induced by each of the business model innovations.

Table 2: Overview of business model innovation cases

Case	Company	Description	BM implications (elements changed)
1	MachineCo	Joint venture to market grain fortification system for developing countries.	<ul style="list-style-type: none"> • What: Full solution and know-how instead of machine. • How: Partnership with complementor. • Why: License sales instead of machine sales.
2	ToolsCo	Tool fleet leasing offering.	<ul style="list-style-type: none"> • What: Full-service package instead of machine. • How: New capabilities in sales, logistics, IT, finance, and supply chain. • Why: Monthly fees instead of one-time payment.
3	MetersCo	“Network of knowledge” to increase development efficiency.	<ul style="list-style-type: none"> • Who: New development partners. • How: Open R&D process of managing partners and their skills instead of everything in-house.
4	MetersCo	Energy consumption visualisation product line.	<ul style="list-style-type: none"> • Who: Private end customers instead of utilities. • What: Appealing visualisation and control of energy consumption (“from basement to the living room”).
5	MetersCo	Interface standards for communications across all products.	<ul style="list-style-type: none"> • Who: Communication providers as new partners. • What: Standards-capable meters, no communication hassles for new services.
6	MetersCo	Configurability of products.	<ul style="list-style-type: none"> • What: Product adapts to customer needs. • How: New R&D, sales and marketing skills and processes.
7	SoftwareCo	New support model for corporate customers.	<ul style="list-style-type: none"> • What: Proactive support instead of classical reactive troubleshooting. • Why: Additional premium support fees on top of license and maintenance revenues.
8	SoftwareCo	Cloud-based software for SMEs.	<ul style="list-style-type: none"> • Who: SMEs instead of large enterprises. • What: Full software-as-a-service offering. • How: New infrastructure and processes throughout. • Why: Usage-based monthly fee instead of one-time license sale.
9	SoftwareCo	B2B internet marketplace for collaborative purchasing and design.	<ul style="list-style-type: none"> • Who: Purchasing departments instead of IT. • What: Out-of-the-box collaboration with industry partners. • How: Partnership with start-up company. • Why: Membership fees.
10	TelCo	Digital newsstand.	<ul style="list-style-type: none"> • Who: Newspaper and magazine publishers instead of telecom customers. • What: Access to potential readers. • Why: Revenue share.
11	TelCo	Fiber cable laying robot.	<ul style="list-style-type: none"> • Who: Construction companies instead of telecom customers. • What: 50% more efficient construction. • How: University partnership for development. • Why: Shared cost savings with construction companies.

Case	Company	Description	BM implications (elements changed)
12	TelCo	Data insurance as part of home insurance.	<ul style="list-style-type: none"> • Who: Home insurance customers. • What: Secure online data backup. • How: Partnership with insurance companies. • Why: Bundling with insurance product.
13	EngineCo	Move from engine supplier of OEMs to full system provider.	<ul style="list-style-type: none"> • Who: End customers instead of OEMs. • What: Branded engines, options, service, support. • How: New capabilities in service, marketing, IT.
14	EngineCo	Entry into stationary engine market.	<ul style="list-style-type: none"> • Who: Electricity producers instead of mobility OEMs. • How: Acquisition of former partially-owned local manufacturer. Use of existing sales organisation.

3.2 DATA SOURCE

To identify past business model innovation projects, we employed an approach similar to that of McGrath (2001). The CTO or senior innovation manager of each of the aforementioned companies was approached with a list of criteria for identifying business model innovations. In particular, we asked them to identify past projects that had developed significant impact on the components of the firm’s business model. We did not give directions with regard to the projects’ perceived success as we feel that learning from failed examples can provide valuable insights into the challenges associated with business model innovations and can thus serve as a source of learning (cp. Cope, 2011). We also insisted that key project participants were identified and made accessible to us

Due to practical reasons, such as the global distribution of the contacts provided, initial case data was then gathered through questionnaires that were filled by respondents who had been significantly involved (e.g., as the initiator or project lead) in the respective innovation projects. Questionnaires were structured by the four generic innovation phases identified above and largely consisted of open-ended questions with free-text answers (19 out of 23) to accommodate the exploratory nature of the study. The data generated in the form of 14 comprehensive responses during this first phase was further enriched through follow-up e-mails to clarify specific details.

As the second main source of data, we conducted two full-day focus group workshops with two to three representatives - CTOs and innovation managers - from each of the aforementioned companies. Due to their senior position in the organisation, participants could provide their perception of the cases from a different viewpoint and thus support triangulation. The focus group setting allowed them to add their broader perspective, exchange points of view, expand on questions, and address further aspects (cp. Morgan,

1998). The group discussions and sessions in the two workshops were observed by four researchers, taking notes independently.

3.3 DATA ANALYSIS

The initial case evaluation included the thorough review and comparison of the collected data. The free-text questionnaire format proved helpful, as no interview transcripts were required and the responses followed the same structure for all cases. Follow-up questions with regards to the questionnaire data were clarified via e-mail with the respondent directly; in the focus group workshops, questions were clarified immediately. Thus, each case was understood as a single unit and analysed in isolation. By subsequent application of inductive reasoning, themes and categories were identified from the data across cases (Miles and Huberman, 1994) and led to a first draft version of a framework that structured the business model innovation process and identified the most important challenges per phase.

Initial evaluation was followed by an iterative process of enfolding literature (Eisenhardt, 1989), comparing the findings against theory, discussing the findings with other researchers, and generating additional insights from practice. The latter part we achieved by presenting our draft findings in the second focus group workshop. This workshop contributed considerably to the abstraction and generalisation of the findings and allowed us to collect further statements and insights.

After multiple iterations and versions, we could condense the key points identified from the data into the 4I-framework of business model innovation. It is presented in the following section.

4 RESULTS: DEVELOPMENT OF AN INTEGRATIVE FRAMEWORK

This section is structured along the four generic phases of innovation processes: initiation, ideation, integration, and implementation. None of the respondents of our questionnaire raised questions or concerns with regards to the meaning of the phases or how the events of the specific case should be divided into them. We hence feel confident that the phases are a good high-level representation of a business model innovation process. For each phase, we explore the exact meaning in a business model innovation context and present the key challenges associated with the single phase. Results are

enriched with quotes from the focus groups and from the questionnaires. At the end of the section, we reflect on the observed nature of the process (linear vs. iterative) before we condense our findings into an integrative framework. The 4I-framework of business model innovation which we develop describes the overall structure of the business model innovation process. It includes the phases, as well as their sequence, and summarises the key challenges of each phase.

4.1 INITIATION

The initiation phase in business model innovation processes can be described by activities which focus on the understanding and monitoring of the surrounding ecosystem of the innovating firm. The ecosystem comprises players such as customers, suppliers, competitors, universities, or governments and immediately influences the operations of the focal firm. We identified two main challenges within the initiation phase, which were frequently outlined throughout the questionnaires and the focus groups. The first challenge refers to the *understanding of the needs of the players*. Their needs and moves influence the focal company and often set the starting point for a change of business model. Therefore, it is important to monitor them closely. In nine cases, contacts with customers, suppliers, or complementors marked the starting point of the innovation; competitor moves such as business model or pricing changes, as well as new offerings, are mentioned as well. A CTO in our focus group emphasised the importance of players as the starting point for business model innovations as follows: *“The last big business model innovation in our company was triggered by our customers. They had the need to get something really different.”*

A second challenge within the initiation phase is the *identification of change drivers*, which can also initiate business model changes. Technology changes, such as digitisation, and regulatory changes are mentioned as such events that triggered the rethinking of the business model. One participant explained this challenge as follows: *“Today changes in the environment or in technology happen so rapidly that it is really difficult to keep up with them, but this is a key precondition for successful business model innovations and a key success factor for our firm.”* In case three, for example, a regulatory change brought new and unexpected competition into the market and caused MetersCo to rethink the business model. In the initiation phase, firms need to identify changes in the environment and in technology in order to be able to respond to those changes with adequate innovations.

Case two, which represents a very successful and industry-changing business model innovation, illustrates the importance of mastering the identified challenges. The impulse to think about a new business model arose from ToolsCo's ecosystem, which the company understood particularly well. With two thirds of its 20,000 staff working in sales and having regular end customer contact, ToolsCo had more a partner- than supplier-type relationship with its customers and could develop a clear sense of their needs. The central need of a construction company with regards to tools was to have a functioning tool available when needed at the construction site – not to physically own a ToolsCo product and take care of its whereabouts, maintenance, and replacement. At the same time, lower-end competitors were catching up technology-wise and jeopardised ToolsCo's profit margins in tool sales. Compared to them, ToolsCo identified two unique features that it could exploit: outstanding product quality, leading to a very competitive TCO for its high-end tools, and the direct sales model. Based on this deep understanding of its ecosystem, the company decided to rethink its business model.

4.2 IDEATION

Ideation, the second phase in the generic innovation process, also has its meaning and specific challenges in the business model innovation context. It focuses on the generation of ideas for potential new business models. More specifically, it is concerned with the transformation of opportunities, which are identified in the initiation phase, into concrete ideas for new business models.

Our findings outline that there are three main challenges during the ideation phase: First, our interviewees stated that they have *difficulty to overcome the current business logic* and to *think out-of-the-box*, as teams are locked into the logic used by the current business model and industry. "Industry laws" are rarely challenged, as is underlined by the fact that, for five of the cases analysed, competitors were the main source of inspiration during ideation. As outlined by one of the CTOs in the focus group: "*It is so difficult to break out of the dominant logic of the company and of the industry when you have been working within this company for many years, which is the case for most of our managers.*" Hence, overcoming the current business logic is the first key challenge for the ideation phase. Second, managers report *difficulties to think in business models*, as they are used to think solely in new product developments when trying to solve a problem. One of the innovation managers nicely termed this the "*business model thinking attitude*" that is missing. Or, as outlined by another innovation manager: "*Almost our entire R&D budget is focused on product development. How should we*

think about business models in such a setting?” Third, our interviewees argue that there are ***no systematic tools to develop new business model ideas***, as becomes apparent in the following quote: *“We have multiple tools and methods to come up with new ideas for products but there is nothing to support idea generation for business models.”* This shortage is also underlined by the results of the questionnaires: The question as to which methods and tools are used to develop business model ideas shows a big diversity of answers. The biggest cluster is “none / unknown” with eight of the cases; value chain analysis and market research, which are generic methods not tailored to business model idea generation, are used by three cases.

In contrast to these analytic approaches, TelCo (cases ten to twelve) applies more creative brainstorming and pitching workshop formats to arrive at new business model ideas. External experts and ideas are brought into the ideation process which, according to the head of the innovation department, helps overcome some of the challenges identified. Overall, however, there does not seem to exist the one best method to purposefully create ideas for new business models.

4.3 INTEGRATION

The third phase typically used in innovation processes, the integration phase, also plays its role for business model innovations. The activities within this phase focus on the development of a new business model based on promising ideas identified in the ideation phase. They need to be transformed into a complete and viable business model. Using the four dimensions (who, what, how, why) of a business model as the lens to look at our cases allows for an interesting insight: typically, the idea initially determines the ‘What’ and/or ‘Who’ component of the future business model, whereas the revenue model (‘Why’) and value chain architecture (‘How’) are added during integration phase. Put differently, the marketing-driven product/market combination perspective prevails in ideation.

Based on our discussions within the focus groups, two major challenges were identified in this phase. The first challenge is that companies struggle to ***integrate all pieces of their new business model***. As outlined by one CTO in our focus group: *“Changing one piece of the business is easy but aligning the rest is where it gets tricky.”* This aspect is not sufficiently considered by the finance-driven approaches, namely business cases and (to a lesser extent) business plans, which are typically used. A lack of integration of the business model dimensions can lead to difficulties or even failure in the implementation of the new business model. In case 14, for example, the existing global sales organisation

should be used to market a different line of products. This decision was found to be “*the main reason for the lack of success in the first place*” and was revised after the first year on the market. Similar challenges with the sales force were present in case nine, whereas the need to up-skill sales representatives for the new business model was identified in advance and successfully actioned upon by case two.

The second challenge for the integration of the business model is the involvement and ***management of partners***. As the new business model needs to be aligned and integrated with the partners’ business models, complexity arises that requires “*a lot of energy and ability to convince*” and “*long discussions that resulted in complex agreements*” (questionnaire quotes). The challenge identified here is different from the one identified during the initiation phase, although both refer to partner interaction. During initiation phase, the challenge is to understand the needs, pain points, and opportunities in the firm’s ecosystem in order to identify a starting point for a new business model. Here, during integration phase, the challenge identified refers to the integration of partners into the design of the concrete new business model. The new model can only work if all involved stakeholders support it and adjust their business models accordingly. Hence, firms need to manage their partners actively.

A closer look at the integration phase of the ToolsCo case underlines the importance of managing the identified challenges. The company invested substantial time and efforts to develop the new idea, which focused on a more service-oriented value proposition, into a consistent business model that would also address the 'Who', 'How', and 'Why' dimensions. The target customer – or 'Who' dimension – was consciously decided to stay the same in the new business model. The 'How' dimension, in contrast, required more changes to ToolsCo’s value chain. Sales had to develop a training concept to be prepared for its new counterparts. Instead of selling tools to the site foreman, sales representatives would in future need the skills to negotiate big multi-year service contracts with senior executives. Logistics and supply chain required new concepts to ensure ToolsCo’s availability promise and manage the collection of tools that were returned after contract expiry. Lastly, IT capabilities that would allow both ToolsCo and its fleet management customers to manage the tool population had to be developed. Defining the revenue model ('Why'), finally, was completely new ground for ToolsCo which had so far sold its products and earned additional money through maintenance and consumables. With the new option, ToolsCo replaced big one-time sales with smaller regular revenues and therewith took over assets from its customers’ balance

sheets. During the entire integration phase, the new business model was discussed with selected key customers to ensure its fit with their expectations and business models.

4.4 IMPLEMENTATION

The last generic innovation process phase, implementation, is clearly a crucial point in time for business model innovations, too. Once fully designed and integrated, the new business model can be implemented - which typically involves huge investments to be made and risks to be taken by the focal firm. In contrast to product innovation, where early prototypes can be shared and evaluated with customers during their development, a new business model often needs to be fully implemented before it can be tested in reality.

As one CTO in our focus group stated, implementation of a new business model can be the hardest task of all: *“The most challenging thing with business model innovation is to successfully implement the new business model. Only if you convince everybody of the new business model and get their full commitment, you can be successful.”* This statement hints at the first of two major challenges that we identified for the implementation phase. The challenge to **overcome internal resistance** became obvious in almost all of the cases. People are reluctant to change due to the fact that they are afraid of the new situation or due to the fact that they do not see a reason to change, as the old business model is still working well. Managing organizational change is not an easy task per se, and the overarching scope of the business model that requires changes to many different areas within the firm makes it even harder. In this phase, it is important to communicate openly and explain how the new business model can help the company. For case one, our contact pointed out that *“many employees did not understand the product and how we wanted to sell it”* – which is not a good prerequisite to enter a new market.

A second challenge, which was reported throughout the questionnaire and the focus groups, is to manage the chosen implementation approach. Typically, **pilots, trial-and-error, and experimentation** are employed to mitigate risk in the implementation process. “Big bang” approaches, as applied by case seven, are rarely used when a new business model is implemented. Rather, firms follow a cautious strategy of taking small steps toward the realisation of the business model such as test pilots or market experiments. The critical challenge is to ensure that learnings from these actions are then used to fine-tune the business model or to perform larger adjustments if required. The approach of trial-and-error learning pays off: in almost all of the cases that applied it,

subsequent adjustments were made to the new business model. Only after one or several iterations of the cycle, these companies decided to fully roll out the new business model. In line with the step-wise approach identified, new business models are typically rolled out by market/country. This is by far the dominant approach used (two cases rolled out by customer group) and also allows to make specific adjustments on a per-country basis.

4.5 NATURE OF THE BUSINESS MODEL INNOVATION PROCESS

Are the phases in the business model innovation process arranged in a strictly linear fashion or is the process characterized by loops, iterations, and alternating paths? This question was consciously kept open in our earlier derivation of the business model innovation phases from innovation management literature, as innovation process models differ in their perception of this issue (cp. Table 1). For business model innovations, our data speaks a clear language in this regard: there are occasions of iterations between phases in almost all of the cases analysed.

Most commonly, iterations between the integration and implementation phases can be observed. Whenever a business model did not work out as planned, the surveyed companies undertook subsequent adjustments in its design. That is, they went back from implementation into integration phase to adjust one or more of the new business model's dimensions. In case eight, for example, this back-and-forth between phases spanned multiple years and is still on-going as the new offering matures. With its new business model, SoftwareCo entered a market that was new to the organization, in combination with a technology that was new as well. Initially, changes to the "How" dimension of the new business model became necessary when the technology platform and data centre strategy had to be readjusted. Subsequently, first market reactions led to a redefinition of the "Who" dimension to also include foreign subsidiaries of large enterprises (instead of SMEs only) and to focus more on service industry customers as opposed to manufacturing companies. Similarly, for case 7, SoftwareCo had to rework the value proposition ("What") of its new business model after the initial market launch and continued to offer the old support model as an option to existing customers who did not agree with the new terms.

Iterations between earlier phases can be observed as well. TelCo in case ten, for example, originally had the idea to launch its new offering on own branded devices for consumers. During the integration phase, however, it turned out that the idea was "*too optimistic concerning the availability of compelling devices*" and that appropriate hardware partners could not be identified. Hence, the project team had to go back into

ideation and develop an alternative approach which considered these restrictions. Even the initiation phase was revisited occasionally by some cases, as it makes sense to periodically realign the on-going business model innovation activities to changed conditions in the company's environment. In case one, for example, a food scandal in China severely decreased the assumed market expectations underlying the new business model. New ideas were needed that led to an adjustment of the business model before its implementation.

Despite these iterations between phases, the business model innovation process as observed in our cases seems to be rather structured overall. Apart from case 12, which directly was initiated by "a bright idea", all cases went through all of the four phases identified earlier. Except for iterations, their sequence was kept and we found a huge overlap in the activities and associated challenges described for each phase. For the purpose of supporting managers in their business model innovation efforts, it hence seems appropriate to condense the findings into an idealised representation of the entire process.

4.6 THE 4I-FRAMEWORK OF BUSINESS MODEL INNOVATION

Based on the results of our study, we developed an integrative framework which encompasses the structure and challenges associated with business model innovation. The framework consists of four phases which were derived from innovation management literature and adapted to business model innovation processes through the exploratory study of the 14 cases. Within each phase we identified various challenges: In the initiation phase, which focuses on the analysis of the ecosystem, the challenges are to understand the needs of the players within the ecosystem and to identify relevant change drivers. In the ideation phase, which refers to the generation of innovative ideas, managers need to overcome the current business logic, focus on business model thinking, and apply tools for the creation of business model ideas. In the integration phase, which is concerned with the building of a new business model, the challenges are to ensure that all pieces of the new business model are integrated and that the relevant partners are involved. The last phase, the implementation or realisation phase, includes two major challenges. The innovating firms need to overcome the internal resistance and implement the new business model in a step-by-step process including pilots, trial-and-error and experimentation. The first three phases - initiation, ideation and integration – can be summarised into the meta-phase "design", as they focus on the business model development with respect to content. The last phase, implementation, in contrast focuses

on the commercialisation of the content and thus the “realisation” of the new business model.

Although the phases seem to form subsequent steps within a linear process, this is not the case. The framework rather displays an iterative process with multiple steps forth and back - only such a framework is able to fully capture systematic business model innovation. There are three major iterative loops built into the framework. The first one refers to the regular alignment between the constantly changing ecosystem and the generated ideas for business model innovation - it is required to ensure the external fit of the new business model. The second one emphasises the alignment between the generated ideas and the components of the business model, as well as the alignment of the business model dimensions themselves - we term this the internal fit which has to be achieved. The third iterative loop stresses the alignment between the design phase as a whole and the realisation phase. Put differently, experiences made during realisation can require adjustments of the business model, as it is recognised that the planned design does not work in real life. This iterative loop is crucial in order to finally develop a business model that can be successfully implemented. As all factors can change over time, it is important to review the framework and especially the existence of the fits or misfits between the single phases of our framework regularly. The integrative framework is displayed in Figure 1.

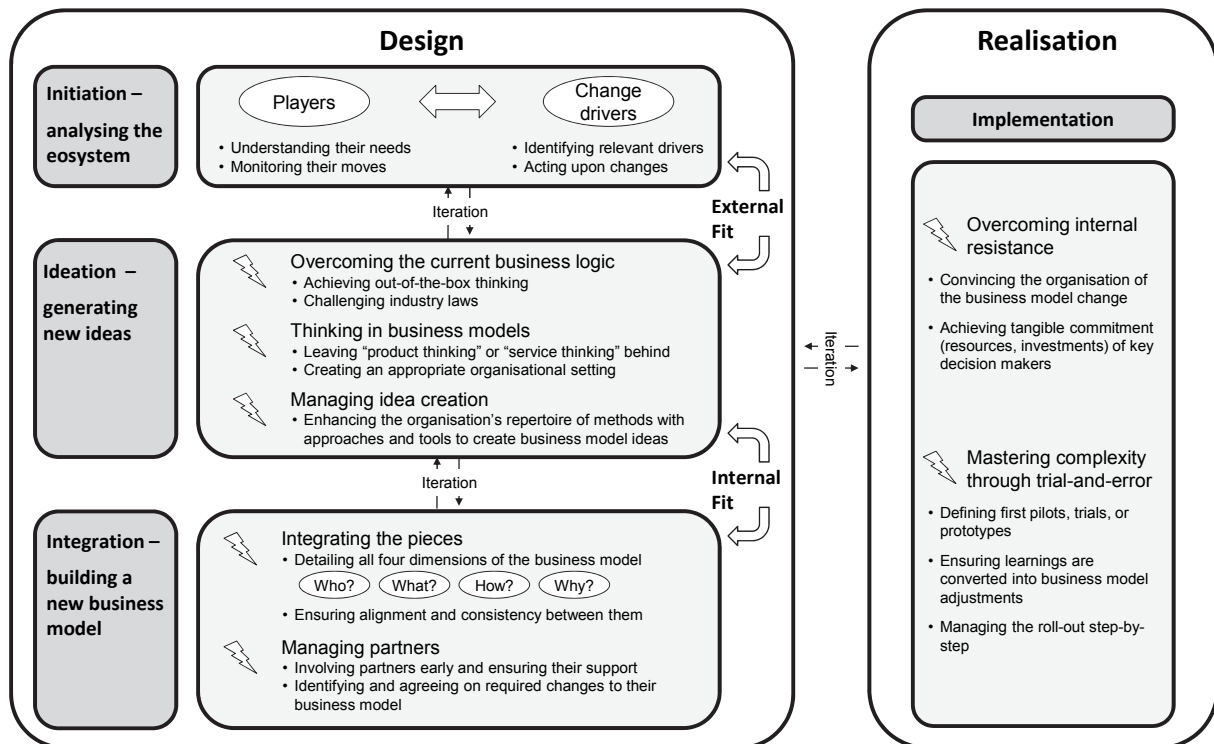


Figure 1: The 4I-framework - Phases of the business model innovation process and their key challenges.

5 DISCUSSION

The main insights of the study are twofold: First, we show that the process of innovating a firm's business model resembles other innovation processes and can thus be structured into four phases, which are iterative in their nature. Second, we identify a comprehensive list of major challenges within the single process phases. Research in the field of business model innovation has not yet focused on a process view of business model innovation. Scholars only highlight the importance of business model innovation (e.g., Mitchell and Coles, 2003; McGrath, 2010; Morris et al., 2005), without showing how the innovation takes place.

Our findings outline that business model innovations can be structured along four phases which are to some extent linear but at the same time iterative in their nature. We want to elaborate on this inherent paradox between structure and iteration in more detail. Managers need some structured schemes and guidance to coordinate their efforts for business model innovation. Put differently, some rough cause-and-effect relationships help organizations navigate their business model innovation efforts into the right direction. However, the actual process that takes place is much more complex and chaotic than the predefined structure. We identified three major feedback loops within the business model innovation process. The first one refers to changes in the ecosystem, such as the development of a new technology or new customer needs, which requires an adaptation in the early-stage innovation activity, the ideation phase. This is what we call the external fit. The second feedback loop refers to the internal resources which can call for adaptations of the aspired innovation during the integration stage. If, for example, a firm tries to develop a business model innovation which does not fit to the natural resource base, the innovation needs to be adapted. The third feedback loop refers to the experiences made in the implementation phase, which can trigger changes in the overall business model concept. Hence, our framework captures the inherent paradox between structure and process through combining a linear structure with iterative feedback loops at each stage. This finding is in line with previous research on innovation processes, which outlines the need for structure and linearity on the one hand and complexity and iterative loops on the other hand (e.g., Gassmann and von Zedtwitz, 2003; Kline, 1985; Kline and Rosenberg, 1986; Roy and Cross, 1983).

Our study provides a comprehensive and detailed list of major challenges during the business model innovation process. While none of the previous contributions in the business model innovation field provides a complete list of such challenges, various

scholars emphasise selected challenges. In the following we elaborate on these in more detail.

The initiation phase is characterised by the challenge to discover and react on triggers from two external sources: from other players in the ecosystem and from change drivers that have the potential to change the entire ecosystem. This finding is in line with other researchers in the business model field. Zott and Amit (2009), for example, highlight the important role that the ecosystem plays for business model success. The importance of understanding the customer and his needs as a starting point for new business models is a theme that is found frequently, for example in Girotra and Netessine (2011) and Kim and Mauborgne (2004, 2005). Similarly, change drivers have found their way into business model research: Tankhiwale (2009), for example, analyses regulatory changes and their effects on telco business. A vast number of authors have identified technology to be a key driver for business model change (Chesbrough and Rosenbloom, 2002; Chesbrough, 2007). Chesbrough (2010, p.356), for example, highlights the difficulty of creating a business model based on an innovative technology as follows: "*[they] literally did not know what to do with these technologies, which became 'orphans' within the company.*" Most prominently, the advent of internet technology has triggered many new business models (Timmers, 1998). Calia, Guerrini, and Moura (2007) show how technological development can ultimately lead to a new business model. Chesbrough and Rosenbloom (2002) show in their case study on Xerox that developing a new business model was of critical importance for the company's spin-offs to commercialise their innovative technology. Björkdahl (2009) draws a similar conclusion from three cases of ICT integration into existing mechanical engineering products. He argues that this cross-fertilisation can create immediate value for the user of the product through improved functionality or performance. Capturing – or appropriating – a share of that additional value, however, requires changes to the business model of the manufacturer.

The key challenges of the ideation phase are to overcome the current business logic, to focus on business model thinking, and to develop tools for the creation of business model ideas. With respect to overcoming the current business logic, few business model scholars have identified the barriers that block the road towards the identification of innovative business models, yet more on an organisational level (Bouchikhi and Kimberly, 2003; Chesbrough, 2010). The other two challenges, the necessary focus on business model thinking rather than on product innovations and the lack of tools and processes, has not been in the focus of previous business model scholars. Only Chesbrough (2010, p.356) refers to these challenges and thus supports our finding: "*Like*

Xerox, however, companies have many more processes, and a much stronger shared sense of how to innovate technology, than they do about how to innovate business models." Closely related literature on product innovation has also identified the need for tools and processes to guide managers in the complex process of generating new ideas (Altshuller, 1973; Goldenberg et al., 2003).

Considerably more has been written about the design of business models around a new idea, namely the integration phase. Our results show that one challenge is to integrate all dimensions of a new business model in order to come up with a successful solution. Previous research has already highlighted the importance of aligning the individual parts of business models, thus underlining our findings. Some outline that the design of one dimension or component is likely to affect the others and vice versa (Casadesus-Masanell and Ricart, 2011; Morris, Schindehutte, and Allen, 2005). Teece (2010, p.188) suggests that they must be *"designed with reference to each other"* and outlines the importance of the integration task as follows: *"without a well-developed business model, innovators will fail to either deliver - or to capture - value from their innovation"* (p.172). The second challenge within this phase refers to the management of partners during the design and commercialisation phase. This finding is in line with recent contributions in the business model field which highlight the importance of partner management and partner integration in the business model. Scholars argue that business models are boundary-spanning concepts (e.g., Shafer, Smith, & Linder, 2005; Teece, 2010; Zott & Amit, 2008, 2009) and that one major task of the business model is to create and capture value for itself and its various stakeholders (e.g., Amit & Zott, 2001; Björkdahl, 2009; Chesbrough, 2007; Chesbrough & Rosenbloom, 2002; Magretta, 2002; Shafer et al., 2005; Teece, 2010). Hence, all stakeholders need to support the new business model, otherwise it will not work, and therefore they need to be managed actively (Adner and Kapoor, 2010).

A new business model's implementation, finally, is the last phase of the innovation process. The first challenge within this phase is the internal resistance which needs to be managed. A few researchers in the business model field have outlined this challenge, as they argue that business model implementation is difficult due to its conflict with the existing business model or with underlying structures (Amit and Zott, 2001; Christensen, 1997, 2003). The second challenge is that successful implementation requires step-by-step implementation including experimentation and learning. McGrath (2010, p.253) argues in a similar vein by stating that new business models are often highly uncertain, making it *"difficult to know in advance how best to take of advantage*

of them". As a consequence, McGrath and others suggest that business model innovation is best achieved through a process of experimentation and learning, meaning that the business model is implemented and adjusted in iterative stages based on the experiences made in the field (McGrath, 2010; Morris, Schindehutte, and Allen, 2005; Sosna, Trevinyo-Rodríguez, and Velamuri, 2010; Teece, 2010). This sentiment is put down in a nutshell by Chesbrough (2010, p.356) who argues that business model innovation "*is not a matter of superior foresight ex ante - rather, it requires significant trial-and-error, and quite a bit of adaptation ex post.*"

6 IMPLICATIONS AND CONCLUSIONS

We started this paper with the ambition to explore the structure and the challenges associated with business model innovations in order to derive a framework that supports managers in innovating their firms' business model. The resulting 4I-framework, which is based on a four-phase model of the innovation process, concisely presents the structure of the process and the challenges that managers face during the initiation, ideation, integration, and implementation phases. It draws its empirical foundations from real world cases and also visualises major interrelations between the phases that are of particular relevance for practitioners. As such, we believe it can be a useful guideline for managers to implement a structured and systematic business model innovation process in their organisations.

In our work with practitioners we often experience that managers are overwhelmed by the task of developing and implementing innovative business models. The topic is hyped in the popular press and shareholders consequently expect business model innovations to happen. Yet, given the newness of the field, there is a lack of structure and proven management knowledge in practice. Managers expect concrete guidance from the academic world but, so far, have to identify and bring together the useful bits and pieces from a dispersed literature base. By collecting the most common challenges of business model innovation and structuring them into a process model, the 4I-framework allows them to better plan their endeavours. Fully aware of typical pitfalls, they can proactively avoid them upfront through their consideration in aspects such as team composition, stakeholder management and project setup. The framework can hence be seen as the first step in the development of a toolbox for practitioners that condenses the essential knowledge required to successfully innovate business models.

To business model innovation literature, the 4I-framework contributes in two ways: First, it develops a process model of business model innovation and, second, it offers a comprehensive list of challenges which arise during business model innovations. As the discussion of our results shows, research so far has not developed a process model for business model innovation and, although challenges have been mentioned in various publications, there is a lack of comprehensiveness and structure in their presentation. Our framework integrates the quite dispersed literature on the subject; it helps organise existing contributions and to identify the “blind spots” of business model research. While we find the initiation, integration and implementation phases extensively covered in literature, fewer results are available for the ideation phase of the business model innovation process.

Creating such an eclectic model is often challenging. Dunning (2000) outlines three criteria which justify the development of eclectic models: First, the sum of the value of the single theories must be greater than the whole. We believe that this is the case with our 4I-framework as, so far, business model innovation theory lacks an integrative framework on how to innovate business models. Second, such a model should allow predictions about the phenomena studied. We think that our framework offers a guideline how managers can innovate their business model. Third, a model is judged to be robust if it addresses relevant problems and offers a conceptual structure for resolving them. Our framework helps organise existing contributions and to identify the “blind spots” of business model research. While we find the initiation, integration and implementation phases extensively covered in literature, fewer results are available for the ideation phase of the business model innovation process.

Further research could for example build on the framework and provide additional insights into the ideation phase, which has so far been widely neglected. Contributions from business model scholars that provide systematic ways of generating ideas for new business models would, as per our estimation, greatly benefit practitioners in their business model innovation efforts. The 4I-framework can thus serve as basis for further empirical research in the important area of business model innovation.

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Chapter 4

The antecedents of open business models An exploratory study of incumbent firms

Co-authored by Karolin Frankenberger and Oliver Gassmann⁷

Abstract

Firms engage increasingly in open business models. While most research has previously focused on typologies or challenges of open business models, their specific antecedents have not been studied so far. We use data from eight open business model cases to explore this question and identify five main antecedents of open business models: (1) business model inconsistency, (2) need to create and capture new value, (3) previous experience with collaboration, (4) open business model patterns, and (5) industry convergence. Based on openness characteristics from the existing literature, we differentiate four basic types of open business models and develop an initial understanding of the relevance of the identified antecedents for each of them. We thereby provide first guidelines for practitioners in choosing the right form of business model openness for their company.

Key words: Open business model, business model, typology, open innovation, consistency, antecedents

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1 INTRODUCTION

Since Chesbrough's (2006) seminal book on the topic, the “open business model” has become a frequently used concept in literature. Open business models describe the value of integrating ideas, knowledge, and resources from external partners into the business model of the focal firm. Research on open business models is still very new and researchers so far have primarily focused on the benefits of open business models (Chesbrough, 2007; Davey, Brennan, Meenan, & McAdam, 2011; Purdy, Robinson, & Wei, 2012), on developing typologies (Holm, Günzel, & Ulhøi, 2013; Sandulli & Chesbrough, 2009; Sheets & Crawford, 2012), on identifying challenges associated with implementing open business models (Chanal & Caron-Fasan, 2010; Romero & Molina, 2011; Smith, Cavalcante, Kesting, & Ulhøi, 2010), and on the link to performance (Alexy & George, 2011; Cheng, 2011; Frankenberger, Weiblen, & Gassmann, 2013). Questions about the antecedents of open business models remain largely unanswered.

An investigation into this topic, however, could help incumbent firms understand not only the importance of open business model designs (Chesbrough, 2007), but, more importantly, when to change their existing business model toward more openness. In their competition with existing market players and new entrants, incumbent firms need to change, adapt, and ultimately innovate their business model. Having an understanding of when to introduce openness into the business model is valuable in this challenge. Therefore, in this paper, we explore the question which antecedents promote openness in the design of new business models. Furthermore, we link the antecedents to basic types of open business models in order to understand how different antecedents trigger different forms of open business models.

This paper aims to clarify these questions by studying eight cases of open business models in detail. We find five different antecedents of open business models, namely (1) business model inconsistency, (2) need to create and capture new value, (3) previous experience with collaboration, (4) open business model patterns, and (5) industry convergence. Subsequently, we introduce a typology of open business models, which we use as an additional lens in the discussion of our results. Our findings suggest that different antecedents are more or less important for different types of open business models.

This paper contributes to the field of open business models by identifying the antecedents of open business models and their relationship to different open business

model types. Therefore, it also advances theory in the closely related open innovation and business model fields.

2 THEORETICAL BACKGROUND

2.1 OPENNESS IN BUSINESS MODELS

The business model, as a concept in research, emerged with the dot.com boom (Magretta, 2002) to describe “how a firm organizes itself to create and distribute value in a profitable manner” (Baden-Fuller & Morgan, 2010, p. 157). Due to its origin in practice and its ubiquity in the popular press, research still struggles to provide a unified and generally accepted definition of the concept (George & Bock, 2011). Researchers from different domains (namely e-business and information technology, strategy, and innovation and technology management) have independently used and developed the concept in silos (Zott, Amit, & Massa, 2011). The definition by Teece (2010, p. 191) is sufficiently broad to capture most research conducted in the business model domain: “A business model describes the design or architecture of the value creation, delivery and capture mechanisms employed [by a particular business].”

Some researchers in the field explicitly consider boundary-spanning activities (e.g., Shafer, Smith, & Linder, 2005; Zott & Amit, 2007, 2009, 2010) or collaboration with partners (Al-Debei & Avison, 2010; Osterwalder, Pigneur, & Tucci, 2005; Teece, 2010) an integral part of business models, whereas others do not (e.g., Afuah & Tucci, 2001; Linder & Cantrell, 2001; Morris, Schindehutte, & Allen, 2005). Chesbrough (2006) was the first to differentiate explicitly between two types of business models by coining the term “open business model”. As Figure 1 illustrates, the concept has received increasing scholarly attention since then. The term was originally used to describe value creation in the context of open innovation (Chesbrough, 2007), and later more broadly to describe openness in “all the aspects of [the] business model” (Sandulli & Chesbrough, 2009, p. 20). The lack of an accepted definition and understanding has led to the situation that an “open business model” largely stands for two different types of openness.

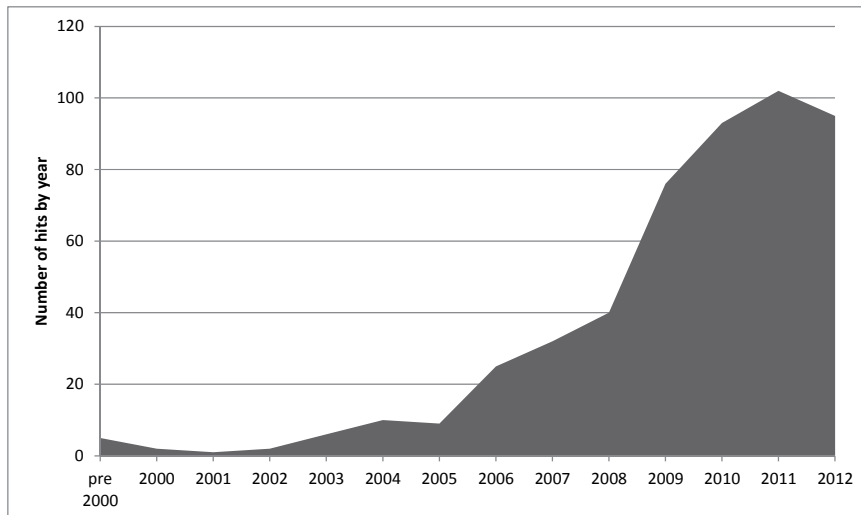


Figure 1: Number of publications containing the term “open business model” by year; according to Google Scholar search*

One stream in literature (e.g., Chesbrough & Schwartz, 2007; Chesbrough, 2006; Davey et al., 2011; Smith et al., 2010) closely links the open business model to openness with regard to a firm’s research and development (R&D) activities, as postulated by the open innovation paradigm (Chesbrough, 2003). Open innovation captures phenomena such as IP commercialization, user and customer integration, and collaborative R&D processes (Gassmann, Enkel, & Chesbrough, 2010). Chesbrough (2007, p. 22) states that “to get the most out of this new system of innovation, companies must open their business models by actively searching for and exploiting outside ideas and by allowing unused internal technologies to flow to the outside [...]”. According to this stream, the open business model is built around R&D openness and ensures value creation and capture from the focal firm’s open innovation activities.

Other scholars conceptualize the open business model more broadly, not necessarily requiring the locus of openness and collaboration to lie in the focal firm’s R&D activities (e.g., Frankenberger, Weiblen, & Gassmann, 2013; Holm et al., 2013; Purdy et al., 2012; Romero & Molina, 2011; Sandulli & Chesbrough, 2009). Scholars highlight that “openness to innovations and openness of business models needs to be adequately recognized, understood, and treated as separate phenomena” (Holm et al., 2013, p. 18). Collaboration with partners is so natural in today’s business world that some of the leading scholars have included partners, business ecosystems, or networks into their respective business model definitions (Osterwalder et al., 2005; Weill & Vitale, 2001; Zott et al., 2011). What, then, is special about an “open” business model? Considering openness as a continuum (cp. Dahlander & Gann, 2010; Sandulli & Chesbrough, 2009) and not a binary choice, scholars seem to label a business model as open if either

openness is very central for the successful operation of the business model under study or if openness in a specific business model is novel in comparison with the firm's previous or industry's predominant logic. For the purpose of this study, we understand open business models as a subclass of business models in which collaboration of the focal firm with its ecosystem is a decisive or novel element of value creation and capturing.

Despite the undoubted relevance of openness and collaboration in today's networked economy, the majority of extant business model research is firm-centric (Berglund & Sandström, 2013; Coombes & Nicholson, 2013; Storbacka, Frow, Nenonen, & Payne, 2012) and aspects and effects of openness are not sufficiently understood (Holm et al., 2013). Complementing general business model research, the open business model field studies the specific characteristics and implications of openness in business models, independent of its locus. Scholars put forth typologies of open business models to structure the field (Holm et al., 2013; Purdy et al., 2012; Sandulli & Chesbrough, 2009; Sheets & Crawford, 2012). Others highlight the interdependence between the focal firm's and its partners' business models, where the business models of all actors need to be aligned (Berglund & Sandström, 2013; Lindgren, Taran, & Boer, 2010) and a separate value proposition has to be formulated for each partner (Storbacka et al., 2012). One further stream in open business model research starts from the assumption that, traditionally, business models are closed (Chesbrough, 2007) and analyzes how established firms can open up their business model (Berglund & Sandström, 2013; Venkatraman & Henderson, 2008). Despite these initial contributions, many aspects of business model innovation toward more openness have not yet been studied (Berglund & Sandström, 2013; Björkdahl & Holmén, 2013).

2.2 ANTECEDENTS OF OPEN BUSINESS MODELS

Research on open business models has not yet analyzed antecedents that influence the change of a business model design toward an open model. In this paper, we perceive antecedents as influencing factors for changing or adapting a business model. Antecedents can refer to internal factors, such as organizational structure or leadership, or to external factors, such as regulatory or environmental changes (Demil & Lecocq, 2010). Some scholars in the general business model field have started to think about antecedents for business model design, albeit on a preliminary level (Zott & Amit, 2013).

Prior research has identified new technologies as an important trigger of business model innovation (Björkdahl, 2009; Calia, Guerrini, & Moura, 2007; Chesbrough & Rosenbloom, 2002; Timmers, 1998). Zott and Amit (2013) identify goals to create and capture value, templates of incumbents, stakeholder activities, and environmental constraints as antecedents for business model design in new ventures. Others argue that external pressure and regulations foster business model innovation (Tankhiwale, 2009) and that new entrants can cause market leaders to change their business model (Casadesus-Masanell & Tarziján, 2012; Casadesus-Masanell & Zhu, 2013). Internal factors, such as changes in the cost and revenue structure (Demil & Lecocq, 2010) or organizational and managerial factors, have been identified as key antecedents for business model change as well (Hartmann, Oriani, & Bateman, 2013).

In the related field of open innovation, antecedents mark an important research direction which advances the phenomenon's understanding and practical relevance (Gianiodis, Ellis, & Secchi, 2010; Lichtenthaler, 2011). Scholars have identified external antecedents as diverse as industry characteristics (Chesbrough & Crowther, 2006; Lichtenthaler & Ernst, 2006) or firm size (Henkel, 2006; van der Meer, 2007), generally finding smaller firms in fast-moving industries more prone to adopt open innovation principles. Internal antecedents are often related to technology characteristics (Dodgson, Gann, & Salter, 2006; Henkel, 2006) or very diverse organizational capacities (Hafkesbrink & Scholl, 2010; Witzeman et al., 2006), such as certain technology sourcing practices. In open innovation, research on its antecedents contributed to a better understanding of the phenomenon itself and its implementation in managerial practice. Aiming for similarly relevant insights, our goal in this study is to identify the specific antecedents of open business models, considering that they can originate from internal and external factors.

3 METHODOLOGY

3.1 MULTIPLE CASE STUDY APPROACH

In answering our research question, we aim at enriching existing theory with new insights from real-world cases (Eisenhardt, 1989). Since no prior research on the specific antecedents of open business model is available, a qualitative research design seems advisable to study the phenomenon in detail. In setting up a multiple case study (Yin, 2009), we established a sampling frame of criteria associated with the theoretical background and research interest of our study: the case firms had to (1) be established

firms in their respective industries, (2) have implemented an open business model as per the above conceptualization during the past few years, and (3) have been preferably mentioned in prior literature on the topic. Eight firms meeting these criteria were identified and contacted in two rounds. First, we identified four cases which represented very different forms of openness to ensure that the entire breadth of the phenomenon under study was sufficiently covered (Eisenhardt & Graebner, 2007). Second, we added four additional cases, each of which seemed similar to one of the cases already selected. This approach allowed us to judge which characteristics found were case specific and which were specific to the emerging categories and thus generalizable (Eisenhardt & Graebner, 2007).

Data were gathered through semi-structured interviews with executives. The interviews focused on the characteristics of openness in the respective business model and on exploring the antecedents of opening up the business model. They were transcribed verbatim to allow for subsequent analysis and complemented through extensive desk research (e.g., websites, media reports, and press releases) to ensure credibility through triangulation (Jick, 1979). Where available, we also drew on existing descriptions of the same cases in the literature. Table 2 in the appendix provides an overview of the companies studied and corresponding data sources.

In a first step, the data were analyzed for each case in isolation and condensed into a case write-up. We asked our contacts to review their cases, which enabled us to complete the write-up and to eliminate some of the biases associated with retrospective interviews (Silverman, 2000). Subsequently, cases were compared pair-wise to distill category-specific characteristics and corroborate the initial findings (Eisenhardt, 1989; Ozcan & Eisenhardt, 2009). Tables and color-coding were used to identify important similarities across the cases and to come to an initial understanding of the antecedents of business model openness in each case. Subsequently, we went back and forth between the initial findings and the original data to clarify specific details and to reach a consistent picture.

3.2 CASE DESCRIPTIONS

BMW: Realizing that its existing co-development relationships with automotive suppliers did not lead to attractive results, BMW's revolutionary in-car control concept iDrive was developed in collaboration with Immersion, a high-tech company which previously had no experience with the automotive industry. The collaboration was limited to the single purpose of integrating Immersion's haptic feedback technology into BMW's on-board control system. Immersion accounted for the first feasibility studies,

then development responsibility moved on to BMW's R&D department and, later, to an established automotive supplier, while Immersion provided technology advice. Thus, the business model of either company did not have to change significantly and sustainably, while BMW was still able to differentiate itself from other automakers through its innovative product.

Nespresso: In a similar way to BMW, coffee capsule pioneer Nespresso collaborated with an engineering firm to develop its milk frother 'Aeroccino'. Realizing that its customers were increasingly demanding milk froth to produce Latte Macchiato and similar treats, the company found that existing devices had weaknesses in ease-of-use and hygiene. As both points are important features of the Nespresso system, the company decided it would offer a complementary milk frother. Involving an engineering firm to solve the challenge, the result was a magnetic stirrer similar to those found in laboratory equipment. Due to the use of magnetism in its design, the stirrer could easily be removed and the vase easily cleaned. After production had been ramped up successfully, the engineering company left the project and Nespresso took over the sale of the device. In the business with coffee machines for its system, Nespresso takes a less active role and collaborates with multiple established manufacturers who market the machines under their own brand.

P&G Connect+Develop: Procter&Gamble opened up its business model for R&D collaboration by initiating its Connect+Develop program in 2000. This move resulted from the insight that its previous R&D process was not capable of developing innovative products fast enough for the quickly moving consumer goods industry. In its program, the company actively seeks technologies outside the enterprise and cooperates with external partners in developing new products. About 50% of its new products today result from Connect+Develop partnerships. To achieve this impact, P&G had to invest in the development of new capabilities in areas such as technology/partner scouting, intellectual property, platform technologies, and innovation network management.

Shire: Responding to escalating research and development costs in the pharmaceutical industry, the UK-based manufacturer of pharmaceuticals has designed its R&D activities around the principle of openness. In its areas of therapeutic interest, the company actively scouts for promising outside developments and prefers to license or acquire late-stage projects. Its open collaboration and venturing models facilitate the early identification of promising candidates, while licensing and strategic partnerships are the means of collaboration with more established partners in the industry. Instead of in-

house development, the focus of Shire's activities is on excellence in discovering outside opportunities and fast commercialization of acquired outside knowledge. About 80% of the firm's R&D pipeline is externally sourced.

3M Services: Collaboration and partnerships are as important for 3M Services in delivering solutions to its customers as they are for P&G and Shire in developing new products. The subsidiary of 3M Germany was founded in 2010 to address frequent customer inquiries regarding solutions from a single source by bundling 3M products with externally sourced services. The subsidiary works closely with 3M's product units in developing solutions; the resulting revenue is credited to their balance sheets. It works equally closely with service partners who are hand-picked and certified, as 3M Services is liable for successful solution delivery to its customers. Many of 3M's collaborations with service partners existed previously, but were intensified and formalized through the foundation of 3M Services.

SAP: As the market leader in enterprise software, SAP is at the center of a software ecosystem of companies which specialize in certain functions required to install, adjust, and operate SAP software for corporate customers. Partners are also encouraged to serve and sell to small and medium customers as well as those in niche industries which SAP does not cover. The partner program of SAP is more open than that of 3M Services and comprises 12,000 partners – more than 3000 resellers and 1700 service partners. To attract and retain these partners the company employs a huge workforce in its “ecosystems & channels” department, which ensures partners get the support they need. Despite this, SAP itself competes with its partners in areas such as hosting or consulting, an industry phenomenon known as “coopetition”.

Hilti: Facing competitive challenges with its old business model of selling tools to construction companies, Hilti looked for ways to meet more effectively the customer need for tool availability while, at the same time, utilizing its unique direct sales relationships. The idea for Hilti's fleet management was adopted from the automotive industry and transformed into an “availability leasing” concept; customers can now lease fleets of Hilti tools, bundled with insurance and services, instead of buying the individual tools as was done before. The concept exploited Hilti's strengths, such as product quality and direct sales, and ensured the company's continued success in the market. Not relying on partners, Hilti's main challenge was to build up missing capabilities for the new business model – such as new logistics, IT, and sales skills.

Buehler: The Switzerland-based world market leader in food processing machines (e.g., wheat mills or rice polishing machines) is constantly looking for growth outside its classic business model of selling machinery, which still contributes to by far the largest share of turnover. One of these opportunities occurred in emerging economies, where the growing population's supply of adequate nutrition is an issue. Partnering with life science company DSM, the concept for 'NutriRice' was developed. Artificial rice kernels are produced from rice processing by-products, which are enriched with vitamins and minerals. Mixed with ordinary rice, the artificial kernels are an important source of supplementary nutrients. For commercialization, the two companies combined their individual areas of expertise and founded a China-based joint-venture, which produces NutriRice and licenses the NutriRice brand to local rice millers.

4 RESULTS AND DISCUSSION

4.1 ANTECEDENTS OF OPEN BUSINESS MODELS

Throughout our case analysis, we identified five main antecedents that lead firms to open up their business models: (1) Business model inconsistency, (2) Need to create and capture new value, (3) Previous experience with collaboration, (4) Open business model patterns and (5) Industry convergence. The first two antecedents could be classified as internal, whereas the latter two are clearly external in nature. We analyze each of these antecedents separately in the subsequent sections, drawing on case evidence and literature to explicate our results.

4.1.1 Antecedent 1: Business model inconsistency

Business model consistency occurs when the components of a business model – such as the customer value proposition, the processes, and the revenue model – are arranged in the form of a coherent and reinforcing system (Casadesus-Masanell & Ricart, 2011; Demil & Lecocq, 2010; Mitchell & Coles, 2003; Morris et al., 2005; Teece, 2010). Our cases reveal that firms with an initially inconsistent business model, meaning some elements are missing or are not designed in an appropriate way, are likely to open up further their business model in order to integrate the missing resources and capabilities of partners.

In the 3M Services case, for example, the company focuses on product production, solution sales, and post deployment support. It lacks capabilities for service provisioning, such as film application. The partners' business model, in contrast, focuses

on this specific process which nicely complements the business model of 3M. Achieving complementarity makes the partnership interesting for both parties – the focal firm and the partner – because both can profit from each other by connecting their business models in the form of a re-enforcing system. Similarly, Buehler's competences in food processing machines were not sufficient to design a new offering which met the requirements of emerging economies. Only by partnering with DSM, which contributed its nutrients and its production know-how, was it possible to achieve a coherently designed business model.

Business model consistency has been recognized as an important driver for business model performance (e.g., Demil & Lecocq, 2010). There are three reasons for this. First, it lowers the risk of failure in the initial stage of implementation or of erosion over time. Second, it plays a crucial role in avoiding a situation where the created value slips away from the focal firm to other players. Third, the consistency of a business model is useful for creating sustained competitive advantage since "it is harder for a rival to match an array of interlocked activities than it is merely to imitate a particular sales-force approach, match a process technology, or replicate a set of product features" (Porter, 1996, p. 73). If consistency cannot be achieved internally, external partnerships are a good way to compensate for the shortcomings. Researchers in the field of strategic fit also highlight the positive effect of the complementarity of resources and capabilities between alliance partners (Ahuja, 2000; Bierly & Gallagher, 2007; Douma, Bilderbeek, Idenburg, & Looise, 2000).

4.1.2 Antecedent 2: Need to create and capture new value

The second identified antecedent for designing open business models is the need to create and capture new value. Firms are increasingly under pressure to sustain their performance and competitive advantage. Increased competition, falling prices, commoditization, and higher costs are only a few reasons why firms need to innovate constantly their business model (Amit & Zott, 2012). This, in turn, leads to a new value creation and capture logic which is needed to stay competitive.

To compete successfully with established pharma giants, for example, Shire could not use the same blockbuster business model as the established players to grow its business, as this would have required huge investments in large R&D capabilities with high risk of failure. Opening up the business model was a key move in order to grow rapidly with its limited resources and to produce permanently a stream of innovative products. Shire's partners and acquisitions are decisive in bringing in new ideas, know-how, and

technology. For Buehler, it was the growth limitations of its old business model that led the firm to experiment with an open business model for emerging markets. Lastly, for Hilti, it was the market entry of lower-priced competitors that triggered the search for a new business model in different industries.

For new ventures, Zott and Amit (2013) argue that the goal to create and capture new value is a major antecedent of business model design. Other business model scholars have found that incumbent firms are more likely to innovate their business model if their old model does not work anymore (Chesbrough, 2007, 2010; Demil & Lecocq, 2010; Markides, 2006). It is widely assumed among managers that opening up the business model is one way of achieving superior value creation and capture (Chesbrough & Crowther, 2006; IBM Global Business Services, 2012). One effect is that external partners can speed up the innovation process. More importantly, however, openness brings in new ideas and knowledge, which allow the focal firm to overcome its dominant logic, a major barrier to business model innovation (Bouchikhi & Kimberly, 2003; Chesbrough, 2010; Frankenberger, Weiblen, Csik, & Gassmann, 2013; Sandulli & Chesbrough, 2009).

4.1.3 Antecedent 3: Previous experience with collaboration

A third antecedent that was mentioned multiple times in the interviews is previous experience with collaborations. Firms that are skilled in working together with other firms are more likely to open up further their business model and vice versa. In the case of the studied BMW initiative, for example, a lack of experience with external non-automotive partners led BMW to pursue a backup project with an established supplier in parallel and to take over development responsibility early. One manager in BMW's R&D recalled Immersion as "a strange animal in the BMW world" initially. The collaboration capabilities with a non-automotive partner had to be built up first and developed slowly. In contrast, cases with a high level of experience through existing relationships with partners, such as SAP, show that the involvement of partners can become "natural" to the organization. This observation is emphasized by one of the interviewees at SAP, who reported that it sometimes takes quite some effort internally to argue why it is not necessary to rely on partners for a certain new initiative.

It is a known fact that firms learn and build up the capabilities required to collaborate over time (Chesbrough & Schwartz, 2007; Möller & Svahn, 2003). Scholars have argued that prior collaboration experience leads to effective collaborations and improves collaboration outcomes (Anand & Khanna, 2000; Sampson, 2005; Simonin, 1997), as

experienced firms are better able to identify potential collaborators, negotiate and manage agreements and know when to terminate collaborations (Simonin, 1997). Also, scholars have argued that firms with collaboration experience are more likely to go for new partnerships (Powell, Koput, & Smith-Doerr, 1996). This is in line with our finding that prior collaboration experience triggers the further opening of the business model.

4.1.4 Antecedent 4: Open business model patterns

Multiple respondents outlined that a main trigger for them to open up further their business model was other successful open business models. They observed elsewhere, even in other industries, that opening up a business model leads to superior value creation and therefore imitated such an approach. In the case of Procter&Gamble, for example, the transfer of the “open business model pattern” (Osterwalder & Pigneur, 2010) occurred from the pharmaceutical and IT industry, where Eli Lilly and IBM had successfully pioneered openness of their R&D activities. Similarly, at 3M Services, management had studied product-service systems in more complex settings when deciding to incorporate externally sourced services into their own business logic of providing solutions. Additionally, the team regularly exchanged experiences with a multinational chemical company which found itself in the same transformation process.

Various scholars have highlighted the possibility of “adopting”, “copying”, “imitating” or “replicating” a business that has proven to work before in order to achieve business model innovation (Baden-Fuller & Morgan, 2010; Casadesus-Masanell & Zhu, 2013; Doganova & Eyquem-Renault, 2009; Teece, 2010; Zott & Amit, 2013). Teece (2010), for example, argues that successful business models can be transferred from one context to another and trigger a successful business model there. Doganova and Eyquem-Renault (2009) outline that business models act as templates both within and across firm boundaries, which in turn enables their replication (intra-firm context) and imitation (inter-firm context). Baden-Fuller and Morgan (2010) argue that business models may also serve as recipes, which by themselves are open for variation and innovation. Finally, Casadesus-Masanell and Zhu (2013) show that incumbents need to decide whether they stay with their own business model or imitate the business model of entrants in order to remain in the market. Hence, business model patterns and especially open business model patterns seem to be an important trigger for opening up the business model further.

4.1.5 Antecedent 5: Industry convergence

The last antecedent that we identified is industry convergence, which is defined as “the blurring of boundaries between industries” (Bröring, Cloutier, & Leker, 2006, p. 487). Industry convergence triggers open business models in two ways: through technology convergence, affecting mainly R&D, and through the power of new market entrants, requiring broader business model adjustments. In BMW’s case, customers increasingly put their focus on seamless in-car entertainment, communication and ease-of-use. An excellent car body and combustion engine were taken as a given, whereas electronic features made the difference. Consequently, outside skills and technologies from high tech and consumer electronics industries were required. Similarly, Nespresso collaborated with household appliance and engineering companies to develop its Nespresso system. Its parent company, Nestlé, could only provide its food-processing experience, but skills to develop the hardware part of the system were missing. Shire, finally, experienced the entry of established pharma giants into the biotechnology industry. It was only through its elaborated management of outside resources and speed in licensing and acquisitions that the company could stay independent and grow rapidly.

Scholars have widely recognized that industry convergence redefines the structure and the competitive forces in an industry (Bröring et al., 2006; Hacklin, Björkdahl, & Wallin, 2013; Lei, 2000; Malhotra & Gupta, 2001). Technological developments trigger the creation of new revolutionary firms which, in turn, challenge industry boundaries and the value propositions of industry leaders (Choi & Valikangas, 2001; Lei, 2000). As a consequence, firms need to acquire the competences necessary to create value for a broader market (Lei, 2000). Put differently, they need to rethink their logic of value creation, value delivery and value capture to respond to the new situation - hence they need to adjust their business model (Hacklin et al., 2013). The fast pace of industry convergence in many industries, however, makes it difficult for the firms to acquire the competences on their own. Opening up the business model in form of strategic alliances and partnerships significantly facilitates the learning of new competences (Bröring et al., 2006; Lei, 2000).

Also, sheer size is a key issue in such converging industries (Hacklin, Marxt, & Fahrni, 2010; Levitt, 1983). Smaller firms need to cooperate or even acquire firms to compete against the newly entering “giants” or alliances, which have both economies of scale and scope on their side (Hacklin et al., 2010). Hence, industry convergence encourages firms to open up further their business model to acquire skills and technologies and to grow in size and power.

4.2 TYPES OF OPEN BUSINESS MODELS AND THEIR ANTECEDENT RELATIONSHIP

With the main antecedents for open business models identified, we now try to achieve an initial understating of their relationship with distinct types of open business models. Building on our literature analysis and prior work (Holm et al., 2013; Sandulli & Chesbrough, 2009), we employ a typology of open business models, which is based on openness characteristics in two broad categories. The first axis is the *locus of openness*, which can be limited to the focal firm's R&D activities or cover several other functions of the business model. As the cases revealed, R&D openness and generic business model openness do indeed differ considerably in their effects on the logic of value creation and capturing. The second axis refers to the *dependence on openness* of the focal firm's business model. This dimension differentiates business models which would hardly change or collapse if openness was taken out. This leads us to four generic types of open business models, which are illustrated in Figure 2.

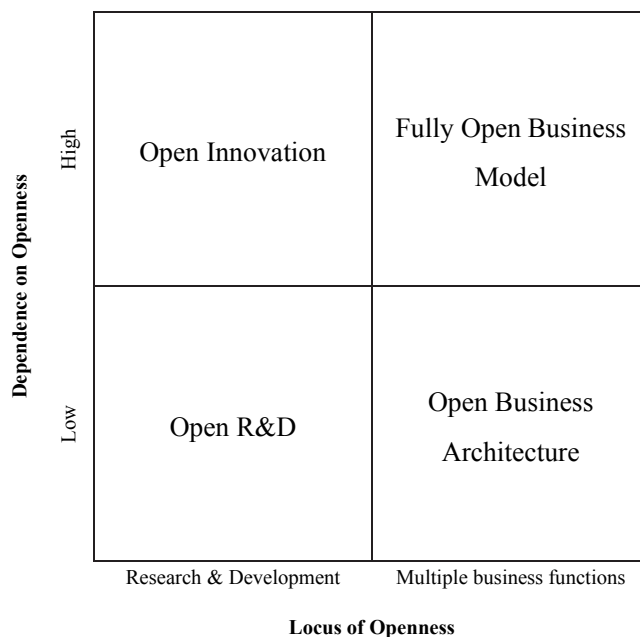


Figure 2: Types of open business models depending on openness characteristics

Bottom-left, we start with the open business model type *Open R&D*, which is characterized by openness in the focal firm's R&D activities and can take the form of small initiatives or strategic moves (see, for instance, many examples in Alexy & George, 2011; Enkel & Gassmann, 2010). The influence on the firm's sustained value creation and capture logic and thus business model in these cases is minor, if existent at all. We include this type of openness into our typology since it can be seen as early and

weak form of open business model adoption. BMW and Nespresso are the cases in our set that fall into this category.

We draw the upward border to the *Open Innovation* quadrant by increasing business model dependency: if openness in a focal firm's R&D activities becomes so significant for its logic of value creation and capture that the entire business model depends on it, a separate construct and thus quadrant seems advisable to explore these phenomena. This is the case, for example, at P&G, where 50% of the new products result from Connect+Develop, and at Shire, where openness in R&D is the key pillar of the entire business model.

Similar dependence on openness occurs in the top-right quadrant, *Fully Open Business Models*. Here, however, the locus of openness is not tied to R&D, but can occur in many areas of the focal firm's business model, such as production (Jagoda, Maheshwari, & Gutowski, 2012) or delivery (Frankenberger, Weiblen, & Gassmann, 2013; Sheets & Crawford, 2012). SAP and 3M Service are the cases in our study which feature this broad dependence on external collaboration.

Bottom-right, finally, the *Open Business Architecture* quadrant captures those cases in which openness has shaped new business models, but is not a central part of the firms' sustained logic of value creation and capture. This is true for Hilti, where the idea for a tool fleet was transferred from the automotive industry (cross-industry innovation) and for Buehler, where the fortified rice business has been established as an exclusive joint venture with DSM.

Matching the antecedents, types of open business models, and analyzed cases reveals that the antecedents relate to different types of open business models. Table 1 summarizes our results.

Table 1: Antecedents for business model openness in cases studied

Case	(1) Business model inconsistency	(2) Need to create and capture new value	(3) Previous experience with collaboration	(4) Open business model patterns	(5) Industry Convergence	
Open R&D	BMW	not relevant	Difficulty to differentiate; innovations expected from premium manufacturer.	not relevant	not relevant	Customers expect full access to communications and entertainment in car, ease-of-use is important.
	Nespresso	not relevant	Closed coffee system as a	not relevant	not relevant	"Coffee system" trend leads to

Case	(1) Business model inconsistency	(2) Need to create and capture new value	(3) Previous experience with collaboration	(4) Open business model patterns	(5) Industry Convergence	
		means to increase customer value and capture higher margins than with classic coffee business.			convergence of coffee (food) and coffee machine (appliance) production.	
Open Innovation	Shire	not relevant	Impossible to survive in pharma industry following the classical blockbuster business model.	Success in first collaborations leading to rapid increase of cooperations, partnerships and acquisitions.	Licensing and open innovation known in industry; decision to excel in these activities.	Convergence of biotechnology and classic pharma industry.
	P&G Connect+ Develop	not relevant	Radical change of R&D practices seen as necessary to keep growth rate and innovation leadership.	Long tradition of prior distribution and marketing partnerships with international reach.	First successful examples of open innovation principles at Eli Lilly and IBM.	Competitive consumer products require materials and skills from chemical or aerospace industries.
Fully Open Business Model	3M Services	Lack of service skills and capabilities needed to deliver solutions.	Solution business identified as promising area to keep up growth.	Informal relationships with service partners existing previously to refer product customers to.	Similar setups in product-service-systems observed (e.g., in mechanical engineering)	Applications in new areas (e.g., films to cars) require specific skills.
	SAP AG	Strategy as standard software manufacturer forbids individual software and services demanded by customers.	High shareholder growth and margin expectations in software industry.	Long tradition of co-development and co-innovation partnerships, spreading into other areas.	General trend towards platforms and openness for complementors in IT industry.	Transformation of prior specialized vendors into one-stop shops for business software (e.g., Oracle).
Open Business Architecture	Hilti	Company strengths (direct sales, high quality) not fully utilized, hard to sell (not meeting customer needs).	Market pressure from new lower-priced competitors.	not relevant	not relevant	not relevant
	Buehler	Resources and capabilities missing to react on market opportunity in emerging economies.	Old business model of selling machines increasingly under pressure.	not relevant	not relevant	not relevant

It is a main insight from our case study that open business models not only differ in the form of openness adopted, as was stated in previous works, but that also different antecedents lead to the adoption of different types of open business models:

Business model inconsistency is a strong antecedent for the adoption of broad openness that spans multiple business functions. To achieve sustainable fit of the business model, missing capabilities and resources can be provided by partners. Eliminating the inconsistency typically requires changes to several functions of the business model, not just openness in R&D for external ideas or IP. As a consequence, this antecedent leads to fully open business models or to open business architecture.

The *need to create and capture new value* due to lack of internal innovativeness and external pressure is an antecedent that can strengthen openness in all four archetypical forms. Recognizing that its old business model is under pressure, a firm might decide to seek external support in many different ways.

Previous experience with collaboration is a strong antecedent to the two types of open business models that lead to high dependence on openness. No firm would probably enter into such a dependency without prior experience, whereas smaller initiatives might be undertaken without it.

Open business model patterns have a similar effect, leading to business models with high dependence on openness. Successful examples external to the company are an important argument to implement the organizational changes required for open innovation or a fully open business model against internal resistance. External patterns additionally play an important role as templates or recipes for the substantial changes required.

Industry convergence, finally, can induce business model openness of all categories except the open business architecture. If convergence leads to inappropriate technology skills of a focal firm, implementing openness in its R&D function might suffice to solve the challenges. Large-scale upheavals in the environment, such as the market entry of industry giants from other industries, require collaboration in several business functions.

The relationship between the antecedents identified and the four open business model types are visualized in Figure 3 in our final conceptualization of the relevance of antecedents for open business models.

that authors have differing perceptions of the concept itself. A more precise terminology, considering the two dominant viewpoints, seems advisable to prevent fragmentation of the field. Openness characteristics, as identified in prior work (Holm et al., 2013; Sandulli & Chesbrough, 2009), proved helpful in structuring the phenomenon and we encourage their use in future studies to clarify the applicability of derived results.

For practitioners, our results are meaningful in that they substantiate the often-heard call for business model innovation in incumbent firms. Managers today are well aware of the importance of business model innovation and know that open business models often lead to superior performance. However, they lack knowledge of when to adapt their business model and whether introducing more openness is beneficial in their particular case. The five antecedents identified in this paper provide firms and their managers with concrete guidelines for this task. If one or several of these antecedents occur in an industry, managers should actively think about opening up their business model. This is of high relevance since, frequently, business model innovators enter from outside the industry (e.g., Apple in telecommunications, Amazon in trade, Ebay in auctioning, or Google in advertising). Managers have to regularly check these perspectives in order to identify and overcome their white spots. In most fields, traditional strategic instruments such as Porter's five forces, combined with a canvas view (Kim & Mauborgne, 2005) or business navigator (Gassmann, Frankenberger, & Csik, 2013), will broaden the analysis and support the decision making process of when to further open up the business model.

Furthermore, we differentiate between various types of openness and show which antecedents lead to which type of business model. Our work should help practitioners clarify the term 'openness' in their innovation activities between R&D and business. While cross-functional teams are often success factors in innovation initiatives, we clearly emphasized where a cross-functional perspective is a *conditio-sine-qua-non*. This often goes that far that these innovation projects are led by non-R&D executives. Knowing which antecedents to look for and the type of openness to implement in the business model in which case is a precious management heuristic that was not available before. It contributes to the effective monitoring and opening up of business models, particularly in fast-moving industries.

While we are well aware of the potential biases and weaknesses of qualitative research, which apply to the study presented, we are confident of having derived useful insights upon which future research in the growing field of open business models can build. We

invite future research to further explore this young field of business model innovation with its exciting potential for single companies as well as for whole industries.

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APPENDIX

Table 2: Overview of cases and sources

Case	Short Description	Primary Data	Secondary Data
BMW iDrive	R&D partnership with high-tech firm Immersion that led to the development of the BMIW iDrive control system.	Interview series with several executives and project managers at BMW	(Gassmann, Zeschky, Wolff, & Stahl, 2010); desk research
Nespresso	Joint development of the Nespresso Aeroccino milk frother with engineering firm, transferring principle from laboratory equipment. Strategic partnerships with coffee machine producers.	Interview with involved R&D manager at Nespresso and top executive at engineering company.	(Gassmann, Daiber, & Enkel, 2011; Matzler, Bailom, von den Eichen, & Kohler, 2013); desk research
P&G Connect+ Develop	Program to seek innovative technology partnerships with external companies accounting for about 50% of P&G's new products.	Joint interview with European director of open innovation and representative of global business development Germany (2 hrs.)	(Dodgson et al., 2006; Huston & Sakkab, 2006); desk research
Shire	Extremely efficient R&D setup (e.g., highest R&D expenditure/R&D employee) through clear focus on external knowledge acquisition.	Interview with three manager in R&D function (conducted by an MBA student; 1,5 hrs. each)	(Jeppesen & Molin, 2003; Schuhmacher, Germann, Trill, & Gassmann, 2013); desk research
3M Services	3M Germany's subsidiary founded to tap the market around solutions containing 3M products. External partners provide the services.	Interviews with general manager and founding business developer (1.5 hrs. each)	(Frankenberger, Weiblen, & Gassmann, 2013); desk research
SAP AG	Vast network of complementors (10,000 registered partners), which install, adjust, and operate SAP's software at corporate customers.	Interviews with two executives in strategic partner management and cloud services (1-1.5 hrs. each)	(Frankenberger, Weiblen, & Gassmann, 2013; Sandulli & Chesbrough, 2009; Yoffie & Kwak, 2006); desk research
Hilti	Innovative concept of "tool fleet management" inspired by automotive industry. Customers lease fleet (including service and insurance) of Hilti tools per project.	Interview with head of corporate innovation (1 hr.)	(Enkel & Gassmann, 2010; Johnson, Christensen, & Kagermann, 2008; Meehan & Baschera, 2002); desk research
Buehler	Establishment of a joint-venture with life science company DSM to manufacture fortified rice to counteract malnutrition in emerging economies.	Interviews with head of nutrition solutions and CTO (1 hr. each)	(Gassmann et al., 2013; Kunz, 2009); desk research

Chapter 5

Network configuration, customer centricity, and performance of open business models A solution provider perspective

Co-authored by Karolin Frankenberger and Oliver Gassmann⁸

Abstract

While research has shown a positive impact of open business models on value creation, it has remained silent on the configuration of the corresponding partner networks and their effect on performance. Studying three cases of solution providers which involve external service partners for solution delivery, we find that solution customer centricity – the degree to which the focal firm focuses on solution customers in the joint delivery of solutions – moderates the relationship between partner networks and open business model performance. For open business models with low solution customer centricity, a network configuration characterized by many weak ties to service partners leads to superior performance. Conversely, for open business models with high solution customer centricity, few but strong ties to partners lead to superior performance. Based on these findings, three ideal configurations of networks for open business models are derived: the controlled, the joint, and the supported model. The findings of this paper are especially relevant for managers of product-focused firms who seek guidance in evolving their business models into solution providers. The paper also contributes to business model research by linking extant insights from network research to open business model performance.

Key words: Open business model; Solution provider; Customer centricity; Business model performance; Networks

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1 INTRODUCTION

Increasing specialization and division of labor in today's economy have led to the emergence of open business models in many industries. One instance of these business models are firms which rely on external service providers in delivering integrated solutions. While the business model, in general, illustrates the logic of how firms create and capture value (Chesbrough & Rosenbloom, 2002; Mason & Spring, 2011; Teece, 2010; Zott & Amit, 2009), the open business model specifically describes value creation and capturing by “*systematically collaborating with outside partners*” (Osterwalder & Pigneur 2010: 109). Scholars in this field explain how the integration of external resources and exchange with partners can create additional value (Chesbrough, 2006, 2007; Sandulli & Chesbrough, 2009). Business model scholars also highlight the importance of customer orientation as a key characteristic of business models (Amit and Zott, 2001) and especially of open business models, whereby multiple actors co-create value for the same customer (Storbacka, Frow, Nenonen, & Payne, 2012). Solution customer centricity – the degree to which the focal firm focuses on solution customers in the joint delivery of solutions – is hence an important aspect in studying open business models involving partner networks.

Although open business models are by definition closely linked to the establishment and management of external networks, research falls short in explaining the configuration of these networks and their impact on the performance of open business models. Understanding these relationships is of particular relevance for manufacturing companies facing the organizational challenge to become solution providers. A solution provider manufactures stand-alone products as well as bundling them with related services into solutions that solve customers' problems (Davies, Brady, & Hobday, 2006; Galbraith, 2002). For these firms, utilizing services provided by partners in the network is an attractive means of achieving successful integrated solutions (Gebauer, Paiola, & Saccani, 2013; Helander & Möller, 2008; Jaakkola & Hakanen, 2013; Martinez, Bastl, Kingston, & Evans, 2010; Windahl & Lakemond, 2006) and, in turn, successful open business models. Scholars have studied partner networks in the context of the development of new integrated solutions (Liu & Hart, 2011; Windahl & Lakemond, 2006), but not the required network setup and logic for successful delivery of solutions.

This raises two research questions we aim to answer in this article: Firstly, how do various network configurations in relation to service partners influence the performance of open business models? Secondly, what is the role of varying degrees of customer

centricity of open business models in this setting? We study these questions in the context of solution providers as a good backdrop.

To come to an answer we build on network theory, which argues that a network of relations of firms produces positive but also negative results (e.g., Lechner, Frankenberger, & Floyd, 2010). Positive effects include information benefits (Burt, 1992; Granovetter, 1985; Hansen, 1999; Rindfleisch & Moorman, 2001), efficient knowledge transfer (Reagans & McEvily, 2003; Uzzi, 1996, 1997), and access to resources (Gnyawali & Madhavan, 2001). Conversely, negative effects stem from reduced information benefits (e.g., Uzzi, 1997) and costs of maintaining additional ties (Burt, 1992). Such networks are characterized on the basis of three dimensions: the relational, the structural, and the cognitive (Lechner et al., 2010; Nahapiet & Ghoshal, 1998; Simsek, Lubatkin, & Floyd, 2003).

Our results suggest patterns new to existing theory. We find the influence of networks on performance of open business models contingent on the level of customer centrality. That is, to ensure superior performance, different levels of solution customer centrality in the business model require different network configurations to service partners. The realization of these relationships contributes to the open business model, solution provider, and network fields.

2 THEORETICAL BACKGROUND

This section analyses in depth the theoretical background necessary for our line of reasoning, namely literature on open business models, social network theory, customer centrality, and solution providers.

2.1 OPEN BUSINESS MODELS

In general, the business model is depicted as an overarching concept assimilating the constituent components of a business and assembling them as a whole. Components proposed often include the value proposition (e.g., Chesbrough, 2010; Morris, Schindehutte, & Allen, 2005), the customer (e.g., Morris et al., 2005; Teece, 2010), and the performed activities and transactions (e.g., Afuah, 2004; Amit & Zott, 2001; Zott & Amit, 2008). The most common role of the business model is to illustrate how the focal firm creates and captures value for its stakeholders and itself (e.g., Afuah & Tucci, 2001; Amit & Zott, 2001; Chesbrough & Rosenbloom, 2002; Chesbrough, 2007; Teece, 2010).

A central feature of the business model is the provision of a holistic view of the business by combining the firm's internal and external factors (Teece, 2010; Zott, Amit, & Massa, 2011). In other words, the business model suggests an interplay between the internal dimension of a business, such as the firm's resources and activities, and the external dimension, such as the firm's customers and partners (Chesbrough & Rosenbloom, 2002; Johnson, Christensen, & Kagermann, 2008; Morris et al., 2005). In this regard, it is often referred to as a boundary-spanning concept explaining how the focal firm embeds in and transacts with its surrounding ecosystem (e.g., Shafer, Smith, & Linder, 2005; Teece, 2010; Zott & Amit, 2008, 2009).

Although the business model describes boundary-spanning value creation, not every firm must do so. Chesbrough (2006, 2007) differentiates between closed and open business models. Firms implementing closed business models focus primarily on internal value creation and rarely collaborate with partners; they only maintain simple buyer-seller relationships with the outside world. In contrast, open business models focus on external resources as key contributors to a firm's value creation process; value for the customer is co-created between actors in a network (Storbacka et al., 2012). Through close partner collaboration, firms implementing open business models gain improved access to markets and knowledge, as well as to external resources and capabilities (Sandulli & Chesbrough, 2009). In this study, we focus on open business models which we define as follows: An open business model explains value creation and value capture of a focal firm, whereby externally sourced activities contribute significantly to value creation.

2.2 NETWORKS

Although open business models are by definition related to the establishment and management of social ties to external partners, the field currently lacks a systematic approach to identify patterns and rules for the composition of partner networks underlying open business models (Zott & Amit, 2009).

Research in network theory in multiple studies shows that a network of relationships produces a number of positive outcomes, including increased access to novel and diverse information (Burt, 1992; Granovetter, 1985; Hansen, 1999), increased access to resources (Gnyawali & Madhavan, 2001), more efficient knowledge transfer (Reagans & McEvily, 2003; Uzzi, 1996, 1997), heightened power and control (Brass & Burkhardt, 1992; Brass, 1984), increased legitimacy and understanding for the products (Tsai & Ghoshal, 1998), increased innovation (Capaldo, 2007; Phelps, Wadhwa, Yoo, & Simon,

2010; Rodan & Galunic, 2004; Schilling & Phelps, 2007), and increased performance (Lechner et al., 2010; Powell, Koput, Smith-Doerr, & Owen-Smith, 1999; Zaheer & Bell, 2005). But scholars also argue that networks have negative effects, such as costs of maintaining additional ties (Burt, 1992), reduced information benefits (Uzzi, 1997), or information overload (Iselin, 1989).

Scholars characterize such networks on the basis of three dimensions: the relational, the structural, and the cognitive (Lechner et al., 2010; Nahapiet & Ghoshal, 1998; Simsek et al., 2003). As these dimensions are too broad to develop hypotheses (Lechner et al., 2010; Miller, 1996; Powell et al., 1999), we use more specific constructs for each dimension: tie strength for the relational, centrality for the structural, and shared vision for the cognitive.

2.2.1 Relational dimension: Tie Strength

Granovetter (1973: 1361), who introduced the concept of tie strength, defined it as a “*combination of the amount of time, the emotional intensity, the intimacy (mutual confiding), and the reciprocal services which characterize the tie.*” With strong ties at one extreme and weak ties at the other, it is viewed as a continuous measure (Granovetter, 1973; Hansen, 1999; Lechner et al., 2010; Levin & Cross, 2004; Marsden & Campbell, 1984).

Researchers argue that both strong and weak ties produce a number of positive outcomes. Granovetter (1973) argues that weak ties lead to novel information by otherwise unconnected groups within an organization. He argues that weak ties are more likely to transfer non-redundant information, since the contacts are less likely to be connected. Similarly, Levin & Cross (2004) show in their empirical study that weak ties, rather than strong ties, provide access to novel and non-redundant information. Conversely, researchers show the positive effects of strong ties, as they facilitate the transfer of fine-grained information and tacit knowledge (Brass, Butterfield, & Skaggs, 1998; Gulati, 1998; Hansen, 1999; Rangan, 2000; Uzzi, 1996), increase the level of trust (Burt & Knez, 1995; Granovetter, 1973; Gulati, Nohria, & Zaheer, 2000; Krackhardt, 1992; Larson, 1992; Podolny, 1994; Uzzi, 1997), and lead to support (Fukuyama, 1995; Gambetta, 1988; Kostova, 1999; McAllister, 1995) between the two actors within the social relationship. Some efforts are made to reconcile the differences between weak and strong ties by introducing a contingency argument to moderate the effects (Burt, 1997; Hansen, 1999; Lechner et al., 2010; Levin & Cross, 2004; Rowley, Behrens, & Krackhardt, 2000).

2.2.2 Structural Dimension: Centrality

Network research mostly defines centrality as the position of an actor within the network, meaning *“the extent to which the focal actor occupies a strategic position in the network by virtue of being involved in many significant ties”* (Wasserman & Faust, 1994: 172).

Several researchers emphasize that centrality in a network is connected to power and control (Brass & Burkhardt, 1992; Burt, 1992; Ibarra, 1993; Salk & Brannen, 2000), to superior information and resource flows (Gnyawali & Madhavan, 2001; Gulati et al., 2000; Powell et al., 1999; Lechner et al., 2010), and to broad access to many resources, partners, or knowledge (Rowley et al., 2000). Some researchers emphasize the value of low centrality, arguing that it allows time for the focal actor, since fewer ties require less time to maintain the relationships and support others in the big network (Hansen, Podolny, & Pfeffer, 2001). Furthermore, they outline that fewer connected partners decrease the risk of exposure to potential hindrance groups (Lechner et al., 2010; Sparrowe, Liden, Wayne, & Kraimer, 2001) or leakage points whereby valuable information is conveyed to others (Gnyawali & Madhavan, 2001). Low centrality improves the ability of the focal actor to conceal activities from those opposing them. Lechner et al. (2010) introduce the notion that effects of low or high centrality are moderated by the type of initiative.

2.2.3 Cognitive Dimension: Shared vision

The cognitive dimension is increasingly recognized as an important element of networks (Gilsing, Nooteboom, Vanhaverbeke, Duysters, & Vandenoord, 2008; Lechner et al., 2010; Nahapiet & Ghoshal, 1998; Nooteboom, Van Haverbeke, Duysters, Gilsing, & Van Den Oord, 2007; Nooteboom, 1999; Rost, 2011; Simsek et al., 2003; Tsai & Ghoshal, 1998; Wuyts, Colombo, Dutta, & Nooteboom, 2005). It refers to the similarity in representation, interpretation, mental models, and world views (Nahapiet & Ghoshal, 1998) and to common backgrounds amongst different social actors within a network (Rost, 2011). The concept is based on the logic that shared understandings and structured regularities of mental processes influence economic action or limit economic reasoning, as described by Zukin and DiMaggio (1990: 15-16): *“By cognitive embeddedness we refer to the ways in which the structured regularities of mental processes limit the exercise of economic reasoning. Such limitations have for the most part been revealed by research in cognitive psychology and decision theory.”*

There is broad evidence in literature that shared beliefs and common visions strongly influence strategic choices and actions taken (e.g., D'Aveni & MacMillan, 1990). Furthermore, research states that shared vision leads to groupthink, as focal actors recognize the same risks and chances and perceive the same strategies and capabilities as valuable (Gavetti & Levinthal, 2000; Hambrick & Mason, 1984; Walsh, 1995). Additionally, it improves communication and facilitates resource and information transfer between the focal actors (Orton & Weick, 1990; Tsai & Ghoshal, 1998). Scholars find positive or curvilinear performance implications of cognitive embeddedness (Nooteboom et al., 2007; Rost, 2011; Wuyts et al., 2005), and others see its effect subject to moderating influences (Lechner et al., 2010).

In this study we consider the three dimensions to characterize networks and analyze their effect on the performance of open business models. Thereby, we focus on social ties between the focal firm and its service partners involved in the value creation and capture processes of the open business model.

2.3 CUSTOMER CENTRICITY AND SOLUTION PROVIDERS

Business model scholars frequently stress that the customer should be at the center of the business model and its primary goal is to create value for the customer (e.g., Johnson et al., 2008; Teece, 2010). Amit & Zott (2001: 513) observe that business models “*are often customer centric in their design*” and customers in some cases even engage in value co-creation. Teece (2010: 172) emphasizes customer centrality, stating that a business model “*reflects management’s hypothesis about what customers want, how they want it, and how the enterprise can organize to best meet those needs, get paid for doing so, and make a profit.*” In the context of open business models, these questions are more important to answer, as several players need to agree a joint value proposition towards the customer and align their co-creation activities accordingly (Storbacka et al., 2012).

Given its prominence in business model literature, we include customer centrality as a defining characteristic of open business models and as a potential construct influencing their performance, in addition to the network characteristics mentioned. In line with previous research (Shah, Rust, Parasuraman, Staelin, & Day, 2006), we conceptualize customer centrality on the basis of three dimensions: (1) customer-oriented values and beliefs guide actions of the organization from the top (Selden & MacMillan, 2006; Webster, 1988), (2) the structure of the organization uses dedicated customer-facing

units (Day 2006), and (3) the focus of the organization is on customer needs discovery and satisfaction (Gummesson, 2008; Sheth, Sisodia, & Sharma, 2000).

We embed our study in the context of solution providers as this is a promising field to study open business models and the effects of networks and customer centricity. During the past two decades, solution selling became a popular concept, particularly in mature industrial settings (Sharma & Iyer, 2011). By a solution, scholars refer to the combination of products and services required to solve specific customer problems (Töllner, Blut, & Holzmüller, 2011). For a former product manufacturer, the transformation into a solution provider requires massive changes to its business model. In the real world many companies fail to innovate their business models coherently (Evanschitzky, Wangenheim, & Woisetschläger, 2011). Literature on the subject hence often deals with questions as to how manufacturers can become solution providers (Davies, Brady, & Hobday, 2007; Helander & Möller, 2008; Matthyssens & Vandenbempt, 2008). A promising possibility identified in this context is the close collaboration with partners in the development and delivery of solutions (Gebauer et al., 2013; Jaakkola & Hakanen, 2013; Kakabadse, Kakabadse, Ahmed, & Kouzmin, 2004; Windahl & Lakemond, 2006). By sourcing certain parts of the value creation externally, solution providers do not develop the corresponding skills and capabilities, and thereby reduce uncertainty (Liu & Hart, 2011). From a business model perspective, this strategy of incorporating partners deeply into value creation can be described as adopting an open business model.

The importance of customer centricity is also highlighted in the context of solution providers, in particular with regard to centricity of the solution customer. Authors from the solution provider field identify customer closeness and customer focus as important factors for solution success (e.g., Cova & Salle, 2008; Davies et al., 2007; Galbraith, 2002). A study by Day (2006) shows that “implementing a solutions strategy” is the most frequently cited rationale for a customer-centric realignment of organizations. Finally, authors highlight that solutions need to be tailored to specific needs of individual customers, explaining why the process of solution selling is characterized by a high level of interaction with the solution customer during requirements definition, customization and integration of goods and services, their deployment, and subsequent support (Tuli, Kohli, & Bharadwaj, 2007). Solution customer centricity hence is seen as a key element in value creation of solution providers.

Based on the theoretical foundations above, we identify two gaps in current literature we aim to close in our study. Firstly, open business models are not analyzed with regards to the influence of partner network characteristics on their performance. Secondly, the role of customer centrality in the context of these business models is unclear and not understood. The solution provider setting allows us to study these questions, as both partner networks and solution customer centrality are important elements of solution provider business models. Figure 1 illustrates the theoretical framework into which our study is embedded.

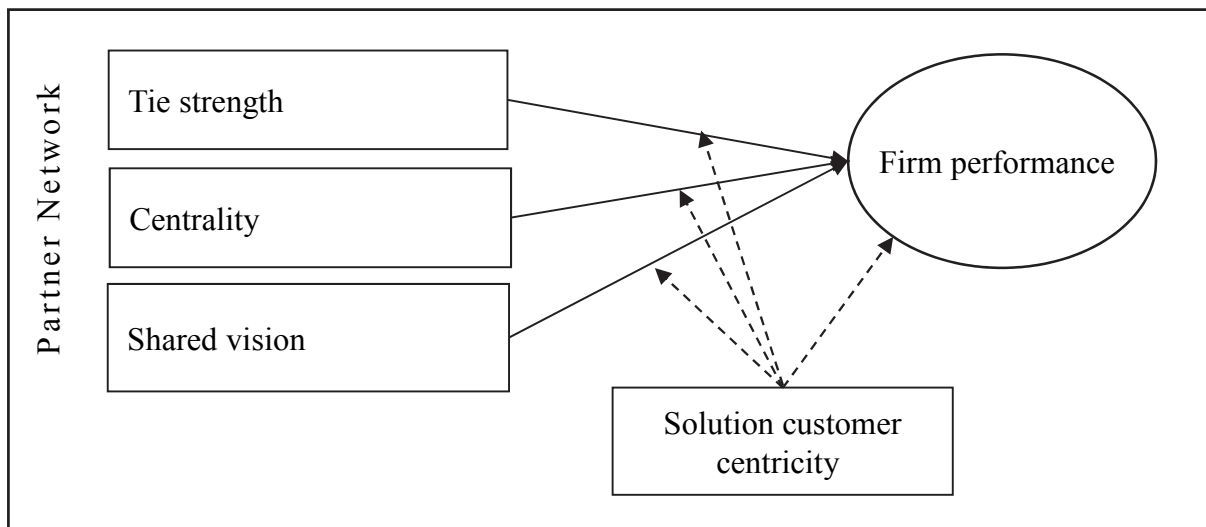


Figure 1: Theoretical framework of the study

3 METHODOLOGY AND OVERVIEW OF CASES

3.1 CASE STUDY APPROACH

Given limited theory on different network dimensions' impact on performance of open business models, and about the role of customer centrality in this context, an inductive multiple case study approach is employed (Eisenhardt, 1989; Yin, 1994). To comply with the theoretical background and aim of our study, the case firms' open business models in the solution provider context must meet two conditions. Firstly, to differentiate from a closed business model, a significant amount of externally sourced activities is included in the value creation process. Secondly, to differentiate from a product manufacturer, the solution providers care for value co-creation for the solution customer. That is, the activities performed by the focal firm are not limited to selling a product to a partner, but include activities which ensure solution delivery for the solution customer.

Three companies meeting these criteria are identified: 3M Services, SAP, and Geberit. While they all rely on a network of partners to deliver the service part of the solution, which thereby contribute significantly to value creation, their open business models differ. 3M Services defines and sells the solutions, such as applying films to cars and buildings, itself. It owns the customer relationship and covers administrative processes such as order handling and billing. Only the service part of solution delivery is subcontracted to external partners operating under the umbrella of the 3M solution. SAP, our second case firm, sells its enterprise software directly to the solution customer, while its partners sell and accomplish the implementation part separately. SAP, however, recommends partners to its customers, invests in their training, and provides support to ensure overall quality of the solution. Finally, Geberit, a Switzerland-based manufacturer of sanitary and piping systems, manufactures the product but leaves the application and the entire process of solution selling to its partners. In contrast to a simple buyer-seller relationship with partners, Geberit ensures value creation for the solution customer by educating and enabling its service partners through a wealth of free partner support offerings. Figure 2 illustrates the differences of the three open business models along a simplified solution provider value chain.

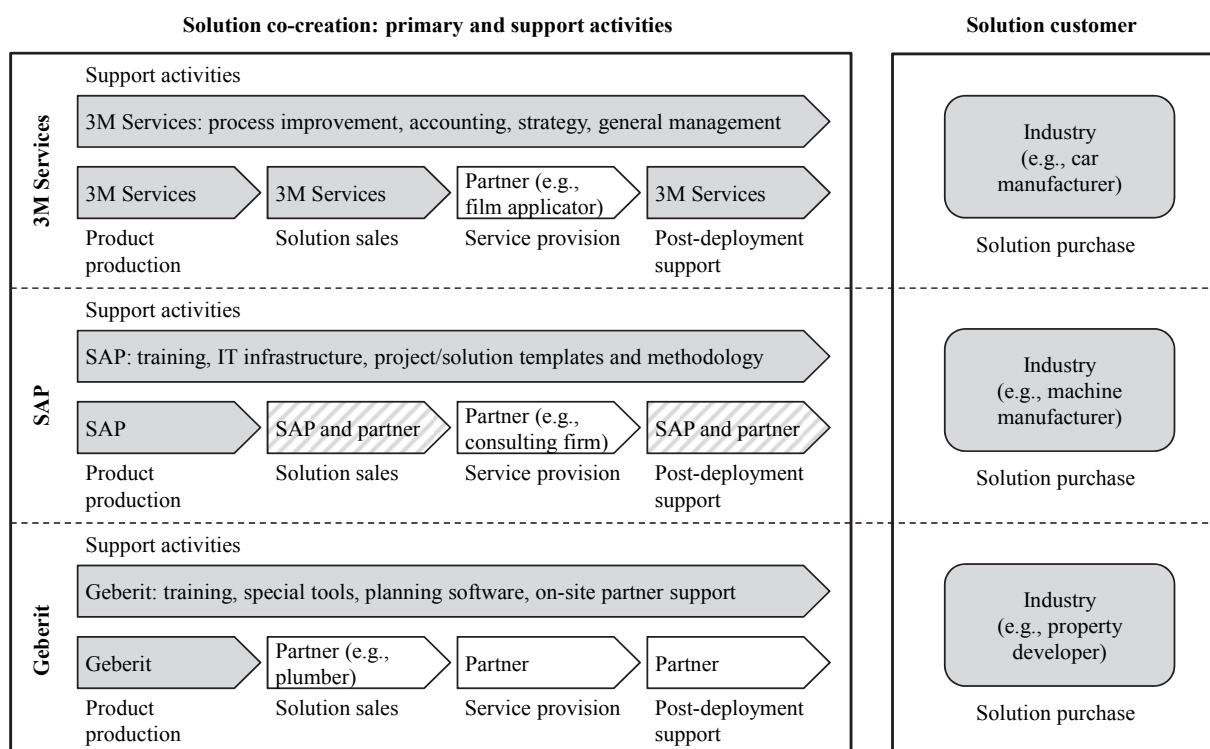


Figure 2: The cases illustrated along a solution provider value chain. Grey activities in solution co-creation indicate activities performed by the focal firm; white activities are performed by its partners.

The unit of analysis in our study is the open business model of the solution provider, including links to the partners co-creating the solution. With respect to the level of analysis, we focus on the inter-firm level as we analyze the relationships between the focal firm and its service partners.

3.2 DATA SOURCE

We use two data sources: (1) semi-structured interviews with executives of the case firms as the main data source, and (2) archives of publications on the three firms and their solutions. Two semi-structured interviews of 1-1.5 hours per case were conducted with senior company representatives from general management, business development, and partner management (cp. Appendix A). The interviewees received our main questions in advance so that they could prepare. The interviews were transcribed, allowing for subsequent analysis, and specific questions clarified in follow-up e-mails.

Following Lincoln & Guba's (1985) criteria of methodological trustworthiness, we address potential biases in several ways. Credibility, the findings' fit with reality, is achieved through triangulation of interview data with that from other sources (Jick, 1979). For this, we use documents provided to us by our contacts or those publicly available. Dependability, the findings' consistency, we achieve through focused interviews of contacts with a deep understanding of the respective company's open business model. This allows us to limit the data to a manageable amount (cp. Pettigrew, 1990). Finally, transferability of the results is ensured in two ways. Firstly, we select our cases from different industries to prevent being misled by industry specifics and achieve a higher diversity. Secondly, as part of the analysis, we compare our results with a broad set of previous findings in literature (Eisenhardt, 1989) to achieve a higher confidence in their transferability.

3.3 DATA ANALYSIS

Based on interview transcripts and additional information obtained, we first wrote a case story for each company in the sample. We allowed the participants to review their cases, enabling us to complete the write-up and eliminate some of the biases associated with retrospective interviews (Silverman, 2000). Following familiarization with individual cases, we commenced with the cross-case analysis (Eisenhardt, 1989; Ozcan & Eisenhardt, 2009). Tables and other visualization methods such as network graphs identified important similarities across the cases and formed initial relationships between our constructs. We then iteratively oscillated between the initial findings and

original data to clarify specific details and reach a consistent picture. As a last step, we conducted multiple iterative loops between data, literature, and initial findings until we achieved a strong match between the data and the identified theoretical framework.

3.4 RATING FRAMEWORK

Despite following a qualitative study approach, we find it worthwhile to employ measures to answer our research question. The three dimensions of network embeddedness are determined along the following relational measures (see section 2.2): For *tie strength*, we use a combination of frequency and closeness (Hansen, Mors, & Løvås, 2005; Hansen, 1999; Lechner et al., 2010; McFadyen & Cannella, 2004; Smith, Collins, & Clark, 2005) of the contact with service partners. For *centrality*, we use degree centrality within the ego network, referring to the number of ties the focal firm maintains with service partners (Wasserman & Faust, 1994). We display the number of service partners in relation to the number of potential partners. For *shared vision*, we measure two items: shared ambition and vision with the partner (Tsai & Ghoshal, 1998), and common background with the partner (adapted from Rost, 2011).

For *solution customer centrality*, we refer to the three items derived from theory, namely (1) customer oriented values of the organization, as measured by firms' readiness to take responsibility for solution delivery and importance attributed to the solution customer; (2) a customer facing structure, as measured by the existence and size of dedicated units interacting with the solution customer; and (3) a focus on customer needs discovery and satisfaction, as measured by the focus of the firm in development (product vs. solution) and the commonness of contact with the solution customer.

Apart from centrality, which we directly asked the interviewees to estimate as a percentage, all measures were rated in line with the rating framework provided in Table 1 by the first two authors independently. Differences in rating on the 5-point Likert type scale initially occur for three of 12 items and were jointly discussed and resolved by re-examining the case data (cp. Bullock, 1986).

Furthermore, we are interested in the *performance of the open business models* under study. As other scholars in this field, we assume that business model performance reflects in the performance of firms implementing the model (Malone et al., 2006; Weill, Malone, & Apel, 2011; Zott & Amit, 2007, 2008). We operationalize firm performance as return on assets (ROA) and net profit margin (NPM) (cp. Agle, Nagarajan, Sonnenfeld, & Srinivasan, 2006) and compare these to respective industry values in the

5-year average. This approach allows us to roughly term a firm’s business model “successful” if ROA and NPM are above industry average. Table 1 shows a summary of the variables, measures, and their operationalization.

Table 1: Overview of measures in the rating framework used for case analysis

Theoretical Construct	Variable	Measure	Scale	
Customer centricity	Solution customer centricity	<ul style="list-style-type: none"> • Solution responsibility • Importance of solution customer • Solution customer facing units • Development focus (product vs. solution) • Commonness of solution customer interaction 	5-point Likert type (average of the five dimensions)	
	Relational embeddedness	<ul style="list-style-type: none"> • Contact frequency: ‘several times per week’ to ‘few times a year’ • Closeness: ‘very close’ to ‘very distant’ 	5-point Likert type (average of the two dimensions)	
	Structural embeddedness	Centrality	Degree centrality	Number of service partners in relation to number of potential service partners (relative value)
Partner network	Cognitive embeddedness	Shared vision	<ul style="list-style-type: none"> • Shared ambition and vision: ‘conflicting goals’ to ‘full alignment’ • Common background: ‘no commonalities’ to ‘extensive prior knowledge and joint investments’ 	5-point Likert type (average of the two dimensions)
	Performance of open business model	Firm performance	Firm ROA and NPM (five-year averages) as compared to corresponding industry average	Delta in percentage values

3.5 CASE DESCRIPTION

3M Services is a subsidiary of 3M Germany incorporated in 2010 to tap the market of solutions within 3M’s wide range of products. A strong product company, 3M adopted an open business model for solutions to rely on a network of partners for service delivery. Thus, the new organization is lean and utilizes the existing knowledge of specialized service providers. In 3M Services solutions, partners with special skills take over the application of the 3M product. One simple example is the application of films to cars, offered by 3M Services to car manufacturers. For special car editions, such as

the 400 exemplars of the matt-finished “Nissan Juke Pure Black”, 3M Services sells a solution comprising both its product (the film) and necessary modifications to the car, such as applying the film and attaching add-on parts. In other settings, cars are individually designed on the car dealer’s site. For service delivery in these car solutions, 3M Services coordinates a nationwide partner network comprising 30 certified film applicators. The applicators are subcontracted, hence 3M Services acts as the single point of contact to the car manufacturer or dealer and takes full responsibility for solution delivery. Although not all 3M solutions are as standardized, and partner-provided services can go far beyond product application (e.g., into consulting), the same general business logic applies to all of the company’s solutions.

Founded in 1972, **SAP** is a Germany-based manufacturer of enterprise application software and today ranks amongst the world’s largest five software companies. At the historic center of SAP’s product portfolio is SAP ERP, a system to help corporate customers run, manage, and track all processes. Customers buy a software license from SAP and sign a maintenance contract to ensure regular updates and fixes. The complex configuration of the software at the customer site, however, is typically performed by independent service partners. Customers’ expenses for these services can exceed product costs considerably for large-scale projects. Despite the attractiveness of this service market, SAP’s share in delivering turn-key solutions is not outstanding. Huge shares are held by global partners such as Accenture, Capgemini, or IBM Global Services. SAP, however, is not just a software manufacturer ignoring customers’ needs for solutions - it possesses a huge “Ecosystem & Channels” department that, amongst other tasks, manages relations to the company’s 1700 service partners. Partners can become certified or preferred partners in different areas, book training at SAP, and are equipped with resources to help deliver better solutions. The split of duties between SAP and its partners is not always clearly defined and a certain degree of “coopetition” (Bengtsson & Kock, 2000) occurs in some areas.

Founded in 1874, **Geberit** is a Swiss-based manufacturer of sanitary and piping systems. Today, the company employs 6000 people and sells in more than 100 countries. A major player globally, with a very strong market position in its core European markets, Geberit’s products are mainly applied behind the walls of buildings to ensure water is available when and where it is needed. Solution customers - corporations, property developers, construction companies, and house owners - do not plan and install these piping systems; they turn to architects, plumbers or sanitary planners for a customized solution. Thus, Geberit’s business model in developed markets aims to make solution

delivery as easy as possible. 500 Geberit technical advisors in Europe alone support the service partners within the firm’s network. Partners have access to a wide choice of free-of-charge Geberit offerings, including training classes for their employees, partner events, planning software, plus remote and on-site support. This focus on value co-creation allows architects, plumbers and planners to deliver solutions faster and better with Geberit products. Compared to the other two cases, Geberit is special - its value chain includes wholesalers distributing products to service partners. Since wholesalers, for Geberit simply assume the role of a distribution network, we do not further consider them in our analysis of the business model.

4 RESULTS AND DISCUSSION: THE EFFECT OF NETWORK EMBEDDEDNESS AND CUSTOMER CENTRICITY ON PERFORMANCE OF OPEN BUSINESS MODELS

In the three cases analyzed, the firms complete their core product offering to a solution through externally provisioned services. Despite these commonalities, we identify significant differences across the employed business models with respect to level of customer centrality and configuration of the network with service partners (see Table 2).

Table 2: Overview of cross-case analysis results

	3M Services	SAP	Geberit	
Solution customer centrality	5/5	3/5	1/5	
Partner network	Tie strength	3/5	2/5	
	Centrality	~5%	30-50%	50-95%
	Shared vision	5/5	4/5	5/5
Firm performance ¹ (delta ROA/NPM above industry)	+11.9%/+12.1% above Industrial Conglomerates	+1.8%/+1.0% above Software	+16.2%/+16.5% above Construction Supplies / Fixtures	

¹ Financial data (5-year average of return on assets and net profit margin of case companies and industries) retrieved from reuters.com on 2012-07-17. Financial data provided for 3M Services is for 3M Co. - specific data for 3M Services subsidiary was not made available to us. We conclude from the company’s expansion plans that 3M Services is at least as profitable as the parent company.

4.1 SOLUTION CUSTOMER CENTRICITY

Since it is ranked high on the five dimensions of our measure, the highest level of solution customer centrality (5/5) is found in the 3M Services business model. The unit was deliberately incorporated as a subsidiary, acting as the single point of contact for solution customers and, as such, is the only one in our set to have this feature. 3M Services develops the solutions, takes legal responsibility for their quality, and has close relationships and frequent contact with all solution customers as it organizes delivery. In contrast, SAP does not own customer relationships exclusively. It maintains direct relationships to all of its solution customers through its sales force and support centers, but interaction is reduced to sale of product licenses and provision of product support. Legal responsibility is shared with partners. Customer-specific adjustments to the product, even down to source code level, are performed by partners since SAP considers itself a standard software manufacturer. Comparing these characteristics to those of 3M Services, the lower level of customer centrality in SAP's business model is obvious. It is hence rated 3/5 on our scale. In Geberit's model, the entire solution customer relationship is handed over to partners - in the "behind the wall" business under study, Geberit itself rarely meets solution customers. Solution responsibility, unless a clear product issue occurs, remains with the partner. In developing and manufacturing the product, Geberit focusses on making partners' jobs easier and providing additional value to the joint solution in the form of extensive support activities, enabling partners to deliver solutions efficiently. Despite these contributions, the business model's solution customer centrality by our measure is low (1/5).

Based on the identified inter-case differences in solution customer centrality, the three network configurations are analyzed and discussed in the following.

4.2 TIE STRENGTH AND SOLUTION CUSTOMER CENTRICITY

Our results indicate the positive and negative effects of strong ties; they depend on the level of solution customer centrality of the open business model. In the case of 3M Services, the level of customer centrality is the highest in the set and its ties with service partners are strong (rated 5/5), as 3M Services communicates with them for every solution delivered. Interactions can occur frequently within a single week and also during the development of new solutions. For solutions incorporating more complex services, both parties work closely together to design the offering. The end result, however, is always a 3M Services-branded solution for which the company takes full responsibility – which is why partners are managed closely.

In the case of SAP, which has a lower degree of customer centricity, interactions with partners occur less frequently. Intensity of partner interaction varies: high in the context of new product implementations, for which SAP meets partners in regular status meetings, test sessions, and ramp-up trainings, and also high when SAP and a preferred partner join forces to convince a prospective customer. In the fundamental business of established products, however, intensity is low: SAP and its partners communicate only in the event of a major issue. Considering this very common set-up, tie strength is rated 3/5 for SAP's partner network.

Finally, Geberit with the lowest level of customer centricity in the sample, also rates low at 2/5 in tie strength with its partners. Despite the high number of support activities offered by Geberit, contact with its partners is not regular. Unless issues occur during implementation at the solution customer, Geberit meets partners a few times per year during training (approximately 50,000 people per year trained free of charge) and partner events.

Despite the three business models' obvious differences in terms of customer centricity and tie strength with partners, the three companies in our sample achieve superior firm performance, as all of them clearly outperform their respective industries (see Table 2). In order to better understand these findings, we discuss them in the light of existing theory.

We start the discussion with the open business model featuring high solution customer centricity and strong ties to partners, represented by 3M Services. 3M Services provides one offer before the customer, which includes the externally sourced service. A convincing solution in this setting requires detailed coordination and exchange of sensitive knowledge and information between service partners and product manufacturer. Tacit knowledge (Szulanski, 1996) and fine-grained information is transferred, and only possible through strong and close ties (Uzzi, 1996). Also, Hansen (1999) outlines non-codified and dependent knowledge transferred only through strong ties.

Furthermore, to offer superior solutions co-developed or co-produced between external service provider and product manufacturer, efficient communication between the two parties is a key precondition. With strong ties between product and service partners, the process of knowledge transfer is more efficient, since the focal firm knows what the partners know and how they work and interact (Gulati et al., 2000; Lechner et al., 2010). Finally, these strong ties lead to increased trust between the firms (Krackhardt, 1992;

Uzzi, 1996), which is crucial for solution providers fully responsible for the entire solution, but sourcing a significant part of the solution externally. While financial payments help ensure performance of external partners, trust is a more powerful lever to ensure a high quality solution and collaboration.

In our second case, SAP, characterized by a medium level of customer centricity, ties to partners are of medium strength. SAP and its partners share solution responsibility for the customer and tasks in solution delivery are split. SAP is concerned with delivering and maintaining the product, whereas the partner delivers the service part of the solution independently. Both parties work loosely together in delivering the solution, yet ties are weaker than the case of 3M Services, as information and knowledge exchanged are more codified and product related.

Geberit, our third case, has a low level of solution customer centricity. It is further characterized by weak and infrequent interactions with service partners during solution delivery. Business models with a low level of customer centricity need direct relationships to numerous partners to overcome lack of direct customer contact. Maintaining a broad partner network, however, requires time and effort (Stevenson & Greenberg, 2000), making it difficult or even impossible to build up strong ties to each of those partners, assuming that time is limited and taking into account that strong ties require a significant amount of time (Hansen, 1999).

Although time constraints make it difficult for solution providers with low customer centricity to build up strong ties to their partners, they actually do not need strong ties for the performance of their business model. As solution customer relationships are managed by the service partners, and the individual solution designed by them, extensive coordination efforts and transfer of fine-grained information between the product manufacturer and its partners is not required. The knowledge transferred is primarily open, codified, and generic – the solution provider seeks to enable its partners to deliver solutions. Examples include general product descriptions, process instructions, checklists, handbooks, or - as in the case of Geberit - planning software and special tools. Hansen (1999) underlines this argument in his study that weak ties are better than strong for the transfer of codified and independent knowledge.

Finally, solution providers with low customer centricity need to gain diverse and non-redundant information about needs and requirements of customers. Then they are able to develop products to fulfill the needs of different customer groups, leading to superior performance. Weak ties to service partners enable the product manufacturer to indirectly

gain diverse information about solution customers, as the partners are not all connected and thus channel back non-redundant and diverse information (Burt, 1992; Granovetter, 1973; Hansen, 1999). Hence, for solution providers with low customer centrality, weak and distant ties to service partners are more beneficial to ensure transfer of non-redundant information, and are key for customer and solution-oriented product development and competitive advantage.

In summary, we argue that solution customer centrality moderates the relationship between tie strength and firm performance:

P1: For open business models with high solution customer centrality, strong ties (in contrast to weak ties) to partners lead to superior firm performance. For open business models with low solution customer centrality, weak ties (in contrast to strong ties) to partners lead to superior firm performance.

4.3 CENTRALITY AND SOLUTION CUSTOMER CENTRICITY

Our cases reveal different levels of centrality in respective partner networks (see Table 2). 3M Services only collaborates with carefully selected partners, and varying by solution, the number of these ranges between one and thirty. The interviewees estimate that only 5% of potential service providers are part of 3M Services' partner network. At SAP, in contrast, there are virtually no barriers to becoming a partner. Almost every systems integrator or consultant delivering SAP solutions joins the company's official network. As investment in product knowledge is high on the service partners' side, however, smaller partners determine either SAP's or a competitor's product as the basis for their services. In line with this reasoning, SAP's centrality in the partner network is estimated to lie within a 30-50% bandwidth. Compared to SAP's network, investment in Geberit-specific knowledge is not as high for their partners. This is especially true since Geberit training is provided free and starts at apprentice level. Thus Geberit, in its European core markets, achieves a centrality of 50-95% in the respective country-wide partner networks.

For centrality, again, we find differences between three profitable open business models. How is this explained? We start our discussion with 3M Services, the case with high solution customer centrality. Firstly, as 3M Services owns the customer contacts, the firm is not dependent on the ability to access customers or gain information about them via partners. Hence, the benefits for high centrality, such as access to information and indirect access to customers, are not as relevant for solution providers with high solution

customer centricity. On the other hand, each additional tie costs time and resources to maintain the contact (Stevenson & Greenberg, 2000). Therefore, we argue that a solution provider with high customer centricity is better off maintaining fewer ties than being more central in the partner network.

A second argument explaining the advantage of low centrality for open business models with high customer centricity is predicated on increased centrality entailing risk of exposure to hindrance groups (Sparrowe et al., 2001; Lechner et al., 2010). 3M Services works very closely with service providers, from joint development of the solution to delivery, including transfer and exchange of sensitive information. In this setting it is important for the success of the business model that information and knowledge exchanged stay with partners and are not provided to competitors or other parties. A smaller network to partners allows the focal solution provider to better control partners and fully understand their interests behind the cooperation. Thus, partners whose intentions do not meet 3M Services' expectations can be excluded upfront.

In the second case in our sample, SAP, customer centricity is of medium level. The company interacts with solution customers as part of product sales and maintenance, leaving final solution design and fine-tuning to partners. As reasoned before, the company's level of centrality in the partner network is medium.

Finally, the business model of Geberit is characterized by a low level of solution customer centricity. Since the company only has limited direct contacts to solution customers, it needs to ensure market reach via relations to service partners that define and sell solutions to the end customers. A central position in the partner network overcomes or even outplays the missing direct contact to customers. Connections to many partners, in turn connected to many customers, enables the focal solution provider to indirectly connect to a large number of solution customers, many more than the solution provider manages in isolation. Therefore, being highly central in the network to service partners is crucial for success of the open business model with low customer centricity, as it provides the focal company with access to resources and customers (Rowley et al., 2000).

Furthermore, no direct connection to solution customers requires the solution provider to use other sources to gain insights about customer needs and preferences. A central position in the partner network enables the focal firm to gain detailed and diverse information about the needs and preferences of their customers. This is crucial for continuous development of products and a competitive position. Literature supports this

argument, as previous scholars have outlined a high degree of centrality leading to an increase in information flow and diversity (Gnyawali & Madhavan, 2001; Gulati et al., 2000; Powell et al., 1999; Lechner et al., 2010).

Finally, solution providers with low solution customer centrality require power within the network of partners to ensure that partners use their - and not competitors' - products in the customer solution. Current literature argues a central position within a network significantly helps achieve this powerful position (Brass & Burkhardt, 1992; Burt, 1992; Ibarra, 1993; Salk & Brannen, 2000). Geberit shows clearly the power of a central position. They achieve between 50 and 95% centrality within the partner network in their core markets, directly translating into a leading market penetration with their products. Competitors, having a much lower centrality within the partner network, have difficulty penetrating the market.

As a result, we argue that solution customer centrality moderates the relationship between the level of centrality of the business model and firm performance:

P2: For open business models with high solution customer centrality, low centrality within the partner network leads to superior firm performance. For open business models with low solution customer centrality, high centrality within the partner network leads to superior firm performance

4.4 SHARED VISION AND SOLUTION CUSTOMER CENTRICITY

Analyzing case data, we assign high levels of shared vision to all cases during the rating process (see Table 2). At 3M Services, shared vision and common background with service partners are given: many solutions are jointly developed with partners, goals are aligned, and relationships often existed informally before the formal definition of a solution. Hence, a 5/5 rating for 3M Services seems appropriate. For SAP, a 4/5 rating is assigned. Much indicates a high level of shared vision, such as common growth history that many SAP partners share with SAP. Also, partners' considerable investment in SAP skills and customer base lock them into the partnership and align vision and goals. One conflicting goal, however, exists: while a partner is focused on a more customized and service-intensive solution, SAP is interested in providing a low total TCO to the customer and hence prefers a low share of services in the overall solution. Finally, at Geberit, goals are aligned with partners as both sides profit from the relationship. The wealth of support activities Geberit provides to ease its partners' work in solution sales and delivery is well received by them. For these convinced "Geberit shops", as one of

the interviewees addresses them, there is little reason to leave the network and cease a relationship often originating at vocational school. Hence, a 5/5 rating is considered appropriate.

We argue that shared vision has a positive effect on firm performance without any moderating effect of solution customer centricity. For the three case examples, a shared vision with partners is crucial for performance of the open business model. For a business model with high customer centricity, such as 3M Services, a high level of shared vision is important. As partners in this case exchange sensitive information and tacit knowledge, a high level of shared vision facilitates efficient communication and tacit knowledge transfer (Tsai & Ghoshal, 1998). Also, as the two parties work closely together, a common worldview is necessary for superior results.

In the SAP case, partners build up knowledge and experience in delivering SAP-based solutions. The more knowledge gained, the more successful they are in the market as they can sell their services more convincingly. Specialization culminates by being nominated a “special expertise partner” by SAP for a specific application or industry. Being successful with SAP-based solutions increases service partners’ belief in SAP products and increase switching costs to a competitor’s products.

In Geberit’s case, whereby service partners sell the solution to customers, a shared vision and common values are key for a functioning business model. Only if partners have the same understanding of the products, the environment, and specific challenges as the product manufacturer, can the solutions be sold independently and successfully. Geberit develops and retains a high level of shared vision amongst its partners through frequent events and training with all partner employees. While partners are trained in Geberit products, tools, and their application, shared values and beliefs are communicated to them.

Furthermore, sharing a vision with external service partners is likely to lead to a cognitive lock-in (Abrahamson & Fombrun, 1994) of the partners. This, in turn, limits the search for alternatives (Barr, Stimpert, & Huff, 1992). Hence, partners cognitively locked-in are more likely to stick to their solution provider, as switching costs are quite high. This has a positive effect on its performance. Summing up, we argue that shared vision is crucial for firm performance and equally important for business models with high and low customer centricity. Formally:

P3: The higher the level of shared vision between a solution provider and its service partners, the greater the firm performance.

Figure 3 summarizes identified relationships between constructs of our study based on insights of the three case studies and existing theoretical contributions. As articulated in propositions 1 to 3, all partner network dimensions influence firm performance. While the influence of centrality and tie strength is contingent on the degree of solution customer centrality, shared vision has a direct positive impact on firm performance.

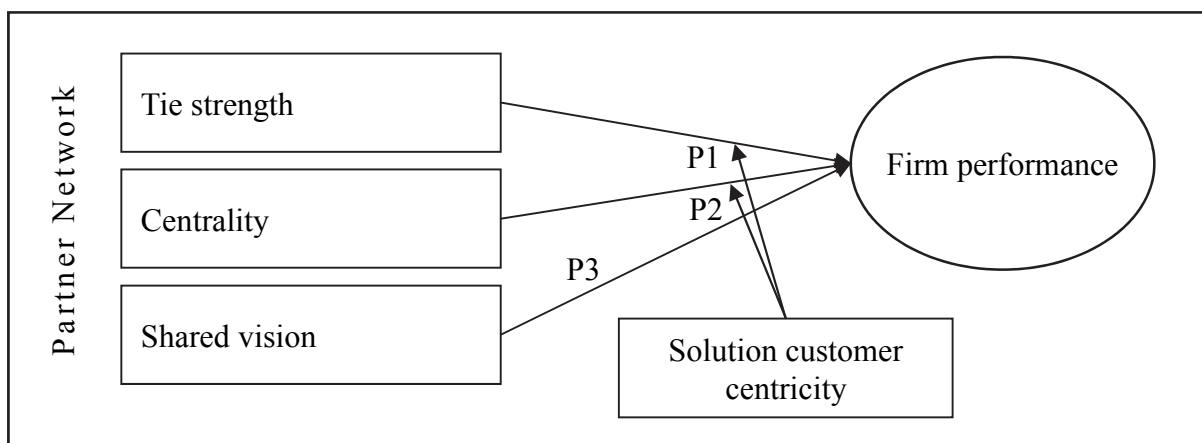


Figure 3: Results summary and the three propositions.

5 CONCLUSION AND IMPLICATIONS

5.1 CONCLUSION

The level of customer centrality is a useful way to explain how the three dimensions of networks with partners of open business models - tie strength, centrality, and shared vision - influence performance of firms. Based on these insights, we derive three ideal configurations of networks for open business models leading to superior firm performance contingent on the level of customer centrality, namely the controlled, the joint, and the supported model. They are summarized in Figure 4.

The controlled model: We term the first configuration, whereby the product manufacturer keeps control of most aspects of the solution and customer relationship, the controlled model. Due to its focus on the solution customer, customer centrality in this business model configuration is very high. We argue in our propositions that an open business model with this property establishes relationships to a few key service partners with whom it builds up strong and reliable relationships. In addition, the level of shared vision between the solution provider and the service providers is strong. This case allows

the solution provider to achieve superior performance with its open business model, since its level of customer centricity and partner network configuration is aligned. In our case analysis, 3M Services represents this type of open business model.

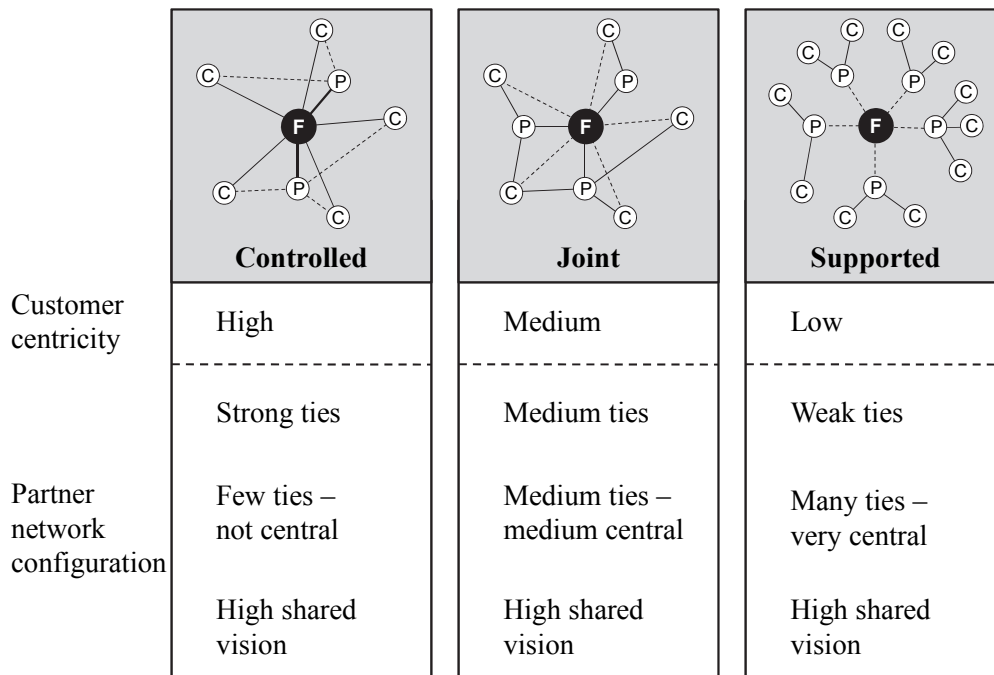


Figure 4: Three ideal configurations of networks with partners (P) for open business models leading to superior firm performance contingent on the level of customer (C) centricity.

The joint model: We term the second configuration, whereby the product manufacturer weakens its customer relationship and allows solution business for independent partners, the joint model. Relinquishing control enables the solution provider to weaken ties with service partners to a medium level but reach out to more to increase market reach, as is represented by a medium level of centrality. Shared vision between the solution provider and service partners is strong in this configuration. It leads to superior firm performance based on an open business model, represented by SAP in our cases.

The supported model: The third configuration, whereby the product manufacturer relinquishes direct solution customer contact entirely, actively enabling partners to design and deliver solutions, is termed the supported model. Since no direct solution customer relationships exist, only a very low level of customer centricity is attributed to this model. As our propositions state, this is a viable option for a solution provider if the partner network is set up accordingly i.e. if it features a high level of centrality and weak partner ties. The level of shared vision is high. In our case analysis, Geberit represents this type of open business model.

The models represent three ideal partner network configurations for open business models with varying degrees of customer centrality. They illustrate our propositions and demonstrate how customer centrality and partner network characteristics are aligned to achieve superior performance of open business models. While the controlled and supported models mark extreme positions in terms of customer centrality in open business models, the joint model shows there is also middle ground between them.

5.2 IMPLICATIONS FOR THEORY AND PRACTICE

With this article we seek to contribute to the growing body of knowledge on design of open business models. By focusing our analysis on solution providers incorporating externally sourced services into solution delivery, we apply the business model concept to a concrete environment of high practical relevance (Liu & Hart, 2011; Windahl & Lakemond, 2006). This allows us to deliver knowledge relevant to both worlds: the underlying theoretical bodies of knowledge, and managerial practice of firms transitioning from manufacturer to solution provider.

We show that high solution customer centrality, often seen as the key ingredient for open business models and for a solution provider strategy, is not the only option for firm success. Through the rise of business services and open business models incorporating partner networks, customer centrality changes its role. It acts as a moderator, shaping the partner network and determining interactions with partners.

5.2.1 Theoretical implications

By applying insights from network theory to business model literature, this paper contributes to research on open business models and business models in general as follows. Firstly, although previous research acknowledges the critical role of networks for business models (e.g., Morris et al., 2005; Osterwalder, Pigneur, & Tucci, 2005; Shafer et al., 2005; Zott et al., 2011), it has not described the causal relationships leading to superior firm performance. This paper advances literature on business models by explaining how networks of open business models influence firm performance. Secondly, our results show that the effect of these networks on firm performance is contingent on the level of customer centrality. Rather than being a key requirement for successful open business models, as seen in previous research (Amit & Zott, 2001; Johnson et al., 2008; Teece, 2010), our findings suggest that customer centrality can be a precondition, but is not mandatory. Thirdly, our analysis suggests broadening the perspective of the term “open business model”. Currently, research under this umbrella frequently addresses concepts of opening R&D and intellectual property management

to the outside network of a firm (Chesbrough 2006, 2007). With the rise of business services, however, business models can open up for partners in manifold ways and gestalts (Ehret & Wirtz, 2010; Holm, Günzel, & Ulhøi, 2013; Sandulli & Chesbrough, 2009).

The paper contributes to network theory as it provides new insights into resolving the ongoing debate in network research between strong and weak tie effects and high and low centrality. Our results suggest that the most beneficial configuration depends on the related level of customer centricity. Similar contingency arguments for networks in other contexts are outlined by Burt (1997), Rowley et al. (2000), Hansen (1999), Levin and Cross (2004), and Lechner et al. (2010). Furthermore, by combining business models with network theory, we add a unit of analysis to network research useful for future research.

Finally, we contribute to solution provider theory by suggesting an alternative to the common assumption that a solution provider is responsible for delivery of the actual solution (Galbraith 2002; Davies et al. 2006). From the solution customer's perspective, the question of who offers and delivers the solution is secondary so long as the need for a solution can be satisfied on the market.

5.2.2 Managerial implications

Given the concrete background to the analysis, our results directly impact managerial decisions at strategy level. Our findings suggest a more deliberate use of the “customer first” paradigm in solution provider contexts as we show that low centrality of the solution customer in the focal firm's business model can be as successful as high centrality, provided the right network configuration is chosen. Furthermore, it is important for managers to understand that there is more than one way of setting up an open business model incorporating service partners for solution delivery. We identify three possible network configurations with external service partners spanning the bandwidth between a highly customer-centric controlled model and a highly partner-centric supported model. Managers can take these models as a reference for their own implementation or draw inspiration from the archetypes in designing their unique open business model variant.

Our propositions provide additional guidance for managers to be increasingly open and network aware. Through awareness of customer centricity acting as a key contingency for partner network design, managers can determine the required levels of centrality in the partner network and tie strength with partners. Finally, our results create awareness

that more network ties are not always beneficial. The conventional wisdom amongst managers is solely on the positive side, following the "the more the better" paradigm. Managers can actively shape their network to partners based on this knowledge.

5.2.3 Limitations and future research

It is a noteworthy limitation that the propositions condensing the results of our study are derived from a comparative study of three cases. This qualitative approach allows us to deeply analyze and compare data in an explorative way and provide meaningful results for practical problems. Yet, our subject of study and the concepts of network theory also allow for a quantitative approach to the research question. In the sense of triangulation, this is a desirable completion of our findings and hence marks a promising route for future research. For the quantitative study, we suggest a combination of network analytic technology and moderated multivariate regression analysis. Researchers need to analyze the partner networks of solution providers that pursue open business models, using those network measures as independent variables in the regression model. Data should be gathered through questionnaires. Such a quantitative study could not only verify the propositions made, but also shed light on the finiteness of business model options within the solution provider space.

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APPENDIX

OVERVIEW OF PRIMARY DATA SOURCES BY CASE

3M Services:

- Presentation by general manager and group discussion (1.5h)
- Interview with general manager (1.5h)
- Interview with founding business development manager (1.5h)
- Multi-year relationship as a coach in innovation management of one author

SAP:

- Interview with senior manager in strategic partner management (1.5h)
- Interview with director cloud services (1h)
- Direct observation during project work in strategic service partner initiative, June – November 2011
- 5 year professional work experience in SAP's solution marketing and consulting units of one author

Geberit:

- Interview with head of strategic planning (1h)
- Interview with country head of field service (1h)

Interviews conducted between June 2011 and January 2012

Chapter 6

Commercializing the Software Ecosystem A taxonomy-based approach to marketplace business model design and implementation

Co-authored by Andrea Giessmann, Amir Bonakdar, and Uli Eisert⁹

Abstract

Implementing a new business model involves specifying free parameters in order to move from a high-level type to one that can be put into practice. The extant research is vague in providing guidance for this process, because it largely stays on the business model type level. By applying the action design research method in the context of the SAP Store, this paper examines how a focal software vendor can be supported in implementing a marketplace business model for complex partner offerings. It suggests an approach which builds on a specialized business model taxonomy and guides practitioners to a fully-specified marketplace business model. The approach thereby operationalizes the business model's role as a construct mediating between business strategy and its IS implementation. It also proposes a new application for business model taxonomies beyond their traditional use as descriptive devices. We highlight the decision parameters influencing business model choice in a marketplace context and use them to develop actionable design guidelines for practice.

Key words: Business model implementation; Marketplace; Software industry; Software ecosystem; Platform

⁹ This paper has been revised and resubmitted to the Information Systems Journal (ISJ), special issue on business models.

1 INTRODUCTION

With advancements in information technology, our economy's increasing digitization has fostered the emergence of platform-based business models in several industries (Brousseau and Penard, 2007; Gawer and Cusumano, 2014; Hagel et al., 2008). Online music or app stores, video game consoles, and online auctions are some common examples which demonstrate the logic of these models (e.g., Osterwalder and Pigneur, 2010): a platform owner links markets from different sides of its network, aiming to achieve a virtuous cycle through indirect network effects (Eisenmann et al., 2006). The more partners and customers that participate, the higher the platform's overall attractiveness (Katz & Shapiro, 1985; Katz & Shapiro, 1994; Parker & Van Alstyne, 2005).

Large software vendors would seem to be perfect candidates to adopt such business models. Typically, they not only possess a vast customer base using their products, but also are surrounded by an ecosystem of partners who complement these products through software extensions or services (den Hartigh et al., 2013; Iansiti and Levien, 2004; Kude et al., 2011; Moore, 1993). Due to their central position in the network, we term these organizations 'focal software vendors' throughout this paper. In recent years, many focal software vendors have started to commercialize their ecosystem's potential through new platform-based business models. Electronic marketplaces have been established (Schmid and Lindemann, 1998), on which partner supply and customer demand for digital products and content are matched. Examples include Salesforce.com's AppExchange, Apple's App Store, Google Play, and the SAP Store (Burkard et al., 2012; Novelli and Wenzel, 2013a, 2013b). Typically, the platform owner takes a revenue share (usually 15% to 30%) from every purchase made in the marketplace.

These emerging marketplaces are not only a new stream of revenues for focal software vendors, but also extend the reach and visibility of partner offerings and reduce customer search costs. The new business model has quickly become an important element of digital business and has led to the emergence of the 'app economy': Apple has announced sales of USD 10bn going through its App Store in 2013¹⁰, of which it typically takes a 30% share; Google has not released comparable figures, but has

¹⁰ see <https://www.apple.com/pr/library/2014/01/07App-Store-Sales-Top-10-Billion-in-2013.html> (last accessed: 2014-05-15)

announced that its overall Q4 2013 revenue growth “was driven by content and app sales in the Play Store.”¹¹ With the launch of Apple’s Mac App Store and Microsoft’s Windows Store, the marketplace model of selling software is spreading from the mobile world to the distribution of desktop software.

These examples demonstrate that focal software vendors are increasingly adopting marketplace business models to profit from their platform position. So far, these models have been applied to standardized digital products that can be immediately delivered, such as media or standard software. Only a fraction of a typical partner ecosystem’s offerings, however, fulfills these requirements, particularly considering B2B markets and enterprise software (Novelli and Wenzel, 2013a; Sarker et al., 2012). Analyst firm HfS Research, for instance, estimates the 2013 total amount of ecosystem spending on SAP- and Oracle-related products and services to be USD 255bn¹². Of this amount, only a small fraction (USD 16.1bn) is spent on software license fees, whereas different types of services constitute the largest share. Current marketplaces in the industry fall short of accommodating ecosystem players which offer, for instance, customer-specific enhancements and integration work (Bosch, 2009), consulting services (Cusumano, 2008), or training (den Hartigh et al., 2013). The prevailing “app store” marketplace business model is not capable of commercializing these more complex partner offerings. Accommodating a wider range of products has broad implications for many aspects of the underlying marketplace business model, from its revenue model to its functional architecture and organizational issues. This practical challenge, faced by software vendor SAP when extending its SAP Store, was the trigger for developing a systematic approach to support the implementation of new business models.

Against the backdrop of a focal software vendor aiming for commercialization of a wider range of partner offerings, this paper investigates the research question: *How can a focal firm be supported in the implementation of a marketplace business model?* In answering this question, we pursue two goals. The first goal is to identify marketplace business models which are suited for the given context. The second goal is to develop a generic approach for taking a strategic direction all the way to its IS implementation.

¹¹ see <http://www.theverge.com/2014/1/30/5362236/google-q4-2013-earnings> (last accessed: 2014-05-15)

¹² see http://www.horsesforsources.com/wp-content/uploads/2013/05/SAP_Oracle_Ecosystem.png (last accessed: 2014-05-15)

This second goal is motivated by the business model's role as the missing link which connects business strategy to its implementation in a digital world (Al-Debei and Avison, 2010). While this mediating role is widely acknowledged (e.g., Hedman and Kalling, 2003; Mäkinen and Seppänen, 2007; Shafer et al., 2005; Veit et al., 2014), research has remained silent about how to operationalize the findings (Solaimani and Bouwman, 2012). Often overlooked is the fact that business models exist on multiple levels of abstraction and that business model types need to be instantiated to become operational (Massa and Tucci, 2014; Osterwalder et al., 2005). A “marketplace business model” is the first step towards implementing a strategy of improved ecosystem commercialization, but one that needs further and thoughtful detailing before it can be useful. There is a lack of knowledge about how this process of instantiation can be supported.

We explore our research question by adopting an Action Design Research (ADR) approach (Sein et al., 2011), closely linking our theory-informed development of a business model taxonomy with the practical need and concurrent real-world evaluation and implementation in the context of the SAP Store. Following a review of extant literature, section three of this paper provides more information on the methodology and research process, and section four presents our results in detail. Our findings contribute to a better understanding of business models in the software industry and their redesign in light of increasing digitization, as suggested by Veit et al. (2014). We also present a practicable approach of using the business model as a mediating device and design template to transform strategic choices into concrete functional implementations, something which does not yet exist in business model literature. The practical implications, which we outline in section seven, show that our results are meaningful for both large focal software vendors and their partners. While the first group profits from a guided design process for innovating its marketplace business models, smaller firms and entrepreneurs profit from the same knowledge in the complementary design of their own business models.

2 RELATED WORK

This section gives an overview of extant work in three areas which relate to our research. First, those insights from the literature on business models and their innovation which contribute to the development of a systematic approach to business model implementation are presented. Second, a detailed review of e-business model

taxonomies provides the background and rationale required to design a specialized taxonomy for marketplaces. Third, the literature base on electronic marketplaces gives further insights about decisive parameters for marketplace design.

2.1 BUSINESS MODELS: FROM INNOVATION TO IMPLEMENTATION

The rise of the business model as a concept in research is closely linked to the rise of the internet and the world of electronic business (Zott et al., 2011). Aptly described as “stories that explain how enterprises work” (Magretta, 2002), business models are a valuable device for understanding “how a firm organizes itself to create and distribute value in a profitable manner” (Baden-Fuller and Morgan, 2010, p. 157). The business model serves as an “abstraction” (Casadesus-Masanell and Ricart, 2010; Osterwalder et al., 2005) or “high-level representation” (Bock et al., 2012) of value creation and capturing. The literature base is rich in approaches which depict reality at different levels of abstraction and granularity (cp. Eurich et al., 2014; Massa and Tucci, 2014).

Table 1: Fixed and free parameters in the design of a marketplace business model for ecosystem commercialization in the framework of (Ballon, 2007)

Value network parameters	Functional architecture parameters	Financial model parameters	Value proposition parameters
Combination of assets: concentration of key resources at focal vendor	Modularity: modular	Cost (sharing) model: <i>not defined</i>	Positioning: complement
Vertical integration: disintegrated offerings on integrated platform	Distribution of intelligence: <i>not defined</i>	Revenue model: <i>not defined</i>	User involvement: high
Customer ownership: intermediated	Interoperability: <i>not defined</i>	Revenue sharing model: <i>not defined</i>	Intended value: quality and lock-in

While many business model representations list various components comprising a business model, a consensus on the constitutive elements has never been reached (Al-Debei and Avison, 2010; Krumeich et al., 2012). In our context of ICT products and services, Ballon (2007) arranges business model design choices around four groups of parameters: value network, functional architecture, financial model, and value proposition. We assume this conceptualization of a business model for the purpose of our study. In the defined context of implementing a marketplace business model, certain parameters (or components) are largely fixed: The platform position of a focal software vendor shall be used to bring existing software ecosystem actors (value network) into a position to market complementary products and services to existing customers (value proposition). Other components, such as functional architecture and financial model, are

open for variation (see Table 1). These remaining free parameters highlight a challenge in the business model's role of bridging the gap between business strategy and its implementation (Al-Debei and Avison, 2010; Hedman and Kalling, 2003; Mäkinen and Seppänen, 2007; Shafer et al., 2005): The question of how to reach a fully specified, implementable business model in practice has not received much attention to date.

Many business model studies stay on a high level of abstraction, identifying design themes (Zott and Amit, 2010) or business model patterns (Osterwalder and Pigneur, 2010) which describe the core logic of a class of business models. This level, with examples such as “razor and blade” or “freemium,” is too abstract to guide implementation. Kumar (2014), for instance, illustrates the many design decisions still required when implementing a “freemium” business model and shows how outcomes differ across implementations.

Figure 1 illustrates the fact that the business model resides on multiple levels, where the topmost and lowest levels connect to strategy and information systems, respectively. We argue that an approach is lacking that moves from a pattern—a “marketplace business model” in our case—to a more detailed and implementable representation of a business model. In the hierarchy proposed by Osterwalder et al. (2005: 5), this would mean proceeding from a business model type to an instance for a particular company. While initial approaches exist to transform a business model instance into business processes (see review and approach in Solaimani and Bouwman, 2012), business model scholars remain vague as to how the preceding instantiation of a business model occurs. The most-often heard recommendation is to be prepared for extensive trial and error during this phase and to iterate between design and implementation (e.g., Chesbrough, 2010; Johnson et al., 2008; McGrath, 2010).

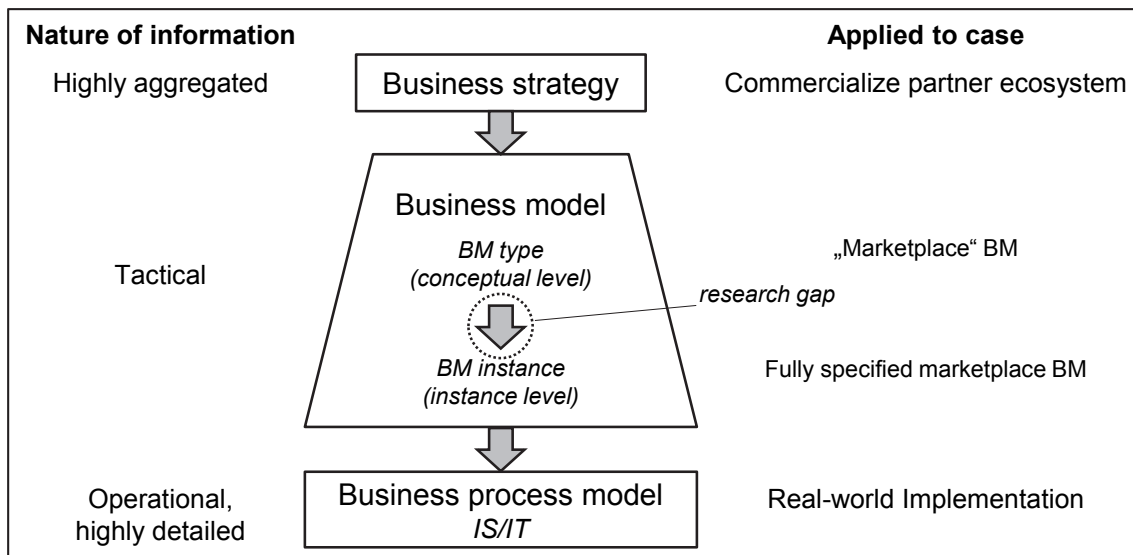


Figure 1: The business model, linking strategy and its implementation through multiple levels. Adapted from (Al-Debei and Avison, 2010: 371) to illustrate research gap.

One interesting observation from research on business model innovation has the potential to reduce the effort of instantiation. Existing business models of other firms can serve as important sources of replication (Winter and Szulanski, 2001) or imitation (Casadesus-Masanell and Zhu, 2013; Enkel and Mezger, 2013). Real-world examples act as “ideal types” of business models and serve as “recipes” (Baden-Fuller and Morgan, 2010; Perkmann and Spicer, 2010) or “templates” (Doganova and Eyquem-Renault, 2009) for the development of new business models. With the insight that “designing new business models is closer to an art than to a science” (Casadesus-Masanell and Ricart, 2010: 213), taking a proven business model and adapting it to the concrete case on hand can be a promising means to achieve internal and external fit quickly. As Baden-Fuller and Morgan (2010: 167) highlight, the template business model “embodies the essential elements and how they are to be combined to make them work.” Following these guidelines, one potential solution to instantiate a marketplace business model would be to choose, learn from, and adapt an existing template model.

2.2 E-BUSINESS MODEL TAXONOMIES: ORGANIZING TEMPLATE

MODELS

There is a tradition in business model research of constructing taxonomies which organize different types, especially for electronic business (Hedman and Kalling, 2003; Zott et al., 2011). As these taxonomies are based on real-world observations (Baden-Fuller and Morgan, 2010), they might prove a valuable source of template models for our purpose.

We have performed a systematic literature search (vom Brocke et al., 2009; Webster and Watson, 2002) for the string “(electronic OR marketplace OR e-business) AND ‘business model’ AND (typology OR types OR taxonomy OR framework)” using the EBSCOhost Discovery Service meta search engine, which we restricted to academic journals, books, and proceedings. It compiles its results from a broad set of scholarly databases such as JSTOR, SSCI, and ScienceDirect. The resulting set of 385 unique hits was screened for those whose abstracts indicated that some type of taxonomy was being presented. We also added taxonomies which were referenced as part of similar reviews (Lambert, 2006; Pateli and Giaglis, 2004; Sharma, 2013). Finally, 14 taxonomies were selected which contained forms of marketplaces and were not specific to either special cases or unrelated industries. They were analyzed and compared in line with the previous findings and based on the following set of criteria:

- *Number of models* or categories differentiated.
- *Level* of models: whether type or instance level.
- Real-world *examples* provided: yes or no.
- *Parameters* used to differentiate models.
- *Application*: use case provided for taxonomy by the author(s).

Table 2 provides an overview of the reviewed literature along these parameters. The set of taxonomies shows a wide heterogeneity, illustrated by the fact that the number of different business models contained in a taxonomy ranges from a few (Mahadevan, 2000; Sandulli et al., 2014; Tapscott et al., 2000) to 30 (Rappa, 2004) to 40 (Bienstock et al., 2002). The amount of detail given for each model differs considerably as well, ranging from brief descriptions (e.g., Linder and Cantrell, 2000; Rappa, 2001) to very detailed characterizations (e.g., Sandulli et al., 2014; Weill and Vitale, 2001). To illustrate the models, real-world examples are provided in all but one case. Most of the taxonomies stay on a business model type level, which Sandulli et al. (2014: 89) see as necessary to provide stability, because the underlying real-world business models change and evolve constantly. Others explicitly mention that the types in their taxonomies specify partial business models and can therefore be combined (Linder and Cantrell, 2000; Weill and Vitale, 2001). Only three of the taxonomies come close to an instance level, but do so at the price of a greater number of models (and less detail).

Table 2: Review of e-business model taxonomies which contain marketplace-like models

Reference	Description	No. of models	Level	Examples	Parameters	Application
(Afuah and Tucci, 2001)	typology of internet business models	7	type	yes	revenue model	description and understanding
(Balocco et al., 2010)	classification scheme for B2B e-marketplaces	9	type	yes	provisioning model supported processes	awareness of differences and specific success factors
(Bartelt and Lamersdorf, 2001)	description of generic e-commerce models	5	type	no	subject (actor) behavior (initiation)	analysis and design of new models
(Bienstock et al., 2002)	B2C and B2B e-commerce business models	40	instance	yes	no. of buyers no. of sellers nature and frequency of offering price mechanism	classification and analysis
(Kaplan and Sawhney, 2000)	B2B marketplaces on the internet	4	type	yes	what is bought how it is bought	explanation of new phenomenon; identification of BMs for entrepreneurs
(Lam and Harrison-Walker, 2003)	generic e-business models	6	type	yes	relational objectives value-based objectives	help managers define their e-strategy
(Linder and Cantrell, 2000)	generic “operating business models”	34	type	yes	9 arbitrary categories	N/A (models can be combined)
(Mahadevan, 2000)	emerging structures in internet markets	3	type	yes	none	understanding and classification of new business models
(Rappa, 2001)	business models observed on the web	9 (41 sub-types)	instance	yes	none	understanding of new business models
(Sandulli et al., 2014)	very detailed characterization of internet business models	4	type	yes	none (revenue model explicitly not a differentiator)	make choices within categories explicit
(Tapscott et al., 2000)	typology of business webs	5	type	yes	degree of control degree of integration	N/A
(Timmers, 1998)	classification of e-commerce business models	11	instance	yes	degree of innovation functional integration	understanding of internet-enabled business models
(Weill and Vitale, 2001)	detailed description of atomic e-business models	8	type	yes	none	evaluate and understand; multiple models can be combined

Reference	Description	No. of models	Level	Exam- ples	Parameters	Application
(Afuah and Tucci, 2001)	typology of internet business models	7	type	yes	revenue model	description and understanding
(Zheng, 2006)	electronic marketplace business models and their value components	4	type	yes	role in network value component	sound taxonomy as basis to study use in industry

Overall, the existing taxonomies are hard to compare because of differing definitions of a business model and of exactly what should be included under such ambiguous labels as “e-business,” “e-commerce,” or “internet business.” Lambert (2006) criticizes the lack of systematics in many e-business model taxonomies, but she also acknowledges the usefulness of those done well. Although limited in terms of versatility and designed for particular needs, she argues that each of them contributes to knowledge on business models and advances research toward the final goal of a universal classification scheme. Conversely, Dubosson-Torbay, Osterwalder and Pigneur (2002) come to the conclusion that a universal classification scheme for e-business models is inadequate and suggest accepting a “web of many classification schemes” (p. 15).

Considering the background of our research, which aims to support the implementation of a marketplace business model for a wide range of products and services within a software ecosystem, a specialized taxonomy seems like a useful concept. A specialized taxonomy can come closer to the instance level and, because of its focus on a small and relevant subset of models, is usable by practitioners. It can also better focus on those descriptive aspects relevant to the concrete-use case. For instance, the different characteristics of the goods sold (which initiated the project at SAP due to different requirements for services) are only considered as a factor by Bienstock et al. (2002), who coarsely differentiate between tangible and intangible products. In other fields, we observe recent examples of similarly specialized business model taxonomies for mobile service providers (Becker et al., 2012), mobile platform providers (Ghezzi, 2012), or special types of solution providers (Frankenberger et al., 2013; Kujala et al., 2010).

Apart from their level and scope, existing e-business taxonomies have another shortcoming for our intended use: the parameters used for classification. These are mostly descriptive, which is understandable, considering the taxonomies’ historic purpose as means to organize emerging internet-enabled business models. Description and understanding is also what most authors state as the purpose of their taxonomies

(cp. Table 2). But even those authors who hint at their taxonomies' usefulness for business model design (e.g., Bartelt and Lamersdorf, 2001; Kaplan and Sawhney, 2000) seem to assume that managers reviewing the models provided know which one is best for their endeavors.

We argue that a taxonomy which intends to support the choice of the right business model (cp. Chatterjee, 2013) should not use descriptive classification parameters such as "revenue model" or "functional scope." Rather, these descriptive or functional parameters should describe the models in the taxonomy, while strategic or non-influential parameters organize the different business models in such a way as to support a guided choice based on business strategy. The taxonomy by Lam and Harrison-Walker (2003) is the only one in our set which connects to strategic objectives (value-based and relational) as a means for classification.

Complementing our findings from e-business model taxonomies, the literature stream on electronic marketplaces provides deeper insights into both the important characteristics of marketplaces and the parameters upon which their design depends.

2.3 ELECTRONIC MARKETPLACES: FUNCTIONALITY AND DESIGN DETERMINANTS

An electronic marketplace, broadly defined as a virtual platform where demand and supply for certain goods meet (Kollmann, 1999), has multiple functions: (1) to offer (supply side) or to find (demand side) products and services in a structured manner; (2) to negotiate the price and conditions; and, (3) to pay for and deliver the products and services (Bakos, 1998; Malone et al., 1987; Schmid et al., 2002). A complete market transaction within an electronic marketplace thus contains three phases: (1) information (resulting in an offer); (2) agreement (negotiation and price setting, resulting in a contract); and, (3) settlement (payment and delivery, resulting in fulfillment) (Schmid and Lindemann, 1998).

Players in three major roles are active on a marketplace. First, the providers of the products and services; second, the buyers; and, third, the marketplace operator, who provides the market infrastructure and acts as a central coordinator (Kollmann, 1999). The operator fills an important role in matching supply and demand (Kaplan and Sawhney, 2000) and frequently provides additional facilitation services throughout the three phases (Bakos, 1998). For its services the operator is often paid by either one or both connected parties (Evans, 2003; Kollmann, 1999).

In their groundbreaking work, Malone et al. (1987) analyze the influence of information technology on the coordination of economic activities. Arguing from a transaction cost perspective, they predict that electronic markets will be increasingly preferred over hierarchical and stable forms of coordination due to reduced search and coordination costs. They also identify two often interlinked product attributes as the decisive parameters for the choice of organizational form: both low asset specificity and low complexity of the product description favor electronic markets. Their predictions are confirmed in a number of later studies (Bakos, 1991; Daniel and Klimis, 1999) and are reflected in our observation that software vendor marketplaces today mainly sell standardized digital products. Less standardized products or services, consequently, might need different business models to be successfully commercialized.

Apart from the degree of product or service standardization, a multitude of aspects plays a role in designing marketplace business models. For example, transaction phases supported by the marketplace differentiate various models (Schmid, 1993) and depend on a range of institutional aspects (Reimers, 1996). In our context of software ecosystems, where the focal software vendor governs its own marketplace and positions both its own and partner-provided offerings, strategic considerations in the context of “coopetition” (Bengtsson and Kock, 2000) might play an important role as well (cp. Hagi and Spulber, 2013). Cusumano (Cusumano and Gawer, 2002; Cusumano, 2008) gives several examples of such overlap in software vendor and ecosystem offerings, which a focal vendor might want to consider in the design of its marketplace. We will come back to these aspects when discussing the parameters that influence the choice of a marketplace business model.

2.4 SUMMARY OF RELATED WORK

The previous sections show that the business model is a valuable tool to translate strategy into its implementation in processes and information systems. Prior research has paid enormous attention to systemizing types of business models along descriptive parameters, particularly in the field of e-business. These taxonomies increase understanding of the variety of business model types enabled by the internet and the digitization of business. How to move from the “type” level to an implementable “instance” level, however, has received less attention. Working with template models and real-world examples has been identified as a promising route to arrive at a new business model, but a practicable approach which would provide a guided choice of the appropriate template in this process is missing. We argue that a specialized taxonomy is

helpful for our case and that the guidance provided by the approach should depend on *strategic* rather than *descriptive* parameters.

3 METHOD

3.1 RESEARCH METHOD: ACTION DESIGN RESEARCH

Induced by a real-world problem, our research aims to develop prescriptive design guidelines which support practitioners in their task of business model development. Design science research has often been cited as capable of successfully producing such results for applications in business (Gregor and Hevner, 2013). Its relevance is achieved through a repeated process of creation and evaluation of artifacts (Hevner et al., 2004), with practitioner feedback gathered during the evaluation phases.

We position our study in the field of socio-technical design research, where close collaboration between all stakeholders (organization-internal and external practitioners, as well as researchers) is required to solve the organizational problem (Henningsson et al., 2010; Sein et al., 2011). As our research setting allowed for a setup in which the artifact could be jointly developed with practitioners, we employed the action design research (ADR) method proposed by Sein et al. (2011). It combines design science research (Hevner et al., 2004; March and Smith, 1995; Peffers et al., 2007) with principles from action research (Babüroglu and Ravn, 1992; Chiasson et al., 2009; Coghlan, 2011) to foster the beneficial interaction of the researcher with the organizational context (Sein et al., 2011). In ADR, the steps of artifact creation and evaluation are concurrent.

ADR is described as “a research method for generating prescriptive design knowledge through building and evaluating ensemble IT artifacts in an organizational setting.” (Sein et al., 2011: 40). Despite its newness, ADR has already seen applications in solving managerial problems similar to ours, such as designing collaboration models for smart cities (Maccani et al., 2014) or business models for a PaaS platform (Giessmann and Legner, 2013).

3.2 RESEARCH CONTEXT AND SETUP

Pursuant to DSR, requirements for research are derived from the environment in order to ensure relevance. According to Hevner et al. (2004: 80), “environment” in DSR usage consists of people, organizations, and technologies. Our research activities were

embedded into the commercial platform activities of SAP, an enterprise software vendor. SAP is an interesting case to study, because it has repeatedly changed its business model in the past, giving more emphasis to its partner ecosystem with every revision (Antero et al., 2013). Its commercial platform unit is concerned with providing both SAP itself and its ecosystem partners with the marketplace functionality to develop, publish, sell, and deploy complementary offerings (Wenzel et al., 2012). In the process of deciding on long-term development priorities, managers in the commercial platform unit were faced with the challenge of specifying functionalities required for the commercialization of more complex partner offerings. This challenge was the trigger for stepping back and assessing which business models were conceivable for the commercialization of different types of ecosystem offerings in general, as well as how they should be selected and prioritized for implementation.

Starting with this practical problem, the research activities spanned nine months in 2011/2012. Over the entire project duration the “ADR team” (cp. Sein et al., 2011) consisted of four researchers along with three practitioners, namely, the head and two top-level solution managers of SAP’s commercial platform unit. Four workshops (two half-day and two full-day) with these practitioners were conducted throughout the project, accompanied by bi-weekly telephone conferences and frequent e-mail conversations. For specific technical input and evaluation, numerous internal experts (e.g., developers, account executives, partner managers) and external experts (executives of ecosystem partners) were involved as needed. All workshops and other interactions, where not in writing, were documented in the form of meeting minutes and then archived to serve as the data source.

3.3 RESEARCH PROCESS: FOUR ADR STAGES

Figure 2 illustrates the four stages and associated principles of the ADR approach and how they have shaped the conducted research.

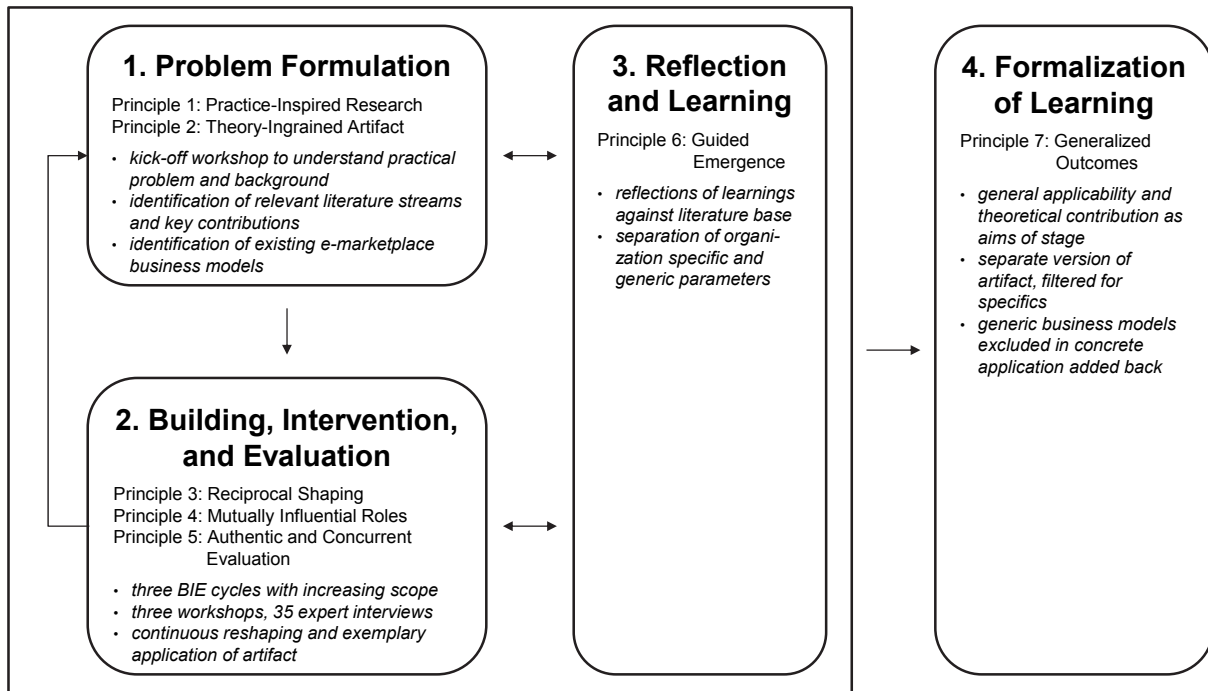


Figure 2: ADR method stages and principles, research activities per stage (*italized*) (adapted from Sein et al., 2011: 41)

(1) Problem Formulation

After the first joint workshop of researchers and practitioners was held for the purpose of reaching an understanding of the practical problem and its background, an intense phase of desk research was conducted in line with both of the principles in the first ADR stage. First, the practical problem was linked to the literature streams on business and software ecosystems in order to achieve a more general context and to be able to abstract from the concrete setting. This generalization helped broaden the search scope in collecting existing business models of real-world e-marketplaces.

Second, existing theory relevant to the problem was identified in the two fields of e-business models and electronic marketplaces. While the first field mainly suggested possibilities for concrete solutions, the second field, through its central consideration of transaction costs and product specificity, gave important hints for structuring the problem and designing a solution. As a result, a first sketch of the business model taxonomy was produced as the artifact for further development and evaluation.

(2) Building, Intervention, and Evaluation (BIE)

In this main phase of the ADR cycle the artifact was refined and evaluated in different settings, involving three workshops and 35 face-to-face and telephone interviews with experts. Figure 3 illustrates the process. In the first iteration, the taxonomy prototype

from stage (1) was discussed and jointly refined with the practitioners in the core team. Similar to a focus group (Hevner and Chatterjee, 2010: 121ff.; Morgan, 1998), this setup allowed for exchanging ideas and points of view among the participants, as well as for addressing new aspects. In line with the fourth ADR principle, mutual learning was achieved. During the first BIE cycle, for example, a “category manager” model, which one participant knew of from the stationary retail industry, was added to the taxonomy.

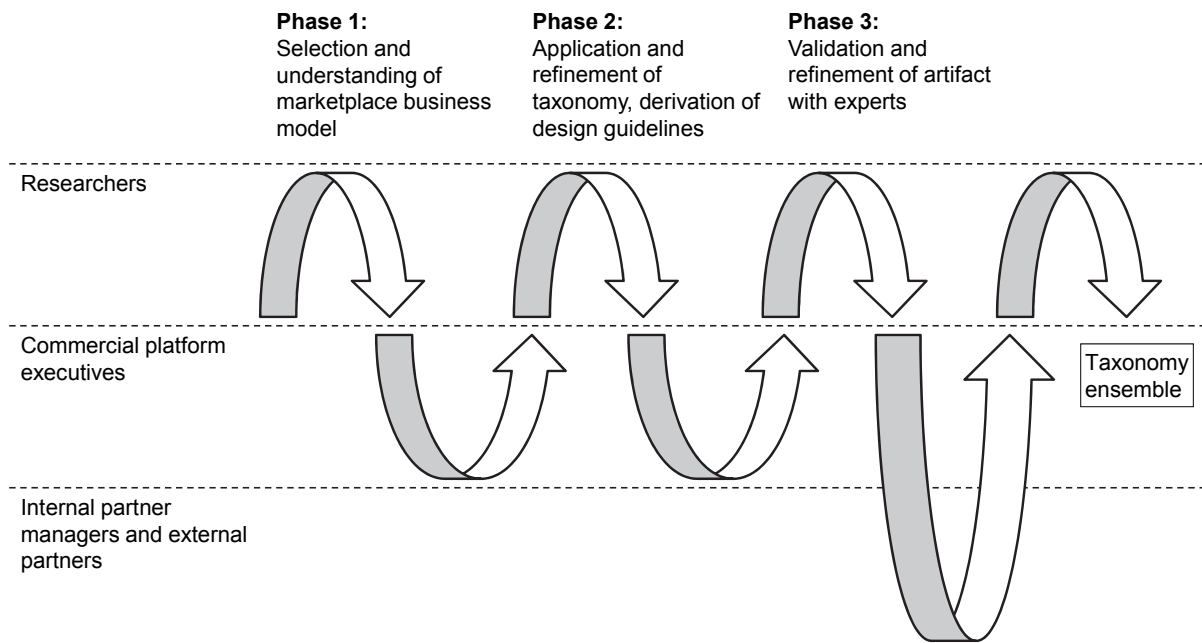


Figure 3: ADR Building, Intervention, and Evaluation process (based on Sein et al., 2011)

The subsequent iteration (2nd BIE cycle), again in the core team, focused on the exemplary application of the artifact to several concrete ecosystem offerings, such as consulting services, which had raised commercialization issues previously. This step, following the principle of reciprocal shaping, led to the tentative selection of a reduced business model portfolio for the concrete use case. It also led to a revision of the decision parameters which guide business model choice, thus laying the foundation for the derived design guidelines.

The third iteration, finally, evaluated the refined artifact with a broader audience. A meeting with top-level ecosystem management executives and 35 interviews with SAP-internal (20) and external (15) experts were conducted. The interviewees were SAP-internal partner managers and SAP-external partners with a strong expertise in certain types of ecosystem offerings. They could judge the applicability of the business models which the artifact proposed for their respective domains of expertise. Their feedback helped refine many details of the business models involved.

(3) Reflection and Learning

In parallel to the iterative design and re-design of the artifact, the knowledge gained was reflected against the ensemble nature of the emerging results. Decisions were continuously evaluated in light of the literature base and applications in other organizational contexts. This was challenging, particularly with respect to the second goal of our research, arriving at a generic approach for moving from a strategic direction to its implementation. Here, a clear separation between organization-specific and general parameters had to be pursued to arrive at a generic set of design guidelines.

(4) Formalization of Learning

While involved in the organizational context of artifact design, the research team made sure to consider the broader applicability of the results as well as the intended theoretical contribution. Broadly specifying the class of the problem as “ecosystem commercialization through a focal software vendor marketplace,” all design decisions were reviewed to filter out case-specific influences. A generic version of the artifact evolved, excluding any organization-specifics in design choices and decision parameters. It serves as the basis for our presentation of results below.

4 A TAXONOMY-BASED APPROACH TO MARKETPLACE BUSINESS MODEL DESIGN

Our research endeavors aimed to provide support for SAP’s commercial platform unit in the implementation of new business models in its SAP Store, enabling commercialization of a wider range of ecosystem offerings. The first research goal was to identify marketplace business models suited for this concrete setting, and the second was to develop a generic approach for moving from a strategic direction to its IS implementation. In this section we present both parts in context and demonstrate their application with an illustrative and hypothetical example. For this purpose we apply the taxonomy-based approach to services provided by the 12’000 SAP partner companies who consult SAP’s customers. The example has been disguised for reasons of confidentiality, but without restricting its descriptiveness.

The developed approach is built around a taxonomy of marketplace business models which are capable of commercializing ecosystem offerings of different kinds. Figure 4 shows this central artifact, which classifies ten business models along two parameters: the degree of product/service standardization and the degree of marketplace openness.

These parameters emerged during the three BIE cycles, in which the initial version of the taxonomy was applied to concrete ecosystem offerings and refined with feedback from experts who were not part of the core team.











Product/Service Standardization	Standardized	 Restricted Model	 Controlled Model	 Delegation Model	 Open Model
	Marketplace as Primary Channel				
	Configurable	 Configurator Model	 RFx Model		
Marketplace as Mediation Channel					
Customer specific	 Infomediary Model	 Affiliate Model	 Community Model	 Advertising Model	
Marketplace as Supportive Channel					
		Controlled -----> Open			
Marketplace Openness					

Figure 4: A taxonomy of marketplace business models to commercialize ecosystem offerings.

4.1 CHOOSING THE RIGHT MODEL BASED ON TWO PARAMETERS

To be guided towards an appropriate business model for a class of ecosystem offerings, two parameters need to be investigated.

The *degree of product/service standardization* is an important determinant of business model choice in practice for two reasons. First, due to feasibility considerations, it determines a huge number of the free design parameters of the marketplace business model. Transaction phases covered, and thus the functional architecture of the marketplace, greatly depend on this parameter. The marketplace cannot, for instance, cover agreement, payment, and delivery of a highly customized and contractually complex service such as outsourcing a customer’s IT operations to a service provider. Second, the degree of standardization can be seen as a given which cannot be influenced directly by the marketplace operator, since it is under the provider’s control. Putting this externally-given and apparent parameter on the first level of a decision system is an

approach that quickly reduces the number of alternative models which need to be evaluated.

The *degree of openness*, which relates to the level of control that the marketplace operator retains in admitting partners and their offerings to the marketplace, is the second decisive parameter. Openness is a decision parameter which is too complex to be determined directly. It depends on several factors, some of which are subject to strategic and managerial judgment. We therefore split the determination of the level of openness according to given (i.e., non-influenceable) and strategic (i.e., arbitrary) factors. Given factors include market maturity and the platform provider's own existing offerings. Strategic factors include the importance of the category of products/services, the importance of their provider(s), and monetary aspects. Table 3 illustrates these factors and exemplifies how different values lead to either a low or a high degree of openness.

Table 3: Factors determining degree of marketplace openness

Factor	Control	Openness
Market maturity	The market at which the offering is targeted is emerging and immature (e.g., new technology).	The market is mature and saturated, many competing providers exist.
Existing own offerings	Own offerings exist which compete with partner offerings (cooperation).	The market category is left to partners.
Category strategic importance	Complementary offerings in category are decisive for own products' success.	Offerings are "nice to have" but not decisive.
Provider strategic importance	Providers are strategic partners, shall be developed and retained.	Providers are numerous and exchangeable. Choice for customers is more important.
Monetary aspects	Direct revenues from commercialization are not the prime target.	Revenue from marketplace operation is the main motivation.

Applying these parameters to our example will illustrate how they can help identify a suitable business model:

First, the degree of standardization is determined. Consulting services are generally project-driven and thus very customer-specific. Consultants typically bill by the hour, or else a detailed fixed-price contract is negotiated beforehand. The level of standardization in this class of ecosystem offerings is therefore very low in general. There are, however, certain services which some consultancies offer for fixed prices, such as setting up a new system or customizing a print form. These services are very standardized, so that consulting services fall into two classes of the taxonomy.

Second, the required openness of the marketplace is determined. In terms of the given factors, we (hypothetically) come to the conclusion that the consulting market is very mature, but that SAP has its own offerings in this field through its consulting arm. The strategic factors would reveal a high importance of the consulting service category (many customers rely on the availability of qualified consultants), but the largest fraction of the service providers is not strategically important. Monetizing the sale of their services is not in our strategic scope. It is now left to managerial judgment to weight the importance of the factors and determine an openness level (cp. Table 3). Here we assume the outcome is a level of openness which falls in the second column of the taxonomy. Consequently, the class of customer specific consulting services might be commercialized through the affiliate model, whereas the controlled model should be used for standardized consulting services. To learn from these template models requires a deeper understanding of the ten models in the taxonomy.

4.2 UNDERSTANDING THE MARKETPLACE BUSINESS MODELS

The degree of product or service standardization is the most prominent driver that determines applicability of a particular business model. So we use this criterion to cluster our taxonomy of marketplace business models into three groups:

1. Models for *standardized products/services*, in which the marketplace serves as the primary channel for transactions and typically covers all or most of the identified transaction phases (information, agreement, and settlement). Table 4 provides a concise description of the four models in this group.
2. Models for *configurable products/services*, in which marketplace support is limited to a mediating and facilitating function, matching supply and demand. The information and agreement phases are supported by the marketplace, whereas settlement (delivery, in particular) is not covered. Table 5 provides a concise description of the two models in this group.
3. Models for *customer specific products/services*, in which the platform owner's marketplace serves as a supportive channel, guiding the customer to appropriate offerings outside the marketplace. Thus, only the information phase of the transaction is covered. Table 6 provides a concise description of the four models in this group.

As the tables demonstrate, the models in each group share huge parts of the functional architecture and financial model, the two components of the (Ballon, 2007) business model framework which were not yet specified by the “marketplace” type. These open

parameters are now more highly specified based on the degree of product/service standardization, and the exact model chosen adds even more detail based on more strategic considerations of the marketplace operator.

Table 4: Primary channel models in detail.

(1) Primary channel models (standardized products and services)		
Functional Architecture: Transaction phases fully handled by the marketplace: marketplace as a centralized, comprehensive, and integrated system (Ballon, 2007).		Financial Model: Typically fixed prices toward the customer side and revenue sharing or per-transaction fees toward the partner side of the marketplace.
Restricted Model	Market entry of product and service providers is regulated by the operator, not permitting substitutes. The resulting category exclusivity allows partners to realize economies of scale.	Examples: the cooperation of Ryanair with Hertz in flight-related car rentals or of Amazon and Toys’R’Us in online toy sales (Hagiu and Yoffie, 2009).
Controlled Model	Market entry still regulated, but substitutes allowed. Product and service providers have to compete and differentiate to attract customers. Choice is limited by the operator’s pre-selection.	Example: Apple’s App Store, where Apple reserves the right to block offerings for strategic reasons (e.g., alternative web browser technologies).
Delegation Model	A category is assigned to a category manager, “responsible for integrating procurement, pricing, and merchandising of all brands in a category [...]” (Basuroy et al., 2001). Its specialized knowledge ensures the right mix of offerings in areas where operator’s expertise does not suffice.	Example: tool manufacturer Bosch acts as category manager for online tool shops, where it maintains certain subcategories.
Open Model	Polypolistic approach, allowing a large number of competing product and service providers who meet certain rules and guidelines. Providers are often rated by customers to achieve indirect control.	Examples: ebay.com or Amazon Marketplace.

Table 5: Mediation channel models in detail.

(2) Mediation channel models (configurable products and services)		
	Functional Architecture:	Financial Model:
	Products or services described along a set of parameters. Marketplace mediates negotiation process between customer and provider. Negotiation phase requires special functionalities, but settlement is done outside the marketplace.	One-sided revenue stream, only charging the provider side of the platform on a per-lead basis or a listing fee. The two models differ in their bias toward either side of the platform (Kaplan and Sawhney, 2000).
Configurator Model	Negotiations with a single provider. Customers first select the provider, then specify wishes by means of supplier-provided parameters. Provider typically replies with a price quote and the offer to purchase “as specified”. Increasing productization of software-related services (Cusumano, 2008) makes configurators a promising option.	Examples: car or PC configurators (including automatic quote and contract creation); else “qualified leads” are created which are followed up by the provider outside the marketplace.
RFx Model	Customer negotiates with many suppliers at the same time using operator-determined parameters to specify wishes. Receive quotes from multiple providers who promise to deliver the requested product or service. This “reverse market” (Daniel and Klimis, 1999) gives more power to the demand side.	Examples: insurancefinder.com, myhammer.com.

Table 6: Supportive channel models in detail.

(3) Supportive channel models (customer specific products and services)		
	Functional Architecture:	Financial Model:
	Offerings hard to commercialize, but benefit the entire marketplace by increasing completeness and transparency. Models based on (Rappa, 2004). The customer has “to contact those who made [the product or service] for further bilateral negotiations” (Reimers, 1996: 76): only information phase is covered.	Different financial models are available which typically collect revenues at the provider side
Infomediary Model	Marketplace operator curates a list of providers and their capabilities. Entries might simply link to external websites for more information. Suited for nascent markets around a new line of software products, where the focal vendor promotes new partners with its brand name (cp. Chu et al., 2005), typically free-of-charge.	Example: Oracle’s solution finder (solutions.oracle.com).
Affiliate Model	Control over which partner is listed due to strategic and profit considerations; monetization through commissions or pay-per-click fees.	Example: Emagister.com lists more than 1M training courses in twelve countries, but refers visitors to the respective provider to place a detailed inquiry.
Community Model	User and developer communities (e.g., MSDN.com) gather professionals with expertise in specialized or niche markets. The community can be used to populate the marketplace with providers. Community experts identify and rate niche players and their offerings, providing the best choice to other marketplace visitors.	Example: Mapquest and Google populate maps with local business information through local users.
Advertising Model	Main focus of the provider shifts toward commercializing the traffic volume in the marketplace. Providers pay to be listed in a certain category or pay a revenue share. Strategic considerations on the side of the operator are absent, any provider willing to pay is listed.	Example: Ebay.com provides “sponsored links” in the context of its catalogue to realize advertising revenues.

4.3 DRIVING IMPLEMENTATION OF SELECTED BUSINESS MODELS

Coming back to the example, there are now two business models (“controlled” and “affiliate”) for commercializing consulting services described on an instance level. Along with the examples referenced, they play an important role in driving organizational activities and communication with stakeholders towards implementation.

First, the applicability of the financial model should be evaluated with experts. One question might be whether consulting partners would be ready to reward their listing on the marketplace by means of per-click fees (as foreseen by the affiliate model), as well as the amount to be charged.

Second, technical requirements can now be determined for the underlying information systems. For instance, the functional architecture of the settlement phase in the controlled model calls for enhancements to achieve an app-store-like experience. The marketplace would need mechanisms to exchange customer requirements (e.g., a logo or template form) and, ideally, would allow the consultant to access the customer’s system in order to implement the changes.

Third, these and further considerations help plot the implementation and roll-out roadmap. For instance, the financial model now available makes it possible to perform revenue projections per class of offerings and weigh them against the estimated costs of implementing required functionality. The ability to investigate issues like these nicely demonstrates how the business model has helped drive a strategic direction to its concrete implementation.

As the example illustrates, the different business models in the taxonomy are not mutually exclusive. A marketplace accommodating diverse ecosystem offerings will most likely implement multiple models in parallel, as needed to accommodate different offerings and contexts. The approach is not only useful for deciding on the initial (set of) business model(s) to be implemented, but serves as a reference to find the right business model for new ecosystem offerings which might arise in the future.

4.4 THE APPROACH AS A SET OF DESIGN PRINCIPLES

The exemplary application of our approach might have obscured the fact that it is meant to contribute to the general knowledge base of marketplace business model implementation. Stripping away the context of the application, our above findings can be concisely summarized in a simple three-step algorithm:

1. Analyze
 - a. an offering class's degree of standardization and
 - b. the required level of marketplace openness suggested by the given and strategic factors.
2. Based on (1), use the business model taxonomy (Figure 4) to determine the appropriate business model.
3. Start from the resulting template model, adapt where needed, and drive implementation.

The algorithm guides business model design in the light of a concrete class of ecosystem offerings which are to be commercialized through a focal software vendor's marketplace. It is built around the central artifact of our work, the marketplace business model taxonomy. Connecting the identified decision parameters to the taxonomy, the algorithm can be seen as the set of generalized design principles which serves as the basis for contributing back to the knowledge base (Sein et al., 2011). These principles, similar to construction principles and design rules, bridge the gap between academic research and managerial practice (Romme and Endenburg, 2006).

5 EVALUATION AND APPLICATION OF THE APPROACH

In the ADR research method applied in this study, evaluation is firmly integrated into the process of artifact design (Sein et al., 2011). While this feature is considered beneficial for the applicability of the end result, the method's composite nature prevents the use of traditional DSR evaluation patterns (Sonnenberg and vom Brocke, 2012). In reference to applicability checks, for instance, Rosemann and Vessey (2008: 10) argue that "the symbiotic nature of the intervention results in continuous feedback between researchers and practitioners rendering an applicability check unnecessary." To summarize our evaluation efforts in a structured manner, we hence use the generic framework proposed by Pries-Heje et al. (2008), which divides evaluation into ex-ante/ex-post and naturalistic/artificial strategies. Our evaluation activities fall into both the ex-ante and the ex-post category, where the finalization of the artifact is the reference point. The evaluation is naturalistic, since it occurs in the real-world context of the

applying organization. The “when,” “what,” and “how” of each of the evaluation categories are briefly reported on in this section.

As described in the methods section, the *naturalistic ex-ante evaluation* was an integral part of the BIE cycle. Complementing the contributions and feedback of the practitioners in the ADR team, which were integrated during the first two iterations of the BIE cycle, the third iteration featured 35 semi-structured interviews with SAP-internal and external experts. The 20 internal interviews were conducted face-to-face or by phone and comprised a guided application of the taxonomy-based approach to clusters of ecosystem offerings matching the interviewee’s respective area of expertise. The experts were asked to provide feedback throughout all steps and were given the opportunity to comment on and propose changes to the resulting business model. The 15 external interviews were conducted by phone to discuss the applicability of the resulting business model to the respective partner’s offerings. Table 7 depicts the interview matrix, illustrating which business models were evaluated with which experts and for which clusters of offerings. For reasons of confidentiality we cannot further detail the six product/service clusters evaluated. Many organization-specific details, such as concrete revenue shares and billing metrics, only emerged during these interviews and were subsequently integrated into the artifact in line with the principle of reciprocal shaping.

Overall, the interviewees saw the need for the proposed approach and converged on a positive assessment of the resulting business models’ applicability. The artifact’s usefulness, being the primary evaluation criteria in design-oriented research, was thus iteratively ensured in a functional and structural test setting (Hevner et al., 2004).

Table 7: Interviews conducted per cluster of ecosystem offerings for artifact refinement during 3rd iteration of BIE cycle.

	Primary channel models				Mediation channel		Supportive channel models			Experts interviewed		
	Restricted	Controlled	Delegation	Open	RFX	Auctioning	Infomediary	Affiliate	Community	Advertising	SAP internal	external
Cluster 1		x					x	x			2	2
Cluster 2				x							1	6
Cluster 3		x									“	“
Cluster 4		x	x	x	x	x		x		x	10	2
Cluster 5	x	x		x						x	6	0
Cluster 6				x							1	5

The *naturalistic ex-post evaluation*, in contrast, occurred in a case-study type of setting (Hevner et al., 2004) by observing the subsequent application of the artifact in the organization. This application by SAP’s commercial platform unit occurred while defining the roadmap for the extension of the SAP Store. The six product/service clusters were prioritized based on a set of criteria whereby the business models that were determined played a key role in calculating revenue potential and required implementation efforts.

The feedback obtained shows that the practitioners appreciated the guidance provided by the artifact and found it useful in prioritizing the business models to be implemented next. The models described in the taxonomy and the examples provided were seen as particularly helpful in discussing with potential partners and in crafting the specifications for technical implementation. As of the time this is written, seven of the business models in the taxonomy have been selected for implementation and five of them (restricted, controlled, delegation, configurator, and infomediary model) are operational. Table 8 details examples of how these models are currently applied.

Table 8: Business models operational in the SAP store (store.sap.com).

Business model	Use in SAP Store (example)
restricted	<ul style="list-style-type: none"> • standardized training classes and certifications for SAP software • SAP is only provider • possibility to book and pay directly in the store
controlled	<ul style="list-style-type: none"> • functional enhancements to SAP software • provided by SAP or selected partners (e.g., Facebook people search) • possibility to purchase directly
delegation	<ul style="list-style-type: none"> • functional enhancements to SAP Business ByDesign specific for SMEs in German-speaking countries • partner Abayoo responsible to maintain partner offerings • not yet integrated into SAP store (marktplatz.abayoo.com)
configurator	<ul style="list-style-type: none"> • infrastructure provisioning in SAP HANA Cloud • SAP is only provider • possibility to configure and book cloud instance directly
infomediary	<ul style="list-style-type: none"> • SAP-related consulting offerings in different categories • provided by SAP or selected partners (e.g., Grey Monarch consulting for process automation) • possibility to access or request more information, call-back

6 DISCUSSION AND THEORETICAL CONTRIBUTIONS

Effective solutions in DSR must meet two central requirements: first, they must address and solve a relevant organizational problem and, second, they must add value to the

knowledge base (March and Storey, 2008). To address the second requirement, this section reflects how our findings contribute to three current debates in different streams of the literature.

6.1 BUSINESS MODEL TAXONOMIES AS A TOOL FOR STRATEGY IMPLEMENTATION

Differing perceptions prevail about the relations between the business model and strategy (Casadesus-Masanell and Ricart, 2010; Shafer et al., 2005; Teece, 2010; Zott and Amit, 2008; Zott et al., 2011). Our findings strengthen the view that sees the business model as a mediating construct between the level of business strategy and the operational level of business processes, including their implementation into information systems (Al-Debei and Avison, 2010; Veit et al., 2014).

With our efforts to operationalize this role in a real-world setting, we find that the business model's nature as a concept that exists at different levels of abstraction has not received enough attention in prior research. A gap exists where a business model "type" (which only specifies key elements of the business model) is to be translated into an "instance" (which specifies all its elements). As most extant works remain on the "type" level, it is unclear how strategy propagation ought to proceed to implementation (cp. Figure 1).

Our proposed approach represents a first contribution towards mitigating this gap. It links two so-far separate streams in business model research: one which studies template models and their role in new business model design (e.g., Baden-Fuller and Morgan, 2010) and one which organizes business models into taxonomies (e.g., Timmers, 1998). Although some authors from the second stream have hinted at the use of taxonomies in arriving at a new business model (e.g., Chatterjee, 2013; Lam and Harrison-Walker, 2003), extant e-business taxonomies suffer from two deficiencies for this purpose: they frequently stay on a 'type' level, and they use descriptive rather than strategic parameters to organize the models.

Our taxonomy-based approach to new business model design is the first to provide a coherent step-by-step approach to applying a taxonomy to business model design and implementation. It has proven very effective during the course of our project, as open questions during implementation could be studied in other instantiations of the same business model. The approach is, on the one hand, specific to the context of our work because of the specialized marketplace taxonomy and the parameters organizing it. On

the other hand, it is generic because of its transferability to other contexts or industries. To support practitioners in other contexts with a similar approach, scholars should appreciate the business model's multi-level nature and come up with further specialized and actionable instance-level taxonomies for ever-changing fields such as energy and mobility. Categorizing the entire world of business models into a few types (e.g., Weill et al., 2011) might help develop new theory, but the archetypes' level of abstraction does not permit their use as templates for strategy implementation in practice.

6.2 STRATEGIC CONSIDERATIONS IN MARKETPLACE DESIGN

Our findings further help integrate prior knowledge regarding the determinants of marketplace business model design, which is currently dispersed over the literature streams of e-business models, electronic marketplaces, and platforms. The factors which we found to determine the marketplace business model during our project work (cp. Table 3 and Figure 4) have mostly been described in earlier works. For instance, we find category exclusivity considerations discussed in detail (Eisenmann et al., 2009) and in connection with the focal vendor's own offerings (Hagiu and Spulber, 2013). The level of functional integration of the marketplace, and thus transaction phases covered, is a central consideration (Timmers, 1998). Deciding on a platform "bias" toward either the provider or customer side is a strategic option discussed (Kaplan and Sawhney, 2000), while charging the supply side of the platform exclusively and offering free services to customers is a common approach (Hagiu, 2009). By combining influential factors into an "openness" construct and characterizing other parameters as outcomes of the openness decision we have made an important first step in differentiating between free strategic parameters of marketplace design and their outcomes on the one hand and implementation prerequisites on the other. While still far from describing causal relationships between the two groups, we show that a stronger differentiation between them is required to be useful for practice.

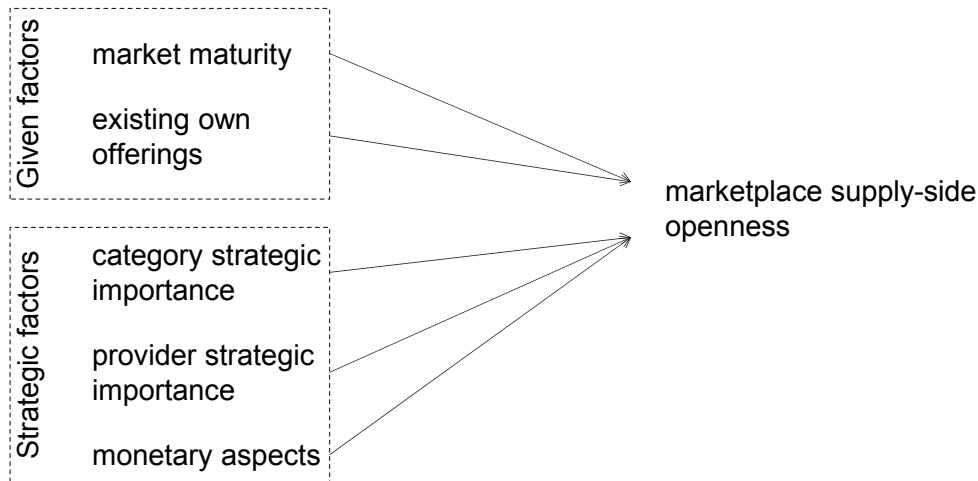


Figure 5: Determining factors of marketplace supply-side openness.

6.3 OPENNESS IN BUSINESS MODELS AND MARKETPLACES

The better understanding of the parameters behind openness also contributes to two current debates in research, those on business models and marketplaces. In the first field, “open” business models, in which firms seek novel ways of creating and capturing value through collaboration with outside partners (Chesbrough, 2006, 2007; Frankenberger et al., 2014), are studied specifically. In essence, the marketplace business models studied here are instantiations of open business models, as they involve collaboration toward a combined value proposition to the customer and a separate value proposition toward partners (Storbacka et al., 2012). Scholars in the field of open business models argue that openness in business models is not sufficiently understood (Holm et al., 2013) and that existing research on business model innovation primarily focuses on firm-internal aspects (Berglund and Sandström, 2013; Klang et al., 2014). To such research on open business models we contribute a better understanding of the parameters which determine business model openness in a marketplace context as well as a tested approach to implementing new open business models in practice.

Research on marketplaces and platforms has repeatedly highlighted openness as a central design parameter (see Eisenmann et al., 2009), hinting at its importance in the trade-off between platform adoption and appropriability (West, 2003). Openness is perceived as a continuum encompassing the easing or absence of restrictions (Boudreau, 2010; Tapscott et al., 2000). It can occur at multiple sides of the marketplace: supply side, demand side, or provider side (Eisenmann et al., 2009).

We contribute to the understanding of supply-side openness by demonstrating that openness here is not a purely strategic and arbitrary design parameter with diverse

consequences (e.g., Boudreau, 2007, 2010; Parker and Van Alstyne, 2008). Rather, openness also has contextual antecedents and is determined as a weighting of given factors and free strategic choices (see Figure 5). Its diverse composition needs more attention in future research on marketplace openness. Our results shed light on the considerations behind an openness decision and may serve as testable propositions in future research.

7 CONCLUSIONS

7.1 SUMMARY AND THEORETICAL IMPLICATIONS

Our paper springs from the real-world challenge for a focal software vendor: how to implement its strategy of improved ecosystem commercialization into its electronic marketplace. Today's software ecosystems provide products and services which require business models beyond the prevalent "standard software" and "30% revenue share" logic. The approach we have developed appreciates the business model's nature as a multi-level construct and is built on a taxonomy which organizes ten instantiations of the marketplace business model type.

These detailed models, accompanied by real-world examples, serve as templates to facilitate business model design and implementation. The guided choice of the template model depends predominantly on two parameters: the degree of standardization of the product or service category in question; and the degree of openness required, where the latter parameter is determined by an array of diverse context and strategy factors. These heuristics have proven to operationalize the business model's promise as a device to transfer strategic decisions into processes and software implementations. The approach was developed, evaluated, and applied in the context of SAP's commercial platform unit, where it served as the basis to determine the SAP Store's long-term functional roadmap. Its applicability is illustrated by the fact that seven of the ten models were selected for implementation and that five of them are operational today.

Our research contributes a practicable approach and thus falls into the research stream of "building methods and developing tools for designing business models" (Pateli and Giaglis, 2004: 309). It contributes to "the exploration of design techniques for generating and assessing multiple models," which Osterwalder and Pigneur (2013: 238) see as an important addition to management research. Business model research has been criticized as being too concept-focused and for not leaving the drawing board (Klang et

al., 2014), but the implications of our work draw on its deep integration with its application in practice.

The previous section has highlighted three key contributions which can support future research endeavors in moving the business model's use from "explaining the business" to "running" and "developing the business" (Spieth et al., 2014). First and foremost, research should be more thoughtful regarding the business model's multi-level nature. Extant work focuses on a "type" level, while the "instance" level is neglected. Both levels of business models are required to transform business strategy into its implementation, including the instantiation steps in between.

Second, as a consequence, we encourage the creation of a new class of "action-oriented" taxonomies. These should organize instance-level business models of a clearly bounded area and do so along strategic and non-influential parameters. Current taxonomies focus on organizing type-level business models along descriptive characteristics, which limits their usefulness for practitioners. Our approach seems applicable to other contexts or industries, provided that the underlying taxonomy is replaced accordingly.

Finally, we have contributed a conceptualization of the determinants of openness in a marketplace context, a new aspect in the ongoing debate on business model and marketplace openness, which usually considers openness as an independent strategic parameter.

7.2 MANAGERIAL IMPLICATIONS

In the software industry many focal vendors currently face difficulties in determining if and how to open their business model for other ecosystem players (Jansen et al., 2012). For them our results provide an actionable pathway for taking the next steps in ecosystem commercialization. As successful examples in the industry show, major revenues can be realized from a marketplace which commercializes complementary ecosystem offerings for the benefit of all parties involved. The design and implementation of a marketplace business model, particularly in the complex context of B2B markets and enterprise software, requires careful choices. Our taxonomy-based approach provides the required guidance and leads to an appropriate business model at an implementable level of granularity. As our experiences show, real-world examples behind each template model facilitate alignment not only within the organization (such as specifying functional enhancements) but also with potential partners who need to be convinced to join the marketplace.

The fact that seven different business models were found to be required to accommodate the entire breadth of ecosystem offerings in our context should encourage practitioners to adopt multiple similar business models simultaneously and thus achieve the synergies required for successful value capture in internet markets (Sandulli et al., 2014). In addition, the marketplace must become a key consideration in developing those products which constitute the focal vendor's platform position. The products must consciously leave functional "holes" which complementors can fill, and their design must allow for easy extendibility through ecosystem products and services (Ghazawneh and Henfridsson, 2013).

The rise of software-as-a-service offerings, in particular, allows new concepts in which the line between the product and the marketplace blurs, as with embedded purchases of complementary offerings. Existing products available in the SAP Store, for instance, allow enhancement of the Business ByDesign solution with services from logistics or payment providers. These partners were not part of the original partner ecosystem and they demonstrate how the increasing digitization of business allows focal software vendors to extend their platform position to new partners.

For supply-side partners, i.e. the providers of complementary offerings, it is important to be aware of the logic behind the marketplace business models offered to them. As Hagi and Yoffie (2009) show, making wrong choices concerning "where to play" and "how to play" can severely limit complementors' success. In addition, there is the danger of provoking direct competition from the focal software vendor (Huang et al., 2013). Our taxonomy provides a concise representation of the inner logic of emerging marketplaces which managers at complementors can use to evaluate the fit of their business model with that of a particular marketplace. They are able to actively shape their offerings to fit a business model which provides them a better (e.g., less crowded or easier for customers to use) position in the focal vendor's marketplace.

Similarly, entrepreneurs and start-ups can use the knowledge to tailor their new business model toward the niches foreseen in large vendors' ecosystems. While these niches are the natural habitat of new ventures, it is crucial for entrepreneurs to understand their own importance for the entire ecosystem and to constantly look for strategies which improve their position within this seemingly constrained environment (Zahra and Nambisan, 2012).

7.3 LIMITATIONS AND FUTURE RESEARCH

One potential limitation of this study stems from the applied research methodology. While ADR allowed us to delve deeply into the organizational setting for which we intended to propose a solution, this very embeddedness may have led us to produce overspecified results of only limited general applicability. While we are confident that we have given proper emphasis to the “ensemble nature” of the produced artifact (Sein et al., 2011) and have made every effort to substantiate our work from existing literature, we cannot be sure of having succeeded. Future research may be able to assess the applicability of our approach to other software ecosystems, or even other platform industries. This repeated application would also serve to corroborate our assumption concerning the applicability of all ten business models to software ecosystem offerings. A generic description of marketplace business models and associated decision parameters in an ecosystem context should be the outcome sought for.

In describing the marketplace business models in our taxonomy, it was necessary to work around the lack of business model representations at our required level of granularity. We have resorted to a combination of a componentized representation of common parts and verbal description of the models’ specific differences. Verbally describing business models, in addition to referencing examples, proved very helpful in our work with practitioners and is common practice (Baden-Fuller and Morgan, 2010; Magretta, 2002). However, we feel research on ecosystems, platforms, and marketplaces would benefit from the enhanced comparability and inherent rigor provided by a dedicated representation for marketplace business models. Future research should pursue this direction, developing a systematic way of describing marketplace business models in the emerging field of software ecosystems.

Software ecosystems and their commercialization are clearly a topic of increasing practical relevance, requiring further insights in order to understand all the diverse aspects involved. We have found the (open) business model, due to its nature as a boundary-spanning construct, to be a useful device for studying the mechanisms of value creation and capturing in a software ecosystem setting. Our results are only a first step toward a full-fledged design theory of emerging marketplaces in the sense of Gregor and Jones (2007). Clearly, this should be the goal of future contributions to this exciting field.

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Chapter 7

Appendix

LIST OF ABBREVIATIONS

ADR	Action Design Research
BM	Business Model
BMI	Business Model Innovation
CEO	Chief Executive Officer
cf.	confer (compare)
cp.	compare
CTO	Chief Technology Officer
e.g.	exempli gratia (for example)
ERP	Enterprise Resource Planning
et al.	et alii (and others)
etc.	et cetera (and so on)
i.e.	id est (that is)
ibid.	ibidem (the same place)
IP	Intellectual Property
IS	Information Systems
IT	Information Technology
ICT	Information and Communication Technology
OBM	Open Business Model
OI	Open Innovation
p.	page
R&D	Research and Development

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