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Journal of Business Models

2018
Vol. 6 - No. 1

Journal of Business Models (2018), Vol. 6, No.1

Editorial staff: Christian Nielsen, Kristian Brøndum & Vibeke Jørgensen

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This edition© Business Model Design Center at Aalborg University, Denmark, 2018

Graphics:

Font: Klavika

ISBN: 978-87-7112-126-1

ISSN: 2246-2465

Published by:

Aalborg University Press

Skjernvej 4A, 2nd floor

9220 Aalborg

Denmark

Phone: (+45) 99 40 71 40

aauf@forlag.aau.dk

www.forlag.aau.dk

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The Concept of Business Model Scalability

Morten Lund¹ and Christian Nielsen¹

Abstract

Purpose: The purpose of the article is to define what scalable business models are. Central to the contemporary understanding of business models is the value proposition towards the customer and the hypotheses generated about delivering value to the customer which become a good foundation for a long-term profitable business. However, the main message of this article is that while providing a good value proposition may help the firm 'get by', the really successful businesses of today are those able to reach the sweet-spot of business model scalability.

Design/Methodology/Approach: The article is based on a five-year longitudinal action research project of over 90 companies that participated in the International Center for Innovation project aimed at building 10 global network-based business models.

Findings: This article introduces and discusses the term scalability from a company-level perspective. It illustrates how managers should be using this term for the benefit of their business by focusing on business models capable of achieving *exponentially increasing returns to scale*, thus fulfilling the objective of making it applicable for business decisions and not merely an abstract economical concept. The article finds five patterns of business model scalability that all companies, regardless of industrial affiliation, can use to their advantage. Especially the role of stakeholders in the business model is highlighted in achieving scalability.

Research limitations/implications: Limitations relating to qualitative research confine the generalisation of the findings. The implication of this research is that achieving scalability is not solely a matter of digitalizing business models. Rather, there are a number of specific business model configurations that support scalability and the mechanisms to do this are not merely characterized as digital.

Practical implications: This article provides managers with a concrete roadmap for how to work towards business model scalability including suggested managerial processes and how to facilitate these.

Originality/Value: The power of business models lies in their ability to visualize and clarify how firms' may configure their value creation processes. Among the key aspects of business model thinking are a focus on what the customer values, how this value is best delivered to the customer and how strategic partners are leveraged in this value creation, delivery and realization exercise. This paper couples these advantages with a structure for identifying scalability, and hence stronger business models.

Keywords: Business models, scalability, growth, flexibility, business model configurations, strategic partners

Please cite this paper as: Lund, M. and Nielsen, C. (2018), The Concept of Business Model Scalability, Journal of Business Models, Vol. 6, No. 1, pp. 1-18

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Introduction

It is the prime responsibility of any company director to optimize the competitiveness of his/her business. Understanding how best to configure the company is a prime mechanism in creating profits in the short term and in the long term, in due course also creating jobs and thereby wealth in society. Many basic textbooks in economics, business, management and marketing introduce students to the concepts of scale and scope. Whereas economies of scale for a firm primarily refers to reductions in the average cost per unit associated with increasing the scale of production for a single product type, economies of scope refer to lowering the average cost for a firm via product diversification, i.e. producing two or more products.

In applying these two concepts to the study of American industrial history, Chandler *et al.* (1990) argue for ways of positioning an organization in relation to the market offering. It seems natural to align these ideas to how a company proposes to make money and such thoughts are not alien to the present debate in the field of business models and the related action of business model innovation. When the word scalability is used in the context of running a company, it implies that the underlying business model offers the potential for economic growth within the company.

In relating the concept of scalability to business models in this manner, a couple of interesting questions arise: Are there degrees of scalability evident in contemporary business model configurations? Under which circumstances is the relationship between scale and scope of particular importance? Hence, it is the objective of this paper to analyze the concept of scalability in relation to growing a company and relate this notion to the specific business model configurations being employed by businesses. In this setting scalability is applied in a slightly different manner than in Chandler *et al.*'s (1990) conceptualization of competitive focus. This paper discusses the dimensions of scalability in the context of business models and creates a roadmap for understanding and analyzing scalability. In turn, it provides input to contemporary understandings of business model patterns, archetypes and configurations as well as practical insights for managers and owners of SMEs and newly created ventures.

The concept of scalability

The adjective 'scalable' means "Able to be changed in size or scale" (Oxford Dictionaries), hence we use the term scalability to denote a state where change in size is achievable. In the context of IT infrastructure, Bondi (2000) argues that, "Scalability is ability of a system, network, or process to handle a growing amount of work in a capable manner or its ability to be enlarged to accommodate that growth". Here scalability refers to the capability of a system to increase its total output under an increased load when resources (typically hardware) are added. This is directly transferable to the context of scaling businesses.

Linking the notion of scalability to business models provides a meaningful framework for discussing and estimating business potential. Business potential is important to many stakeholders in business. From a social and community level, business potential is related to societal wealth creation through the creation of jobs and thereby also tax money for sustaining welfare. From an investor perspective business potential is the backbone of valuation techniques like the Discounted Cash Flow (DCF) model and the bets that many investors make regardless of holding a few stocks on their private account, active Business Angel investors or large institutional investors. From the perspective of stakeholders directly involved in a business and its ecosystem, like for example employees, customers, suppliers and other types of business partners, business potential is important for lowering risk perceptions such as loss of a job, loss of receivables, and loss of money. We might accrue scalability and business potential to the related topic of *growth*.

From Bondi's (2000) description it can be deduced that in addition to growth, addressed above in conjunction with business potentials, the flexibility of a system, structure or business, likewise is an important characteristic of scalability. Flexibility is related to having a certain organizational agility (Christopher and Towill, 2001; Boden, 2004) that allows for changes instigated by external events such as new competition, regulation or macro-economic pressures, or internal events such as R&D, loss or gain of core competences, financial resources etc. Flexibility might induce a certain agility in the offering of value to customers or be conceived as the ability to innovate the business.

Finally, the effects of scalability are also important to consider. In entrepreneurship, there is talk of the entrepreneur's dilemma (Wasserman 2006), which relates to the problem of when to sell a venture to a more capital abundant owner, but also the problems entrepreneurs face when having to decentralize decision-making or hire a professional administrator or CEO to run the company for them. In the organization literature, there is an abundance of growth models and development phase models for organizations (see for example Greiner, 1972; Mintzberg, 1983) depicting the organizational, financial and managerial challenges of a growing, or declining, company.

The key lies in unlocking exponentially increasing returns to scale

Going back to the notions of scale and scope from an economics perspective, three different variations of returns are given (Basu 2008, Gelles and Mitchell 1996), namely increasing, constant and declining returns to scale. In addition to this can be added the dimension of a linear relationship versus an exponential relationship. In table 1, this provides an overview of the possibilities according to these two dimensions. Obviously, in situations of declining returns to scale, the question is merely how quick to leave the business. In the case of linear relationships there might be a case for selling out tactically so as to destroy as little value as possible. In a situation with constant returns to scale, the business needs to be innovated or investments of excess capital should be done elsewhere, and finally in the increasing returns to scale column, the business models become more attractive from a scalability perspective.

Table 1 illustrates the importance of understanding that scalability can take several forms. For the manager

of a company, it should be unsatisfactory to expect an increase in returns of 10% if the capital employment to reach that goal also is 10%. This is the case of constant returns to scale. And employing an increase in staff of 10% to receive a positive net-result of 5% would be an example of declining returns to scale.

Take the example of a small but stable design company. There are four partners that create a profit of USD 80.000 in year one to be split among them. In year two they hire in a 5th partner, resulting in a profit of USD 100.000, but splitting into five parts results in constant returns to scale. This is a situation seen in many small consultancy companies and scalability achieved merely by selling more hours of service is seldom an activity with increasing returns to scale. It might be the case that some administrative costs, over time, can be spread out across a greater revenue base to achieve some form of synergy effect, but this cannot be termed a scalable business model.

The point being made here is that the objectives of scaling a business should not just be the ability to employ 10% more employees, 10% more capital or resources and get 10% more output. Even despite the fact that synergies might provide the case for linear increasing returns to scale. For a business model to be truly scalable, it ought to hold the promise of exponential increasing returns to scale. While achieving scalability in the context of linear increasing returns to scale is concerned with finding synergies, the promise of exponential returns to scale are found in cases where the applied resources, competences and value propositions of a business models in combination with one another evolve to completely new properties, by Nielsen and Dane-Nielsen (2010) denoted emergent properties. The synthesis of these arguments can be summarized in figure 1 below.

	Declining RtS	Constant RtS	Increasing RtS
Linear Attributes	Sell out sensibly	Innovate or invest elsewhere	Synergies make this a good place to be
Exponential Attributes	Leave as soon as possible		The sweet-spot

Table 1: Analyzing business model scalability

Methodology

The empirical inputs for this paper is based on a longitudinal action research project from 2007 to 2013. It reports the research focusing specifically on the innovation of the 10 network-based business models being studied. The Danish research program “International Center for Innovation” (ICI) was initiated in 2007, ending in March 2013. The project aimed to inspire and assist participants in a development process of innovating new network-based global business models and in providing a solid base for relevant qualitative data, parallel to a business and industry ambition of creating sustainable business models for the companies involved. The collaborating companies were structured into networks consisting of at least 5 companies. Each network was followed for a period of at least two years. ICI has since 2007 followed and documented the development of 10 network-cases including a total of 92 companies that were in the process of understanding their business model with the ambition to innovate their existing business models to become new global network-based business models.

We applied longitudinal interventionist type methods (Lukka, 2005) to the facilitation and study of business model innovation processes. These were combined with a series of non-interventionist type semi-structured interviews (Yin 2013). The research group followed the companies involved in the 10 networks through workshops, company meetings, board meetings and observations. During the research project, there were numerous meetings, workshops, reports

and semi-structured interviews, which were recorded and/or documented with minutes, pictures or video. The terminology of business models was introduced to all participants during workshops, and especially the use of the Business Model Canvas (Osterwalder & Pigneur 2010), and narratives exemplifying existing, successful business models (Lund 2014) were mobilized to the business model innovation project.

Where are scalability attributes located in business models?

Business model scalability can be defined as: “A business model that is agile and which provides exponentially increasing returns to scale in terms of growth from additional resources applied”. Hence, in the search for such attributes we would be looking for business models flexible enough to cope with internal and external forces and demands, and where business potential is not constrained by physical or material assets, such as number of man hours, machine time, cash liquidity, storage, and other forms of capacity. The search for business models that are able to juggle the characteristics of having few or no capacity constraints while simultaneously providing unique and hard to copy value propositions to customers seems to be the name of the game.

Interestingly, the hype of business models at the turn of the Millennium was concerned with precisely the notions of scalability attributes, namely in the context of E-business models. Unfortunately, many of the early

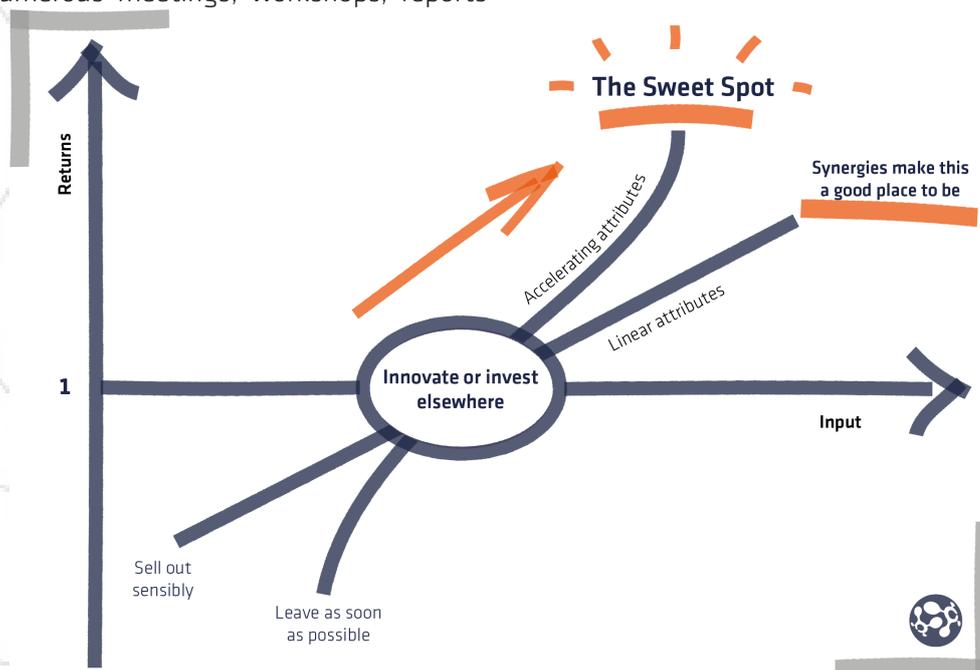


Figure 1: Hitting the scalability Sweet Spot

E-business companies forgot to calculate realistic business cases and many therefore ended up bankrupt at the hands of the dot.com bubble crash in 2001. The E-business hype took advantage of the Internet as a new global channel to reach customers and users. Technology made it possible for companies to multiply their market potential. By combining Internet-based marketing and ordering mechanisms with traditional physical distribution channels, many E-businesses were able to outcompete the (then) traditional bricks and mortar stores, for example in retailing. A very notable example of this is the case of Dell, described in detail by Kraemer *et al.* (2000), who succeeded in disintermediating the existing retail value chain of the PC industry. We highlight the past tense of *then*, because today, not a respectable retail store exists without an Internet platform of some sort.

But is it necessarily “a unique business model” to have an online marketing channel (incidentally like everybody else) whereby an order made in the webshop can be delivered by postal services? This is definitely questionable. However, if it was possible to add a new distribution channel that, in addition to satisfying a new group of customers, provided additional value to the customers using the existing distribution channels, then that would be defined as “a unique business model”. The aspect of scalability could then be judged by the notions of the returns to scale and if these were increasing, we would have a sweet-spot situation of business model scalability.

In a related article, Nielsen and Lund (2018) provide evidence of five patterns relating to the link with exponential increasing returns to scale. Below we describe these five patterns:

Pattern 1 – Scalability achieved through new distribution channels

According to Nielsen and Lund (2018), the notion of selling through multiple distribution channels cannot

be deemed *novel* in any sense it is important to consider the returns to scale attributes. If the implementation of a new distribution channel cannibalizes on existing channels the returns to scale would be declining, a worry that many retailers face. Linear increasing returns to scale could potentially be obtained through the sharing of corporate overhead and savings related to higher production outputs, which would be the normal economic argument for adding new channels to the business. However, creating a *sweet-spot scalable business model* would be achieved in cases where adding a new distribution channel provides additional value to existing channels and the customers using them. Coca-Cola addresses this by delivering content to consumers through as many channels as possible, while Zara takes the integrator approach of being in command of the bulk of the steps in a value-adding process by controlling all resources and capabilities in terms of value creation. This is illustrated in Tabel 2.

An example of achieving scalability through new distributions channels simultaneously with a higher value proposition to existing channels was found in a case study of the Danish supplier of fresh fish, Copenhagen Seafood. The company added a new channel for private consumers of fresh fish and as a result achieved being able to sell higher quality fish to their restaurant segment at a lower price. Mixing the channels meant that the private consumers of fresh fish also were made aware of which restaurants they shared suppliers with and this rise in awareness increased the business of the involved restaurants. This is an example of the type of complementary fit identified by Zott and Amit (2013) which occurs when activities are mutually reinforcing. According to Milgrom and Roberts (1990, 1995), activities are complements when the marginal value of one activity increases as the other activity is increased.

	Declining RtS	Constant RtS	Increasing RtS
Linear Attributes	Channels might cannibalize each other	Channel might give access to new market segment	Sharing of overhead costs and production costs between channels
Exponential Attributes	Cannibalization and loss of brand value		Channels create value for each other's customer segments

Table 2: New channel scalability

Pattern 2 – Scalability through release from traditional capacity constraints

From the field of managerial accounting comes the lessons of investing at points of constraint in the production process. However, Nielsen and Lund (2018) argue that when viewing this from the perspective of business model innovation, companies should be asking themselves how to innovate in order to avoid such constraints altogether. In this sense companies should be asking themselves whether they are in the business of selling consulting or service hours, products, data or reports. Each of the above has different characteristics relating to capacity constraints. In the private banking sector this release from capacity constraints is sought by focusing on the customer relationship activities and outsourcing infrastructure management and product innovation activities. A notable example applying this business model configuration is the Swiss network operator TelcoMobile International.

In our case study of the Nordic engineering consulting company, COWI, involved in a technology-based joint venture, several possibilities were at hand. Embedded in the corporate culture of this company, strongly influenced by industry tradition, was the notion of the ‘coverage ratio’ – the percentage of hours billed to customers. This generally gives R&D activities in the industry a hard time and tends to lead to a focus on specific types of customers, namely large government organizations best acquainted with reimbursing activity on an hourly basis. Table 3 reports the characteristics of the different patterns lending themselves to this capacity constraint problem. The example illustrates that for COWI to move into the sweet-spot this would mean focusing on a new customer segment, selling a different product and essentially a showdown with the longstanding corporate culture of invoicing hours.

	Declining RtS	Constant RtS	Increasing RtS
Linear Attributes	Developing new report types for each specific customer	Selling commented and further analyzed but standard data-reports	Selling and cross-selling the system as a product with an annual software license
Exponential Attributes			Selling standard data reports to smaller customers. Selling data about customers

Table 3: Capacity constraint scalability

Pattern 3 – Scalability through the outsourcing of investments

‘If money grew on trees’ is a popular expression typically leading to some sort of ranking and choice of options in a company. The ability to optimize the cash liquidity constraints, cash flow and working capital attributes of one’s business model would take the worries from many a CFO. However, since cash is almost never in abundance, or free for that matter, business models that are able to push capital requirements over to strategic partners are most often welcome and Nielsen and Lund (2018) argue that this is an important mechanism for building scalable business models. Thoughts aligned to business model configurations (Taran *et al.*

2016) applying these mechanisms are similar to Henry Chesbrough’s open innovation mindset. Procter & Gamble is a notable example here because they routinely utilize external sources to fuel the business model and allow unused ideas to flow outside to other companies.

One of our cases, SkyWatch, a company that has developed and produces a drone, a business model with fewer financial and other resource constraints, than those of the closest competitors, was developed. SkyWatch stuck to developing their core platform and let other companies develop the software and hardware technologies the drone could carry and operate. Much like the business model of Apple, where software

developers create content for the iTunes platform and pay to have it presented there, SkyWatch's partners created software and hardware for checking oil tanks, mapping minefields, search and rescue operations, just to name a few. Table 4 reports these characteristics.

			
Declining RtS		Constant RtS	Increasing RtS
Linear Attributes			Partners create technologies that help market the drone
Exponential Attributes	Own R&D of applications and technologies for the drone		Partners create Technologies that provide content to data-reports SkyWatch can re-sell

Table 4: Scalability throughout outsourcing financial constraints

Pattern 4 - Scalability through the leveraging of partners working for free

Nielsen and Lund (2018) describe how this pattern of business model scalability is concerned with understanding the value perspective of the stakeholders around the company and how to optimize the value proposition of your product/service offering to them. We might briefly return to Apple and congratulate them on receiving 30% of revenues from the partners that ensure the lock-in of Apple's paying customers to - yes you guessed it - Apple. Business models here are concerned with leveraging resources and partners

in more intelligent manners. Tupperware applies such attributes to attaining a free sales force, and in the era of social media, Groupon and similar companies have taken this leveraging of customers as key marketing partners to a whole new level of business. Table 5 illustrates how these attributes relate to notions of scalability. Here we have used the notions of marketing partners, but such strategic partners could be leveraged for distribution, creating customer loyalty, giving access to resources and performing other activities according to the value configuration of the business model.

			
Declining RtS		Constant RtS	Increasing RtS
Linear Attributes		Customers see what other customers with similar interests purchased	Sales force works for free and receives revenue-based percentages
Exponential Attributes			Marketing of offers is taken over by the potential customer giving unique access to relevant segments

Table 5: Scalability through the leveraging of partners

Pattern 5 – Scalability through the implementation of platform models

Achieving scalability through the implementation of platform models is somewhat related to example D above concerning leveraging partners and Nielsen and Lund (2018) characterise this as the fifth mechanism of business model scalability. However, in this case the implementation typically creates slightly more radical form of business model innovation. Platform-based business models have collaboration as their central element. Examples of companies here are value chain coordinators like PrintConnect.com, collaboration platforms like Podio and multisided platform models like VISA. When looking at business model innovation from this platform-based perspective, an important question to ask is, “How do we make our competitors into our partners or even main customers?” Some

companies will be able to leverage constant returns to scale, maybe even linear increasing returns to scale by cooperating with competitors on distribution services, inbound logistics, even service center and administrative center constructions.

An example of a hidden champion doing just this is an organizer of professional networks, The Relationship Factory, that during our research with them developed a dedicated software platform that their competitors were willing to pay to get access to. In doing so, they were released from the constraints of selling hours and products and moved into selling ease of use attributes and benchmark data. Table 6 illustrates that the sweet-spot entails becoming the chosen partner of the competition

	Declining RtS	Constant RtS	Increasing RtS
Linear Attributes		Service and administration collaboration	Cooperation of distribution and logistics
Exponential Attributes			Competitors become customers and strengthen the position of the firm. Selling access to existing customer base

Table 6: Scalability through the implementation of platform models

Business model scalability patterns

The five patterns presented above illustrate how a number of companies studied have been able to innovate and concurrently re-design their business model attributes. While these attributes would commonly have led to declining, constant or at best linear increasing returns to scale, novel ways of configuring business models have the potential of leading to the attributes of the sweet-spot, i.e. exponentially increasing returns to scale. Our data on business model scalability illustrates that the novel attributes identified here fall into

four dimensions capable of leveraging exponentially increasing returns to scale:

1. Features/components that enrich the existing value proposition (for free)
2. Features/components that free the business model of existing capacity constraints
3. Features/components that change the business model to a platform for other businesses
4. Features/components that change the role of existing stakeholders and utilize them in simultaneous roles in the business model

Table 7 below illustrates how the four dimensions of achieving business model scalability interact with the key attributes identified in the five patterns above. It illustrates how the five patterns (horizontal) cross the four (vertical) dimensions. A general insight is that companies that only search for cost-cutting alternatives typically will find their way to declining, constant and at

best linear increasing returns to scale. However, achieving exponentially increasing returns to scale is achieved by thinking in terms of value propositions between and among the stakeholders and partners involved in the immediate business-ecosystem of the company.

Enriching Value Propositions	Removing Capacity Constraints	Creating a Platform	Change the role of Stakeholders
New channel enriches the value proposition to existing customers			
Selling data instead of selling man-hours			
Strategic partners create lock-in for customers			
		Customers do marketing or become salespeople	
		Competitors become customers	

Table 7: Dimensions of achieving business model scalability

Business model configurations with scalability characteristics

The five patterns illustrate the configuration of ‘exponentially increasing returns to scale’ business models. They also show that it is possible to find novel ways of configuring the business models of companies in even very traditional industries. The identified dimensions in table 1 also highlight how to distinguish between the synergetic offerings of the linear increasing returns to scale and the emergent properties of the exponentially increasing returns to scale characteristics.

Leaning on the examples discussed above, this next phase in the paper looks for generalizations capable of capturing the identified characteristics of sweet-spot business models. There are various levels of abstraction available for the modeling of the value creation of businesses. For example, Osterwalder *et al.* (2004) distinguish between meta-models of business models, taxonomies of business model types, modeled instances of business models and real-life companies. Lambert (2015) and Groth and Nielsen (2015) also survey the usefulness of taking ones point of departure in specific levels of abstraction. While Lambert’s (2015) goal is to set the scene for a stronger theory-building

practice within the field of business models, Groth and Nielsen’s (2015) objectives are concerned with illustrating that the level of business model taxonomies is the most advantageous point of departure for developing statistically reliable models of different ways of doing business.

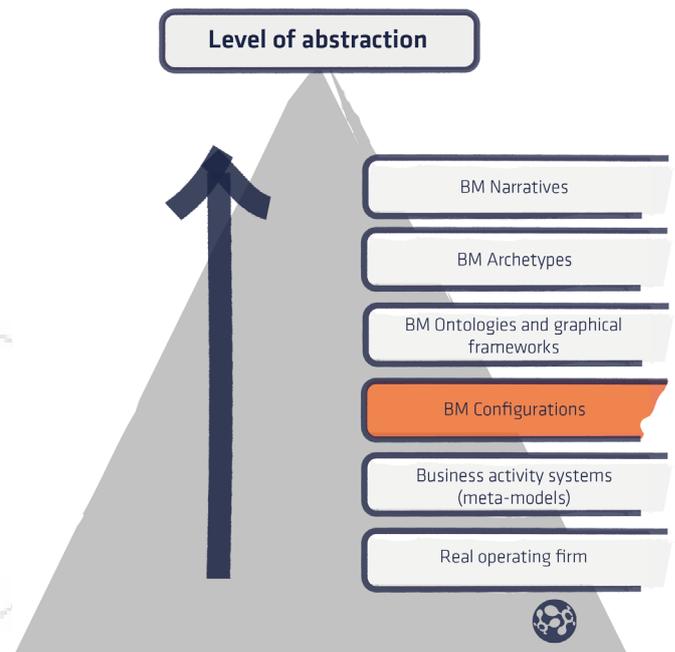


Figure 2: Different levels of business model abstraction (inspired by Massa and Tucci 2013)

In another recent contribution, Massa and Tucci (2013), distinguish between six levels of abstraction (see Figure 2).

For the purpose of the following analysis and identifying and describing the characteristic features of business models and their value creation processes, we choose the level of business model configurations as our point of focus here. In this phase of the study, we considered the configurations suggested by Linder and Cantrell (2000), Osterwalder and Pigneur (2010),

Gassmann *et al.* (2014) and finally Taran *et al.* (2016). Coupled with the four attributes of business model scalability derived from figure 2, table 7 below reports the desk survey of the sources quoted above. The objective here has been to identify already recognized and classified business model configurations capable of containing the four scalability characteristics. This in turn is expected to lead to a sounder understanding of how to generalize the five patterns and provide a possible framework for further investigation.

Enriching value propositions	
Virtual community	
Named by	Weill & Vitale, 2001
Description	Facilitate and create loyalty to an online community of people with a common interest enabling interaction and service provision. Members (customers or partners) add information into a basic environment and thereby create value for one another
Real life examples	Trust Pilot, YouTube
Related labels	Community model (Rappa, 2001), Crowdsourcing (Johnson, 2010), Open source (Gassmann <i>et al.</i> , 2014)
e-shop/shop	
Named by	Timmers, 1998
Description	Customers will pay premium prices for convenience such as: broad selection, ubiquitous access and fast delivery
Real life examples	ASOS.com
Related labels	Merchant model (Rappa, 2001); One stop, convenient shopping (Linder and Cantrell, 2000); Supermarket (Gassmann <i>et al.</i> , 2014), Shop in shop (Gassmann <i>et al.</i> , 2014), linked to E-commerce (Gassmann <i>et al.</i> , 2014)
e-mall/mall	
Named by	Timmers, 1998
Description	A collection of shops or e-shops, usually enhanced by a common umbrella
Real life examples	eBay
Related labels	Merchant model (Rappa, 2001), one stop low price shopping (Linder and Cantrell, 2000), Shop in shop (Gassmann <i>et al.</i> , 2014), linked to E-commerce (Gassmann <i>et al.</i> , 2014)
Removing capacity constraints	
Channel maximization	
Named by	Linder and Cantrell, 2000
Description	Content is delivered through as many channels as possible
Real life examples	Coca Cola
Related labels	
Integrator	
Named by	Gassmann <i>et al.</i> , 2014
Description	Be in command of the bulk of the steps in a value-adding process by controlling all resources and capabilities in terms of value creation
Real life examples	Zara
Related labels	Bundling business models (Osterwalder and Pigneur, 2010)

Disintermediation	
Named by	Johnson, 2010
Description	Deliver directly to the customer a product or a service that has traditionally gone through an intermediary
Real life examples	Dell
Related labels	Manufacture (direct model) (Rappa, 2001), Direct to consumer (Weill and Vitale, 2001), Direct selling (Gassmann <i>et al.</i> , 2014)
Customer focused	
Named by	Taran <i>et al.</i> 2015
Description	Focus on the customer relationships activity and outsource the infrastructure management and the product innovation activities
Real life examples	Mobile Telco, Private banking
Related labels	Unbundling business models (Osterwalder and Pigneur, 2010), linked to From push to pull (Gassmann <i>et al.</i> , 2014), linked to Orchestrator (Gassmann <i>et al.</i> , 2014)
Trade show	
Named by	Taran <i>et al.</i> 2015
Description	Leave marketing or other value chain functions (payment, logistics, ordering) to a 3rd party with a well-known brand name e.g. licensing, outsourcing
Real life examples	Alibaba.com, Exhibition fair
Related labels	Third-party marketplace (Timmers, 1998)
Changing the role of stakeholders	
Round up buyers	
Named by	Taran <i>et al.</i> 2015
Description	Buyers are rounded up to gain purchase discounts and thereby offer attractive prices
Real life examples	Costco, Groupon
Related labels	Buying club (Linder and Cantrell, 2000)
Content creator	
Named by	Taran <i>et al.</i> 2015
Description	Provide content (e.g. information, digital products and services) via intermediaries
Real life examples	Bloomberg L.P.
Related labels	Content provider (Weill & Vitale, 2001), Digitalization (Gassmann <i>et al.</i> , 2014)
Creating Platform-Based Value	
Free for advertising	
Named by	Linder and Cantrell, 2000
Description	Offer free products and services through a platform and make revenues from selling advertising space
Real life examples	Facebook, GOOGLE
Related labels	Advertising model (Rappa, 2001), Free advertising (Osterwalder and Pigneur, 2010), Market aggregation (Linder and Cantrell, 2000), Hidden revenue (Gassmann <i>et al.</i> , 2014)
Integrated	
Named by	Chesbrough, 2006
Description	Routinely utilize external sources to fuel the business model and unused ideas are allowed to flow outside to others' business models. The company becomes a system integrator of internal and external technologies
Real life examples	Procter & Gamble
Related labels	Open Business Model (Gassmann <i>et al.</i> , 2014)

Table 8: Business model configuration with business model scalability attributes (continued)

Adaptive	
Named by	Chesbrough, 2006
Description	Create an “ecosystem” by establishing its technologies as the basis for a platform of innovation for the value chain and benefit from the investments of other in the platform
Real life examples	Apple Iphone
Related labels	
Value chain service provider	
Named by	Timmers, 1998
Description	Specialize on a specific function for the value chain, such as electronic payments or logistics, with the intention to make that into their distinct competitive advantage.
Real life examples	Shipping- and freight companies
Related labels	Layer player (Gassmann <i>et al.</i> , 2014); Reliable commodity operations (Linder and Cantrell, 2000), Service-wrapped commodity (Linder and Cantrell, 2000)
Value chain coordinator	
Named by	Taran <i>et al.</i> 2015
Description	Provide transaction coordination services and optimization of the communicational and organizational workflows for all parties involved in the same value chain
Real life examples	Celarix, PrintConnect.com
Related labels	Value net integrator (Weill & Vitale, 2001), Value chain integrators (Timmers, 1998), Transaction service and exchange intermediation (Linder and Cantrell, 2000)
Collaboration platforms	
Named by	Timmers, 1998
Description	Provide a platform (a tool kit and an information environment) for collaboration between enterprises
Real life examples	Podio
Related labels	Shared IT infrastructure (Weill and Vitale, 2001)
Brokerage	
Named by	Johnson, 2010
Description	Bring together buyers and sellers and facilitate transactions
Real life examples	Saxo Bank, stock exchanges
Related labels	Information brokerage, trust and other services (Timmers, 1998), Intermediary (Weill and Vitale, 2001), Affiliate model (Rappa, 2001); Brokerage model (Rappa, 2001), Open market making (Linder and Cantrell, 2000), Exclusive market making (Linder and Cantrell, 2000)
Infomediary	
Named by	Rappa, 2001
Description	Collect or/and produce information for other in regards to market information, products, producers and consumers
Real life examples	Edmund
Related labels	
Multi-sided platforms	
Named by	Osterwalder and Pigneur, 2010
Description	Multi-sided platforms create value by facilitating interactions between two or more distinct but interdependent groups of customers
Real life examples	Nintendo, GOOGLE, VISA

Table 8: Business model configuration with business model scalability attributes (continued)
(inspired by Taran *et al.* 2016)

The analysis of the configurations in patterns one to five led to a set of common attributes that could be mobilized in relation to attaining exponentially increasing returns to scale. Using the language provided by the Business Model Canvas (Osterwalder and Pigneur, 2010), the business model configurations presented here have a tendency to concentrate around the building blocks on the left-hand side of the Business Model Canvas, also denoted the back-end of the business model (Günzel and Holm 2013) or the value configuration (Osterwalder *et al.* 2004). These building blocks relate to Strategic Partners, Activities, Resources, Cost Structure and are connected to the Value Proposition.

This analysis of already recognized configurations in the present business model literature illustrates that while the notions of creating platform-based business models with exponentially increasing returns to scale is quite widespread, there is much more scarcity according to the three other proposed dimensions. These listed configurations offer to the reader the possibility of finding inspiration. However, in order to come to terms with analysing the business models of their own companies, managers might need an additional framework from which to start their analysis. This is provided in the roadmap below.

A roadmap for achieving business model scalability

The five scalability patterns above illustrate how companies have been able to innovate and concurrently re-model their business model attributes. While these attributes would commonly have led to declining, constant or at best linear increasing returns to scale, in the instances described in this manuscript, novel ways of configuring the business model led to exponentially increasing returns to scale. It is evident that achieving exponentially increasing returns to scale requires thinking in terms of value propositions between and among the stakeholders and partners involved in the immediate business ecosystem of the company, also denoted the focal firm. This is because aligning and leveraging the competences and motivations of strategic partners has primary effects relating to smoother cooperation, but also important secondary effects relating to greater trust, higher loyalty and lock-in of such relationships.

Using the language provided by the Business Model Canvas (Osterwalder and Pigneur, 2010), the five patterns presented above clearly focus on rejuvenating the building blocks relating to the value configuration part of the canvas (Osterwalder *et al.* 2004). These building blocks relate to engaging strategic partners, identifying relevant activities and necessary resources, observing cost structure mechanisms and the value proposition towards customers. Instead of stomping down the habitual road of analyzing cost structures, product segment profitability and market-segment growth, managers should follow the roadmap below which outlines three steps towards achieving business model scalability.

Our suggestion is that the company to go through these three stages in three management meetings with 1-2 weeks in between. The meetings need not be longer than 90 minutes each to foster brainstorming and discussion on identifying whether there are novel ways to tweak the existing business model.

STEP 1: Identify potential strategic partners

Scalability typically connects strategic partners to the value proposition being offered either through activity-sharing or resource-sharing. Remembering that achieving scalability requires thinking beyond the scope of merely sharing costs, executives need to ask their management team the following questions:

1. Are there potential strategic partners that could perform activities in our business model cheaper while providing a higher value proposition to our customers at the same price?
2. Are there potential strategic partners that could provide resources in our business model at a cheaper price while providing a higher value proposition to our customers at the same price?

Take one question at a time. First, give the individuals time to contemplate by themselves, typically 4-6 minutes, before pairing them. In pairs, ask them to create a top-3 list of the most potent ideas they have generated between them. This should take 6-10 minutes. These ideas are then shared with the whole team on a whiteboard or flipover, being presented in 30-60 seconds by the person who did not bring it to the table. Repeat this scenario for question two. The answers to these two

questions provide indications of which aspects of the business model that are prone to innovation. Finish off by prioritizing all of the suggestions, for example through a dotmocracy vote (see Osterwalder *et al.* 2014) if it is difficult to reach agreement. This may be advanced by making a vote “with the brain” and a vote “with the heart” to make sure the radical ideas also receive attention.

STEP 2: Questions that unlock scalability

This second step is designed to induce greater detail about how to reconfigure the business model of the firm at hand. This can be achieved by asking a series of questions listed below. We suggest to have the management team prepare thoughts about the questions in advance. Divide the questions among teams of 2-3 and ask each group to come up with minimum two ideas per question. Each idea should be presented in 1-2 minutes, for example according to the following structure, containable within one PowerPoint slide that can be printed in A3 in advance:

- The title and basic catch-phrase of the idea
- How does it challenge our existing way of thinking business?
- What would we need to do differently?
- Who (which other company) excels at this?
- What is the key connection(s) in this business model?
- Explain how it achieves scalability

Unlocking-scalability questions:

1. Are there potential strategic partners that can offer features that enrich the existing value proposition to our customers (for free), while receiving value back themselves?
2. Are there alternative ways of generating revenue?

3. Are there alternative configurations that free the business model of existing capacity constraints?
4. Is it possible to change the business model to a platform for other businesses to buy in to?
5. Is it possible to change the role of existing stakeholders and utilize them in simultaneous roles in the business model?
6. Who would pay for either access to our customer-base or knowledge about our customers and their characteristics?
7. How strong are the “hard to copy” and “time to copy” attributes of our current value proposition towards customers?
8. Which mechanisms are in place to create lock-in of our customers?
9. How agile is our company towards threats from new entrants or new technologies and quickly would we be able to readjust?

When all of the ideas have been presented, it is important to create an overview of them, for example by hanging the printed A3's on the wall, and facilitate a discussion that helps to identify ambitious and realistic possibilities for example by prioritizing them. It may also be necessary to divide out follow-up assignments relating to further reality checks, before the most applicable options are taken into the next step.

STEP 3: Analyze the scalability attributes

Finally, step 3 of this roadmap to scalability is to analyze the attributes of each of the possibilities the company has identified and prioritized in steps 1 and 2 according to the table below. Start by placing the option in the quadrant it is most likely to be situated. Discuss then how to configure this option so that it gains in exponentiality on the one hand, and on the other how it can be configured to increase the returns to scale in its application.

Concluding remarks

Following Osterwalder and Pigneur's (2010) Business Model Canvas, business models can be based on many different value propositions towards customers. While some business models allow for economies of scale, others are based on economies of scope and differentiation. Hence, in returning to the concept of scalability in the context of business models this article illustrates that scalability comes in varying degrees. Achieving sweet-spot business models is typically connected with the ability of leveraging exponentially increasing returns to scale. The many examples applied in this study illustrate the difference between ordinary and novel implementations. The point here is that the devil lies in the detail and in choosing the most intelligent manner of configuring the business model.

Despite the study identifying several business model configurations in table 7 holding promise for sweet-spot business models, and identifying a number of novel business models, from which four dimensions of exponential returns to scale were identifiable, our research indicates that this does not constitute an explicit enough process for managers to follow. Accordingly, a roadmap to be used to structure the managers' business model innovation process was suggested.

To conclude this article, scalable business models have the following characteristics:

- The business potential is characterized by exponentially increasing returns to scale
- They remove themselves from otherwise typical capacity constraints of that type of business
- Partners enrich the value proposition without hurting profits
- Stakeholders take multiple roles and create value for one another
- The business model becomes a platform that attracts new partners, including competitors

Furthermore, the discussion led to the identification of the two criteria:

- Agile and flexible businesses both in growth and decline
- Hard to copy value propositions or ones that take a long time to replicate

Working with this roadmap for business model scalability is relevant for entrepreneurs who are in the process of starting up companies and developing business models from scratch as well as business managers concerned with innovating, rejuvenating and re-modelling their businesses. The ideas put forth here are also important for potential investors to understand when analysing businesses. Finally, these aspects are highly relevant for policy-makers because they relate to the support mechanisms for entrepreneurial activities and support activities for Small and Medium-sized Enterprises (SMEs) both on national and supra-national levels.

While a lot of the recent research relating to business model innovation tends to focus on the alignment of value propositions and customer needs (cf. Osterwalder *et al.* 2014) or the organizational effects of business model innovation (Foss and Saebi 2015), we found the topic of business model scalability to be more concerned with achieving configuration alignment between the value proposition and strategic partners. In this analysis costs were found to be either associated with activities or resources. As such, this research indicates that the notions of cost structures were actually irrelevant as a stand-alone building block in the business model. This would imply that future discussions about the financial aspects of business models are focused on *revenue models* and not profit models, as for example suggested by Zott *et al.* (2011).

Looking towards future perspectives, three of the dimensions identified as gateways to scalable business models (enriching value propositions, removing capacity constraints and changing the role of stakeholders) were found to a lesser extent in the literature on business model configurations. Hence, research ought to focus on uncovering new configurations with these characteristics. Using the approach generated in this paper might be difficult for managers. This can be overcome by introducing better guidance, for example through the use of analogies, metaphors or storytelling. Finally, this article suggests that the notion of scalability would be an important dimension of a yet to see sound business model archetypes scheme (Massa and Tucci, 2013; Taran *et al.*, 2016).

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Business Model Scalability in the Cloud Business Context

Marko Juntunen¹, Petri Ahokangas², and Hang Nguyen³

Abstract

Purpose: The paper explores the antecedents to business model scalability.

Design/Methodology/Approach: The paper is conceptual and exploratory in nature and builds on the practice / action learning approach.

Findings: The paper presents an action research based framework for approaching and understanding the change needs of business models and business model scalability as practices. These practices are based on a literature review of business opportunities, scalability and market dynamics.

Practical Implications: From a managerial and entrepreneurial perspective, the findings of the paper highlight the role and dynamism of the business environment and the continuous assessment of the business environment in evaluating business opportunity and changes in opportunity.

Originality/Value: The paper proposes a novel framework for business model synchronization against business opportunity, and vice versa. It also connects the business model to the market and hence to the market value of the firm.

Keywords: Business model, business model change, cloud computing, business model scalability

Please cite this paper as: Juntunen, M., Ahokangas, P., and H. Nguyen (2018), Business Model Scalability in the Cloud Business Context, Journal of Business Models, Vol. 6, No. 1, pp. 19-39

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Acknowledgements: This research has been supported by the DIGILE Need For Speed Program.

Introduction

Cloud technology is increasingly becoming the core of many firms' business strategies (Srinivasan, Lilen & Rangaswamy, 2002: 58). The rapid pace of technological development within web technologies has opened up a multiplicity of ever-changing business opportunities to be explored and exploited with various business models (Amit & Zott, 2001). In line with this, Lee & Whang (2001) discuss that e-business enabled opportunities and business models are as limitless as the imagination. However, the exploration and exploitation of these opportunities call for unheard-of business model flexibility and experimentation compared to traditional business. Indeed, web business has turned out to be extremely dynamic, specialized, unpredictable, volatile, and competitive (Kalakota & Robinson, 2000). In these circumstances, demands for the scalability of the business model have increased considerably, highlighting the role of foresight, initiative, and dynamic capabilities in the exploration and exploitation of business opportunities through business models (c.f., Ahokangas & Myllykoski, 2014; Leih, Linden & Teece, 2014).

Bock and George (2011) discuss strategy as being environment-centric, and business models as opportunity-centric. In continuation of this line of argumentation, we claim that the scalability of the business model stems from the synchronization of business models to the respective business opportunities, and that the business environment frames the opportunity. The opportunity perspective is supported for example by Ardichvili *et al.* (2003), who claim that experimentation with opportunities results in a business model. Similarly, Zott and Amit (2009) suggest that a business model is created to exploit the opportunity. Ardichvili (2003) stated that "*the elements of opportunities are recognized, but the actual opportunities are made, not found,*" but not all the opportunities are viable (Song, Bij & Halman, 2008). As business environments are changing faster than ever, continuous exploration of opportunity is required, and companies need to employ scalable business models to quickly synchronize their business models respective to the changing business opportunities. For example, Bock and George (2011) support this view by defining opportunity-centric business model reconceptualization, and present a useful framework to assess the impact of opportunities on firms' behavior and business models. Similarly Fiet

and Patel (2008) argue that a business model is built through the opportunity assessment behavior or the entrepreneur.

Teece (2010), in essence, argued that a business model needs to be calibrated to the dynamism of the business environment. Business model scalability can be conceived as the ability to deal with business-volume related changes, business-space related changes regarding markets and customers, and business-model related changes in the business over time. The cloud as a context brings the capabilities for value provisioning and utilization to the core of business model scalability because resource pooling, dynamic scalability, on-demand availability, pay-per-use pricing, and ubiquitous access (Ahokangas *et al.*, 2014) are all required for conducting cloud businesses. Looking from the dynamic capabilities perspective (e.g., Teece & Pisano 1994, Teece, Pisano & Shuen 1997, Eisenhardt & Martin 2000), we argue that the scalability of the business model fundamentally stems from the synchronization of a business model to the respective business opportunity. Cloud technology allows an organization to easily scale its business operations, hence it enables a company to quickly benefit from economies of scale (Berman, *et al.*, 2012: 29). Although dynamism in the e-business models have been popular topics of research, so far no systematic effort has been made to discuss and research business models and scalability in the e-business context.

The business model describes how business is done in practice (Chesbrough & Rosenbloom, 2002) and it can be conceived from different perspectives. In this paper, we see business models from the action perspective (e.g., Zott & Amit 2010, Seddon *et al.* 2004, Casadesus-Masanell & Ricart 2011) and as devices by which business opportunities and advantages are explored and exploited (Leih, Linden & Teece, 2014; Ahokangas & Myllykoski, 2014). Thus, we see business opportunity to be at the heart of the business model and we view business models comprising of four elements of action: what, how, why and where (Ahokangas *et al.*, 2014). In the extant literature, business model innovation, creation, and transformation have been highlighted when discussing the dynamic aspects of business models (e.g., Baden-Fuller & Morgan 2010; Zott, Amit & Massa 2011; Teece 2010; Casadesus-Masanell & Ricart 2011).

Four key assumptions from recent literature can be drawn:

Assumption 1: *A business model is a boundary-spanning unit of analysis (e.g., Sosna et al. 2010, Amit & Zott 2012).*

Assumption 2: *A business model is about value creation and capture (e.g., Zott & Amit 2009, Baden-Fuller & Morgan 2010)*

Assumption 3: *A business model synchronizes to the business opportunity in a context (e.g., Bock & George 2011, Leih et al. 2014)*

Assumption 4: *Value provisioning and utilization influence business model scalability (e.g., Amit & Zott 2001, Ahokangas et al. 2014)*

Taking these starting points, this paper seeks to discuss and analyze the antecedents and characteristics of business model scalability within the cloud business context, paying attention to how scalability unfolds in business models in the cloud through dynamic capabilities. Specifically, this paper seeks to discuss, “*What are the antecedents to business model scalability in a cloud business context?*”

Cloud, scalability and the business model

Cloud computing can offer the development of a new business model where a solution is delivered through the cloud (Ahokangas et al., 2014). Marston et al. (2011) define cloud computing as an information technology service model where customers, regardless of devices and locations are able to access their selected services through the network. From the business perspective cloud computing is identified as “*a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management effort or service provider interaction,*” (Mell & Grance, 2011). From the Technology perspective cloud computing has appeared as a prosperous model bringing applications that use a web browser into large-scale use, and during unpredictable growth (or decline) the scalable system have an capacity to change load resources without impacting the whole system (Agrawal et al., 2011). This unique feature of the

cloud is important, as new ventures usually improve their business models about four times or more before they vitalize their revenue and profit growth (Johnson et al., 2008). Business models in e-business firms is typically designed according to the internal variables of organizations, such as their strategy, and with external environmental factors, such as market opportunities (Al-Debei & Avison, 2010: 373), and thereby influenced by the factors inside and outside the company (Teece, 2010). McDonald & Eisenhardt (2014) conclude that the heart of a strategy in new markets is the rapid development of a viable business model, otherwise firms will fail or exit the market. McGrath (2010) note that the use of business models may improve the decision making during the ongoing search for temporary competitive advantages in turbulent environments (McGrath, 2010). A successful business model attracts copycats, and in these cases the business model needs to be “differentiated, effective, and efficient” (Teece, 2010), and for this reason the business models for e-businesses should be reviewed continually to ensure they fit with the complex, uncertain, and rapidly changing external environment,” (Al-Debei & Avison, 2010: 374).

Since the dynamic capability approach focuses attention on the firm’s ability to renew its resources in line with changes in its environment (Bowman & Ambrosini, 2003), we note that McDonald & Eisenhardt (2014), Al-Debei & Avison (2010) and McGrath (2010) speak about dynamic capability. Hence if firms are moving towards some form of dynamic capability, they should develop business models that are sufficiently scalable. Business modelling concerns detailed requirements, making improvements, modification and recreation (Morris et al., 2005) and the model needs to be reassessed multiple times (Shafer, Smith & Linder 2005; Baden-Fuller & Morgan 2010). In this manner continuous business model innovation is an important capability for every firm seeking success in the long term (Sosna, Treviño-Rodríguez & Velamuri, 2010: 384). We agree with the view of Sosna et al. (2010) who describe dynamic capability as the ability of a firm to develop new capabilities in response to shifts in its external environment. For the e-business it is supposed to be insufficient to emphasize solely the scalability of the technical infrastructure, as firms utilizing e-business should simultaneously pay attention to the scalability of the business model (Su et al., 2001). Similarly, Peyton et al.

(2014: 29) have pointed out the importance of flexibility and adaptation in the business model, especially in the situation when the frequency of business model is identified as a static description of how the organization creates value. Scalability is about achieving profitable growth, meaning that most successful businesses today are those that are able to build up a scalable business model (Nielsen & Lund, 2018). Furthermore, Amit & Zott (2001); Rappa (2004) and Bouwman & MacInnes (2006) mention that scalability is a fundamental factor in business model innovation and firm growth.

“Scalability” is firstly connected with the performance of systems from a technical viewpoint (Menasce, 2000). *“The scalability refers to the ability of your e-business idea to continue to function well, regardless of how large the company gets,”* (Napier, Rivers & Wanqner, 2006: 47). From the e-commerce perspective, it is impossible to ignore the scalability characteristics of the technology because almost all activities are available virtually on the Internet and websites can endure significant growth, and this means that systems that cannot scale up with that growth will lead to inefficiency in their performance (Agrawal *et al.*, 2011). Scalability is generally rooted in the firm utilizing Internet based business opportunities (Nguyen, 2002), and thus firms should be seriously concerned about the scalability of the business model (Su *et al.*, 2001). The growth potential in business model scalability has a positive impact on investor attractiveness (Stampfl *et al.*, 2013: 240). Hence a startup should consider easily scalable business models in order to catch the attention of venture capital investors (Paull *et al.*, 2003). Another approach to scalability is utilizing existing business models to concentrate only on the value of combining with co-partners or franchising (Littlewood, 2011). Stampfl *et al.* (2013) state, *“It is important to be in an environment which provides the adequate people and other resources you need, because otherwise whole business model cannot be scaled.”* A study by Menasce (2000) reveals that all features of an e-business impact the scalability of the e-business firm. Hence, he investigates four aspects of e-business to introduce a multi-layer reference model in order to maximize the capacity of e-business site. These four analyzing factor layers consisted of: 1) A business model: all the business issues involved in the e-business corresponding with the components of a traditional business model, 2) A functional model:

the way e-business sites operate and how they are managed, 3) A customer behavior / user-orientation model: what users need, and 4) An IT resource model: the hardware, software and solution resources needed to execute the e-business site (Menasce, 2000). As the business model is a system which shows how the pieces of a business concept are connected (Magretta, 2002; Osterwalder *et al.*, 2005), and we are examining business model scalability, this study utilizes the business model layer as an analyzing factor allowing us to discuss the antecedents to business model scalability.

“A scalable business model is one that is flexible and where the addition of new resources brings increasing returns” (Nielsen & Lund, 2018: 66). Hence, there are many successful companies with multi-million dollar businesses, such as Facebook, Groupon, or Salesforce, which are former Internet start-ups (Stampfl, Prügl & Osterloh 2013; Markides 2008) that utilize the e-business ability to serve numerous additional customers at extremely low incremental cost (Hallowell, 2001). Many companies will integrate ICT in their business processes in order to innovate their business models so they can surpass their competitors and increase their profit making abilities. Thus firms utilizing ICT are able to achieve significant performance and attain accelerated growth and growth in profits compared to traditional businesses (Sakellariadis & Stiakakis, 2011). Technology by itself has no single objective value until it is commercialized via a business model, and the same technology commercialized by different business models will cause different returns (Chesbrough, 2010: 354). Wirtz, Schilke and Ullrich (2010) suggest that the evolution of the Internet will result in many ideas for business model innovation. Hence Internet-based start-ups are seen as being quite suitable for understanding and exploring business model innovation (Stampfl *et al.*, 2013). Scalability is one unique characteristic of ICT business, and it should be considered as an important element for business model innovation due to a company’s capacity to scale or not during periods of economic disruption (Stampfl *et al.*, 2013). This belief is supported by many researchers such as Amit and Zott (2001) and Rappa (2004).

Makadok (1999) defines economies of scale as being marginal improvements in efficiency that a firm experiences as it incrementally increases its size, and firms with greater economies of scale in the same industry

will later gain market share from their competitors. In global dynamic markets, push and pull policies can be integrated to maximize the advantages of scale (Corniani, 2008). For instance, the study by Walsh, Kirchoff & Newbert (2002) shows that new firms often use push and pull strategies simultaneously and this provides market advantages. The push strategy refers to the logic that a company invents and develops and proposes a product that is destined to find purchasers. The pull strategy refers to the logic that demand seeks supply and 'pulls' it out of the company (Corniani, 2008). The business model refers to the logic of the company, meaning how it operates, and creates and captures value for stakeholders in a competitive marketplace (Casadeus-Masanell & Ricart 2011: 9). Additionally, Kalakota & Robinson (2000) discuss market volatility and its effect on business models. A firm's market strategy and its business model are distinct constructs that affect the market value of the firm (Zott & Amit, 2008: 19), and thus the best variable for scale is market capitalization (Easton & Sommers, 2003). This supports our view that the market is the key business environment variable for studying the scalability of business models. Hence in this study we see that market has an impact on the business opportunity, and vice versa. For instance, if a firm selects a new market segment, the opportunities available to the firm change and existing business model needs to be calibrated against these new opportunities. If the business environment is changing (e.g., loss of market share), it is not choice of the firm, instead it impacts the business model and in this way the business opportunity must be calibrated against a new business model. This definition is supported for instance by Zott & Amit (2008:20) who conclude that product market strategies follow business model design, and vice versa. Similarly Trimi & Berbegal-Mirabent (2012: 463) highlight the importance of flexible business models that enable entrepreneurs to efficiently re-shape strategic choices that outline the business logic according to market demands.

Agrawal *et al.* (2011) developed two approaches related to the scalability concept; First, is the *scale-up* approach which is interpreted as the vertical approach to scaling the system (i.e., only one node of the system will be modified by adding more resources), and the second is the *scale-out* approach which is interpreted

as the horizontal approach to scaling the system (i.e., it takes effect on the whole system by adding more nodes to the system). Since "*the concepts of economies and diseconomies of scale in production pervade much of economists' basic thinking about market structure and pricing*" (Panzar & Willig, 1977), our research uses the marketplace as a system and thus the *scale-up* approach can be seen as a vertical market (i.e., existing markets or customer segment) and *scale-out* approach as a horizontal market (i.e., new markets or customer segment). As the changes in markets can quickly make existing business models obsolete or less profitable (Sosna *et al.*, 2010), the scale up and scale out aspects have two dimensions reflecting the increase (i.e., scale up +, scale out +) and the decrease of markets (i.e., scale up -, scale out -). Figure 1 presents the scaling model for four market scenarios by using two aspects of the marketplace, the scale-up is a sales volume of vertical markets and the scale-out is a sales volume of horizontal markets.

Our scaling model comprise four scenarios; 1) Market push – vertical (i.e., increase in existing market or segments), 2) Market push – horizontal (i.e., increase in new market or segments), 3) Market pull (i.e., increase in new and existing market or segments), and 4) Market churn (i.e., decrease in new and existing market or segments). In line with Corniani (2008), we see that market push is controlled by the firm (i.e., by internal

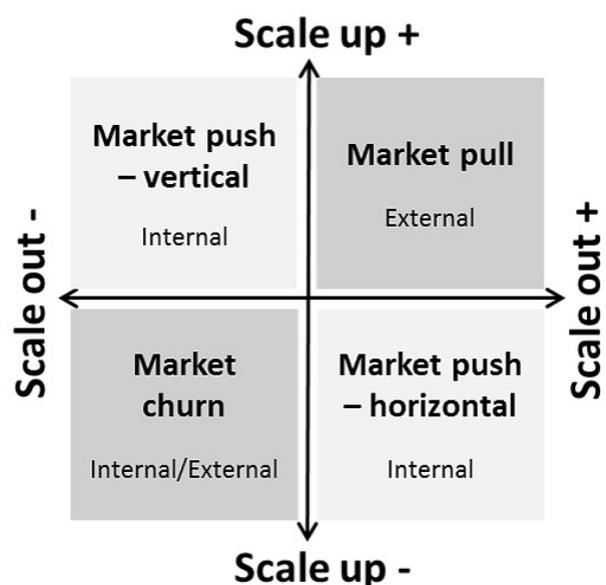


Figure 1: Four market scenarios (i.e., change in business opportunity).

decisions), and market pull is controlled by the markets (i.e., by external demands). Technology-oriented B2B companies are especially influenced by new technologies (Brem & Voigt, 2009). For instance, if a company is not prepared for the entry of new technology, they may lose some share of their existing market size, therefore in this manner market churn is controlled by the markets. Companies may also choose to reduce part of their unprofitable business, product lines or market areas, indicating that market churn may be controlled either by the company or by the markets.

A business model is created to take advantage of an opportunity (Zott & Amit, 2010), and experimentation with the opportunity results in a business model (Ardichvili *et al.*, 2003). Zott and Amit (2005) reveal that business models can be considered not only as a reflection but also as a consequence of the opportunity exploitation and exploration process, and business models are designed to maximize the business opportunity. Therefore, firms can use the business model innovation as potential source for market opportunities (Wirtz, Göttel & Daiser, 2016: 18). For example, a startup should attempt to discover opportunities through a suitable business model to test the feasibility of the business opportunity (Johansson & Abrahamsson, 2014). Thus, a goal of business model innovation is the retention of a sustainable competitive advantage (Wirtz *et al.*, 2016: 3).

Business models for e-business firms are being designed and shaped not only according to the internal variables of organizations, such as strategy, but also with respect to external environmental variables such as national culture, market opportunities, laws and regulations, customer-base size and nature, competition level, and technological advances (Al-Debei & Avison, 2010). Similarly, Teece (2010) notes that a “*good business model design and implementation involves assessing internal factors as well as external factors concerned with customers, suppliers, and the broader business environment.*” Hence, the business model innovation can be seen as either directed inwards or adjusting to the environment (Jensen 2013: 71), and business model innovation frameworks serve as a kind of guided trial-and-error process to anticipate and react to external and internal changes (Wirtz *et al.*, 2016: 18).

Due to business models being opportunity centric (e.g., Bock & George 2011; Zott & Amit 2010; Ardichvili *et al.* 2003; Amit & Zott, 2001) and the business model design consisting of internal and external factors (e.g., Teece 2010; Ojala & Tyrväinen 2011), we build on the business model concept developed by Ahokangas *et al.* (2014). Their business model concept is built around business opportunity and comprising of four key elements: 1) What? This refers to offers of the firm to their customers including their offering, value proposition, customer segments, and differentiation. 2) How? This refers to activities involved in delivering the previous “what” to the company’s customers including key operations, basis of advantage, mode of delivery, selling, and marketing. 3) Why? This refers to the reasons the company obtains profit from the previous “what” offered to the customer including the basis of pricing, ways of charging, cost elements and cost drivers. 4) Where? This refers to places where the previous “what” is executed or occurs including the location of activities or items internally.

Research method and process

This paper is a qualitative single case study of a company that has recently changed their business model towards the utilization of cloud technology. The case was examined through a qualitative action research method, and the data was collected within this process. “*Action research has a complex history because it is not a single academic discipline but an approach to research that has emerged over time from a broad range of fields,*” (Brydon-Miller *et al.*, 2003:11). Action research is rooted in each participant’s experience of the situation (Coghlan, 2007) and thus enables the researchers to get close to the business reality and fosters the development of a deep, rich insight and understanding of the complexities within decision-making (Carson *et al.*, 2001). Action research is described as an “enabling” science (Susman & Evered, 1978: 599), and the concept is reserved for situations in which researchers assume the role of change agents of the processes and events they are simultaneously studying (Gummesson, 2013). Working collaboratively with others leads also to personal changes in the action researcher (Brydon-Miller *et al.*, 2003:14). Ballantyne (2004) and Gummesson (2000) argued that action research is a suitable method

for seeking an in-depth understanding about changes in organizational settings, but it requires confident and experienced researchers (Coughlan & Coughlan, 2002). Daniel and Wilson (2004) state that action research is a valuable method in research dealing with dynamic and turbulent environments. The action research process consists of a cycle of planning, acting, observing and reflecting (Carson *et al.*, 2001).

The first phase of the action research was to identify the core problem and to *plan* the consequences. In the case study, this phase consisted of the identification of two different business models of the case company and the creation of suitable workshop content, structure and processes for the successful analysis of the business model. The second action research step consisted of envisioning the business opportunity scalability scenarios effect on two comparative business models through several workshops, keeping mind the earlier assumptions. In the case study this phase consisted of several business modelling workshops that were organized between the years 2012 and 2015. Each workshop was recorded for research purposes and relevant materials were developed during the workshops. These materials provided the base data for the purpose of analysis. The company representatives had in-depth business knowledge and decision making power. These workshops were integral elements of the company's business model transformation process. The third step was to *collect data* and *observe* the *data* in order to form a full, integrated picture of two separate situations. This involved gathering and analyzing the data during the workshops. This consisted of recordings of the workshop sessions and documentation created presenting the results. The recorded data consisted of over 90 hours of recorded workshop activities. Part of the results that are relevant to this paper are attached in the analysis chapter. The last phase of our process was *reflecting* and *learning* from the action. This paper is an essential part of the learning process, presenting the theoretical approach adopted by the researchers, describing the methodological choices of the research, and incorporating the data and the findings of the research into a discussion on the topic of the paper. The conclusion chapter discusses our assumptions from the perspective of this research and hence furthering its information for academic research usage.

This paper seeks to answer the question, "*What are the antecedents to business model scalability in a cloud business context?*" by looking at a rather well-established Finnish technology/service -oriented case company (referred to as Alpha in this paper). The company is a service provider in the Business-To-Business (B2B) market segment, and is an entrepreneurially managed and privately owned SME that actively seeks new international customers. This case company is well suited this study due our wide business modeling work experience with their executives, and it has been using two different business models in exploiting one business opportunity. At the outset of our case study, Alpha was doing business without the cloud. During our case study process, Alpha transformed their business model towards the utilization of the cloud. Today Alpha is providing their services for their international clientele primarily through the cloud.

The reliability of the research was ensured by presenting descriptions of the action research process and the output of the organized workshops in this paper. The reliability of this study was further improved by implementing a longitudinal case study of single case company. The single case study method was selected because the business context of this specific case company was similar in comparable business models, and thus the company's management team were familiar with the business model concept and its transformation process. Since the difficulty of simultaneously participating as a change agent and a researcher has been recognized (Gummesson, 2000), we paid special attention to the researcher roles in the workshops. Carson *et al.* (2001) have pointed out that action research enables the researcher to reach a deep, rich insight and understanding of the complexities of the decision making process. Hence our access to the in-depth data through company management level workshops contribute extensively to the strength of the empirical research in this paper. The action research was constructed from several questions on issues that were relevant to potential business environment change. Our roles as researchers were not to say how the business model should or could be affected because of the environment changes, but to provide a suitable framework, working process, facilitation and avenues of thought for the participating managers.

Description and analysis of the cases

Alpha belongs to the ICT industry, has some e-business and was established as a spin-off of a larger company. Alpha specializes on providing of 3D visualization solutions for the furniture industry, serving both furniture manufacturers and retailers globally. Alpha is relatively young as a firm but it has a state-of-the-art offering that is way ahead of the traditional CAD-based 3D visualization solutions. Alpha only started to utilize cloud technology in their service offering less than two years ago when their main goal was to reach international markets. Figures 2 and 3 depict Alpha's former and current business model. Alpha's business focus has remained the same during these years, and these figures indicate that many business model building blocks changed between the years 2012 and 2015.

In the "what" section of Alpha's former business model, the customer building block includes two different types of customers. The offering block consists of Supply Chain Management (SCM) visualization Pads and Enterprise Resource Planning (ERP) integration that will be tailored to Alpha's customers on a project basis. The value proposition claims that usage of the service will boost the sales of Alpha's customers. The differentiator is the 3D visualization technology that was developed by Alpha. In the "how" section, Alpha delivers its service by SW hosting and licensing, meaning software required installation on customer's tablets or computers. Alpha's basis of advantage is its visualization technology. Key operations are product tailoring, product pricing, product development and marketing of their own products. The sales and marketing is carried out by Alpha and its distributors. In the "why" section, the cost driver

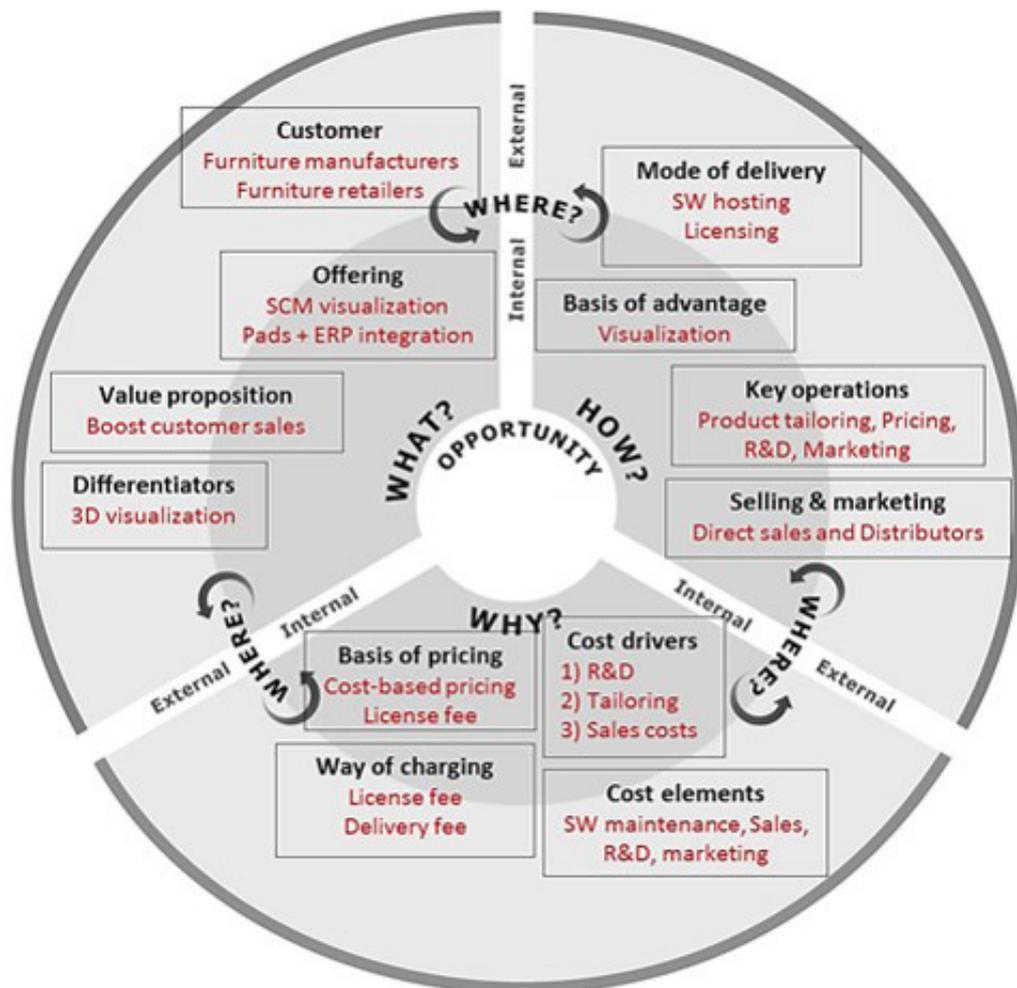


Figure 2: Alpha's former Business model in year 2012.

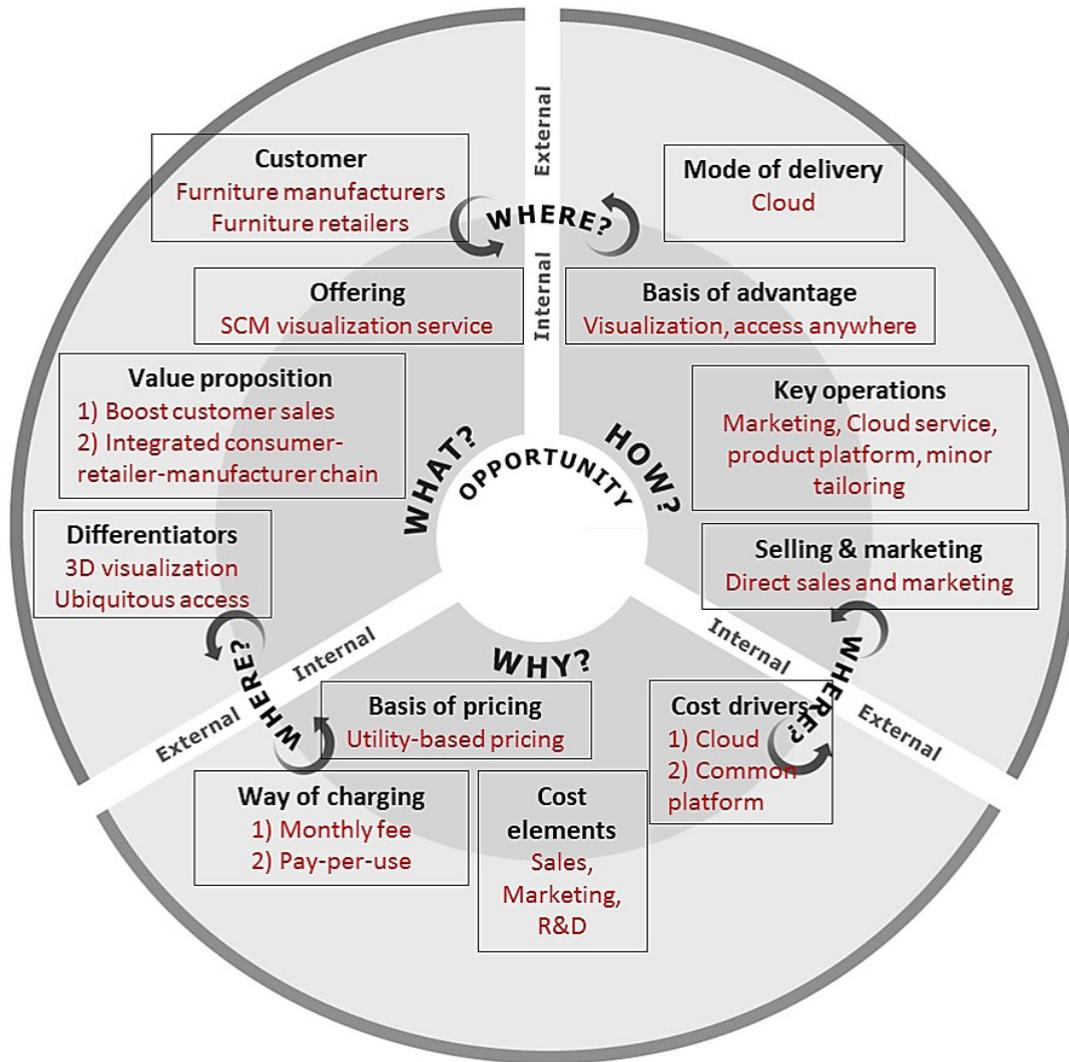


Figure 3: Alpha's current business model in year 2015.

include the cost of research and development, product tailoring and sales, and cost elements are research and development, software maintenance, sales and marketing costs. The basis of pricing comes from the cost based pricing and licence fee. Finally the way of charging can be done with license fee, or on the basis of service delivery.

In the “what” section of Alpha’s current business model, the customer building block includes two different types of customers. The offering block consists of SCM visualization service that will be available to Alpha’s customers through the cloud. The value proposition is that usage of service will boost the sales of Alpha’s customers, and usage of service will integrate the supply chain of consumer, retailer

and manufacturer. The differentiator is the 3D visualization technology and ubiquitous access through the cloud. In the “how” section, the delivery mode is the cloud, meaning that software is available in the cloud. Alpha’s basis of advantage is the visualization technology and the access anywhere through the Internet. Key operations are minor product tailoring, cloud services, product platform, and marketing of their own products. The sales and marketing is done by Alpha. In the “why” section, the cost driver is the cost of cloud and development of common platform, and cost elements are research and development, sales and marketing costs. The basis of pricing comes from the utility based pricing. And the way of charging can be done by monthly fee, or on the basis of service usage.

Table 1, 2, 3 and 4 consist of data that was derived from the workshop held with the business owners of Alpha. Table 1 contains the research data of former and current business models in scenario A - market push - vertical (existing markets or customer segment). Table 2 contains the research data of both business models in scenario B - market push - horizontal (new markets or customer segment). Table 3 contains the research data of both business models in scenario C - market pull (existing and new markets or customer segments). Finally, table 4 contains the research data of both business models in scenario D - market churn (existing and new markets or customer segments). These tables outline to what degree the contents of the building blocks of a business model are influenced by when the market size changes. This selection offers the most accurate and reliable data for analysis and discussion purposes, and thus furthers the conclusions of this research. The business model building blocks for "What" contain the offering, value proposition, customer segments and differentiation. The blocks for "How" contain key operations, the basis of advantage, mode of delivery and selling & marketing. The blocks for "Why" include the basis for pricing, ways of charging, cost elements and cost drivers. The blocks for "Where" are embedded in each of these business model specific building blocks and thus it specifies the location of the business opportunity impact (i.e., company internal, external, or both).

influenced by when the business opportunity changes due to a vertical market push (increase in existing markets or segment). It is clearly evident that the current business model is influenced less by the change in business opportunity. For instance, a business opportunity change due to a vertical market push has no impact on the business models' "what" element, but the same change does have an impact on Alpha's former business model without the cloud. Similarly the business models' "how" element remains almost untouched as the business opportunity change caused just minor changes in the mode of delivery, and thus the change is carried out by the external cloud service provider. The marketing effort of Alpha is visible in the "how" elements of both business models and is obvious as new business opportunities are sought through market growth. It is obvious that a change in business opportunity is more visible in the "how" element of the former business model because change has an influence on two additional building blocks compared to the current business model. Similarly, the business model "why" element is influenced more by the change in business opportunity. This change has an impact especially on SW maintenance and tailoring. In summary, a change in business opportunity due to a vertical market push seems to change the current business model very little compared to the former business model. Hence in contrast to the former business model the changes needed in the current business model are considered to be company external changes rather than internal ones.

Table 1 outlines to what degree the former business model and current business model of Alpha are

BUSINESS MODEL	Scenario A: "Market push - vertical" impact on	
	FORMER BUSINESS MODEL (Figure 3)	CURRENT BUSINESS MODEL (Figure 4)
WHAT SECTION		
OFFERING	MINOR CHANGE (INT)	NO CHANGE
VALUE PROPOSITION	NO CHANGE	NO CHANGE
CUSTOMER SEGMENTS	NO CHANGE	NO CHANGE
DIFFERENTIATION	NO CHANGE	NO CHANGE
HOW SECTION		
KEY OPERATIONS	CHANGE IN PRODUCT TAILORING (INT) and MARKETING (INT & EXT)	CHANGE IN MARKETING (INT & EXT)
BASIS OF ADVANTAGE	NO CHANGE	NO CHANGE
MODE OF DELIVERY	CHANGE IN SW HOSTING (INT & EXT)	MINOR CHANGE (EXT)
SELLING & MARKETING	CHANGE (INT & EXT)	CHANGE (INT & EXT)
WHY SECTION		
BASIS OF PRICING	NO CHANGE	NO CHANGE
WAY OF CHARGING	NO CHANGE	NO CHANGE
COST ELEMENTS	BIG CHANGE IN SW MAINTENANCE (INT), MINOR CHANGE IN SALES (EXT), CHANGE IN MARKETING (INT & EXT)	NO CHANGE
COST DRIVERS	CHANGE IN TAILORING (INT), CHANGE IN SALES COSTS (INT & EXT)	CHANGE IN CLOUD (EXT)

Table 1: The impact of change in business opportunity on Alpha's business models in scenario A.

BUSINESS MODEL	Scenario B: "(Market push - horizontal)" impact on	
	FORMER BUSINESS MODEL (Figure 3)	CURRENT BUSINESS MODEL (Figure 4)
WHAT SECTION		
OFFERING	CHANGE IN Pads + ERP integration (INT)	MAYBE MINOR CHANGE (INT)
VALUE PROPOSITION	NO CHANGE	NO CHANGE
CUSTOMER SEGMENTS	POSSIBLE CHANGE	POSSIBLE CHANGE
DIFFERENTIATION	NO CHANGE	NO CHANGE
HOW SECTION		
KEY OPERATIONS	BIG CHANGE IN PRODUCT TAILORING (INT), CHANGE IN PRICING (INT), CHANGE IN R&D (INT), CHANGE IN MARKETING (INT & EXT)	MINOR CHANGE IN PRODUCT PLATFORM (INT or EXT), CHANGE IN MARKETING (INT & EXT)
BASIS OF ADVANTAGE	NO CHANGE	NO CHANGE
MODE OF DELIVERY	BIG CHANGE IN SW HOSTING (INT & EXT), CHANGE IN LICENSING (INT & EXT)	CHANGE IN CLOUD (EXT)
SELLING & MARKETING	BIG CHANGE IN DIRECT SALES & DISTRIBUTION (INT & EXT)	BIG CHANGE IN DIRECT SALES & DISTRIBUTION (INT & EXT) NOTE REQUIRE DISTRIBUTION
WHY SECTION		
BASIS OF PRICING	CHANGE IN LICENCE (INT)	NO CHANGE
WAY OF CHARGING	NO CHANGE	NO CHANGE
COST ELEMENTS	BIG CHANGE IN SW MAINTENANCE (INT & EXT), BIG CHANGE IN SALES (INT & EXT), CHANGE IN R&D (INT), CHANGE IN MARKETING (INT & EXT)	BIG CHANGE IN SALES (INT & EXT), CHANGE IN R&D (INT), CHANGE IN MARKETING (INT & EXT)
COST DRIVERS	CHANGE IN R&D (INT), CHANGE IN TAILORING (INT & EXT), CHANGE IN SALES COSTS (INT & EXT)	CHANGE IN CLOUD (EXT), CHANGE IN COMMON PLATFORM (INT)

Table 2: The impact of change in business opportunity on Alpha's business models in scenario B.

Table 2 outlines to what degree the former business model and current business model of Alpha are influenced by when the business opportunity changes due to a horizontal market push (increase in new markets or segment). The change in opportunity due to a horizontal market push has almost the same impact on both business models' "what" element, but the business model changes in the "how" and "why" elements are more substantial in the former business model. For instance, the key operations and mode of delivery require a big change in the former business model, but the current business model unravels with minor changes. Similarly, the former business model requires more changes in the basis of pricing, cost drivers and cost building blocks. In both business models, selling and marketing requires a major changes and marketing costs influenced the cost elements building block. Hence the current business model requires a distribution building block to ensure market growth in a new market location. Even though the changes are now more equal between the two business models of Alpha, it is evident that the current business model is influenced less by the same change in business opportunity.

Table 3 outlines to what degree the former business model and current business model of Alpha are impacted when the business opportunity changes due to a market pull (increase in both existing and new

markets or segment). When the opportunity changes due to a market pull, it causes almost the same impact on both business models' "what" element, and the business model changes needed are rather large. Further, the changes in the key operations and mode of delivery for the former business model are large, but the same changes in the business model building block in the current business model are relatively small. In the same way as with scenario B, the current business model requires a new distribution building block to support geographical market growth. Interestingly in both business models, the key operations require a new financial building block. The financial building block is to support the cost building block that is impacted a lot in both business models. In both business models the changes in the cost elements building block are big, and R&D and sales are especially affected by this new business opportunity. Again, the current business model changes are less noticeable in the business model "why" element because the basis of pricing and way of charging remain the same. Furthermore, the cost driver changes are small compared to the former business model. Hence the changes are just external and the change in common platform is not yet certain. Even though the changes are now more radical in both business models, it is still evident that the current business model is impacted less by the same business opportunity change.

BUSINESS MODEL	Scenario C: "Market pull" impact on	
	FORMER BUSINESS MODEL (Figure 3)	CURRENT BUSINESS MODEL (Figure 4)
WHAT SECTION		
OFFERING	BIG CHANGE IN SCM VISUALIZATION and Pads + ERP INTEGRATION (INT)	BIG CHANGE IN SCM VISUALIZATION SERVICE
VALUE PROPOSITION	BIG CHANGE (EXT)	BIG CHANGE (EXT)
CUSTOMER SEGMENTS	CHANGE (EXT)	CHANGE (EXT)
DIFFERENTIATION	NO CHANGE	NO CHANGE
HOW SECTION		
KEY OPERATIONS	BIG CHANGE IN PRODUCT TAILORING (INT), BIG CHANGE IN PRICING (INT), BIG CHANGE IN R&D (INT), NEW FINANCE ELEMENT IS NEEDED (EXT)	NEW PRICING ELEMENT IS NEEDED (INT), NEW FINANCE ELEMENT IS NEEDED (EXT)
BASIS OF ADVANTAGE	NO CHANGE	NO CHANGE
MODE OF DELIVERY	BIG CHANGE IN SW HOSTING (INT & EXT), BIG CHANGE IN LICENSING (INT & EXT)	CHANGE IN CLOUD (EXT)
SELLING & MARKETING	BIG CHANGE IN SALES (INT or EXT)	MINOR CHANGE IN MARKETING BIG CHANGE IN SALES (INT & EXT) NEW DISTRIBUTION ELEMENT IS NEEDED (EXT)
WHY SECTION		
BASIS OF PRICING	BIG CHANGE IN COST-BASED PRICING (INT), NEW VALUE BASED PRICING ELEMENT IS NEEDED	NO CHANGE
WAY OF CHARGING	CHANGE IN LICENCE FEE (INT), CHANGE IN DELIVERY FEE (INT)	NO CHANGE
COST ELEMENTS	BIG CHANGE IN SW MAINTENANCE (INT & EXT), BIG CHANGE IN SALES (INT & EXT), BIG CHANGE IN R&D (INT & EXT), MARKETING IS SAME OR EVEN REMOVED	BIG CHANGE IN SALES (INT & EXT), BIG CHANGE IN R&D (INT & EXT), MARKETING IS SAME OR EVEN REMOVED
COST DRIVERS	BIG CHANGE IN R&D (INT & EXT), BIG CHANGE IN TAILORING (INT & EXT), BIG CHANGE IN SALES COSTS (INT & EXT)	CHANGE IN CLOUD (EXT), POSSIBLE BIG CHANGE IN COMMON PLATFORM (INT)

Table 3: Business opportunity change impact on Alpha's business models in scenario C.

Table 4 outlines to what degree the former business model and current business model of Alpha are impacted when the business opportunity changes due to market churn (decrease in both existing and new markets or segment). When the opportunity changes due to market churn, it has equal impact on both business models' "what" element. All the business model elements require a change, and all the changes are big.

Additionally, the business model changes in the "how" and "why" elements are broad in both business models. Only the basis of pricing and way of charging building blocks in the current business model remain the same, otherwise all elements are impacted by the change in business opportunity. In this scenario the changes in both business models have become revolutionary and thus it is meaningless to make any comparison in detail.

BUSINESS MODEL	Scenario D: "Market churn" impact on	
	FORMER BUSINESS MODEL (Figure 3)	CURRENT BUSINESS MODEL (Figure 4)
WHAT SECTION		
OFFERING	BIG CHANGE (INT)	BIG CHANGE (INT)
VALUE PROPOSITION	BIG CHANGE (INT)	BIG CHANGE (INT)
CUSTOMER SEGMENTS	POSSIBLE BIG CHANGE (INT)	POSSIBLE BIG CHANGE (INT)
DIFFERENTIATION	BIG CHANGE (INT)	BIG CHANGE (INT)
HOW SECTION		
KEY OPERATIONS	POSSIBLE BIG CHANGES IN EVERY ELEMENT (INT & EXT)	POSSIBLE BIG CHANGES IN EVERY ELEMENT (INT & EXT)
BASIS OF ADVANTAGE	MAJOR CHANGE (INT)	MAJOR CHANGE (INT)
MODE OF DELIVERY	NO CHANGE	NO CHANGE
SELLING & MARKETING	POSSIBLE BIG CHANGES IN EVERY ELEMENT (INT & EXT)	POSSIBLE BIG CHANGES IN EVERY ELEMENT (INT & EXT)
WHY SECTION		
BASIS OF PRICING	CHANGE (INT)	NO CHANGE
WAY OF CHARGING	CHANGE (INT)	NO CHANGE
COST ELEMENTS	BIG CHANGE IN R&D and MARKETING (INT & EXT), CHANGE IN SALES (INT)	BIG CHANGE IN R&D and MARKETING (INT & EXT), CHANGE IN SALES (INT)
COST DRIVERS	BIG CHANGE IN R&D (INT), NEW MARKETING ELEMENT IS NEEDED (INT & EXT)	NEW R&D ELEMENT IS NEEDED (INT & EXT)

Table 4: The impact of change in business opportunity on Alpha's business models in scenario D.

Discussion

In the situation of a change in business opportunity due to a *vertical market push* (scenario A), our research indicates that the market push in a vertical market requires the least business model element changes, and thus seems to be the easiest way to grow the market size of a firm. The same results are visible in both Alpha's business models, where the current business model with the cloud requires almost no business model element changes and far fewer changes than the former business model. For these reasons the current business model is more scalable than the former business model in the case of vertical market push.

In the situation of changes in business opportunity due to *horizontal market push* (scenario B), our research indicates that market push in a horizontal market requires more business model element changes than scenario A. The results remain the same in both Alpha's business models, though now in this case the current business model elements also require some changes. It seems that the cloud offers easy delivery, but new market entry requires local support in marketing and sales activities. Therefore Alpha needs to add one additional business model building block into selling and marketing element. Furthermore, new markets seem to require some product changes due to specific local customer needs. In the current business model, market specific product changes are hard to make as Alpha now operates with one common product platform. Even though the change in the former business model is bigger in terms of the number of business model elements, their product is tailored according to customer requirements and thus the new market entry is similar to their existing business operations. To conclude scenario B, we note that the cloud improves the scalability of the business model and thus the current business model is more scalable than the former business model in the case of vertical market push. New markets require local presence in sales and marketing and some level of product tailoring for the new market location.

In the situation of business opportunity change due to *market pull* (scenario C), our research indicates that market pull requires many changes in the business model. For instance, it caused major changes in value proposition, offering and sales in both business models of Alpha. Interestingly in both models key operations

required the finance building block because the cost elements were impacted so heavily in both cases. Again in this scenario the current business model requires fewer changes than the former business model, but the results are not that evident as both business models require multiple changes in every element. The big difference is that most of the current business model changes were external, and the former business model changes were more internal. Similarly to scenario A and B, the current business model did not require changes in the mode of delivery, way of charging or the basis of pricing elements. To conclude scenario C, we note that because of the cloud the current business model is more scalable than the former business model in case of market pull. Similarly to scenario C, new markets require local presence in sales and marketing and some level product tailoring for the new market location. Additionally, finance is one of the key activities in both business models.

In the situation of change in business opportunity due to *market churn* (scenario D), our research indicates that market churn requires big changes in every element and almost every building block of both business models. In scenario D, the only mode of delivery remains the same in both business models, and the basis of pricing and way of charging remain untouched in the current business model. Interestingly scenario D requires a big change in the offering, value proposition and differentiation building blocks. As the business model innovation focuses on changing the value delivery system of the firm (Mitchell & Coles, 2004) and thus the value proposition needs change, our research indicates that scenario D requires business model innovation. Since a business model is created to take advantage of an opportunity (Zott & Amit, 2010), the firm must seize a new business opportunity.

Conclusions

This study discusses the antecedents to business model scalability for a software oriented company by using a business model as the unit of analysis from the standpoint of change in business opportunity. We reviewed business opportunity and scalability literature, and adopted a framework that uses market and business opportunity as the central point in understanding the antecedents to business model

scalability. Similarly, we reviewed a business model and some business model transformation literature, especially the literature on business model scalability. We created a framework for business model scalability (Figure 4) during our research process. For instance, Doganova and Eyquem-Renault (2009) use a business model as a scale model for analyzing markets for new ventures. The firm's product market strategy and its business model are distinct constructs that affect the firm's market value (Zott & Amit, 2008) and market capitalization can be regarded as a variable for the scalability of firm (Easton & Sommers, 2003). Hence, in our framework market change is the main variable of the business environment.

Wirtz & Daiser (2017) defines a framework for the business model innovation that consists of environmental (e.g., industry/market shifts) and central (e.g., target group/customers) business model dimension elements. Similarly, our framework notes that the change needs for a business model might come from outside or inside the company. In the framework the inside change need takes the form of a market push or market churn, and the outside need is instigated by market pull or market churn. Hence the change need is determined by the change in the business environment, and thus it is a limiting (-) or enabling (+) factor for the business opportunities of the firm. Our research indicates that market push in a vertical market requires only slight business model changes, market push in a horizontal market requires a bigger business model

change, while market pull requires a tremendous business model change, and market churn requires so massive business model changes that it supports the establishment of entire new business opportunity and also a business model.

The business model is about value creation and capture (e.g., Zott & Amit 2009, Baden-Fuller & Morgan 2010) and the business model synchronizes to the business opportunity in a given context (e.g., Bock & George 2011, Amit & Zott 2001, Leih, *et al.* 2014). Hence we see *business opportunities as choices regarding attempted value creation and capture*. In line with the argument that *"...competitive advantage can emerge from superior product market positioning, as well as from the firm's business model"* (Zott & Amit, 2008:20) and *"the market-focused strategic flexibility is enabling firms to take advantage of opportunities as they rise"* (Johnson, *et al.* 2003: 83), we reason that a competitive advantage reflects a fit between the market position and business model. Market-focused, strategic flexibility enables a firm to make its own opportunities and thus generate a competitive advantage by being proactive in the markets (Johnson, *et al.* 2003). Hence the scalability of the business model enables market-focused strategic flexibility, and thus firms can quickly choose new business opportunities. Johnson, *et al.* state that, *"The effectiveness of market-focused strategic flexibility depends on the firm's extent and approach to (driven versus driving) market orientation, along with the environment in which the firm operates"* (2003: 87).

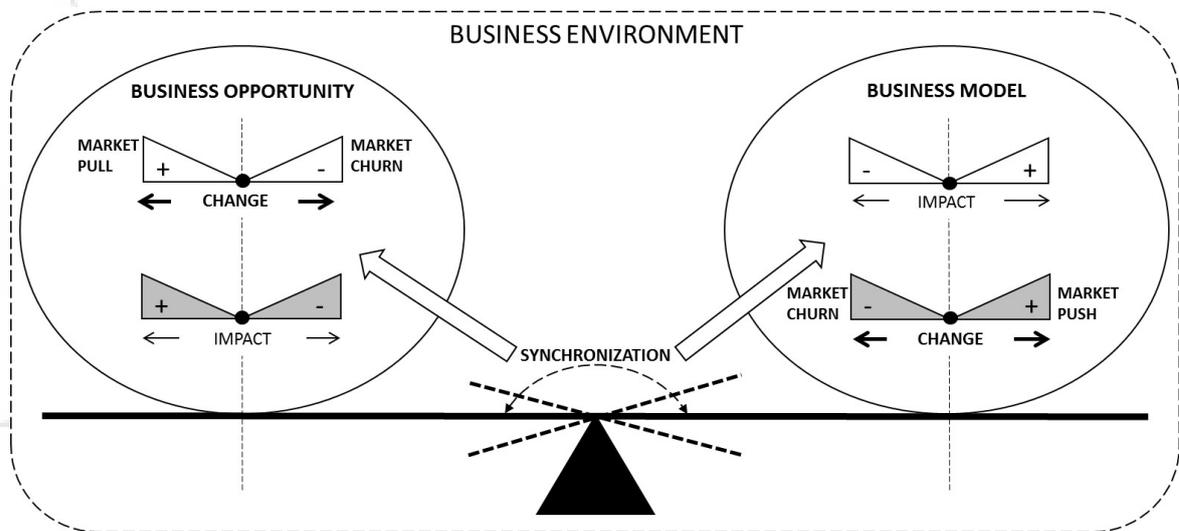


Figure 4: A framework for business model scalability.

Similarly, we argue that not all the market changes are a firm's own choices, instead market pull and market churn are caused by market changes in the business environment. This change influences the business model, and thus the business opportunity is synchronized against a new business model.

Similarly to Stampfl *et al.* (2013) and Bouwman & MacInnes (2006), our research scenarios A, B and C show that the scalability of business models have a positive influence on company growth. Furthermore, similarly to Zalewska-Kurek *et al.* (2016: 61), our research scenarios A, B and C show that changing the mode of delivery from the private SW installations to cloud service have positive influence on market growth. Our research scenario D shows that without a sufficiently scalable business model the firm must choose new business opportunities, and hence develop a new business model. From the business model perspective, our research supports the argument put forward by Demil & Lecocq (2010: 227) that a business model concept represents a transformational approach, where the business model is considered as a tool to address change. Hence our research shows that business models work as a boundary-spanning unit of analysis (e.g., Sosna *et al.* 2010, Amit & Zott 2012). Similarly to Leih *et al.* (2014), our research indicates that a business model transformation can change the boundaries of the firm. In line with Zott & Amit (2008: 19), we explore the fit between a firm's business level market strategy and the design themes of its business model. Our research also supports Sosna *et al.* (2010) in that changes in markets can make an existing business model obsolete or less profitable. To continue in line arguments put forward by Zott & Amit (2008: 19) that firm's market strategies and business models are distinct constructs that affect the market value of firm, we see that *potential market size and its scalable business model are distinct constructs that affect the market value of firms*. This would explain the precious market value of former Internet start-ups such Facebook, Groupon and Salesforce.com.

As the dynamic capability approach focuses attention on the firm's ability to renew its resources in line with changes in its environment (Bowman & Ambrosini, 2003), we see scalability unfolding in business models in context through dynamic capabilities. Our research shows that the antecedents to business model scalability through the cloud include resource pooling, on-demand availability, pay-per-use pricing, and ubiquitous access (c.f., Ahokangas *et al.*, 2014). Besides the cloud, we identified new antecedents of business model scalability as: *the flexible presence of local sales and marketing resources, a flexible product platform and flexible financial resources*. With these antecedents, the firm increases the scalability of its business model and thus the dynamic capability of firm. Looking from the dynamic capabilities perspective (e.g., Teece & Pisano 1994, Teece, Pisano & Shuen 1997, Eisenhardt & Martin 2000), we argue that *the scalability of the business model fundamentally stems from the synchronization of a business model to the respective business opportunity*.

The positive feedback provided by the study participants of firm, Alpha, about our framework, shows they see that the usage of this framework as a tool will elaborate their future scenario planning especially when the firm is planning a horizontal market push (for new markets or customer segment). Just a limited amount of research has been conducted so far on how changes in market based business opportunities affect the business model of the firm. Further studies may involve and compare start-ups and large multinational organizations, for instance, in the ICT segment, and thus reveal why startups are more scalable or not. In this study, we have offered some of the foundations necessary to productively explore these new avenues for research. The limitation of this study is the qualitative single case study method employed. With this method, broad generalizations cannot be made and different approaches, such as utilizing quantitative research, are required to build a more comprehensive view.

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Business Model Innovation Processes: A Systematic Literature Review

Bernd W. Wirtz¹ and Peter Daiser²

Abstract

Purpose: The starting point of this study is the heterogeneously dispersed knowledge on the business model innovation (BMI) process. To accelerate the development of this topic in research and practice, the study explores insights concerning the BMI process to enhance our understanding about this phenomenon and to present a helpful guidance for researchers and practitioners.

Design/Methodology/Approach: Given the study design (systematic review), we conducted a literature-based investigation to identify important insights on the BMI process in the literature and derive a generic BMI process from the findings.

Findings: Our findings underline the heterogeneous structure of BMI process knowledge in the literature. Furthermore, we could detect several content-related and scope-related differences between existing BMI processes and derive seven generic BMI process steps: Analysis, Ideation, Feasibility, Prototyping, Decision-making, Implementation, and Sustainability.

Practical Implications: The literature review provides researchers and practitioners with a clear guidance on the BMI process literature and the seven generic BMI process phases serve as a blueprint for BMI initiatives in research and management.

Research Limitations: Given the amount of academic journals, it is unlikely that every applicable scientific publication is included.

Originality/Value: The study's main contribution lies in the unifying approach of the dispersed knowledge on the BMI process. Since our understanding of the BMI process is still limited, this study should provide further insights that support the development of the concept and guide its practical application.

Keywords: Business model innovation; framework; elements; factors; conceptual study

Please cite this paper as: Wirtz, B.W. and P. Daiser (2018), Business Model Innovation Processes: A Systematic Literature Review, Journal of Business Models, Vol. 6, No. 1, pp. 40-58

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Introduction

Business model innovation (BMI) is a prominent topic in science and management. In particular because BMI is considered an effective and efficient form of innovation (Chesbrough, 2007; Wirtz *et al.*, 2016a) that deals with new ways to organize business and which is directly linked with sustainable competitive advantage—if implemented successfully (Mitchell and Coles, 2003; Casadesus-Masanell and Zhu, 2013; Massa and Tucci, 2014). Furthermore, BMI allows companies to quickly adjust to market changes and to survive and prosper within today's dynamic and competitive business environment (Johnson *et al.*, 2008; Kastalli and van Looy, 2013).

A key benefit of BMI, which can be understood as an activity of modifying an existing business model or designing and implementing a new business model (Massa and Tucci, 2014), is that it sheds light on identifying new value propositions to generate revenues and to find new ways to create and capture value for its stakeholders (Amit and Zott, 2001; Magretta, 2002; Teece, 2010). Despite the topic's academic and managerial importance, our understanding on BMI is still limited (Bocken *et al.*, 2014; Wirtz *et al.*, 2016b; Foss and Saebi, 2017) and managers lack appropriate frameworks and tools that support them in their BMI endeavors (Taran *et al.*, 2016).

So far, scientific BMI knowledge has developed largely in silos (Zott *et al.*, 2011) and is dispersed across various fields (Schneider and Spieth, 2013; Massa *et al.*, 2017). Given the heterogeneous structure of BMI knowledge, several contributions in the scholarly literature recommend a consolidating research approach that fosters a common understanding of important BMI concepts and that has the potential to accelerate BMI development in research and practice (e.g., Boons and Lüdeke-Freund, 2013; Massa and Tucci, 2014; Bocken, 2015; Carayannis *et al.*, 2015).

According to the literature, the BMI process is a vital BMI concept (Schneider and Spieth, 2013; Wirtz *et al.*, 2016a; Foss and Saebi, 2017) and a fiercely debated research topic (cf. Pynnönen *et al.*, 2012; Sinfield *et al.*, 2012; Frankenberger *et al.*, 2013; Wirtz and Daiser, 2017). Since our analysis of the literature showed that research on the BMI process mainly consists of

widely-dispersed, independently developed exploratory studies, a unification of the scattered knowledge on the BMI process—following the previous recommendations in the literature concerning a consolidating approach—contributes to building a common foundation and accelerate the topic's development (cf. Boons and Lüdeke-Freund, 2013; Massa and Tucci, 2014; Bocken, 2015; Carayannis *et al.*, 2015). Moreover, providing further insights on the BMI process supports researchers and practitioners in scholarly and managerial BMI endeavors since the BMI process can be applied as a procedural framework for BMI.

Since there is—to the best of our knowledge—no study available that brings together the wide-spread insights on the BMI process, this investigation systematically analyzes extant research on the BMI process to contribute to academia and management by consolidating existing insights and by deriving a generic BMI process that can be used as a blueprint for BMI endeavors in research and practice. This way, this study explicitly addresses the call for research of Schneider and Spieth (2013, 23) concerning the need for further studies that “create a better understanding of the potential process and elements of business model innovation” and also contributes to an editorial question of a recent special issue on BMI, how a transformation of existing business models can “be organized to lead companies to success?” (Lüttgens and Montemari, 2016, p. 1). In addition, the generic BMI process can serve as a guideline to structure BMI initiatives.

As extant scholarly literature provides a wealth of information on the process of BMI that is dispersed across various fields and sources, we chose to address this issue by conducting a literature-based analysis of scholarly publications bringing together available insights and consolidating them into a generic BMI process. By aggregating and integrating existing knowledge on the BMI process, the study supports the recommended consolidating research approach and also provides a handy knowledge collection on the process of BMI for managers. To achieve these aims, the study continues as follows: In the upcoming section we explain the study approach and outline the current state of research. Next, we present the results of the literature analysis, which serve as a basis to deduce the generic BMI process in the following section. Finally,

the discussion and conclusions section summarizes the findings, implications, and limitations of the study and suggests directions for future research.

Methodology

Given the research aim of this study, to scrutinize scholarly literature on the BMI process to identify elements, patterns, and structures as well as to aggregate and integrate existing insights on the BMI process, we chose a systematic literature review approach since it is regarded the ideal method for this type of research problem (Tranfield *et al.*, 2003). A systematic literature review is characterized by a clearly formulated research target, a reproducible, transparent approach, a wide-ranging identification of available literature, as well as a systematic evaluation and synthesis of the relevant study content (Khan *et al.*, 2003; Rousseau *et al.*, 2008; Fink, 2014). We started the literature analysis by conducting a title and abstract search in peer-reviewed academic journals via EBSCOhost using the databases 'Academic Search Complete' and 'Business Source Complete' (search term: "business model innovation" OR "business model evolution" OR "business model development" OR "business model dynamics" OR "business model reinvention" OR "business model innovation process" OR "business model change"). We favored the database approach since the literature on BMI is dispersed across various fields and disciplines. Scrutinizing these publications allowed us to identify 20 studies that explicitly deal with the BMI process.¹

Business Model Innovation Processes in the Scholarly Literature

Developing a process of BMI has been an important element of BMI research. In total, we could identify 20 distinctive approaches that differ in content, procedure, and scope, showing that there are various ways how people have handled BMI so far. The identified BMI processes are presented in Figure 1.

¹ Since we could identify more BMI process publications with the chosen approach than a recent BMI literature review (cf. Wirtz *et al.* (2016a), which clustered BMI research into BMI subfields and assigned 15 publications to the subfield BMI process, we assume that the set of articles assures a meaningful census of the literature on the process of BMI.

The first difference we noticed is the varying number of process steps, which fluctuate between three and ten. The BMI process of Lindgardt *et al.* (2009), for instance, uses three process steps ("Uncover opportunities", "Implement new business model", and "Build platform and skills") at a rather abstract level, while the BMI process of Pramataris *et al.* (2001) consists of ten activity-oriented process steps.

The second difference that came to our attention is the difference in orientation and focus of the identified BMI processes. While some processes are rather BMI design-oriented, other processes focus on the operations of BMI. The BMI process of Voelpel *et al.* (2004), for instance, concentrates on the activities that should be conducted to successfully redesign a business model. Therefore they propose four steps: (1) Sensing potential for change in customer behavior and new customer value propositions, (2) Sensing the strength, direction and impact of technology, (3) Sensing the potential for value system (re)configuration, including organizational structure(s), and (4) Sensing the economic feasibility and profitability of the proposed business model. In contrast, the six step BMI process of Amit and Zott (2012) shows a straightforward focus on operations: (1) Analyze customer needs, (2) Business model content innovation, (3) Business model structure/government innovation, (4) Checking value creation through novel business model, (5) Defining Revenue Models, and (6) Launching model.

Linder and Cantrell (2000) elaborate on the related general steps of identifying the current business model, how to develop new business models and, lastly, implement the desired change of these business models. Similarly, Deloitte (2002, p. 20) define the BMI process steps of scan & scope, rethink & redesign, as well as plan & implement. Both studies present a cross-industry approach. Pramataris *et al.* (2001) follow a different path. They present a rather fine-grained BMI process, which consists of a sequence of ten steps and intends to facilitate BMI "under the influence of digital interactive television in the advertising industry" (Pateli and Giaglis, 2005, p. 169).

Pateli and Giaglis (2005) build their BMI process upon the work of Pramataris *et al.* (2001). They suggest a first process phase of understanding and documenting the

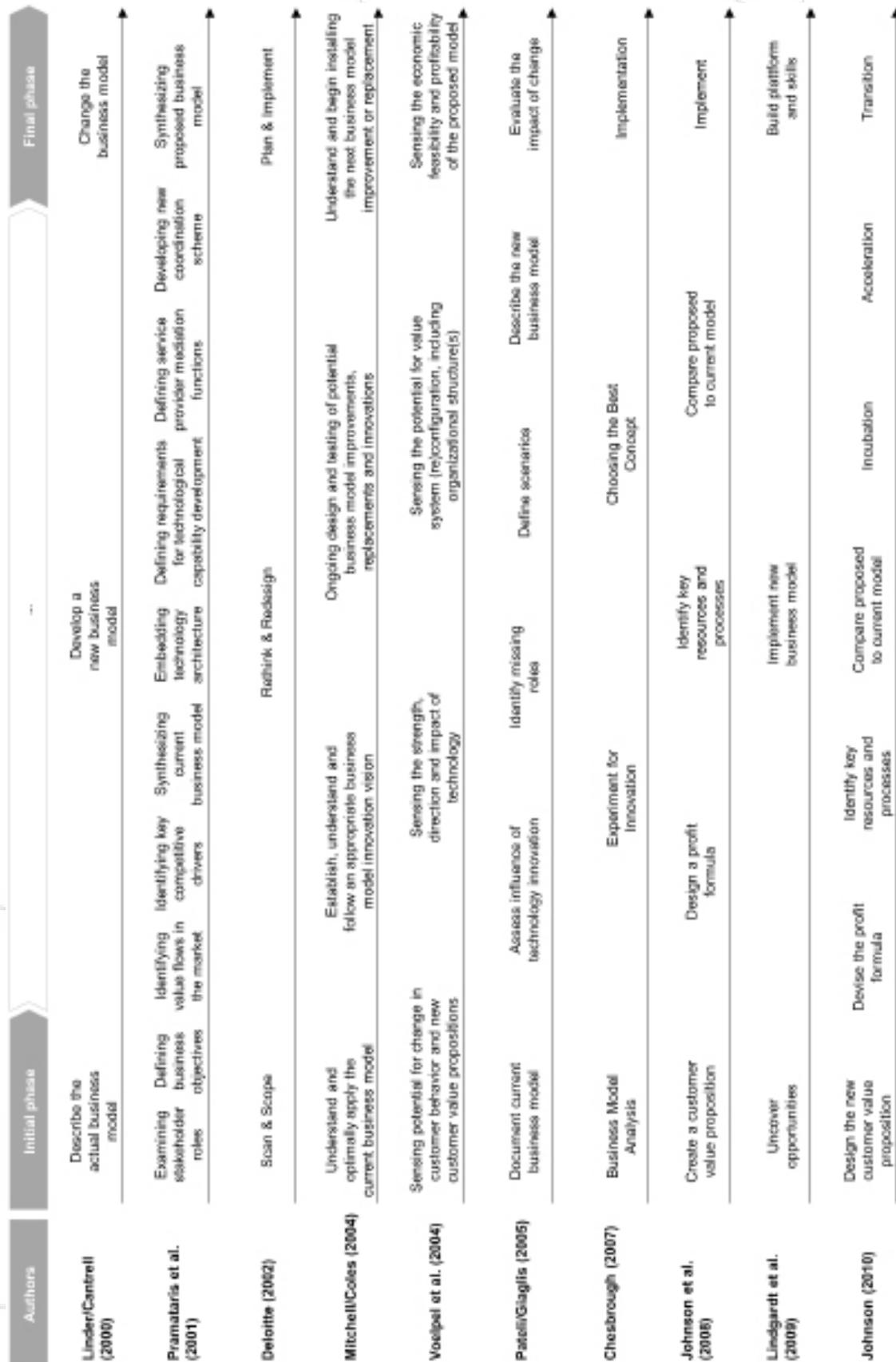


Figure 1: Identified business model innovation processes

current business model. In the subsequent phase, they explicitly refer to the influence of technology, which, for example, should be assessed to identify missing roles/functions. Pateli and Giaglis (2005) also suggest to use scenario planning to define different scenarios from which management should choose the preferred option. Their process closes with the evaluation of the impact of the proposed BMI.

The recommendation to define scenarios for alternative configurations of BMI can also be found in the BMI processes of Chesbrough (2007), Osterwalder *et al.* (2010), and Wirtz (2011). These authors suggest that the final selection of a BMI should be preceded by a kind of experimentation phase, which serves the purpose to design, evaluate, and test different business models or business model options. Johnson *et al.* (2008) presents a clear road map for reinventing business models which involves the steps of developing a particular value proposition, constructing a related profit formula, identifying key resources and processes, and comparing the new model to the current one in order to know which way to go and to implement the new business model.

Two years later, Johnson (2010) breaks down the implementation step to incubation, acceleration, and transition. He explains incubation as a process that, in a first step, identifies the business assumptions that are most critical to the success of the business and, in a second step, systematically tests them to evaluate their viability. If the new business model is viable, the BMI process should enter the acceleration phase, meaning that activities and processes should become standardized and multipliable to quickly expand the new business model. The transition phase applies only to incumbent businesses since it deals with the integration of the new business model into existing structures.

The BMI processes of Mitchell and Coles (2004), Lindgardt *et al.* (2009), Johnson (2010), Osterwalder *et al.* (2010), Sosna *et al.* (2010), Teece (2010), and Wirtz (2011) go beyond the execution phase of the new business model since they explicitly suggest post-implementation process steps. Sosna *et al.* (2010), for instance, use a case study to exemplify the BMI process. Their BMI process starts with business model design and testing and—if tested successfully—hands over to business

model development. In a similar fashion like the acceleration phase, as recommended by Johnson (2010), they propose to scale up the refined business model. In their final BMI process step, however, Sosna *et al.* (2010) suggest a phase of organization-wide learning to sustain the growth of the new business model, which can be partly compared to the approach of Lindgardt *et al.* (2009), who recommend to build a platform and the skills necessary after the implementation of the novel business model.

While Teece (2010) also includes a post-implementation phase in his BMI process, he places special emphasis on the implementation of isolating mechanisms to block or at least hinder imitation by competitors as well as disintermediation by customers and suppliers. Osterwalder *et al.* (2010) introduce management-oriented process phases of assembling all needed elements, analysis of these elements, generate and test different business model options as well as selecting the best, implement the selected business model prototype in the field and, lastly, manage—adapt and modify—the business model if needed. This is comparable to Wirtz (2011) who likewise stresses the importance of alternatives in the prototyping phase of the business model design process (idea generation, feasibility study, prototyping, decision-making), but additionally illustrates the subsequent phases of implementation and controlling.

Frankenberger *et al.* (2013) offer a “structured view on process phases and challenges” (p. 249) including initiation, ideation, integration, and implementation (see also Gassmann *et al.*, 2014), whereas Enkel and Mezger (2013) present a strongly reduced process version of design and implementation. Yang *et al.* (2014) address the BMI process rather from a conceptual perspective by presenting generic BMI process steps that are used to illustrate the BMI procedure within their framework.

When looking at the research approaches of the publications, all of them show an exploratory research design. Of the 20 publications, 11 are conceptual and 9 empirical. All empirical studies are of qualitative nature, using interviews—and in 5 cases also a case study approach—to collect the insights for the analysis. The research approaches of the identified publications are summarized in Table 1.

Authors	Research class	Research type	Research design	Key methodical aspects
Linder and Cantrell, 2000	Conceptual	-	Exploratory	Logical reasoning and case examples
Pramataris et al., 2001	Conceptual	-	Exploratory	Literature and logical reasoning
Deloitte, 2002	Conceptual	-	Exploratory	Logical reasoning and case examples
Mitchell and Bruckner Coles, 2004	Conceptual	-	Exploratory	Literature and logical reasoning
Voelpel et al., 2004	Conceptual	-	Exploratory	Literature and logical reasoning
Pateli and Giaglis, 2005	Empirical	Qualitative	Exploratory	Literature, logical reasoning, and interviews
Chesbrough, 2007	Conceptual	-	Exploratory	Logical reasoning and case examples
Johnson et al., 2008	Conceptual	-	Exploratory	Logical reasoning and case examples
Lindgardt et al., 2009	Conceptual	-	Exploratory	Logical reasoning
Johnson, 2010	Conceptual	-	Exploratory	Logical reasoning and case study examples
Osterwalder et al., 2010	Empirical	Qualitative	Exploratory	Literature, logical reasoning, case study, and interviews
Sosna et al., 2010	Empirical	Qualitative	Exploratory	Literature, logical reasoning, case study, and interviews
Teece, 2010	Conceptual	-	Exploratory	Literature, logical reasoning, and case examples
Wirtz, 2011	Conceptual	-	Exploratory	Literature, logical reasoning, and case examples
Amit and Zott, 2012	Empirical	Qualitative	Exploratory	Literature, logical reasoning, case examples, and interviews
Pynnönen et al., 2012	Empirical	Qualitative	Exploratory	Literature, logical reasoning, case examples, and interviews
Enkel and Mezger, 2013	Empirical	Qualitative	Exploratory	Literature, logical reasoning, case studies, and interviews
Frankenberger et al., 2013	Empirical	Qualitative	Exploratory	Literature, logical reasoning, case examples, and interviews
Gassmann et al., 2014	Empirical	Qualitative	Exploratory	Literature, logical reasoning, case examples, and interviews
Yang et al., 2014	Empirical	Qualitative	Exploratory	Literature, logical reasoning, and case study

Table 1: Research approaches of the identified publications

Our findings of the literature review underline the previously mentioned heterogeneous diffusion of BMI knowledge (e.g., Boons and Lüdeke-Freund, 2013; Massa and Tucci, 2014; Carayannis *et al.*, 2015; Wirtz *et al.*, 2016a). While we found a wealth of knowledge on the BMI process, this knowledge shows a high degree of independent development and is mostly scattered in different areas of application and/or different fields of research, supporting the statement of Zott *et al.* (2011, p. 1019) that the literature on BMI “is developing largely in silos”. Furthermore, the analysis of the identified publications showed that the BMI process field is so far entirely build upon exploratory research. From the findings of the literature-based analysis, we derive a generic perspective of the BMI process in the following.

Generic BMI process perspective

To detect generic aspects and common features of the identified BMI processes, we scrutinized the BMI processes on process step level. For this purpose, we followed a three-stage approach: We examined the descriptive content of each process step (1) and arranged them in chronologically order (2). Next, we—based on the content and sequence of the respective process step—formed process step clusters (3) that summarize the process-step-related findings of the identified BMI processes, and thus, support a unified approach by providing harmonized insights with regard to a generic BMI process.

As with any classification approach, the forming of clusters according to common criteria is also a key challenge of this literature-based analysis. This task usually requires multiple cycles of denominating and aggregating particular characteristics and synthesizing them into a reasonable set of clusters that provide a clear and transparent picture of the subject. While this approach—by its very nature—leads to a loss of information, this limitation of literature-based analyses is generally acceptable if the gain in transparency and unification of insights outweighs the constraints (Webster and Watson, 2002).²

² The BMI process step clusters of the generic BMI process are referred to as BMI process phases in the following.

From a chronological sequence, the first BMI process phase, which we identified, is the phase Analysis. The BMI process of Linder and Cantrell (2000), for instance, starts with the description of the actual business model. Similarly, Pateli and Giaglis (2005) recommend to document the current business model and Chesbrough (2007) proposes to start BMI with a business model analysis. From a content perspective, these steps clearly overlap with the analysis activities that are suggested by other authors. For example, the initial phase of Deloitte (2002) is used to scan and scope the current situation, Amit and Zott (2012) propose to analyze the customer needs, Pynnönen *et al.* (2012) suggest to analyze customer value preferences of the current business model, or Frankenberg *et al.* (2013), who recommend to analyze the ecosystem as the first step.

While these BMI process steps show a similar level of aggregation, the BMI process of Pramataris *et al.* (2001) demonstrates a more detailed, slender BMI process structure. Their first four BMI process steps (examining stakeholder roles, defining business objectives, identifying value flows in the market, and identifying key competitive drivers) describe particular analysis activities, and thus, these are summarized in the analysis phase of the generic BMI process, which compiles activities such as analyzing the current business model and target groups/customers.

Having analyzed the current BMI situation, the next chronological step is the Ideation phase, which serves to generate BMI ideas (Wirtz, 2011; Frankenberg *et al.*, 2013), uncover BMI opportunities (Lindgardt *et al.*, 2009), create a customer value proposition (Johnson *et al.*, 2008; Johnson, 2010; Teece, 2010), design a profit formula (Johnson *et al.*, 2008; Johnson, 2010), and/or innovate the business model content and/or structure (Amit and Zott, 2012). This generic BMI process phase involves BMI activities such as determining the BMI mission, generating customer insights, and developing customer scenarios.

While several BMI process steps of the identified BMI processes can be clearly allocated to this BMI process phase, this does not apply to all of the BMI processes. The BMI process steps of Voelpel *et al.* (2004) and Osterwalder *et al.* (2010) do rather present a higher level of abstraction, and thus, combine both phases.

When looking at the BMI process of Osterwalder *et al.* (2010), their first step is assembling all elements for new business model design. To our understanding, this includes the analysis and ideation activities since the determination of the elements for the new business model usually requires a preliminary analysis and idea generation process. For this reason, their initial BMI process step covers the BMI process phases analysis and ideation.

After the analysis of the BMI situation and the generation of the BMI ideas, the developed BMI must be questioned concerning the feasibility of the planned BMI endeavor. Several publications explicitly mention this BMI process step and recommend that responsible managers sense the feasibility and profitability of the proposed BMI, before realizing the intended changes (e.g., Voelpel *et al.*, 2004; Osterwalder *et al.*, 2010; Wirtz, 2011). In this context, it is important to define the underlying assumptions about the technological requirements and the business environment, identify key resources and processes, and analyze critical interdependencies (e.g., Pramataris *et al.*, 2001; Pateli and Giaglis, 2005; Johnson *et al.*, 2008). Pynnönen *et al.* (2012) and Yang *et al.* (2014) also suggest to already address the customer perspective by recommending the use of customer surveys and evaluation feedbacks in this phase.

If the feasibility and the profitability of the proposed BMI is confirmed, a prototype of the BMI (and its concept/design alternatives) should be developed (Linder and Cantrell, 2000; Wirtz, 2011). This prototype helps to evaluate different BMI design alternatives/concepts and to refine and optimize the BMI alternatives/concepts (e.g., Osterwalder *et al.*, 2010; Yang *et al.*, 2014). Furthermore, it allows a straightforward comparison with the current business model (e.g., Johnson *et al.*, 2008; Johnson, 2010), and a more profound evaluation of the change impact (e.g., Pateli and Giaglis, 2005).

Since the BMI phase Prototyping mainly serves the analysis of different BMI design alternatives, the impact assessment of the BMI, and the development/refinement of particular BMI concepts, this BMI phase is a vital part concerning the decision, whether the BMI will be realized. Thus, with successful completion of the prototype phase the generic BMI process moves to

the decision-making phase, in which the responsible managers have to decide, whether and in which form the proposed BMI is going to be implemented. In this context, Chesbrough (2007), Osterwalder *et al.* (2010), and Wirtz (2011) suggest that the decision makers should choose the best concept between the different BMI alternatives.

The most commonly used BMI process step among the identified BMI processes is the following BMI phase Implementation (e.g., Deloitte, 2002; Chesbrough, 2007; Osterwalder *et al.*, 2010). While there are also other notions for this BMI process step (e.g., Linder and Cantrell (2000) denominate this as change the business model, Enkel and Mezger (2013) as adaptation, and Yang *et al.* (2014) as execution), it usually includes the testing, realization, and go-live of the BMI as well as the necessary change management to support a successful implementation of the BMI (Wirtz, 2011).

Following the implementation phase, several authors recommend further activities to secure the sustainability of the BMI. Lindgardt *et al.* (2009) and Sosna *et al.* (2010) suggest to start scaling up the BMI, build the required skills in the organization, and promote organization-wide learning. Moreover, the organization should implement isolating mechanisms to prevent the BMI from copycats and imitators and reduce potential substitution effects (Teece, 2010). Wirtz (2011) proposes to install a continuous BMI monitoring and controlling to sense potential market reactions and adapt and modify the BMI in response to these changes.

The final BMI process step of Johnson (2010) is the transition of the BMI into the current business model of the organization. However, this implementation step only applies to incumbent organizations. They have to decide, whether the BMI can be integrated into the current business model, replace it, or must remain in a separate unit. Against this background, we see this BMI process step rather as a BMI activity concerning the sustainability of the BMI than as an additional phase. For this reason, the sustainability phase closes the integrated BMI process.

Apart from denominating and aggregating the BMI process steps to unifying BMI process phases, we also

evaluated their level of thematization in the identified BMI processes. On the whole, the first three BMI process phases (Analysis, Ideation, and Feasibility) are a frequent subject of discussion. Nearly all BMI processes explicitly refer to these BMI process phases and stress their importance for successful BMI.

Compared to these BMI process phases, the BMI process phase Prototyping receives less attention. This is interesting since the prototyping phase is of utmost importance for real-time testing and assessment of the proposed BMI solutions. Moreover, a prototype puts the decision-makers in the position to visualize the BMI in action. Similarly, the BMI process phase Decision-making is rarely explicitly mentioned and often taken for granted. However, this phase should strictly precede the BMI implementation phase since it is the last opportunity for comprehensive corrections before the realization of the BMI.

Although some BMI processes do not explicitly mention the BMI implementation as a particular BMI process step, it forms an integral part of nearly every BMI process description. The BMI process phase Sustainability has so far only received limited attention. Given the importance of enduring competitive advantage, this has also been an interesting finding. The allocation of the BMI process steps to the respective BMI process phases as well as their overall thematization in the identified BMI processes is presented in Figure 2.

Although these seven BMI process phases do not allow a fully accurate process step allocation without any overlaps, we believe that the loss of information, which is caused by the aggregation of several different process step categories, is outweighed by the gain in transparency. Moreover, this approach is not supposed to detail differences between the distinctive BMI processes, but to support the creation of a generic BMI process, which summarizes the insights of the individual investigations (see Figure 3).

Given the consolidating approach of the study, the generic BMI process contains a consolidated set of BMI process steps that are derived from the 20 studies identified. These generic BMI process steps shall reflect the potential stages of any BMI process, whether it is, for example, a BMI with comparably little impact on the

current business model or a radical shift, requiring a comprehensive renewal of the existing business model. Against the universal character of these BMI process steps, the generic BMI process needs to be adjusted to the particular requirements of the BMI situation (e.g., a slight change of the current business model may not require a feasibility analysis). Furthermore, it needs to be noted that the generic BMI process is not a unidirectional, but a multidirectional process. For example, if the outcome of the feasibility phase is not satisfying or if the decision-making phase leads to rejecting the BMI, the company has to go back to the analysis or ideation phase. Thus, some BMIs may require passing some BMI stages several times.

The generic BMI process starts with an analysis of the initial situation, including an analysis of the current business model, products, services, target groups, customers, market, and competition. The objective of this phase is to get a clear picture of the business model environment, in particular the strengths, weaknesses, opportunities, and threats of the current business model. Summarizing, the person/team that is responsible for the BMI initiative needs to have a solid understanding of the company's present business model and the associated business model environment.

The next BMI process phase is ideation, which is used to determine the BMI mission and to create clear ideas, stories, and scenarios for the BMI. For this purpose, creativity techniques can be used to generate different proposals and to create a basis for the BMI. Here, it is important that a BMI does not necessarily have to result from new ideas; they can also be the result of reacting to a weakness or threat (Markides, 2008). At the end of this phase, the persons responsible should have a conceptual design of the new business model.

The main objective of the feasibility phase is to evaluate the practicability and impact of the BMI. This means, the conceptual draft—the result of the ideation phase—has to be assessed concerning its realizability. In this context, it is important to analyze differences and interdependencies between the new potential business model(s) and existing structures to evaluate internal and external business model alignment necessities. For this purpose, the person/team that is responsible for the BMI should conduct an environmental analysis,

Authors/Phases	Analysis	Ideation	Feasibility	Prototyping	Decision-making	Implementation	Sustainability
Linder and Cantrell, 2006	Describe the actual business model			Develop a new business model	Change the business model		
Pramanitis et al., 2001	Examining stakeholder roles, Defining business objectives, Identifying value flows in the market, Identifying key competitive drivers		Defining requirements for technological capability development, Defining service provider mediation functions	Synthesizing current business model	Embedding technology architecture, Synthesizing proposed business model	Developing new coordination schemes	
DeLoitte, 2002	Scan & Scope	Rethink & Redesign			Plan & Implement		
Mitchell and Colea, 2004	Understand and optimally apply the current model	Establish, understand and follow an appropriate vision	Organizing design and testing of potential business model improvements, replacements and innovations		Understand and begin installing the next business model improvement or replacement		
Voegele et al., 2004	Sensing potential for change in customer behavior and new customer value propositions, Sensing the strength, direction and impact of technology, Sensing the potential for value system (re)configuration, including organizational structure(s)		Sensing the economic feasibility and profitability of the proposed business model				
Patil and Gargita, 2005	Document current business model	Assess influence of technology innovation, Identify missing roles, Define scenarios	Experiment for innovation	Describe the new business model, Evaluate the impact of change	Choosing the Best Concept	Implementation	
Chesbrough, 2007	Business Model Analysis	Create a customer value proposition, Design a profit formula	Experiment for innovation identify key resources and processes	Compare proposed to current model	Implement	Implement new business model	Build platform and skills
Johnson et al., 2008	Uncover opportunities	Create a customer value proposition, Design a profit formula	Identify key resources and processes	Compare proposed to current model	Incubation	Acceleration, Transition	
Johnson, 2010		Research and analyze elements for business model design effort	Business model development	Generate and test business model options and select the best	Adapt and modify the business model in response to market reaction	Scaling up the refined business model, Sustaining growth through organization-wide learning	
Osterwalder et al., 2010	Assembling all elements for new business model design	Initial business model design and testing	Design and implement mechanisms to capture value from each segment	Business model development	Implement leading mechanisms, Deconstruction and evaluation	Monitoring & Controlling	
Scans et al., 2010	Segmenting the market	Create a value proposition for each segment	Design and implement mechanisms to capture value from each segment	Business model development	Change management, Implementation	Monitoring & Controlling	
Teece, 2010		Design and implement mechanisms to capture value from each segment	Business model development	Business model development	Business model development	Business model development	
Wirtz, 2011		Design and implement mechanisms to capture value from each segment	Business model development	Business model development	Business model development	Business model development	
Amit and Zott, 2012	Analyze customer needs	Business model content innovation, Business model structure/government innovation	Business model development	Business model development	Business model development	Business model development	
Pyynönen et al., 2012	Analyze customer value preferences of current business model	Innovate the business model according to customer needs to test the business models	Business model development	Business model development	Business model development	Business model development	
Ernst and Megeer, 2013	Abstraction	Abstraction	Abstraction	Abstraction	Abstraction	Abstraction	
Frankenberger et al., 2013	Initiation (analyzing the ecosystem)	Ideation (generating new ideas)	Integration (building a new business model)	Integration (building a new business model)	Implementation (refinement)	Implementation (refinement)	
Gassmann et al., 2014	Initiation (analyzing your ecosystem)	Ideation (adopting patterns)	Integration (shaping your business model)	Integration (shaping your business model)	Implementation (refining year plans)	Implementation (refining year plans)	
Yang et al., 2014	Definition, Analysis	Innovation	Evaluation feedback	Optimization, Verification, Risk management	Execution	Execution	
Thematization							

Overall level of thematization in the identified articles:
 ● very high ● high ● medium ● low ○ none

Figure 2: BMI process step allocation to generic BMI process phases

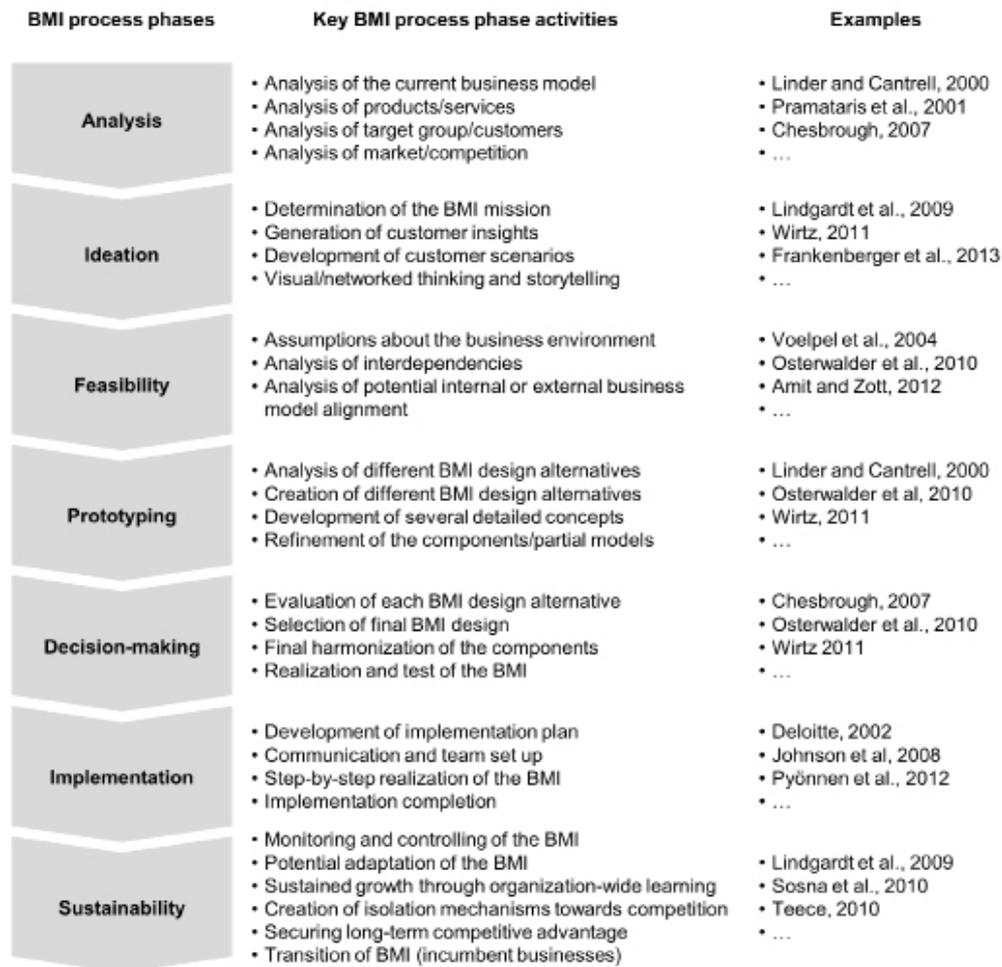


Figure 3: Generic BMI process with key activities

an analysis of the market, industry and the competition as well as a technological analysis (Chesbrough and Rosenbloom, 2002; Afuah, 2004; Wirtz, 2013). In contrast to the analysis that is conducted during the first BMI process phase analysis, the focus of the feasibility phase is on the new/planned business model.

If this phase leads to results that justify pursuing the desired BMI, a prototype of the BMI should be developed to evaluate different BMI design alternatives/concepts and refine the BMI until at least a satisfactory status of the prototype/prototypes has been achieved. Next, the BMI process enters the phase Decision-making, which serves to evaluate the different alternatives and make a final decision concerning the further progress of the BMI. Given the type, extent, and complexity of change, which the BMI may cause, this step will often include a final harmonization of the components or testing the BMI before the management takes its final decision.

The decision phase closes the design-oriented part of the BMI process and hands it over to the operations-oriented part, which deals with implementing the BMI and securing its sustainability. The implementation of the BMI has a strong project and change management character at the beginning. Thus, those responsible have to develop an implementation plan and should establish a competent implementation team to take care of the realization of the BMI.

This leads to the final step of the BMI process: Sustainability. To secure the sustainability of the BMI, the responsible managers have to assure that necessary adaptations of the new business model are applied. Furthermore, they have to take the appropriate measures to protect the BMI from imitation and disintermediation and ensure a continual knowledge transfer as well as organization-wide learning. In this context, the controlling of the value proposition and the value constellation are of crucial importance. The management

needs to know if the desired value proposition and value constellation have been achieved with the BMI. If the monitoring and controlling shows that there are deviations between the actual and the target values, those responsible have to derive the appropriate conclusions and implications and make the required adjustments. Furthermore, incumbent businesses have to determine the transition approach of the BMI. They have to decide, whether the BMI can be integrated into the current business model, can replace it, or must remain in a separate unit.

Discussion and conclusion

The starting point of this systematic review is the heterogeneous structure of knowledge on BMI and the call of several scholarly contributions to unite the dispersed knowledge of fundamental BMI concepts within a consolidating approach that creates a common ground. Given the importance of the BMI process, the heterogeneously disseminated knowledge on this topic, and the circumstance that the BMI process is an ongoing topic of debate, this study contributes to this consolidating approach by summarizing and aggregating available insights on the BMI process. To achieve these aims, we conducted an extensive review of related scholarly literature, from which we could identify 20 publications that investigate the BMI process.

The findings of the systematic review of the literature and the deduced generic BMI process provide several contributions to research and BMI management practice. From a general research perspective, the systematic review and the generic BMI process support the recommended consolidating research approach, and thus, foster a common understanding of the BMI concept. By harmonizing and unifying important aspects of several BMI process studies, the findings and conclusions of this study should also serve as a helpful guidance for further BMI research.

When looking at the findings of the literature review and the identified BMI processes, it becomes obvious that the general criticism concerning the heterogeneous and siloed structure of BMI knowledge also applies to this subfield of BMI research. Concerning the BMI process we found a wealth of knowledge, which shows a high degree of independent development, and thus

supports the statement of Zott *et al.* (2011, p. 1019) that knowledge on BMI “is developing largely in silos”.

Although the identified studies principally try to cover the same topic, we could detect several content-related and scope-related differences. While some BMI processes rather approach the BMI process from a conceptual side, others show a more detailed and operations-oriented approach. Thus, the BMI processes also vary significantly concerning the number of proposed BMI process steps. The BMI process of Lindgardt *et al.* (2009), for instance, consists of three, the BMI process of Linder and Cantrell (2000) of four, the BMI process of Amit and Zott (2012) of seven, and the BMI process of Pramataris *et al.* (2001) of ten process steps.

Apart from that we also encountered differences concerning the orientation of the identified BMI processes—some focus on the design of new business models, while others focus on the management and realization of BMI. This finding may also be seen as a further indicator of the partly differing views and opinions of what BMI actually is. If there are fundamental differences about the understanding of BMI, this leads to different BMI processes. Against this background, this study uses a far-reaching definition of BMI to develop a generic BMI process that includes the necessary elements for narrow as well as broad BMI definitions.

After scrutinizing and comparing the BMI processes on an abstract level, we could derive seven generic BMI process phases, which should be taken into account when dealing with BMI: (1) Analysis, (2) Ideation, (3) Feasibility, (4) Prototyping, (5) Decision-making, (6) Implementation, (7) Sustainability. Although the individual steps of the identified BMI processes cannot be allocated to these seven BMI process phases without any overlaps, they nevertheless reflect a wide-ranging aggregation of the recommended BMI process steps in the scholarly literature.

The generic approach to the BMI process also provides a comprehensive perspective on the BMI process. While previous approaches do either not cover the entire scope of the BMI process (e.g., Linder and Cantrell, 2000; Pateli and Giaglis, 2005; Enkel and Mezger, 2013) or do not detail particular phases (e.g., Pramataris *et al.*, 2001; Mitchell and Coles, 2004; Sosna *et al.*, 2010),

the generic BMI process supports a holistic perception. However, the generic BMI process is not a ready-made, one size fits all concept that can be blindly accepted without making any modifications. It should be seen as a BMI process framework that provides researchers and managers alike with a BMI process blueprint, which they can adapt to their specific needs.

A further important conclusion of this study is the multidirectional character of the BMI process. Instead of being a sequential, unidirectional, standardized procedure, the BMI process is rather a semi structured flow of activities that need to be matched with the specific requirements of the respective BMI initiative. Thus, it is not an essential prerequisite that each BMI initiative actually covers each of the BMI process phases: Depending on the requirements of the BMI initiative, some BMI process phases may be passed several times and some not at all. However, the initial planning of the BMI initiative should start with the extensive process, taking into account each possible BMI process phase, and each decision concerning deviations from this plan or upcoming variances from the course of the BMI initiative should always be based on a holistic BMI process perspective.

Given that this is—to the best of our knowledge—the first study that provides an overview of the scattered knowledge on the BMI process, this article also assists academics and practitioners in navigating in the literature and allows them to quickly get a grasp of the subject. Thus, the gain in transparency provides research and management with a clear and systematic BMI process that aggregates the insights of the identified studies. Against this background, especially managers should benefit from this approach since the generic BMI process can serve as a straightforward guidance for BMI development and integration. In this context, the generic BMI process can also be regarded a procedural framework that supports managers in establishing a new business model and/or renew an existing business model.

Moreover, the generic BMI process suggests a standard workflow and highlights the main activities that have to be performed within the respective BMI process phases. This presents managers with the opportunity to assess potential conflicts at an early stage and to

align the BMI process as a whole. This way, the generic BMI process provides a transparent approach that supports managers in planning, organizing, leading, and controlling BMI initiatives.

Even though this study provides several benefits to research and practice, it also has its limitations. Given the vast number of available journals, it is unlikely that every available, applicable publication was included in the analysis, especially as this study is limited to peer-reviewed English-language publications, excluding studies in other languages. Thus, it is possible that there are further aspects of the BMI process that may have skipped our scrutiny. However, considering the extensive, systematic analysis of the literature, the article should adequately reflect extant knowledge on the BMI process.

Apart from that, the process of aggregating and classifying the BMI processes is an elusive procedure that by its very nature leads to a loss of information. Moreover, the allocation to the abstract BMI process step categories can sometimes be questioned since the steps of the identified BMI processes occasionally match several selection criteria. However, these constraints are part of scientific practice when dealing with systematic analyses. Since the authors are conscious of these limitations, the results of the analyses should be acceptable though.

The findings and limitations of this study as well as the transparent illustration of previous research works also provide several opportunities for future research. Since all studies identified were of exploratory character—both conceptual and empirical papers—there seems to be a need for confirmatory research. While exploratory research is often used in the beginning of new fields of research, BMI research should start to intensify the use of confirmatory approaches to substantiate previous findings. This would also support the recommended consolidating approach for the field, as empirical evidence might help to separate promising from languishing approaches. In this context, research should empirically validate the number of BMI process phases, in particular, whether one can speak of an overall BMI process (one size fits all approach) or whether the BMI process and its phases are dependent on different industries or situational conditions. Furthermore the

question remains, whether there are variations in the BMI process concerning different business model types (e.g., for online business models content, commerce, etc.).

In a similar fashion, empirical research should shed light on the question, whether the BMI process really is a linear process or linear sequence of steps—as usually presented in the scholarly literature—or a whether it rather is a retrograde process or cycle. In reality, for example, innovation processes often include parallel activities and/or feedback loops that may also cause cyclical sequences. A further important aspect of the BMI process are its success factors. In this connection, research should analyze two vital elements: (1) the general success factors of the BMI process throughout all phases and (2) the phase-specific success factors. This way, research can contribute to identify crucial determinants that have a significant impact on the success of BMI endeavors.

From an organization perspective it is of great importance to clarify the question, how the BMI process should be anchored in the organizational structure. Does BMI, for instance, rather have a project character or does it make sense to embed the BMI process in the day-to-day management and operations. In this context, it is also interesting to clarify the respective roles, responsibilities, and accountabilities and to identify the required skills and competences that foster BMI. In this context, the connection between the individual BMI process phases and company strategy as well as operations seems to be a further interesting field—especially concerning the integration and implementation of BMI. In this context, research should, for example, provide transparent concepts on how the BMI

phases and the company functions interact and have clear suggestions on how to effectively incorporate BMIs in day-to-day business and how to elaborate efficient interfaces between BMI implementation, strategy, and operations.

While the investigated publications generally describe BMI as a company activity that takes place during a foreseeable period of time, research should also look into medium- and long-term BMIs, which rather have an evolutionary character. How are these business model evolutions to be managed and anchored in the organizational structure? And what should be the focus of these activities—rather technology-driven or customer-oriented? Against the background that research has so far devoted less attention to the BMI process phases Prototyping, Decision-making, and Sustainability, these phases should be subject to further conceptual and empirical study.

Furthermore, considering the different level of detail and different areas of application of the BMI processes, investigating BMI process discrepancies and particularities seems to be a fruitful avenue for future research. In this context, differences and adaptation requirements of BMI processes concerning situational, cultural, or hierarchical aspects could provide further interesting insights for research and practice. After all, BMI has established itself as a vital instrument of successfully innovating companies and shaking up entire industries and markets. Hence, its importance cannot be overstated. Given the still limited understanding of this phenomenon, research must continue to obtain new findings. In this context, the BMI process deserves particular attention since it plays an important role for academia and management.

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Business Models and Complexity

Lorenzo Massa¹, Gianluigi Viscusi², and Christopher Tucci³

Abstract

Purpose: To offer a -necessarily non-exhaustive- analysis of the meaning and significance of the notion of a complex system for research on the Business Model (BM).

Design/Methodology/Approach: Conceptual paper

Findings: Drawing from early research in complexity and debates that have inspired work in General System Theory, system thinking and cybernetics, we identify four insights, notably i) modeling of complex systems, ii) interdependencies, iii) nested hierarchies and iv) information processing that, we contend, have the potential to shed light on novel possibilities for understanding BMs. We offer an analysis.

Research Limitations/Implications: Limitation: exclusive focus on early interpretation of the notion of complexity as referring to a characteristic of a system. The paper does not explore the implications of the more modern understanding of complexity as referring to the 'behavior' of a system (complex system vs. complex behavior)

Practical Implications: we may be attempting to represent a system which is very complex, the BM and the organization behind it, at the level of the anatomy, only reflecting its main components. This is subject to inherent limitations.

Originality/Value: To show that, within the line of inquiry understanding the business model (BM) as some reality existing at the level of the firm, a BM may resemble what students of complexity refer to as a complex system. To explore the meaning and significance of the notion of complexity and of a complex system for research on the BM.

Keywords: Business Models, Complexity, Complex Systems

Please cite this paper as: Massa, L., Viscusi, G., and Tucci, C. (2018), Business Models and Complexity, Journal of Business Models, Vol. 6, No. 1, pp. 70-82

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Introduction

The business model (BM) has captivated scholars and managers for over twenty years. Part of its mystery may be the difficulty organizations exhibit in communicating and adopting business models. In this article, we suggest that these difficulties may partially be due to the fact that a BM can have characteristics shared with what scholars interested in complexity refer to as a *complex system* (e.g., see Anderson, 1999). Generally speaking, and oversimplifying to some degree, a complex system can be defined as a system comprising a large number of parts characterized by non-linear interdependencies (Simon, 1996; Forrester, 1961; Sterman, 1994; Casti, 1986), together creating a whole that is more than the mere sum of its parts.⁵⁹ We contend that both the notions of complexity and of complex systems bear important insights for research on BMs that may have not been fully acknowledged. In this brief and necessarily non-exhaustive contribution, we examine some of them. We build on the line of inquiry understanding the business model as a reality existing at the level of the firm and affecting its performance in markets (cf. Amit & Zott, 2001, Zott & Amit, 2008; Massa, Tucci & Afuah, 2017).

We proceed as follows. First, we offer some reasons supporting the view of BMs as complex systems. Second, building on that literature, we offer a short excursus into the notion of complexity applied to systems and a classification of systems into classes of increasing complexity. This allows elucidating why we contend that BMs may rank high in a hierarchy of systems complexity. Third, we identify some insights emerging from this recognition of BMs as complex systems, namely modeling of complex systems, interdependencies, nested hierarchies and information processing, and comment on their meaning and significance for research on BMs.

⁵⁹ Recall the Aristotelian argument on unity that “the whole is something besides the parts” (Aristotle, *Metaphysics* H6, 1045a8-10) and the insights of Gestalt psychology: “The whole is more than the sum of its parts. It is more correct to say that the whole is something else than the sum of its parts, because summing up is a meaningless procedure, whereas the whole-part relationship is meaningful” (Koffka, 1935, p. 176).

Business Models as Complex Systems

Despite the well known ongoing debate, scholars tend to agree, at least at a general level and within the interpretation of BMs as referring to something real at the level of an organization (cf. Massa et al., 2017), that a BM is a *system level concept* (Zott and Amit, 2007; Casadesus-Masanell & Ricart, 2010; Teece, 2010), centered on *activities* (e.g., see Zott and Amit, 2010), *spanning the boundaries* of a focal organization to include exchanges with a network of partners (Amit & Zott, 2001), and overall trying to describe how that organization functions in achieving its goals. The goals are typically conceptualized as creating, delivering and capturing value (Teece, 2010). A system level concept means that the business model focuses on the functioning of an organization as a whole (and not on isolated parts) (cf. Zott, Amit & Massa, 2011). Boundary-spanning activity systems conveys the idea of a focus on activities and exchanges (including the rules governing those exchanges) within the organization as well as between the organization and its network (Zott & Amit, 2008). Overall and at a general level, these considerations intuitively suggest that behind a BM is some (broadly defined) system, comprising the focal firm and its network of exchange partners, and that such system is a complex one, by virtue of the organization being a complex system (cf. Anderson, 1999).

System Complexity

A system can be broadly defined as a set of interacting or interdependent components forming an integrated whole. According to the Oxford dictionary, a system is “a set of things working together as parts of a mechanism or an interconnecting network; a complex whole.” Under this general definition, things as different as a house, a train, a computer, but also a cell, an organ, a team, or a community could be all conceptualized as systems. What strikes immediately, however, is that there are inherently important differences among these systems. Among other things, these systems differ in their complexity, with some systems intuitively appearing simpler than others (e.g., a house vs. an organ vs. an organization) (see Kast & Rosenzweig, 1972 for a discussion of general concepts in systems).

The idea that systems differ in their complexity has strong roots in system thinking, General System Theory (GST: Forrester, 1961; von Bertalanffy, 1968), cybernetics and, more recently, in complexity science (see Anderson, 1999 for a review of the evolution of thinking in complexity in relationship to organization theory). Overall, these various facets of approaches to the study of systems found their common denominator in some very basic, yet important, considerations: (1) systems differ in their complexity, implying that it is theoretically possible to build a hierarchy of systems; (2) reductionist approaches, which may work relatively unambiguously with simple systems, have strong limitations in supporting understanding of systems of increasing complexity; and (3) different levels of theoretical model building (explained later) are needed to understand systems of increasing complexity.

A Hierarchy of System Complexity

The notion that systems, broadly defined, differ in terms of complexity, and the corollary that understanding systems with increasing complexity may require different levels of theoretical understanding has been a central concern for system theorists (e.g., Boulding, 1956; Forrester, 1961; Buckley, 1968; Von Bertalanffy, 1968; Kast & Rosenzweig, 1972). A synthesis and re-elaboration of major themes within this line of inquiry led us to propose Figure 1 and Table 1.

The figure illustrates the idiosyncratic characteristics of different classes of systems (i.e., characteristics of that specific class of systems and that are not possessed by systems in a class of lower degree of complexity). For example, self-awareness and self-consciousness are

characteristics that are idiosyncratic to human beings as psychic systems (Luhmann 1995), participating in social systems they enforce; nevertheless, these characteristics are not possessed by systems at lower levels of complexity (for example, animals). Thus, systems of higher levels of complexity possess the characteristics of systems of lower levels of complexity (e.g., a human being is also a biological system), but not the opposite.

The figure distinguishes between mechanical, biological, and social systems (Fontana & Ballati, 1999). The distinction between the first and the second classes of systems is that one of life/nonlife. The distinction between the second and third classes of systems is that one of intentionality, self-consciousness and purposefulness which characterize individual beings and communities, including organizations, markets and, more broadly, society.

Mechanical systems are divided into subclasses of systems (Boulding, 1956). At the lowest level of complexity are so-called mechanical non-retroactive systems, such as a chair or a building (static structures incapable of dynamics). At the next level are systems with predetermined, necessary motion (e.g., a lever, a pulley, steam engines, dynamos). The third level is the control mechanism or cybernetic system in which the transmission and codification of information is an essential part of the system. Moving from mechanical to biological systems, we move from non-living towards living systems (with the introduction of properties such as permeable boundaries, ability of the system to “reproduce” and “maintain” itself, metabolism, energy exchanges, increased mobility, teleological behaviors and the like).

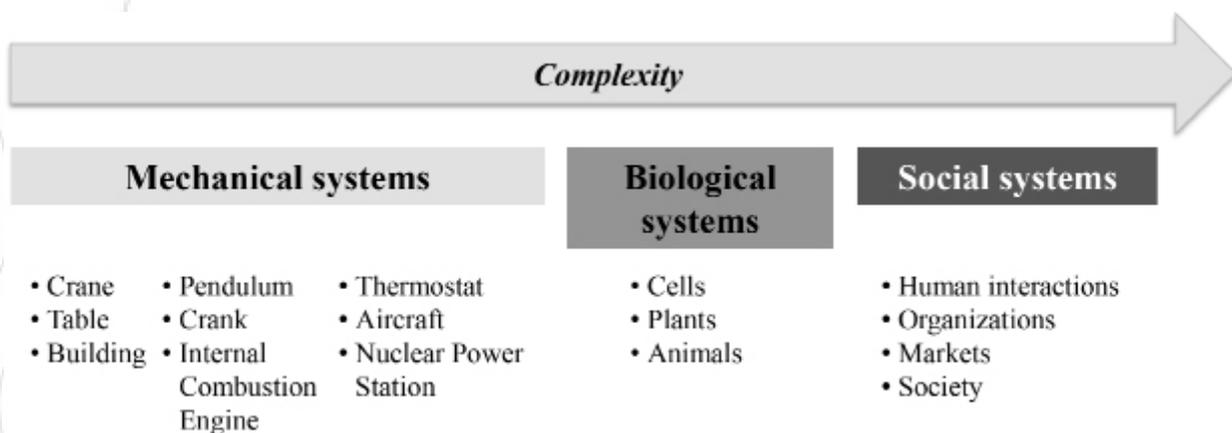


Figure 1: Hierarchy of Systems Complexity

Systems Types	Mechanical Systems			Biological Systems	Social Systems
Systems sub-types	Static Mechanical non retroactive Systems	System with predetermined dynamics	Systems with control mechanisms	Self maintaining structures	Purposeful Systems
Examples	Crane Table Building	Pendulum Crank Internal Combustion Engine	Thermostat Aircraft Nuclear Power Station	Cells Plants Animals	Human interactions, Organizations Markets Society
Core Properties of the system (CUMULATIVE)	<ul style="list-style-type: none"> • Static Structures • Modularity (subsystems or components) • Closed Systems • Rigid - well defined boundaries. • Static mechanics • Mechanics of inorganic materials 	<ul style="list-style-type: none"> • Simple Dynamics (motion equations) • Predetermined motion • Stochastic equilibrium • Could be viewed as transformation models or input-transformation-output models (e.g. ICE) 	<ul style="list-style-type: none"> • Feedback loops • Regulation mechanisms 	<ul style="list-style-type: none"> • Autopoiesis • Open System - Exchange of material, energy and information with the environment - principles of conservation of mass and energy - laws of Thermodynamics - Metabolism • Information exchange within the system and between the system and the environment • Negative Entropy • Hierarchy • Division of labor and specialization • (e.g., among cells, organs, etc.) • Increased mobility • Teleological behavior • Adaptation (evolution) • Equifinality • Emergence 	<ul style="list-style-type: none"> • Communication • Operatively Closure • Functional Differentiation • Structural Couplings • Interaction communications • Decisions communications • Understanding • Learning • Sense Making - Interpretation - Purposefulness • Agents with Schemata • Self organized networks sustained by importing energy • Co-evolution at the edge of chaos • Recombination and system evolution

Table 1: a Hierarchy of Systems Complexity

At the nexus between biological systems and social systems are human beings, characterized by self-awareness and self-consciousness (which is, individuals know they know and can engage in partly deliberate acts). Collectivities of human beings form social systems. By comparison with the natural sciences, historically there has been relatively little work on complexity applied to social systems. The notable exceptions are the work of Luhmann on autopoiesis, Arthur, Durlauf and Lane (1997) in economics, and the work on strategy by Lane & Maxfield (1997), Parker & Stacey (1994) and Stacey (1995, 1996, 2000, 2001). However, social systems may have specific characteristics making them different from other complex systems. While biological systems are primarily energy and material bounded, social systems are fundamentally information bounded. As pointed out by Seidl (2004), communication is not considered by Luhmann to be an asymmetrical process of transferring meaning or information from a sender to a receiver, but as selection or distinction. Thus, communication leads to three basic

types of autopoietic social systems: (1) interactions, (2) organizations, and (3) society as a whole made up of different subsystems such as the economy, politics, law, science, the mass media, education and religion (Luhmann, 1995; Mingers, 2002; Schoeneborn, 2011; Seidl & Becker, 2006). Among the three types of social systems identified by Luhmann, business models are particularly concerned by organizations, distinguishing themselves within society from society and reproducing themselves on the basis of decisions (communications) as distinct from other communications (Seidl & Becker, 2006).

The key message of Figure 1 (and Table 1) is that the more we move toward systems of increased complexity, the more we need to account for aspects such as the role of information flows and interpretation, purposefulness and intentionality, and, in general, complex interdependencies, if we are to understand how such systems ultimately work. As we propose below, these aspects have largely been ignored within the literature on the BM.

Putting emphasis on them has the potential to offer fresh insights into research on the BM.

1. Modeling complex systems Both scientists and individuals reduce a complex description of a system by engaging in the activity of modeling. Modeling is the “activity of formally describing some aspects of the physical and social world around us for the purposes of understanding and communication” (Mylopoulos, 1992, p. 2). To model is to simplify, to abstract what is unnecessary or minor, with the goal of improving tractability. One advantage of presenting a hierarchy of systems on the basis of their complexity (Figure 1, Table 1) is that it gives some ideas of the appropriateness of different theoretical levels of model building that are required in order to shed light and theorize on the functioning of the system. Mechanical systems can be more or less comprehensively described (and, partly, understood) at the level of their anatomy, or what Boulding (1956) originally referred to as the level of the *framework*. Since no dynamics are involved, a representation of the fundamental elements (components) comprising the static structure, offers an already quite accurate description of the system.

The more we move from simpler to more complex system, the less the level of the static framework is sufficient in providing a comprehensive picture that would allow understanding the system. This is not to say that such a description is not useful. Rather it is to say that it represents a necessary—perhaps not sufficient—step in theorizing and understanding the system. In the words of Boulding (1956), “the accurate description [at the level of the framework] is the beginning of organized theoretical knowledge in almost any field, for without accuracy in this description of static relationships no accurate functional or dynamic theory is possible” (p. 202).

At this stage, scholars of the BM may have already noted one of the issues with early research on the BM. Such a literature is fundamentally characterized by efforts to make sense of a system, organizations and their BMs, which is high in the hierarchy of complexity by focusing at the level of the static framework. Early attempts to make sense of BMs

by enumerating the fundamental components of a BM have been fundamentally concerned with the anatomy of BMs (Zott, et al., 2011), ignoring many other aspects, such as dynamics, nested hierarchies, flows of information, and the like. While, by definition, “all models are wrong” (Sterman, 2002), received formal models of the BM may be *very wrong*. We believe that such a situation is partly responsible for the lack of agreement on what a BM is and how it could be represented (e.g., see Massa et al., 2017). Symmetrically, this suggests that a promising avenue for future research may be one concerned with looking more closely at what it entails to create formal models of BMs.

2. Interdependencies A key feature of complex systems is the importance of interdependencies among components. Among other things, a system is complex by virtue of the architecture of interdependencies among its components. Interdependencies are at the core of two aspects of complex systems: *emergent properties* and *system behavior* (with the possibility that system behavior is an emergent property itself). Emergent properties are properties that cannot be reduced to the properties of the system’s components. Rather they are a function of the properties of the components *and* of the interdependencies among the components. In other words, it may not be sufficient to understand the behavior of individual components to understand the behavior of the system as a whole. In the context of research on the BM, this means that shedding light onto how certain BMs result in certain outputs, for example, efficiency or novelty (Zott & Amit, 2010), may benefit from more explicitly focusing on the role played by the interdependencies among BM components and their internal fit—including self-reinforcing mechanisms—in addition to looking at the properties of specific components (Siggelkov, 2002).

The structure of interdependencies is also critical to explain the behavior and evolution of the system. Consider business model reconfiguration, which is an organization’s second (or subsequent) business model (Massa & Tucci, 2014). As noted by Chesbrough (2010), structural barriers, i.e., conflicts with existing configuration of assets, represent

one impediment to such a type of innovation (the other one being represented by cognitive barriers). Looking at interdependencies more closely may offer insights into how to better substantiate this high level insight. For example, consider the reconfiguration of a business model that requires changing one component of the business model, for example, the revenue model currently adopted or some other activities (or bundles of activities). How strong are conflicts with existing configuration of assets? One way to think about it is to consider that in a web of complex interdependencies, some components may be more central (which is more interdependent with others and as such more difficult to change) and others more peripheral (which is less linked and as such easier to change). This aspect may have important implications for BM innovation in that innovation that targets central, highly interdependent components may backfire if the changes in the rest of the BM are not appropriately accounted for. A look into interdependencies may help develop hypotheses, operationalize measures, and conduct empirical tests.

Another way to think about our suggested question is to reason in terms of the *type* of linkages (e.g., being linear unidirectional, non-linear, involving a dyad, multiple connections, etc.) as well as the *nature* of linkages, for example the extent to which two or several components are interlinked by virtue of processes and activities, strategic complementarities (e.g., see Brandenburger and Stuart, 1996), information flows, or simply political interests and power of coalitions within the organizations (Mintzberg, 1985). For example, one component may be peripheral when interdependencies are understood as processes of activities. Which is, from an operations or process standpoint, conflicts with other components may be limited. However, the same component may be very central (and, as such, more difficult to change without unintended consequences) when interdependencies are understood from the point of view of sustaining the interest of powerful coalitions in the organization or from the point of view of information processing. These examples are speculative, and would require a serious research program. However, we contend they

illustrate some ways in which a closer look to interdependencies can advance BM research.

Overall, we believe that appropriate accounting of BMs may require going beyond the sub-systems or components to also include an account of the interdependencies among them. To our knowledge, the perspective offered by Casadesus-Masanell and Ricart (2010) which examines the BM as a system of choices and their consequences (and the interdependencies among choices by virtue of the consequences they engender) is one of the few attempts to model interdependencies within the fields of strategy and strategic corporate entrepreneurship (IS and computer science have devoted effort to develop modeling languages which, however, have not main inroads in more mainstream business model research). We believe that much is to be gained by moving beyond a discussion of BMs that focuses on its static representation and rather starting to theorize on the interdependencies. The complexity lens, and in slightly more advanced effort, insights from from System Dynamics (SD) and Complex Adaptive Systems (CAS) models coupled with Agent Based Models (ABM) may offer a language to do that.

3. Nested Hierarchies and the organization behind a BM

Another important aspect of complex systems is that they are organized as *hierarchies* as briefly discussed above. Looking at BMs as real-world phenomena, a parallel could be drawn with respect to hierarchies in a BM. At the lowest level there are individual workers performing activities being organized into teams, into departments, into divisions, into a firm. These activities can be described at different levels of abstraction (Massa & Tucci, 2014). A first consequence of this consideration may be that understanding how BMs function dynamically may require opening the black box of the organizational model behind a BM, an aspect which to date has often been neglected. BMs may be functioning in certain ways because of non-obvious organizational practices behind them, some of which may also be occurring at the level of the informal organization (cf. Ferriani, Gernsey, Lorenzoni, & Massa, 2015).

Shedding light on how BMs are managed and run may require a more explicit emphasis on organizational practices, routines, capabilities, and other organization-level concepts that have often been overlooked by students of the BM. In addition, this hierarchical structure may also require assessing the extent to which it is appropriate to refer to a single BM as a collection of hierarchically nested *models* together comprising one BM. A BM may be a higher order system comprising lower order systems, each functioning with localized logics (or models), such as a *marketing logic*, the *logic of revenues*, the *logic of customer relationship management*, etc., In other words, embracing the notion of nested hierarchies suggests questioning the conditions under which it is meaningful to refer to a firm's BM as a monolithic entity, or as a system resulting from several, perhaps different and yet related, subsystems operating at lower levels of granularity.

4. BMs and Information Systems As we have seen above, information and computation are two core concepts and constructs in complexity studies (Mitchell, 2009) and play a key role in social systems (Luhmann, 1995). Social systems are fundamentally interpretive systems, being information bounded (Garajedaghi, 2011), in addition to energy and material bounded (as in biological systems). Information and computation have been specifically investigated in the field of research focusing on information systems (IS). Such a line of inquiry offers some opportunities for better understanding BMs. Examining the definitions provided throughout its history (Hirschheim & Klein, 2012), IS emerges as having several characteristics commonly represented in a BM. Nevertheless, the information system of an organization is usually not explicitly considered a key element in representations of BMs, at least in the domains of strategy, technology and innovation management, strategic entrepreneurship, and sustainability.

One of the arguments for the gap seems to be that IS is not a key issue to be designed coherently in a value proposition. In other words, IS design is often considered to be a consequence of the design of the main components of a BM and

the implementation of the supporting technological infrastructure. However, this stance seems to imply a narrow perspective on IS as comprising only its technological aspects. On the contrary, most of the components of an IS are actually considered in traditional BMs conceptualizations (e.g., the system perspective by Zott & Amit, 2010) and most BM representations have been produced in IS-related areas (Osterwalder, Pigneur, & Tucci, 2005). In addition, BM representations as a result of business modeling have been investigated to provide a tactical and strategic perspective to requirements engineering and business process management (Andersson et al., 2006; Gordijn, Akkermans, & van Vliet, 2000; Osterwalder, Parent, & Pigneur, 2004; Pigneur, 2002). Taking these issues into account, and accepting the argument that BMs are also models (Baden-Fuller & Morgan, 2010), leads one to question the relationship between a wide perspective on information systems and BM representations.

Even if BM innovation may occur without technological innovation (as in the case of "just in time" production (Baden-Fuller & Haefliger, 2013)), management of information flows and exchanges have a relevant role there as well as in BMs seen from an activity system perspective (Casadesus-Masanell & Ricart, 2010; Zott & Amit, 2010). However, at the state of the art management scholars seem not to consider the above mentioned IS related perspectives. This gap may be a consequence of the double bind nature of business model, intersecting business strategy and a company's operations, business processes, and the information and communication technology (ICT) infrastructure, namely a company IS (Al-Debei & Avison, 2010). Nevertheless, the IS field is flourishing in terms of contributions to the research on BM. As summarized by the analysis done by Al-Debei & Avison (2010, pp. 371-372) most of them point out, on the one hand, the relevance of BMs as "conceptual tool of alignment" or "interceding framework" between the design and development technological artifacts and the implementation of strategic goals; on the other hand, BM is often considered as a "strategic-oriented knowledge capital" showing how business rules and practices used to perform the business activities. Therefore, considering BMs as complex social systems

would lead to considering not only (1) the organization behind them, and their nested hierarchies, but also (2) the information system that characterizes interdependencies in terms of information flows and decision communications, thus improving the capacity to face the challenges of modeling BMs.

As pointed out by Merali (2006), the vocabulary of complexity has been used to articulate the different facets of the network economy and the consequent networked world, and the actual information *network-in-use* can be viewed from an IS perspective as the informational representation of the interactions of agents situated in a social, economic, political, informational, and technological context. Consequently, the *informational complexity* of networks is determined by variable connectivity over time, the diverse and multifaceted information transmitted, the heterogeneity of nodes; whereas the actual network is shaped by the feedback cycles generated by its nodes as well as by path dependencies related to their history and learning dynamics (Merali, 2006, p. 217). Relating this to BMs, the *decisions* and *activities* within an organization depend on the bounded and limited knowledge of the state of the network at a given time and the information they can gather on and from the network itself. Overall, we think that to the extent that managers attempt to make sense of BMs from a complex social

system perspective, the more attention should be paid to the role of information and communication.

Conclusion

Complexity has been a central construct in the language of organization scientists for several decades. Yet, and perhaps surprisingly, scholars interested in the business model seem to have only implicitly drawn from the notion of complexity and of complex system to better understand business models. While part of the reason may be disagreement on what business models are, we contend that within the boundaries of a view of the business model as an organizational level construct referring to some property of real firms there is an opportunity in referring to complexity science and relative insights. Complexity science is a broad domain. This very humble contribution suggests that rich insights can be derived from better appreciating the characteristics of complex systems (*vis-à-vis* non-complex ones) and how such characteristics determine the appropriateness of different levels of theoretical model building to advance knowledge creation. In this early contribution we offer some preliminary and necessarily non-exhaustive insights. We believe that this is just a first step in a longer and hopefully insightful journey, and hope this short article offers an opportunity for scholars to better reflect on this possibility.

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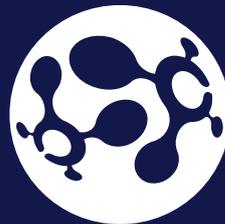


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