Tommi Rissanen

# PERSPECTIVES ON BUSINESS MODEL EXPERIMENTATION IN INTERNATIONALIZING HIGH-TECH COMPANIES

ACTA UNIVERSITATIS LAPPEENRANTAENSIS 852

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Supervisors Professor Sami Saarenketo
LUT School of Business and Management
Lappeenranta-Lahti University of Technology LUT
Finland

Professor Liisa-Maija Sainio
LUT School of Business and Management
Lappeenranta-Lahti University of Technology LUT
Finland

Reviewers Professor Christian Nielsen
Department of Business and Management
University of Aalborg
Denmark

PhD Arto Ojala
Faculty of Information Systems Science
University of Jyväskylä
Finland

Opponent Professor Christian Nielsen
Department of Business and Management
University of Aalborg
Denmark

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# Abstract

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The main research question addressed in this doctoral dissertation is "How do high-tech companies employ business model experimentation in their internationalization processes?" As the business model concept is itself complex and diverse, this issue is approached from five distinct perspectives, yielding differing interpretations of business model experimentation. For present purposes, the five chosen perspectives are (1) company development stage; (2) application of business model ambidexterity; (3) effects of home market context; (4) approach to internationalization; and (5) relation to technical debt as an outcome of business model experimentation in high-tech companies.

Digitalization and the Internet has made most industries more prone to change and disruption. As high-tech companies are especially vulnerable to disruptive forces, they must find new ways of staying competitive in a changing business environment. Among these companies, internationalization is now commonplace and further increases the uncertainties they face, requiring them to find ways of rapidly changing their business model. As a process of trying out new methods to find the best solution, experimentation is a useful way of identifying a new business model through an iterative cycle of exploration and exploitation.

Using qualitative methods, the purpose of the present research was to provide new insights into this process of experimentation for both practitioners and academics. The data were collected through interviews with relevant actors from internationalizing companies in high-tech industries. The main findings indicate that the contextual factors of company development stage and home market maturity strongly affect how these firms approach business model experimentation. In addition, it emerged that companies may follow different routes by experimenting with multiple business models at the same time when entering international markets. It became clear that business model experimentation could not be done in isolation, as it affects and is in turn affected by product innovation.

**Keywords**: business model, business model experimentation, internationalization, high-tech

# Acknowledgements

The idea of PhD studies first came to me in 2003. I was working in a University project organization in Tampere and many of my colleagues began their PhD studies. I was also encouraged to begin my own journey, but the time was not right for me. I thought that I would not have the persistence to study any one topic deeply enough. The idea stayed, however, and in 2013 I had several discussions with Professor Liisa-Maija Sainio that led into finding project funding for my work and her becoming my first supervisor. After 5,5 years I am finally writing these final words to finish my thesis.

I would like to thank my supervisors Professor Sainio and Professor Sami Saarenketo. Professor Sainio guided me for the first two years and Professor Saarenketo the latter part of my dissertation journey. I was quite lost in the academic world in the beginning and needed a lot of help in finding my way. Both of my brilliant supervisors learned quickly how to make progress with me: clear deadlines and regular meetings. I sincerely thank you both for your patience and for your valuable guidance throughout the process.

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Tommi Rissanen
May 2019
Lappeenranta, Finland

*To Paula.*

# Contents

# List of publications

This dissertation is based on the following papers. The rights have been granted by publishers to include the papers in the dissertation.

I. Rissanen, T., & Sainio, L. M. (2016). Business model experimentation in incumbent and startup companies. *Proceedings of XXVII ISPIM Innovation Conference (Porto)*.
II. Rissanen, T., Ermolaeva, L., Torkkeli, L., Ahi, A., & Saarenketo, S. (2019). The role of home market context in business model change in internationalizing SMEs. *European Business Review* (tbc: accepted for publication).
III. Rissanen, T., & Karhu, P. (2017). New organizational forms of innovation: What is business model ambidexterity? *Proceedings of ISPIM Innovation Symposium (Melbourne)*.
IV. Rissanen, T., Asemokha, A., Torkkeli, L., & Saarenketo, S. (2018). Business model experimentation in internationalizing SMEs: Evidence from Finland. *Proceedings of 22nd McGill International Entrepreneurship Conference (Halmstad)*.
V. Yli-Huumo, J., Rissanen T., Maglyas, A., Smolander, K., & Sainio, L. M. (2015). The relationship between business model experimentation and technical debt. In: Fernandes, J. M., Machado, R. J., and Wnuk, K. (Eds.), *Proceedings of International Conference of Software Business,* pp. 17–29. Cham: Springer.

## Author's contribution

Tommi Rissanen is the principal author and investigator in papers I-IV. In paper V, Dr. Yli-Huumo was the corresponding author, and Rissanen conducted the interviews, analyzed the data, and assembled the literature review with Dr. Yli-Huumo.

# 1 Introduction

Since the wider adoption of the Internet, all industries have gradually entered a state of continuous change. The Internet made new business models possible and, along with digitalization, has affected businesses since the beginning of this century to much the same extent as industrialization (McGrath, 2010). In most industries, these changes have not been fast, but on a global scale, the cumulative effects of digitalization have been unprecedented.

Two streams in the strategy literature focus on the issue of competitive advantage. According to the industry positioning view, competitive advantage depends on a company's ability to find and defend a unique market position among the competitive forces of customers, suppliers, substitute products, new entrants, and competitors (Porter, 1979). On the other hand, the resource-based and dynamic capability views explain competitive advantage in terms of a company's unique resources and capabilities relative to their competitors (Barney, 1991; Teece, Pisano, & Shuen, 1997; Eisenhardt & Martin, 2000). The problem with both of these views is that neither provides an adequate account of dynamic factors or tools for rapid change in a turbulent business environment where the ability to adapt is of increasing importance (McGrath, 2010).

Innovation can transform the structure of company value creation process or create new product offerings for a company (McMullen & Dimov, 2013). Until recently, innovation has been understood as the process of developing new and more effective products, services, and technologies. However, since the Internet opened up, new possibilities for business model innovation have also entered this realm (Schneider & Spieth, 2013). Three decades on, business models have become the primary focus of innovation, and the world's largest companies, such as Google, Facebook, Alibaba, Amazon, and Apple, all rely as much on business model innovation as on technological breakthroughs.

While business models are recognized as an important source of innovation, the dynamic process of actually developing and improving business models has received less attention. For a long time, academia has concentrated on defining business models and the elements of business model innovation. However, companies have shown less interest in the process of business modelling, as they have been busy keeping up with the competition. They are very interested in new business models, however. While academia has contributed to systematic development in this area, the issue is so wide-ranging and industries are so different that it has been impossible to find a solution that meets everyone's needs.

Experimentation is the key to creating new knowledge (Hayashi, 2009). The experimentation-based approach to product development was popularized by Steve Blank's (2005) customer development concept and by Eric Ries' (2011) lean startup process. Business model experimentation means applying this process to change existing business models or to develop new ones. However, academic research on business model experimentation suffers from the same difficulties as business model and business model

innovation research; companies, industries, and the competitive landscape are so varied and so volatile that it is almost impossible to develop a universal definition of business model experimentation. In addressing that problem, this dissertation examines five distinct perspectives in an attempt to increase understanding and to provide for the development of practical tools for in-company business model experimentation.

## 1.1 Research background

Alongside more traditional planning-driven methods, experimentation-driven innovation has become increasingly popular over the past decade (Hassi & Tuulenmäki, 2012). Experimentation is a form of problem solving that builds on a best guess and looks to learn from the results of the experiment (Thomke, 1998). This is something we all do as toddlers, wondering about our surroundings and learning through a process of trial and error. Well-planned and properly executed experiments are also essential to the scientific process of creating new knowledge (Hayashi, 2009). Experimentation is an iterative process involving a number of interrelated stages. Thomke (1998) divides the process of experimentation into four stages; (1) design; (2) build; (3) run; and (4) analyze. He also suggests that it is sometimes more beneficial to first identify "wrong" ways of doing things rather than getting it "right" at the first attempt. In other words, learning is essential to experimentation, and experimentation-based innovation is most appropriate where the process and the outcome are uncertain (Tuulenmäki & Välikangas, 2011).

Business models have been studied intensively since 1990's, when the number of articles in both academic and non-academic business and management journals began to rise steeply (Zott et al., 2011). However, this body of research is very diverse, and the concept of the business model still suffers from a lack of theoretical grounding in the business and economics literature (Teece, 2010). Given the lack of scholarly consensus, interpretations of the business model are wide-ranging; in one review, Onetti et al. (2012) identified 70 different definitions published between 1996 and 2009. That said, it seems clear that the business model concept has attracted significant academic interest, and has been applied in different ways in business model research as the basis for enterprise classification, enterprise performance, and innovation (Lambert & Davidson, 2013).

Research streams in the business model literature can be variously categorized. For example, Zott et al. (2011) distinguished between (1) e-commerce; (2) strategy; and (3) technology and innovation management. Wirtz et al. (2016) also identified three perspectives to business model literature: (1) technology-oriented; (2) organization theory-oriented; and (3) strategy-oriented.

The difference between the concepts of business model and strategy is not entirely clear, but McGrath (2010) notes four ways in which the business model differs from the more traditional concept of strategy. (1) The business model looks at the company from the outside in rather than from the inside out. (2) While the business model cannot be fully anticipated in advance, strategy is always explicitly stated. (3) While business models embrace dynamism, strategy pursues sustainable competitive advantage. (4) The business

model determines the extent to which strategy is discovery-driven or planning-oriented. Teece (2010) views the business model concept as more generic than business strategy, claiming that the business model is not in itself sufficient to deliver competitive advantage, as it is often easily imitated. Casadesus-Masanell and Ricart (2010) see the business model as a reflection of a company's realized strategy, and they define strategy as a plan for reconfiguring the business model in the event of unexpected changes.

In this dissertation, the business model is seen as a dynamic concept following McGrath's (2010) approach. The business model research streams are defined as entrepreneurship, strategy and innovation and they will be described in more detail in Chapter 1.4.1.

## 1.2 Research objectives and questions

The business model has received a lot of research attention, but that research is very diverse. This has impacted on business model innovation research and on business model experimentation as part of the same stream. The main objective of the present research was to explore different perspectives on business model experimentation in order to make better sense of the process and to provide new insights for both practitioners and academics.

Table 1.1 sets out the dissertation's main research question, along with three sub-objectives and three sub-questions, and links the publications associated with this thesis to the research sub-questions, which together address the main question.

Table 1.1: Main research question and sub-questions

| **Main research question:**<br>*How do high-tech companies employ business model experimentation in their internationalization processes?* | | |
|---|---|---|
| Publications | Research sub-objective | Sub-question |
| 1, 2 | To understand the different ways in which companies can experiment with multiple business models and how company background affects that process | ***RQ 1**: How does company development stage and home market context affect the business model experimentation process?* |
| 3,4 | To construct typologies of the ways in which companies build and experiment with multiple business models during internationalization | ***RQ 2**: How can companies experiment with multiple business models when internationalizing?* |

| | | |
|---|---|---|
| 5 | To examine the connection between business model experimentation and lean startup product development in high-tech companies | ***RQ 3**: What are the effects of business model experimentation on product development in high-tech companies?* |

This dissertation explores business model experimentation from five distinct perspectives, following Courtney's (2001) decision-making paradigm as shown in Figure 1.1. Business model experimentation is a cyclical process (Thomke, 1998; Ries, 2011) that begins with problem recognition, followed by perspective development. In Courtney's model, those perspectives include (1) technical; (2) organizational and social; (3) personal and individual); (4) ethical; and (5) aesthetic. Perspective development is followed by perspective analysis, actions, and results, after which the cycle starts again.

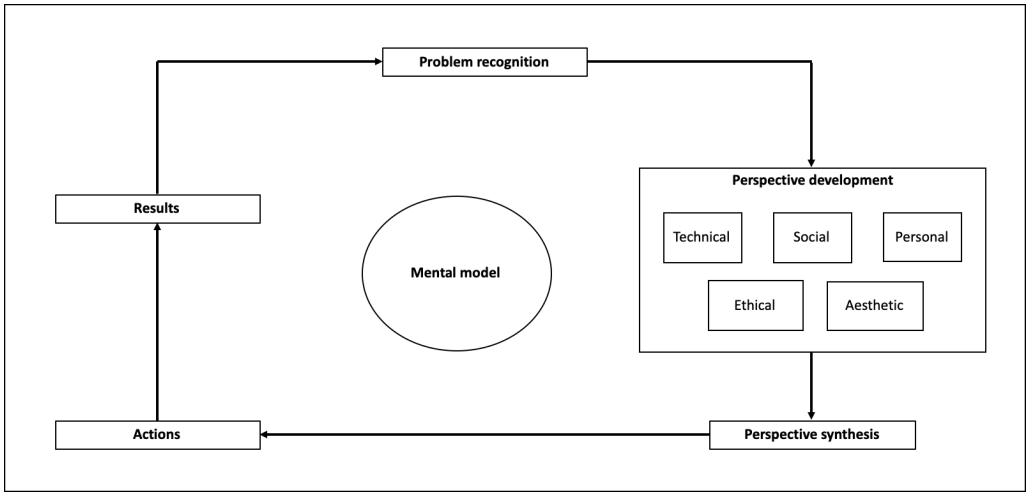


Figure 1.1: Decision making paradigm for decision support systems (adapted from Courtney, 2001).

Courtney's (2001) paradigm is based on Singerian philosophy and is well suited to solving "wicked" or complex problems that are affected by multiple conflicting forces. For present purposes, five selected perspectives are examined to explain business model experimentation in an internationalizing company.

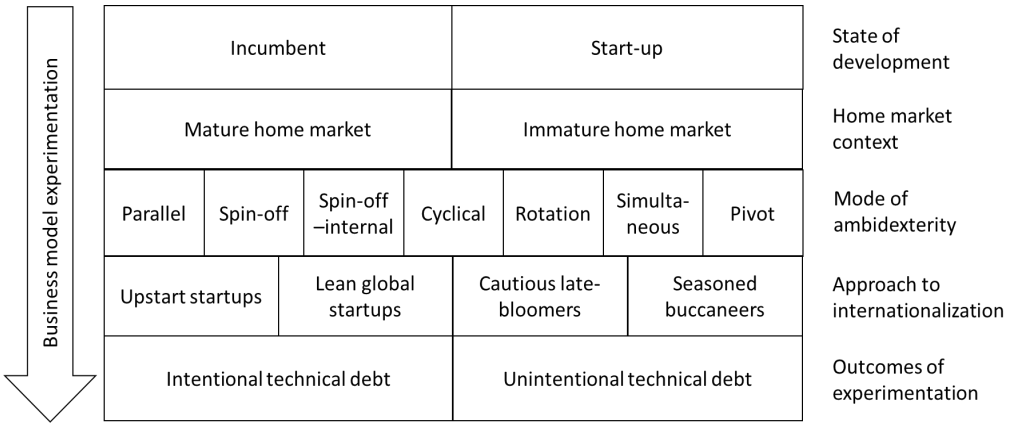


Figure 1.2: Business model experimentation in internationalizing high-tech companies.

Business model experimentation in an internationalizing high-tech company can be analyzed in terms of the layered framework in Figure 1.2. The layers are independent of each other meaning that an incumbent company can come from immature home market and so forth. The first layer is the company's state of development. There are other company development stages, but for the purposes of this thesis, the division between startup and incumbent companies is adequate. While incumbents are established SMEs or large companies, startups have yet to build a sustainable business. Home market context is the second layer of analysis in understanding the business model experimentation process of an internationalizing company. While a mature home market provides a better platform for gradually moving the business toward internationalization, an immature home market can force companies to internationalize early. The mode of ambidexterity layer reveals how companies can run different business models simultaneously as a necessary element of business model experimentation. The next layer examines different approaches to internationalization companies can have depending on the way they conduct business model experiments, what is their international business model and what kind of internationalization strategy they adopt. Finally, business model experimentation will incur intentional or unintentional technical debt to high-tech companies that must be assessed and dealt with. This layered framework provides an overview of the different perspectives on business model experimentation discussed in greater detail throughout this dissertation.

## 1.3 Research gap

Business model experimentation has been studied in various contexts that include designing new products (Thomke, 1998); development of new offerings (Hassi & Tuulenmäki, 2012); building products with lean startup methods (Ries, 2011); attempts to apply successful product experimentation to business model experimentation (Hayashi,

2009); trial and error in developing new business models (Teece, 2010; Sosna et al., 2010); the relationship between business model experimentation and effectuation (Chesbrough, 2010); and the discovery-driven approach to business models and experimentation (McGrath, 2010).

However, as there is still no holistic view of business model experimentation that encompasses the different research streams, this dissertation attempts to bridge that gap by examining five perspectives on business model experimentation. The layered framework outlined above conceives of business model experimentation in an internationalizing company as an ongoing process, involving different stages that interlock and affect each other.

While this framework illuminates business model experimentation in internationalizing high-tech companies, the process of business model experimentation is context-specific and cannot be universally generalized. Because it is unique to each case, the dynamic and cyclical nature of business model experimentation and innovation may not be easy to replicate. Courtney's (2001) multiple perspectives approach has been adapted to overcome these challenges.

## 1.4 Definitions and key concepts

To understand the concept of business model experimentation, it is first necessary to define for present purposes the concepts of business model, business model innovation, and internationalization.

### 1.4.1 Business model

The concept of business model has been widely researched, and definitions differ slightly across literature streams and even within the same research field. Tables 1.2 - 1.4 summarize business model definitions used in key studies from the streams of entrepreneurship, strategy, and innovation. The choice of research streams is based on Zott, Amit, and Massa's (2011) classification of the business model literature into e-business, strategy, and innovation. Here, the e-business stream has been replaced by entrepreneurship because e-business has become "business as usual" while entrepreneurship has emerged as an important and interesting research area in the business model literature (Demil, Lecocq, Ricart, & Zott, 2015). The choice of studies in the tables is based on clear definition of the concept in published research papers The entrepreneurship literature is presented first in Table 1.2, followed by the strategy stream in 1.3, and finally, innovation in Table 1.4. The order of presentation within streams is based on year of publication. The theoretical background is included to provide deeper understanding to the definitions.

Table 1.2: Business model definitions in entrepreneurship literature

| Author(s) | Theoretical background | Literature domain | Business model definition |
|---|---|---|---|
| Bock & George (2011) | Organization theory | Entrepre-neurship | The business model is the design of three organizational structures to enact a commercial opportunity: resource structure, transactive structure, and value structure. Resource structure refers to the static architecture of the firm's organization, production technology, and core resources leveraged to serve customers. Transactive structure is the organizational configuration that determines key transactions with partners and stakeholders. Finally, value structure is the system of rules, expectations, and mechanisms that determine the firm's value creation and capture activities. |
| Trimi & Berbegal-Mirabent (2012) | Entrepreneurship and new venture creation | Entrepre-neurship | (1) How things have to be done to (2) deliver value to customers, (3) invest money for firm sustainability, and (4) manage the organization. |

In relation to business models, the entrepreneurship literature emphasizes the importance of opportunity and structures for creating value, capturing part of that value for the company, and managing and organizing the operation.

Table 1.3: Business model definitions in strategy literature

| Author(s) | Theoretical background | Literature domain | Business model definition |
|---|---|---|---|
| Magretta (2002) | Drucker | Strategy | Business models are stories that explain how enterprises work by answering the following questions. 1) Who is the customer? 2) What does the customer value? 3) How do we make money in this business? 4) What is the underlying economic logic that explains how we can deliver value to customers at an appropriate cost? |
| Voelpel, Leibold, & Tekie (2004) | Competitive advantage, change management | Strategy | Core value proposition for customers, a configurated value network, and leadership capabilities that ensure the satisfaction of relevant stakeholders. |
| Zott & Amit (2008) | Contingency theory, Porter's product market positioning | Strategy | Structure, content, and governance of transactions between the focal firm and its exchange partners |

| | | | |
|---|---|---|---|
| Chesbrough (2010) | Dominant logic, open innovation | Strategy/ Innovation | The business model 1) articulates the value proposition; 2) identifies the market segment and specifies the value generation mechanism; 3) defines the structure of the value chain required to create and distribute the offering and complementary assets needed to support position in the chain; 4) details the revenue mechanisms by which the firm will be paid for the offering; 5) estimates the cost structure and profit potential; 6) describes the position of the firm within the value network linking suppliers and customers; and 7) formulates the competitive strategy by which the innovating firm will gain and hold advantage over rivals. |
| McGrath (2010) | Arguments against the industrial positioning and RBV or dynamic capability views Discovery-driven planning | Strategy | BM comprises two components: 1) the basic "unit of business" that customers pay for and 2) the process or operational advantages yielding performance benefits. |
| Moigneon & Lehmann-Ortega (2010) | Integrating Porter's competitive advantage (Porter 1985), resource-based view (RBV), theory of transaction costs, and entrepreneurship | Strategy | A firm's business model is a description of the mechanisms that enable it to create value through a) the value proposition to clients; b) the value architecture and harnessing of this value to transform it into profits; and (c) the profit equation. |
| Sosna, Trevinyo-Rodriguez, & Velamuri (2010) | Behavioral theory, organization theory | Strategy | "The design of transaction content, structure and government so as to create value through the exploitation of business opportunities" (Amit & Zott) |
| Teece (2010) | Dynamic capabilities | Strategy | Business models reflect management's hypotheses about what customers want, how they want it, and how the enterprise can organize to best meet those needs, get paid for doing so, and make a profit. |
| Casadesus-Masanell & Ricart (2011) | Drucker | Strategy | A business model comprises four elements: a customer value proposition, a profit formula, key resources, and key processes. |
| Khanagha, Volberda, & Oshri (2014) | Change theory (Pettigrew, 1990) | Strategy | A business model consists of a customer value proposition, key resources and processes, and a profit formula. |

The strategy literature offers the widest range of interpretations and definitions, from business models as stories of how companies work to different configurations of value proposition, value creation, and revenue model.

Table 1.4: Business model definitions in innovation literature

| Author(s) | Theoretical background | Literature domain | Business model definition |
|---|---|---|---|
| Demil & Lecocq (2010) | Own RCOV framework based on the Penrosian view of the firm | Innovation | Elaborating the Penrosian firm view, a business model is described as having three core components: 1) resources and components, 2) organizational structure, and 3) propositions for value delivery. |
| Cavalcante, Kesting, & Ulhoi (2011) | Organizational change, dynamic capabilities | Innovation | An abstraction of the principles supporting core repeated standard processes necessary for a company to perform its business. |
| Dmitriev Simmons, Truong, Palmer, & Schnecken-berg (2014) | Innovation literature, Schumpeter's technology push vs. market pull | Innovation | Business model development includes the following elements: customer value proposition; target market segment; revenue model; partners' network; key resources; key assets; cost structure; and estimation of profit potential. |
| Clauss (2017) | Multidisciplinary | Innovation | The three main dimensions of a business model are (1) value creation; (2) value proposition; and (3) value capture. Value creation consists of four sub-constructs (new capabilities, new technologies, new processes and new partnerships); value proposition consists of four sub-constructs (new offerings, new customer segments, new channels and new customer relationships); and value capture consists of two sub-constructs (new revenue models, new price/cost structures). |

The innovation literature also defines the business model mainly as the sum of different components. Business model definitions are more recent in innovation literature than in the other two literature streams.

There are slight variations in the language used in different studies of business models. The most comprehensive recent analysis of the concept was Clauss's development of a business model innovation scale (2017). On this interpretation, the business model entails three main dimensions, each with a number of sub-constructs. The present study adopts Clauss's approach as the most comprehensive study to date. For present purposes, the business model is defined as the ***structural template on which companies build and develop their business, comprising value creation, value proposition, and value capture elements*** (Zott et al., 2011; Spieth et al., 2014; Zott & Amit, 2013; Clauss, 2017).

### 1.4.2 Business model innovation

Like the concept of business model, the term *business model innovation* is variously used in different studies. Spieth et al. (2014) divide perspectives on business model innovation into three categories: (1) explaining the business; (2) running the business; and (3) developing the business. According to Trimi and Berbegal-Mirabent (2012), (1) business models may themselves entail a form of innovation without altering the essence of the product or service; (2) technology-push innovation involves small changes in the business model and product renewal; and (3) demand-pull innovation involves reformulation of the business model to address changes in customer needs and the business environment.

Business model innovation activities can be characterized as incremental changes in some business model dimensions; extension of the current business model; creation of a parallel business model, or replacement of the existing business model by a disruptive new model (Khanaga et al., 2014). The present dissertation focuses on understanding how companies actively change their business model through experimentation. In this context, business model innovation is interpreted as developing the business (Spieth et al., 2014) using the demand-pull approach (Trimi & Berbegal-Mirabent, 2012; Teece, 2010), and again follows Clauss's (2017) approach in defining business model innovation as ***changes in the three dimensions of the business model to meet market demands***.

### 1.4.3 Business model experimentation

Experimentation is fundamental to innovation (Thomke, 1998). While economic activity in general always aims at making the right decisions, experimentation processes acknowledge the value of making errors and learning from them (Thomke, 1998; Sosna et al., 2010). Developing a company's business model is rarely a straightforward journey, instead involving an incremental process of exploring the optimal business model and subsequently exploiting that model to achieve high growth (Sosna et al., 2010). The exploration phases benefit from cyclical experimentation, managing the uncertainty of changes in the market environment. The more uncertainty a company faces as a result of customer needs, market development, or their own actions (e.g., internationalization), the better an experimentation-driven model is suited to changing the business model (Hassi & Tuulenmäki, 2012).

Continuous search and experimentation with changes to model dimensions is one of four key requirements for successful business model innovation (Mitchell & Bruckner Coles, 2004). To provide real learning, business model experimentation should simulate real market situations as closely as possible (Chesbrough, 2010). Effective experimentation requires robust in-company entrepreneurial and leadership skills (Doz & Kosonen, 2010; Trimi & Berbegal-Mirabent, 2012; Mitchell & Bruckner Coles, 2004).

Saebi et al. (2016) distinguished between business model *adaptation* and business model *innovation*. Business model adaptation refers to how management reacts to changes in the market by realigning the company's business model. Business model experimentation

can be defined in various ways; for present purposes, the term is used to refer to ***an active process of iterative testing of one or more business model dimensions to arrive at a disruptive new business model for a given market.***

### 1.4.4 Internationalization

Internationalization is the process by which a company gradually increases its involvement in international markets through a series of incremental decisions (Johanson & Vahlne, 1977). Beyond this incremental model, there are reports of young entrepreneurial startups that enter international markets rapidly from the outset (Knight & Cavusgil, 2004).

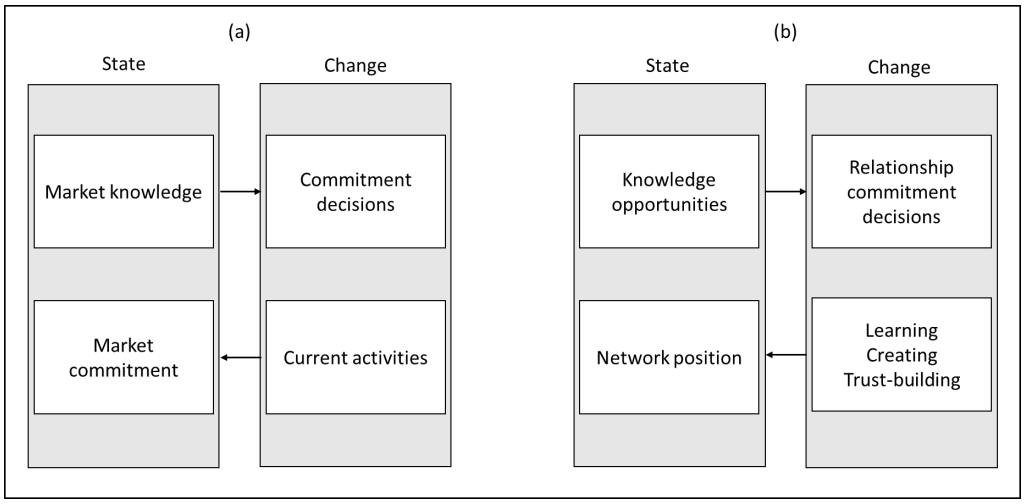


Figure 1.3: (a) The basic mechanism of internationalization (Johanson & Vahlne, 1977) and (b) a process model of business network internationalization (Johanson & Vahlne, 2009).

According to the original Uppsala model (Johanson & Vahlne, 1977) in Figure 1.3(a), internationalization is an incremental process, involving an interplay between state and change. State aspects include commitment of resources to a foreign market and understanding or knowledge of that market by the internationalizing company. Change aspects include current business activities and the decision to commit resources to foreign operations. According to this model, a company's existing market risk is the product of existing market commitment and existing market uncertainty. In general, a company will increase internationalization activities incrementally until it encounters its maximum tolerable market risk.

The revised Uppsala model (Johanson & Vahlne, 2009) in Figure 1.3(b) also distinguishes between state and change aspects. The elements of state are network position in terms of partner relationships and knowledge opportunities. In this revised model, change aspects include learning, creating and building trust, making current business activities more dynamic, along with relationship commitment decisions (adding to the original model). In the revised model, then, internationalization depends on the company's relationships and partners as well as on its own actions. Rather than mechanically calculating risk, the new model is opportunity-driven.

While the Uppsala model is well known and widely accepted, it does not adequately describe rapidly internationalizing companies. As risk and change increase, stable incremental internationalization has become difficult if not impossible for most companies. Internationalization is very common for early-stage companies, especially in the high-tech industry and must be examined holistically rather than as a separate process (Jones, 1999). Oviatt and McDougall (1994) introduced the concept of *global startups* to refer to companies that from their inception seek opportunities in global markets. The rapid internationalization of these born global companies requires strong domestic and international networks, and there are many ways of utilizing the elements of born global internationalization (Chandra, Styles, & Wilkinson, 2012). For present purposes, internationalization is defined as the exploitation of international opportunities as a dynamic process of learning from involvement in foreign markets (Johansson & Vahlne, 1977; Oviatt & McDougall, 2005; Johansson & Vahlne, 2009; Ellis, 2011).

## 1.5 Outline of the study

Table 1.3 summarizes the main research question, empirical data, and key findings of publications in this dissertation.

Table 1.3: Dissertation publications

| # | Publication | Research question | Findings |
|---|---|---|---|
| 1 | Business model experimentation in incumbent and startup companies | What are the differences in business model experimentation process between startup and incumbent companies? | Incumbents have better business model experimentation processes, but startups are more willing and able to use business model experimentation. |
| 2 | The role of home market context in business model change in internationalizing SMEs | How does home market affect business model change in internationalizing SMEs? | Home market maturity affects the timing of companies' internationalization efforts and the home market context has an effect on how companies aim to change their business model when internationalizing |

| | | | |
|---|---|---|---|
| 3 | New organizational forms of innovation: What is business model ambidexterity? | How do companies respond to the challenges of exploration and exploitation through business model experimentation to achieve organizational ambidexterity? | Typology of seven distinctive business model ambidexterity applications |
| 4 | Business model experimentation in internationalizing SMEs: Evidence from Finland | How do internationalizing SMEs use business model experimentation? | Four different approaches to experimentation with international business models |
| 5 | The relationship between business model experimentation and technical debt | What effect does business model experimentation have on the amount of technical debt incurred during the software development lifecycle? | While business model experimentation can reduce the amount of technical debt, too much focus on experimentation can reduce product quality in high-tech companies. |

The rest of the dissertation is structured as follows. Chapter 2 establishes the theoretical background from the point of departure. There follows a review of the existing literature on business models, business model innovation, and business model experimentation, setting out the perspectives applied in the thesis.

Chapter 3 describes the research methodology, detailing approach and design, research methods, data collection, and analysis and discusses the study's reliability and validity.

Chapter 4 introduces all the publications included in the dissertation, including research objectives and main contributions.

Finally, Chapter 5 elaborates conclusions, theoretical contributions, managerial implications, limitations, and suggestions for further research. The chapter begins by offering answers to the research questions based on the dissertation publications.

Following the Introduction and References, the five publications are presented in section 2.

# 2 Theoretical points of departure

To reduce the potential bias of a single approach and to strengthen interpretation of the results, this study approaches business model experimentation from multiple perspectives (Ordoobadi & Wang, 2011). The multiple perspectives approach is especially useful in a holistic worldview, in which everything is connected to everything else (Courtney, 2001). This approach is based on the Singerian model of the inquiring organization, which supports an open and cooperative culture, holistic decision-making, diffuse authority, and continuous assessment and refinement of progress (Richardson, Courtney, & Paradice, 2001).

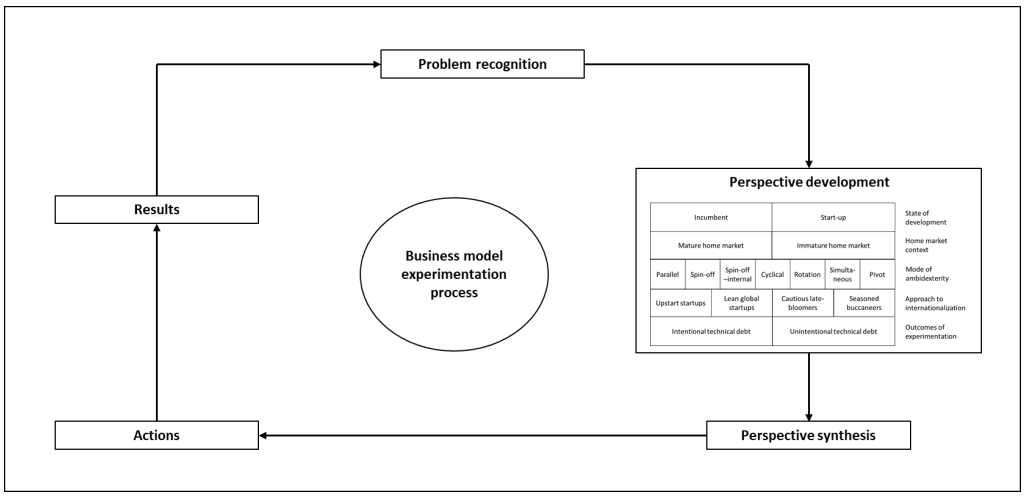


Figure 2.1: Decision making in business model experimentation using a multiple perspectives approach (adapted from Courtney, 2001, p. 31).

The use of multiple perspectives to describe the process of business model experimentation is described in Figure 2.1. This provides a more comprehensive view of the issue than a single perspective approach. For example, interpreting a company's business model experimentation process by referring only to its development stage would provide only a partial explanation of the end results. To understand the whole picture, a wider lens is needed, incorporating all five perspectives as described below.

For incumbent companies, business model experimentation is typically reactive, following some kind of difficulty. In contrast, startup companies experiment proactively to find a winning business model before anyone else (Sosna et al., 2010). This is not because incumbent companies are ignorant or badly managed, but because they are built

to maximize revenues and profit, and experimentation in pursuit of new and often disruptive business models is not rewarding within these boundaries (Christensen, 1997). For that reason, ***company development stage***—that is, incumbent or startup—offers a useful perspective on a company's business model experimentation process.

Home market and industry sector have been identified as the two main contextual influences on a company's international business model (Child et al., 2017). As the focus here is on business model experimentation in high-tech companies, ***home market context*** is the second perspective selected to explain the process and outcomes of business model experimentation.

As described earlier, business model ambidexterity refers to a company's ability to run multiple business models at the same time. Seven different applications of business model ambidexterity have been identified, and these ***modes of ambidexterity*** provide a third perspective in the present study.

Internationalization introduces significant uncertainty for decision-making because of limited knowledge about the international market and the process of internationalization (Andersen, 1993). No matter how much the new market is studied or how well the process is planned, unexpected events and challenges will need to be addressed. As companies can adopt different approaches that will affect their business model experimentation process, ***approach to internationalization*** is the fourth perspective to business model experimentation.

Finally, a fifth useful perspective is ***outcomes of experimentation*** in high-tech companies. Business model experimentation needs to minimize effort, cost and time, as in the case of agile software development, which results in unintentional and/or intentional technical debt. As business model experimentation is linked to technical debt, this fifth perspective considers the outcomes of the process in this regard.

## 2.1 Business models

Business model research emerged in the 1990s when the Internet suddenly made new models possible, stimulating academic interest in this new phenomenon. Between 1995 and 2009, more than 1000 scientific articles were published on this topic (Zott et al., 2011). In a number of literature reviews, scholars have identified different research streams on business models, which are variously grouped, depending on the study. For example, Zott et al. (2011) claimed that the business model has been used to describe or explain three phenomena: (1) e-business; (2) strategy; and (3) innovation. Wirtz et al. (2016) divided the business model literature into three further research domains: (1) technology-oriented; (2) organization theory-oriented; and (3) strategy-oriented research.

The business model literature can also be classified by level of abstraction. Massa, Tucci, and Afuah (2016) identified three categories: (1) business models as attributes of real firms; (2) business models as linguistic schemas, and (3) business models as formal

conceptual representations of the firm. Using varied terminology, the first of these categories investigates value creating and value capturing attributes. The second category explores business models as cognitive schemas or images of real systems rather than as actual systems. The third category investigates formal conceptual representations of how firms do business, making business models easier to understand and compare.

Spieth, Schneckenberg, and Ricart (2014) again divided the business model literature into three categories: (1) explaining the business; (2) running the business; and (3) developing the business. The first of these refers to research that seeks to explain how companies work and make a profit. The second category describes the operational models that companies use to run the business in relation to employees, management, and shareholders. Finally, the third category explores how companies identify opportunities and create sustainable competitive advantage.

Another way of classifying the business model literature by level of abstraction is to consider the unit of analysis. Business models can be studied at product level, business unit level, company level, and industry or networked business level (Wirtz et al., 2016), and these different units of analysis contribute to the difficulty of defining the concept. The first business model studies looked at the business model for a single product. With the digitalization of the business environment, the emphasis shifted to company level. More recently, business model research has focused on industry networks or ecosystems.

Foss and Saebi (2017) offered another tripartite classification of this literature: (1) business model as a basis for company classification; (2) business model as a factor in company performance; and (3) business model as a unit of innovation.

The most comprehensive approach to the business model concept in terms of level of abstraction was first introduced by Massa and Tucci (2013) and further developed by Nielsen, Lund and Thomsen (2016). Their six levels of abstraction are described in Figure 2.2.

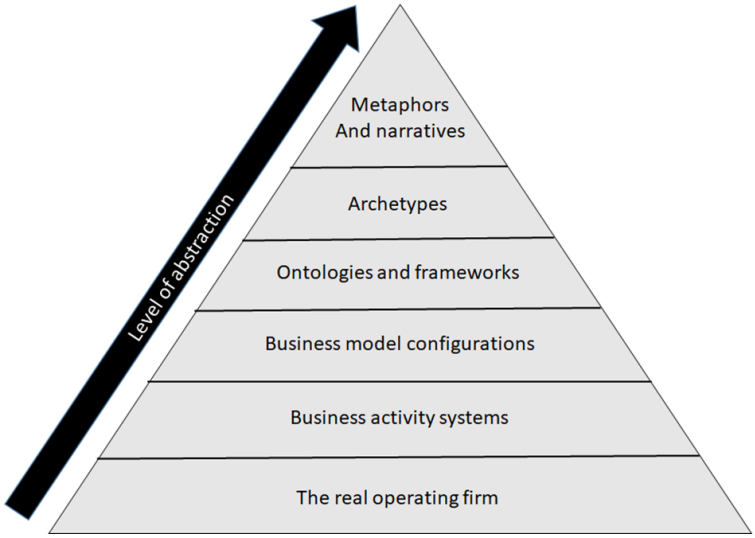


Figure 2.2: Business model levels of abstraction (adapted from Massa & Tucci, 2013; Nielsen, Lund, & Thomsen, 2016).

The levels of abstraction in Figure 2.2 help to clarify the differences between business model definitions. At the highest level of abstraction (narrative or metaphor), business models are stories that explain how enterprises work (Magretta, 2002). The next level (archetype) describes the business model in a generic way—for instance, the razor is sold at a minimal margin while repeat sales of disposable razor blades yield the profit (e.g., Teece, 2010). These two highest levels of abstraction provide a good overall understanding of what a firm does but do not explain the actual mechanisms of how it actually functions.

The next level of abstraction is the ontological or graphical framework, best described in the well known concept of the business model canvas (Osterwalder, Pigneur, & Tucci, 2005; Osterwalder & Pigneur, 2010). This provides a comprehensive visualization of a company's business model and has become the de facto tool for managers and consultants because of its simplicity and its ability to describe core company functions on a single sheet. Again, however, it is fairly generic and offers only a static snapshot at one point in time. At the next level of abstraction, business model configurations (Nielsen, Lund and Thomsen, 2016) or meta models (Massa and Tucci, 2013) provide a more functional approach and accommodate dynamic aspects. Although less generalizable, this offers a more accurate description of the company and its functions, and any company's business model can be described as one of 71 possible business model configurations (Taran, Nielsen, Montemari, Thomsen, & Paolone, 2016).

Just above the actual operating firm, the final level of abstraction is business activity systems. This approach views business models as design elements that describe the architecture of the activity system and design themes that describe the sources of value creation (Zott & Amit, 2010). This provides a highly specific description of a firm's business model but is difficult to apply to an actual company environment.

As this study views the business model as a dynamic concept that is intelligible for companies, the business model configurations approach is considered most applicable.

## 2.2 Business model innovation

As business model innovation is closely linked to the business model concept, it can also be viewed from different perspectives. In their literature review, Foss and Saebi (2017) divided the research into four distinct streams: (1) conceptualizing business model innovation; (2) business model innovation as a process of organizational change; (3) business model innovation as an outcome; and (4) consequences of business model innovation. The first stream concentrates on defining business model innovation as a concept. The second stream investigates business model innovation as a dynamic process of organizational change. The third stream studies business model innovation as an outcome of successful change or as an innovative business model. Finally, the fourth stream considers the implications of business model innovation for firm performance.

Schneider and Spieth (2013) proposed a theoretical framework for business model innovation rooted in the strategic entrepreneurship literature. Their framework puts business model development in a different category comprising identification, adjustment, and results of deploying firm resources and competences. According to this framework, business model innovation involves the exploration and exploitation of new opportunities.

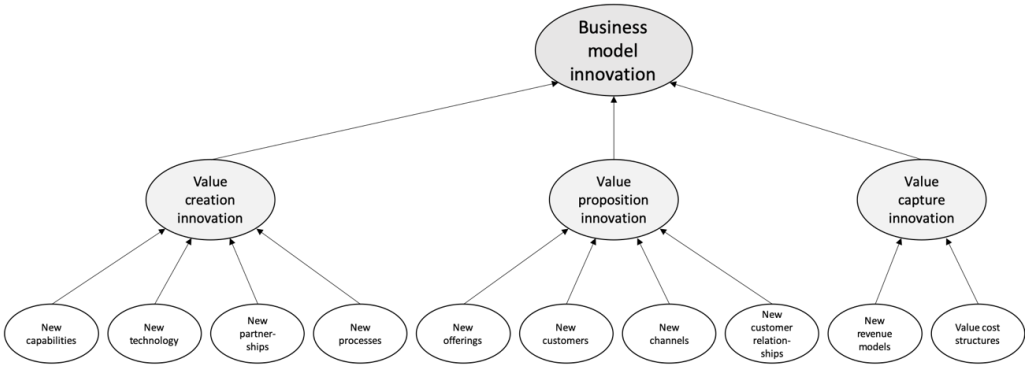


Figure 2.3: Hierarchical elements of business model innovation: dimensions and sub-constructs (adapted from Clauss, 2017).

Clauss (2017) developed a scale to measure business model innovation based on three dimensions: (1) value proposition innovation; (2) value creation innovation; and (3) value capture innovation. As shown in Figure 2.3, these dimensions entail 10 further sub-constructs. This approach supports the interpretation of business model innovation used in this study.

Massa and Tucci (2013) described business model innovation as a subset of business model design and reconfiguration. They further described the staging between product innovation, process innovation, and business model innovation as a continuum of market development (Figure 2.4).

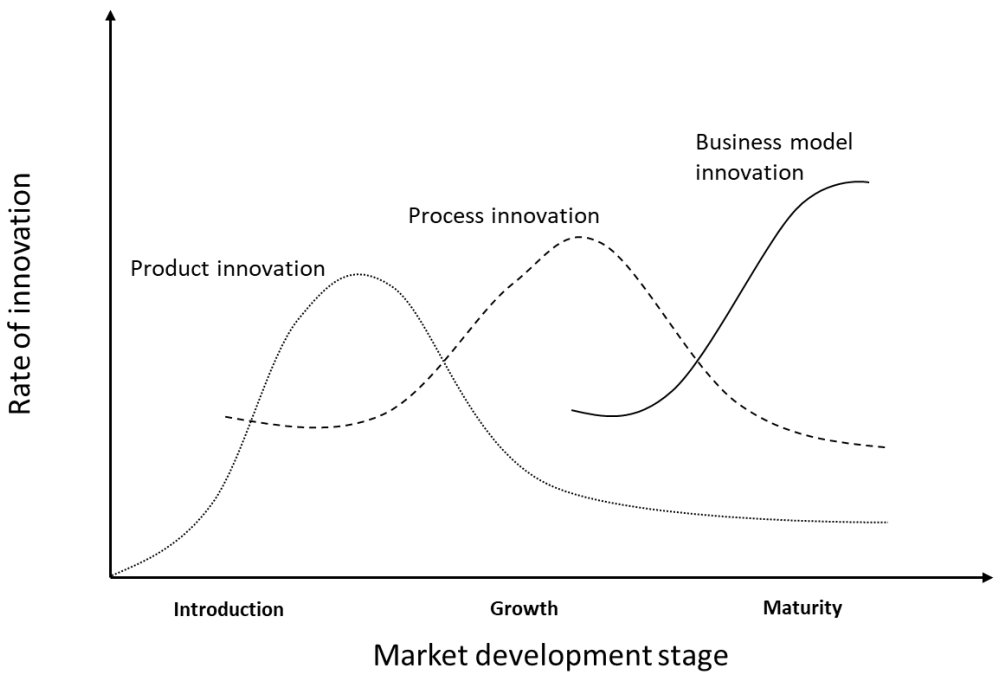


Figure 2.4: Innovation at different stages of market development (adapted from Massa & Tucci, 2013).

Massa and Tucci (2013) proposed that business model innovation could be used by companies to explore new opportunities in three different ways: (1) to support new value propositions for existing customers; (2) to identify new customer segments for existing value propositions; and (3) to enter entirely new markets with new value propositions. The first two of these follow the path in Figure 2.4. In the early stages of new market, companies concentrate on product innovation. As the market develops, the focus shifts to

process innovation. Finally, when peak growth is reached, the company turns to business model innovation in their attempt to stay competitive.

## 2.3 Business model experimentation

Experimentation is a problem-solving process that aims to find the optimal solution as an outcome of successive experiments (Thomke, 1998). This approach to solving complex problems was first introduced by Lindblom (1959) as the method of *successive limited comparisons*. As building and implementing a business model is a highly complex process, experimentation is especially useful in this context. From a company perspective, it is not a question of whether the business environment and the rules of the game will change but of whether the company can make the radical changes required for long-term survival (Voelpel et al., 2004). Business model experimentation can provide companies with the tools to survive such changes. These tools can lead into concrete business model experiments or provide an experimental mindset to the organization culture that helps it overcome the changes.

Kaplan (2012) claimed that business model innovation is all about experimentation, and his approach closely resembles the lean startup model (Ries, 2011). However, while the lean startup model concentrates on product development, Kaplan developed 15 principles within the mantra connect-inspire-transform. His main message is that business model innovation is a collaborative effort between the company and its stakeholders, that passion and inspiration is needed to build anything great, and that success depends on experimentation and customer contact rather than deskbound incremental change.

Business model experimentation is most often described as a cyclical process, in which the business model is constantly changing. Voelpel et al. (2004) visualized business model change as the "wheel of business model reinvention" that involves four sensing elements: (1) customer sensing (acceptability of a new value proposition); (2) technology sensing (importance of technology in customer perceived value); (3) business infrastructure sensing (ease of change of business configuration); and (4) economic/profitability sensing (economic feasibility of the new model). This approach looks at business model from inside the company and it does not take elements outside of the company into account. In this dissertation the approach to business model experimentation is more holistic, but still following a cyclical approach of continuous improvement.

Ojala (2016) suggested a preliminary theory for business model creation and evolution. He used an iterative cycle in which the process begins with business model creation followed by business model reassessment and further business model development. After that, a new business model is realized and the cycle starts over or the business model is abandoned. This approach supports very well the business model experimentation thinking where the business model is never ready, but in constant loop of reassessment and development.

Wrigley and Straker (2016) also claimed that the business model is a dynamic concept that is never "ready" but instead requires ongoing iteration. They proposed five design typologies for business model experimentation.

Table 2.1: Five design typologies for business model experimentation (Wrigley & Straker, 2016)

| **Strategy** | **Objective** | **Focus of experimentation** |
|---|---|---|
| Customer-led | Finding new customer segments | Exploring potential new customer segments beyond current norms |
| Cost-driven | Reducing costs | Finding radical cost savings by challenging all current processes |
| Resource-led | Restructuring resources | Exploring new ways of structuring and applying existing and new resources |
| Partnership-led | Identifying new partnerships | Breaking current constraints and finding partners for value co-creation |
| Price-led | Positioning firm as price leader in the market | Radically reducing costs to provide the same offering for a much lower price |

Design typologies show that there are various ways for implementing business model experimentation depending on the strategy of the company. This supports very well the approach in this dissertation that provides different perspectives on business model experimentation. There is no one way of interpreting business model experimentation, but instead it can be very different depending on the strategy or the context of the company.

Whereas Wrigley and Straker's (2016) typology concentrates on the focus of experimentation, this dissertation proposes an alternative typology, looking at the process of experimentation from a more holistic perspective, encompassing the type of experimentation, mode of business model ambidexterity, and the context of internationalization.

## 2.4 Perspectives on business model experimentation

Because of the inconsistent development of the business model literature as a whole, there are multiple alternative interpretations. The present thesis introduces five perspectives on

business model experimentation in high-tech industry. The objective here is to specify the filters that an internationalizing high-tech company must pass through and to describe how these affect company's business model experimentation.

### 2.4.1 Effects of industry context

As this research is confined to high-tech companies, industry context is not addressed here. However, the choice of context is significant. Because high-tech companies must often operate on a global scale from the outset, their business environment is characterized by uncertainty from the beginning (Rasmussen & Tanev, 2015). These companies also incur high research and development (R&D) expenses as compared to sales and employ a high proportion of R&D employees (Burgel & Murray, 2000). Information technology is one of the fastest changing high-tech industries and it is essential to understand how companies can develop their business model while the technology is evolving rapidly and the markets are uncertain and in constant change (Ojala, 2016)

Internationalization is often inevitable for these companies, and they must adjust their business model accordingly. Onetti et al. (2012) argued that high-tech companies must make crucial decisions about (1) location of activities; (2) relationships with partners; and (3) activity focus. In this sense, they identify an important connection between internationalization and business model change for high-tech companies, which is central to this dissertation.

### 2.4.2 Company development stage

A company's development stage is a major determinant of available resources and of how it does innovation (Massa & Tucci, 2013). The different company life stages can be characterized in various ways. For example, Massa and Tucci (2013) defined these stages as (1) introduction; (2) growth; (3) maturity; and (4) decline. In their longitudinal study of the corporate life cycle, Miller and Friesen (1984) identified five life stages: (1) birth; (2) growth; (3) maturity; (4) revival; and (5) decline. The difference between these two approaches, 30 years apart, is Miller and Friesen's (1984) "revival phase," marking a period of diversification and expansion following maturity before the organization finally declines.

The present study distinguishes between incumbent and startup companies. As discussed here, incumbent companies are mature and have established their business model. Regarding new business models, incumbent companies often have conflicting assets in addition to complementary assets for a new business model, which makes adopting new business models difficult for them (Kim & Min, 2015). Very often, they are assimilated to larger companies when they fail to renew themselves through innovation as new competitors with disruptive business models capture their market (Christensen, 1997). Although they possess good resources and functioning processes, the problem is not straightforward; according to Christensen and Overdorf (2000), their processes are finely

tuned to achieve success by using the current business model, which yields superior gross margins and is supported by the company value system. Nevertheless, incumbent companies may be able to take advantage of new innovations.

Startups are young companies that have not yet reached their potential while testing their technology and business model in the market (Batocchio et al., 2017). They can be defined as "temporary organizations in search of a scalable, repeatable, profitable business model" (Blank & Dorf, 2012, p. xvii). Startups have promising ideas; they are agile, willing to take risks and are striving for rapid growth, but they lack the resources, processes, and scalability of incumbent companies (Weiblen & Chesbrough, 2015). For the purposes of this study, startups are defined as growth-driven companies in the development stage of inception and growth while incumbent companies have already gone through these two phases and have reached maturity, revival, or decline.

Because incumbent companies operate in established industries with proven business models (Osiyevskyy & Dewald, 2015), they may find business model changes challenging. Voelpel et al. (2004) claimed that incumbents resist radical change and are often reluctant to let go of their existing business models. To change its business model, a company must be able to unlearn things that made them successful in the past, which is more difficult for an incumbent company.

### 2.4.3 Business model ambidexterity

The concept of business model ambidexterity derives from the literature on organizational ambidexterity—that is, a company's ability to remain competitive in their current business while simultaneously adapting to changes in the business environment (Gibson & Birkinshaw, 2004). Simsek et al. (2009) identified four types of organizational ambidexterity according to structural and temporal characteristics. *Harmonic ambidexterity* co-exists with existing processes. *Cyclical ambidexterity* also operates within the company, but it is sequential, involving phases of exploiting existing business and phases of exploring new opportunities. *Partitional ambidexterity* refers to establishing a structure in which exploration activities can occur simultaneously and interdependently with exploitation. Finally, *reciprocal ambidexterity* sees different units of the company in sequential pursuit of exploitation and exploration.

In the context of business model innovation, ambidexterity refers to simultaneous utilization of two (or more) business models (Markides, 2013). As business model design themes (Amit & Zott, 2001), Hu and Chen (2016) link efficiency to exploitation and novelty to exploration. Their interpretation of ambidexterity deploys these conflicting business themes to improve innovation performance through interaction. In the present study, business model ambidexterity is defined as a company's ability to run and develop different business models, either sequentially or simultaneously, within the company or in separate business units.

### 2.4.4 Effects of home market context

Context provides a lens that explains and sets limits to the phenomenon being researched and may be understood in terms of several dimensions: (1) business context, referring to the industry or market; (2) social context, including networks or household-related issues; (3) spatial context, referring to geographical areas; and (4) institutional context, referring to cultural and political issues (Welter, 2011). For the purposes of this study, business context relates to high-tech industries. Home market context can be linked to both spatial and institutional contexts. In this case, spatial context relates to the distance from home market to international markets. However, the institutional context is more important here as a means of understanding and comparing cultural differences, regulatory issues, and societal attitudes (Welter, 2011).

There is little existing research on how home market context affects internationalization or business model experimentation. Companies that have succeeded in domestic markets may encounter problems when they enter international markets because the economic, political, legal, and cultural environment differs from country to country (Child et al., 2017). Depending on the extent of those differences between home and target market, entry to foreign markets may present major obstacles. Child et al. (2017) proposed three predictors to explain an SME's international business model: industry context, entrepreneurial experience, and home market context. A hostile or unstable home country situation can exert a strong influence on internationalization and network relations between companies (Caputo, Matteo, Pellegrini, Dabic, & Paul Lana, 2016).

### 2.4.5 Approach to internationalization

Internationalization is examined here as a context for business model experimentation, involving two state aspects—market commitment and market knowledge—and two change aspects—commitment decisions and current activities (Johanson & Vahlne, 1977). As the process of internationalization entails multiple uncertainties in relation to market behavior and company performance in the international market, most innovation-related internationalization models involve experimentation (Andersen, 1993), making this a useful context in which to study business model experimentation.

For present purposes, internationalization is understood as a continuous and dynamic process of exploiting international opportunities. Business model construct provides an alternative, value creation -based approach to internationalization (Sainio et al., 2011). The present research focuses on international business models (Child et al., 2017) and international growth strategy (Rasmussen & Tanev, 2015).

### 2.4.6 Technical debt and outcomes of business model experimentation

The concept of technical debt was first introduced by Cunningham (1992) to describe the cost of accelerated software development. While this allows companies to build a good enough product in the shortest possible time, they must then rewrite the code more

robustly to pay back the technical debt. According to Tom et al. (2013), there are five categories of technical debt: (1) code debt; (2) design and architectural debt; (3) environmental debt; (4) knowledge distribution and documentation debt; and (5) testing debt.

Technical debt can occur through unintentional acts of oversight or ignorance, or as intentional managerial choices based on pragmatism or prioritization (Tom et al., 2014; Yli-Huumo et al., 2014). Here, technical debt is considered as a conscious choice, validating best guesses with the minimum amount of effort in much the same way as lean startup thinking, business model experimentation, and discovery-driven planning (McGrath, 2010).

# 3 Research methodology

This chapter describes the individual publications and the methods used, including the approach to data collection and analysis, providing an overview of the design and underlying arguments.

## 3.1 Research approach and design

The purpose of this dissertation is to illuminate the real-world phenomenon of business model experimentation in companies' internationalization processes, with particular reference to the strategy, entrepreneurship, internationalization, and innovation literature streams. Because the business model literature encompasses a range of disciplines, it cannot be reduced to any one epistemological position, where epistemology is the branch of philosophy that investigates what is considered acceptable knowledge within a discipline (Bryman & Bell, 2011).

One such position is positivism, which claims that valid knowledge must be confirmed by the senses. However, according to Tsoukas and Knudsen (2003), positivism fails to take account of the conditions in which knowledge is produced. Realism, on the other hand, offers a singular and certain representation of the past while relativism offers plural but non-grounded narratives that directly oppose the realist approach (Durepos, Mills, & Weatherbee, 2012). As a research tradition, realism holds that all things exist independently, regardless of whether they are theorized or experienced by an outside observer. (Mir & Watson, 2000) On this view, theoretical claims are either true or false, and the objective of theory is always to get as close as possible to the truth.

Interpretative epistemological approaches argue that the social world differs from the natural world and cannot therefore be understood in the same way (Hatch & Yanow, 2003). Constructivism is "a philosophical school of thought arguing that research is fundamentally theory-dependent" (Mir & Watson, 2000, p. 941). On this view, the researcher's theoretical position serves to define the research problem and procedures and what constitutes evidence. Mir and Watson (2000) view constructivist researchers as craftsmen, who sculpt models of reality grounded in theory; it follows that the researcher (subject) and the studied phenomenon (object) cannot be separated, and the same applies to theory and practice. This dissertation adopts an interpretative constructivist stance in attempting to make sense of the complex decisions and activities that characterize business model experimentation in internationalizing firms.

## 3.2 Research methods

The thesis and its associated publications employ qualitative case research methods. Data were collected using semi-structured interviews and NVivo software was used for the analysis. These choices and processes are discussed in detail below.

### 3.2.1 Qualitative research methods

The objective of this dissertation is to examine the process of business model experimentation in a holistic way and from different perspectives. A qualitative methodology was adopted to enrich data collection and analysis, as there was a need to build understanding to a relatively new and multi-faceted phenomenon. (Eriksson and Kovalainen, 2010). All of the articles in the dissertation used case study approach, which made the results more easily generalizable and theoretically testable (Eisenhardt, 1989; Eisenhardt and Graebner, 2007).

Because each qualitative study is different, the quality of research is difficult to measure. Tracy (2010) defined eight criteria for excellent qualitative research: (1) worthy topic; (2) rich in rigor; (3) sincerity; (4) credibility; (5) resonance; (6) significant contribution; (7) ethics; and (8) meaningful coherence. For present purposes, these criteria can be interpreted as follows.

The ***topic can be considered worthy*** if it is relevant, timely, significant, and interesting (Tracy, 2010). The present dissertation pursues an in-depth understanding of how high-tech companies use experimentation to change their business model when entering international markets. In light of the acknowledged megatrends of digitalization and globalization driving industry competition and change, forcing companies to enter international markets much faster than before, the study is relevant and timely for companies in the high-tech industry. Indeed, the topic is significant for the many companies seeking to respond effectively to this turbulence. All companies must have a business model, and increasing internationalization inevitably means change.

A qualitative study can be considered ***rich in rigor*** if its theoretical constructs, data and time in the field, samples, contexts, and data collection and analysis are sufficient and appropriate (Tracy, 2010). The theoretical constructs used in the present case represent a minor weakness, as each article is independent and draws on a particular theoretical construct from its literature review. The construct that informs the dissertation as a whole is the combination of perspectives to provide a solid understanding of business model experimentation in the given context. As described in subsequent chapters, data collection and analysis were rigorously conducted, respecting both the context and the scientific method. At the same time, it is important to note that this is not the only possible approach to the topic.

The ***sincerity*** of qualitative research is evaluated on the basis of self-reflexivity in relation to subjective values and biases and transparency about methods and challenges (Tracy, 2010). In the present case, the sincerity of the research can be considered high, as none of the articles addresses personal interests. While many of the interviewees were already known to the researcher, this made it easier to build rapport, and there are no personal ties. All procedures have been reported truthfully and transparently; there was no agenda to pursue certain research results, and the participating companies have not used the

research results to advance their business. Names of participating companies and individuals have been withheld in all cases to facilitate analysis without endangering trust.

The ***credibility*** of qualitative research is marked by thick description incorporating concrete detail, triangulation, multivocality, and participant reflections (Tracy, 2010). All of the dissertation articles are multiple case studies that focus less on describing individual cases than on differences and commonalities between them. In this sense, the cases do not include as much concrete detail as highly credible qualitative research would require. Triangulation of data was used in some studies mainly to provide financial or historical background based on secondary data sources. Actual triangulation involving additional data sources to confirm interview data would have been extremely difficult, given the use of multiple cases. Multivocality was pursued meticulously to ensure that all informants had an equal opportunity to express their thoughts freely. The study made no use of member reflections. All interviews were recorded by the researchers and transcribed and analyzed without affording informants an opportunity to check what they had said. There were multiple interviews with some informants to check some uncertain issues. While the study's credibility is not perfect, the choices made were appropriate to this type of research.

A qualitative study has ***resonance*** when it can be said to influence audiences through aesthetic representation, naturalistic generalizations, and transferable findings (Tracy, 2010). In this context, aesthetic representation refers to how the research is presented to the reader. While some take this to mean long and difficult sentences that use obscure and archaic terms, aesthetic value is defined here as text and illustrations that are clear and approachable. Across the different studies, an effort has been made to ensure that cases and company stories are accessible and believable, so enhancing the generalizability and transferability of the findings.

Qualitative research can make a ***significant contribution*** to theory, practice, morals, methodology, or heuristics (Tracy, 2010). Theoretical significance relates to studying a phenomenon that has not previously been investigated in the same context. In that regard, the present study contributes to the neglected topic of business model experimentation from a holistic perspective. At a practical level, the research is significant in many ways, as companies in high-tech industries currently struggle to understand how to change their business model to remain relevant in the long term. This research does not make any significant moral or methodological contribution, but the perspectives approach is potentially significant at a heuristic level, suggesting ideas and opportunities for further research.

***Ethical*** research considers procedural, situational, culturally specifics, relational, and exiting ethics (Tracy, 2010). Procedural ethics means using ethical methods and avoiding fraud and fabrication, as well as informing participants about how the collected data will be used. The present research meets high standards of procedural ethics, as all studies and data collection were conducted transparently, using predetermined procedures. Situational ethics are not immediately relevant here, as the research methods were

straightforward and uncontroversial. Relational ethics considers the actions of the researcher and how those actions affect others. As mentioned earlier, the researcher acted as objectively as a qualitative researcher can, and there were no issues of attachment or power relations with the participants. Finally, exiting ethics refers to how the research results are presented. In this dissertation and its articles, all results have been neutrally presented, avoiding any effect or phrasing that might enhance their appeal to readers. In short, the results have been presented with high regard to research ethics.

The eighth criterion of good qualitative research is ***meaningful coherence***. This means achieving what it claims to be about, using the right methods to meet the research goals, and meaningfully linking the literature, research questions, findings, and interpretations (Tracy, 2010). The objectives of this dissertation were stated at the beginning, and in the author's humble opinion, the thesis achieves these objectives well. Qualitative methods and the case study approach are appropriate for this kind of research. Finally, the structure also meets the requirements above, and all parts of the study interconnect to ensure coherence.

In terms of the eight criteria above, this dissertation meets the requirements for good qualitative research. The topic is worthwhile for different stakeholders, and the main quality issue relates to the rigor of the theoretical contribution. While this could be stronger, data collection and analysis were rigorous, and sincerity is very high. The choice of a multiple case study approach fails to fully meet the credibility criterion. Resonance is considered high by the author's standards, but someone else might consider more difficult and archaic terminology more aesthetically resonant. The study makes significant theoretical, practical, and heuristic contributions. Finally, the research meets high ethical standards and is meaningfully coherent in all respects.

### 3.2.2 Case study approach

The use of case studies is not a methodological choice but rather a choice of the object to be studied (Ghauri, 2004). The case study method is suitable for research that asks "How?" and "Why?" (Yin, 1994). The objective of this thesis is to examine business model experimentation from different perspectives. As the business model concept itself cannot at present be defined unambiguously, the case study method was chosen because it facilitates extensive examination of a single instance of the phenomenon of interest (Collis & Hussey, 2003).

Case studies make it possible to explore the choices made by the case companies and so advance understanding of the research phenomenon (Ghauri, 2004). All the studies used a multiple cases design to concentrate exclusively on the relationships replicated in the different cases (see Table 3.1). This approach yielded conceptual frameworks and models that are more generalizable than results from a single case study (Eisenhardt & Grabner, 2007).

Table 3.1: Cases and interviews in each publication

| Publication | Number of cases | Number of interviews |
|---|---|---|
| Publication 1 | 19 | 32 |
| Publication 2 | 2 | 10 |
| Publication 3 | 15 | 28 |
| Publication 4 | 12 | 20 |
| Publication 5 | 4 | 9 |

The data were collected from a total of 43 semi-structured interviews from 22 different companies. The multiple case study approach was used to construct explanatory middle-range theory in relation to the different perspectives. The criteria for choosing cases should be consistent with the research problem (Ghauri, 2004), and this was true of the choice of cases in each paper as detailed in Chapter 4.

## 3.3 Data collection

This section describes the process of data collection in the dissertation and articles, all using qualitative methods.

### 3.3.1 Sampling

The study was based mainly on purposive sampling (Lincoln & Guba, 1985), which is used to identify cases that are likely to provide the best information in relation to the research questions (Lee & Lings, 2008). Some elements of convenience sampling were also used—that is, approaching informants who meet certain practical criteria such as easy access, proximity, or availability at a certain time (Etikan, Musa, & Alkassim, 2016). Most of the participating companies were Finnish because they afforded easier access. In addition, the selection of companies and interviewees was based largely on the researcher's prior acquaintance with them. This made the selection process easier, as the researcher knew which informants could provide relevant and valuable information.

In choosing informants, the objective was to find those people within the case companies who were most knowledgeable about the research topic and problem (Saunders, Lewis, & Thornhill, 2009). Most of the interviews were conducted in Finnish and in face-to-face meetings rather than online. Purposive sampling seeks to achieve saturation by continuing

data collection until no new information emerges (Etikan, Musa, & Alkassim, 2016), and this approach was adopted in all of the dissertation case studies.

### 3.3.2 Qualitative data collection

Collection of qualitative data using case studies is usually interview-based. The objective of the research interview is to acquire information from the informants that is as useful and truthful as possible (Hannabus, 1996). According to Roulston et al. (2003), the main challenges of the interviewing process are (1) unexpected participant behavior; (2) consequences of the researcher's own actions and subjectivity; (3) phrasing of questions; and (4) dealing with sensitive issues. The researcher's experience helped to avoid unexpected participant behavior. For example, in several instances during the interviews, the informant deviated from the issue or provided very short answers. As the researcher had 15 years' experience of communicating with companies, was very familiar with the research topic, and had acquired advance information on the companies, these unexpected situations did not undermine data collection.

Any effects of the researcher's own actions and subjectivity were minimized by employing an interview structure that did not lead the interviewee into any direct answers and by avoiding any expression of the researcher's own opinions. Here, too, the researcher's experience helped. The third challenge was more difficult to overcome, as the interviews were semi-structured, and the interviewees were given a lot of freedom in answering the questions. In many cases, experienced entrepreneurs told a long story in response to a specific question, and the interviewer took the discussion even deeper into this digression by asking follow-up questions. In some interviews, the thread was lost for an extended period of time. Nevertheless, the main topics of the semi-structured questionnaire were covered in each of the interviews. The fourth challenge, dealing with sensitive issues, was handled at the beginning of each interview, when provisions for confidentiality and data use were explained to the informant. As the interviews did not pry into sensitive or personal issues, this was not a problem for data collection.

Establishing rapport with the respondent is extremely important if the interviewer is to gain their trust. In the introductory phase before the interview commences, it is crucial to establish a positive relationship with the informant and to reassure them about confidentiality issues. In collecting the data for this thesis, particular emphasis was placed on building rapport. All informants were first approached to inquire about the possibility of their participation in an interview for a doctoral dissertation. Most of the interviewed companies were either involved in the same project with the interviewer or were known to him personally prior to the interview, making it easier to build trust than would otherwise have been the case.

Interviews can be classified as (1) structured; (2) group; or (3) unstructured (Fontana & Frey, 1994). In this study, the interviews concentrated on business model development in individual companies. For this reason, group interviews were not appropriate. The dissertation articles include several comparative studies; to make the data comparable,

interviews had to be conducted using common comparable items. This meant that unstructured interviews were unsuitable for data collection. Strictly structured interviews would have been most suitable for the purposes of data analysis. However, as the objective of the interviews was to understand the development of companies' business models from initial business idea to current status, and because the stories were all quite different, it was decided to base all interviews on a semi-structured questionnaire, and the same questionnaire was used in every case. During the interviews, the researcher posed additional questions about items that were of particular interest for the research.

Interviews were conducted either in person or via Skype. All interviews were recorded after confirming that this was acceptable to the informant. At the beginning of the interview, the informant was advised that (1) the interview was being conducted for a particular study that formed part of the researcher's dissertation; (2) the recorded interview was confidential, and the data would not be accessed by any outside party; and (3) the data would only be used for the stated purpose.

During the interview, respondents were encouraged to answer questions freely in their own words and to ask for clarification if needed. To provide a common understanding, the concept of business model was defined at the beginning of the interview, as it might be defined in different ways, depending on the situation. The researcher took care to ensure that the agreed time for the interview was respected and that the questionnaire was fully covered, with additional questions where necessary. The researcher avoided leading questions or suggesting answers, concentrating instead on seeking further information on any interesting issues that arose during the interview.

After the interviews were completed, they were transcribed by a professional service, making sure that the confidentiality agreement was not broken. The interviews were collected and stored by the researcher for subsequent analysis.

## 3.4 Data analysis

The interviews were analyzed using NVivo. This qualitative analysis software allows the researcher to code the data meticulously for analysis in relation to the research question. This software-based procedure for analyzing the data allowed the researcher to ensure and confirm the trustworthiness of the research (Sinkovics, Penz, & Ghauri, 2008).

For each study, the main research topics were first decided on the basis of a literature review. These topics were used to identify and code the relevant items of information in the interview data. The coded data were then assigned to containers that included linked items of information. These nodes were then labeled, and the labeled nodes were categorized and used to build models and to visualize the data. To address the research question, the models were linked to the findings from the literature review.

The methods used for data analysis included cross-case analysis as suggested by Miles and Hubermann (1994). While publication 2 adopted a within-case focus, all of the other publications focused within and across cases (Ayres, Kavanaugh, & Knafl, 2003).

## 3.5 Reliability and validity

External reliability refers to the extent to which a piece of research can be replicated by others (Bryman & Bell, 2011). This poses a difficulty for qualitative research studies, as the initial social setting changes, and interview-based data collection cannot be replicated at a later stage. In the present study, all interviews were recorded and transcribed systematically and meticulously, including all sounds and auditive gestures. For that reason, although the interviews would be difficult or impossible to replicate, they can be accessed at any later time as when the data for each article were collected and analyzed.

Internal reliability refers to the level of agreement between different observers about what they see and hear (Bryman & Bell, 2011). Most of the interviews were conducted by a single person (the author of this dissertation). Three of the interviews in publication 5 also involved another researcher; these were again transcribed by a professional outside service. Five of the interviews in publication 3 were conducted in Russian by a Russian researcher and were subsequently translated into English by a professional translator. In addition, two of the interviews in publication 5 were conducted by a co-author and were again transcribed by a professional outside service.

Publications 3 and 5 were the most challenging in terms of ensuring internal reliability. Publication 3 included two cases: one in Finland and one in Russia. The author of the thesis conducted the interviews with the Finnish firm, and the Russian co-author conducted similar interviews with the Russian company, based on the same semi-structured interview template. Interviews with the Finnish company were conducted in Finnish, and those with the Russian company were conducted in Russian. All interviews were then translated into English text and cross-analyzed by both researchers. Internal reliability was ensured by agreeing on the analysis of their own and each other's interviews. In publication 5, the case companies were partly interviewed by the author of the thesis, partly by a co-author, and partly by the author of the thesis and the co-author of the paper together. All interviews were transcribed using the same outside service and were then cross-analyzed by both interviewers. Again, internal reliability was ensured by agreeing on the analysis results. This was done for each paper and for this introduction by combining the theoretical framework of the dissertation with all of the data collected in the different studies. As some of the interviews were used in multiple articles, they were used to develop and support different theoretical ideas. Additionally, some interviewees were visited multiple times to gain a deeper understanding of their cases.

External validity determines the extent to which research results are generalizable (Bryman & Bell, 2011). This is a known challenge for qualitative research, as cases can never be representative of all companies. Although these research papers include only a small number of cases, they aim to be as representative as possible of the particular setting

defined in each article. As a whole, the interview data collected from the different cases ground the theoretical framework elaborated here, which cannot usefully be generalized beyond the context of internationalizing high-tech SMEs. In addition, most of the companies are Finnish, making it difficult to generalize the results to different cultural contexts. These must be accepted as limitations of qualitative research.

# 4 Summary of publications and review of results

This chapter summarizes the articles included in the dissertation, setting out the objectives and main contributions of each. At the end of the chapter, the results are combined to ground the conclusions in Chapter 5.

Table 4.1: Dissertation publications and author's contribution

| | Publication | Authors | Outlet | Role in publication |
|---|---|---|---|---|
| 1 | Business model experimentation in incumbent and startup companies (2016) | Rissanen, Tommi<br>Sainio, Liisa-Maija | Proceedings of XXVII ISPIM Innovation Conference (Porto), 2016 | Corresponding author, collected and analyzed the data. Major contribution. |
| 2 | The role of home market context in business model change in internationalizing SMEs | Rissanen, Tommi<br>Ermolaeva, Lyubov<br>Torkkeli, Lasse<br>Ahi, Ali<br>Saarenketo, Sami | European Business Review, 2019 | Corresponding author, collected and analyzed the data. Major contribution. |
| 3 | New organizational forms of innovation: What is business model ambidexterity? | Rissanen, Tommi<br>Karhu, Päivi | Proceedings of ISPIM Innovation Symposium (Melbourne), 2017 | Corresponding author, collected and analyzed the data. Major contribution. |
| 4 | Business model experimentation in internationalizing SMEs: Evidence from Finland | Rissanen, Tommi<br>Asemokha, Agnes<br>Torkkeli, Lasse<br>Saarenketo, Sami | Proceedings of 22nd McGill International Entrepreneurship Conference (Halmstad), 2018 | Corresponding author, collected and analyzed the data. Major contribution. |
| 5 | The relationship between business model experimentation and technical debt | Yli-Huumo, Jesse<br>Rissanen Tommi<br>Maglyas, Andrey<br>Smolander, Kari<br>Sainio, Liisa-Maija | Proceedings of International Conference of Software Business (Cham), 2015 | Collected and analyzed the data with corresponding author. Major contribution. |

## 4.1 Publication 1: "Business model experimentation in incumbent and startup companies"

The business environment is changing rapidly for incumbent and startup companies, and both must find ways of adapting their business model in order to remain relevant in their respective markets.

*Research objectives and theoretical approach*

The main objective of the research was to understand differences in the business model experimentation processes of startup and incumbent companies. In startups and some incumbents, the lean startup method (Ries, 2013) has become popular for experimenting with new products. However, incumbent companies are constrained by the innovator's dilemma (Johnson, Christensen, & Kagermann, 2008).

The study approaches business models and business model innovation on the basis of the strategy and entrepreneurship literature streams. Business model experimentation is explored by combining three distinct theoretical concepts: entrepreneurial opportunity creation, effectuation, and discovery-driven planning.

*Main contributions*

Based on the theoretical analysis, the study concludes that incumbent and startup companies operate differently in terms of business model innovation activities. Incumbent companies have the necessary resources and processes to change their business model, and in most cases, they also acknowledge the need for change. However, the limitations of their managerial and entrepreneurial skills make them less effective in conducting business model experiments.

In contrast, startups have the necessary entrepreneurial skills and commitment to change but often lack the skills and processes to meticulously pursue the business model experimentation process.

Based on the empirical analysis, the theoretical conclusions from previous studies were deemed to be largely accurate. However, incumbent companies were found to be better at using experimentation to try out new business models. For incumbents, this experimentation more often ended in termination of the project while startups pivoted into experiments with another business model.

## 4.2 Publication 2: "The role of home market context in business model change in internationalizing SMEs"

Internationalization is always a risky process and commonly requires companies to change their business model. Several factors affect how a company approaches business model change when entering international markets.

*Research objectives and theoretical approach*

The main objective of this research was to enhance existing understanding of how home market context affects how an internationalizing SME changes its business model. The study compared two companies with similar backgrounds other than their home market: one from Russia and the other from Finland.

In the business model innovation literature, internationalization has to date attracted little interest but reveals two different approaches to external stimuli. The first is the threat-rigidity hypothesis (Staw et al., 1981), which claims that companies facing external threats will approach these cautiously and will avoid risk-taking (Shimizu, 2007). The second line of research indicates that managers are more concerned to avoid losses than to make equivalent gains. Based on cumulative prospect theory (Tversky & Kahneman, 1992), emphasis is placed on avoiding risks if there is a high probability of equal gains or losses.

One important incentive for taking the risks involved in internationalization and business model change is to find and exploit new entrepreneurial opportunities. However, risk perception differs across cultures (Weber & Hsee, 1998).

*Main contributions*

As a starting point, there is very little research on the effects of home market context on business model changes during the internationalization process. This study adds to the discussion by illustrating differences in how internationalizing SMEs act, depending on their success and other home market factors. The study also confirms the findings of Tversky and Kahneman (1992) in the context of this research. Faced with a choice between certain loss of all growth opportunities and a high probability of losing much more—possibly even the whole company—if they entered unknown foreign markets, the Russian company chose high-risk internationalization with business model experimentation, which ultimately paid off.

Home market maturity has a strong influence on how and when SMEs decide to enter international markets and how they change their business model. Depending on its image abroad, country of origin m be used in different ways by internationalizing SMEs.

## 4.3 Publication 3: "New organizational forms of innovation: What is business model ambidexterity?"

As the business environment becomes more volatile, a static approach to business models is no longer adequate. In these circumstances, the interplay between exploration and exploitation of new business models is increasingly important.

*Research objectives and theoretical approach*

The objective of this study was to draw on the organizational ambidexterity and business model experimentation literatures to understand the different ways in which incumbent and startup companies can exploit business model ambidexterity.

Business model innovation is examined here in terms of exploration and exploitation dynamics. Disruptive change in the industry can be responded in different ways; companies can (1) ignore the threat and maintain their existing business model; (2)

discard the existing business model and explore a new business model; (3) continue to run the existing business model while simultaneously exploring a new business model; or (4) continue to exploit the existing business model while changing it incrementally. The study concentrates on the different ways in which incumbent and startup companies react; companies that ignore the threat are not included (Osiyevskyy & Dewald, 2015).

According to Tushman and O'Reilly (1996), there are three distinct ways of employing ambidexterity in response to the exploration-exploitation dilemma. Structural ambidexterity means building separate structures for exploration and exploitation activities. Cyclical ambidexterity (Simsek et al., 2009) is based on the view that companies develop through periods of stability (exploitation) and change (exploration). Contextual ambidexterity builds on companies' capacity to run exploration and exploitation activities simultaneously using the same teams (Gibson & Birkinshaw, 2004).

*Main contributions*

The main contribution of this study is a proposed typology of business model ambidexterity applications as shown in Table 4.2.

Table 4.2: Proposed typology of business model ambidexterity applications

| **Ambidexterity mode** | **Group** | **Business model ambidexterity application** |
|---|---|---|
| Structural ambidexterity | a | Creation of parallel structures for exploration and exploitation |
| | b | Emergence of spin-off from exploration activities |
| | c | Move from spin-off to internal exploration |
| Cyclical ambidexterity | d | Cyclical alternation of exploration and exploitation activities |
| | e | Rotation of different business models within exploration activities |
| Contextual ambidexterity | f | Simultaneous internal exploration actions by the same unit |
| | g | Changing business model after exploring new pivots for business |

Companies in Group (a) build separate structures for exploring new business models while continuing to exploit the existing business model in a separate business unit. Group (b) comprises companies that also separate the exploration of new business models into a separate entity but as a spin-off while the company continues to exploit the existing business model. Group (c) companies begin as a spin-off from a large organization but follow up with internal exploration activities. These three groups represent the structural ambidexterity mode.

The cyclical ambidexterity mode is represented by two groups. Companies in Group (d) enter exploration mode to devise a new business model and then change to exploit that business model. Group (e) companies build a stable and exploitable business model but use exploration to experiment with new business models before integration into company operations.

Contextual ambidexterity mode also includes two groups. Group (f) companies run multiple business models simultaneously and are in constant exploration mode. Companies in Group (g) follow the classical startup model by experimenting with a business model in exploration mode until it becomes unsustainable, after which they pivot or restructure the business model and start over.

## 4.4 Publication 4: "Business model experimentation in internationalizing SMEs: Evidence from Finland"

Business model experimentation is a specific way of pursuing business model innovation. It is used to identify the optimal business model in a highly uncertain business environment through a cyclical process of experimentation. The megatrends of globalization and digitalization make it much more likely that companies will enter international markets, and business model experimentation is one way of developing and optimizing their business model in the process.

*Research objectives and theoretical approach*

The main objective of this study was to increase understanding of how internationalizing SMEs use business model experimentation when entering a new market.

For the purposes of this study, business model was defined as a combination of value proposition, value creation, and value capture dimensions, including the ten sub-constructs (Clauss, 2017). Business model experimentation is used to prepare for and react to unexpected events in the market. In this cyclical process, specific experiments with a new business model are conducted with actual customers. Based on the results, the business model is adjusted, and a new experiment is devised. In other words, business model experimentation is a trial-and-error process that aims to improve the existing business model (Sosna et al., 2012).

In this study, analysis of the case SMEs was based on three criteria: (1) type of experimentation; (2) international business model used; and (3) international growth strategy.

*Main contributions*

The main theoretical contribution of the study is a proposed typology of business model experimentation for internationalizing SMEs as shown in Table 4.3.

Table 4.3: Typology of business model experimentation in internationalizing SMEs.

| Group | Experiment type | International Business model | International Growth strategy | Description |
|---|---|---|---|---|
| **Upstart startups** | Pivot | Market adaptive | Lean to global | Lean startups trying to succeed in the international market after domestic success |
| **Lean global startups** | New offering | Technology exploiter | Lean global | Technology firms going straight to international markets with unique offerings |
| **Cautious late-bloomers** | New venture | Ambidextrous explorer | Lean to global | Building international business in a separate company after domestic success |
| **Seasoned buccaneers** | Pivot | Technology exploiter/ ambidextrous explorer | Lean global | Born global startups that have made a successful major pivot with their business model |

The study identifies four different ways of using business model experimentation during a company's internationalization process. The investigation concentrates on differences in the kinds of experiment performed, the approach to business model used to enter the international market, and strategies for international growth.

## 4.5 Publication 5: "The relationship between business model experimentation and technical debt"

Companies use business model experimentation to accelerate their product development cycle and to minimize time-to-market. This often leads to increased technical debt, which

means sacrificing long-term quality for short term gains in order to get software to market quickly.

*Research objectives and theoretical approach*

In this study, the research objective was to examine the similarities and differences between business model experimentation and technical debt.

Mintzberg and Waters (1985) studied the different strategy choices available to companies and the degree of deliberation or emergence they entail. The entrepreneurial strategy has emergent elements linked to entrepreneurial skills. Lean startup (Ries, 2011; Blank & Dorf, 2012) is a well known approach to product and business model experimentation that answers the questions posed by Mintzberg and Waters (1985) concerning the challenges of emergent strategies: the lack of realized or intentional strategy in the business context.

Technical debt may be intentional or unintentional. Intentional technical debt is created when a company realizes it is taking shortcuts that will need to be repaired but decides that time-to-market is more important than quality. Unintentional technical debt is created as a result of personnel changes, inferior processes or other unplanned events beyond the company's control.

*Main contributions*

There were four key findings linking business model experimentation and technical debt. First, business model experimentation creates and requires intentional technical debt. The lean startup approach to developing new business combines elements of business model experimentation and technical debt. This involves building a *minimum viable product* for business model experimentation to learn more about the product being developed. In deciding to build a minimum viable product, the company accepts intentional technical debt.

Second, development without business model experimentation can lead to unintentional technical debt. In some cases, a company jumps into developing new software features before validating them through business model experiments. In such cases, there is a chance that customers will not receive the improvement as intended, and the company must make additional changes. This unintentional technical debt is caused by lack of business model experimentation.

Third, both intentional and unintentional technical debt can be reduced through business model experimentation. With an experienced team, rigorous use of lean startup methods and business model experimentation can reduce both intentional and unintentional technical debt. Experts who can identify the most relevant experiments and commit just enough resources to get to the next validation point will make the most of business model experimentation, minimizing technical debt while achieving excellent results.

Finally, too much focus on business model experimentation rather than on technical debt reduction can have consequences for product quality. Problems will arise if a company pursues a continuous cycle of experimentation without taking the time to correct the software and repay the technical debt. Companies cannot remain indefinitely in exploration mode without taking the time to exploit the business model; similarly, companies must at some point ensure that the product quality is meeting customer expectations.

The findings suggest that the benefits of combining business model experimentation and technical debt follow an inverted U-shaped curve. Up to a point, a meticulous experimentation process will keep the technical debt on the intentional side and at reasonable levels. However, as with any debt, technical debt must be paid back before the company is too deep in the red.

# 5 Discussion and conclusions

The main objective of this dissertation was to illuminate the process of business model experimentation in internationalizing companies in a holistic, multi-perspective way. Although there is an extensive literature on business models and business model innovation, this wider perspective adds a new level to the discussion of how companies innovate and experiment with their business model in situations of uncertainty.

Table 5.1: Main research question and research sub-questions.

| **Main research question:** *How do high-tech companies use business model experimentation in their internationalization processes?* | |
|---|---|
| Publications | Sub-research questions |
| 1, 2 | ***RQ 1**: How does company's development stage and home market context affect the business model experimentation process?* |
| 3,4 | ***RQ 2**: How can companies experiment with multiple business models when internationalizing?* |
| 5 | ***RQ 3**: What are the effects of business model experimentation on product development in high-tech companies?* |

The overarching research question is "*How do high-tech companies use business model experimentation in their internationalization processes?*" This has been addressed through the three sub-research questions presented in Table 5.1, combining the five perspectives on business model experimentation in internationalizing companies. This section discusses the sub-questions, and the main research question is answered. Theoretical conclusions and managerial implications are then presented. This introduction to the dissertation concludes by noting the limitations of the study and suggesting avenues for further research.

*RQ 1: How does company's development stage and home market context affect the business model experimentation process?*

All companies start small; as they grow, they develop advanced processes and acquire resources. Company development stage has an effect on how they conduct business model experiments and how well they endure the risks associated with business model experimentation under uncertainty. Incumbent companies have adequate resources and abilities for successful business model experimentation, but they often lack the courage

to take a chance. In contrast, startups have the courage and will to change their business model as often as they need to but lack the systematic processes and resources needed to take advantage of that experimentation.

An SME's home market context can have a significant effect on the timing of internationalization. High-tech companies from immature home markets are likely to commence business model experimentation in international markets early in their startup phase, regardless of the risks involved and their lack of requisite skills. Companies from stable and mature home markets can grow steadily and begin internationalization at the later incumbent stage. However, business model experimentation processes are largely similar regardless of the timing of internationalization.

Business model experimentation is always a risky process, and entrepreneurs, like most people, are risk averse. Risk-seeking behavior is more likely in two circumstances. First, people like to take minor risks if the prize is large, even if the probability of winning is very small. Second, people take risks when choosing between a sure loss and a high probability of even greater loss (Kahneman & Tversky, 1992). The present findings can be interpreted to mean that startups are willing to take their chances because they have less to lose but can do really well if they succeed, however improbable that may be. On the other hand, incumbents often avoid the risks of business model experimentation until faced with a sure loss.

*RQ 2: How can companies experiment with multiple business models when internationalizing?*

Running a company with an existing business model while at the same time looking for a new business model involves a constant interplay between exploitation of the existing one and exploration of the new one. These processes can be internal to the company or external. There are three different modes of business model ambidexterity, with different applications. While development stage does affect which mode is adopted, incumbents and startups can be found in almost all categories. Here, the main differentiating factor is that all of the companies studied have experimented with their business model.

Internationalizing companies can approach business model experimentation in different ways. This may be seen to depend on international growth strategy, choice of international business model, or type of experimentation, and these criteria can be combined to categorize internationalizing SMEs and their business model experimentation activities.

The findings in publications 3 and 4 must be combined to answer the research question. Business model ambidexterity applications can be used to offset the challenges of business model experimentation in internationalizing companies. Although it remains unclear how these explain the business model experimentation process, both provide tools that can help companies to better understand their options in this regard.

*RQ 3: What are the effects of business model experimentation on product development in high-tech companies?*

The third research sub-question aims to bring business model experimentation closer to the product innovation process in high-tech company context. In many ways, business model experimentation processes and practices resemble the lean startup approach to product development and agile methods for software development. This is especially true with high-tech companies. For this reason, it is useful to investigate the parallel with technical debt as a means of understanding both the benefits and some of the risks of becoming too involved in business model experimentation.

As a company matures, it can move from product innovation to process innovation and on to business model innovation (Massa & Tucci, 2013). These are distinct processes, but there is a link between them. Additionally, business model innovation (and business model experimentation) can take place early in a company's development. As simultaneous business model experimentation and product development can reduce technical debt, business model experimentation can have both indirect and direct outcomes.

Based on the publications and the combined answers to the sub-research question, it is possible to answer the main research question: *How do high-tech companies employ business model experimentation in their internationalization processes?* First, the way in which high-tech companies approach business model experimentation relates to development stage and home market context. Startup companies from countries with an immature domestic market for their products or services are the most eager to enter international markets and to begin experimenting with their business model. However, despite their innate caution, incumbents or companies from a stable and mature home market can also engage in business model experimentation. For some incumbents, the risks may seem too great, but they often have the requisite processes and resources.

Second, companies can make various choices about running multiple business models at the same time and about how to use business model experimentation during internationalization. The business model ambidexterity application was described in publication 3, and the types of experiment, international business model, and international growth strategy were described in publication 4.

Table 5.2: Business model experimentation choices for internationalizing high-tech companies

| Choice | Options |
|---|---|
| Business model ambidexterity application | a) Parallel structures for exploration and exploitation<br>b) Spin-off for exploration<br>c) From spin-off to internal exploration<br>d) Cyclical alternation of exploration and exploitation<br>e) Rotation of different business models<br>f) Simultaneous internal exploration by the same business unit<br>g) Changing business model after exploring new pivots for business |
| Type of experiment | a) Pivot: a new business model to experiment with<br>b) New venture to experiment with a new business model<br>c) New opportunity to experiment with current offering |
| International business model | a) Market adaptive: securing value through rapid market adaptation<br>b) Exploiting technological innovation in international markets<br>c) Exploring new business models in international markets |
| International growth strategy | a) Lean to global: domestic validation of business model before rapid internationalization<br>b) Lean global: lean startup entry to global markets from inception |

Third, companies must realize that business model experiments cannot be done in isolation, as they will affect product development processes and outcomes (and vice versa). The technical debt incurred in high-tech companies by taking shortcuts to develop minimum viable products or business model experiments may in the long run affect business model experimentation unless addressed in timely fashion.

In conclusion, internationalizing high-tech companies make different choices in respect of business model experimentation. Company development stage and home market context affect these choices, and there are consequences for product development in the form of technical debt.

## 5.1 Theoretical contributions

This doctoral thesis makes three theoretical contributions to the existing literature on international entrepreneurship and business model experimentation. As a qualitative research project, the theoretical outcomes serve to increase understanding of the complex phenomenon of business model experimentation in internationalizing high-tech companies.

First, the study contributes to the existing literature by describing a holistic approach to the process of business model experimentation and proposing two typologies: of business

model ambidexterity application (after Tushmann & O'Reilly, 1996; Simsek et al., 2009; Gibson & Birkinshaw, 2004; Markides, 2013); and of business model experimentation in internationalizing SMEs (after Johnson et al., 2008; Blank, 2007; Child et al., 2017; Rasmussen & Tanev, 2015). While acknowledging the possibility of alternative approaches, the thesis provides a starting point for further research in this area.

Secondly, the dissertation adds to the international entrepreneurship literature. Internationalization is a risky venture and, despite all preparations, some uncertainties cannot be anticipated (Figueira de Lemos et al., 2011). The thesis provides tools for business model experimentation by specifying different choices that internationalizing companies can make. Although it is known that choice of business model explains why some rapidly internationalizing companies succeed from the beginning while others take much longer (Hennart, 2014), this thesis provides a new perspective to the process of business model experimentation during internationalization.

Finally, while business model innovation has commonly been described as an ongoing cyclical process (e.g., Dmitriev et al., 2014; Spieth et al., 2014), this dissertation adds a level of abstraction to that process and its development by adopting a multiple perspectives approach (Courtney, 2001) to business model experimentation. Choices related to business models and business model experimentation are difficult because the outcomes depend on multiple factors beyond the company's control. Instead of trying to map all possible outcomes, the multiple perspectives approach provides for continuous assessment of the different perspectives to be considered when experimenting with a business model.

## 5.2 Practical and managerial implications

It can often seem contradictory for an academic to discuss business models with a manager. Most managers are well aware of the business model canvas (Osterwalder & Pigneur, 2010) and have even used it to visualize their business model for financiers or for colleagues. In that sense, managers can be said to be more familiar with this topic than with other interesting research topics in business studies. However, when asked about the company business model, managers often struggle, and all the more so if the discussion turns to changing business models or business model innovation. While the business model canvas is known to most managers, most remain unclear about the essence of business models.

Clearly, this thesis is not a managerial handbook, but a number of its implications can help managers to introduce business model experimentation to their management toolbox. First, business model experimentation is valuable for all kinds of company. For example, startups are often willing to change their business model biweekly, but if those changes are not well planned and aligned with company strategy, they are likely to fail. Rigorous use of business model experimentation can also save a lot of time and effort, which is crucial for early stage startups. Incumbent companies are by nature careful about taking risks with proven business models. While many incumbent companies experiment in this

way, the results are often compared against their existing model, and future opportunities are overlooked. For this reason, most experiments are discarded before having any chance to prove their potential. For incumbents, business model experimentation promises to create new opportunities for alternative futures as long as the experiments are not discarded and forgotten. Business model experimentation can be used in many different ways—for example, to offer choices for changing the core business, creating a spin-off company, or building a new business unit targeting new markets.

Secondly, the thesis proposes a typology of business model ambidexterity. There are practical examples of how companies can experiment with business models while continuing to exploit their existing model. All companies are different, and one way of describing the company's business model, such as the business model canvas, does not fit all. Similarly, running multiple business models at the same time is a complex problem, to which there are different solutions. The present study proposes seven business model ambidexterity applications (described in detail in publication 3 and in section 4.3).

Third, there are various ways of using business model experimentation as a pathway to international markets; the type of experiment, the international business model, and the international growth strategy all affect how the process unfolds. Publication 4 identifies four archetypes for SMEs that use business model experimentation as part of their internationalization process, providing a yardstick for any such company. The elements of the typology serve as a lens through which to explore the process of business model experimentation.

Fourth, many startup companies (and, increasingly, incumbents) adopt the lean startup model (Ries, 2011) of build-measure-learn and use agile software development methods to devise new products. These processes have much in common with business model experimentation, and a link was identified between technical debt incurred by the minimum viable product thinking of the lean startup method and business model experimentation. For managers, it is important to understand that it is possible and even desirable to create new products using agile methods while simultaneously using business model experimentation to optimize the business model. However, it is crucial to balance the two processes to avoid falling into a never-ending cycle of building non-functioning minimum viable products in one business model experiment after another while accumulating technical debt that needs to be paid back before the product is ready. Experimentation is an increasingly popular managerial mantra, but it can be dangerous to fall too deeply in love with the process without recognizing its limitations in actual business settings.

## 5.3 Limitations of the research

While the use of qualitative methods here is well founded, exclusive use of this approach has certain limitations. Compared to quantitative research, the qualitative approach is softer and more subjective. While quantitative data can provide exact answers supported by numbers, qualitative data require interpretation, and the results are suggestive rather

than exact. This limitation could have been avoided by using mixed methods at some points. Nevertheless, the methods used here serve the objectives of the study very well. As noted in section 1.2, the main objective was "to explore different perspectives on business model experimentation in order to make better sense of the process and to provide new insights for both practitioners and academics." In general, the use of qualitative research methods best meets this objective.

A second limitation relates to the volume of data. All of the included publications drew on different samples, but more data would provide further support for the theoretical contributions and managerial implications. On a related point, most of the data referred to Finnish high-tech companies, and more international cases would help to clarify how cultural differences affect the process of business model experimentation.

A third limitation of this dissertation is that the publications span a period of five years, during which time the thinking that eventually became the doctoral dissertation also evolved. Consequently, the insights in the latter publications (and in this introduction) are less clearly articulated in the earlier publications.

## 5.4 Avenues for further research

This dissertation opens up a number of avenues for further research. First, as mentioned in the previous paragraph, this study depended solely on qualitative methods, and mixed or quantitative methods would undoubtedly help to confirm or challenge the findings. In particular, the two typologies would benefit from quantitative inputs.

Business model experimentation in incumbent and startup companies is a complex issue. While some differences were identified between these company types, further research is needed to clarify how company development stage affects business model experimentation. In addition, longitudinal research would provide further insights into how home market context affects the decisions that companies make about the use of business model experimentation during the process of internationalization.

As noted in the limitations above, all but one of the case companies in the thesis publications were based in Finland, and it would be interesting to compare these results with companies from other countries and cultural backgrounds, especially with regard to the influence of home market context and international growth strategies.

Finally, it was beyond the scope of this dissertation to examine how the business model experimentation process affects company performance, and this issue would be of great interest to academics and practitioners alike.

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# Publication I

Rissanen, T., and Sainio, L.M.
**Business model experimentation in incumbent and startup companies**

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# Business model experimentation in incumbent and startup companies

Tommi Rissanen*

School of Business and Management, Lappeenranta University of Technology, Skinnarilankatu 34, 53850 Lappeenranta, Finland
E-mail: tommi.rissanen@lut.fi

Liisa-Maija Sainio

School of Business and Management, Lappeenranta University of Technology, Skinnarilankatu 34, 53850 Lappeenranta, Finland
E-mail: liisa-maija.sainio@lut.fi

* Corresponding author

**Abstract:** All companies are facing toughening global competition in rapidly digitalizing business environment. In order to stay competitive they must be ready to challenge, adjust and even change their business models constantly. This applies to both incumbent and startup companies. Traditionally incumbent companies have been perceived as unable to stay innovative, but now they do not have a choice. This paper presents research on the differences between incumbent and startup companies on how they change their business model through a process of experimentation. Incumbent companies have imitated the startup business model experimentation methods but they still lack the agility and courage of startup companies in business model change. However, the incumbents excel in business model validation processes. This study confirms previous research on the importance of managerial skills and managerial choices.

**Keywords:** business model; business model innovation; business model experimentation; effectuation; entrepreneurial opportunity creation; discovery driven planning; startup; incumbent; entrepreneurship; lean startup; digitalization.

## 1. Introduction

In the rapidly changing business environment companies face toughening global competition. New business opportunities emerge and old business models are made redundant fast. Both incumbent companies that have stabilized their business, and startup companies that are in the beginning stages of their entrepreneurial journey, must find ways to adjust or change their business models in order to stay competitive. Business model innovation is a term used to describe incremental changes in the components of a business model; extension of an existing business model; introduction of a parallel business model with the existing one; or creation of a new disruptive business model (Khanagha, Volberda, & Oshri, 2014). Business model experimentation is an iterative process of changing business model through experiments. Its well-known practical applications include the lean startup method and customer development (Blank & Dorf,

2012; Ries, 2011). There is little academic research on the business model experimentation process and how different kinds of companies use it in their business model innovation activities, however.

This study concentrates in understanding the business model experimentation process in startup and incumbent companies. Incumbent companies are often reluctant or even incapable of changing their existing business model (Johnson, Christensen, & Kagermann, 2008). On the other hand, many large incumbent companies have created internal startup initiatives with which they try to solve this innovators' dilemma. Startups, on the other hand, lack the resources and to rigorously follow the lean startup method by Eric Ries (2011) for long enough to go through the number of iterations it takes to succeed. What makes it more difficult is the fact that in digitalized business environment it is not possible to create permanent competitive advantage even with the most ingenious business model. That means all companies must continuously develop and adjust their business models.

## 2. Literature review

Academics approach business models from different domains, which causes different interpretations to the term. The different business model research domains identified by Zott, Amit, & Massa (2011) are innovation, strategy and e-business. An alternative way of approaching business model research is to view them from three distinctive perspectives: explaining the business (entrepreneurship); running the business (innovation and technology management); and developing the business (strategy) (Spieth, Schneckenberg, & Ricart, 2014). Business model research can also be divided into technology oriented, organization theory oriented and strategy oriented domains (Wirtz, Pistoia, Ullrich, & Göttel, 2016). George & Bock ( 2011) identified 6 thematic groups that reflect and describe the business model in their own way. The themes are: (1) organizational design; (2) the resource-based view (RBV); (3) narrative and sense making; (4) nature of innovation; (5) nature of opportunity; and (6) transactive structures.

In this paper we study how startups and incumbents use business model experimentation in changing their business model. To achieve this goal we concentrate on entrepreneurship and strategy streams of business model research.

The essence of a business model is a representation of how a company is designed to create value to its customers, find a way to make the customers pay for the created value and convert the payments into profit (Teece, 2010); or a logic of the firm, how it operates and creates value for its stakeholders (Casadesus-Masanell & Ricart, 2010); or a system of interdependent activities (Christoph Zott & Amit, 2010). In entrepreneurship literature business model has been defined as *the design or organizational structures to enact a commercial opportunity*. Organizational structures mean *resource structures* or static architecture of the firm's resources; *transactive structure*, or the organizational configuration enabling and determining key transactions with customers and partners; and *value structure*, or the firm's way of creating and capturing value. (George & Bock, 2011) Business models in entrepreneurship literature can also be defined as opportunity facilitators that provide entrepreneurs the means for exploiting the better understanding

of endogenous market interaction costs and exogenous outside options for resource providers (Fiet & Patel, 2008).

Business model is equally important to both incumbent and startup companies. Incumbents are defending their market position against startup companies that try to disrupt their business. In most cases incumbent companies have superior resources and it should be easy for them to replicate a successful business model that is threatening them. However, incumbents may be reluctant of changing their business model, because it could cannibalize their existing business model and shock both existing customers and company stakeholders (Teece, 2010). While incumbents' assets create the potential for positive performance after the implementation of a new business model, the incumbents' managerial choices are what is required to succeed or fail in realizing the opportunities (Kim & Min, 2015). On the other hand, even though startups require business model experimentation to rapidly validate their business model (Trimi & Berbegal-Mirabent, 2012), small startups may fail in creating a successful business model to create and retrieve maximum amount of value from customers and instead content in selling items rather than solutions to customers' problems (Teece, 2010). The ability of a company to create business model innovation is related to the top managers' managerial skills, entrepreneurial skills and managerial ties. (Guo, Zhao, & Tang, 2013) It is more likely that entrepreneurs that are capable of adjusting their business model will succeed better, especially in emerging industries (Teece, 2010).

Concluding the literature on incumbents and startups in business model innovation we suggest that incumbent companies have the resources for business model innovation, but they often lack the managerial and entrepreneurial skills to change an existing, well-functioning business model. Startups have the inherent ability to continuously experiment with their business model, but they lack the processes and resources to take full advantage of a successful business model.

### *Business model experimentation*

Business model experimentation is one form of business model innovation in which new business model is sought in a continuous, iterative process of trial and error. Especially early-stage companies require experimentation to rapidly test and validate their assumptions on the market (Trimi & Berbegal-Mirabent, 2012). Thomke's (1998) experimentation process consists of four steps; (1) design, (2) build, (3) run and (4) analyze. Widely known lean startup process is a three-step iterative process the steps being (1) build, (2) measure and (3) learn (Ries, 2011). The goal of business model experimentation is to identify the most crucial hypothesis in the business model and find as efficient way as possible to test if it holds with customers. If the hypothesis is validated, move to the second important hypothesis. If it was not, change the elements of the business model and build new hypothesis. Because the market elements in most industries are changing rapidly, business model experimentation should become an ongoing process that will continuously validate the company's business model elements. "*Business model innovation is not a matter of superior foresight ex ante - rather it requires significant trial and error, and quite a bit of adaptation ex post*" (Chesbrough, 2010: 356).

Business model experimentation has strong ties to entrepreneurship and strategy domains of business model research. There are three theoretical concepts used in this research to

approach business model experimentation: entrepreneurial opportunity creation, effectuation, and discovery driven planning.

Entrepreneurial opportunity is one of the main concepts in entrepreneurship literature. "*An opportunity is an idea or dream that is discovered or created by an entrepreneurial entity and that is revealed through analysis over time to be potentially lucrative.*" (Short et al., 2010: 55) There are two dominant approaches to entrepreneurial opportunity in the literature: entrepreneurial opportunity discovery and entrepreneurial opportunity creation. The first approach sees opportunities as existing, tangible realities that entrepreneurs must find and exploit. Entrepreneurial opportunity creation approach claims that the opportunity development is an essential part of creating a business from an entrepreneurial opportunity and that business model development begins with the creation of an opportunity. (Ardichvili, Cardozo, & Ray, 2003) In this study we follow the entrepreneurial opportunity creation approach.

Effectuation is a principle introduced by Sarasvathy (2001). She created an alternative approach to prediction-based logic of causation in interpreting the existence and creation of firms and markets. In effectuation process the set of means are given and the focus is in selecting between the possible effects that can be created by the means. In more traditional causation approach the effects are chosen first and the means are selected so that the effects can be created with them. (Sarasvathy, 2001). In effectuation thinking the focus of the company is in the creation of short-term experiments to identify business opportunities that can be tested affordably (Chandler, DeTienne, McKelvie, & Mumford, 2011). The thinking relies on existing resources that are assembled to create value rather than strong understanding of the market needs.

Conventional strategic thinking concentrates in planning and the success is measured by comparing the projections to the actual events. Discovery driven thinking aims at learning as much as possible at the lowest possible cost instead of careful planning and rigorous implementation of the plan. Discovery driven approach to business models assumes that it will take market place experimentation and time to discover the most effective model to survive in the market. The investment strategy in discovery driven planning follows real options theory by investing in many small opportunities instead of betting on one large plan. Most of the experiments will fail, but some will succeed and all of them will increase learning. (McGrath, 2010)

There are similar elements in all three concepts mentioned above. In this study we define the concepts in relation to business model experimentation as follows:

- Entrepreneurial opportunity creation is the experimentation of a radically new business idea before the creation of a service or product.
- Effectuation is the experimentation of a business model based on the existing resources and processes of a company. Company possesses tangible and intangible resources, but no understanding of customer needs. The needs are validated by creating affordable experiments.
- Discovery driven planning is the experimentation of a business model in a systematic way following a pre-determined plan that is adjusted as the understanding increases. The experimentation is done through an iterative experimentation process following the real options theory.

## 3. Research design

This study has been conducted as a multiple case study using inductive reasoning. A total of 32 interviews were made with 28 interviewees from 19 different companies. 11 of the companies were startups and 8 of them incumbents. The companies were all from Finland representing ICT service, ICT product, media and venture capital industries. These industries were selected because the global competition that the internet has made possible has had a very profound impact in these industries. The selection of the companies was based on preliminary inquiries and knowledge of the companies beforehand. All of the selected companies had used experimentation in either developing the business model of the whole company (startups), or in developing the business model of a product or service (incumbents).

The interviews were semi-structured and lasted from 25 minutes to 71 minutes. Most interviews were conducted between 29.7.2015 – 22.12.2015 with 8 interviews a year earlier. The questionnaire was designed to follow the development path of the company from the first idea to the present day concentrating on the creation and changing of the business idea and business model.

**Table 1** Interviewees

| *Company* | *Main Industry* | *Size* | *Offering* |
|---|---|---|---|
| Startup 1 | ICT products | small | b2b |
| Startup 2 | ICT products | small | b2b |
| Startup 3 | VC | small | b2b |
| Startup 4 | ICT services | micro | b2b |
| Startup 5 | ICT products | small | b2b |
| Startup 6 | ICT products | micro | b2b |
| Startup 7 | ICT products/services | small | b2b |
| Startup 8 | Food products | small | b2c, b2b |
| Startup 9 | ICT services | small | b2b |
| Startup 10 | ICT services | small | b2b |
| Startup 11 | ICT products | small | b2c |
| Incumbent 1 | ICT services/VC | medium | b2b |
| Incumbent 2 | Media | large | b2c |
| Incumbent 3 | ICT services | large | b2c, b2b |
| Incumbent 4 | ICT products | medium | b2b |
| Incumbent 5 | Media | medium | b2b |
| Incumbent 6 | ICT services | medium | b2b |
| Incumbent 7 | VC | large | b2b |
| Incumbent 8 | Media | small | b2b |

The interviews were transcribed into text and analyzed using Nvivo qualitative research software. The objective of the analysis was to identify differences between incumbent and startup companies in how they use business model experimentation. For that purpose the interview data was coded to highlight different phases of the business model

innovation: ideation, validation and change. Also, elements of using entrepreneurial opportunity creation, effectuation and discovery driven planning were coded.

## 4. Findings

The different instances where business model experimentation was mentioned by the interviewees are presented in figure 1.

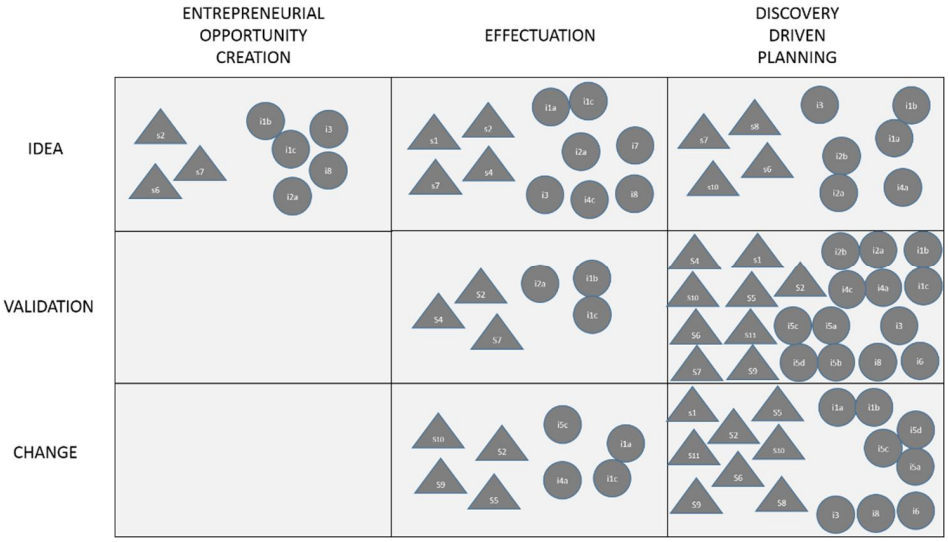


**Figure 1.** Business model experimentation divided between different concepts and different business phases.

The triangles in Figure 1 represent startups and circles incumbent companies. Alphabetical identifiers with incumbents refer to different interviewees in the same company. This study is qualitative rather than quantitative and thus the number of comments in different segments is not analyzed any further.

### *Entrepreneurial opportunity creation*

Entrepreneurial opportunity creation in this study refers to presenting a new business model idea to customers or other stakeholders without building a service or product yet. Only ideation phase of the business model development in companies had features of entrepreneurial opportunity creation in it.

> "It was this high-flying vision. And the thought that something like this could probably be done with today's technology. And something like this would make consumers' life easier in this content flood. Very fuzzy [idea]. High level… suits to the company strategy and customer feedback promised some interest. And on the other hand I had a thought that this would be a killer thing and that we must do something" – *Incumbent 2*

Entrepreneurial opportunity creation begins with an idea that has some backing to it. This idea later became a new service that was experimented with using other methods.

### *Effectuation*

Effectuation was interpreted in this study as trying out an idea based on existing tangible and intangible resources with customers. There were much more comments to the effectuation category. There were features of effectuation in all business model innovation phases of one company and two had them both in ideation and validation phases. With incumbents there were also features of effectuation in all three phases of one company, but otherwise mostly with the ideation phase.

> "…For example this [spin-off company] began so that we had a guy working for us who had done this kinds of systems and he had a vision and a thought on how the business could be done better. Then we built it around him, because he wanted to do it and he obviously had the competence and contacts and so that company pretty much was born around the initiative of this one person." – *Incumbent 1*

Above quotation was an example from the idea phase. Sometimes just one person is enough to initiate a change.

> "What worked well was that people were interested in this sharing activity and it got pretty good publicity and also quite many [people] began these free... pretty fast about a thousand of them were started all over the world. In over 50 countries. And people were very enthusiastic saying 'yes, this is great what you are doing, cool that this is done, it is very important'." – *Startup 2*

This startup had put out a new service following effectuation logic and got validation for it from customers.

> "Five years ago we were in a situation where we had to make a decision. At that point we decided that we will begin making something similar to businesses [than we previously had done for consumers]. When we have a team, we have the competence and we have fought for this so much that we decided to change our business upside down and to quit this community service and start a b2b service with tan idea that everything we do has a price. So we can create cash flow fast and prevent business going bankrupt. This is where we began. For the first two years the company name stayed the same and the community existed even though there was no upkeep to it. Then later we closed the community and changed the company name to what it is now." – *Startup 10*

In the above quotation startup 10 describes a rare case in which their company changed their business model radically and leaned only to the competence of their team without understanding the market at all. Through experimentation they have refined their business model and are now a very successful company with strong funding and steady growth.

### *Discovery driven planning*

Discovery driven planning is in the crossroads of strategic and entrepreneurship streams of business model research. It is based on causational planning rather than effectuation, but experimentation, trial-and-error learning and small iterations rather than long lasting plans are inherent in discovery driven planning. Being closer to traditional business thinking, there were more comments related to discovery driven planning than to other concepts used in this study.

Discovery driven planning appears to suit best to explain the validation of a business model though experimentation. All but one incumbent and 9 out of 11 startups had features of discovery driven planning in the validation phase of their business model innovation. Startups were more eager in business model change phase than incumbents.

> "Well, yes, we immediately that own thing we had at use… we made a few additional things to it and just tried to get pilot users to it before nobody could actually register to the service. And we got the pilot user and talked to the customers and tried to understand the area more and, before we started coding, we were sure that there was some sense in this thing."– *Startup 7*

This startup used the classical lean startup method to create a minimum viable product to test the initial hypothesis. That has strong ties to discovery driven planning in the idea phase of business model innovation.

> "The first pilot, I sold it for 150€ per month, a year ahead. And exactly five of those. … In the next phase I have thought of 250 € per month and tried to charge something for the implementation, but it is only for this phase and not how it is going to go next year. … in practice I have an estimation in my head that 2,99 € per person if it goes over 250 € minimum per month. … But this is not even the right way to price [the product]. You don't price them logically according to the number of users, but for me it's the best guess, easy guess that it should cost about that much to your kind of company. … But why should I think that now. Let's make the product now and sell it for about the right price and then get precise."– *Startup 6*

> "The idea is that we draw a business model canvas from the process. It forces to make your guesses explicit. Then they are there under your nose. Then we just evaluate, which is the most critical of the assumptions. We choose that and then there is the creative part of deciding on the experiment we use to validate the assumption. Is it an additional feature to the product? In my opinion the definition of MVP [minimum viable product] is: minimum amount of product or work that gives a credible result whether our hypothesis was right or wrong." – *Incumbent 1*

The startup example had elements of discovery driven planning in the validation of its business model in a very free and intuitive way. On the other hand, the incumbent used a very rigorous and systematic way to validate the assumptions. The limited resources dictate on how early stage startups can move forward with their business.

> "…they sent our users a questionnaire in which they tried to find out why people were not ready to pay for it. And based on that we would have started to work on changes, but unfortunately we were not given the chance to that. There were naturally several reasons, but one big issue was the price. Okay, the price was high, but we could not decide the price ourselves, but instead it was decided in the company management team." – *Incumbent 2*

In this case the validation proved one element of the business model flawed. The case was in a large incumbent company and the service they were building in a very startup-way was ended. The main reason for failure was not in the service, however, but in pricing that was decided without testing it with customers. This embodies on main difficulty of incumbent companies confirming the findings of Guo et al. ( 2013).

The final square of the matrix represents how discovery driven planning are found in the change phase of business model innovation. There was a strong representation of both startups and incumbents. Startups were more active in business model innovation than incumbents, which confirmed the findings of previous studies (Trimi & Berbegal-Mirabent, 2012).

> "The subscription fee… you can always say that things change, but that is so built-in to the model that it would be hard to change. But hardware is something that can be adjusted much more, because hardware is the gate to this world and if it's our hardware or someone else's hardware is secondary to us. As long as users get the right experience and get their hands on this. So, there can happen changes or could happen." – *Startup 11*

> "We have been growing our competence palette in kind of backwards direction to the chronology of the product. We began at the hard code. When we have done that we have noticed that the things that have taken place before our work began have not gone well. Always a small team to the customer, enthusiastic people who want to do it… everyone have always been interested in the end customer. So, we have realized that we can't create diamonds, because it has been ruined already before us. Then the reaction has always been that we need to get this our little team, this mutual way of doing things that other part as well. So we went from coding to agile methods, service concepts, business models, data science and digital marketing." – *Incumbent 1*

In many interviews the same difference between incumbent and startup ways of doing things could be seen. Startups were preparing themselves for a possible changes and incumbents changed their business model because they had to. It is a rather subtle difference, but clear in the interview data.

## 5. Conclusions

In the previous research on incumbents and startups using business model experimentation the findings were indicating that startups are more active in using experimentation. The startups' problems were related to lack of resources and possible inability to take full advantage of the business model. The biggest difficulties for incumbents have been related to the very commitment to changing existing, fully functioning business model. They have the resources and processes to change the model, but managerial skills, entrepreneurial skills and managerial ties in incumbent companies do not support business model experimentation.

The theoretical concepts used in this paper to study business model experimentation were entrepreneurial opportunity creation, effectuation and discovery driven planning. Entrepreneurial opportunity creation was the most difficult to find in the case companies. As there is a lot of ideation taking place before companies are established, we could argue that the data is lacking in this part. However, only the mentioned few case companies indicated that they had used business model experimentation in the ideation phase with elements from entrepreneurial opportunity creation. There were no remarkable differences between incumbents and startups in this area.

Looking at the features of effectuation in business model experimentation there can be seen some differences between incumbents and startups. Incumbents used business model

experimentation to try out new business opportunities because they had the resources and wanted to see if it would make a good business. Startups in many instances validated their business model or made a radical change to it because they did not have any other choice.

Discovery driven planning was the easiest of the concepts to identify with both incumbents and startups. Here also the biggest differences between the different kinds of companies were seen. The startups used business model experimentation intuitively and in fast cycles while preparing the company for the next business model change. In most cases they were not even trying to find a lasting, stabile business model, but were in a mode of constant change instead. Incumbents worked systematically and used their processes to efficiently pursue the target. In more than one case incumbents decided to end the development of a product or service based on the experiments. Startups in the same position pivoted and tried something else. The managerial and entrepreneurial skills or the lack of them were seen as the cause for this in the incumbents.

In many ways this study confirms the previous research in the area. New findings in this study were that actually incumbents are better in following the rigorous business model experimentation process than startups. One reason for that is their better resources and skilled use of processes. Very few startups use the lean startup method or any other strict process for business model experimentation, but instead they ready themselves for change and make quick decisions mostly based on intuition. Many incumbents imitate startups in business model experimentation and use the lean startup method more than startups themselves and while some of them succeed for the reasons mentioned above, many still fail because of the previously identified managerial problems.

There are differences between incumbents and startups in using business model experimentation. Better understanding of the reasons requires further research on the topic.

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# Publication II

Rissanen, T., Ermolaeva, L., Torkkeli, L., Ahi, A., and Saarenketo, S

**The role of home market context on the business model change in internationalizing SMEs.**

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**The role of home market context in business model change in internationalizing SMEs**

**Purpose** – The paper explores the underlying reasons for business model change among internationalizing SMEs and illustrates how home market context affects that change.

**Design/methodology/approach** – This is a comparative case study of two companies with similar backgrounds from different countries of origin. In each case, the data were collected by means of in-depth interviews with key informants. For its theoretical background, the study draws on the business model innovation and international business literature.

**Findings** – We found that home market context has two kinds of effect on business model change in internationalizing SMEs. First, home market maturity has a strong effect on the timing of companies' internationalization efforts. Second, the company's home market can either be used to strengthen the value proposition or may be disguised, depending on how the country of origin is seen in international markets. This factor has a strong influence on how SMEs change their business model when internationalizing.

**Research limitations** – The study's limitations relate to its qualitative and exploratory nature. Future research should further assess the generalizability of these findings across different cultural contexts and countries of origin by quantifying the central concepts and examining how they relate to larger-scale cross-national and cross-sectional panel data.

**Practical implications** – As internationalization increasingly poses both threats and opportunities, companies must be able to experiment with business models when necessary in order to adapt to the host market. In so doing, it is also important to consider how a company's home market affects business model change.

**Originality** – This is one of the first studies to illustrate how the process of internationalization drives SMEs to change their business models. As such, the paper enhances existing understanding of business model change in the context of internationalization. To our knowledge, no previous study has described these dynamics in a comparative context that takes account of SME country of origin.

# Introduction

In most industries, companies face more changes in their business environment than ever before (Teece, 2010; Trimi and Berbegal-Mirabent, 2012; George and Bock, 2011). They need to change their business models accordingly, making it crucial to understand the importance of business models to ensure success and competitiveness in the market (e.g. Wirtz *et al.*, 2016; Sosna *et al*., 2010). Internationalization often increases business model complexity, as models that work well on the home market can encounter challenges abroad in terms of economic, political, legal or cultural environments (Child *et al*., 2017). As the process of internationalization always involves greater risk and uncertainty than the domestic market, well-managed companies tend to plan their international interventions carefully (Figueira de Lemos *et al*., 2011). For that reason, internationalizing companies usually have no option but to change their business model if they are to succeed in the new environment. However, there is to date little research on how companies make such changes as they enter international markets, as only a few studies have sought to understand how SMEs internationalize through business model innovation (Rask, 2014) or how internationalization is linked to the business model (Child *et al*., 2017). This is a notable research gap, as rapidly internationalizing enterprises tend to be characterized in particular by business model change (Hennart, 2014).

Child and colleagues (2017) recently attempted to address this gap by investigating the role of context in the international business models of SMEs. They argued that three predictors explain the variation in SME international business models: (1) industry context, (2) entrepreneurial experience of company management and (3) home market context. While the first two of these have been studied previously (Child *et al*., 2017), the influence of home market context has received little attention in the international business model literature. As a result, Child *et al*. (2017) called for further qualitative research on the importance and consequences of context in SMEs' choice of international business model, noting this as a promising area for novel research. Responding to that call, the present study is a qualitative empirical analysis of business model change among SMEs operating internationally.

We focus on the role of home market context in business model change during internationalization. Hostile home country factors such as political risk and instability have been identified as external issues that can hinder or assist internationalization (Caputo *et al*., 2016). Home market context is also an enabler for international business in the sense that a small home market is one of the necessary conditions for international new ventures (INV) or 'born global' companies (Hennart, 2014). The business model plays a role in this dynamic, as the firm may not initially aim to change its business model if it is thought to work efficiently. However, new opportunities and, in particular, new threats can prompt a firm to change its existing business model (Saebi, Lien and Foss, 2017).

For the reasons outlined above, this study attempts to clarify the effects of home market context on business model change in internationalizing SMEs. Drawing on in-depth qualitative data from two contrasting cases, we argue that an SME's home market context affects business model change in different ways. Accordingly, our main research question is as follows: *How does an*

*SME's home market affect how it changes its business model when entering international markets?*

The paper is organized as follows. The next section outlines the theoretical approach to business models and entrepreneurial opportunities in the context of internationalizing companies. We also highlight linkages between business model change and international opportunity creation in the international business and entrepreneurship literature, emphasising the particular need to examine these issues in the Russian-Finnish empirical context. After describing the applied research methodology, we present the empirical findings. The paper concludes with a discussion of the results in relation to the existing literature and the study's contribution to theory.

## Business models and business model innovation

Business model research has been of interest to scholars since the emergence of the world wide web (Zott and Amit, 2007). In the early days, the business model concept was variously interpreted, depending on the literature stream (Zott *et al*., 2011). In recent years, the concept has matured, and while differences persist in terms of interpretations or elements, the research has moved forward (Foss and Saebi, 2018). For Demil and Lecocq (2010), a business model consists of the firm's resources, competences, organizational structure and value propositions. Casadesus-Masanell and Ricart (2010) defined the business model as '*the logic of the firm, the way it operates and how it creates value for its stakeholders*'. According to Johnson, Christensen and Kagermann (2008), the business model comprises four interlocking elements: (1) the customer value proposition, (2) the profit formula, (3) key resources and (4) key processes. Magretta's (2002) approach to the business model addressed three questions: 'Who is the customer?', 'What does the customer value?' and 'How do we make money in this business?' Examining business models from a dynamic point of view, McGrath's (2010) construct has two components: (1) the unit of business and (2) process or operational advantages. Moingeon and Lehmann-Ortega (2010) concluded that the business model consists of three elements: (1) the value proposition, including the client and the product; (2) the value architecture, including the company's internal value chain and its value network; and (3) the profit formula, explaining incomes and costs. A study by Amit and Zott (2001) and its subsequent development (Zott and Amit, 2010) defined the business model as an activity system involving two sets of design parameters related to (1) content, structure and governance and (2) a dominant value creation driver such as novelty, lock-in, complementaries or efficiency.

In an analysis of the business model literature for the period 2002–2014, Clauss (2017) identified 120 potential business model components, which can be divided into three main dimensions:

1. value proposition;
2. value creation;
3. value capture.

For present purposes, we follow Clauss (2017) in defining the business model in terms of three elements (value proposition, value creation and value capture) that evolve and change over time. Table 1 organises the various business model definitions above along those three dimensions.

***Table 1. Business model definitions and dimensions***

| Study | Value proposition | Value creation | Value capture |
|---|---|---|---|
| Demil and Lecocq (2010) | Propositions for value delivery | Organizational structure, resources and components | |
| Casadesus,-Masanell and Ricart (2010) | Policy choices | Governance choices, asset choices | Policy choices |
| Johnson, Christensen, Kagermann (2008) | Customer value proposition | Key processes and resources | Profit formula |
| Magretta (2002) | What does the customer value? | | How do we make money in this business? |
| McGrath (2010) | Unit of business | Process or operational advantages | Unit of business |
| Moingeon and Lehmann-Ortega (2010) | Value proposition | Value architecture | Profit equation |
| Amit and Zott (2001); Zott and Amit (2010) | Design themes of activity system: NICE | Activity system governance, activity system structure, activity system content | |

In a rapidly changing environment, the ability to adapt and change the business model is an increasingly important competence for companies (Doz and Kosonen, 2010). However, business model definitions rarely account for time or the dynamic nature of the business. McGrath (2010) noted that business models can rarely be anticipated in advance but are instead learned over time, reflecting what works and what does not. Doz and Kosonen (2010) also emphasized the need for companies to transform their business models more rapidly, more frequently and more extensively in this era of global competition, discontinuities and disruptions. Achtenhagen *et al*. (2013) suggested that certain strategizing actions, when combined with specific critical capabilities, enable companies to change their business model more effectively over time. They too stress the importance of the business model's dynamic nature. Connective mechanisms in the business model allow adjustments of its elements, rendering it dynamic and cyclical (Dmitriev *et al*., 2014). However, although the business model may change in response to external shifts, little is known about how and why firms adapt their business models to environmental opportunities and threats (Saebi *et al*., 2017). In the strategic and organizational literature, various streams (e.g. behavioural theory of the firm) have investigated how firms adapt to their external environment (Chakravathy, 1982; Teece *et al*., 1997), and business model innovation has garnered notable research attention in efforts to conceptualize the phenomenon. In different studies, the concept of business model dynamics and innovation has been variously characterized as business model evolution, business model erosion, business model transformation and business model innovation (Foss and Saebi, 2018).

Trimi and Berbegal-Mirabent (2012) identified three forms of innovation within business models: (1) business models themselves as a source of innovation; (2) the technology-push approach of disruptive innovation, encompassing small changes in the business model; and (3) the demand-pull approach, in which business models are reformulated to meet changing customer demands. At a higher level of abstraction, business model innovation can be said to describe either the creation of a new business model or changes to an existing one (Clauss, 2017). The term has also been used to describe strategizing actions that shape, adapt and renew the business model to achieve sustained value creation (Achtenhagen *et al*., 2013), as well as the design of business models to generate virtuous cycles or feedback loops that continuously reinforce competitive advantage when aligned with company goals. This is neither strategy nor tactics but refers to the use of business models to gain competitive advantage (Casadesus-Masanell and Ricart, 2011). Business model improvement is any successful change in any element of the model that delivers substantially enhanced ongoing sales, earnings and cash flow for competitive advantage. (Mitchell and Bruckner Coles, 2004). On this view, business models are seen as a source of innovation and continuous improvement—that is, as vehicles for business transformation and renewal.

As business model research rarely takes account of location, internationalization has not received much attention in the relevant literature (Onetti *et al*., 2012; Child *et al*., 2017). Sosna *et al*. (2010) viewed business model development as a process of trial and error that aims to identify a viable business model through cycles of exploration before moving on to an exploitation phase that replicates the business model, for example, in new international markets. Osiyevskyy and Dewald (2015) concluded that most incumbent firms engage in pure exploitation of the existing business model or pursue incremental innovation even when threatened by new disruptive business models. Schneider and Spieth (2013) distinguished between incremental business model development and radical business model innovation, arguing that business model innovation has its roots in strategic entrepreneurship, addressing the question of how to explore and exploit opportunities. Foss *et al*. (2017) also differentiate between business model adaptation and business model innovation. The level of business model innovation depends on how many business model elements are changed, and on the weight of the changed elements or components (Ammar and Chereau, 2018). As defined in the present study, business model innovation involves exploring and exploiting new business opportunities rather than creating new business models from scratch, developing an existing business model incrementally or serving as a source of innovation.

There are two distinct lines of argumentation that predict firms' behaviour in response to external stimuli. The threat-rigidity hypothesis (Staw *et al*., 1981) assumes that firms faced with external threats will respond cautiously, applying known and routinized patterns of action (Shimizu, 2007), while opportunities are more likely to lead to risky managerial actions (Chattopadhyay *et al*., 2001). The second approach, prospect theory, argues that managers are more sensitive to losses than to gains of equal magnitude. They are therefore risk averse with high probability of gains and risk seeking with high probability of losses – and reversely risk seeking with low probability of gains and risk averse with low probability of losses (Kahneman and Tversky, 1979; Tversky and Kahneman, 1992; Barberis, 2013). While some studies therefore acknowledge that business

model adaptation is likely to happen under conditions of external threat (e.g. De Reuver *et al*., 2009; Voelpel *et al*., 2004), others emphasize the importance of perceived opportunities as a catalyst for business model adaptation (e.g. Pateli and Giaglis, 2005; Sabatier *et al*., 2012). For companies operating internationally, their home and host markets represent a major source of threat or pressure, and we turn to this issue next.

## The role of the home market in SME business model change and internationalization

Internationalization is a dynamic process of learning that results in a firm's increasing involvement in foreign markets (Johanson and Vahlne, 1977, 2009). Although the idea of internationalization as a dynamic, incremental process is well established in the international business literature, scholars have argued that many SMEs do not adopt this approach (e.g. Buckley, 2011; Knight and Liesch, 2016). For example, SMEs may begin by entering international markets early in their life (Autio, Sapienza, and Almeida, 2000; Knight and Cavusgil, 2004); these firms internationalize rapidly from inception rather than gradually increasing their commitments in foreign markets. In addition, some firms may reduce rather than increase their commitments in a foreign market as time passes (Benito and Welch, 1997) while others may escalate their involvement abruptly (as opposed to incrementally)—for example, by switching from exporter status to wholly-owned subsidiary (Calof and Beamish, 1995). Nevertheless, there is consensus that the process of internationalization encompasses a firm's involvement in international markets, regardless of its size. The process is risky because of a lack of knowledge of new foreign markets and associated managerial decisions (e.g. Andersen, 1993). Because of this uncertainty when operating in new environments, firm strategy should adapt continuously during internationalization (e.g. Calof and Beamish, 1995).

Changing the business model facilitates trial-and-error learning and therefore eases the adaptation to the new environment (Sosna *et al*., 2010; Chesbrough, 2010). Even when operating locally, SMEs often need to adapt their business model in response to uncertainty and ambiguity (Andries and Debackere, 2007; Cuccelelli and Bettinelli, 2015). As SMEs face more uncertainty when entering international markets, it is unsurprising that the business model must embrace innovative response to change if it is to overcome that uncertainty. At the same time, Saebi et al. (2017) argued that business model change is also risky, as it always involves altering routinized patterns of actions, with uncertain outcomes. They found that the more severe the external threat, the more likely it is that firms will engage in business model adaptation. As companies face significant barriers when deciding to change their existing business model (Chesbrough, 2010), most are reluctant to do so unless there are strong incentives (Saebi *et al*., 2017).

One important incentive for internationalization, and therefore for business model change, is exploitation of international opportunities (Oviatt and McDougall, 2005; Ellis, 2011) as discovered by individuals (Venkataraman, 1997). Opportunities can be defined as situations with a higher probability of gain, over which more control can be exerted (Chattopadhyay *et al*., 2001). Ellis (2011) defines 'international opportunity' as the chance to exchange with new partners in new foreign markets. Chandra *et al*. (2012) found that opportunity identification and development is a

continuous, cyclical process, as one opportunity stimulates and generates other opportunities through learning and exposure to new information, resources and network ties. This confirms that both the pattern of international opportunity identification, refinement and development and commitment to international markets are path- and history-dependent (Sydow, Schreyögg, and Koch, 2009). Chandra *et al*. (2012) also showed that failures and false opportunities are not uncommon in internationalization but can be a source of learning insofar as they help firms to better define their 'opportunity space'—that is, which opportunity, business partner, client, and country domain to become involved with or enter).

However, firms also face certain threats when entering foreign markets—in other words, situation involving a high probability of loss, over which the company has little control (Chattopadhyay *et al*., 2001). To offset the negative consequences of threats, firms are likely to respond by making internal changes (e.g. cost cutting, budget tightening) to ensure greater efficiency (Thomas *et al*., 1993). This in turn may lead to business model modification in terms of value creation or value capture. On the other hand, firms in an unfavourable situation may pursue risk because they have little to lose (Kahneman and Tversky, 1979). In this sense, firms may respond to threat with externally directed actions. In relation to business model components, external threats may lead to value proposition change, and perceived threats may outweigh opportunities as a stronger incentive for business model change (Saebi *et al*., 2017).

Child *et al*. (2017) argue that home country development level is an important factor predicting business model variation in internationalizing SMEs. Home country characteristics affect firms' internationalization, for example, via trade, foreign direct investment, and institutional and competitive learning (Cuervo-Cazurra *et al*. 2018b). Home country institutions such as government trade agencies, industry associations, and research institutes are significant resources that can support SMEs to internationalize (Brouthers *et al*. 2009), and therefore influence which business models they adopt (Child *et al*. 2017). In addition, uncertainties arising from the home country political risk and corruption can influence firms' internationalization and performance (Cuervo-Cazurra *et al*. 2018a). For example, firms mitigate their home country political risk by entering into foreign markets, as this decreases their dependency on the domestic market (Witt & Lewin, 2007; Yamakawa, Peng, & Deeds, 2008). Similarly, home country corruption can help firms enhance their performance when internationalizing, as they learn how to deal with changing application of rules and regulations and become more adaptable to sudden changes — a capability specifically useful for firms dealing with changes in regulations when entering a foreign market (Cuervo-Cazurra et al. 2018a). In addition to the role of institutions and different uncertainties, home country culture can also influence firm internationalization and business model change. For example, Weber and Hsee (1998) identified significant differences in how risk is perceived in different cultures. While people in all cultures are willing to pay more for less risky options, the home country context can be a major factor in a firm's willingness to pursue risky internationalization through business model experimentation. Despite the significant effect of the home country characteristics of an SME on its business model change, there is little empirical evidence to clarify this relationship in detail. Using a comparative case study, the present research aims to do so.

# Methodology

To address our research question, we compared two contrasting cases. As we sought to understand a relatively new and complex phenomenon and related practices, it was deemed appropriate to employ a qualitative approach to data collection and analysis (Eriksson and Kovalainen, 2010). A comparative in-depth case study enabled us to capture the dynamics and complexity of the phenomena to be explored (Woodside and Wilson, 2003; Yin, 2009). In addition, the case study approach is easily generalizable and theoretically testable (Eisenhardt, 1989; Eisenhardt and Graebner, 2007). We expected this approach to yield fresh insights into how SMEs' business models change during the process of internationalization, and how their home market affects this change.

## Case selection

To enhance the existing understanding of business model changes during internationalization, we used purposeful sampling (Pratt, 2009). After considering several cases, we finally selected two SMEs from different business environments on the basis that they represented contrasting situations in terms of internationalization and business model change. In addition, the chosen SMEs suited our research purpose in that they originated from quite different home markets while being similar in certain other respects, including size, core activities, international operations and industry. Both operate in the same industry, and both were founded by friends with a technical background. The choice of industry (IT) was based on previous evidence that technology-intensive industries to be especially suited to rapid internationalization (Crick and Crick, 2014; Sekliuckiene, 2017). Their similarities and differences meant that our proposed theoretical framework was applicable in both cases; that is, it helped us understand the link between internationalization and business model changes and the role of the SME's home market context. As Yin (2009) explained, choosing two contrasting cases facilitates theoretical replication. One of the case companies is an IT software producer based in Russia and the other is a software consultancy based in Finland. Table 2 presents basic information about the two companies and the main similarities and differences.

***Table 2. The two case companies***

| | **Software provider (Russia)** | **Software consultancy (Finland)** |
|---|---|---|
| Home market | Russia | Finland |
| Size of home market, inhabitants | 140 million | 5.5 million |
| Size of home market, euros | 5.3 bn euro | 9 bn euro |
| Year of incorporation | 2008 | 2000 |

| | | |
|---|---|---|
| Founders | Two friends (graduates from technical university) | Six friends |
| Core activities | Internet marketing software development | IT consultancy |
| Number of employees | 330 | 400 |
| Year of entry to foreign market | 2008 | 2014 |
| International operations | FDI, export | FDI |
| Foreign markets | USA, Czech Republic, Cyprus | USA, Japan, Netherlands |
| Foreign subsidiary—number of employees | USA—60 | USA—30 |
| Foreign subsidiaries sales/profit (%) | 20% of total sales | 20% of total sales |

Although they are neighbours, Russia and Finland have very different economies and business cultures. As one of the largest countries in the world, Russia is in many ways self-sufficient, and Russian companies do not necessarily need to enter international markets in the same way as companies from countries with a smaller home market. However, Russia's history of socialism means that its internal market is less developed than that of many Western countries, and Russian companies have recently faced economic constraints because of political disagreements with US-led countries in the West. Finland is a small but highly developed country with a large number of high-technology enterprises, but because its domestic market is small, internationalization is an important prerequisite for economic growth. As shown in Table 1, the IT market in Russia is half the size of Finland's. For that reason, and on the basis of the interview data, we defined Russia's home market as immature and Finland's home market as mature.

**Data collection**

As the interview is an efficient means of collecting rich, empirical data, particularly in relation to previously unexplained phenomena (Eisenhardt and Graebner, 2007), primary data collection took the form of interviews with key informants from the case companies. We conducted five interviews with the two founders of the Russian firm and their assistant and five interviews with three business directors or founding partners of the Finnish company. To ensure that the interviewees were involved in decisions about internationalization and were responsible for their implementation, we targeted the business owners and founders as key informants.

We used a semi-structured interview guide, simultaneously allowing for a discussion driven by the respondents. The interview included open-ended questions, which allowed interviewees to tell their own stories and to discuss key issues related to their business. During the interviews, we used a repeated comparison approach to detect differences and similarities across the two cases and across respondents (Pratt, 2009). The interviews were conducted in Finnish for the Finnish company and in Russian for the Russian company.

## Data analysis

All interviews were digitally recorded and transcribed, and the transcripts and recordings were translated into written English by a professional translation company to minimize the risk of mistranslation. The results were also fact-checked by the native interviewer to further minimize errors. NVivo software was used for data analysis; employing a software-based procedure for analysis and interpretation of the interviews helped to ensure the trustworthiness of the research (Sinkovics, Penz, and Ghauri, 2008).

**Data coding**

For data analysis we used a two-step coding procedure. Firstly, we coded all business model changes in value proposition, value capture, and value creation we found in the interview transcriptions. We used the business model definition of Clauss (2017) as basis for coding these business model elements. Two authors were doing it independently in order to avoid biases. Secondly, we coded all environmental changes, including factors related to home market context by identifying and coding instances, where the home market had influenced company's actions regarding internationalization or business model changes. After the second stage we combined two codes and revealed the connection between business models changes and home market context.

**Data analysis**

Based on the techniques suggested by Miles and Huberman (1994), we conducted a cross-case analysis to examine similarities and differences between the particular cases. First, we conducted within-case analyses, combining interview data with archival data to produce an event history data set for both cases and to assess each case in relation to the research objective (Garud and Rappa, 1994). We then conducted a between-case analysis to look for cross-case patterns. Next, we examined the between-case and within-case analyses (Strauss and Cobrin, 1990) to produce a summary of the findings and to capture the dynamics of business model change in the two different contexts. The process was iterative; moving from data to theory or to emerging patterns, we were able to refine our findings, assigning them to specific conceptual categories (Strauss and Cobrin, 1990). As is typical of most qualitative research, the analysis involved a cycle of inductive and deductive reasoning (e.g. Walsh and Bartunek 2011).

For the data triangulation we complemented our interview data with archival data such as companies' documents available in open data sources, companies' websites and media materials related to the industry and home market situation. This information allowed us to depict the whole process of two firms' internationalization and changes caused by their home market environment.

## Findings

This section reports the results of our data analysis in relation to business model change at the two IT firms during internationalization. We begin by describing the antecedents of business model change in each case, looking at the effects of home market context on the

internationalization process. We then present the results of the cross-case analysis. Finally, we discuss how home country factors shaped business model change at both firms during internationalization.

**Case analysis**

The Russian company started out in 2008 as a small group of SEO and IT specialists developing internet marketing software. After seven years of trailblazing experiments and constant progress, the company has grown into one of the world's leading research services for online marketing. Having travelled the path from small startup to large international company, they remain loyal to the fundamental values that brought the company to where it is now: adapting to change rather than following a strict plan, and always prioritizing individuals rather than processes. Today, the company employs three hundred specialists in four countries (Russia, USA, Cyprus and the Czech Republic).

Founded in 2000, the Finnish company is now a leading ICT consultancy. A pioneer in agile methods, the company has grown rapidly over the past 12 years, expanding its services from software coding to design, business development and marketing to provide a more comprehensive service to its customers. The company has recently opened offices in New York and Tokyo; this international expansion owes partly to the limits of growth in the home market and partly to an emerging business opportunity in the US. However, initial plans and expectations were soon revised as a consequence of certain discoveries—some positive, some negative—during the internationalization process. The two companies' different paths to internationalization are illustrated in Figure 1.

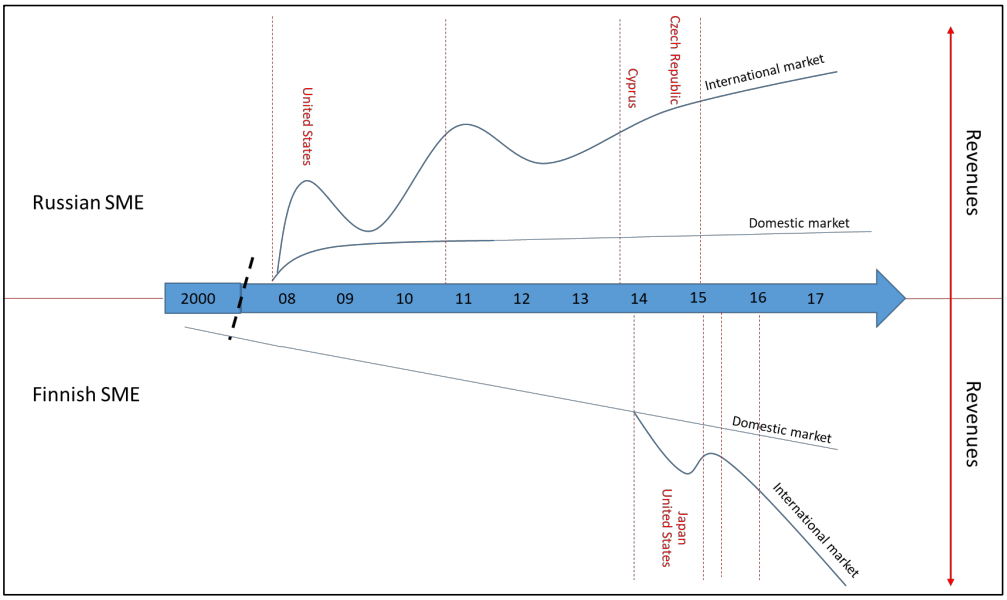

*Figure 1. Internationalization: Events that changed the case companies' business models*

In the upper half of Figure 1, the blue line indicates the development of the Russian SME's revenues in different markets, and the red dashed lines indicate the point in time when business model changes occurred. The first business model change occurred immediately after the company was established. As the major driver for entering the US market was the need to be closer to customers, most of the US office's main activities were concentrated in the sales department and customer support. The company did not initially deploy its existing business model but instead simply entered the new market and followed its rules. According to Business Owner 1, '*The US office was established to support existing business. It gave us a presence in our main consumer market. Initially, the office served customers, with only sales and customer support in the US market'*. This change in value creation was a consequence of threats and opportunities in a foreign market.

The second business model change occurred after the company had spent several years in the US market and understood the business environment. Although it was becoming difficult to manage the affiliate, they saw an opportunity for growth. '*The office was open, but the market doesn't just come. We had to put a lot into making this office work as we wanted. Just opening the office doesn't ensure success. To understand our customers better, we established a marketing department*'. (Business Owner 1)

The third major business model change involved global expansion and new locations, using the US company to avoid cultural suspicion of Russian companies. '*Being registered in the US, we could be perceived as an American company making an American product'.* (Business Owner 2)

The fourth business model change occurred when the company pursued international growth and outside investments. This was driven primarily by financial sanctions against Russian companies and individuals, as the company wanted to further identify itself as a growing international company. '*Now we wanted to target new customers — large enterprises — suggesting new products to them'.* (Business Owner 1)

In Figure 1, the curve below the timeline shows the Finnish software consultancy's internationalization path. The company's first business model change was leaving it late to go abroad — 14 years after the company was founded. The driver for internationalization was that the domestic market in Finland had become saturated. The company was already working with the largest companies in Finland, broadening its position in the value network from software development to design and management consulting, and had already pushed pricing to its limit. A decision was made to open offices in New York and Tokyo. Although the business culture was different, the US business started out well. '*The US has begun very well, I don't know why, but we have found the right people, who introduced us to our next customers. It is a very fast-moving market where you get opportunities, but you are out the door just as quickly if you can't deliver'*. (Founding Partner)

The second business model change occurred when the company tried to gain a better foothold in the US market. The company decided to focus on work-life balance, which is very different in Finland as compared to the US, where long working days are widely accepted and respected. Customers had to be convinced, but the approach was well received in the competitive recruiting market. '*Companies can pay ridiculous salaries that we can't afford. We have been able to attract professionals who are tired of the high workload and have accepted our salary levels'. (Founding Partner)*

A third business model change followed once the company had landed a few very prominent clients and became known in the market, helping to attract both new business and new talent. '*The guys we recruited are very excited about our company, and I believe they will pass it on. Once we get the opportunity to show our actual knowhow, that will impress a lot of people'.* (Founding Partner)

For the Finnish company too, the fourth stage was expansion—in this case, by sharing the work between the US and Finnish companies. The original company has a long history of refining its processes, and there is a lot of talent in the Finnish office, which therefore performs the most complicated work. Scaling software consulting work is very challenging because the output depends completely on human expertise. '*The employer image must be consistent … If talented developers have good experiences in one place, it will attract other top talent to join the team. The best want to work with the best'*. (Business Director 1)

**Between-case analysis**

Table 3 shows the case companies' business models. Although both operate in the software industry, their business models differ. The Finnish company provides software consultancy, which requires close collaboration with their clients. The Russian company's their main product, on the other hand, is a software tool, which can be distributed globally more easily than software consultancy. This in part explains the difference in respective internationalization speeds. The Russian company aligns well with Hennart's (2014) characteristics of an INV/born global; as it sells niche products globally, there is no need to adapt the international marketing mix, and digital products can be delivered at very low cost. In contrast, the Finnish company is left with only a small home market, which also seems disadvantageous because the software market in Finland is quite mature.

***Table 3. Business model comparison***

| **Dimension** | **Russian SME** | **Finnish SME** |
|---|---|---|
| Value proposition | Online marketing solutions for SMEs; close cooperation with customers; constant product improvement | Collaborative coherence, adaptive to unique needs of customers |

| | | |
|---|---|---|
| Value capture | Online marketing software sales to worldwide customers (mainly SMEs) | Software project sales |
| Value creation | Skilled personnel and expertise in software development, r&d, sales and marketing and customer support | Skilled human resources in agile software development |

The two case companies share similar backgrounds, and although they had different reasons for entering the international market, Table 4 shows that there were several similarities in their business model changes during internationalization. For example, although both companies had several foreign subsidiaries at the time of the interviews, both had recognised a similar initial entrepreneurial opportunity: US customers. Both companies concentrated on changing their value creation processes to match their new business environment, and for similar reasons, both made partial changes to their business model. First, they had to do so because of their new business environment; second, once their market position became more stable, they recognized new opportunities.

Both companies also faced obstacles resulting from cultural differences. The Russian company found that the distance from head office became problematic, and the Finnish company encountered difficulties related to differences in the US working culture. Because Russian companies are very hierarchical, management becomes difficult across different continents. For the Finns, adapting from a 40-hour week and long holidays to the very work-oriented and hectic US business environment proved difficult. Both companies overcame these challenges by concentrating on new opportunities involving high growth through their US customer base. Both companies were able to grow much faster than was initially planned. For the Russian company, that meant adjusting to the US market, while the Finnish company turned a short working week and long holidays into a recruitment asset rather than a hindrance.

***Table 4. Comparison of business model change at different stages***

| | **Russian SME** | **Finnish SME** |
|---|---|---|
| **First stage** | **2008** | **2014** |
| Driver | Gain access to large market area | Gain access to large market area |
| BM change | Value creation: sales and support in new market | Value creation: new resources in the new market area |
| | | |
| **Second stage** | **2011** | **2015** |
| Driver | Increase market share | Gain a foothold in the market |
| BM change | Value creation: marketing in US and development in Russia | Value creation: increasing resources via recruitment and additional sales effort |
| | | |
| **Third stage** | **2014** | **2015** |
| Driver | Need to build reputation in the global market | Increasing market share |

| | | |
|---|---|---|
| BM change | Value proposition: branding as an American company | Value proposition: embracing the Finnish reputation of skilled workforce |
| | | |
| **Fourth stage** | **2015** | **2016** |
| Driver | Stabilizing business after sanctions against Russian companies | Responding to increased demand |
| BM change | Value capture and creation: attracting foreign investments, providing new products | Value creation: distributing work between domestic headquarters and international subsidiaries |

In terms of our research focus, the most interesting difference is that the Finnish company has grown mainly in the domestic market and has entered international markets much more slowly than its Russian counterpart, as shown in Figure 1. Hennart (2014) claimed that home market size is one of the denominators in rapidly internationalizing INVs/born globals. Here, absolute market size is more important than country population size; the difference is partly explained by the fact that the Russian software market is much less developed, with lower revenues than in Finland.

The two cases were very similar in many ways, other than the business environment from which they came. The Russian company acted much faster and initially did less planning, establishing its US office very early in the life of the company. In contrast, the Finnish company concentrated first on growth in the domestic market. Although Russia is a large country, the business environment is not very well developed, which meant the company found itself in an immature home market. That pushed the Russian company to enter the international market much earlier while the Finnish company was initially slow to internationalize because its domestic markets allowed them to grow over the first 10 years. After the domestic market became saturated, they too were quick to change their business model. One major difference between the companies was how they used their cultural environment during the change process. The Russian company disguised its origins by becoming as American as possible, using its US company in marketing and investment negotiations. The Finnish company, on the other hand, used its origins to justify differences in working culture and used this to its advantage. Another major difference in the firms' business model changes was in the last stage, where the Russian company changed its approach to value capture by accessing the capital markets as an international rather than a Russian company while the Finnish company continued changing its value creation approach. The last changes made by the Russian company owed in part to an unfavourable home market environment at a time of geopolitical tension between Russia and the West, with financial sanctions imposed on Russia, and in part to new opportunities offering safe future growth.

In general, then, the home market context played an important role in key decisions, serving as a catalyst for business model changes. While both firms faced an unfamiliar environment, the Russian company was more radical and quicker to change, reflecting home market risks as well as new opportunities. This supports the view that such opportunities are dynamic and may evolve over time, requiring business model adaptation and creative decisions; it also confirms the findings of Saebi *et al*. (2017) that perceived threats are more likely to prompt business model changes than perceived opportunities.

# Discussion and conclusions

In this study, we have combined two theoretical perspectives: business model innovation and internationalization in the context of the home market. Based on data from two similar companies from different cultures and business environments, the analysis demonstrates that internationalization is risky and requires continuous modification of business models. The home market affects how a company adapts its business model in a changing business environment during internationalization, especially when facing threats.

McGrath (2010) suggested that business models are more often learned over time rather than anticipated in advance. Our findings confirmed that the business model development of the case companies was not based on careful planning, but more on learning through experiments and adjusting the different elements over time (Dmitriev et al., 2014). Business model innovation can take place in three different forms: business models themselves; innovative business models of new technological innovations; and new business models to meet the changing customer needs (Trimi & Berbegal-Mirabent, 2012). The case companies in this study were very customer-oriented and experimented and changed their business model based on the changed customer needs in the international markets. The changes were done with all different business model elements of value creation, value proposition and value capture (Clauss, 2017).
Thefindings in this study partly support the claim that, when faced with threats, a firm will consciously take a risk if it seems that there is high probability for losses (Kahneman and Tversky, 1979). The Russian case confirms this assumption; risking isolation from financial resources due to sanctions, the company took the risk of radically changing its business model by re-branding the company as American. Similarly, the Finnish case company was operating in stable markets and they saw high probability of gains in the home market, which made them risk aversive towards other opportunities. It was not until they were able to put a small bet into an international opportunity that the Finnish company went to international markets.

Cuerco-Cazurra et al. (2018a) found out that political risk and corruption can have an effect in the firms' internationalization and performance. The Russian company decreased their dependence of the immature home market context by internationalizing early (Witt & Lewin, 2007; Yamakawa, Peng, & Deeds, 2008), while the Finnish company grew their business in their mature and stable home market for a long time. In this way, home market context can play an important role in key decisions, sometimes acting as a catalyst for business model change. While both firms faced an unfamiliar new environment and accompanying opportunities, the Russian company changed faster and more radically than the Finnish company, in part as a reaction to home market risks rather than to new opportunities.

This study contributes to the existing literature by illustrating how internationalization motivates SMEs to change elements of their business model. This is valuable information because very few studies to date have clarified how business model development and entrepreneurial internationalization interact. Those few studies (Rask, 2014; Child *et al*., 2017) fail to identify empirically the change across elements, nor do they provide any cross-country comparison as here. In addition, the home market context can have an effect on how companies perceive the

risks in internationalization and therefore also affect the choices they make based on the risk seeking or risk averse behavior.

This research also has several managerial implications. First, it is clear that internationalizing companies need to prepare not only for planned internationalization but also for the almost inevitable changes in their business models that the process entails. Secondly, as well as studying foreign market opportunities, it is important to understand the relation between home market context and internationalization. Companies carry different baggage into new markets, and entrepreneurial opportunities may look different, depending on the company's origins. Finally, as threats may provide a more effective stimulus for business model changes than entrepreneurial opportunities, they should be explored even more intently. Internationalization involves many uncertainties, and to succeed, a company must be able to react quickly, changing its business model to pursue entrepreneurial opportunities or to avoid entrepreneurial threats.

We acknowledge the study's several limitations, including the retrospective approach to data collection. Longitudinal investigation of the processes of business model change and internationalization would help to further reveal the logic of business model changes in greater detail. We also note that the generalizability of the results may be limited by the qualitative approach and the specificity of cultural contexts. Alternative interpretations of the concepts of business model and business model innovation may provide a different perspective, and future research should explore whether the dynamics of business model change and internationalization hold across the definitional spectrum. A comparative study across both countries of origin and business model constructs may yield valuable insights for scholars interested in applying the concept in different fields and empirical contexts.

Finally, future research can usefully combine theoretical concepts to better understand the process of business model change and the relationship between entrepreneurial opportunity and business model change during internationalization. Rask (2014) divides the interplay of internationalization and business models into upstream and downstream elements, and this broader approach may also yield further useful insights.

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# Publication III

Rissanen, T., and Karhu, P.
**New Organizational forms of Innovation: What is Business Model Ambidexterity?**

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# New Organizational Forms of Innovation: What is Business Model Ambidexterity?

Tommi Rissanen*

Lappeenranta University of Technology, School of Business and Management, Skinnarilankatu 34, 53850 Lappeenranta, Finland
E-mail: tommi.rissanen@lut.fi

Päivi Karhu

Lappeenranta University of Technology, School of Business and Management, Skinnarilankatu 34, 53850 Lappeenranta, Finland
E-mail: paivi.karhu@lut.fi

* Corresponding author

**Abstract:** In order to respond to the opportunities or challenges in the turbulent operating environment, companies need to innovate and experiment with new business models. By conducting a qualitative study with 28 managers in 7 startups and 8 incumbent companies in Finland, this paper explores the ways how companies innovate with two or more business models at the same time or sequentially, one after the other. To explain the phenomenon, we draw from organizational ambidexterity literature and establish a typology in the business model innovation context. As a result we found seven different applications of business mode ambidexterity. Specifically we discovered that spin-off companies are quite common way for incumbent, but also some startup companies to run parallel business models.

**Keywords:** business model experimentation; organizational ambidexterity; business model innovation; business model ambidexterity; business model

## 1 Introduction

Business models and business model innovation have been popular research areas in the past decade. Much of this is because the business environment has become increasingly volatile and many industries are in the middle of disruptive changes (Doz & Kosonen, 2010). This has put pressure into businesses that have static business models and the need for understanding business models and business model innovation has increased fast among both practitioners and academics.

Companies are faced with the need for exploration and exploitation (March, 1991), which are interdependent and non-substitutable activities to the firm (Gibson and Birkinshaw, 2004). These refer to either maintaining and gradually improving existing marketing

activities (i.e. exploitation) or challenging existing activities and creating new ones (i.e. exploration). The companies, business units or employees who engage in both, exploration and exploitation, have been called 'ambidextrous' (see e.g. Gibson and Birkinshaw, 2004). Ambidextrous organizations, those that can find a good balance in the opposite activities, can better survive in a dynamic operating environment in the long-run than those that over-emphasize one or the other.

Exploration and exploitation have also been linked to business model innovation (Sosna et al., 2010; Osiyevskyy & Dewald, 2017; Child et al., 2017; Schneider & Spieth, 2013). Sosna et al. (2010) see business model innovation as a trial-and-error -process in which the initial stages of business model development involve exploration activities and latter stages concentrate in exploitation of the found business model. Schneider & Spieth (2013) make a distinction between business model development and business model innovation. The latter includes exploration and exploitation activities.

Casadesus-Masanell & Ricart (2010) emphasize that business models generate virtuous cycles that strengthen components of the business model with each cycle. This is on par with the exploration and exploitation of new business models. The exploration phase of business model innovation is crucial, as it is impossible to know in advance, even with a thorough research, how a new business model will function in real life (McGrath 2010).

*Research gap*

While there has been remarkable progress in understanding certain business models in specific industries and market situations, yet little is known about how firms manage dual business models (Winterhalter et al., 2015). Majority of the current research suggests building new business models as a separate business unit. Even though this may be the most straight-forward option, this view is rather simplistic and might not always offer the best solution (Markides, 2013) in terms of business model experimentation. With this study, we follow up on the call for more in-depth studies to investigate how companies respond to the exploration and exploitation challenges with business model experimentation to achieve organizational ambidexterity. We do this in the context of Finnish startup and incumbent companies.

This submission focuses in increasing the understanding of the use of business model ambidexterity in the business model innovation processes. Moreover, it investigates the different modes of ambidexterity and understanding why companies that are innovating new business models use specific modes of ambidexterity.

Our goal is to empirically scrutinize the various ways the managers contend with explorative and exploitative demands by altering the business models. We explore how

the contingency factors such as size of the firm impacts the ambidexterity mode selection and implementation.
We suggest that firms adopt different ambidexterity modes to leverage the dual business models, and ask why do companies decide to facilitate business model ambidexterity in different ways?

As a result we expect to provide new insight to the different approaches that startup and incumbent companies can opt to follow in business model innovation and participate in the emerging discussion combining business model innovation and ambidexterity.

In the following chapters, we first review the extant literature on business model innovation, and focus in particular to the reasons why companies begin to experiment with new business models. We then combine business models to ambidexterity literature and refer this as business model ambidexterity. Thereafter, we outline the used methodology and empirical data. This is followed by an analysis and discussion of the findings. The paper concludes with recommendations for future research.

## 2 Theoretical background

*Business model innovation*

Despite of two decades of intensive research there is still not an all-inclusive definition to the term business model. This is not expected to be solved in the near future according to study by Klang et al. (2014) and therefore the definition of business model varies depending on the scope of the target audience and research design. Zott et al. (2011) concluded that business models seek to explain both value creation and value capture in a holistic approach of explaining how firms operate and that the activities of the focal firm and its partners play an important role in the process. The business model also aims in securing the competitive advantage of the company, which requires critical evaluation and dynamic elements in the business model (Wirtz et al. 2015). Business model research can be divided according to the motivations behind the studies. These are: explaining the business, running the business and developing the business (Spieth et al. 2014).

Business model innovation is used to explain the actions companies do in response to the changes in their business environment. Its dimensions are value creation, value proposition and value capture (Clauss 2016). Business model innovation derives from strategic entrepreneurship literature while minor scale business model development draws from dynamic capabilities and resource-based view literature (Schneider & Spieth 2013). In this study we are particularly interested in the exploration and exploitation dynamics of business model innovation and thus lean towards strategic entrepreneurship literature on business model innovation.

Business model change can be divided into explorative adoption of new business models and exploitative strengthening of an existing business model. Osiyevskyy & Dewald (2015) see that incumbent companies can respond to disruptions in their industry with any combination of exploration and exploitation. They can (a) ignore the threat and do nothing; (b) discard their existing business model and exploratively adopt a new one; (c) simultaneously strengthen their existing business model and explore a new one; and (d) incrementally develop and exploit their existing business model. In this study we are looking for both startup and incumbent companies that are not ignoring the threat, but reacting to it in one of the three aforementioned ways.

*Business model ambidexterity*

In 1996, Tushman and O'Reilly suggested that the firms that are capable of engaging in exploration and exploitation activities at the same time are more likely to obtain a superior performance than those that lean on one or the other. Those firms that tend to merely explore bear a risk of having difficulties in estimating their returns and their investments entail uncertainty of when or if those will be materialized (Raisch & Birkinshaw, 2008). In a long run, this develops into a vicious cycle of experimentation, search and failure without achieving the desired outcomes. In addition, the benefits of the exploitation, like the returns from the knowledge, cannot be reaped (Volberda & Lewin, 2003; Levinthal & March, 1993). On the contrary, the firms that have their primary focus on exploitation of current knowledge and activities enjoy high specialization and predictability of returns, however, which may not be the case in the turbulent business environment. The old practices may become obsolete very rapidly.

The past research shows that companies have been responding to the exploration and exploitation needs differently (March, 1991) to achieve organizational ambidexterity, which indicates the ways and the methods how companies have decided to respond to the demands of maintaining their current activities viable and experimenting novel differ. When companies change the focus from exploitation to exploration of new, this may causes changes also their business models. These methods have been discussed as structural, cyclical and contextual ambidexterity and we refer to those as the means to obtain exploration and exploitation via novel business model application.

Structural ambidexterity (Tushman & O'Reilly, 1996) refers to so called dual-structures, which are characterized by the spatial separation of exploration and exploitation and parallel structures facilitating exploration and exploitation (Raisch & Birkinshaw, 2008). The spatial separation means that the exploration activities are sustained by separate business unit such as the R&D department. Christensen (1998) proposed that exploratory units need to be completely separated from exploitative units in order to enable the pursuit of disruptive innovation in the first place. Thus, structural ambidexterity ensures the realization of both exploitation and exploration by structurally separating the exploration

activities (e.g., Tushman & O'Reilly, 1996), possibly even outside of the firm's boundaries.

Cyclical ambidexterity (Simsek et al., 2009) builds on the notion that organizations develop through periods of stability, the times for exploitation, which are interrupted by episodes of change, the so called exploration periods. The logic of this ambidexterity mode thus lies in the temporal alternation of opposite business models and it may refer to sequential pursuit of exploitation and exploration across units, where for instance the exploration outputs of one business unit become the exploitation inputs of another business unit in a processual manner.

Companies can also generate synergies by realizing both exploration and exploitation tasks within the same team or by the same individuals, which requires the skills to engage in contradictory demands rather simultaneously. This has been termed as contextual ambidexterity *(*Gibson & Birkinshaw, 2004), where companies establish behavioral and contextual solutions to do conflicting tasks, exploration and exploitation in parallel. This ambidexterity mode allows the individuals to use their own judgment of how best to divide their resources between routine and renewal, but this calls for the active support and trust from the management team, and facilitation of the conditions that enable such behavior to be realized. Contextual ambidexterity has been said to be possible only once internal processes, structures, goals and rewards are in line to support it.

Business model ambidexterity literature addresses on the other hand the difficulty of running two business models simultaneously (Hu & Chen, 2016), and on the other hand the emphasis of integrating the different business models together, especially in the case of spatial separation (Markides, 2013). Running two separate business models requires a delicate balance between independence and integration to allow synergies (Markides & Oyon, 2010).

## 3 Research methodology

To examine the research question, we conducted 33 semi-structured interviews with the founders or managers in 20 companies mostly in ICT and media industry. These industries are changing fast and therefore companies often have to develop new business models to survive, grow or to respond contradictory demands. The interviewed companies included 11 startups and 9 incumbent companies. The distinction between startup companies and incumbent companies was based on a combination of company size and age. The oldest company, "s7" was established already in 2007, but it has made a major change in its business model in 2012. The smallest incumbent company has a turnover of 3 million, but it has stabilized its market position and its revenues have risen fast in the past years. The interviews lasted 33-80 minutes, 49 minutes in average, and were recorded and transcribed for the analysis.

After the initial analysis of interviews four startups and one incumbent company were removed from the analysis. The reason for this was that one startup had bankrupted after their initial business model failed and other companies had not had any major business model changes in their history. This left us with 7 startups and 8 incumbents and a total of 28 interviews.

Table 1 and table 2 describe the background of the 15 companies included in the study. the financial data is from year 2015, which is the latest year of confirmed financial statements available for all companies.

**Table 1** Startup and small companies

| *ID* | *Industry* | *Establ.* | *Pers.* | *Turnover* |
|---|---|---|---|---|
| s1 | Online b2b services | 2013 | 9 | 111.000 € |
| s2 | Online b2b services | 2012 | 14 | 152.000 € |
| s3 | b2b software service | 2015 | 12 | 430.000 € |
| s4 | b2b software consultancy | 2011 | 15 | 652.000 € |
| s5 | food production innovations | 2014 | 0 | 12.000 € |
| s6 | b2b IT- services | 2011 | 8 | 2.008.700 € |
| s7 | b2b translation services | 2007 | 4 | 607.500 € |

**Table 2** Incumbent companies

| *ID* | *Industry* | *Establ.* | *Pers.* | *Turnover* |
|---|---|---|---|---|
| i1 | b2b software consultancy | 2000 | 145 | 20.377.200 € |
| i2 | Consumer media services | 1889 | 1652 | 525.264.000 € |
| i3 | Operator services | 1919 | 2896 | 1.934.318.500 € |
| i4 | b2b software services | 2005 | 113 | 24.797.000 € |
| i5 | b2c learning solutions | 2005 | 168 | 43.635.000 € |
| i6 | b2b software quality services | 2011 | 63 | 8.623.000 € |
| i7 | Multinational corporation | 1892 | 287.000 | 127.000.000.000 € |
| s8 | Manufacturing electric machinery | 2009 | 30 | 3.138.000 € |

When conducting the interviews, the interview guideline was fine-tuned as more experience was gained throughout the study. The questions in the guideline explored the business model changes in the history of the companies and the reasons and rationale why companies have held two business models simultaneously and how have they practically organized these business models in the company and for what reason.

In order to approach companies, we referred to secondary data sources to find suitable interview partners. The final dataset consisted of 28 interviews of 15 companies. All interviews were recorded, transcribed into text and analysed with Nvivo 11 software.

## 4 Findings

In figure 1 and figure 2 the companies have been presented in a matrix, where horizontal axis describes whether the company is exploiting its existing business model or exploring new business model. The vertical axis describes if these exploitation and exploration activities are made inside the company or in a separately managed unit or in a spinoff-company.

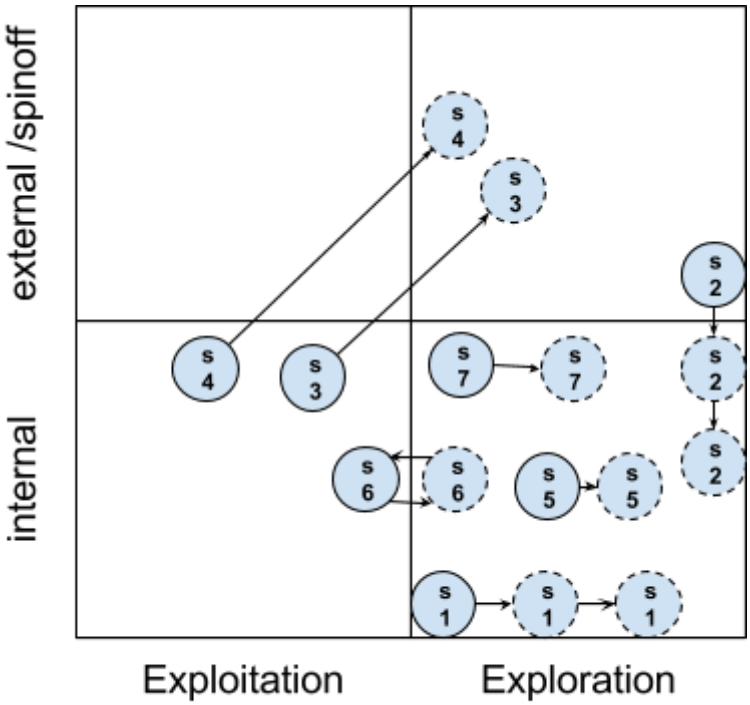


**Figure 1** Startup positioning in the exploitation-exploration / internal-external matrix

The companies in figure 1 are presented so that the first circle describes the position the company had in the beginning. Their initial business model. The second and in some cases third dashed circle describes to which part of the matrix the follow-up iterations of the business model have landed. The positions of the companies in the matrix are not scaled and the length of arrows doesn't have any emphasis or meaning.

s1 made two radical changes in their value proposition and revenue model. s2 began as a university spin-off and made two major changes in its business model. s3 began as outsourced service provider, but built product business simultaneously on the side. s4 provided software consultancy, but invested in other startups both money and development resources at the same time. s5 provides technology to grow food products and simultaneously sells food products on a webstore. s6 provides b2b services to other companies and occasionally makes experiments of different business models that could enhance their business. s7 began as a b2c social media platform, but after mediocre success changed the business totally into providing translation services in b2b market.

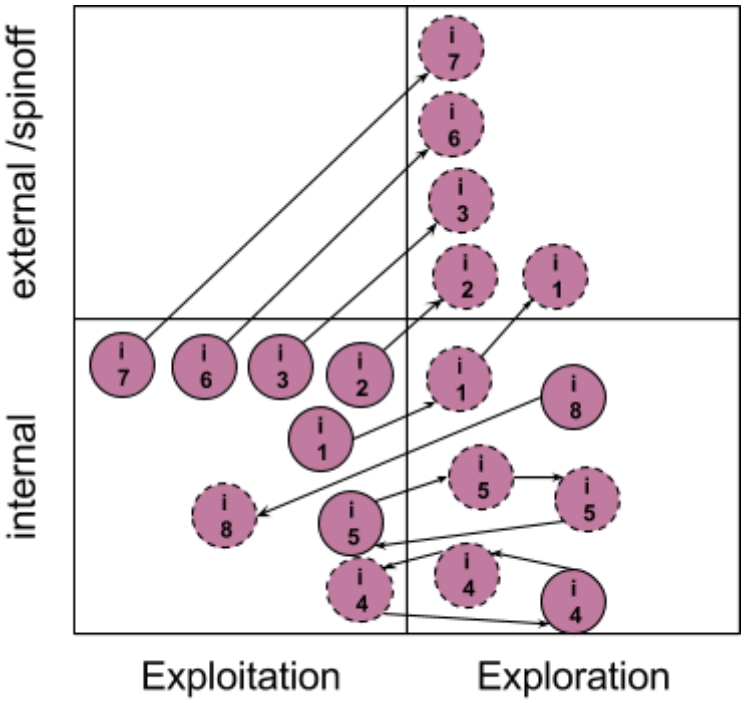


**Figure 2** Incumbent positioning in the exploitation-exploration / internal-external matrix

Similarly to figure 1, figure 2 also presents the positioning of companies in the matrix. The positioning is not relative, just presenting in which quadrant the company has been.

i1 sold software consultancy for many years. Then the company broadened its service provision into training, design and consulting. Later still they began investing in startups and managing a venture fund that provided both money and free software consultancy for companies in it. i2 is a venerable media company that decided to build internal startups to manage changing industry environment. i3 is a telco that has an associated company that builds new services that are later integrated into the parent company. i4 provides b2b software and it has experimented with different business models in its internationalization process. i5 provides learning materials to schools and it develops, pilots and eventually integrates digital games into its learning material offering. i6 provides quality assurance services for companies, but it has a spin-off company that build real time quality measurement. i7 is a global multinational corporation (MNC) operating in different industries. The Finnish subsidiary (among several others) has an internal startup program that is used to build new businesses coming from within the company. i8 is a company building electric drivetrains to heavy industry use. They have tried different business models, but are now stabilizing their business.

From the ambidexterity and business model literature we found out that (1) structural business model ambidexterity builds on internal exploitation of a business model combined with external exploration of new business models (Tushman & O'Reilly, 1996; Raisch & Birkinshaw, 2008); (2) cyclical business model ambidexterity comes from temporal changes between internal exploitation of an existing business model and internal exploration of new business models (Simsek et al., 2009); and (3) contextual business models come from running internal exploitation of existing business models and internal exploration of new business models by the same people (Gibson & Birkinshaw, 2004).

Established companies lean towards structural ambidexterity in business model innovation, because they have the resources and capabilities for running several business units (Khanaga et al. 2014). For startups this is not possible in most cases. Startups are by nature contextually ambidextrous as those are smaller companies "where everyone needs to do everything".

**Table 3** Business model ambidexterity typology

| *Ambidexterity mode* | *Business model ambidexterity application* | *Companies* |
|---|---|---|
| Structural ambidexterity | a. Creation of parallel structures for exploration and exploitation | s3, i2, i7 |
| | b. Emergence of spin-off from exploration activities | s4, i1, i3, i6 |
| | c. From spin-off to internal exploration | s2 |

| | | | |
|---|---|---|---|
| Cyclical ambidexterity | d. | Cyclically alternating exploration and exploitation activities | s6 |
| | e. | Rotation of different business models within exploration activities | i4, i5 |
| Contextual ambidexterity | f. | Simultaneous internal exploration actions by the same unit | s5 |
| | g. | Changing business model after exploring new pivots for business | s1, s7 |

Table 3 presents the suggested typology for different business model ambidexterity applications. Our data, albeit a bit limited, consisted of a wide variety of companies and different ways of business model changes. We found evidence from all three modes of ambidexterity and identified a total of seven business model ambidexterity applications. **Group a** consists of companies that are creating parallel structures within the company and building new business models in a separately managed unit inside the company. **Group b** includes companies that have separated the building of new business models into a spin-off company or a startup they have invested in. This group is the largest of all groups and we found it interesting that the existing literature has not given this group any attention. **Group c** is a case where the company has initiated as a spin-off from another organization as an independent startup and has moved into exploring their business model. **Group d** consists of companies that carry out business model experiments in exploration mode and then come back to exploiting the adjusted business model. **Group e** is formed from companies that have developed a stable business model either in exploitation or exploration mode and have experimented with new business model opportunities before integrating the functioning parts into existing model. **Group f** includes companies that build their business model in the exploration mode and simultaneously build parallel business model on the side. **Group g** are the classic startups that have built a business model in the exploration mode and later pivot to a completely new one, possibly more often than once.

As previous literature indicated, structural business model ambidexterity was most popular among the incumbent companies. There were three startups that utilized this method of developing and changing business models, which was unexpected. Major finding in this study came from the separation of internal startups or separately managed units within the company (group a) and spin-off companies (group b) as equally potent alternatives in structural business model ambidexterity. We also found different applications of business model ambidexterity in cyclical ambidexterity mode and contextual ambidexterity mode, as presented in the previous paragraph.

## 5. Discussion and conclusions

Although business models have existed as long as there has been business, the turbulent and fast-changing business environment of today require companies to concentrate on their core competences but at the same time, they need to pay attention to the possible future opportunities. In the changing business environment companies need to be constantly innovating their business model in order to stay competitive. Despite the vast number of articles published on organizational ambidexterity during the last decade in the context of innovation, literature on how it has been carried out with dual business models (Markides (2013) or more, is still scarce. Especially the empirical investigations in the field are lacking (for exceptions see Khanagan et al (2014); Winterhalter et al., 2016).

We suggest a typology that relies on the ambidexterity literature and propose it to explain the different business model innovations. In this study, we observed that companies divided their exploration and exploitation activities into different business models by structurally separating those, sequentially or together in parallel. Gibson and Birkinshaw (2004) suggested that structural ambidexterity can be achieved by "developing structural mechanisms to cope with the competing demands faced by the organization for alignment and adaptability" (p. 211). Past studies have shown examples of what these structural mechanisms should be like. Our findings illustrate the context of business models and bring to light that the companies, both start-ups and incumbent firms, engage in radically explorative operations through spin-off emergence, which is in line with Christensen's (1998) proposition that disruptive innovations require a completely separate unit in order to be manifested. Similarly, Porter (1996) argued that most companies attempting to compete with dual strategies will likely fail, yet admitting that companies that seek for growth by expanding within their industry can best bear the risks to strategy by putting up stand-alone units that have their own brand names and activities.

We find that the companies pursue structural business model ambidexterity, however, not in the manner that it has been described in the past research. In their study of design firms, Jansen, Andriopoulos and Tushman (2013) discovered that the most successful firms first facilitated exploration and exploitation via structural ambidexterity mode, then switching to contextual ambidexterity, and finally back to structural ambidexterity in a longer period of time. Markides and Charitou (2004) suggested that separation of business models can be the favoured strategy when the new market (exploration) is a) strategically very different from the existing business not only strategically different from the existing business (exploitation), and b) in difficult tradeoffs and conflicts with the existing markets. In this study we find also other reasons for developing new business models. In addition to the difference of the market itself, our study shows that the business model

innovations can be also due to identification of new business opportunities that are difficult to reach within the current operations and business model.

Similarly, we observed "business model vacillation", which can occur in a much more complex way than the mere rotation between exploration and exploitation. For instance, some companies quickly discarded their previous business models as soon as the new business model showed enough promise. Markides and Charitou (2004) propose that when the new market is strategically similar to the existing business, but the two face serious conflicts, a valuable solution may be a separation of the activities for the necessary period of time and thereafter merge the concepts so as to minimize the disruption from the conflicts. This is true with some cases in our study (s6, i3 and i4), but not all.

Markides and Charitou (2004) suggested that when the new market is fundamentally different from the existing business, but the two are not substantially conflicting, it might be better to first build the new business inside the organization so as to leverage the firm's existing assets and experience (and learn about the dynamics of the new market) before separating it into an independent unit. In contrast, no separation of exploration and exploitation is necessary when the new market is very similar to the existing business and presents few conflicts that need managing (Markides & Charitou, 2004). In such a case, embracing the new business model through the firm's existing organizational infrastructure can be considered as the superior strategy.

Our contribution to the existing literature is threefold. First, we have identified the exploitation (current business model related activities) and exploration (new business model experimentation activities) in order to answer the research question *how* do firms hold dual business models through experimentation of new business models while keeping the existing model operative.

Second, our empirical study provides evidence about different mechanisms how companies facilitate the co-existence of the twin business models and insights on the rationales why managers choose to opt for those mechanisms. Although prior research has provided insights on business model innovation, research on facilitation of exploration and exploitation activities with the different business models is still scarce.

Third, this study extends the current knowledge and literature stream about business model experimentation in organizational ambidexterity context. It also makes a contribution to illustrating the differences in the innovation processes of mature and start-up companies.

## 6. Practical implications

All companies need to be constantly ready to innovate with their business models. Companies can benefit directly from the outcomes of this research by reflecting their own business to the case companies and increasing their understanding of different business model ambidexterity applications. There are many different ways of building and running separate business models and for companies it is important to understand the best solution in their own case. This paper will bring information into this process.

This study paves the path towards understanding how companies can benefit from systematic business model ambidexterity and continuous development of new business models to stay competitive in the ever changing business environment.

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# Publication IV

Rissanen, T., Asemokha, A., Torkkeli, L., and Saarenketo, S.

**Business model experimentation with internationalizing SME's: Evidence from Finland**

*Proceedings of 22nd McGill – International Entrepreneurship Conference, August 22nd-24th, Halmstad, Sweden*

# Business Model Experimentation with Internationalizing SME's: Evidence from Finland

*Tommi Rissanen, Agnes Asemokha, Lasse Torkkeli & Sami Saarenketo*

*LUT School of Business and Management*

## Abstract

Business model experimentation is an increasingly popular research topic in business model literature. There are few studies analysing business model experimentation in the context of internationalizing SME's, however. The objective of this paper is to identify different ways of conducting business model experimentation in internationalizing SME's. We approach the problem by looking at experimentation with international business models of 12 Finnish SMEs. We studied the companies' business model experimentation from three viewpoints: (1) innovation and change; (2) entrepreneurial aspirations; and (3) internationalization and growth. As a result, we found four different approaches to experimenting with international business models. The upstart startups are making pivots to find a sustainable business model in the home market to replicate that in the international markets. The lean global startups are technology-oriented born-global companies building their business in the lean startup manner, and cautious late-bloomers have found success in their home market and have built a new venture for internationalizing to experiment with new business models while protecting their existing business. Seasoned buccaneers are born global startups that have been able to radically change their business model to find international growth. For practitioners the study opens up different approaches to experimenting with international business models. For academics the research combines different research streams for further investigation.

## 1. Introduction

Business model experimentation is a method for discovery-driven dynamic innovation of business model with unknown assumptions by testing and clarifying the results (Chesbrough 2010; McGrath 2010). The aim of the study is to increase understanding on business model experimentation in internationalizing small- and medium-sized enterprises (SMEs). So far, the role of business model experimentation in SME internationalization literature has received scant research attention (Onetti et al. 2012; Sainio et al. 2011). This is notable as we live in the age of globalization and digitalization where time and geographical space no longer play as significant role in the competitiveness of new ventures as they used to (Onetti et al. 2012). In other to thrive, managers are faced with the challenge of experimenting with their business models to meet up with the external and internal challenges (Doz & Kosonen 2010; Balboni, B., & Bortoluzzi 2015; Hennart 2014).

The business literature is yet to generate a unifying definition and consensus to the meaning of business models and how they apply to entrepreneurial theoretical perspectives (Johnson et al., 2008; Morris et al., 2005; Malmström et al., 2014). Nonetheless, studies suggest that business models hold potential to establish further development in international entrepreneurship theory (Morris et al., 2005; Zott & Amit, 2001; Onetti et al., 2012). Our purpose is to provide further understanding to the effects of business model experimentation in internationalizing firms, especially from entrepreneurial perspective (Mitchell et al., 2002; Morris et al., 2005; Onetti et al., 2012; Clauss 2017; Sainio et al., 2011; Hennart 2014). We are studying high-tech companies' internationalization as they have the need to rapidly capitalize their competitive advantage in the international market (Crick & Crick, 2014; Child

et al, 2017; Onetti et al., 2012).

We continue as follows: The next section provides a review of literature on business models in general, and on business model experimentation in particular. From there we continue to discussing what literature would expect to be the role of business model experimentation in international entrepreneurship and internationalization of SMEs. Then the research methodology and the cases used in the empirical analysis are described, followed by the analysis itself. We conclude with discussing the merits of the results and their implications on theory and practice.

## 2. Business Models

Recently, management research has received a lot of attention on *business models* on both academic and practical level. The term business model has become a commonly mentioned terminology in various domains within and outside of business management (Shafer et al., 2005; Osterwalder & Pigneur, 2010; Zott & Amit, 2010). Research on business models also show that the general lack of consensus in the conceptualization of business models may be attributed to the diversified views of the concept in various industrial perspectives (Shafer et al, 2005).

A cross-theoretical perspective of business models is based on the perception that business models do not exist in isolation instead can be seen as a unifying unit of analysis that emphasizes how value is created and captured from various sources (Amit & Zott, 2001; Morris et al., 2005; Malmström et al., 2014). Johnson et al. (2005) propose that an effective

business model embodies customer value proposition, profit formula, key resources, and key processes as key elements which combine to create and deliver value. Clauss (2017) reviewed the business model innovation literature from the years 2002 to 2014 and came up with three business model innovation dimensions: value creation, value proposition and value capture. All of these dimensions include a number of components that form a total of 10 sub-constructs (Clauss, 2017). The sub-constructs are presented in table 1.

Table 1. Sub-constructs of business model dimensions (Adapted from Clauss 2017)

| | **Value creation** | **Value proposition** | **Value capture** |
|---|---|---|---|
| **Sub-constructs** | Capabilities | Offering | Revenue models |
| | Technology | Customers and markets | Cost structure |
| | Partnerships | Channels | |
| | Processes | Customer relationships | |

Although business model elements are independent of each other, changes in an individual element tend to impact other elements. Thus, a complementary evaluation of business model elements is essential for an effective business model (Johnson et al., 2005).

## 2.1. Business Model Experimentation

Business model experimentation is a unique approach to business model innovation. It can also be seen as a way to discover the most effective models of allocating resources in the market, considering competitive environment constraints (McGrath, 2010). Several researchers see experimentation as a trial-and-error process following the single-loop and double-loop learning. (Argyris, 1976; Sosna et al., 2010; Trimi & Berbegal-Mirabent, 2012).

Most companies begin experimenting and innovating with their business model only after their existing business model has been disrupted as a reactive rather than proactive process (Chesbrough, 2010).

Experimentation is used in preparing and reacting to unexpected changes that occur in the process of replicating the business model into international markets. Sosna et al. (2010) separate the business model experimentation and exploration phase from the exploitation phase where international growth is achieved with the refined and tested business model. However, they also see further trial-and-error processes as vital also in the exploitation phase to execute rapid international growth with changing environment.

### 2.2. Viewpoints to experimenting with international business models

Regardless of the abundance in firm resources and capabilities, some firms struggle and fail vehemently and poorly planned or managed business models have been attributed to the possible shortcomings of such ventures (Morris et al., 2005; Malmström et al., 2014; Mitchell et al., 2002). Extant literature argues that sustained value creation presumes abilities to change the existing business model (Achtenhagen et al. 2013) as either external or internal forces can trigger or even demand changes in the business model (Torkkeli et al. 2015; Wirtz et al. 2015). Thus, being able to exert change and experiment with business models can be critical for the long-term success of an enterprise, and may even require organizational capabilities to innovate across different parts of the business model design (see Clauss, 2017). our viewpoints firm and entrepreneurial activities that trigger business model experimentation are further explained below.

### 2.2.1. Innovation and Change

Johnson et al. (2008) draw attention to factors which affect business models and may trigger change. These factors are (1) opportunity to challenge competition of expensive competitive products through provision of cheaper and competitive products using disruptive innovation; (2) capitalization and leveraging on brand and technology advantage; and (3) capitalizing on new market opportunity where there is little or no competition. The first factor can be interpreted from a startup's point of view as the making of a pivot. Pivot is an iterative loop that takes a startup back to defining the customer needs if it can't validate its business model with adequate number of paying customers (Blank, 2007). It drives the startup into finding disruptive innovation with enough interest from customers. Second factor means using the company's competitive advantage in technology or brand to enable business model change. This is not typically possible for startups, but incumbent companies can use a new venture as a vehicle for experimenting a new business model safely and utilising their brand and technological advantage. Third factor is interpreted as taking the existing business model into new markets to experiment with a new offering there. These three factors have been used in the analysis to understand the different motives for changing company business model with experimentation.

### 2.2.2. Entrepreneurial Aspiration

Studies on SME international business models that identify three different types of international business model entrepreneurs the traditional adaptive, the technology exploiter and the ambidextrous exploiter (Child et al. 2017). Stating that the traditional market-adaptive are those who do not invest in innovation, but make efforts to readily and rapidly change their

business model when needed. Secondly, the technology-exploiter who invests more on R&D and builds competitive advantage by exploiting its technological prowess; and thirdly ambidextrous explorer, who combines exploitation of the current business model with exploration of new business models in the international market.

Girotra and Netessine (2014) emphasize the importance of managers' role in business model experimentation as a process linked to the cognitive maps of managers' perception of environmental conditions added with their own prior knowledge and experience. Thus, there are managerial competencies that can be identified as a requirement for conducting business model experimentation in a company. The quality and success of an entrepreneurial business model should mirror unique value in the nature of offerings produced and delivered, in order to achieve uncontested market space and sustainable competitive advantage (Magretta 2002; Busenitz & Barney, 1997; Osterwalder and Pigneur 2010; Malmström et al., 2014).

Moreso, managers also tend to struggle to leverage on core competences and achieve sustainable growth (Johnson et al., 2005) due to insufficient knowledge of their existing business models also due to the changing dynamics of business model development processes (Busenitz & Barney, 1997; Magretta, 2002). Hence in order to breach inadequacies in internationalization of business models entrepreneurs may in fact make extensive efforts in modifying their internal and external operations and processes to realize optimal functionality business models in foreign markets (Child et al 2017; Foss and Saebi 2017).

### 2.2.3. Internationalization and growth

Various discussions have been raised on fragmentation and diversification in views in business model literature especially in regards to explaining how changes to business models and impact firm activity (Wirtz et al 2016). In other words, it is still unclear how business models are used to measure SME growth and internationationalization activities (Wirtz et al 2016; Foss and Saebi 2017; Child et al.2017;). However, we acknowledge that the type of business model adopted by a firm is highly dependent on the intensity and extent of the business owner's ambition as well the implications of venture (Morris et al 2005). Thus, the level of entrepreneurial aspirations may impact the design business model may conform to (Malmström et al., 2014; Morris et al., 2005; Johnson et al., 2008). Therefore, firms who are more proactive tend to have a significantly different business model compared to firms who are less proactive. Dunford et al. (2010) see business model replication as a basis for internationalizing a company.

Child et al. (2017) highlight that the business model an internationalizing SME is likely to adopt in the foreign market is highly dependable on the level of development of it's home economy. They also claim that the industry of the company has a major contextual effect on the choice of business model used in the international markets. For born global firms the balance between the novelty and efficiency is extremely important considering the limitations of their resources (Johansson & Abrahamsson, 2014). Sainio et al. (2011) studied value creation of internationalizing firms and suggest that business model construct provides an alternative value creation process based approach to internationalization as opposed to managing disparate international activities and functions.

Rasmussen & Tanev (2015) also made a distinction between lean global and lean to global startups. Lean global startups are born global companies that have combined the lean startup strategy with born global strategy from the inception of the company. Lean to global companies on the other hand have first established themselves on their home market in the lean startup way and later explored rapid internationalization in the born global manner.

## 3. Research Methodology

To explore the phenomenon empirically, we chose to apply qualitative methodology as it is particularly suitable for theory development (Yin, 2009). Specifically, we employed the case study method (Eisenhardt, 1989), as it is particularly fitting for research aiming to describe and increase understanding in-depth of the focal research phenomenon (Woodside & Wilson, 2003). This approach is suitable for this context due to the goal of better understanding the researched area, of which little is understood previously. Our aim is to open new research opportunities and distinguish the relationship between internationalization and business model experimentation.

We selected 12 case companies using purposive sampling. The selection for this study was done from a sample of 20 interviewed companies that had previously been selected using purposive sampling to represent business model experimentation in high-tech companies. The selection of the 12 companies for this study was based on the companies' internationalization activities using business model experimentation in changing, building or adapting their business model. Interviews were semi-structured and the questions evolved on the events of experimentation with the company's business model in events of change such as

internationalization. The companies were all either startup companies or SME's. Startup companies are defined here as SME-sized companies that are less than five years old. All companies originated from Finland and were in an industry that requires high level of technology, eg. IT, media and food technology.

***Table 2. Background information on the case companies***

| *ID* | *Industry* | *Establ.* | *Pers.* | *Turnover* | *Profit* |
|---|---|---|---|---|---|
| **Startup 1** | Online b2b services | 2013 | 10 | 329 300 € | - 305 700 € |
| **Startup 2** | Online b2b services | 2012 | 15 | 699 000 € | - 47 000 € |
| **Startup 3** | food production innovations | 2014 | 5 | 19 000 € | - 7 000 € |
| **Startup 4** | b2b translation services | 2007 | 4 | 647 000 € | - 190 000 € |
| **Startup 5** | online b2b software | 2014 | 4 | 54 000 € | - 134 000 € |
| **Startup 6** | b2c hardware | 2014 | 0 | 42 000 € | - 641 000 € |
| **Incumbent 1** | b2b software consultancy | 2011 | 21 | 2 228 000 € | 116 000 € |
| **Incumbent 2** | b2b IT-services | 2011 | 11 | 2 790 800 € | 196 400 € |
| **Incumbent 3** | b2b software consultancy | 2000 | 325 | 46 308 000 € | 2 412 000 € |
| **Incumbent 4** | b2b software services | 2005 | 131 | 29 279 000 € | 254 000 € |
| **Incumbent 5** | b2b software quality services | 2011 | 70 | 8 983 000 € | 250 000 € |
| **Incumbent 6** | media productions | 1998 | 15 | 2 494 000 € | 546 000 € |

From the financial data on the case companies we can see that six of them is making profit and six are not. The ones that are on the negative are all small startups building their business and going to international markets from the beginning is very difficult and costly. The incumbents are not large companies, but SME's that are operating or have operated in the lean startup manner in building their business.

### 3.1. Analysis

For analysis we drew from the theoretical study the different viewpoint to business model experimentation to understand better the differences between companies in their experimentation activities while going to international markets. Our sample included six

startup companies and six incumbent companies. We analysed these companies from three angles: (1) the type of experimentation they conducted (Johnson et al., 2008; Blank, 2007); (2) the international business model they adopted (Child et al., 2017); and (3) the internationalization strategy they used (Rasmussen & Tanev, 2015). The categorizations and explanations of different categories are presented in table 3.

***Table 3. Criteria for the analysis categories.***

| | | |
|---|---|---|
| Experiment type | Pivot | A completely new business model to experiment with |
| | New venture | New unit or company that is used to experiment with a new business model |
| | New offering | New business opportunity in which to experiment with the existing offering |
| Int. business model | Market adaptive | Securing value through rapid market adaptation rather than innovation |
| | Technology exploiter | Exploiting technological innovation in the international market |
| | Ambidextrous explorer | Exploring new business models in the international markets |
| Int. Growth strategy | Lean to global | Lean startup company first validates its business model in the domestic market and then goes into rapid internationalization |
| | Lean global | Lean startup company that provides its products and services globally from the beginning |

From the literature review we identified three different ways of doing experiments in companies (Johnson et al., 2008; Blank, 2007), three international business models (Child et al., 2017) and two international growth strategies (Rasmussen & Tanev, 2015). We acknowledge that there are more categories in each of these factors, but with the case companies, these are the relevant ones in their cases. Also, we claim that this provides the most accurate results to our research question.

## 4. Results

There were notable differences between the companies. The result of the analysis is presented in table 4. The category companies fall in are presented in columns 2-5. Based on the categories the companies are divided into groups of similar companies.

***Table 4. Analysis results***

| Company | Experiment type | Int BM | Int growth strat. | Group |
|---|---|---|---|---|
| **Startup 1** | Pivot | Market | lean to global | 1 |
| **Startup 2** | Pivot | Tech | lean global | 4 |
| **Startup 3** | Pivot | Market | lean to global | 1 |
| **Startup 4** | Pivot | Explorer | lean global | 4b |
| **Startup 5** | New offering | Market | lean global | 2a |
| **Startup 6** | New offering | Tech | lean global | 2 |
| **Incumbent 1** | New venture | Explorer | lean to global | 3 |
| **Incumbent 2** | New offering | Tech | lean global | 2 |
| **Incumbent 3** | New venture | Explorer | lean to global | 3 |
| **Incumbent 4** | New offering | Tech | lean to global | 2b |
| **Incumbent 5** | New venture | Explorer | lean to global | 3 |
| **Incumbent 6** | New offering | Market | lean to global | 1b |

We found four different groups of companies in our cases.

<u>Group 1: Upstart startups</u>

These companies had made a major pivot with their business model and were building their business in the lean startup mode in the local market before going to international market to fill a market gap there. They are small, agile startups that do not have the resources or capabilities for going straight into international markets. Companies in this group are trying hard to find a sustainable business model that can take them into international success. Their

future is yet unseen.

Group 2: Lean global startups

This group of companies approached new markets with a new offering using technological innovation to provide competitive advantage. They went straight to international markets and interestingly both early stage startups and incumbent startups belonged in this group. We included one startup that had market adaptive international business model and one incumbent startup that had lean to global international growth strategy as they were otherwise very similar to the group 2 companies. These companies represent closely the ones identified by Rasmussen & Tanev (2015) as lean born global startups.

Group 3: Cautious late-bloomers

consisted of incumbent startup companies that had built a successful business in domestic market and were now exploring new business opportunities in the international market. These companies built a new venture for these activities so that they could continue their existing business using the proven business model. They have found the recipe for success and are willing to test their wings in the international markets, but are not ready to put all eggs in the same basket, but instead make business model experimentation in a separate unit that they can afford to make mistakes with and still reap comfortable revenues with the proven business model.

Group 4: Seasoned buccaneers

The last group was formed by two lean global startups who had made a major pivot with their business model. The other of these companies was leaning to technological innovation in their international business model while the other explored a new one. These companies were operating in the international market since their inception, but had run into difficulties with their business model. Instead of folding they made a major revision in their business model and continued growing in the international markets. This maneuver requires a lot of skill, experience and luck.

Internationalization and fast growth requires agility to change business model and this result supports the previous studies by Sosna et al. (2010) and Johnson et al. (2008).

## 5. Discussion and conclusions

The objective of this study was to increase understanding on how business model experimentation is done in internationalizing firms. We decided to look at the different ways internationalizing companies can conduct business model experimentation (Johnson et al., 2008), study the way companies see their market situation and finally investigate the international growth strategy of companies. We found four distinctive ways of combining business model experimentation with international growth. The results were combining the results of different previous studies and were in many ways aligned with the previous results. We confirm Johnson's (2008) results of identifying three factors that can trigger change in the business model even though we named the factors slightly differently. We also found the three international business models defined by Child et al. (2017) in the sample of our case companies. Finally, we confirm Rasmussen & Tanev (2015) separation of lean global startup

and lean to global startup. In fact, we found further elements defining lean global startups: they are exploiting technological innovation in building a new offering to the international markets.

The obvious limitations of our study is that the sample is coming from a single country and single industry. According to Child et al. (2017) the level of home economy development and industry are key contextual factors affecting the choice of international business model. In our study these factors were same for all the companies.

There are several interesting areas for future research. Firstly, comparative analysis of the different international growth strategies of companies would further increase the understanding of business model experimentation in the internationalization context. Secondly, studying companies from different countries would provide better view to the effect of home country factor in business models of internationalizing companies. Finally, it would be interesting to analyze differences in companies' performance using different international business models and different approaches to business model experimentation.

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# Publication V

Yli-Huumo, J., Rissanen T., Maglyas, A., Smolander, K., and Sainio, L.M.

**The relationship between business model experimentation and technical debt**

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# The Relationship Between Business Model Experimentation and Technical Debt

Jesse Yli-Huumo(✉), Tommi Rissanen, Andrey Maglyas, Kari Smolander, and Liisa-Maija Sainio

Lappeenranta University of Technology, Lappeenranta, Finland
{jesse.yli-huumo,tommi.rissanen,andrey.maglyas,kari.smolander, liisa-maija.sainio}@lut.fi

**Abstract.** The use of lean software development methodology and business model experimentation has become popular in software companies in recent years. Business model experimentation is used to validate assumptions made on a product from real customers before the actual product is created. A minimum viable product is used to test the business model by gathering and measuring customer feedback. However, in many cases creating a minimum viable product requires the development team to take shortcuts and workarounds in the product. This phenomenon in software development is called 'technical debt', where companies trade long-term software quality to short-term gain in time-to-market. We investigated four software companies and conducted nine interviews to understand the relationship between business model experimentation and technical debt. The goal was to study how business model experimentation is affecting to technical debt. The results showed that business model experimentation has a clear relationship to technical debt.

**Keywords:** Business model experimentation · Technical debt · Case study · Startup company · Large company · Software development lifecycle · Minimum viable product

## 1 Introduction

Startups and increasingly also larger companies use business model experimentation as a way to accelerate their product development cycles. The well-known process of business model experimentation is the lean startup framework introduced by Ries [1]. The lean startup framework considers learning to be the essence of the product development process and everything else is waste, following the lean manufacturing thinking. A lean startup creates a minimum viable product (MVP) that is a simple prototype of the product attached with a business model. The product team measures different elements of the product functionality and the business model, learns from the customer feedback and builds a better product with an adjusted business model to start the cycle again.

When a company accelerates its product development cycle to create a minimum viable product instead of releasing a ready and complete product, the development


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team has to make shortcuts in the implementation of the product. In the software development lifecycle this is called 'technical debt' [2]. The term technical debt refers to a situation in the software development lifecycle, where long-term quality is traded for short-term gains. Taking shortcuts and workarounds in the development can give a company an advantage to release faster and to acquire customer feedback earlier, but if this 'debt' is not paid back later, it can affect to the quality and further development of the product.

When a new product is launched, it rarely has the optimal business model. The business model has so many elements and variables that it is impossible to predict how all components of the business model pan out when it is in the market. The lean startup process allows the tweaking of the business model efficiently.

The objective of this paper is to study the relationship between business model experimentation and technical debt. We explore if conducting business model experimentation has any effect to the amount of technical debt occurring during the software development lifecycle. We study four case companies and interview their key persons related to business models and technical debt and analyze the interviews for theoretical results.

The rest of the paper is organized as follows. Chapter 2 provides the background and the terminology related to this research. Chapter 3 describes the research process and methodology used in this study. Chapter 4 introduces the results analyzed from the gathered data. In Chapter 5 we discuss about the results and Chapter 6 concludes the paper.

## 2 Background

### 2.1 Business Model Experimentation

Every business enterprise either explicitly or implicitly employs a particular business model [3]. There are multiple interpretations of the concept, however. The business model can be defined as a system of interdependent activities that enables the firm to create value and also to appropriate a share of that value [4]. It can also be defined as the logic of the firm, the way it operates and how it creates value for its stakeholders [5] or the basic unit of business and process or operational advantages [6]. Business models generate feedback loops or virtuous cycles that strengthen components of the business model through iteration [5]. There are many other slightly different interpretations of the concept. In this study the business model is defined as the way a firm creates value and appropriates a share of that value following the definition by Zott & Amit [4]. The difference between a strategy and a business model is not always clear. Casadesus-Masanell & Ricart [5] see the business model as a reflection of the firm's realized strategy.

Many business model studies take the dynamic nature of the business model into consideration. The current dynamic business environment with a multitude of simultaneous changes shortens the lifecycles of business models and requires companies to be constantly able and ready to adapt their business models. McGrath [6] points out that business models can rarely be anticipated in advance but rather learned over time

based on experiences and learning. Doz & Kosonen [7] also emphasize the need for companies to transform their business models more rapidly, more frequently and more far-reachingly now at the era of global competition, discontinuities and disruptions. Business model innovation is the term often used to refer the development of new business models. Business model innovation has been described as "a type of organizational innovation in which firms identify and adopt novel opportunity portfolios" [8] , "the discovery of a fundamentally different business model in an existing business" [9] and "the search for new logics of the firm and new ways to create and capture value for its stakeholders: it focuses primarily on finding new ways to generate revenues and define value propositions for customers, suppliers and partners" [10]. Following the chosen business model definition, the business model innovation definition of Casadesus-Masanell & Zhu [10] is best suited for this study.

Minzberg & Waters [11] separated deliberate and emergent strategies and defined entrepreneurial strategy to be relatively emergent but able to emerge depending on the entrepreneur. Emergent strategy formation is therefore closely linked to business model experimentation, which is one distinct way of doing business model innovation. McGrath [6] sees experimentation as a way to discover which are the most effective models of allocating resources in the market, considering the constraints that are set by the competitive environment. Dunford et al. [12] see experimentation as one of the four processes in business model replication of an internationalizing multinational company. Companies conduct business model experimentation in most cases only after external innovations have disrupted their existing business model, because there are several barriers especially in large companies for creating experiments [13]. Many startup companies have utilized business model experimentation using the specific lean startup method, which originates from Steve Blank's Customer development methodology [14] and was made popular by Eric Ries with his book The Lean Startup [1]. The lean startup methodology is based on validated learning where every action a startup does that does not increase learning how its products can serve customers better is considered waste. In addition to startups, also larger companies have started using the lean startup method for boosting their internal startup activities.

### 2.2 Technical Debt

The concept of technical debt was introduced by Cunningham as a metaphor to financial debt: "every minute spent on not-quite-right code counts as interest on debt. Entire engineering organizations can be brought to a stand-still under the debt load of an unconsolidated implementation, object-oriented or otherwise" [2]. Technical debt has recently become widely used for describing all shortcuts and workarounds in software development processes and artifacts though it was initially used for coding only [15]. As a result, there is a number of corresponding terms to describe shortcuts and workarounds related to other than coding processes and artifacts like quality debt, testing debt, documentation debt [15]. These types of technical debt are considered as subtypes of technical debt but their distinctive characteristics has not been established [16]. Therefore, this article uses the term technical debt to refer to any type of debt taken in the process of developing a minimal viable product.

In general, technical debt is an action or plan to circumvent a problem without developing a proper solution to solve it [17]. This is often done through developing a quick fix that is supposed to be replaced with a proper solution later but it is never done in practice. The temporary solutions that can be implemented in a shorter time in comparison with proper solutions provide companies with a competitive advantage to release new products to the market faster than their competitors. In a longer perspective, temporary solutions accumulate over time having a negative impact to the codebase maintainability [15].

The development of a minimal viable product done in startup companies or special internal startup departments of large companies through corporate venturing and experimentation requires the generation and testing of numerous ideas [18]. However, only a few ideas can potentially generate significant revenue to the company. The selection of the ideas for implementation is often done through experimentation by developing a product that is not fully functional but has primary features partially implemented for testing the product in the market [19]. The trade-off between releasing the product faster and having features properly implemented requires a company to take technical debt. By accepting that time-to-market is more critical than code quality, the company incurs intentional technical debt according to the McConnell's taxonomy [20]. In addition to intentional technical debt, any company is prone to unintentional technical debt. The sources of unintentional technical debt are out of control and the company can be even unaware of them. For example, it can be the result of significant changes in the product architecture that were not planned in advance but suddenly became essential for the product success in the market.

Overall, intentional and unintentional technical debt contribute to uncertainty of the environment in which the company operates [21] by setting limitations on features that can be implement and time required for their implementation. Finding the right balance between time-to-market and amount of technical debt accumulated in the product can be seen a success factor of experimenting with various ideas and delivering these ideas to the market in forms of products that provide value to the customer.

## 3 Research Methodology

The study began with a literature review on business model experimentation and technical debt. Based on the literature, we argue that the current knowledge about the relationship between technical debt and business model is not well-studied and requires more examination. Therefore, this study is exploratory in nature and the goal is to find the linkages between the constructs and understand the relationship. We decided to use case study as the research methodology. We conducted multiple inductive case-studies with semi-structured interviews to gather data from the companies' representatives. Semi-structured interviews can provide rich and detailed data for a specific research question. Interviews bring forth the respondents' own perspective and provide insight to particular experiences they have had with the topic [22].

The cases selected for this study were three large companies in different fields of business and one small startup. From one of the large companies multiple informants

were interviewed to ensure the understanding of the whole phenomena of conducting business model experimentation and the effect on technical debt. In other companies only one informant was interviewed in a company. These interviews were used to confirm the findings in the first company with multiple interviewees.

The data collection was initiated with the large company that had multiple informants. They are studying technical debt in their own processes quite closely and the idea of investigating the relationship between technical debt and business model experimentation came up in discussions with this first case company. The research questions were drawn from those discussions and more informants were selected to increase the understanding in this company. In order to validate the findings, other companies were needed to be interviewed. The initial large case company is in the software development industry. The three other companies were chosen to represent other industries and company sizes; one large media company, one medium-sized software consultancy and one startup in software services business. Interviews with representatives from these companies enforced and proved the findings made in interviews with the first large case company.

The fact that there are six informants in one case company and one from each of the remaining three companies is a limitation in this paper. A wider selection of informants from the other three companies would have validated the findings more soundly.

The informants were experts in the particular area in companies. The interviews were semi-structured and conducted in November-December 2014. The duration of the interviews varied from 28 minutes to 52 minutes. In total there were nine interviews. The roles of the interviewees are shown in Table 1.

We analyzed the interview data with Atlas.ti software by making a thematic analysis, concentrating on the aspects related to technical debt and business model experimentation and identifying elements that played a role in their relationship. In the analysis, the following elements emerged: intentional and unintentional technical debt, the amount of focus on business model experimentation, emphasis on product quality and competence of the development team. As this was not a cross-case analysis trying to identify and examine the possible company-specific differences in the relationships between technical debt and business model experimentation, we present our findings by discussing the results on the level of the phenomenon itself.

**Table 1.** The roles of the interviewees

| ID | Company | Role |
|---|---|---|
| A1 | A | Test manager / project manager |
| A2 | A | Project owner |
| A3 | A | Technical coordinator |
| A4 | A | Software developer |
| A5 | A | Software developer |
| A6 | A | Lead developer |
| B1 | B | Development manager |
| C1 | C | Managing partner |
| D1 | D | Chief executive officer |

# 4 Results

## 4.1 Finding 1: Business Model Experimentation Creates and Requires Intentional Technical Debt

We were able to identify a clear relationship between business model experimentation and technical debt. The studied companies used often a lean methodology and experimentation to build new idea, feature or service in iterative cycle with a minimal effort to product quality to receive faster feedback from the customer. The companies' goal was to test the assumptions of the current business model by experimenting the idea first at the customer before the actual development. To have minimal effort to the quality and fast feedback cycle, the development team had to take shortcuts and workarounds to produce a simple demo or prototype for the customers to use. This demo or prototype consisted only the most minimal amount of source code necessary and sometimes they were just graphical presentations done on the paper to demonstrate the possible functionality in the real version.

*"We have done this product in few iterative steps and always tried to produce the minimal amount to validate the next steps and hypotheses. This has worked for us really well and we have gone always one step forward, but on the other hand we have accumulated technical debt there during that."* – B1.

When companies got an idea to improve the current business model by creating a new feature or a service, the assumption that it would improve the current business model needed to be validated with an experimentation before the actual development phase could start. The companies did not want to waste time and money to first build something and realize afterwards that the assumption of beneficial feature or service was not correct. The reason was that it would have resulted to a significant loss in the development time, because the feature or service would not have been valuable to the customer and therefore to companies' new business models. This was the reason why the case companies first created a demo or a prototype from the idea and experimented it at the customer to receive a fast feedback that would help the company to make the decision for further development.

*"Every thought, idea, or a single feature in the product that you have in mind must be validated somehow before you start to implement it. Otherwise you could use valuable time to build something that does not necessarily have value."* – B1.

The demo or prototype created by the companies were usually developed as fast as possible with minimal amount of source code. At this stage companies made a decision to intentionally take technical debt to the product, as the quality of the feature was really low compared to what it should have to be in the future if the experimentation turned out to be successful. This resulted to situations where a company gave the customer a demo or a prototype of the feature that had a lot of usability issues and bugs, but that would still somehow demonstrate the main functionality that the company assumed would make customers interested.

*"The goal is not to code everything when you have an idea. For example we had a lot of weird usability issues in the prototypes we had this summer, or actually in the beta version, but we decided not to fix them. It is in the accordance of MVP method that you must be little bit ashamed of your product that is going to customer first time."* – B1.

The opinion of most interviewees was that technical debt is bad for the company and product, because it starts to hurt overall quality and it is challenging to manage. However, one informant thought that taking technical debt is not necessarily a bad thing to do in the beginning of the business model experimentation. The reason was that when companies are looking for the correct business model, it does not matter if technical debt keeps accumulating, because the goal is to find the correct business instead of developing something that does not have value to the business model. It would be easy for companies to just throw away the demo or prototype consisting of technical debt, if it would not be good part of the business model.

*"I think that in the beginning start-up does not have to be worried about technical debt, because at that point you have not even validated if your idea good and does it grow to actual business. So technical debt at that point… just get features released and it might even be that the whole product will go to trashcan and also the technical debt at the same time. At that point let's just do something else."* – D1.

The results indicate that while business model experimentation was clearly creating intentional technical debt, it was also required to be taken. The goal of the business model experimentation was to acquire customer feedback as fast as possible to confirm the assumptions made in the business model. This is the reason why companies had to take technical debt intentionally. It made the customer feedback cycle much faster and hypothetically decreased the possibility of unintentional technical debt as the next software development steps were validated with customer.

### 4.2 Finding 2: Development without Business Model Experimentation can Create Unintentional Technical Debt

Business model experimentation has also a relationship to unintentional technical debt. The interviewees described situations where the companies did not use business model experimentation as a tool to develop the business model. Instead, when companies got an idea to improve the business model with a new feature or a service, the software development was begun immediately without conducting customer validation first. We were able to see scenarios where the new ideas were successful without experimentation and the companies were able to improve the business model. However, we also saw scenarios where the idea got developed and after the release the company realized that customers had no need for that certain feature or service.

*"When you think portfolio companies we have worked with that have not used any iterative development of business model, instead they have just gone after some big idea, they have also made huge mis-steps in their technology."* – C1.

The reason for not to use experimentation was that the new idea appeared to be so good that the company decided to begin the development immediately. In addition, experimentation was seen as time consuming and expensive practice to do that could give competitor an edge to be first on the market. Instead, the company could just develop the feature instantly without losing any time while trying to get the feedback from the customers. One of the interviewees also mentioned that reason not to conduct experimentation was that customers were not always willing to take part to the experimentations, since the customer might not be interested in intermediate results.

*"Sometimes it happens like that but not all the time customers are actually Interested in the intermediate results, so sometimes they don't want to be involved in that cycle. They just want the feature because they have a business need for it and they think everything is clear and it should be just implemented."* – A3.

Sometimes companies go after a big idea and start the development instantly without first conducting customer validation through experimentation. These are examples where companies can incur technical debt to the product unintentionally. Even if the new idea would be developed really well with good scalability for the future ideas, if the idea does not fit to the current business model and the customer does not have any need for it, the unnecessary time used for the development can be seen as technical debt.

*"Actually you could say that if we would now put a lot of effort and development to the idea we think is good and would develop it really well, we would not make a lot of technical debt. But actually if the business model would be wrong at that point, we would great a huge amount of technical debt."* – A6.

### 4.3 Finding 3: Both Intentional and Unintentional Technical Debt can be Reduced with Business Model Experimentation

Business model experimentation can cause accumulation of technical debt because the goal of lean startup methodology and business model experimentation is to create a viable product with minimum effort. It requires shortcuts and workarounds in the development that is considered technical debt. However, business model experimentation can reduce both intentional and unintentional technical debt if used properly. We were able to identify situations where the business model experimentation was used to reduce intentional technical debt and to prevent unintentional technical debt.

The reason for the reduction of intentional technical debt was the customer feedback, which was acquired through business model experimentation that gave companies information how to prioritize the developed components in the product. With customer feedback, the companies were able see what was the most important for customers and were able to reduce previously intentionally taken technical debt from those areas.

The benefit of lean startup methodology and business model experimentation was the identification of wrong assumptions in the business model early and avoid wasting developer time on matters that customer's do not need or want. In these cases there is

a possibility for a quick adaptation based on customer feedback. If the company learned that some feature did not have any business value, it was easy to just throw that part of the product to the trash without having a huge damage, since the solution was done already with major shortcuts and it would in any case have required refactoring and rewriting.

*"I think that if we move forward by doing demos it is a good thing. When we have like weekly sprints, it does not matter if we go to wrong direction, we have only lost that one week by then, and sometimes not even that much."* – A4.

*"On the other hand we have thrown so much stuff to the trash can that we developed really fast previously and they should have been refactored, but we did not need them anymore because they were not important to customer."* – D1.

Business model experimentation was also used to prevent unintentional technical debt. One of the interviewees explained us a situation that happened when a team had a great new business idea. One of the managers in the company assumed that the feature was so brilliant that there was no need for experimentation and customer feedback before development. However, the lean startup team insisted on gathering customer feedback to confirm the assumptions. The result was that the majority of customers thought the feature was useless and there was no need for it.

*"So we had this good idea and we had little time to do the experiment design. But one of the managers was like "well I think that this is not necessary because it is so good idea". Anyways a team went to interview 20-30 customers and when they came back they said "Dammit, no one was interested, people thought it sucks."* – B1.

In this case, by conducting the experimentation, the company was able to prevent unnecessary work and technical debt from happening. If the company would have skipped the experimentation and started to develop the feature, the amount of technical debt would have been huge, since all the work of the developers would have gone to waste and company would have not needed that feature in the business. However, now the company was able to prove that the assumptions of the current business model were wrong and it got valuable customer feedback to not develop the feature.

### 4.4 Finding 4: Focusing Too much on Business Model Experimentation and not on Technical Debt Reduction can have Consequences to the Product Quality

Business model experimentation is a great way for companies to receive fast customer feedback and to realize how to improve or change the current business model and the product. However, it can also create some challenging consequences in a long-term. We were able to identify some long-term problems that the case companies were facing when using the business model experimentation. The biggest challenge was the balance between developing new features and improving already existing features. Some of the interviewees felt that the business model experimentation is creating too much pressure to the development team and it is hard to improve features already consisting technical debt, because there is all the time a need for new features and

prototypes demanded by customers. It can be argued that this has not been business model experimentation in the same sense that the lean startup method suggests, however.

*"That is the problem because you also get a lot of features requested by the product line, and the problem is because they actually set deadlines on them. The thing is that those deadlines are not even related to the release window that we have. Although writing the code is quite easy, getting it in requires this downtime cycle. The downtime cycle is the biggest legacy or technical debt that we have. So architectural decisions have been made based on our customer and those decisions are killing us."* – A3.

The consequence of continuing business model experimentation instead of paying technical debt back in already existing product was that the code base started to become too complex and challenging for further development. This resulted to slowness, breakdowns, bugs and scalability problems and the companies had to conduct a lot of refactoring and rewriting to fix the issues.

*"Yes it is really complex at the moment and you really do not know what happens if you change some part of the code. Another problem is the scalability issues that is currently really weak. So we have had discussions that should we write this again."* – A3.

*"For example we talk now a lot about architecture because we just got three new developers and they told us that the product is slow and when you change something you will break something else. The team and product is getting bigger, so we must have some process to get technical debt in control, because otherwise nothing gets developed anymore."* – D1.

The balance between business model experimentation and technical debt reduction is something that companies need to improve in the future. However, it is challenging because the competitive business environment forces companies to constantly improve and change their business model to gain advantages over competition. When the majority of company's focus goes into finding new business model possibilities through a series of experimentations, the focus on technical debt decreases and that can have consequences to the product quality.

## 5 Discussion

When combining the experiences and examples described by the interviewees, we can see that the growth of the business and product quality were connected with business model experimentation, reduction of technical debt and competence of the development team. We were able to see that companies had two ways to test their current business model and its assumptions. The first one was to develop the idea with a good design and scalability and release it to a customer when it was ready. We saw situations where companies developed the idea with a good design and then the release was a success. However, we could also identify cases where the well-designed new

features were not that successful. The reason was in most cases wrong assumptions about the actual customer needs. According to McGrath [6] business model cannot be fully anticipated in advance and it should be rather learned through experimentation in discovery and development.

The second way was to test the business model with experimentation. There the companies figured out the minimal way to experiment with the customer if the assumptions were right or wrong before even starting the actual development. When a company had a clear vision about the business model and all the assumptions were confirmed, the company started to improve the feature that was previously developed with shortcuts for experimentation purposes. In these situations the overall development time was often longer and more expensive, since companies had to conduct series of experimentations before starting the development. Chesbrough [23] claims that some companies do not use business model experimentation, because it is time-consuming to create, conduct, obtain, interpret and understand the experimentations. This is why some companies prefer to just grow the current business model [23]. However, the experimentations conducted in studied cases helped a company to find the correct business model instead of using the wrong one. Most of the interviewees thought that even though using experimentations might take a longer time to create and release the features to the customer, it is still a better way to grow the business and create a good-quality product.

Another factor for a business to grow and create a quality product is the competence of the development team [24]. The use of a lean methodology and business model experimentation required a lot of competence to experiment and develop features in fast iterative cycles with a product in minimum viable state. When the development team had to work with the code base that had incurred already technical debt during the experimentation, it required a lot of experience and knowledge to be able to create solutions that have high quality and scalability, when the business model is evolving in the future.

Having a growing business and quality product can also depend on the reduction of technical debt. The companies in this case study were eager to make experimentations and try out demos and prototypes in fast phase to find out possible new business ideas and areas to great more successful business. However, when companies had a high focus on creating new businesses and features to answer to the demand of customer, the focus on improving existing features and reducing technical debt was low. The improvement and refactoring of existing code is important part of product overall quality [25,26]. We were able to identify situations where technical debt started to affect to the success of business and product quality. Sometimes there were situations where too much technical debt started to show as slowness and bug errors in the product. The quality of the product has a strong relationship with the customer satisfaction [27]. The problems in the product could transfer to negative customer satisfaction that can have consequences to the business of the company. At this stage companies had to start massive operation to refactor and rewrite parts of the product, which led to significant economic costs.

## 6 Conclusion

This paper has explored the relationship of business model experimentation and technical debt in the context of software development. Our analysis reveals that technical debt should be divided into intentional and unintentional in this context, and that product quality and the competence of the development team are elements that need to be considered. The overall result is that with business model experimentation, the amount of technical debt can be reduced. However, there may be an inverted U-shaped curve concerning the benefits of business model experimentation – it is a balancing act to do enough experimentation but not too extensively, and simultaneously pay careful attention on the amount of accumulating technical debt. The targets of experiments must be well-chosen and the competence of the development team sets pragmatic limitations on the amount of experiments that can be executed with a reasonable time-to-market goal. Further research could compare and measure both the amounts of technical debt and business model experimentation in specific projects and compare the levels to the success of the products and business model launch to learn more about the interrelationships of these constructs. As a limitation, this research mainly used informants from R & D. To get a more complete picture of this phenomenon, also marketing and product managers' viewpoints could be incorporated in the analysis more strongly.

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