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**BUSINESS MODEL ADAPTATION AND ITS RELATION TO INTERNATIONAL
OPPORTUNITY RECOGNITION**

Case: Finnish SMEs in Cleantech sector

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ABSTRACT

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Business model adaptation and international opportunity recognition have been relatively broadly studied as separate concepts. However, there is a significant gap in the literature in regards these concepts' interplay. Thus, this study opens up an important research area, and offers insights into the relationship between business model adaptation and international opportunity recognition. Additionally, the study increases understanding on the ways companies adapt their business models and recognize international opportunities, focusing on the early stages of internationalization. Moreover, this paper is limited to study SMEs in the Cleantech sector, which again is lacking research until now.

The empirical part of the research is based on multiple case studies, consisting of five Finnish SMEs in Cleantech sector. The data is collected through semi-structured interviews and analyzed using NVivo-program. The results of the research indicate that international opportunities do not drive for business model adaptation, but instead, the relationship can be considered as reversed; business model frames and limits the opportunity recognition process. Overall, the value proposition is the most adapted component in the business model, and is commonly a result of reactively answering to the environmental threats or opportunities. The international opportunity recognition process has similar characteristics among the case enterprises, emphasizing the importance of networks, own deliberate search and brand building.

TIIVISTELMÄ

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Tämä tutkimus pyrkii lisäämään tietämystä yritysten liiketoimintamalleissa tapahtuviin muutoksiin ja tapaan tunnistaa kansainvälisiä mahdollisuuksia, keskittyen erityisesti aikaan kun kansainvälinen toiminta aloitetaan. Vaikka näitä kahta konseptia on tutkittu erikseen melko laajasti, niiden yhteyden tutkiminen on puutteellista, ja siksi tämä tutkimus keskittyy erityisesti selittämään näiden kahden konseptin suhdetta. Tutkimuskonteksti on lisäksi rajattu suomalaisiin pieniin- ja keskisuuriin yrityksiin, jotka toimivat Cleantech-sektorilla, joka osaltaan vaatii myös lisää empiiristä tutkimusta.

Tutkimuksen empiirinen osuus perustuu viiden suomalaisen pienen- tai keskisuuren Cleantech-yrityksen tapaustutkimukseen. Data on kerätty teemahaastatteluilla, ja se on analysoitu NVivo-ohjelmiston avulla. Tutkimuksen tulokset osoittavat, että kansainvälinen mahdollisuuksien tunnistaminen ei ohjaa liiketoimintamallin muutoksia, vaan liiketoimintamalli enemmänkin rajaa mahdollisuuksien tunnistamista. Eniten muutoksia tunnistettiin liiketoimintamallin "value proposition" elementissä. Kaiken kaikkiaan, muutokset pohjautuvat joko ympäristössä havaitun uhkan tai mahdollisuuden reaktiiviseen vastaamiseen. Kansainvälisten mahdollisuuksien tunnistamisessa korostuu suhteiden käyttö, oma aktiivinen etsintä sekä brändin luominen.

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LIST OF ABBREVIATIONS

BM – Business Model

BMA - Business Model Adaptation

BMI – Business Model Innovation

SME – Small and Medium sized companies

OR- Opportunity Recognition

IE – International Entrepreneurship

IOR- International Opportunity Recognition

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1 INTRODUCTION

In general, companies have to, not only to design and implement, but also refine their business continuously to be successful in the volatile and changing environment (Teece 2010). Consequently, it is crucial to develop a business model which determines how to create value both for customers, as well as for the company itself. According to Cavalcante et al. (2011) business model functions for two purposes; enabling stability for enterprises activities and but simultaneously allowing enough flexibility for changes. Thus, the logic of BM change is to make alterations over time in the company's activities; as a business model is used to create value, sustainable value creation requires constant and successful business model adaptation (Osterwalder & Pigneur 2010).

At early phases of operations, opportunities are the ones that create business concepts, which eventually leads to business model creation (Ardichvili et al. 2013). Moreover, due to the rapid changes in the environment, companies are also dependent on new opportunities to survive and be successful (Hamel 2012). The importance of opportunities can also be implemented in the companies' internationalization process; at the time companies internationalize, they must recognize international opportunities. Moreover, for internationalization SMEs, these international opportunities function as the process' facilitators (Hilmersson & Papaioannou 2015).

Both business model and its adaptation, as well as opportunity recognition, are essential concepts for enterprises. Thus, it is important not only to understand these concepts separately but also add insights to their relation. In other words, do opportunities drive business model adaptation or are there other reasons for the business model change? Similarly, do changes in business model reveal new opportunities?

The market for Cleantech is constantly increasing (WWF 2014). A study conducted by the German government shows that the global clean technology market is worth over €2tr a year, with the average growth percentage of 12 % annually. Most importantly, it predicts that the rate is going to inflate to double within the next four years (Business Green 2012). In Finland, Cleantech is referred to be the most prominent success economy to Finland (Tweed 2014) and the industry is increasing fast in the country; in 2008 the turnover of Finnish Cleantech business was around 18 million and in 2013 already almost 26 million.

Moreover, over a third of Finnish public R&D funding is currently going to Cleantech sector, which indicates that Finland is investing heavily on it. (Cleantech Finland 2016).

Small and medium-sized enterprises make up more than 99 percent of all the businesses in Europe (European Commission 2016), making them a crucial part of its economy. In Finland, the percentage is equally high, but still, only one-fifth of these Finnish SMEs have international operations (Yrittäjät 2015). Thus, it is important to study different aspects of the internationalization process to facilitate it for Finnish SMEs in Cleantech sector. Consequently, by examining the relationship between IOR process and BMA, it offers insights for these companies to improve their chances in the international markets.

1.1 Research Gap

All in all, the two main concepts of this study, business model and opportunity recognition, are relatively broadly researched, but only as separate studies. The concept of the business model is not new, but it has only recently increased its popularity in the business world by becoming a common term to use, both in practice and in the academic community. Nevertheless, there are not many empirical studies that explain BM change (Wirtz et al. 2016), and more specifically, BM change in the context of internationalization has not yet reached many insights in the research field. Thus, there is not much knowledge, for instance how the business model is related to the internationalization process (Sainio et al. 2012) or about the determinants or antecedents of BM in internationalizing enterprises (Torkkeli et al. 2016).

Similarly, opportunity recognition has become a central element in entrepreneurship field, (Baron 2004; Venkataraman 1997; Kontinen & Ojala 2011) and the importance of the notion has made it a common theme to study among scholars (Baron 2004; Kontinen & Ojala 2011). More specifically, there is an increasing interest towards opportunity recognition among IE researchers (Zahra et al. 2005). Nevertheless, there is still a lack of focus on investigating the origins of opportunities as most of the studies are conceptual and do not include a lot of empirical papers (de Jong and Marsili 2010). Moreover, most of the studies focus on one specific element of the process; such as cognition (see e.g. Zahra et al. 2005) or prior knowledge (see e.g. Shane 2000).

Lately, as the focus has shifted to BM innovation, opportunities are also identified as one of the drivers on BMI. Notwithstanding, there is no existing literature explaining the relation between IOR and business model adaptation. Thus, this study concentrates on finding out how companies adapt their BM and how they recognize international opportunities. Moreover, this research is aimed to add insights towards these concepts' relation; in other words, do opportunities have an impact on the business model adaptation or do new opportunities derive as a result of business model changes.

Even though Cleantech has been reviewed by non-academic literature, consulting companies and other research institutions (Kachan and Co. 2013), it is apparently missing academic insights. Moreover, Cleantech industry in an international SME context has barely been studied at all. Asemokha et al. (2016) introduce in their article the antecedents of Internationalizing Cleantech SME's in Finland, and according to their findings, firstly, the internationalization process of Cleantech SMEs is similar with traditionally viewed processes, as well as with born globals. Nevertheless, the findings revealed some factors that distinguish Cleantech SMEs as a separate phenomenon, most important being different regulative environment. Therefore, this study also continues filling the gap in the research of Cleantech companies and their nature.

1.1 Research Questions

The aim of this study is to find out how companies recognize international opportunities, especially at the time of early internationalization, and why they adapt their business models. Moreover, this study is aimed to examine whether recognized international opportunities have an impact on the existing business model and/or whether the business model adaptation has an impact on the recognized international opportunities. Thus, the main research question, to answer to the research objectives, is built accordingly:

How do companies adapt their business models, recognize international opportunities, and how are these concepts related to each other?

As the main research question is broad and consists of different phenomena, supportive questions are created to give a more comprehensive answer to the main research question. All in all, three sub-questions are created. The first supportive question explains how and why Cleantech SMEs adapt their business models. This question aims to find out

the different factors influencing the adaptation of the business model. In addition, it seeks to identify the different types of changes occurring. Thus, the question is built as:

How and why do internationalizing Cleantech SMEs adapt their business models?

The second supportive question focuses on explaining the process of international opportunity recognition focusing on the early phases of Cleantech SMEs internationalization process. It aims to explain what factors are impacting on the process and whether the recognition occurs through creation or discovery. Moreover, it explains whether the companies are purposefully searching or serendipitously discovering the opportunities. Thus, the question is built as:

How SMEs in Cleantech sector recognize international opportunities?

The third question is aimed to explain the connection between international opportunity recognition with the business model and its adaptation. The important notion here is that the connection can be two-way, meaning that either of these two concepts can impact to the other one. The third supportive question follows as;

How business model adaptation and international opportunity recognition are related to each other?

The following figure summarizes the research questions used in the study.

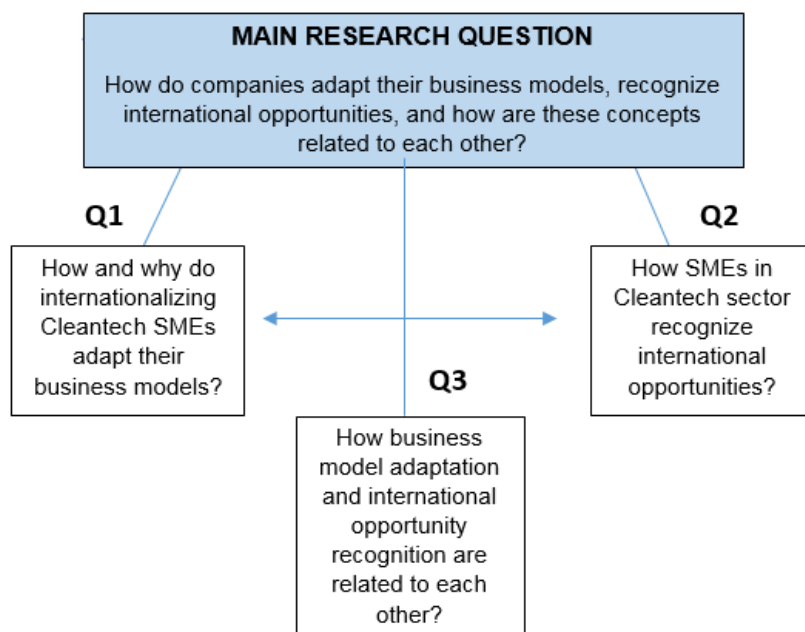


Figure 1. Research Questions

1.2 Theoretical Framework

There are two distinct frameworks used in this study for two different concepts. The first framework is used to describe business model and its components, whereas the second one describes the opportunity recognition process. Both of the frameworks are described more closely below.

1.2.1 Business Model Framework

The business model framework used in this paper is based on the quantitative empirical framework developed by Thomas Clauss (2016). The framework is built based on a synthesis of BM literature from 2002-2014, with a focus on literature on BM conceptualization and components described. This comprehensive and validated three-level scale for business model innovation works as a base in this paper to investigate enterprise's existing business model and its adaptation. In this thesis, Claus' (2016) scale of BM innovation is generalized to study the business model as a whole, not only the notion of innovation. Therefore, the adjusted framework does not include the word "new" nor "innovation" but focuses on the elements at the general level.

Altogether, the author identified 16 different conceptualizations of BM, where a number of identified elements varied from three to 17-20. Most of these components could be placed into three dimensions, which were then divided into ten subcategories. The three main dimensions in the business model framework are referred as value creation, value proposition, and value capture. Therefore, the framework can be seen as accordingly; firstly, the value proposition includes all the decision regarding what is offered, on what channels and to whom. Secondly, value creation category is an essential part of the BM indicating how to create value based on proposed issues. These elements that make a difference, whether, for example, the offerings will be successful, are the use of technology, capabilities, partnerships and processes. Lastly, in addition to knowing what is the value offered and how to create that value, it is important to understand the earning logic, in other words, how to capture the value.

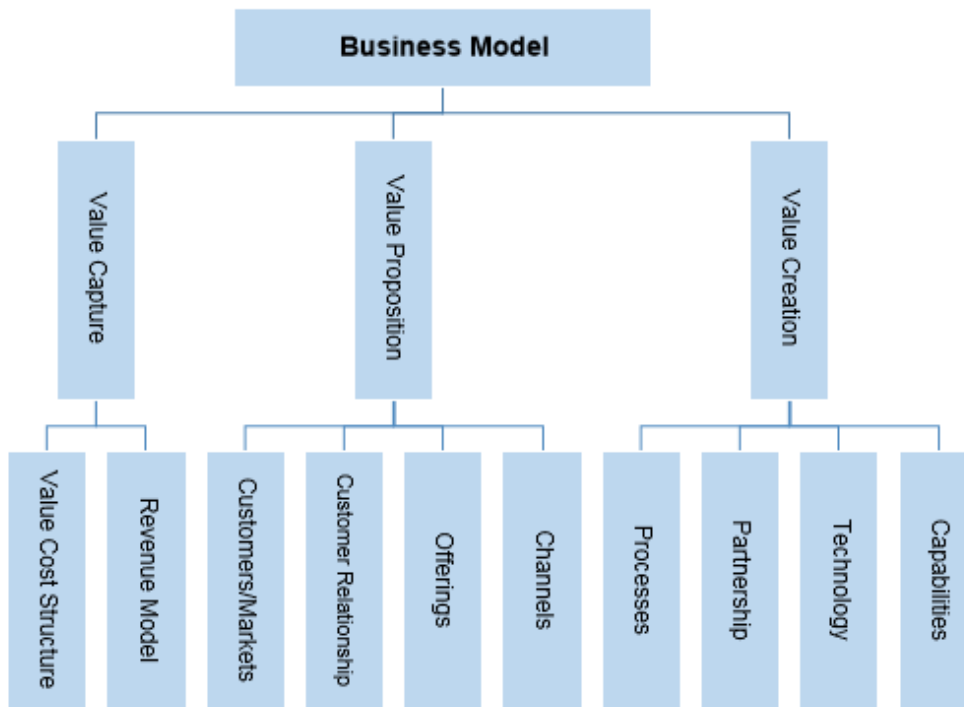


Figure 2. Business Model Framework (Adjusted from Clauss 2016)

1.2.2 Opportunity Recognition Framework

The opportunity recognition framework used in this paper is build based on literature review and focuses on the elements that are most commonly pointed out by the existing literature.

As opportunities are, in this paper, viewed from the entrepreneurship perspective, it is important to identify and analyze different personal factors affecting the opportunity recognition process. The three identified elements used as the main factors impacting on the ability to recognize international opportunities are prior knowledge, social networks, and personality traits. The decision to use these is based on their common identification by existing literature. Also, it is important to remember that opportunity recognition is merely the first step in an ongoing process as it also includes assessment of the usability of the opportunities and the actual development and implementation of opportunities. All these steps are necessary to have a successful business (Ardichvili et al. 2003).

Nevertheless, in this paper, the main focus is in on the recognition process, and thus, only the evaluation element is included in the framework.

Researchers argue about the connection between two theories, creation and discovery, which both explain the source of an opportunity. Some do not believe that they can easily coexist, meaning that only either type explains opportunities (see e.g. Alvarez & Barney 2007). Nevertheless, the dominant view is that both types can be present simultaneously, making them different kinds of opportunities (de Jong & Marsili 2011). These views that combine the approaches are more focused on the actual behavior of the entrepreneur rather than in the question of the existence and nature of these views (Mainela et al. 2014). Moreover, Short et al. (2010) believe that in the near future, opportunity literature will move towards this middle view. Thus, in this paper as well, the recognition of the opportunities can be done both through discovery and creation. Similarly, this paper does not draw a distinction between whether opportunities are recognized only through actively search or through serendipity. For instance, Chandra et al. (2009, 32) describe opportunity recognition as *“a process that consists of both discovery as well as deliberate and systematic search.”* Thus, in this paper, these two perspectives are considered as not mutually exclusive. The main themes of the opportunity recognition process have been outlined in figure 3, which thus works as the framework for this paper.

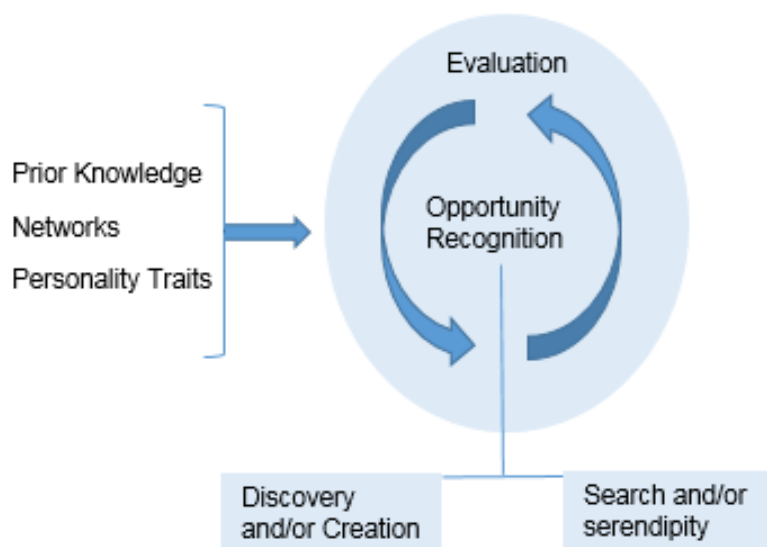


Figure 3. Opportunity Recognition Framework

1.3 Definitions

The following chapter introduces the definitions of the most central concepts used in the thesis. Consequently, it defines important concepts used to explain business model, which are business model, business model adaptation and business model innovation. In the context of opportunity recognition most important concepts referred are entrepreneurship, opportunity recognition, entrepreneurial opportunity, international entrepreneurship as well as international opportunities. Lastly, the concepts of Clean technology and SMEs internationalization are defined as they are used as the context of the thesis, and thus, are important to understand.

Business Model (BM):

What comes to the definition of business model, it is rarely well, or at all defined, in the existing academic literature on business models (Zott, et al. 2011). Moreover, the current range of definitions varies significantly, and the definitions used only moderately overlaps each other. The reason for broad variety and inaccuracy of definitions originate from several different disciplines being interested in the phenomenon (Muller & Vorbach 2015; Shafer et al. 2005).

BM can be defined with a variety of terms; for instance, it is stated to represent the organizational story (Magretta 2002), an architecture that transforms innovation into value (Chesbrough & Rosenbloom 2002), structural template (Zott & Amit 2008) or a machine with logic (Casadesus-Masanell & Ricart 2010). Moreover, BM is commonly used as a description of the key components of a given business (Hedman & Kalling 2003). In this paper, the definition of the BM also focuses on its main components. The choice of components used in this paper is based on Clauss (2016) framework and are value creation, value proposition, and value capture. All in all, the concept is defined as following: *“A business model articulates the logic and provides data and other evidence that demonstrates how a business creates and delivers value to customers. It also outlines the architecture of revenues, costs, and profits associated with the business enterprise delivering that value (Teece 2010, 173).*

Business Model Adaptation (BMA):

Business model adaptation describes changes in the BM over time, usually impacted by external factors. These drivers can be, for instance, customer demand changes, competition, and technological changes. The characteristics of such BM adaptation have been referred in the literature as “evolution,” “learning” and “lifecycle” (Saebi et al. 2016). Cavalcante et al. (2011) identify four different types of BM change that can be all seen as different types of BM adaptations. These are creation, extension, revision and termination. The “creation” refers to the transition from a business idea into a functioning business model. The extension means adding or expanding the core processes, while revision means removing and replacing something from the BM. Termination refers to ending the non-functioning processes from the BM.

Business Model Innovation (BMI):

BMI means making radical changes in the existing business model (Wirtz 2000 in Wirtz 2011). The amount of required changes in the BM, to call it BMI, varies among different views. According to Johnson et al. (2008), BMI is essential at times, when significant changes are needed in all the elements in the existing model. This is aligned with Clauss (2016) view, which states that to capture BMI, changes are required in all three main dimensions of the business model identified. Wirtz (2011), on the other hand, has defined BMI as following: “*design process for giving birth to a fairly new business model on the market, which is accompanied by an adjustment of the value proposition and/or the value constellation and aims at generating or securing a sustainable competitive advantage*”. Similarly, Lindgardt et al. (2009) identify that BM change can be called as BMI when two or more elements of the BM are reinvented.

Opportunity Recognition (OR):

Opportunity recognition is here defined as “*the ability to identify a good idea and transform it into business concepts that add value and generate revenue*.” This definition highlights opportunity recognition being part of entrepreneurship. (Lumpkin & Lichtenstein 2005 457) Moreover, align to this paper’s framework, opportunity recognition consist both discovery as well as deliberate and systematic search (Chandra et al. 2009, 32).

Entrepreneurship:

Entrepreneurship has traditionally been defined in terms of the entrepreneur as an individual or of what this individual does. This view leaves out the notion of opportunities that different people identify. As the focus of this paper is on opportunity identification, it will also be emphasized in the context of entrepreneurship, and thus, entrepreneurship is not defined in terms of an entrepreneur but by using the central concepts around the phenomenon; the nexus of opportunities and entrepreneurs. (Venkataraman 1997) The entrepreneurship is therefore defined, based on Venkataraman's (1997, 120) definition, as "*seeks to understand how opportunities to bring into existence "future" goods and services are discovered, created and exploited, by whom and with what consequences.*" This definition emphasizes the importance of opportunities in the entrepreneurship process. In addition, it considers that opportunities can be either created or/and discovered, which is aligned with the framework used in the paper.

International Entrepreneurship:

The first definition of IE was "*innovative, proactive and risk-seeking behaviors across borders*" by McDougall and Oviatt. This definition has later been reformed by the same authors to "*discovery, enactment, evaluation, and exploitation of opportunities- across national borders.*" (Mainela et al. 2014, 105) This revised definition shows that the focus has been shifted away from the type and characteristics of the companies towards the recognition and exploitation of the opportunities (Chandra et al. 2009).

Entrepreneurial Opportunity:

Entrepreneurial opportunity can be defined as a "*situation in which goods, services, raw materials, markets and organizing methods can be introduced through the formation of new means, end, or mean-ends relationships*" (Eckhardt & Shane 2003, 336). This particular definition takes into account also other aspects besides to goods and services. Nevertheless, this definition does not consider the role of entrepreneur. Thus, more suitable definition is created by Oyson and Whittaker (2015,309), built on Eckhardt and Shane's definition; "*entrepreneurially discovered or created situation in which new goods, services, raw materials, markets, and organizing methods are conceived as having a potential for exploitation through entrepreneur-led action to form and transform them into new means, ends, or means-ends relationships*". Here also the notion of discovery and creation is taken into account.

International Entrepreneurial Opportunity:

As the focus of this paper is on international entrepreneurial opportunities, it should be distinguished from the entrepreneurial opportunity. Oyson and Whittaker (2015, 309) have continued from Mainela et al.'s (2014) definition, and thus define international entrepreneurial opportunity as "*entrepreneurially discovered or created situation that spans and integrates elements to multiple national contexts in which new goods, services, raw material, markets and organizing methods are conceived as having a potential for exploitation through entrepreneur-led action to from and transform them into new means, ends or means-ends relationships.*" Here the exploitation refers to an entry of a firm into the international market.

Cleantech

The term "Cleantech" is also referred, depending on the context, as green technology, sustainable technology as well as environmental technology. As the majority of Cleantech operations is related to energy technologies, covering 77% of total Cleantech venture capital investments in 2010, its definition is sometimes seen only in relation to clean energy. (WWF 2014) Nevertheless, the field goes beyond that by being used in many different technologies (Kachan & Co. 2013; WWF 2014). Cleantech Scandinavia (2016) defines Cleantech as an investment that consists of products, services and/or processes designed to:

- Improve the productive and responsible use of natural resources
- Substantially reduce or eliminate negative ecological impact, and
- Provide superior performance at a lower cost compared to existing solutions

Cleantech as a term can also be seen as an umbrella, linking investment, technology and business sector together (Dikeman 2016). Cleantech is defined as "*a range of innovative products and services that contribute both financial returns and positive environmental impacts and outcomes*" (WWF 2014). Following with Kachan and Co.'s (2013) definition: "*Cleantech is a new technology and/or related business models intended to provide a diverse range of products, services, and processes that use renewable materials and energy sources while reducing the use of natural resources and cutting or eliminating emissions and wastes. It also aims to provide superior performance at lower costs.*"

SME Internationalization

An enterprise is considered as small or medium-sized, if it has less than 250 employees (European Commission 2016). Internationalization is defined as the process of operating beyond domestic markets (Bose 2016). Internationalization as a phenomenon has achieved a lot of interest by researchers over the last few decades, and it has been studied by various approaches and viewpoints (Ruzzier et al. 2006). Moreover, especially SME internationalization has become a significant research field in the modern literature of international business (Bose 2016). Three dominant approaches that have explained the internationalization of SMEs can be identified to be stage models, network theory, and international entrepreneurship approach (Lin 2010).

In today's world, not only large but also smaller companies are challenged in having a role in the international markets; as the domestic market is shrinking due to increasing globalization, it is commonly considered as inadequate for having enough opportunities to grow businesses (Bose 2016). Align with OECD (2009) report, the motivation to grow seems to be critical to SMEs and is recognized as one of the main drivers in the process. All in all, the drivers that enhance internationalization can be divided into internal and external categories. Internal drivers include growth, knowledge-related, resource-seeking and network-related motives and external drivers consist of domestic market and foreign market drivers (Messina 2015). Simultaneously, the main barriers identified for SME internationalization derive from a lack of resources, international contacts and internationalization knowledge (OECD 2009).

1.4 Delimitations

Firstly, as the context of the research is relatively precisely limited, it creates delimitations. As the research focuses on one particular field (Cleantech), of one specific country (Finland) and one specific type of company (SME), the results cannot be easily generalized outside of the context. Nevertheless, as this is a case study, it is not purposed to generalize the results but rather offer a deep understanding of phenomena with rich descriptions and explanations (Eisenhardt 1989).

Secondly, there are delimitations regarding the opportunity recognition notion. Even though the existing theories of internationalization (stage model, network theory, and eclectic paradigm) are currently acknowledging the importance of opportunities, they initially took the notion for granted. For example, Johansson and Vahlne, used the word “opportunity” in their work of Uppsala model, without explaining it any further. Nevertheless, in recent years the authors have emphasized opportunities in their revisited models (Chandra et al. 2009) and all in all, opportunity recognition has started to increase its popularity among the internationalization theories. Nevertheless, due to limited resources, in this paper, opportunity recognition is viewed from the entrepreneurship field alone.

It must be acknowledged that opportunity recognition is only the first phase of a continuing process, as it also includes assessment of the opportunities recognized and the actual opportunity development; all these steps are necessary to have a successful business (Ardichvili et al. 2003). Nonetheless, this paper is mainly focusing on the identification of the opportunities, both in theoretical and empirical parts, even though some elements of the evaluation of the potential opportunities are covered.

1.5 Research Methodology

This study uses qualitative research method, with the aim to describe, understand and interpret a particular phenomenon (Tuomi & Sarajärvi 2003, 87). In this case, how companies recognize international opportunities, how they adopt business models, and how these concepts are related to each other. In this research, the objective is not to generalize the concepts and their behavior but in particular understand them more closely. Moreover, a case study is selected as a research method, which also offers the possibility for a thorough understanding of phenomena as it generates abundant descriptions and explanations (Eisenhardt 1989). The appropriateness of this specific research method was tested with Yin's (2009) criteria for using the case study as a research method. More specifically, as there are altogether five cases in the study, the multiple-case method was selected.

The research context of this study is Finnish SMEs in the Cleantech sector. In addition, the companies should have international operations or plans to internationalize in the near future. Cleantech is referred to be the most prominent success economy to Finland (Tweed 2014) and the industry is increasing fast in the country. Moreover, 99.7 percent of all the Finnish companies are small and medium-sized (Eurostat 2012) of which only one-fifth have international operations (Yrittäjät 2016). All these facts indicate the importance of understanding the internationalization process of Finnish SME Cleantech companies. A four-step criterion was used when selecting appropriate case companies.

The data for the study is collected through interviews. An interview is a good method as it allows flexibility in the interview situation and gives in-depth insights of the phenomenon (Tuomi & Sarajärvi 2003). More specifically, a semi-structured interview is used, and it is based on the two main themes with additional and supporting areas of focus. The selected interviewees had to be founders of the company or in charge of the company, with enough applicable information to share. This is called elite sampling, meaning that only the persons who are assumed to know the most of the subject are chosen (Tuomi & Sarajärvi 2003, 88).

The data from the interviews is analyzed with the help of computer-assisted qualitative data analysis software, NVivo. All in all, the analysis method of this research can be referred as template analysis. Template refers to the combination of codes and categories representing the themes that were found from the data collected (Saunders et al. 2009).

1.6 Structure of the Study

This study is broadly divided into two main sections: theoretical and empirical part. In the first chapter, the reader is introduced to the theme by explaining its background, research gap as well as the research questions used. Moreover, it introduces the theoretical frameworks used, as well as the main definitions and delimitations.

Chapters two and three form the theoretical part of the study by introducing all the relevant existing literature regarding the main concepts of the study. The first part, chapter two, is focusing on the business model, its research field and important concepts around it. The second theoretical part, chapter three, introduces the literature regarding opportunity recognition and main themes around it. This section acts as a basis for the research and assists, together with the empirical part, to answer the research questions created.

The empirical part of the study is presented in the next chapters. Firstly, in chapter four, the research method used is presented and justified, including the methodology, context, design, data collection, analysis and the quality of the study. Next, in chapter five, the case companies and the results are introduced and further on analyzed. In the last chapter, the findings are summarized, and both, its theoretical and practical implications, are discussed. Lastly, the limitations and directions for future research are presented. The overall structure of the study is demonstrated in figure 4.



Figure 4. Structure of the Study

2 BUSINESS MODEL

As the competitive environment is constantly becoming more complex and volatile, it is important for companies to be able to answer to these changes accordingly. Thus, business model is a necessary assistance to navigate and manage firms in this fast changing environment, as it helps them to *“develop new business ideas, examine existing business activities and modify their strategies and structures by simplifying the complexities and dynamics of the modern business environment”* (Wirtz 2011, 6). According to Cavalcante et al. (2011), business model functions for two purposes; first by enabling stability for enterprises activities and secondly, simultaneously allowing enough flexibility for changes.

What comes to the definition of the business model, it is rarely been well or at all defined in the existing academic literature on business models (Zott et al. 2011, 1020). Also, the existing range of definitions varies significantly, and the definitions used, only moderately overlaps each other. The variety and inaccuracy of definitions originate from several different disciplines being interested in the phenomenon (Muller & Vorbach 2015, 56; Shafer et al. 2005, 200). This makes it easy to interpret the concept in several ways, which therefore complicates the researchers' ability to rely on previous papers (Zott et al. 2011, 1022). The lack of well-established definition makes it also more common to mix the terminology and business model as a definition is, therefore, overlapping, as well as used as a substitute, with other related concepts, such as strategy and other revenue models (Morris et al. 2005). Moreover, according to Casadesus-Masanell and Ricart (2010), the reason, why the academic world is deferring on the research field, is due to the confusion between the terminologies.

BM has been called, for instance as a narrative, (Magretta 2002) architecture, (Chesbrough & Rosenbloom 2002), structural template (Zott & Amit 2008) or logic (Casadesus-Masanell & Ricart 2010). All in all, it can be agreed that BM focuses on how the enterprise's system elements work as one whole entity, and thus, BM can be referred as a structured management tool that helps a company to achieve its aims (Magretta 2002). More specifically, BM determines the logic and choices done for value creation and capturing within a value network (Shafer et al. 2005, 202).

2.1 Evolution of the Concept

The concept of the business model is not new, but it has only recently increased its popularity in the business world by becoming a common term to use, both in practice and in the academic community. Ghaziani and Ventresca (2005) analyzed the utilization of the term “business model” in public literature between the years 1975-2000, revealing that 90% of the publications were published only after 1995. This aligns with similar analysis conducted by Zott et al. (2011), which exposes that between the years 1975-2009, there were over 8000 mentions of the business model in non-academic journals and 1200 in academic literature, the majority being published after the end of 1990’s, with a rapid growth towards recent years. This indicates that the common knowledge, as well as the interest to study business models, has grown significantly in the last decade.

Even though the concept of business model was first introduced already in 1954 by Peter Drucker work, but as stated, it has only recently gained popularity (Brea-Solis et al. 2014; Casadesus-Masanell & Ricart 2010). The popularity towards business models has increased as a result of changing business environment, which, by constantly becoming more complex and volatile, makes it crucial for companies, with the desire to become global competitors, to continuously adapt themselves to the changing market conditions (Wirtz 2011). This era can be referred as new economy (Morris et al. 2005), and its most visible development is the rise of the ICT field. Internet-based companies, being relatively different from traditionally viewed companies, have embattled to create sustainable business models around their operations, which has speeded up the need to study business models (Teece 2010). All in all, it can be stated that the main reason to focus more on business model, has evolved from the interest of understanding the nature of web-based firms, e-commerce and ICT-field in general (e.g. Morris et al. 2005; Casadesus-Masanell & Ricart 2010; Chesbrough & Rosenbloom 2002; Wirtz et al. 2016).

Nowadays, the business model is also common in another context than in e-business, and it has gained interest in several fields, such as in the field of strategy and technology management (Zott et al. 2011). Even though there is a clear understanding among practitioners of the importance of business models to sustain and grow companies, the concept is only slowly finding its way to academic literature (Chesbrough & Rosenbloom, 2002). Moreover, the existing literature does not yet offer a generalized conceptualization of the phenomenon, nor a comprehensive composition of the key components in business models (Casadesus-Masanell & Ricart 2010; Morris et al. 2005). All in all, the research

field is in effect in its early stages, lacking consensus on many fundamental questions (Wirtz et al. 2016, 37). Nevertheless, when business model as a concept started to become better adopted by the companies in “old economy”, it brought up also new aspects to the research field along with the terms “business model change” and “business model innovation” (Muller & Vorbach 2015). All in all, the BM literature has been started to clear the concept, with synthesis and classification work (Wirtz et al. 2016, 37).

2.2 Business Model Classification

Onetti et al. (2010), have identified two main streams of business model literature; e-business and generic streams: The literature in e-business context is strongly oriented towards contextual direction and therefore lacks generalization. The generic streams, on the other hand, have focused on conceptualization and identification of the BM components without linking it to other phenomena. This categorizing could be used best to describe the field at the early phases. The focus on e-stream is also mentioned by Zott et al. 's (2011) classification. All in all, they recognized that business model is mainly used to answer the following three categories; (1) e-business and technology use (2) strategic issues and firm performance (3) innovation and technology management. This categorizing indicates that the concept of the business model is also recognized by different fields and contexts.

Another classification is offered by Clauss (2016), who identified two distinctive areas of focus during the development of BM research. This classification is concentrating more on time after the formation of the field by leaving out the e-business stream. His classification includes definition/differentiation and case-specific analysis; at early stages, the focus has been on the conceptualization and differentiation to other related concepts such as strategy. This trend was followed by increasing number of case studies, which on the other hand lacks' generality, but simultaneously has increased the insight towards the concept. Clauss (2016) has also acknowledged that recently, the focus has shifted from conceptualization and cases towards greater generalization, antecedents, and impacts.

A comprehensive synthesis about the important areas of BM research is also introduced by Wirtz et al. (2016). They have divided the research field into three categories; Concept/Terminology, Business Model Structure and Business model management

process. This framework describes the current status of the field broadly; the most addressed subcategories have found to be: innovation (26%), change & evolution (18%), performance & controlling (16%) and design (10%).

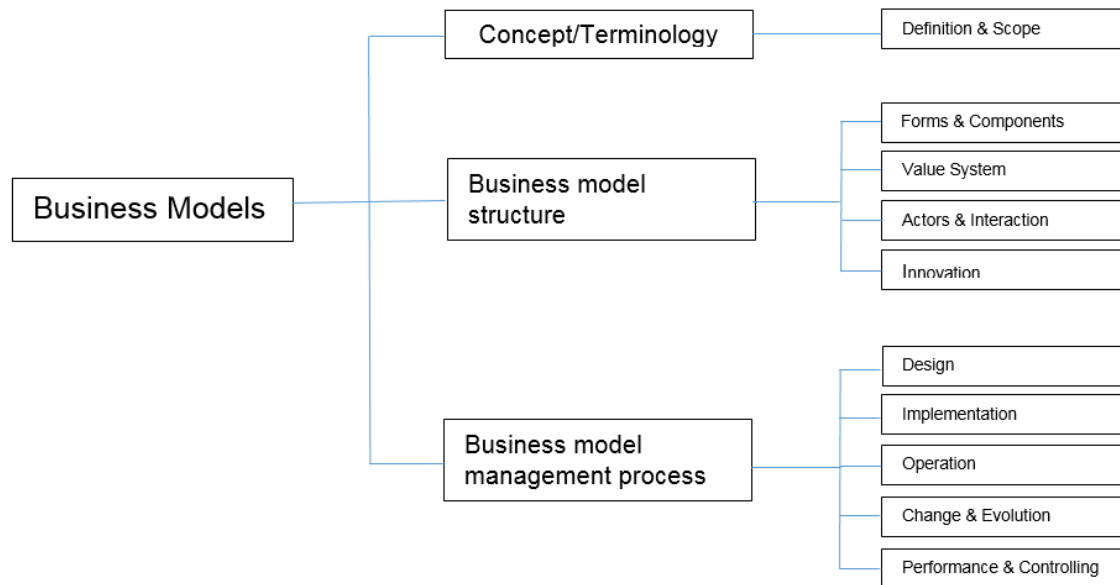


Figure 5. Business Model Research Categorization (Wirtz et al. 2016, 46)

Overall, the research field of business model can be summarized as following; it has first focused on the e-business context as well as the conceptualization of the phenomenon. Later on, the concept has gained interest in different fields and contexts, and nowadays it is moving its focus towards greater generalization, antecedents, and impacts of the business model.

2.3 Business Model Components

Subordinate components are used to express the content of the BM (Wirtz et al. 2016, 41). These elements are especially useful when creating assessment measurements and tools for business models (Voelpel & Leibold 2004). The components that are identified to build the BM differ significantly among different authors; according to Clauss' (2016) literature synthesis, the amount of components mentioned in the existing literature varies between three to 17-20 components. Nevertheless, the components are built typically around the value proposition, value creation, and revenue models, to construct the complete model

Table 1. Business Model Components based on Existing Literature

Author	Year	No.	Components
Clauss	2016	10	Capabilities, technology, parents, process, channels, offerings, customer relationship, markets, revenue model, value cost structure
Osterwalder & Pigneur	2010	9	Customer segments, value proposition, channels, customer relationships, revenue stream, key resources, key activities, key partnership, cost structure
Chesbrough & Rosenbloom	2002	6	Value proposition, market segment, value chain structure, cost structure, value network, competitive strategy
Morris et al.	2005	6	Value creation, market segment, competitive advantage, market position, revenue logic, personal factors
Lindgardt et al.	2009	6	Target segment, offering, revenue model value chain, cost model, organization
Teece	2010	5	Technology, value for customer, market segment, revenue stream, design of value capture
Zott & Amit	2001	4	Efficiency, complementarians, lock-in, novelty
Saebi et al.	2016	4	Value proposition, target customer, structure of value delivery, value capture
Shafer et al.	2005	4	Strategic choices, value creation, value capture, value network
Onetti et al.	2010	3	Focus, locus, modus
Sainio et al.	2011	3	Value-creation driver, design elements, value exchange
Demil & Lecocq	2010	3	Resources/competences, organizational structure, value delivery
Casadesus-Masanell & Ricart	2010	2	Choices, consequences

Among the broadest set of components is, for instance, the identification of Osterwalder and Pigneur (2010). They have created so-called BM canvas, which consists of nine components; customer segments, value proposition, channels, customer relationships, revenue stream, key resources, key activities, key partnership, cost structure. Another broad categorization is created by Clauss´ (2016), whose components include in total three main elements; value creation, value proposition, and value capture, with ten subcomponents. Clauss´ set of components, work as the framework for this paper, which is introduced in the chapter 1.4.1.

Commonly, a number of components identified are varying between five to six components. For instance, Chesbrough and Rosenbloom (2002) have identified in total six components which are value proposition, market segments, value chain structure, cost structure, value network and competitive strategy. Morris et al. (2005) have also found six, relatively similar components, which are value creation, market segments, competitive advantage, market position, revenue logic and personal factors. Nevertheless, they have added another element to the picture; each of the components is evaluated in each of the following three levels; foundation, proprietary, and rules. Saebi et al. (2016) determine the components as value proposition, target customer, structure of value delivery, value capture. Lindgardt et al. (2009) also identify six components that are divided into two main categories; in the value proposition, there are target segment, offering and revenue model and in operating model, there are value chain, cost model and organization. Also, five

components, still different, are identified by Teece (2010) being technology, value for customer, market segment, revenue stream, value capture.

There are also distinct views about the composition of BM elements. Casadesus-Masanell and Ricart (2010) consider that BM is built based on the choices and consequences and thus, does not require specific components in it. Whereas Onetti et al. (2010) have defined the components as “focus,” “locus” and “modus”, and Zott and Amit (2001) as efficiency, complementary, lock-in, and novelty.

2.4 Business Model Change

Recent studies have understood the value of business model adaptation (Achtenhagen et al. 2013), and BM change has become a widespread phenomenon to study. Similarly, Saebi et al. (2016) have identified an increase in studying BM in recent years by focusing more on dynamic views, which have brought up, for instance, the concepts of business model adaptation and innovation. Nevertheless, there are not many empirical studies that explain BM change (Wirtz et al. 2016).

Business model can be described in terms of scientific method: it starts with the hypothesis, it is tested in action, and then revised if necessary (Magretta 2002). All in all, BM should not be regarded as a static concept, as companies need to react to opportunities and threats by reshaping their BM (Bucherer et al. 2012). Thus, the logic of BM change is to make alterations over time in the company’s activities; as business model is used to create value, sustainable value creation requires constant and successful business model adaptation (Osterwalder & Pigneur 2010). Designing a business model at first is vital, but keeping the model up-to-date is a constant task (Teece 2010). Companies should be able to regularly revise their BM in order to make sure that their strategies are successful in the fast-changing competitive world (Voelpel & Leibold 2004; Teece 2010). BM changes are a crucial part of BM management in order to survive and adapt to changing conditions in long-term (Linder & Cantrell 2000). In other words, the success of enterprises derives not only from the effective business model and its execution but also from being able to adapt the BM at the same speed as the market is moving (Linder & Cantrell 2000).

Moreover, BM change enables to take advantage of new opportunities that create value, and in addition, it decreases the risk of inertia to change, which is a common case when a specific BM has been successful for an enterprise for some time (Achtenhagen et al. 2013). It has been noticed that if successful companies do not adapt their BM to meet the changes in the environment, they may fail. The lack of adaptation usually derives from doing things in the way that used to be a good way for too long, in other words, “fall victim to the rigidity of their business model.” (Doz & Kosonen 2010, 370)

Business model changes are usually driven by discontinuities and distractions as well as higher global competitiveness (Doz & Kosonen 2010). According to Bucherer et al.’s (2012) study, companies make changes in their BM both due threat or opportunity, and for the majority of the companies, external opportunity led to BM changes. These opportunities were for instance changes in the major technologies.

An important concept in the field of BM change is the recognition of change. According to Muller and Vorbach (2015), development of capabilities is the key notion, not only in recognizing the need for BM changes but also making these changes to work; this insight has thus increased the interest towards the identification of capabilities and basic conditions in recent years. According to Doz and Kosonen (2010), by developing three capabilities; strategic sensitivity, leadership unity and resource fluidity, it makes it easier to balance between rigid BM at the time of changes by becoming agiler.

It is apparent that business models tend to change. Nevertheless, it is important to remember that not all changes considering the company lead to changes in BM; only the changes that have an impact on the core processes of BM are count as BM change (Cavalcante et al. 2011, 1330). All in all, the level of the change can vary, and according to Saebi et al. (2016), there are two main types of BM dynamics; other one referred as “business model adaptation” and the other one as “business model innovation.” This is aligned with Achtenhagen et al.’s (2013) classification, where changing the business model more incrementally over time can be seen as an alternative to more dramatic BM changes. Key differences between the concepts, according to Saebi et al. (2016) are:

- (1) BMI requires the concept of novelty whereas BMA can be non-innovative
- (2) BMA occurs due external triggers whereas BMI can be driven by both external and internal factors (Bucherer et al. 2012)
- (3) The motivation in BMA is to keep the balance with the environment whereas BMI is to disrupt the environment

2.4.1 Business Model Adaptation

According to Balboni and Bortoluzzi's (2015) research, BMA is extremely important for enterprises' survival. Moreover, the main drivers for change were found to be environmental changes such as market demand and technological advancements. Align with Saebi et al. study (2016) business model adaptation describes changes in the BM over time, usually impacted by external factors. These changes can be for instance due to changes in customer demand, competition, and technological changes. The characteristics of such BM adaptation have been referred in the literature for instance as "evolution", "learning" and "lifecycle". Saebi et al. (2016) identified four main, partly intersecting, literature streams about the BM adaptation. These are drivers, performance implications, processes, and facilitators. The concept of opportunities is mentioned in the studies regarding the drivers for business model adaptation; business model adaptation is found to occur when there is an opportunity. Nevertheless, surprisingly, based on the results of Saebi et al. (2016), opportunities did not make companies to adapt their current business model but moreover made to remain the existing status. In contrary, threats worked as triggers for changes in the BM.

Cavalcante et al. (2011), identify four different types of BM change that can be all seen as different types of BMA. These are creation, extension, revision and termination. The "creation" refers to the transition from a business idea into a functioning business model. The extension means adding or expanding the core processes, while revision means removing and replacing something from the BM. Termination refers to ending the non-functioning processes from the BM. The framework of the different types of changes is seen in figure 6.

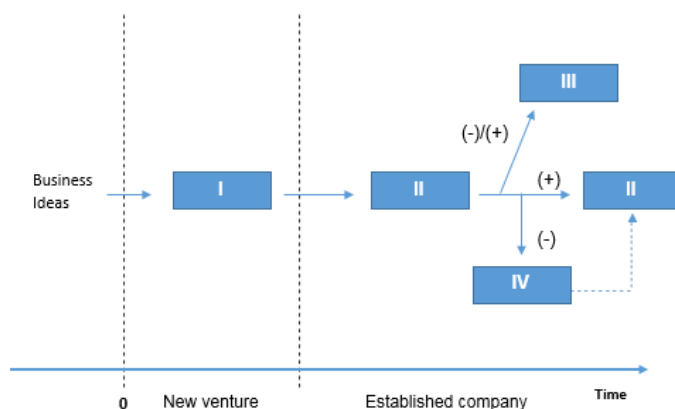


Figure 6. Types of Business Model Change (Cavalcante et al. 2011, 1331)

Linder and Cantrell (2000, 10-13) have also identified four different change models; realization, renewal, extension and journey models. Realization model means using the existing BM in order to grow and profit. Renewal model means changing through the constant and consistent renewing of the operations e.g. adding features to the product. Extension model means expanding the business to cover new grounds, e.g. new markets, product lines, where these new lines do not replace but add to existing operations. Journey model means taking a company to a new business model. From these change models, the two middle ones; renewal and extension, can be seen as different types of BM adaptation models, similar to the ones Cavalcante et al. (2011) identified. Nevertheless, the last type, journey model, can be considered to be a radical (Achentagen et al. 2013) or innovation change (Saebi et al. 2016).

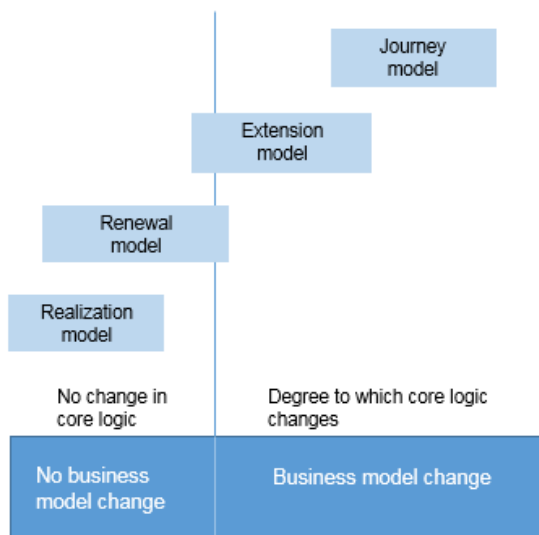


Figure 7. Change Models (Linder & Cantrell 2000, 13)

2.4.2 Business Model Innovation

Due to the new economy bubble, numerous enterprises have had to reconsider their BM and often have had to make radical changes in them (Wirtz 2000 in Wirtz 2011). A study, conducted by IBM, revealed that nearly all (98 percent) of the interviewed CEOs was aiming to make a BMI in the next three years. Moreover, almost 70 percent of the contestants were planning for extensive BM innovation, whereas 30 percent had in mind a moderate innovation. (Giesen et al. 2008) Thus, it can be stated that BMI is nowadays important and common concept (Wirtz 2011).

Having a unique BM gives a better competitive advantage for a company; as many elements in the BM are adjusted for specific needs, it makes it harder for companies to copy it (Bucherer et al. 2012). As already stated, the aim of the BMI is to disrupt the environment. Thus, BMI is considered especially valuable at times of instability, as it can offer a way to differentiate the company, especially in intense competition. Moreover, BMI can be implemented when companies face disruptions that request radical approaches. (Lindgardt et al. 2009) Nevertheless, BMI “*should not be treated lightly,*” as it is, for most times, also possible to disrupt the competitive situation through BMA without considerably innovating the model (Johnson et al. 2008, 57).

There are different views to determine what counts as BMI. According to Johnson et al. (2008), BMI is essential at times when significant changes are needed in all the elements in the existing model. This is aligned with Clauss´ (2016) view, which states that there has to be changes in all three main dimension of the business model to capture BMI. Whereas, Wirtz (2011) has defined BM innovation as following: “*design process for giving birth to a fairly new business model on the market, which is accompanied by an adjustment of the value proposition and/or the value constellation and aims at generating or securing a sustainable competitive advantage,*” stating that changes either in value proposition or in value constellation can result as BMI. Similarly, Lindgardt et al. (2009) identify that BMI requires a reinvention of two or more elements of the current BM.

2.5 Business Model & Strategy

One important aspect that has been studied in the field of business model research is the differentiation between the business model and strategy. It is important to introduce the relation between these two concepts, as they are commonly mixed in terms of terminology and business model as a definition is overlapping, as well as used as a substitute for strategy (Morris et al. 2005; Magretta 2002). In addition, as the framework used for business models in this paper, distinguish these two concepts, it is essential to describe their differences.

It is stated that even though BM has a lot of elements of strategy, it is not one itself (Morris et al. 2005). Nevertheless, linking BM and strategy is compulsory in order to have a sustainable competitive advantage (Teece 2010). For instance, the research conducted

by Zott & Amit (2008), found a distinctive difference between product market strategy and business model, even though they together effect on firms market value.

Several other authors have also contributed into the separation of concepts; firstly, business model is stated to be a tool to analyze, implement and communicate the strategic choices done (Shafer et al. 2005). Secondly, even though BM describes activities it cannot be called as an activity set (Morris et al. 2005). Thirdly, BM's objective is to create value for business whilst strategy's to shareholders (Chesbrough & Rosenbloom 2002). Fourthly, BM is more generic than business strategy, *which makes the selection of business strategy more granular than designing a business model* (Teece 2010). Lastly, in BM, knowledge is limited whilst strategy requires careful assessment (Chesbrough & Rosenbloom 2002).

Casadesus-Masanell and Ricart (2010) have created a generic, two-stage competitive process framework, distinguishing a clear separation between BM, strategy, and tactics. According to the authors, the object of strategy is the choice of business model through which the firm will compete in the marketplace and the BM then determines the needed tactics. In addition, they have added the aspect of dynamism to their view, stating that *"strategy is much more than the selection of BM; it is a contingent plan as to how the business model should be configured, depending on contingencies that might occur"* (p.22).

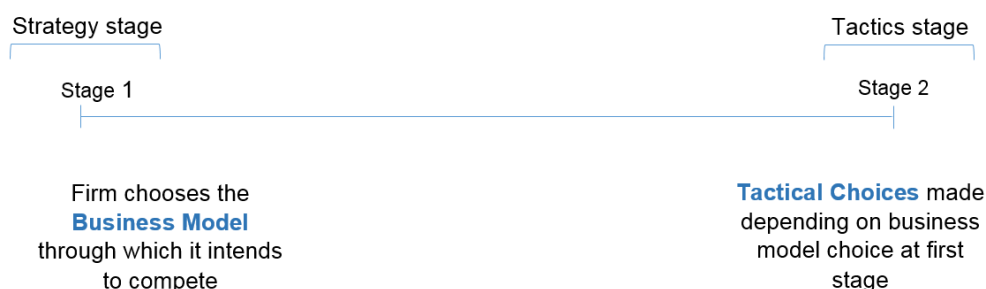


Figure 8. Competitive Process Framework (Casadesus-Masanell & Ricart 2010, 196)

3 OPPORTUNITY RECOGNITION

In order to create and deliver value for stakeholders, companies need to identify business opportunities (Ardichvili et al. 2003). Moreover, for internationalizing SMEs, these international opportunities function as the process' facilitators (Hilmersson & Papaioannou 2015). All in all, the survival and success of companies are dependent on new opportunities, especially in the rapidly changing environment (Hamel 2012).

3.1 Entrepreneurship

Opportunity recognition as a concept has been the most discussed in the entrepreneurship domain (Chandra et al. 2009). A review of the existing opportunity literature by Short et al. (2010) revealed that the use of "opportunity" as a title, keyword or in abstract, was mostly found in the entrepreneurship journals; in comparison to management field in general, articles in entrepreneurship journals covered 68 percent of all the articles analyzed.

Moreover, opportunity recognition has become a central element in entrepreneurship field, (Baron 2004; Venkataraman 1997; Kontinen & Ojala 2011) and the importance of the notion has made it a common theme to study among scholars (Baron 2004; Kontinen & Ojala 2011). All in all, it is nowadays quite generally accepted view that the core of the entrepreneurs is to understand how to identify and exploit opportunities (de Jong & Marsili 2010). As Shane and Venkataraman (2000, 220) state: *"to have entrepreneurship, you must have entrepreneurial opportunities"*. Consequently, one of the most fundamental issues in the domain of entrepreneurship is to understand opportunity identification process (Gaglio & Katz 2011).

Even though opportunity recognition is nowadays a popular concept in the entrepreneurship field to study, the development of its interest has been rather slow. The notion of the importance of opportunities has been out for quite a long time as it has been introduced already through the seminal work of Knight (1921), Schumpeter (1934) and Kirzner (1973) (Alvarez and Barney 2007). Nevertheless, the interest towards the opportunities has increased only after Shane and Venkataraman's (2009) seminal work (de Jong and Marsili 2010). The current opportunity studies are based on varying, often

controversial assumptions, deriving from different fields, from cognitive psychology to Austrian economics (Ardichvili et al. 2003). Even though it is widely acknowledged that opportunity is central to entrepreneurship research, there is still a lack of focus on investigating the origins of opportunities; most of the studies are conceptual and do not include a lot of empirical papers (de Jong and Marsili 2010). Moreover, most of the studies focus on one specific element of the process; such as cognition (see e.g. Zahra et al. 2005) or prior knowledge (see e.g. Shane 2000).

3.2 International Entrepreneurship

As noticed, opportunities are an important notion in the field of entrepreneurship. Consequently, as opportunities exist in both home and foreign markets (Zahra & Dess 2001; Zahra & Gravis 2000 in Zahra et al. 2005), it is evident that the phenomenon is essential also in the international entrepreneurship context. IE combines two distinct fields; international business and entrepreneurship, and its development can be roughly divided into two phases; at the beginning, the research field was focusing on international business and lately, the focus has shifted towards the entrepreneurship field. As IE theory is moving from “how” to internationalize towards “why” to internationalize, also the concept of international opportunity has grown interested in IE field. (Peiris et al. 2013)

The whole internationalization process is stated to start by recognizing international opportunities (Peiris et al. 2013), which makes opportunity research fundamental for the development of IE field. Fortunately, there is an increasing interest towards opportunity recognition among IE scholars (Zahra et al. 2005), as it deserves more attention to be researched (Chandra et al. 2009). Moreover, the concept has been stated to possible become the element that unifies the international business and entrepreneurship as one entity (Mainela et al. 2014).

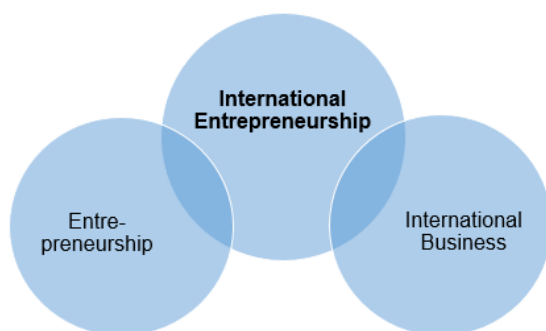


Figure 9. International Entrepreneurship Field

At the beginning of 1990's, new concepts; "born global" and "international new venture" were emerged to answer the companies' internationalization process. These concepts were describing the characteristics of such enterprises, most important being the rapid international growth and the use of several entry modes. As these characteristics are seen as part of entrepreneurship, IE theory started to evolve by combining the field of entrepreneurship and international business. (Jones & Coviello 2005) The first definition of IE was "*innovative, proactive and risk-seeking behaviors across borders*" by McDougall and Oviatt, which has later been reformed by the same authors to *discovery, enactment, evaluation, and exploitation of opportunities- across national borders*. (Mainela et al. 2014) This revised definition shows that the focus has been shifted away from the type and characteristics of the companies towards the recognition and exploitation of the opportunities (Chandra et al. 2009).

According to Jones et al.'s (2011) analysis of IE research, entrepreneurship research is stated being the newest thematic area, as well as less studied in the field. Entrepreneurship was categorized as one of the fields of studies in IE domain under the main category of "entrepreneurial internationalization". The other subcategories were identified to be venture type, internationalization, network & social capital and organizational issues. All in all, from the articles analyzed in this category, only seven percent were placed in the entrepreneurship category. Moreover, from these articles, only 40 percent were concerning opportunities. Additionally, Mainela et al.'s (2013) synthesis of existing international opportunity literature indicates that the interest towards the field has increased significantly at the end of the period between 1989- 2012. Only less than ten percent of the articles analyzed were published before the year 2000.

3.3 Entrepreneurial Opportunities

According to Cambridge dictionary (2016) opportunity is defined as "*an occasion or situation that makes it possible to do something that you want to do or have to do, or the possibility of doing something*". This is relatively broad definition, and thus, in this paper when talking about opportunities, it is referred to entrepreneurial opportunities. The definition used in this paper for entrepreneurial opportunity is created by Oyson and Whittaker (2015, 390), which is built on Eckhart and Shane's definition as "*entrepreneurially discovered or created situation in which new goods, services, raw materials, markets, and organizing methods are conceived as having a potential for*

exploitation through entrepreneur-led action to form and transform them into new means, ends, or means-ends relationships. This definition takes into account the entrepreneur as individual as well as the possibility to both create and discover opportunities. The main difference between entrepreneurial opportunity and other opportunities is that in entrepreneurial opportunity, new means-ends framework has to be created (Kirzner 1997). Another important notion in entrepreneurial opportunities is that not all of them are necessarily profitable (Shane 2003).

Moreover, as the focus of this paper is on international entrepreneurial opportunities, it should be distinguished from the entrepreneurial opportunity. Oyson and Whittaker (2015, 309) have continued from Mainela et al.'s (2014) definition, and thus define international entrepreneurial opportunity as “ *entrepreneurially discovered or created situation that spans and integrates elements to multiple national contexts in which new goods, services, raw material, markets and organizing methods are conceived as having a potential for exploitation through entrepreneur-led action to from and transform them into new means, ends or means-ends relationships.* “ Here the exploitation refers to an entry of a firm into the international market.

3.4 Theories of the Nature of Opportunities

The two main theories in entrepreneurship research, which explain the source of opportunities, are Schumpeterian and Kirznerian views (Shane 2003; Alvarez & Barney 2007). There are some notions in these theories that are the same for both; firstly, they both consider the market as in disequilibrium, and secondly they both have the same dependent; the entrepreneurial action (Shane & Venkataraman 2000). Nevertheless, these views see the nature of opportunity differently. The table below describes the main differences, which are more closely explained below.

Table 2. Differences between the Opportunity Theories (Shane 2003, 21)

Schumpeterian perspective	Kirznerian perspective
New information	Does not require new information
Disequilibrating	Equilibrating
Rare	Common
Innovative	Less innovative
Creation	Discovery
Riskier	Less-risky

The main disagreement between these two theories is the type of information needed to recognize opportunities. Kirznerian perspective sees that in order to have opportunities, it requires only different access to existing information, whereas, Schumpeterian perspective believes that new information is needed to explain the existence of entrepreneurial opportunities (Shane 2003). In Kirznerian view, people use the information they already have to create beliefs about the efficient use of resources. Nevertheless, as these assumptions are not always correct, their actions create surpluses and shortages, which thus enable the new use of resources to other people. The Schumpeterian view sees that changes in the environment create new information, which people can thus implement to find better ways to use resources than the existing ones. The new information that the entrepreneur can leverage, when considering the new combinations, comes from the changes in the technology, political forces, regulations, macroeconomic factors and social trends. (Shane & Venkataraman 2000)

Even though both of the theories see the market as in disequilibrium, Kirznerian opportunities bring the economy closer to equilibrium, whereas Schumpeter opportunities disrupt it; as entrepreneurs innovate new solutions that are better than the existing ones, the market moves into disequilibrium. This concept is called creative destruction. As most opportunities are “*constructive to established ways of doing things*” (Aldrich 1999 in Shane 2003, 20), it can be argued that most of the opportunities are Kirznerian, as they reinforce the equilibrium rather than disrupt it (Shane 2000, 20). As noticed, the Kirznerian opportunities differ from Schumpeter’s opportunities quite significantly; thus it can be argued that the whole process, including identification, evaluation, and exploitation is also different. Schumpeter’s opportunities are rarer and require new knowledge and are thus more innovative, whereas Kirznerian opportunities are more common, and not as innovative. Therefore, also the level of risk should be higher in the rarer opportunities. (Shane 2000)

Researchers argue about the connection between these two theories; some do not believe that they can easily coexist, meaning that only either type explains opportunities (see e.g. Alvarez & Barney 2007). The dominant view is that both types can be present simultaneously, making them a different types of opportunities (de Jong & Marsili 2011). The views that combine the approaches are more focused on the actual behavior of the entrepreneur rather than in the question of the existence and nature of these views (Mainela et al. 2014). Moreover, Short et al. (2010) believe that in the near future, opportunity literature will move towards this middle view.

3.4.1 Discovery and Creation Theories

The two most common perspectives explaining the identification of opportunities are Discovery Theory and Creation Theory. From these theories, discovery theory has been more attended (Gaglio & Katz 2011; Shane 2003), simultaneously creation theory lacking more groundwork, and moreover, lacking connection to discovery theory (Alvarez & Barney 2007). Commonly, Kirznerian opportunities are found to be identified through the discovery process, simultaneously, Schumpeterian opportunities through creation theory (Aldrich 1999 in Shane 2003). Alvarez and Barney (2007) have explained the key difference between these two theories with the metaphors; “climbing mountains” and “building mountains”. Here climbing is used to describe the discovery process, whereas building is used to describe the creation theory.

There are views that see either creation or discovery theory to exist alone. Ardichvili et al. (2003, 106) states that even though elements of opportunities can be recognized, opportunities are made and not found: thus, the focus should be on the opportunity development rather than in opportunity recognition. Nevertheless, much scholars' view that both types of opportunities can coexist simultaneously. For instance, Zahra et al. (2005, 131) state that some opportunities are discovered whilst others are created by the entrepreneur's enactment process, where an idea is given meaning.

Opportunity discovery theory views that opportunities derive from external shocks, for instance, from changes in the industry, market, or technology. (Alvarez & Barney 2007; Shane 2003); these changes disrupt the competitive equilibrium which therefore creates opportunities for entrepreneurs. The key notion here is that opportunities are not created by entrepreneurs and that they exist even though they would not be recognized. Thus, opportunities are objective. The notion here is that entrepreneurs need to discover these opportunities before others do in order to leverage from them; the ones who delay in the discovery process do not commonly succeed as well as the ones first discovering the opportunity. (Alvarez & Barney 2007)

The differences between the opportunity discovery possibilities are based on the knowledge and information gaps between the people (Kirzner 1997). These are called knowledge asymmetries, which secures the entrepreneurial profits, as not all people recognize same opportunities. According to Kirzner (1997), another phenomenon that impacts on the ability to discover opportunities lies in “alertness”. “Alertness” as a

phenomenon is identified to have different components among scholars, such as information asymmetries, risk preferences and cognitive differences (Shane, 2003). As opportunities can be discovered by anyone, thus their existence is based on these differences in the information and alertness.

Even though Creation theory can be seen as an alternative to Discovery theory (Venkataraman 2003), it has not yet established a same coherent theory in the literature (Alvarez & Barney 2007; Mainela et al. 2014). Firstly, according to Creation theory, the opportunities do not have to be linked to a specific industry nor market; after the possibility has been recognized and exploited, it can nevertheless always be linked to the market/industry, but only afterward. (Mainela et al. 2014) In Creation theory, opportunities are seen to be subjective, and they do not need external changes in order to be created. The key notion here is that the opportunities are actually created internally by the entrepreneurs themselves (Shane 2003). Thus, search as an action is not important; as search is used to discover opportunities, in this theory, it does not have a role as these opportunities are created and thus cannot be found. Another important notion is the difference between entrepreneurs and non-entrepreneurs; even small differences between two individuals can lead to another one forming and exploiting an opportunity. (Alvarez and Barney 2007)

3.4.2 Deliberate search and serendipity

One fundamental question in the opportunity literature is if entrepreneurial opportunities are found through deliberate search or through serendipity (Gaglio & Katz 2011). Deliberate search means concretely trying to find opportunities in the environment. Another one is serendipitous discovery, where opportunities are recognized in the environment without directly searching for them. This latter view focuses on the conditions that enable opportunity discovery including relevant skills, prior knowledge, alertness, and networks (Kirzner 1973, 1979, 1997 in Chandra et al. 2009).

Some authors see the search as a central element of the OR process while others do not. Nevertheless, the view that considers opportunities being found through serendipity, neither thinks that the opportunity is identified through luck. (Alsos & Kaikkonen 2006) These two perspectives can be combined as well, and for instance Chandra et al. (2009) describe opportunity recognition as *“a process that consists of both discovery as well as*

deliberate and systematic search. Whereas, Kirzner (1997) sees that opportunities are discovered neither through deliberate search nor through serendipity, but by being alert. The notion here is that people do not search for opportunities to be discovered but by recognizing the value of information that they receive (Shane 2000).

3.5 Factors Affecting Opportunity Recognition

As stated earlier, according to Discovery theory, opportunities exist even though they would not be recognized. In other words, it is not certain that individuals will recognize them as opportunities. In addition, according to Creation theory, the differences between individuals lead to opportunity creation. Thus, it is important to understand the factors influencing these processes. Until now, the empirical studies of the factors driving opportunities have been focusing on the individuals recognizing the opportunities, by mostly focusing on either knowledge or entrepreneurial behavior (Short et al. 2010, 56). Shane and Venkataraman (2000) also identify two main factors in the process, which are knowledge and cognitive process. In this paper, the factors that have been identified by several authors are introduced more closely.

Most commonly introduced factors can be stated to be knowledge, network structure (see e.g. Chandra et al. 2009; Kontinen & Ojala 2011; Ardichvili et al. 2003) and different entrepreneurial characteristics/behavior. In addition, there are factors identified that are not as commonly mentioned in the literature such as access to resources (Peiris et al. 2013) and the type of the opportunity (Ardichvili et al. 2013). Shane and Venkataraman (2000, 222) also state that the willingness to exploit a specific opportunity is affected by the characteristics of the opportunity; the cure for cancer is a bigger opportunity than discovering that students need a snack, which thus impacts on the desire to exploit the opportunity. All in all, the expected value of the entrepreneurial opportunity needs to compensate the costs (Kirzner 1973). In addition, marketing efforts can be considered as a factor impacting the OR process. For instance, according to the study of Kontinen and Ojala (2011), the main factor for IOR was found to be trade exhibitions. Nevertheless, the scholars state that more research is needed to explain how entrepreneurs recognize these opportunities from foreign markets at the time of entry.

3.5.1 Prior knowledge

Prior knowledge is mentioned as one of the factors in the opportunity identification process by several authors (see e.g. Kontinen & Ojala 2011; Oyson & Whittaker 2015; Chandra et al. 2009). In the context of international opportunities, internationalization knowledge, and market knowledge are found important to identify international opportunities (Chandra et al. 2009).

Prior knowledge allows an individual to discover opportunities that could not be discovered without, as it enables pooling the information in new ways (Alvarez & Barney 2007). This existing information creates “information corridors” (Shane & Venkataraman 2000), which refers to individual’s prior knowledge that allows the recognition of certain opportunities. All in all, the dispersion of the knowledge has two essential roles in the process; firstly they create the actual dispersion and secondly they work as barriers to exploit the opportunities profitably. (Venkataraman 1997)

Oyson and Whittaker’s (2015) study about opportunity discovery concluded that in initial internationalization, two-third of the companies discovered opportunities based on the entrepreneurial knowledge. This knowledge was acquired through networks and contacts and by general knowledge of foreign markets. Moreover, it was identified that serendipity, in many cases, was involved in the entrepreneurial acquisition of knowledge. Chandra et al. (2009) concluded, based on their research that earlier international knowledge and experience has a significant effect on the opportunity recognition process; the companies at the time of their first international entry, with no or little international experience or knowledge, tend to discover opportunities rather than deliberately search for them. Vice versa, companies with more international experience and knowledge, tend to search for their first international opportunities deliberately.

When it comes to prior knowledge, different dimensions can be identified. For instance, Shane (2000) have identified three main knowledge dimensions; prior knowledge of markets, the ways to serve markets and customer problems. Åkerman (2015) studied the importance of different knowledges, finding out that when recognizing international opportunities, network-specific knowledge (knowledge about local business network) is more important than local institutional knowledge.

All in all, knowledge is a crucial element in the opportunity identification; nevertheless, an important notion here to recognize is that the knowledge alone is not a sufficient condition; two persons can have the same exact knowledge, but they can use it in totally different way. Thus, in order to see the means-ends relationships, skills, aptitudes, insight, good circumstances and capabilities are needed. (Venkataraman 1997) In addition, it has been found out that the lack of knowledge is not necessarily an obstacle to discover opportunities. Oyson and Whittaker (2015) found out in their study that in several cases, entrepreneurs discovered and subjectively created initial international opportunities by imagining them. This is also aligned with the view that both discovery and creation can coexist, and in creation theory, the existing knowledge does not play a crucial role.

Here, in relation to prior knowledge, experience can also be introduced; for instance, according to Åkerman (2015), having a varied international experience is positively connected with the international growth opportunity recognition. Similarly, Hilmersson and Papaioannou (2015) have found out that the enterprise's international experience plays an important role in the international opportunity development. In addition, the experience impacts on the level of systematic and active scouting of opportunities. In other words, more experience means more search activity.

3.5.2 Networks

One factor that has been emphasized in the context of opportunity recognition process is the importance of networks (e.g. Kontinen & Ojala 2011; Ardichvili et al. 2003). This has also been called as "social capital", and it is defined as the individual's location within a social structure in which, a specific opportunity, is recognized (Peiris et al. 2013, 19).

Overall, networks have been indicated to impact in the OR process. Hilmersson and Papaioannou (2015) found out that networks ties influence the opportunity recognition process. This aligns with Chandra et al. (2009) study of international opportunity recognition where the majority of the participants tend to rely on their networks as sources of ideas, information, and new knowledge, leading to opportunity recognition in international markets. In addition, Kontinen and Ojala (2011) found out in their study that family-owned SMEs tend to form new formal ties instead of leaning on existing informal or family networks during international opportunity recognition process.

The importance of networks is highlighted especially at the early stages of operations. Wasdani and Mathew (2014) found out in their study that social capital is an important factor for opportunity recognition process for pre-stage-entrepreneurs, and in addition, bonding social capital was found to influence opportunity recognition process both for early-stage and late-stage-entrepreneurs. As stated earlier, in Oyson and Whittaker (2015) study, entrepreneurial knowledge was the major factor for initial international opportunity recognition. Nevertheless, this experience was acquired through their networks and contacts, knowledge of foreign markets, and queries and solicitation by foreign customers or distributors. Thus, the importance of networks can be highlighted; without networks and contacts, the knowledge would not have been at the same level.

3.5.3 Entrepreneurial Characteristics

This subcategory includes different factors that could be linked all together below the “entrepreneurial characteristics” category. There are varying concepts used to describe the entrepreneurs, such as with entrepreneurial orientation (Chandra et al.) alertness (Kontinen & Ojala, 2011; Ardichvili et al. 2003) entrepreneurial capacity (Peiris et al. 2013), cognition (Baron 2004) and personality traits (Ardichvili et al. 2013).

All in all, Oyson and Whittaker (2015) found out that the whole discovery process can be seen as a cognitive process, which involves a variety of different mental processes such as recognition, perception, identification, knowing, and imagining. Baron (2004) uses the cognitive principles to explain why individuals become entrepreneurs, identify opportunities and exploit them. According to the scholar, there are two ways how entrepreneurs process their thoughts; by a systematic analysis of the facts and by application of heuristics. He suggests that specific persons recognize opportunities because they possess cognitive framework that helps to “connect the dots” of the changes in the environment. Based on the study by Wasdani and Mathew (2014), the cognitive style was found to have an impact on the opportunity recognition process in every stage of operations. However, at the mature stages of operations, the entrepreneurs’ cognitive style was not found to have a significant impact on the process. Here the possible notion is that the late-stage entrepreneurs were acting more based on intuition than on cognition.

Entrepreneurial alertness is necessary to have a successful opportunity identification process. Kitner (1997) states that entrepreneurial alertness, a set of skills including both

perceptual and cognitive components that impacts on opportunity identification process, makes the entrepreneur's mental ability different. The process of entrepreneurial alertness considers the differences between alert and non-alert persons in their decision making about the present situation; the ones who are not alert do not read the current market environment in a right way, which can lead for instance to ignoring the situation. Simultaneously, alert persons, understand the cues that the changing environment offers, and is aware of the current situation all the time by assessing it constantly. (Gaglio & Katz 2011)

3.6 Opportunity Evaluation and Exploitation of Opportunity

One must acknowledge that opportunity recognition is only the first phase in a continuing process; it also includes the evaluation of the opportunities recognized and their actual development; all these steps are necessary to have a successful business (Ardichvili et al. 2003). Even though it is necessary for entrepreneurs to firstly discover opportunities, it is not enough. From these discovered opportunities, it has to be decided which one should actually be exploited. For instance, according to the study by Oyson and Whittaker (2015), the case companies evaluated the potentiality of the opportunities by traveling to the specific country in order to understand the market, by screening or by concentration on specific markets.

The exploitation process includes the acquisition, recombination, and organization of the resources available (Shane 2003, 10). Even though there is no specific statistics about the amount of exploitation of discovered opportunities, it is known that not all found opportunities are further on implemented (Shane & Venkataraman 2000, 222). Thus, the overall focus should be on opportunity development and not only on opportunity recognition as the recognized need is not viable without the development part (Ardichvili et al. 2003). Eckhart and Shane (2010, 65) state that it is more probable that an opportunity will be exploited when markets are large, the competition level is lower, capital is cheaper, and profit margins are high.

The exploitation process is also seen differently among the two theories of opportunities. In discovery theory, the decision making is called to be less risky whereas in creative theory is it uncertain. The decision making is less risky when there is enough information

to assess all the possible outcomes with their probabilities, whereas the decision making is uncertain if not enough information can be collected to assess the possible outcomes; in creation theory, it is uncertain as opportunities do not exist before creating them. (Alvarez & Barney 2007)

As stated, there are different factors that impact on the opportunity recognition process. For instance, Venkataraman (1997) states that cognitive conditions, incentives, and creative processing impact significantly in the process, and also differ from individual to another. Nevertheless, these factors do not impact only on the recognition process but also on the actual exploitation process. It is important to take into account, that even though these factors can increase the level of opportunity exploitation, it does not lead directly to successful exploitation. For instance, being overoptimistic can make an entrepreneur to exploit opportunities easily, which can however fail. (Shane & Venkataraman 2000)

4 RESEARCH METHODOLOGY

The overall trend in the existing business model research field has been the use of qualitative methods. Moreover, the existing quantitative studies have not been focusing on presenting generalized measurement scale for BM (Clauss 2016). Based on the synthesis of international opportunity recognition studies by Mainela et al. (2014), more than two third of the 78 articles used either conceptualization or case study as a case method. In addition, nearly all the studies have been qualitative. Consequently, this study follows these trends by using a qualitative case study to research how companies adapt business models, how they recognize international opportunities, and how these concepts are related to each other.

All in all, qualitative research can be seen a contrast to quantitative research. In general, qualitative research is not used to acquire statistic generalizations, but the main objective is to describe, understand and interpret a specific phenomenon, event or behavior (Tuomi & Sarajärvi 2003), by creating new information from real-life scenarios. Qualitative research is about making connections among the phenomena where the context plays a significant role (Roller & Lavrakas 2015). Moreover, it is especially good to be applied in the situations where existing knowledge is not yet broad. As different kinds of data collection methods can be implemented in the qualitative research, it also increases the variation of its usage. Qualitative research is essentially all about how the results are interpreted, meaning that researcher conducts the analysis of the data. In addition, the nature of the qualitative research can be described as emergent rather than tightly prefigured. Thus, it is possible that new aspects, which were not thought originally, are emerging during the study. (Creswell 2003)

In this research, the objective is not to generalize the concepts and their behavior, but in particular, understand them more closely. In addition, the context, Finnish SMEs in Cleantech industry, has an important role in this study. Most importantly, there is a clear gap in the literature about the relation of business model adaptation and international opportunity recognition, in other words, the existing knowledge of the phenomena is not broad. All these facts indicate the suitability to use qualitative research in this thesis.

4.1 Case Study

In this paper, a cross-sectional case study is used as a research method. A case study is defined as *“a research strategy which focuses on understanding the dynamics present within single settings”* (Eisenhardt 1989, 534). It offers the possibility for a deep understanding of phenomena as it generates abundant descriptions and explanations (Eisenhardt 1989). In addition, using case study allows challenging the existing theory, as well as bring up new research questions (Saunders et al. 2009). The table below introduces the relevant situations to use different research methods.

Table 3. Relevant Situations for Different Research Methods (Yin 2009, 8)

Method	Form of Research Question	Requires Control of Behavioral Events	Focuses on Contemporary Events
Experiment	how, why	yes	yes
Survey	who, what, where, how many, how much	yes/no	yes
Archival	who, what, where	no	yes/no
Analysis	how many, how much	no	yes/no
History	how, why	no	no
Case Study	how, why	no	yes

The first part “form of research question” describes what kind of forms of research questions should be used in different methods. This study uses the questions; “how” and “why” which are considered more explanatory, and thus commonly used in case studies, histories and experiments. The second part “requires control of behavioral events” means the investigator’s ability to control on actual behavioral events. In this study, there is no control over the behavior, and thus, only history and case study are applicable. The last part “focuses on contemporary events” draws the distinction between case study and history, and case study is used to examine current events and history past events. (Yin 2009) As the phenomenon studied is contemporary, it proves the applicability of the case study as a research method.

Multiple case study is required when a study contains more than one case. Moreover, a single–case design can be only used if all of the following criteria are met; it is used to test a well-formulated theory, or the case is unique/ extreme, typical, revelatory or longitudinal. As this study has five cases altogether, and none of the criteria are met, the multiple-case design is proved to be applicable. Multiple-case method makes it possible to see the

similarities and differences between the cases, and in this case, it is used to predict similar results among the cases. (Yin 2009)

Even though the applicability of case method in this study is proved, there are criticisms towards the method in general. Overall, it is important to remember that conducting a case study is difficult and its major critics are: (Yin 2009, 14-16)

- (1) Lack of precision during the research
- (2) Results cannot be generalized
- (3) Time-consuming
- (4) Cannot explain causality directly

4.2 Research Context

Cleantech is referred to be the most prominent success economy to Finland (Tweed 2014) and the industry is increasing fast in the country; in 2008 the turnover of Finnish Cleantech business was around 18 million and in 2013 already almost 26 million (Cleantech Finland 2016). Moreover, from 2011 to 2012, Cleantech sector in Finland increased by 15% in spite of the overall economic downturn (Tweed 2014). Over a third of Finnish public R&D funding is currently going to Cleantech sector, which indicates that Finland is investing heavily on it (Cleantech Finland 2016). In addition, in Finland, Cleantech companies have a strong network with other Cleantech companies (see e.g. Cleantech Finland), and Finland was ranked as no. 4 in the world within the Cleantech innovation index, with high rank both in input as well as in output to innovation (WWF 2014). In addition, the focus on SME is evident; 99.7 percent of all the Finnish companies are small and medium-sized (EC 2012), but only one-fifth of these companies has international operations (Yrittäjät 2015). All these facts indicate the importance of understanding the internationalization process of Finnish SME Cleantech companies.

This study delimits the context of the study in four ways. Firstly, it studies the behavior of Finnish companies. Secondly, the companies had to be small and medium-sized, and according to the definition of OECD (2016) SMEs have less than 250 companies. As a matter of fact, all the case companies could be defined as small companies as they all have less than 100 employees (OECE 2016). Thirdly, the companies had to be operating in the Cleantech sector, and were thus, chosen from the Cleantech Finland network.

Fourthly, the case companies had to have started their internationalization processes or had to have the intention to internationalize in the near future.

4.3 Data Collection

Data collection method in case studies usually combines different methods, and the data retrieved can be qualitative, quantitative or both (Yin 2009; Eisenhardt 1989). In this study, the data is collected through interviews. Interviewing is a central element in the majority of qualitative research designs, and its main advantage is the possibility of being flexible, meaning that during the interview, it is possible for instance to repeat the question, clarify and correct. Moreover, it is possible to ask the wanted questions from the person who is actually aware of the issues asked. (Tuomi & Sarajärvi 2003)

In this study, the interviewees were chosen according to their position and knowledge of the company studied. This is called elite sampling, meaning that only the persons who are assumed to know the most of the subject are chosen (Tuomi & Sarajärvi 2003); as the main focus of this research was on the early internationalization and BM changes over time, the interviewees had to know enough of the company's earlier activities. The interviews were conducted via phone and skype, and were held between 10/2016 and 12/2016. The length of the interviews was varying from half an hour to one hour. Table 4 summarizes the details of each interview.

Table 4. Interview Details

Company	Date	Length (min)	Position of the interviewee
Alpha	10.10.2016	30	CEO
Beta	14.10.2016	24	CEO
Gamma	19.10.2016	40	CEO
Delta	03.11.2016	52	CEO
Epsilon	02.12.2016	36	CEO

Tuomi and Sarajärvi (2003) introduce three different types of interviews; survey interview, theme interview, and deep interview. The survey interview is used for quantitative research. So-called deep interview, also referred to an open interview, is completed without structure and thus feels more like a conversation. In theme interview, also referred as a semi-structured interview, certain themes are followed. The objective in theme

interview is to discover meaningful notions according to the research objectives that have been created. In this study, theme interview, (or semi-structured interview) is used. Semi-structured and guided interviews can be used to answer both “what” and “how” questions (Eriksson & Kovalainen 2008). The interview is based on two main themes with additional and supporting areas of focus. The first theme covered in the interview focuses the company’s existing business model and its changes over the time as well the reasons for possible adaptation. The second part of the interview centers the internationalization process and the ways the company has recognized opportunities, focusing on early/initial opportunities. Moreover, the study is aiming to find the relation between these two main themes.

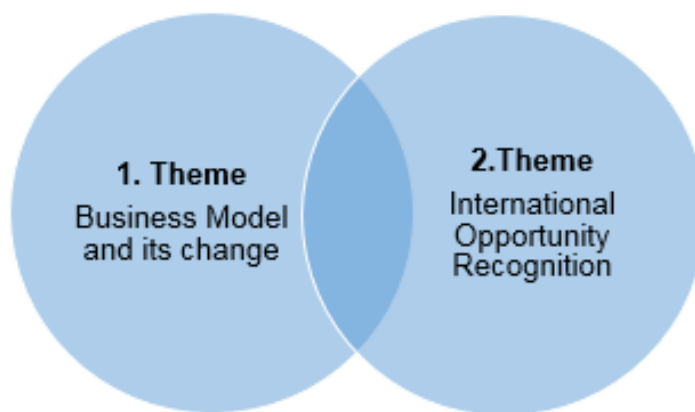


Figure 10. Main Themes of the Interview

The interview base can be found in appendix I. Nevertheless, it is important to remember that as the type of this research’s interview is semi-structured, and follows certain themes, the interviews were not following precisely the interview plan. Moreover, the questions were there to make sure that all the relevant issues were gone through at some point of the interview.

4.4 Data Analysis

To begin with the data analysis, the recorded audio from the interviews was transcribed into text and translated into English. This phase was done by external service. In order to then gather, organize and analyze the data, NVivo, a computer-assisted qualitative data analysis software (CAQDAS), was primarily used. In addition, Microsoft Excel was

implemented mostly to summarize results. The use of CAQDAS can significantly support the process of interpreting the research outcomes, having one significant advantage the ability to cope with a large amount of data in the fast and reliable way (Roller & Lavrakas 2015). Most importantly, *“if used systematically, it increases both transparency as well as methodological rigor”* (Saunders et al. 2009, 514).

Saunders et al. (2009) introduce three main types of analysis processes, which were all used to analyze this research’s findings.

- 1) Summarizing
- 2) Categorization
- 3) Structuring

Firstly, the content of each case was thoroughly read and summarized in own words in Excel, in a way that it corresponds to each interview questions separately. This was done to get an overall picture of the interviews. Secondly, NVivo was implemented to categorize the data further. In NVivo, the content of the interviews was coded, meaning tagging and labeling the content into units (Miles & Huberman 1994). The way to code the themes can be called as “selective coding,” which intention is to identify the main themes and their relation to each other (Saunders et al. 2009). Miles and Huberman (1994) endorse on creating “start list” of codes related to the theoretical part of the study. Thus, the initial codes were designed beforehand to correspond the initial research questions and frameworks. This was followed with the actual coding of the interview transcripts. Here, also new, more specific codes were created along the way. When new codes were emerging, all the transcripts were reread again to see if these themes were found in other interviews as well. Lastly, the final codes were structured into a hierarchical order, to find relevant patterns among the interviews. The initial coding, as well as the final coding list, can be found in the appendix II and III.

All in all, the analysis method of this research can be referred as template analysis. Template refers to the combination of codes and categories representing the themes that were found from the data collected (Saunders et al. 2009). This method enabled to find both the specific results to one case company, but most importantly, the comparison between the cases with different codes.

4.5 Validity and Reliability

There is a lot disagreement between the qualitative researchers' about the definition and evaluation of "quality" in the research (Roller & Lavrakas 2015) Thus, validity, reliability, and generability in qualitative research are not to be used with the same meaning as they are used in the quantitative method. Overall, reliability and generability are not significant in the qualitative research (Creswell 2003). As stated earlier, one of the critiques towards case studies was its unsuitability to create generalized results. Nevertheless, in this study, a case study is selected exactly because it suits to offer a deep understanding of the specific phenomenon (Eisenhardt 1989). Moreover, reliability is often measured on the repeatability of the study (Yin 2009). This is hard to achieve in case studies, and most importantly in semi-structured interviews.

Yin (2009) introduces four tests that are commonly used to test the quality of empirical research, from which three of them are related to validity. The tactics used in case study method are described in the table below. One of the tests, the internal validity is used when examining the causal relationships and thus it is excluded from this study. All in all, it can be said that reliability and external validity are strong in this study. The construct validity has minor delimitations, still having the chain of evidence well established.

Table 5. Case Study Tactics for Four Design Tests (Yin 2003, 41)

TEST	Case Study Tactic	Phase
Construct validity	<ul style="list-style-type: none"> ▪ Use of multiple sources of evidence ▪ Establish chain of evidence ▪ Revise the case study report draft by key informants 	Data collection
		Data collection
		Composition
External validity	<ul style="list-style-type: none"> ▪ Use Replication logic in multiple-case studies 	Research design
Reliability	<ul style="list-style-type: none"> ▪ Use case study protocol ▪ Develop case study database 	Data collection
		Data collection

Construct validity identifies correct operational measures for the concepts studied. To strengthen the validity, three different tactics can be used. Firstly, it is good to use multiple sources of evidence. This tactic is not fulfilled in this paper, as only one source of evidence, interviews, is used. The second tactic is to establish a chain of evidence, which

means that the reader can easily follow any evidence from research questions to a conclusion. This can be done by firstly having enough citations to the database. Secondly, the database should reveal the actual evidence and the circumstances of the data collection and thirdly it should be exposed that data collection has followed procedures. This tactic is well-established in this paper; the analysis offers citations directly taken from the interviews, the evidence is easily found from the interviews, and the data collection has followed the procedures determined. The last tactic is related to revision; it is important to have the paper reviewed not only by peers but also with case companies. In this paper, only supervisors have reviewed the work which can decrease the construct validity.

External validity defines the domain to which the study's findings can be generalized. This can be seen as the greatest barrier in case studies, and the tactic that improves this validity is to use replication logic in multiple-case studies. The replication logic means selecting cases that predict similar results, and an important part in replication process is to develop a rich theoretical framework. In this paper, the theoretical frameworks, both for BM and OR, are carefully designed after an extensive literature review. In addition, the criterion was followed when the cases were selected, with the expectation that results are similar in all of the cases. Thus, the external validity, within the context, can be stated to be relatively strong.

Lastly, the reliability of the study demonstrates that the operational side of the study can be repeated with the same results. In other words, if the same study would be done by another researcher by following the same steps and procedures, the findings and conclusions would be the same. Thus, the goal of reliability is to minimize the errors and biases in the study. The tactic for strong reliability is to create a case study database and to use case study protocol. Overall, this study has a strong database; all the interviews have been recorded, and then transcribed from word to word before actual analysis. Moreover, all the data is coded using NVivo, which again increases the database.

4.6 Research Process

The figure below describes the overall process of the research by summarizing the main notions of the study. First of all, both deductive and inductive approaches have been used in the research. The deductive approach was implemented at the first steps of the process when forming the research questions. Nevertheless, the data was analyzed inductively, in order not to miss any emerging themes that would not necessarily be involved in the theoretical frameworks. The research strategy was selected to be a case study, and more specifically multiple case study. Next, it was decided that mono method, here a qualitative method, is used. In addition, the cases were selected to be studied cross-sectionally, and the data would be retrieved through interviews. To analyze the data, coding through NVivo was mostly implemented.

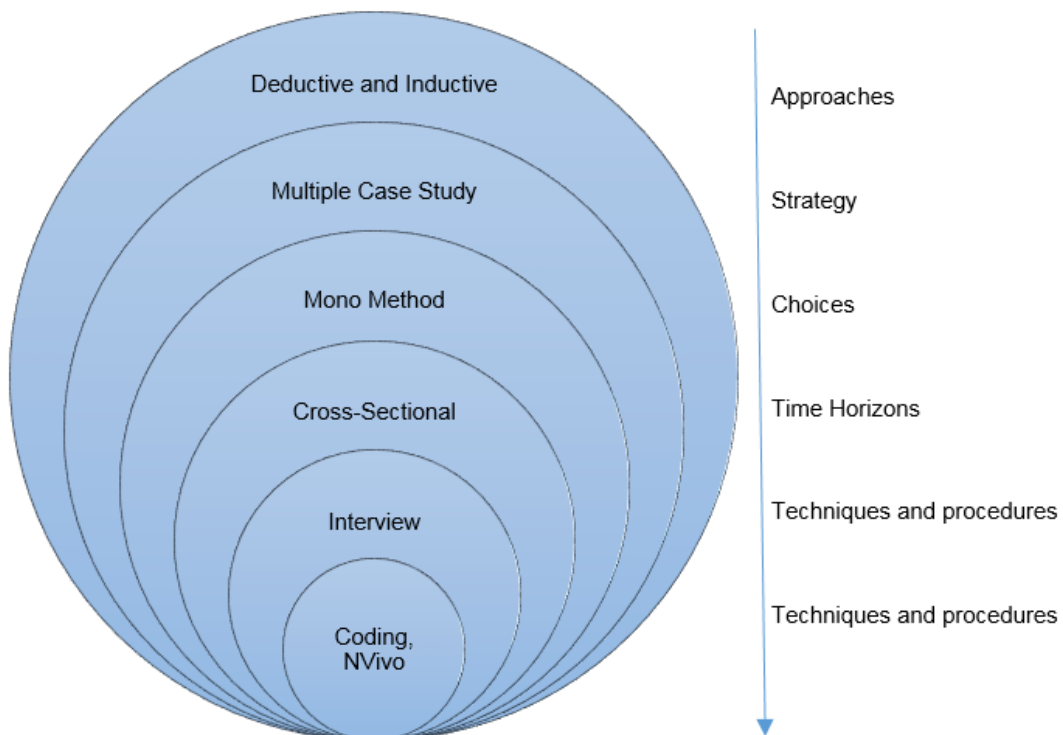


Figure 11. The Research Process (Adjusted from Saunders et al. 2009, 108)

5 FINDINGS AND ANALYSIS

The following chapter discusses the findings of the research in the following way. To start with, the case companies and their features are introduced, following with the actual analysis of the interview data. This part is divided into three main parts. First one focuses on business model and its change, the second one in international opportunity recognition, and the third one in these concepts' relation.

5.1 Case Companies

Company Alpha was established in 2006 to offer energy efficient portable solar harvesting products and components. Currently, it has reduced the role of consumer business, and focuses on system designs related to solar energy. The company outsources its manufacturing, concentrating on R&D, marketing and sales. There are currently five employees in the company. Alpha has operations in 20 markets all over the world.

Company Beta is founded in 2012 and is currently employing six persons. Beta offers wind energy solutions for cargo vessels and passenger ships, being the first one in the world introducing this technology. The company is concentrating on the R&D and marketing and sales, outsourcing the manufacturing. Beta is about to close its first international sale in the near future.

Company Gamma was established in 2008 to initially improve the renewable energy's quality. Nowadays the company is more focused on power quality, energy efficiency and environmental performance in a variety of industries, such as heavy industry and hospital sector. Gamma is employing currently 28 employees and has international distributors in 25 markets.

Company Delta was established in 2001 and is currently employing six persons. In the past three years, the company has shifted from being a project company to a company offering products. The company offers hardware and software solutions in bringing intelligence to industrial machines and connecting them to the companies' business processes. Delta is currently focusing on expanding its international operations to several countries in Europe.

Company Epsilon was founded in 2007 and it employees currently five persons. Epsilon offers machinery, process systems as well as service for different recycling processes. Nowadays its main product is pyrolysis machinery which turns organic waste into oil. Epsilon has not had international sales yet but is currently moving in that direction.

Company	Founded	Industry	Field	Employees	Internationalization
Alpha	2006	B2C & B2B	Solar power	5	High
Beta	2012	B2B	Wind power	6	Low
Gamma	2008	B2B	Power quality IoT	23	High
Delta	2001	B2B	technology	9	Low
Epsilon	2007	B2B	Recycling technology	5	Low

Table 6. Company Info

There are similarities but also differences among the case companies. First of all, all the companies are small sized, having the number of employees varying from five to 28 persons. In addition, all of the companies have been established in 00's, the oldest being Delta with 16 years of operations, and youngest Gamma, with four years of operations. All the case companies are also working in B2B industry, as an exception Alpha, which has functions also in B2C markets, still having the main focus on B2B industry. The level of international operations is varying significantly. Here, the level of internationalization is divided into "high" and "low," depending on a number of international operations. For instance, Alfa has operations already in about 20 international markets whereas Delta has just currently started to focus on internationalization, and Beta is about to close its first international sales soon. The description of the companies' internationalization is explained more detailed in chapter 5.3.

5.1.1 Cleantech Context

The majority of worldwide Cleantech operations are related to energy technologies, covering 77% of total Cleantech venture capital investments in 2010. (WWF 2014) Thus, the definition of Cleantech is sometimes seen only in relation to clean energy. Nevertheless, the field goes beyond that by being used in many different technologies

(Kachan & Co. 2013; WWF 2014). Kachan and Co. (2013) have identified eight different groups into which Cleantech companies can be categorized (see figure 12), which indicates the broadness of the field. The fields where the case companies are functioning are also varying; two of the companies are working with renewable energy, one with power solutions, one with IoT, and one with recycling technology. All in all, focusing on different industries may also have an impact on the case companies' operations. As Asemokha et al. (2016) introduce in their article, there are some factors that distinguish Cleantech SMEs as a separate phenomenon from SMEs in general, most important being the different regulative environment. It may be possible that there are also differences in the Cleantech industry. For instance, IoT-field does not necessarily have the same strict regulations than clean energy -field.

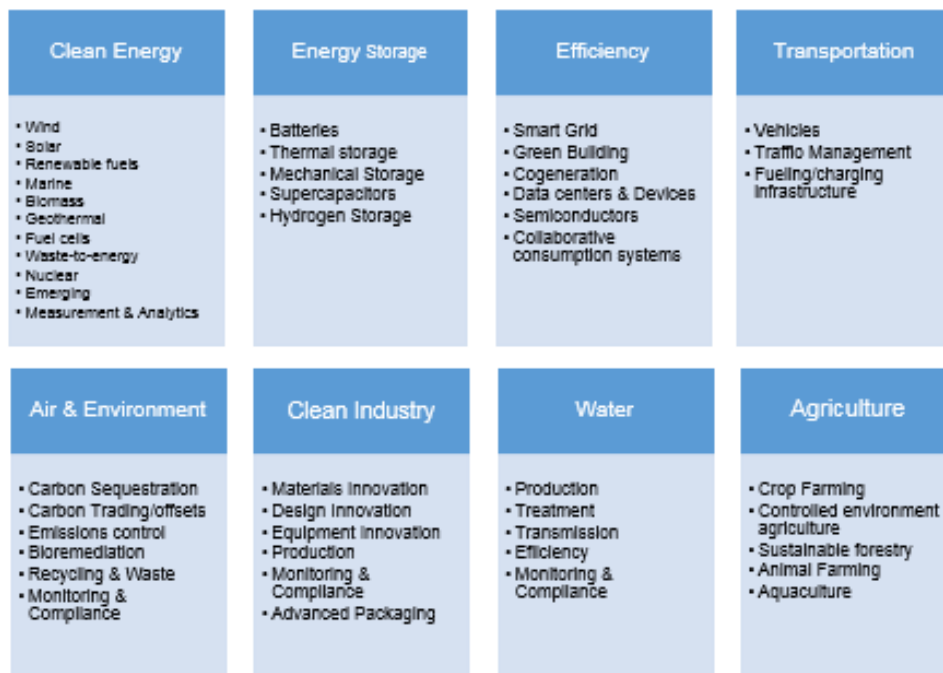


Figure 12. Cleantech Categorization (Kachan and Co. 2013)

The importance and focus on being a Cleantech company is also varying among the case companies. Alpha states starting its whole business based on the idea to decrease carbon footprint, and it is still focusing on the same ideology. Moreover, Alpha states being the first small company participating in the Cleantech Finland Programme, at a time when the network defined Cleantech as a technology based on ecological principles and energy economy. Overall, Alpha's CEO thinks that the word "Cleantech" has suffered an inflation, and thus, the company is not anymore active in the network as *"its advertising value increased, it became sexier, and then all these big companies came along...if*

somebody does the cleaning up of an industrial process better than in the past, it is a Cleantech company". Beta points out originally evaluating potential business ideas based on Cleantech values, which have worked as an important motivator since the beginning. *"Seriously, everybody wins. That is a pretty rare business"*. Thus, Cleantech is deeply embedded into the company's set of values: *"if we are successful, then we can save a small piece of the remaining world. That is a really important thing for us."* Gamma also states Cleantech being a fundamental concept for the company, as the whole business, as well as the value created for customers, is based on the on the efficient use of energy and resources.

For Delta, being a Cleantech company is not in the same way embedded in the value set. *"In practice, it comes down to business and the development of the business"* Nevertheless, the company sees Cleantech as a positive thing, which can also be leveraged for instance by getting new customers. Similarly, Epsilon sees the concept of Cleantech as an enhancer of the image of clean Finnish technology, and of the marketing efforts.

It may be possible that as there are distinct views among the companies about the importance of Cleantech, the companies can thus also operate differently. For instance, companies that have Cleantech embedded in their values can have stricter criteria related to the selection of partners, use of materials and customers than the companies that consider Cleantech as a way to improve business. Having Cleantech as the core of the operations can also, for instance, impact on the companies' motivation to focus not only on financial profits but consider the whole triple bottom line more important.

5.2 Business Model Changes

According to Cavalcante et al. (2011) business model functions for two purposes; enabling stability for enterprises activities and but simultaneously allowing enough flexibility for changes. Thus, the logic of BM change is to make alterations over time in the company's activities; as business model is used to create value, sustainable value creation requires constant and successful business model adaptation (Osterwalder & Pigneur 2010). Business model changes are analyzed based on the paper's framework, and thus divided into three main BM components; value creation,

value proposition, and value capture. Overall, the framework can be seen as accordingly; firstly, the value proposition includes all the decision regarding what is offered, on what channels and to whom. Secondly, value creation category is an essential part of the BM indicating how to create value based on the proposed issues. These elements that make a difference, whether, for example, the offering will be successful, are technology, capabilities, partnerships and processes. Lastly, in addition to knowing what is the value offered and how to create that value, it is important to understand the earning logic, in other words, how to capture the value.

5.2.1 Value Proposition

Customers and Offerings

Company Alpha focused for the first eight years in the consumer markets but has recently made some significant changes by shifting its focus more towards B2B solutions. Thus, the company can be identified to have made changes both in “offering” as well as “customer” components. This change can be referred as business model adaptation and more specifically as “extension,” as the core processes were expanded (Cavalcante et al. 2011; Linder & Cantrell 2000). Here, an interesting notion is that even though the change can be seen relatively large, by adding B2B solutions, it is not referred as BMI. According to paper’s literature review, the dominant view seems to be that in order to call a change as innovation, all the elements in the existing BM has to be changed (see e.g. Johnson et al. 2008; Clauss 2016; Lindgardt et al. 2009). Here, no changes can be identified for instance in “value creation” component related to this change.

The main reason, why Alpha adapted its “customers” and “offerings” components, was the high competition in the B2C markets. The difficult competition situation derived from Chinese companies’ domination on the consumer markets, by offering products so affordable prices that it cannot be competed with. *“In portable electronics, the Chinese have gotten the upper hand, so with the aforementioned criteria we can’t compete effectively, since their price is half or one-third of ours. They always say that the consumer cares about quality especially in the market X. But that isn’t true.”* The main notion is that threat, here difficult competition situation, pushed for the adjustment, and not a potential opportunity. This aligns with the statement that business model changes are usually

driven by discontinuities and distractions as well as higher global competitiveness (Doz & Kosonen 2010, 370).

For Gamma, change can be identified in the “customer” component. The company was initially planning to offer solutions for improving the quality of renewable energy. Nevertheless, the company shifted its focus to other industries’ energy quality solutions, in other words to other customers. The change can also be referred as business model adaptation, and more specifically as “extension” in the customer component (Cavalcante et al. 2011; Linder & Cantrell 2000), as a new customer segment was added in the operations. The reason for this change was the transformation of the initially targeted market; the technology related to the renewable energy improved and the need for the solutions that Gamma was offering decreased since customers had other interests. *“We have found our markets elsewhere and, of course we have not abandoned this original, noble idea but, this kind of a growth company, we need to get revenue and income so that we can keep on growing and, the solutions related to connecting renewable energies to the grid could not give us that at the beginning”*. An interesting notion here is that recently, Gamma has been able to make first deals regarding their initial idea of providing solutions to renewable energy providers. The reason for this, according to the company, is that the initially planned market is becoming ready for the company’s offerings and at the beginning of the operations, the company was just too early to that specific market.

All in all, to identify the triggers for Gamma’s changes, is not as straightforward; Originally, the changes were made due low demand in the specific market, in other words, due threat, but recently the evolving market has brought opportunities for the company. Thus, these findings can be seen similar to Bucherer et al.’s (2012) study, as according to them, companies make changes in their BM both due threat or opportunity. In addition, a change in Gamma’s “offering” component can also be recognized. The company has later on added a maintenance service to its portfolio, not only for company’s products but also for competitors’ products. This change can also be considered as BM extension. The possibility to also maintain competitors’ products has been a new opportunity for the company, where direct demand from the customers worked as the main trigger to adapt the business model.

Company Delta has also made relatively significant changes in its “offering” component by widening its selection, resulting as an “extended” business model. In the beginning, the company focused on subcontracting and software development projects, from where it

has moved to also producing own hardware products. Moreover, during the past three years, the company has transformed from being a project company to a company offering products. *“So earlier even though our business was exactly the same as it today, nevertheless we were more focused on customer projects... these days we are more focused on selling products... and our aim is to offer our customers a generic solution faster and cheaper, or a more generic solution than an actual project...”* The company adopted its BM firstly due to the challenges in scaling these software development projects, and secondly, the company countered cases where its customers also needed hardware, in other words, they recognized an opportunity and need in the market. In addition, know-how and motivation were stated to be driven factors for change. Here, as both opportunity and threat has impacted on the BMA, the results can be seen similar to Bucherer et al.'s (2012) study. According to them, companies make changes in their BM both due threat or opportunity, and for the majority of the study's companies, external opportunity led to BM changes.

Company Epsilon was initially developing a machinery for treating electronic waste, but according to the company the product was at the time of establishment ahead of the time, as it is still today. *“We reached the conclusion that it's not the right time yet, as long as cheap child labor exists we won't be able to sell that machine, that's the sad truth. And there's a lot of that in China and Africa and so on”.* Thus, they shifted their focus to developing the pyrolysis product, for which they recognized a demand. Nevertheless, the initial product is still in the background of the operations, and the company hopes that in the future, when for instance the legislation towards cheap labor improves, the market would become readier for the company's product. The change in the business model can be referred as BMA and more specifically as BM expansion. The reason why the company started to develop a new product was due to low market demand, in other words, threat. Nevertheless, in the future, the evolving environment can create new opportunities for the company with its initial offering. Additionally, the company was able to expand its customer portfolio after introducing the new pyrolysis solution to energy businesses in addition to recycling businesses.

For Beta, one component that has been evolved is the customer segment. First, the focus was on ship-owners, as it was recognized as the central target group. As the information and experience grew, the role of the other recognized target groups has increased, such as design offices who design vessels and shipyards who manufacture them.

Nevertheless, the initial plan and idea have remained the same, in other words, the customer segment has not been changed, but the ways to reach them has evolved.

Channels

Alpha uses fairs and seminars to be noticed. In addition, it emphasizes the networking, also when it comes to marketing. Beta states to be using not only direct contacting but also sales and marketing partners, as well as seminars/fairs to reach customers. The company has lately also started to get contacts from potential customers, by them finding the company, for instance through the internet. For Gamma, they have two distinct models to reach customers. First one is direct selling for distributors, where the company offers the technical solution and support and the distributor takes care of the rest. The other model is to deliver products to big system integrators for different large projects. The company also states to attend fairs to some extent. Delta is also using direct contacting and selling to reach customers. The company mentions the pull side, where customers might contact them. Additionally, Delta is using conferences and trades to reach customers.

For Epsilon, being a small company limits the resources available, and thus the company is not using direct contacting as a tool to reach customers. Nevertheless, *“perhaps in the future once we get some more resources that would be also possible, actively searching for potential companies and contacting them.”* Moreover, the company is focusing on advertising itself on its website, as well as in other portals. In addition, the company is attending to fairs, international events, and conferences. Here, an important notion is that the company has experienced a pull effect in regards its marketing efforts. *“You know when people are paying for stories in newspapers, we’ve said that our product is so good that we don’t have to pay for it for someone to be interested, we’ve gotten publicity even in television and newspapers without us having to pay anyone.”*

Overview

Overall, from the three main BM components, the value proposition has been the most adjusted component in all of the cases, more specifically, the subcomponents “offerings” and “customers/markets.” Both Alpha and Gamma have shifted their market focus and expanded their offerings. Epsilon has as well expanded its offerings, simultaneously being able to expand its customer portfolio. Delta has as well widened its offerings. Both

threats and opportunities were found to drive the changes; difficult competitive situation, low demand, and transforming market identified as threats and customers’ unmet needs as opportunities.

Table 7. Value Proposition Changes

	Value Proposition			
	Offerings	Customers	Channels	Customer relationships
Alpha				
Beta				
Gamma				
Delta				
Epsilon				

According to Balboni and Bortoluzzi’s study (2015), the main drivers for change were found to be environmental changes, such as market demand and technological advancements. Thus, the reason why “value proposition” component has experienced the most changes, could originate from the fact that its subcategories are the most impacted by these external changes. For instance, having a high competitive situation impact directly on customers and markets, but not necessarily for instance on the technology used. Likewise, an expansion for instance “offerings” component can be seen easier to achieve than other BM components, such as value creators. Moreover, as customers have required for changes, it is evident that they expect alterations, especially in these specific components, for instance in the actual products rather than in the processes or revenue models. Lastly, it may also be possible that as changes in these components are the most visible, thus they are also the most discussed in the interview situations.

What comes to the channels of reaching customers, similarities can be found among the companies. First of all, the majority of the companies are using direct contacting to reach customers. One reason that can drive companies on relying on direct contacting could be derived from the uniqueness of the markets the companies are operating; the more specific customer segments, the easier it is to attract the customers directly and thus save resources. Nevertheless, as an exception, Epsilon states not having enough resources

quite yet to search for customers actively. On the contrary, in Epsilon interview the marketing efforts were more highlighted than by other companies, such as the use of Google ads and PR. Here, an interesting notion is the differences between the case companies' views regarding the use of channels; when having relatively limited resources, it is important to determine the best way to use them, and here most of the companies rely on direct contacting, which on the other hand is according to Epsilon, impossible with the current resources. It could be seen that by contacting customers directly would speed up the selling process and thus lead to faster profits. Nevertheless, by focusing on brand image, it can be a slower process but on the other hand, result in higher sales volumes in the future. The brand development and its slowness are also acknowledged by Gamma, stating that *"people are slowing starting to find us... so called brand development but it is slow work"*. Another reason that could also impact on companies' choice of using channels similarly can stem from the companies' focus on B2B markets. Brand building in B2B market can be considered not as important as building a brand in B2C markets. Thus, it may be one driver that has made companies focus overall more on direct selling rather than other marketing efforts.

The use of different events, such as trade fairs, was found common to all cases, and in addition, use of marketing partners was mentioned by some of the case companies. The use of different events can be linked to direct contacting as well. Since the companies are relying on direct selling, it is crucial to be able to meet and introduce their operations as many potential customers as possible, and thus participating in events can be seen as an efficient way to do that. Many of the case companies also mention the pull effect, where customers directly contact the company. One reason, why the pull effect is working, could be found in the type of these companies; as the case companies are operating in relatively niche markets, it may be more straightforward for the customers to contact as there are fewer companies offering same solutions. For instance, Beta is currently the only one offering its specific technology worldwide.

5.2.2 Value Creation

Technology

All the companies considered their technology being the major part of their competitive advantage in their business model. In Alpha's case, quality, simplicity, and reliability were

emphasized, as well as the design. Beta 's competitive advantage is that they have the only technology in the world which has been proven functional for the use of renewable energy sources in their specific field. Delta states having three main factors that create value, from which two are related to technology. Firstly, the actual activity of bringing intelligence to the machines, and secondly its applicability also in the harsh environmental conditions. This latter factor, the suitability of the technology in difficult environmental conditions, is the main factor that differentiates the company from competitors, and also enables for more specific customer targeting inside their potential customer segments. For Epsilon as well, the technology and its quality are emphasized: *“they are more efficient to use and more environmentally-friendly and for personnel it is safer to use...we have really invested in these things.”* For Gamma, the technology is also important, but according to them, it is not enough alone; *“...of course our product is better than the products offered by our competitors but that alone is not enough if you want to make it in the market.”*

Networks

All in all, networks and/or partners are mentioned in case companies' interviews in different occasions. Nevertheless, in the value creation context, networks were not significantly emphasized among the case companies. This does not mean that networks would not be important for case companies operations.

Alpha mentions that one of the factors, which has made it possible to develop the company to what it is today, is the diverse use of networks, such as when it comes to design, manufacturing, and marketing. This is comparable with Epsilon view: *“because we are a small group of people and we are not able to do everything on our own”* the company uses a lot of sub-suppliers. Beta states that partners play a big role in their operations, most important being the manufacturing subcontractors, but also the sales and marketing partners. For Gamma, partners are also one of the key factor, as well as the most challenging part of their operations; *“selecting a partner... is similar to recruiting people in the sense that sometimes you succeed and gain good experts and then sometimes, the expert you hired is not a good fit for our company, or something else is not right...”*

Overall, the importance of networks for case companies can be easily identified. In addition, in the IOR analysis, it can be noticed that networks are highly emphasized

among the case companies. Thus, it may be possible that leveraging from networks is for these small companies a must, and that is why it is not considered as a special factor that would create value; as all the companies have less than 30 employees, it may become impossible to function and more importantly, to grow, without the use of specific network or partners. The importance of networks is also found in earlier literature in the context of BM change. Torkkeli et al. (2016) have studied the determinants of BM adaptation in internationalizing SMEs, resulting that specific network capabilities impact on the BM change in internationalizing SMEs. Nevertheless, in this study, networks were not found to especially impacting on the BM change, nor the “network” component has been changing.

Capabilities

Capabilities, directly referred as value creation factors, were neither significantly highlighted in the interviews. Nevertheless, different capabilities, in general, have been mentioned in the interviews frequently, and thus, it can be concluded that the capabilities have had an impact on the success of the companies. For instance, according to Muller and Vorbach (2015), development of capabilities is the key notion, not only in recognizing the need for BM changes but also making these changes to work.

One distinctive similarity that can be recognized by most of the companies is the experience of the companies’ CEOs. The majority of the CEOs have a broad range of experience from different fields, with a large established network. Alpha’s CEO has more than two decades of experience in different fields as well as entrepreneur background. Beta’s CEO is also experienced businessman, and his educational background is both technical and commercial. Gamma’s CEO has also acquired a significant amount of experience and knowledge before establishing this company. Moreover, the contacts of all the founders of the company were crucial for the initial international deals. Delta’s CEO has experience from various fields and also from internationalization process. Epsilon also has some experience from international customers, and in general background related to technology.

For Alpha, expertise works as part of its competitive advantage: *“We’re utilizing the expertise we’ve gathered during these ten years, both in ... products as well as through our own component supplier network.”* In addition, the capabilities of the employees are highlighted: *“...one of our boys, he’s now an industrial designer and has been in the*

business for three years and, he has his own company which is part of this group of companies, so we consider it our own design bureau.” As the company is emphasizing their products’ design, this specific individual capability seems extremely important for the company. Similarly, Gamma emphasizes that being an expert in the field is an important value factor. Beta states that for their operations, the team is really important, especially at the beginning of the operations. Moreover, the CEO stated that: *“you have to have critical functions inside your organization and I think we have succeeded in that quite well.”* For Delta, one of the main drivers, why they have been able to develop their operations to what it is today, derive from company’s employees’ personal know-how and motivation. In addition, for instance hiring a salesperson who speaks German to grow in German countries, indicates the importance of some specific capabilities inside the company. Similarly, Epsilon has been implementing the knowledge and expertise of their employee originating from Latin America, in regards reaching customers in those markets.

Processes

Alpha sees its products being the most important value creators. As stated, their competitive advantage comes from the products being high quality. The importance of the quality being superior derives from the fact that most products are sent to distant markets, and thus, it is important that they do not have to be maintained nor returned. This notion can also be linked to the importance of internal processes; the company has to make sure that the quality of the products is good enough in order to avoid returns and extra costs, and as the CEO of Alpha states: *“I can proudly say that our fault percentage is 0.02 or something like that. So they really don't come back, they're used up in the market”*.

Gamma is competing on the markets with giant competitors, and thus, it needs to differentiate itself well. Thus, the company focuses on the process and provides for the customers also service through partner networks. All in all, it could be stated that for Gamma, the “customer-centric” process is an important value creator, where for instance all customers, even the smallest ones are important, and *“our customers are often thanking us for, paying attention to their own problems.”* In addition, the company has widened its offerings and now offers also maintenance service, not only for own but also for competitors’ products. This service was added due to customers’ demand, which also demonstrates that the company is focusing on customers’ demand and thus on its customer-centric processes.

For Delta, the third factor that was specified to create value was flexibility: *“we have learned over the years to be very flexible when it comes to the programs as well as hardware, and also business-wise in order to be able to, make solutions based on the needs of the customers.”* This shows that the company is creating value through its flexible processes. More importantly, the only visible change among all the companies in regards to value creation component was identified to be Delta’s changes’ in internal processes. *“We’ve introduced quite many processes and ways of working and that way improving, even though it has caused a slight increase in bureaucracy but we are enhancing our ways of working and so on and that way we have been, and in the future we will be even more ready for this growth, this growth in volumes”.* During these internal changes, the company has also changed its name to suit better to international markets. Overall, the main objective of these internal changes has been the ability to provide high quality efficiently and be ready to meet the needs of the future growing international markets.

Overview

The other main component of the BM framework, value creation, includes the following subcomponents: technology, capabilities, processes, and partnership. All in all, not many changes were identified in the value creation component. As an exception, Delta has experienced rather large changes in the internal processes.

Table 8. Value Creation Changes

	Value Creation			
	Technology	Partners	Process	Competences
Alpha				
Beta				
Gamma				
Delta				
Epsilon				

Based on the NVivo analysis, the most referred subcomponent in the interviews was technology. As all the case companies can be viewed to be high-tech companies, creating value through technology can be seen evident. Overall, as no changes were

identified in the technology component, and all of the companies have relatively niche and complex technologies, it seems apparent that the technology seems to be the backbone of the case companies' operations. Since all the case companies are relying heavily on their core technology, it makes it more challenging to change that component, when comparing, for instance, extending the offerings based on the specific technology.

Nevertheless, all the other subcomponents were also mentioned, which indicates that technology alone is not enough to create sustainable value. Moreover, it could be concluded, based on the interviews, that the use of networks and having critical functions inside the company are essential for the companies, but on the other hand, are leveraged in the way that they support the operations, rather than be the initiators for change or the innovative value creators.

Overall, it could be deduced that the value creation component is the most stable part of the case companies' business models, and it creates the limits and frameworks for other adjustments in the BM. As long as the technology behind the operations stays relatively same, companies are willing to change the BM, in regards to other components, such as add customer segments.

5.2.3 Value Capture

Alpha has two earning logics behind its operations; first one is direct selling of consumer products, and the other one is more service-kind by offering consultancy and expertise to companies as well as providing sub-parts for products. The latter model can be stated to be added later on, simultaneously when the offerings were adopted. Beta has also developed two parallel revenue models, first one being a turnkey delivery model alongside with a continuous maintenance service. The second one is referred as "pay as you save"-model, where the technology is sold as service. The second earning logic was stated to be "*entirely new innovation in the business.*" Nevertheless, according to the interviewee: "*That was part of our plans originally, that we'd try to introduce this kind of model alongside there and now we have done it.*"

Gamma has one main revenue model, which is the direct selling of the products. In addition, approximately five percent of their turnover comes from services related to the products, such as maintenance, measuring, assessing and consulting. This additional revenue logic has been added to the operations later on. The reason why the service was

added to the offerings was that, as company's equipment have been sold already for a while, at some point they need maintenance. In addition, the company has been able to offer system maintenance for products supplied by other companies. This has been a new opportunity for the company, and it was discovered by customers' direct contact and request for this kind of service. Here, changes have been done to BM due discovered opportunity. Nevertheless, the existing business model has not been changed, but more functions are added to it. According to Cavalcante et al. (2011) division of business model changes, this can be stated to be an extension, where something is added to the core processes.

Most importantly, Beta states having experimented and thought different kind of revenue models, such as renting. Nevertheless, it has not been working, at least not yet. Here the main notion is the experimentation; the company has thought of different models indicating the importance of the value delivery component. Similarly, Epsilon has thought about different revenue models, which are considered still impossible to implement due to limited capital. Here again, giving thought to different models illustrates the component's importance. All in all, Epsilon is currently focusing on direct selling of the product, and also to some extent in offering services.

Delta has divergent revenue logic when compared to other companies. *"Our revenue logic is pretty much based on our agreements with the customer and, we are also flexible when it comes to that, it depends on our customers' business models..."* Nevertheless, the most common model for Delta is to charge for the hardware and then from the software as a service (SaaS-model). In addition, the company offers the whole package as service with a monthly fee, consulting and other professional services.

Overview:

The revenue model for the majority of the companies is well-structured. All in all, the companies tend to have more than one earning logics, which are designed to fit the range of offerings they have. In addition, for most of the companies, the earning logic has remained the same from the beginning. The changes done in earning logics have originated from widening the offerings, such as in Gamma's case, adding service to product offerings.

Table 9. Value Capture Changes

	Value Capture	
	Revenue model	Cost Structure
Alpha		
Beta		
Gamma		
Delta		
Epsilon		

Overall, the value capture can be seen as an essential component for the companies. For instance in Beta’s case, the interviewee referred revenue logic as business model, indicating the importance of the element in the BM. The importance of this specific component is also supported by the findings related to the experimentations of different revenue models. For instance, Delta has introduced a totally innovative revenue model to their operations, simultaneously having Gamma already experimented and Epsilon thought of different options regarding the revenue models. As the value delivery explains how the company earns from the operations, it is thus evident that the companies are focusing on this element to increase the profitability of the business.

5.2.4 Overall BM Changes

Overall, the case companies have not made a lot of changes in numbers in their business models since their establishment. Most of the changes have been occurring in the “value proposition” component, and more specifically in the “customers” and “offerings” subcomponents. All in all, the identified changes can be seen as BM extensions, where for instance new customer segment, revenue model or service has been added to operations. Even though some of the changes can be seen relatively large, for instance, Alpha’s shift from B2C to B2B markets, or Delta’s shift from being a project company to a company producing products, they are still not considered as BMI.

The drivers for the BMA were identified to be both opportunities and threats. Being able to answer to the threats in the environment can be seen more reactive behavior; the BM is kept the same until something is threatening the operations. Simultaneously, adapting BM

when encountering opportunities could be seen more proactive behavior; for instance changes in the technology can be leveraged by adapting the company to suit these changes. Nevertheless, when looking more detailed into the opportunities driving BMA within these case companies, it can be seen that the trigger has commonly been a direct request from the customers. Thus, this can also be seen as more reactive behavior, as the BM is changed only after someone is actually looking for new solutions. As an exception, Delta can be seen to be proactive in terms of changing its internal processes beforehand to suit to future international markets. This is a great example of adapting the company, not only due opportunities but due upcoming opportunities. Overall, these findings are comparable with study results of Saebi et al. (2016), where opportunities were found not to make companies to adapt their current business model, but moreover to remain the existing status. In contrary, threats worked as triggers for changes in the BM.

Another evident finding based on the study, is that there are least changes in the value creation component. It is possible that the companies are willing to adjust other BM components but not necessarily the value creation component. As all the companies are technology-oriented, it seems evident that changing their core technology is not considered as easy as adapting for example offerings. All in all, limiting the business model changes based on the technology can be seen related to many areas of operations. For instance, many of the companies are especially contacting customers that can fit the technology offered and not the other way around.

Table 10. Overall Changes in Business Model

	Proposition				Creation				Capture	
	Offerings	Customers	Channels	Customer relationships	Technology	Partners	Process	Competences	Revenue Model	Cost Structure
Alpha										
Beta										
Gamma										
Delta										
Epsilon										

Beta can be seen the most static company as no adaptations were identified in its business model. According to the CEO, the reason for that is firstly in the careful planning before implementation, by e.g. investigating how the BM should be structured, and secondly in the type of the company: *“You have to remember that these kinds of venture-capital-funded startups are typically such that they first make some business plan at the beginning when they start looking for funding and developing the company and then in principle that’s what you also stick with...”* Thirdly, the reason can lie in the fact that there has not been any need for changes yet; thus it may be possible that Beta, being relatively young, have not countered yet situations that would evolve into BMA.

Even though Gamma has experienced some adaptations in its business models, it states that the main reason why radical changes have not been done in BM lies in the conservative customer base: *“We have researched different models and it can be, the way I see it, is that our customer base is quite conservative so when they are ready to accept other models besides these investment models then it’s easier..”* In other words, only after the customer base is ready to accept other business models, no radical changes can be done. Nevertheless, the important thing is the acknowledgment and experimentation of different possibilities: *“Of course we have recognized that different models exist, and, we have tried them... but at the moment that is, on a micro-level, but we are looking into these things.”*

One reason, which could impact on having such static BM could be derived from the size of the companies. As all the companies are small-sized, it first of all impacts on the resources available, especially when it comes to human resources. Having fewer resources may impact on the possibilities for the companies to adjust their BM. Even though there would be an opportunity to, for instance, expand to a new customer segment, small-sized companies can not necessarily meet the demands of these opportunities. Thus, if the existing BM is working well, it may be possible that the companies prefer to grow in those limits. Simultaneously, being a small company, it is easier to be flexible, and thus, different projects can be treated as individual cases. As an example, delivering a product to a specific customer can be agreed quite specifically according to agreements, and thus, it does not require to change the business model. Nevertheless, once the company grows, it may be a requisite to adjust the revenue model to have a more efficient model to so it can be implemented to several customers at the same time.

5.3 Internationalization

The level of current international activities varies among the case companies. Alpha has already broadly established its international business activities, being active in 20 countries worldwide. Some of the main markets mentioned are parts of Asia, for instance, Japan and Africa. Gamma has also already a larger international scope, having in total 25 international distributors in most of the continents. The company has both direct and indirect export in international markets, and its main markets are Asia, Middle-East, Africa and recently increased South America. The company states using “low-hanging fruit” internationalization strategy, meaning that it expands into markets it believes having the best possibility to fast close deals. The company has recently started to think about establishing subsidiaries for the main markets to sell products directly through them.

Beta, on the other hand, is currently just finishing its first international sale. Even though the company’s first sale has been domestic, it has focused on fully international marketing and sales efforts for the last one and a half years, regardless of the region, to all potential ship-owners. Similarly, Epsilon has not sold anything abroad yet, but it has already received requests for quotations and has had negotiations and visitors from many countries. According to the company, acquiring new international customers is a long process: *“Once or twice it has been like just as you think you’ve made a deal it gets delayed again and it might also be that after two years, as you’ve already forgotten about a particular project, the customer calls again and asks if it’s still possible. It’s really a long-term thing.”* All in all, the company considers their market to be the whole world: *“The market in everywhere because the problems with waste are global ones and there are problems everywhere.”* Delta, even though having almost two decades of operations, has just recently started to focus on international markets. Until now the company has focused on Finland and in Sweden and is currently looking for new customers from Scandinavian countries, simultaneously targeting the UK and German markets.

5.3.1 Motivation to Internationalize

What is common for all the case companies is the motivation to internationalize; to grow, the international market is a must. This is aligned with the OECD report (2009) which discloses that the motivation to grow is extremely important for SMEs, and thus functions

as one of the main drivers of their internationalization process. Alpha states the issue as accordingly: *“In a country as small as this, if a company wishes to be a growth company, and assuming that the product or service idea is such that it can be copied and scaled, as early as on the second day you have to start talking about markets that are at least the size of Europe, if not something even broader. That is a vital condition”*.

In line with this statement, other companies also state their motivation to internationalize to derive from the need to grow. According to Beta, as it has such a niche market, there is no chance of making it profitable and growing on domestic sales only. Gamma also mentions that operating in niche market made it clear for the company to find markets from abroad. Similarly, Delta sees the motivation to internationalize as the objective to grow. As an exception, Epsilon has at the beginning focused domestic markets. Nevertheless, the company sees the Finnish market becoming saturated quite fast and thus is now seeking growth opportunities from international markets.

All in all, most of the companies could be called as born globals, as they are viewing themselves as an international company already from the very beginning. According to Beta: *“International activities have been our starting point since the beginning.”* and for Gamma: *“it was very clear to us before the company was even established that our markets are international ones.”* This could be one factor impacting on the stability of the business models; international opportunities do not necessarily impact that significantly on the BM as it has been developed from the beginning to suit to international markets. Delta’s recent actions are also supporting this view; even though the company has had operations already for nearly two decades, it has only recently started to focus on international markets. With a line of this plan, the company has adapted its internal processes to meet the needs of the future international markets. Thus, the upcoming international opportunities do not necessarily require BMA as relevant adjustments have been made beforehand.

5.3.2 International Opportunity Recognition

For Alpha, the most impacting factor on recognizing first international opportunities derived from company’s owners’ experiences, knowledge, and existing networks. The first opportunity was thus created by everyone in the company thinking from their own perspectives and finding possible markets. These possibilities were then evaluated

together in terms of, for instance, opportunities, resources, is it interesting enough, too early or challenging. Here an important notion is that the company's ownership structure, having stakeholders around the world, has made the recognition of international opportunities easier. The ways Alpha recognize international opportunities has evolved, and in general, the company emphasizes the following notions in its opportunity recognition process. Firstly, it searches for opportunities, in which the most important thing is that the *"homework is done properly."* This requires knowing own frameworks and use it in the background when carrying out a market-specific investigation. Secondly, it wants to be noticed by others, and thus participate for instance, in fairs/seminars; *"even though nine out of ten of these events would be a waste of time, only couple of contacts per year is already a victory."* Lastly, the network is emphasized, also in domestic market but most importantly in the target market.

For Gamma as well, the recognition of first international opportunities was based mainly on founders' and other personnel's existing networks. The two first deals, both in Asia, were chosen due to personal and existing relationships with the customers. The CEO states that *"the trust our customers had in us, it was born out of a common history, so they dared to buy from us even though we didn't have references or proof of our operations."* The third deal in Europe can be said to happen due serendipity; a potential customer contacted the company as its regular supplier had too long delivery times. Even though the company focused highly on personal networks at early international opportunity recognition, it has also, later on, started to use different tactics for finding opportunities. The reason for this, according to the CEO, is that the existing contacts do not last forever, and are used in a few years' time. Thus, it is a necessity to start creating new markets to expand. The way Gamma has done this is a consistent and systematical search to figure out the best markets and industries that fit for the products. For the search of possible partners, the company has created certain profiles that determine the requirements for the partners. Nevertheless, the primary information for the search still comes from the network of partners, even though they are not exploited directly. The company also highlights the brand development which is done through trade fairs, being active online and for instance getting awareness through winning competitions.

For Beta, the most important action in the international opportunity recognition at early phases has been an own active search of opportunities. As an example, Beta has used the following way to search potential customer *"...our technology functions the better, the stronger the winds are on a specific route. We have managed to get good leads by just*

researching international wind statistics, looking at which are the sea areas from which these good business cases probably could be found. And then we've started to look through vessel information databases to see what kind of vessels operate in that area on sensible routes, and then we've looked at who are the ship-owners, and through that we've ended up with people to contact to proceed with making deals." In addition, the company has used contacts originating from Finland to connect with potential customers. These contacts are formed from founders' personal relationships. For Beta, the active search is highlighted in the overall IOR. In their case, *"the central process is that we actively look for the best business cases for our technology all around the world and try to identify who our customers are that could provide those and then we, one way or another, make contact with these particular parties."* In addition, the company is participating in different fairs and seminars, and as the experience is growing, so is the pull side, mainly through online search by customers or through seminar presentations. In addition, the company is using different sales and marketing partners.

For Epsilon, the early IOR has focused mainly on the pull side, in other words, potential customers as well as potential agents who want to sell company's products, have contacted the company. The customers have found the company as a result of the company's marketing efforts, such as through different conferences, events, internet sources and different publications. All in all, the company thinks that: *"if we had more resources for marketing, there is no knowing how much business we would have already. But a small company has small resources for marketing"*. In addition, the company has searched for some potential markets by visiting them, and also contacted some potential Swedish customers directly. Moreover, the company has been leveraging from personal networks with the regards to Latin America, since one of the employees is from there and has existing contacts. Nevertheless, for instance, in regards to European countries, networks have not been implemented. In the future, the company is expecting to use more agents.

For Delta, the internationalization process is based mainly on Finpro's growth program, and thus, it has recognized opportunities through that. For instance, one of Finpro's target segment is the UK, and that is why that market is also targeted by Delta. The other markets and opportunities are selected based on the suitability and closeness of the markets; Germany has a huge market potential, and Scandinavian countries are close by. In addition to Finpro, Delta has leveraged from other similar kinds of public organizations such as Helsinki Business Hub and Chambers of Commerce. Also, the company has

been attending fairs and seminars, mostly with the cooperation of their growth program. As Delta has taken its first steps in IOR, with the help of the growth program, the way of recognizing opportunities in the future is still open for the company. Nevertheless, the idea is to find suitable partners and agents in target markets and focus on direct contacting. Thus it can be seen, that in the future new kind of networks and partners will be used as well as focusing on own search to directly contact the customers.

All in all, recognizing early/initial opportunities can be seen relatively similar among most of the case companies. The most affected factor has been the use of networks, following with deliberate search. After the initial IOR, the ways to find potential opportunities can be seen changed or better said, evolved. Here a distinctive notion is that the ways are same for the majority of the companies, focusing on deliberate search, brand building/awareness, and networks.

Table 11. Factors Influencing IOR process

	Early IOR	Subsequent IOR
Alpha	Knowledge, Experience & Network	Search, Brand Building, Network
Beta	Search, Network	Search, Network, Brand Building
Gamma	Network	Search, Brand Building, Network
Delta	Growth Program, Search	
Epsilon	Brand Building, Search, Network	

For Alpha and Gamma, which both have broadly established international activities, similarities in the opportunity recognition process can also be identified. Both of the companies were relying on networks in initial IOR and have later on evolved it also to search and brand building. The reason why the companies have such a similar IOR-process can stem from the fact that these companies seem to have the strongest network at the beginning of the operations. Thus, it is logical for them to leverage from those contacts to get a strong and fast start in the international markets. For Beta, similar patterns can be recognized. Nevertheless, the company has focused on the early IOR heavily on searching potential customers. It may be possible, that Beta was not able to leverage from the existing networks to the same extent that Alpha and Beta were, and thus have focused on the search activity. It may also be possible that the company has such a specific technology/narrow customer segment, which made it efficient to rely on search. An interesting notion is a similarity in all of these three companies' overall IOR-

process. All in all, the main notion here is that whether a company is using networks or search in the initial IOR, one activity alone is not efficient in the long-run. Thus all the companies have been widening their strategy.

Delta has been relying on a growth program to grow in international markets the beginning. It seems that the use of this kind of growth program can be seen as an alternative to using other existing networks. All in all, it indicates that the use of networks is important, whatever kind of network it is.

As an exception, Epsilon has been focusing from the very beginning on brand building and relying on customers' direct contacts in terms of potential international sales. The company states not having enough resources for direct contacting and thus, is not focusing on search activity. One reason why Epsilon could be focusing on the brand building is that the company is currently focusing on domestic market, and thus, maybe does not have such a rush to close international sales. This way the company has the possibility to build its awareness in international markets more slowly.

5.3.3 Evaluation of Opportunities

Many of the companies stated to evaluate the opportunities in regards to the resources available. According to Alpha: *"there have been points where we have had to decide whether to do something or not along the way through either our experience or through the fact that we know quite well what our products are fit for..."* Moreover, Alpha's CEO highlights, that for a small, hungry company, it is often hard to say no. *"Then you do things, with a mindset that is too positive and then you get burned."* Thus, the company has a strict filter and often says no to opportunities. This illustrates the importance of having a well-established business model: when knowing the exact resources and limits the company has, it makes it easier to determine the potential of the specific opportunity. Similarly, Gamma states the issue accordingly: *"if our revenue was 100 million then we would be able to handle projects worth of 5 million but if our revenue is 5 million then a project worth of 5 million is too big a risk"*. Align with Epsilon *"there are always those kinds of things where you instantly have to say this is too big for us."*

The companies seem to use different criteria or profiles when evaluating the opportunities. Gamma uses different profiles to evaluate the suitability of potential partners during the

search activity *"We have certain profiles for them, certain market segments we require for them to have experience and know-how in, and we've chosen for example mining industry, steel industry, then. Hospitals, and demanding properties and certain other industrial fields..."* Similarly, Beta states on focusing on *"best customers in the world"* for its technology, and thus evaluates the potential customers in regards to the size, route, and ideology: *"...the right size of the vessel and on a sensible route. Of course, at this point of the technology lifecycle, it's important that as our end customer we have an innovative ship-owner who looks at things in the long-term."* For Delta, targeting the potential customers is also relatively specific: *"when we are choosing our customers, it's not about shooting with a shotgun, but it's more about shooting with a rifle, and targeting these customers one by one, so in these target countries we have chosen certain target segments that we want to target"*

Not all recognized and implemented opportunities are successful. Alpha, for example, started to develop the market in Africa as it noticed its potential after participating in an event there. After intensive market development during two years, the company found out the market being too challenging for it; the typical way to operate in African markets was to make consignment sale, which was impossible for a small company with limited resources. Epsilon, on the other hand, participated twice in an export-ring group, which were both found disappointing and thus are not used anymore: *"It felt like a bit of a sham, and it seemed like the agent who was abroad was just collecting money and relaxing in a hammock all the while in the southern countries and kept on collecting money from companies, "Yeah yeah there will be business."* These examples demonstrate the complexity of evaluating the opportunities, and most importantly that the process is not a one-time nor fast one.

As demonstrated, the recognition of a potential opportunity does not make its implementation necessarily successful. Thus, the evaluation of the recognized opportunities is important to assess their suitability for the company. All in all, the evaluation of potential opportunities can be seen to be based on the resources available. In addition to resources available, the companies seem to be using a different kind of criteria for assessment. This finding can be linked to the overall view of the relation of BM and OR explained in the further chapter; the companies seem to evaluate opportunities in regards to their business model and choose opportunities that are suitable for that.

5.4 The Relation of BM and IOR

Overall, for Beta, the business model comes first, then suitable opportunities. According to the company, the main reason for that lies in the type of the enterprise, in the technology, as well as in the careful planning. *“It starts from the basic logic of this type of startup companies. These kinds of companies are started so that you write your business plan, whip it into shape, find funding and committed investors and partners for it, and then you go forward accordingly. That’s the logical order.”* The type of the technology refers for its being niche *“we have quite a comprehensive offering, in the sense of making use of a certain technology. That probably also enables not having to change this a lot”*. Lastly, the CEO also emphasizes the planning, *“of course we tried to think about it quite thoroughly before we got going. We investigated how it’s sensible to structure this and I think we succeeded quite well.”* Moreover, Beta states not having encountered opportunities that would have required changes in the BM. *“We haven’t gotten any essential demands from the market to change our concept. Of course you have to do some fine-tuning, but we’ve managed to do all of that so that it’s just normal product development and the big concept remains the same all of the time.* The reason for this can derive from the fact that, as the company acts with a well-established business model first, which frames and limits the opportunity recognition to those opportunities that actually suit to the company’s current activities, surprising opportunities have not been discovered. Additionally, as the company is mainly focusing on searching potential opportunities, the discovered opportunities are already suitable for the company and thus do not demand BMA.

Delta has neither made changes in the BM due potential opportunities nor encountered specific opportunities due BMA. Here an important notion is that the company has actually made changes in the internal processes beforehand in order to be ready for the international opportunities and growth. Thus, the company does not necessarily have to change its BM in the middle of internationalization process. Nevertheless, the CEO states the company still being in its first steps when it comes to internationalization and hopes that in the future the company would be for instance able to establish subsidiaries for different markets. This kind of opportunity would most probably make the company to adapt its existing business model. Nevertheless, when speaking about the relation of BM and opportunity recognition, the company sees itself operating business model ahead, at least for now: *“... We need to understand the things we are good at and then strengthen them, and not do the things that we are not good at, and not go there”*. Nevertheless, the CEO states the competition in its field being really hard, resulting in that *“if we come up*

some huge case then, we might end up changing our direction.” These statements indicate again the importance of knowing own strengths and weaknesses when it comes to BM and evaluate the opportunities based on that. Nevertheless, the company seems to be open to changes in the future. All in all, it could be viewed that as the company is only now starting its international activities, it may be possible that the company wants to focus on its advantages, at least for the beginning, to get the foreign sales to grow. Eventually, when the company has more established position in the international markets, it may be easier for the enterprise to adapt the BM.

According to Alpha, it does not make changes in its business model when an opportunity comes around, but more another way around; *“before we make any product-related decisions, we have to find out the market need and the usage situations and the operational requirements... I would say that we have not had any surprises”*. Based on this statement, it could be seen that the company is creating itself the opportunities, by carefully planning and weighing them against the resources available.

Epsilon noticed an international demand for their current main product, which made the company develop that further. Adding a new offering adapted its BM, and thus it can be stated that an international opportunity has impacted the BMA. Moreover, adding the new product to offerings brought up new opportunities for the company, by for instance being able to meet the need of new customer groups and recycle new materials. Thus, it can also be stated that adapting the BM, also brought up new opportunities. An interesting notion here is that the relation of BMA and IOR can be seen two-sided; international opportunity made the company adjust their BM, which again brought up new opportunities. All in all, the company sees that the business model can be changed due potential opportunities: *“Someone might point out an opportunity that’s close to us and we see if, our technology can be adjusted to fit that purpose then, why not?”* Nevertheless, the company has not made a lot of changes in the BM, and according to the CEO *“development is nevertheless quite a long-term thing so, we have to have some fixed point to follow. If we keep shifting from one thing to another, we will never get anything done.”* Here an interesting notion is that the technology behind the operations is considered as the factor that influences on the stability of business model: *“it is not the simplest process, our technology. So you cannot keep shifting all the time”*. To conclude, it could be seen that the company is ready to adjust its BM to some extent still having some points fixed, one major being the technology, which thus draws the limits for the opportunities.

Similarly, as Epsilon, Gamma states not acting based on its BM but seeing the issue on the other way around, by first starting to look at the customer market and then trying to adapt the existing ways of working to fit that model. According to the company, since the markets are changing quickly and the fastness to react these changes is important, they might be able to do that faster than the competitors can: *“Last week I was in Russia and it’s a complete waste of time trying to introduce your own business model there, they have their own way of working and you need to make sure your way of working fits into what is suitable for them.”* Nevertheless, the CEO highlights the importance of knowing own limits, *“Out there in the markets there are a lot of opportunities that are, such big projects that our financial resources are not able to handle them or it’s not sensible to, try that, so even though we have the functioning technology then nevertheless it might not make sense to, the risks related to those projects are so great that it doesn’t make sense”*.

To sum up, it seems that that the majority of the companies are considering the business model as the limitation creator to which potential opportunities are recognized. In other words, opportunities do not drive for BMA, but BM limits the recognized opportunities. Even though some companies contemplate acting in a way that opportunities come first and only then the business model and possible adaptation, it seems that some parts of the BM, here the value creators, and especially the core technology, still draw limits. These findings could be placed to Casadesus-Masanell and Ricart (2010) two-stage competitive process framework which distinguish a clear separation between BM, strategy, and tactics. According to the authors, the object of strategy is the choice of business model through which the firm will compete in the marketplace and the BM then determines the needed tactics (see figure 8). Here in this relation, it can be considered that it is easier for companies to make changes in stage two, related to the tactics, which are dependent on the business model choice of the first stage.

These conclusions are also supported by the fact that despite the companies are in different stages of the internationalization process, there are no distinct differences between the companies when it comes to adjusting the BM due to international opportunities. All in, the enterprises that have a higher level of international activities, Alpha and Beta, have not altered their BM more than the other companies even though they have experienced more global growth and thus, evitable also more international opportunities. This pattern originates evidently from the overall view of the relation between BM and OR. As most of the companies act with BM first and use it as a frame to

select potential opportunities, thus, the amount of changes in the BM due international opportunities is not varying based on the level of internationalization. Additionally, international opportunities do not necessarily impact that significantly on the BM, as the majority of the companies see international operations as a must for them. Thus, the BM has been from the very beginning adjusted in the way that it suits to international markets as well. This is an interesting notion, as it could be seen that when an enterprise, in general, adds international operations, it would have a larger impact on the BMA. Nevertheless, based on these findings it does not have an impact on which stage of internationalization the company is.

Another finding supporting these conclusions is related to the overall drives for BMA in this study. All in all, companies tend to change their BM only reactively, mostly due threat or, as customers' direct request as an opportunity. This indicates that the opportunities are in fact recognized in a way that they support the current business model rather than disrupt it; In other words, BM comes first and then suitable opportunities.

Additionally, it may be possible that particularly at the moment when resources are still strictly limited, as for most of the case companies, it alone draws limits for nearly all the potential opportunities that would require adaptation of BM. Thus, it leads to the situation where BM is only changed due threat and kept the same when possible. In other words, it is easier to neglect potential opportunities if things are currently working well, and implementing these new opportunities would require substantial use of resources. Consequently, it would mean that when there are more resources available, for instance, more personnel, it would be easier to adapt the business models due to new opportunities.

6 DISCUSSION AND CONCLUSIONS

The following chapter will firstly summarize the research's findings, pointing out the most relevant results. Secondly, it will indicate the theoretical contributions, linking the findings to previous literature. Thirdly, it will demonstrate the practical implications that the research discloses and lastly, the limitations and areas of future research are discussed.

6.1 Summary

The case companies have both similarities and differences with each other. They all are small-sized and relatively young companies, still having significant differences in the current level of international operations. Some of the case companies have already well-established international operations, while some are about to start their first international operations in the near future. The companies are all focused on B2B markets, but are still working in different industries within the Cleantech field. This highlights the broadness of the field, covering a variety of different technologies and industries. Moreover, the case companies have different ideologies when it comes to Cleantech. All in all, the companies could be divided into two groups, ones who have Cleantech embedded into values and other ones having it as a commodity not only for the stakeholders but also to the company itself.

How and why do internationalizing Cleantech SMEs' adapt their business models?

Overall, the companies' business models have remained relatively stable since their establishment. All the changes can be considered as "extensions" as they add or expand the core processes (Linder & Cantrell 2000; Cavalcante et al. 2001). Moreover, none of the companies were found to have made radical or innovative changes in the BM. Most of the changes can be found in the "value proposition" component and more specifically in the "offerings" and "customers/market" subcomponents. In the "value creation" component, least changes were identified. The most discussed value creation subcomponent was identified to be technology, but as all the other components were also mentioned, it indicates that technology alone is not enough to create superior value. For most of the companies, the earning logic has remained the same from the beginning. The changes done in "value capture" component have originated from widening the offerings. Overall, the revenue model can be seen as an essential element for the companies.

When analyzing the factors driving for BM change, both threats and opportunities were found to have an impact on the change. Some of the changes were made due to threat, in the form of high competitive situation and changed need in the target market, and some of them as opportunities in a form customers' direct requests. Answering to both of these drivers can be seen as reactive behavior as the BM is kept the same until something is threatening the operations/someone is looking for new solutions. In other words, it seems that most of the companies are adapting their BM only as a result of reactively answering to the environmental threats or opportunities.

How SMEs in Cleantech sector recognize international opportunities?

Identifying early/initial opportunities can be seen relatively similar among most of the case companies. The most affected factor has been the use of networks, which has been mainly focusing on the founders' personal networks, but in one case, a public growth program was also implemented to target potential international markets. Also, the deliberate search is used to find opportunities. After the time the initial international opportunities have been recognized, the tactic to find new, later, opportunities can be seen changed, or more to said, evolved. Factors impacting on the subsequent IOR are also relatively same for all of the companies, focusing on deliberate search, brand building/awareness, and networks.

How business model adaptation and international opportunity recognition are related to each other?

The majority of the companies considers operating business model ahead and then finds suitable opportunities for that. Even though some of the companies contemplate acting another way around, in a way that opportunities come first, it seems that some parts of the BM, here the value creators and especially the core technology, still draws limits to IOR. Despite the fact that the companies are in different stages of the internationalization process, there are no distinct differences between the companies when it comes to adjusting the BM due to international opportunities. Thus, it can be concluded that the international opportunities do not drive for BMA but more in the other way around; business model frames and limits the opportunity recognition process, and thus these opportunities make the companies remain the current status.

6.2 Theoretical Contributions

There is a clear gap in studying the relationship between business model adaptation and international opportunity recognition, as until today, there is no existing literature explaining it. Thus, this study opens up an important research area and offers insights towards the phenomena. Additionally, the study increases understanding on the ways companies adapt their business models and recognize international opportunities, focusing on the early stages of internationalization process in the context of SMEs in Cleantech sector, which also deserves more research.

6.2.1 Business Model

Designing a business model at first is vital, but keeping it up-to-date is a constant task (Teece 2010). These cases demonstrate that companies make changes in their business models to remain successful in the fast-changing competitive world. All in all, the findings of this research reveal that some parts of the business model are experiencing more changes than others. Most changes can be identified in the “value proposition” component, and more especially in the “offerings” and “customers” subcomponents. In contrary, “value creation” component has experienced the least changes. Thus, these results indicate that business model is not considered as one entity that can easily be transformed as a whole. Moreover, it could be argued that there are elements in the business model that are more easily adapted, and especially in the context of Cleantech companies, it can be seen that the value creator components, here “technology” form the backbone of the operations. Thus, the business model could be more considered being hierarchical, which is illustrated in figure 13.

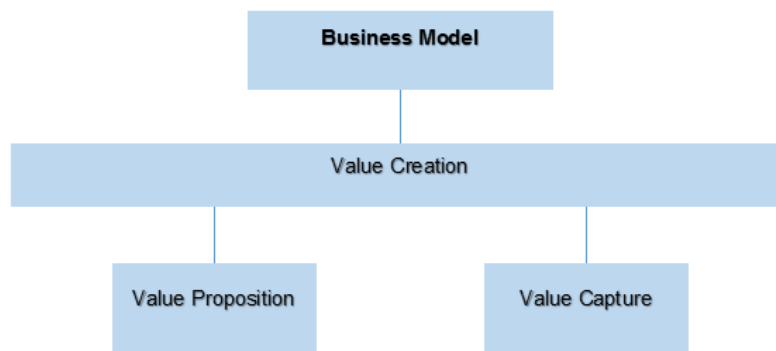


Figure 13. Revised Business Model

According to Doz and Kosonen (2010), BM changes are usually driven by discontinuities, distractions, and higher global competitiveness. Similarly, Balboni and Bortoluzzi (2015) found out the primary drivers for BMA to be environmental changes such as market demand and technological advancements. Moreover, according to Bucherer et al. (2016), companies make changes in their BM both due threat or opportunity and for the majority of the study's companies, external opportunity led to BM changes. Whereas in contrary, Saebi et al. (2016) found out threats working as the main trigger for changes in the BM, while opportunities made the company remain their existing status.

All in all, the results of the case studies are mostly supporting Saebi et al.'s (2016) findings. The case companies seem to operate reactively, by adjusting their BM at the time of threats. Additionally, even though also opportunities were identified to drive for BMA, these opportunities were mainly direct requests from the customers. This can also be considered as reactive behavior as the BM is only adapted after customers are actually looking for new solutions. Moreover, when analyzing the relation between BM and OR, most of the case companies considered to operate with BM first and then potential opportunities. This means that they have focused on the well-established business model, in other words, being aware of what they are good at, and thus select opportunities that fit that. Thus, the opportunities can be seen to help to remain the current business model in contrary for driving for changes.

The level of BM change can vary, and according to Saebi et al. (2016), there are two main types of BM dynamics; other one referred as "business model adaptation" and the other one as "business model innovation." This is aligned with Achtenhagen et al. (2013) classification where changing the business model more incrementally over time can be seen as an alternative to more dramatic BM changes. According to Saebi et al. (2016), the main differences between these two concepts are that in BMI, novelty and disruption of the environment, are required whereas BMA can be non-innovative and the aim is to balance with the environment. In addition, BMA always occurs due external triggers, whereas BMI can have both internal and external drivers. Moreover, BMI, being more radical, requires a certain amount of changes done and according to Johnson et al. (2008) and Clauss (2016) there has to be changes in all of the BM components. Based on the findings, all the changes in the case companies' business models can be considered as business model adaptations rather than business model innovations. Firstly, the aim of all the changes was to balance rather than disrupt. Secondly, all the changes can be seen as

non-innovative and as a result of external triggers. Moreover, none of the companies made changes in all of the elements of the business model simultaneously.

Different types of business model adaptations have also been identified in the earlier literature. Cavalcante et al. (2011) identify four different types of BM change that can be all seen as different types of BM adaptation. These are creation, extension, revision and termination. Linder and Cantrell (2000, 10-13) have also identified four different change models; realization, renewal, extension and journey models. From these categorizations, the changes that the case companies have done can be placed into “extension” category. This means expanding the business to cover new grounds, e.g. new markets, product lines, in a way that new lines do not replace but add to existing operations.

The research also adds insights towards the relation of internationalizing Cleantech companies and their BMA. All in all, there were no distinct differences in the case companies’ way to adapt their BM even though there are differences in their stage of internationalization. In other words, companies with a higher level of internationalization have not made more BMA when compared to companies with lower international activities. These results indicate that changes in BM are not influenced by international activities, and thus from international opportunities. This finding is somewhat surprising, as it could be considered that when increasing international activities, more changes would be required in the BM. All in all, as explained earlier the main reason for this can derive from the overall view of operating with BM first, and then finding potential opportunities to suit that. Thus, in the international context as well, the companies can be seen to follow the same pattern.

6.2.2 Opportunity Recognition

The theoretical part of this paper introduced two main theories that explain the source of opportunity, discovery and creation theories. Opportunity discovery theory views that opportunities derive from external shocks, for instance from changes in the industry, market, or technology, (Alvarez and Barney 2007; Shane 2003) and in creation theory opportunities are seen to be subjective, and they do not need external changes to be created. The key notion here is that the opportunities are created internally by the entrepreneurs themselves (Shane 2003), and thus, search as an action is not important in the creation theory. All in all, it can be concluded that the case companies are using both ways to recognize opportunities. Both Alpha and Gamma were using own networks in the

initial IOR and thus created opportunities to those markets. Nevertheless, especially later on, companies seem to discover opportunities which are supported by the fact that all the companies' use search as an activity in the IOR process.

In addition, the paper introduced two common ways of how opportunities can be discovered; deliberate search and serendipity. This latter view focuses on the conditions that enable opportunity discovery including relevant skills, prior knowledge, alertness, and networks (Kirzner 1973, 1979, 1997 in Chandra et al. 2009). All in all, based on the research, the case companies tend to use both of the ways in discovering opportunities. This aligns with the view which combines these two perspectives. For instance Chandra et al. (2009, 32) describe opportunity recognition as *"a process that consists of both discovery as well as deliberate and systematic search."* All in all, as stated earlier, companies are using the systematic search broadly what it comes to opportunities. Notably, the search as an activity is shown to be significant after the IOR with two other factors; networks and brand building. In addition, serendipity is also mentioned in the interviews. For Gamma, one of the first international deals can be said to happen due serendipity; a potential customer contacted the company as its regular supplier had prolonged delivery times.

Several factors are identified to impact on the opportunity discovery process. Most commonly introduced factors can be stated to be knowledge, network structure (see e.g. Chandra et al.; Kontinen & Ojala, 2011; Ardichvili et al. 2003) and different entrepreneurial characteristics/behavior. In this research, especially network structure was found to impact significantly on the IOR process, as all of the companies mentioned the use of networks/partner in the overall IOR process. These findings are supported by the earlier literature. For instance, Hilmersson & Papaioannou (2015) found out that networks ties influence in general in the opportunity recognition process. This aligns with Chandra et al. (2009) study of international opportunity recognition, where the majority of the participants tend to rely on their networks as sources of ideas, information, and new knowledge, leading to opportunity recognition in international markets. More importantly, as this research concluded as well, the importance of networks is highlighted especially at the early stages of operations. For instance, Wasdani & Mathew (2014) found out in their study, that social capital is an important factor for opportunity recognition process for pre-stage-entrepreneurs. In addition, in Oyson & Whittaker's (2015) study, entrepreneurial knowledge was the major factor for initial international opportunity recognition. Nevertheless, this experience was acquired through their networks and contacts,

knowledge of foreign markets, and queries and solicitation by foreign customers or distributors, and thus, the importance of networks can be highlighted; without networks and contacts, the knowledge would not have been at the same level. A similar impact can be seen in Alpha's case as well, as the CEO states that "*this communication that we have with our network of partners, that is perhaps the primary source of information.*"

Knowledge and experience, as exact drivers, in the opportunity recognition process were not accentuated by this paper's findings in the same level as it has by the earlier literature. According to Chandra et al. (2009) internationalization knowledge and market knowledge were found as important drivers in the identification of international opportunities and based on the study by Oyson and Whittaker (2015) the majority of companies discovered opportunities based on the entrepreneurial knowledge. Notwithstanding, as indicated earlier, this research's case companies, and most importantly their CEOs, are rather experienced as well as knowledgeable. Thus, it can be seen evident that their capabilities have impacted on the opportunity recognition process, for instance through the ability to search for opportunities as well as leveraging from networks and marketing. In addition, according to Hilmersson and Papaioannou (2015), experience also impacts on the level of systematic and active scouting of opportunities. In other words, more experience means more search activity. This result is similar to this paper's finding, as most of the companies have indeed used search as a way to recognize international opportunities.

In addition, the "pull" effect can be considered as a factor impacting the OR process. For instance, according to the study of Kontinen and Ojala (2011), the main factor for IOR was found to trade exhibitions. In this research as well, building the brand awareness, for instance through trades was highlighted as a general way to advance the opportunity recognition process.

6.3 Managerial Implications

The network was found to be the most critical factor especially in the early IOR process, but also important in the subsequent international opportunity recognition process. The contacts are mainly built through the founders' existing networks, but in one case, a public growth program was also implemented to target potential international markets. Here an important notion is a recognition of implementing networks at least to some extent.

All in all, enhancing the "network" component in one's business model can be done in different ways. When establishing the enterprise, formation of the founders' team should include people who already have existing networks, preferably from the various international markets. For instance, Alpha's whole internationalization process started from having the ownership structure such that the company had stakeholders in different international markets. Another way to enhance the use of networks, and thus find new opportunities, is to consider employing new personnel who already have established contacts. For instance in Epsilon's case, the company hiring a new employee with connections to South America has eventually brought new opportunities for the company from those markets. Additionally, some of the companies also mentioned the use of different marketing and sales partners as part the operations. Thus, it is advisable to consider also using these kinds of partners; as the companies have small resources, getting efficient marketing partners could speed up the internationalization process and make the marketing efforts of the company more resourceful.

Continuing from the notion of networks being important, it must be remembered that networks alone are not enough in the long-run to find potential opportunities from the international markets. For instance, Gamma, which focused highly on personal networks at early international opportunity recognition, has later on started to use different tactics for finding opportunities. The reason for this is that the existing contacts do not last forever, and are used in a few years' time. Thus, it is a necessity to start creating new markets to expand. Additionally, by also concentrating on other ways to recognize international opportunities, new contacts and relationships can be created, which makes it possible to leverage from networks as a continuous process.

Based on the findings, especially in subsequent IOR, the active search was used as a tactic to recognize new opportunities. All in all, developing criteria to assess potential customers, or search for the best possible customers, were recognized as ways how case

companies have been doing a deliberate search. Developing criteria may help to direct the focus to the most potential customers/partners, and thus also facilitate the evaluation process of recognized opportunities. For instance, Gamma has created certain profiles to potential partners that set out the standards related to industry, experience, and know-how. All in all, search as an activity and direct contacting, wear out a lot of resources, especially for a small company, and thus, it is advisable to use this kind of criteria/profiles, to efficiently implement the resources given.

In addition, case companies seem to focus on the brand building when it comes to tactics to recognize new opportunities. The most common way for the companies was identified to be the participation of different fairs and seminars. Nevertheless, attending to these kinds of events is often taking a lot of resources, and especially for smaller companies, one must consider whether participation in these events is the best possible way to use the resources available. Thus, it would be advisable to focus on the specific fairs that will help in reaching specific customers/partners and redirect the marketing resources more broadly. In addition to attending fairs and seminars, the majority of the companies are focusing on having versatile web-pages. As an exception, Epsilon highlighted more ways to market, such as advertising and PR. All in all, being active in various channels simultaneously increases the pull-effect, which again increases the amount of new international opportunities.

All in all, the majority of the case companies are operating BM ahead and then finding suitable opportunities to fit that, at least to some extent. Thus, it is crucial to make sure that the business model used is well-thought and well-established as it seems to limit subsequently the opportunities recognized. All in all, even though the core of the business model would remain the same, here technology used, companies must remember to be flexible with other components. Based on the findings, “offerings” and “customers” components have experienced the most changes, and thus it is advisable to focus on those changes that are easier to achieve.

6.4 Limitations and Future Research

The definition of SME, according to European Commission (2016), is a company with less than 250 employees. Nevertheless, in this study the focus has been only on significantly smaller enterprises, having the amount of personnel varying from five to 28 persons. A company that has for instance five employees is most evidently operating differently than another SME that has closer to 250 employees. Firstly, smaller SMEs have different, usually smaller resources, at least when it comes to human resources; for example, having only one sales person responsible for all the international sales compared to having more employees can impact on the speed and number of the sales done. Secondly, smaller size can impact on being able to be more flexibility. This may decrease the need for adapting the BM as each customer can be treated as an individual case, and thus no actual changes in BM are required. When a company grows, it may be that more specific changes are needed in the BM to make sure every employee is aware of the situation. Lastly, having fewer resources can impact on the possibilities to implement new opportunities that require changes in the BM. In other words, having just enough resources for the current activities forces the companies to neglect potential opportunities that would require BMA. Thus, the phenomenon should also be studied from the viewpoint of larger SMEs, to see whether the size of the company impacts on the findings.

All the case companies are somehow related to Cleantech. Nevertheless, the fields where the case companies are functioning are varying significantly, as three of the companies are working with renewable energy, one in power solution, one in IoT, and one in recycling technology. All in all, the variation of different industries may also have an impact on the case companies operations. Asemokha et al. (2016) introduce in their article that there are some factors that distinguish Cleantech SMEs as a separate phenomenon from SMEs in general, most important being different regulative environment. It may be possible that there are also differences in the regulatory inside the Cleantech industry. For instance, do the same regulations concern IoT-field similarly to clean energy field. In addition, based on the interviews, the case companies were divided into two groups based on their relation to being a "Cleantech" company. As the findings revealed, more or less half of the case companies had Cleantech embedded in their values, whilst others used the concept more as a marketing tool. Thus, one limitation of this study is the case companies' suitability to be studied as Cleantech companies. It may be possible that studying the same concepts with only companies which have Cleantech embedded in their values

would give different results, and thus significantly impact especially in the contextual interpretations. For instance, for companies that have Cleantech embedded in their values, the decisions related to partner, material, and customer selection can have stricter criteria than for the companies that consider Cleantech as a way to improve business. Having Cleantech as the core of the business can also for instance impact on the companies' motivation not to focus only on financial profits but consider triple bottom line more important. Nevertheless, based on this research, the findings cannot be specifically linked to the fact that the companies are working in a Cleantech sector. Thus, it can be concluded that the results of this study are applicable to be also used SMEs from other industries than Cleantech.

According to the findings of this research, the case companies have changed their business models, but not to the extent that the change could be called as business model innovation but rather as an adaptation. Nevertheless, according to the existing literature, BMI is becoming an increasingly popular concept, and for instance according to study conducted by IBM in 2008, nearly all of the interviewed CEOs were aiming to make a business model innovation in the next three years (Giesen et al. 2008). For further research, studying the relation between IOR and BMI would be necessary to find out whether, for instance, there are different drivers in BMI than in BMA. Another interesting notion related to BMI is that whether the whole concept is over-emphasized among the authors. According to Jonson et al. (2008, 57) BMI "*should not be treated lightly,*" as it is, for most times, also possible to disrupt the competitive situation through BM adjustments without considerably innovating the model. Thus, for further research, the impact of BMI in contrary to BMA impact would add insights in its overall importance.

One of the main findings in this paper was the obvious exploitation of networks, especially in the early international opportunity recognition, but also in the IOR in general. Nevertheless, as all of the companies' CEOs' are fairly experienced, and more importantly, the majority of them seem to have well-established and broad business networks, it may be possible that the similarity among the CEO's has impacted on these findings. As an exception, in the Epsilon case, the network was not used in the IOR, and in general, the personal networks were not either highlighted in the interview. Thus, it would be important to study the IOR process from the viewpoint of entrepreneurs, who do not have a well-established network to get started with. These findings would indicate how companies deal with opportunity recognition, especially in the early times, without the support of networks.

Based on the literature review, different entrepreneurial characteristics have been emphasized as impacting factors on the opportunity recognition process. For instance, Oyson & Whittaker (2015) found out that the whole discovery process can be seen as a cognitive process and Wasdani & Mathew (2014), disclosed cognitive style having an impact on the opportunity recognition process in every stage of operations. Nevertheless, in this study, different entrepreneurial characteristics lacked attention, and overall no findings related to them can be described. Thus, for further research, one should focus on these individual characteristics and their impact on the results.

Even though it is necessary for entrepreneurs to discover opportunities firstly, it is not enough. From these discovered opportunities, first it has to be decided which one should be exploited, and later on actually exploit them, including the acquisition, recombination, and organization of the resources available (Shane 2003). Moreover, it is important to remember that being successful in recognizing opportunities, does not automatically lead to successful exploitation. For instance, being overoptimistic can make an entrepreneur to exploit opportunities easily, which can, however, fail (Shane and Venkataraman 2000). Thus for further research, the whole opportunity exploitation process should be studied.

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APPENDICES

Appendix I. Interview Questions¹

Basic information:

Company:

Foundation:

No. of employees:

Other relevant info:

Interviewee:

Name:

Position:

Education and Experience:

What Cleantech means for the company:

Business Model:

Value
proposition

- What products/services company offers? Changes?
- Who are company's customers? Changes?
- What channels are used to reach the customers? Changes?
- What benefits customer gets of using company's service/product? Changes?

Value
Creation

- What is company's competitive advantage/ What makes the company better than competitors? Changes?
 - Technology
 - Specific partners/networks
 - Process
 - Competences

¹ The interviews were all conducted in Finnish. Here the interview questions are translated to English.

Value
capture

→ What is the company's earning logic? Changes?

In general, how has the overall BM changed after its foundation? Which components and why?

Have these changes in BM brought up new opportunities, especially in the international context?

Internationalization:

Tell about your current international operations/markets

What was the initial reason/motivation to internationalize?

How did you recognize your very first international opportunity?

Where the more opportunities available? How did you decide which one to implement?

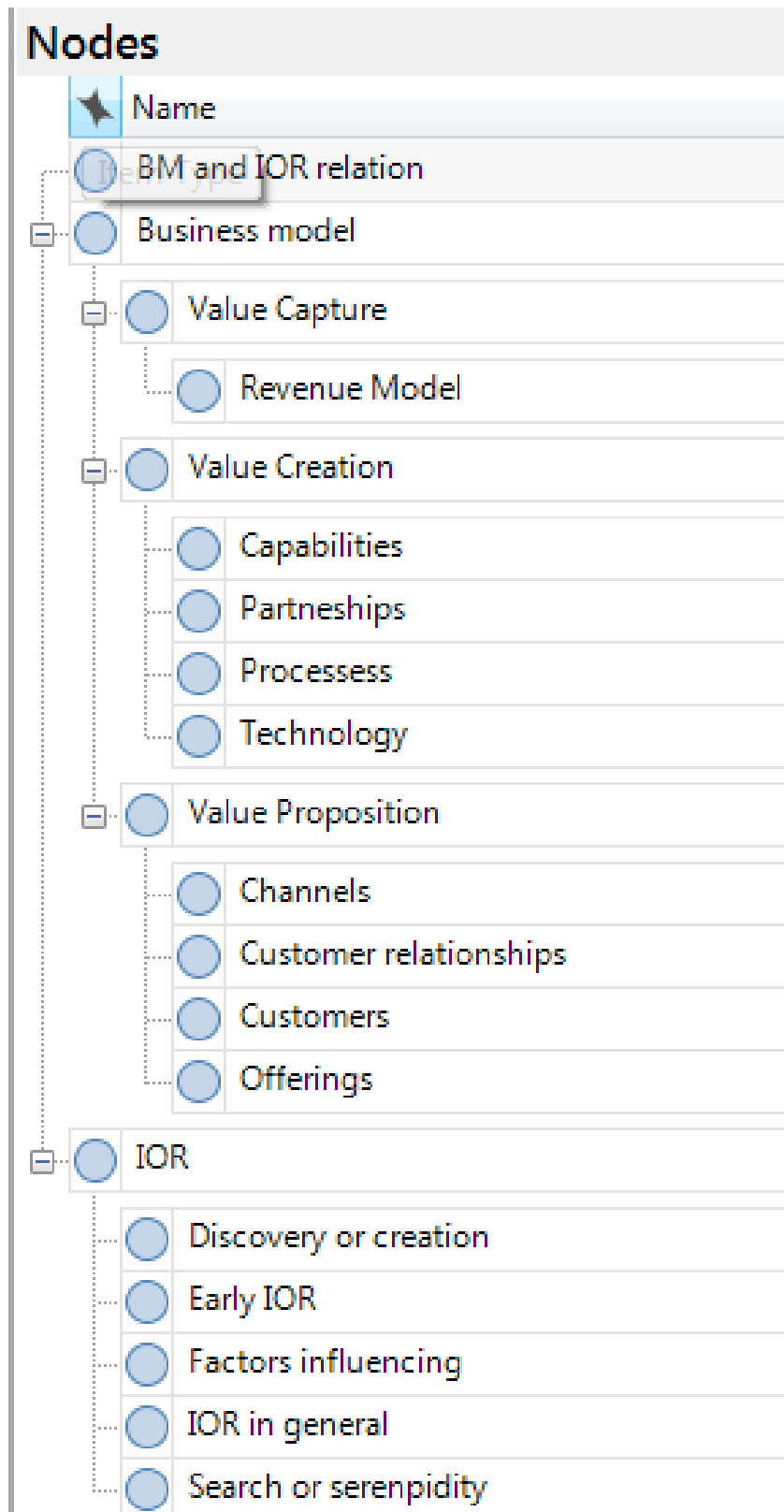
How the recognizing of international opportunities have evolved/ do you have now different ways to recognize international opportunities?

When your company has found new international opportunities, have their implementation required some BM changes?

→ Which components and what kind of changes?

Do you act more based on your BM and recognize opportunities that fit into that BM, or another way around; seeing what opportunities are coming your way and then making the necessary changes to your BM?

Appendix II. Initial codes in NVivo



Appendix III. Final codes in NVivo

Nodes			
Name	Sources	References	
BM and IOR	5	7	
BMA impact on opportunities	3	3	
Opportunities impact on BMA	5	9	
Business Model	0	0	
Overall Changes	5	6	
Value Capture	0	0	
Revenue Models	5	5	
Experimentation	3	3	
Value Creation	0	0	
Capabilities	4	4	
Expertise	3	3	
Networks	4	5	
Processes	2	4	
Technology	5	9	
Value Proposition	0	0	
Channels	3	3	
Direct contact, sales	3	3	
Marketing, Advertising	0	0	
Fairs, conferences, events	2	2	
Marketing partners	1	1	
Other ways	1	2	
Website	1	1	
Customers	5	8	
Changes	3	4	
Why changes	4	5	
Offerings	5	10	
Changes	5	5	
Why changes	4	6	
General info	0	0	
CEO	5	6	
Cleantech	4	4	
Employees	4	5	
Foundation	3	3	
Other info	2	2	
IOR	1	1	
Evaluation	3	5	
Experimentation	1	1	

Failures	2	2
First IOR	3	5
experience & knowledge	2	3
networks	4	6
requests from customers	2	2
search	2	4
Funding	2	2
International markets	5	6
IOR in general	5	9
awareness through being part of ne	1	1
customers contact	1	1
fairs and seminars	4	4
internet search	2	2
networks	3	4
other	1	1
search	5	7
Motivation to internationalize	5	6