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How to Recognize Opportunities for Digital Transformation: a framework for Large & Established Firms

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How to Recognize Opportunities for Digital Transformation: A Framework for Large & Established Firms

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Abstract. This thesis investigates how large established companies can recognize opportunities for digital transformation. Based on existing research as well as case studies of five companies and one expert on IT- and business transformation we map the tools, methods and techniques best suited for companies depending on their innovation strategy and the desired impact the recognized opportunities will have on the business. We find support for the use of specific techniques that are drawing from specific sources of knowledge for companies depending on factors such as pro-activeness of innovation and the area of the business being targeted, which may provide insight that can be put through practical use by large established companies with the desire to improve their recognizing capabilities.

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1. Introduction

This chapter introduces the reader to the research question and provides background to core concepts such as business transformation and technological change. We present our definition of “digital transformation” and discusses the scope, objective and limitations of our research before outlining the disposition of our paper.

In the early 21st century, technological advancements have vastly changed the playing field for many traditional corporations. Particularly, developments of IT have allowed companies to fundamentally improve their business in many ways, such as expanding and refining customer segments (Zettelmeyer, 2000), streamlining internal processes (Dutta & Segev, 1999), improving customer relationships & communication (Kenny & Marshall, 2000), and re-designing the supplier networks (Kaplan & Sawhney, 2000). The fundamental nature of an open market society is that it doesn't allow for a status quo over time due to competitive pressure (Schumpeter, 2013), which by extension means that incumbent firms need to constantly adapt to changing industry conditions by transforming the way they do business. (Johne, 1999). This process of adapting to the changing environment can be a great hurdle for large corporations, but at the same time it may offer great competitive potential for those able to capture and implement the opportunities before others (Johne, 1999), especially if they consistent doing so (Reinganum, 1985). How to make the company successful at this is one of the major questions that managers in incumbent firms are faced with today. But no matter what any of them think or do, it must all start with an idea.

In this study we will focus on investigating in what way a business can recognize (i.e. not capture and implement) opportunities to undertake digital transformation initiatives. We will do this by identifying typical practices and key success factors that companies with different innovation strategies face and how they differ depending on what part of their business they want to improve upon. Research taking a holistic view directly on the subject of is sparse, but an empirical foundation can be extrapolated from theories in related fields. For example, the fields of innovation management provides us with various tools and techniques that can be used in the innovation process, such as corporate foresight (Rohrback and Gemunden, 2011) and innovation jams (Schilling, 2013; Bjelland and Wood, 2008). It also gives us strong reason to suspect that companies can use different innovation strategies and approaches to the level of pro-activeness in their innovative efforts (Dodgson, Gann & Salter, 2008). The four models of corporate entrepreneurship (Wolcott & Lippitz, 2007) applies these theories to corporate strategy and shows us the different ways that companies actually operationalize lateral growth. However, the basic requirement for an incumbent that want to avoid being pushed out by their competitors is not their ability to develop new technologies or new business models, but their ability to change and re-purpose existing capabilities as the circumstances calls for. This concept is commonly known as dynamic capabilities (Teece, Pisano and Sheun, 1997). It represents a way of thinking about the evolution of an organization that want to adapt to changes in increasingly dynamic environments, especially those characterized by rapid technological change (e.g. Daniel & Wilson, 2003; Shuen & Sieber, 2009; Rindova & Kotha, 2001). All of these systems and theories are dealing with the development and implementation of an already captured idea and thus need to work in tandem with

systems that allow the company to identify and assess the feasibility of the ideas in the first place. Commonly referred to as ideation, most research in this stage have been performed on an individual level by investigating entrepreneurs (e.g. Graham & Bachmann, 2004; Swenson, Rhoads & Witlark, 2013). In the following paper we will be translating this research into the context of large and established firms and complementing it with our own empirical findings. For detailed information on how to successfully implement specific initiatives we refer you to the comprehensive works of other authors on topics as change management theory (Curry, Flett and Hollingsworth, 2006; Kotter, 1995; Anderson and Ackerman-Anderson, 2010).

1.1 Defining the concept of digital transformation

The Digital Transformation is one of the most used buzzwords in business today. But even though almost every manager have heard the term, there seems to be an abundance of conflicting interpretations of the concept. Some think of it as synonymous with business transformation, and that digital transformation is simply the natural evolution of the concept in an increasingly digital world where practically every innovation or transformation is enabled to some extent by new technologies (Venkatraman, 1994). Others consider the concept to be limited to improvements of business practices following what is known as the fourth industrial revolution (Lee, Kao, and Yang, 2014), and the increased connectivity of things (Ferber, 2013). Some specifically point to technological investments to improve specific areas of the business, such as automating the manufacturing process or increasing top line growth through new customer channels (Altimeter Group, 2014).

We consider digital transformation to be all digitally-enabled changes to the way companies conduct business, and we consider it to encompass both radical and incremental improvements. We build upon Westerman's, Bonnet's & McAfee's (2014) who define digital transformation as 'the use of technology to radically improve performance or reach of enterprises'. We do this by removing the word 'radically' and emphasizing that the technology in question is digital. The purpose of modifying their definition is to limit any association during our interviews between the concepts of 'radical and incremental innovation' and the term 'to radically improve', as well as to emphasize that the improvement in question is digitally-enabled. The improvement itself can be aimed at either improving the *performance* (i.e. the customer's perceived value of the offer or the operational efficiency) or the *reach* (i.e the scope of the targeted customer segment by the use of new or improved customer channels). Hence, the definition used throughout our research is:

Digital Transformation - '*The use of digital technology to improve the performance and reach of enterprises.*'

1.2 Objective, Scope and Research Question

The objective of this thesis is to investigate how companies can find new opportunities to digitally transform their business and to create a framework for analysis on a company-level. The goal is to connect dispersed literature on several different subject (e.g. opportunity recognition, business transformation and strategic management) with empirical data (i.e. interviews) and applying it to answer a research question that until recently have been given limited attention. The few sources directly comparable are mainly reports from consultancies and may therefore be heavily biased due to possible economic interest. As the target timeframe for this thesis project is a mere 20 weeks we focus on providing a holistic picture of a limited part of the digital transformation process. With this in mind, we have arrived at the following research question:

Research Question

'How can Large Established Companies Recognize Opportunities for Digital Transformation?'

Our Theoretical and Practical Contribution

This study will contribute to the academic literature in two ways. Firstly, most research on digital transformation in the context of opportunity recognition is spearheaded by quasi-scientific reports from consultancies such as Capgemini and Altimeter, or research divisions of larger companies such as IBM. Actual academic literature directly on the subject is to our knowledge non-existent. We will combine dispersed literature on several topics, such as opportunity recognition, corporate entrepreneurship and strategic business development in order to shine an unbiased light on the subject. Secondly, no satisfying framework on how to recognize opportunities for digital transformation does yet to our knowledge exist. We therefore find it suitable to take a holistic approach when creating such framework, acting as guidelines for companies with the desire to digitally transform.

1.3 Limitations

Our main limitation is that we only focus on large established companies. This limitation is added on purpose since we suspect the organizational and environmental context of for example IT-businesses or a small start-up firms situation vastly differs than that of a large traditional company which would require us to gather a much larger sample size than we estimate our current resources allow for. It is also reasonable to expect the capabilities required to actually undertake the transformation initiative differs from the capabilities required to recognize the potential transformation initiatives. Due to the same time constraints cited as the reason for limiting us to large traditional companies we therefore choose to focus only on the recognizing part of the potential transformation initiative, leaving the actual capturing (i.e. detailed assessment and implementation of the opportunity) outside the scope of our study. More specifically, the recognizing part of potential transformation contains the search (i.e. discovery or creation of an idea) as well as the brief initial assessment of them.

1.4 Disposition

In this thesis we will first be hypothesizing a holistic conceptual framework outlining the major elements that determine the capacity of a company to recognize new opportunities to digitally transform. The second stage of the research will be an investigation of academic literature based on the conceptual framework. In the third stage we will test and expand upon the model using primary data gathered through interviews with professionals. We will follow a classic report structure that makes it easy for the reader to find the information he or she seeks, starting with an introduction and methodology, moving on to report on our findings from the secondary data (the development of the theoretical framework), to the results of our primary data collection (interviews), and finally analysis and conclusion. Figure 1 below outlines our research processes and how we structure the report.

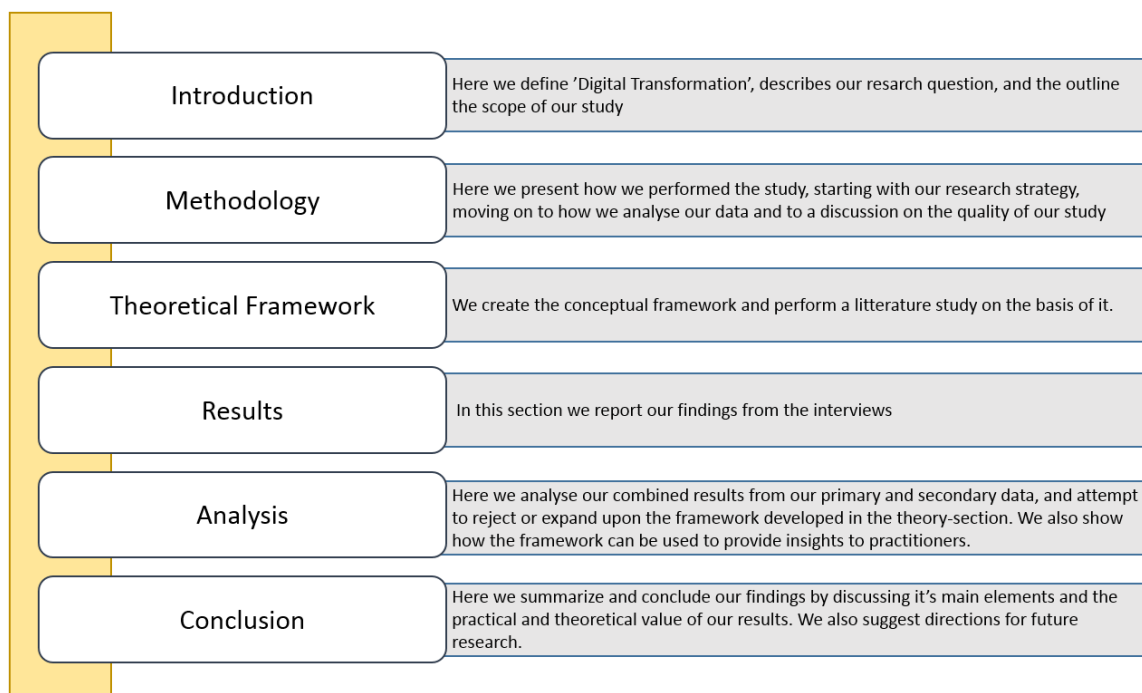


Figure 1. Thesis Disposition

2. Methodology

This chapter outlines the methodology used and motivates our choice of research strategy and design. We show the reader our practical approach and report the characteristics of our search efforts and our sample.

2.1 Research Strategy

The goal of this study is to find how large established companies can recognize opportunities for digital transformation. Since current research on the subject is limited we first construct a conceptual framework to base our analysis on. This requires qualitative analysis of both secondary and primary data, and therefore an exploratory approach is suitable (Bryman & Bell, 2011). We approach the construction of the conceptual framework in reverse by beginning with what the desired output of our model is (i.e. the quantity and the quality of recognized opportunities to digitally transform), and then we investigate how it is possible for companies to actively change the output. We also go into details on the determinants of the model, and how they impacts the type of output the companies can direct their efforts towards achieving. In simpler terms, we want to understand how companies can get better at identifying new ideas that digitally transforms their current business. Most likely, this is done through various tools, methods and techniques that draw from different sources of information. Which tools, methods, techniques, as well as sources of knowledge, that companies want to use also depends on their strategic situation since different processes may produce different types of ideas.

2.2 Research Design

This research is highly exploratory and aims at connecting current literature on multiple subjects into a framework of analysis on a novel topic. The creation of the hypothesized framework will be the first stage. Since we set out to test our model and then later refine it, we adopt both a hypothesizing and an expansionistic approach. We started with a literature review aimed at identifying where digital transformation initiatives can be undertaken in order to improve the current business. To complement the literature search we conducted a handful of exploratory interviews, whose main purpose are to guide the literature search towards those areas most likely to contain a latent potential of improvement through digital transformation. Once the literature search was concluded we performed semi-structured interviews with experts in the field in order to evaluate and elaborate on the initial model.

2.3 Research Methods

As with the literature search, we take an expansionistic approach to the interview guidelines in order to acquire as relevant information as possible. Further, the interview guidelines are set to expand and develop upon the subjects. This will allow us to pursue the topics that a particular interviewee is most knowledgeable about and thus acquires the most useful and detailed results possible. However, this design puts more pressure on the skill of the researchers, since the more flexible the guidelines comes with more room for mistakes or loss of information (Bryman and Bell, 2011).

Our research design requires us to collect and combine data from several sources. The specifics of the research process are described below. The literature review is our source of secondary data for the first phase of the research, while the second phase of primary data collection is gathered through interviews. In order to be able to both generalize our findings and find specific examples on how to recognize opportunities we have chosen to attack our problem through the use of multiple case studies (Hennink, Hutter and Bailey, 2010), as opposed to performing a single case study, and our final sample consists of professionals at six case companies, i.e. innovation managers and executive level managers

2.3.1 Secondary data

We constructed the conceptual framework with the help of an expansionistic literature review starting with the keywords '*Digital Transformation*'. The expansion of the literature review was directed by a combination of previous knowledge, findings in the literature, and the result from the exploratory interviews being conducted in parallel. The literature search to develop the hypothesized framework was conducted partly systematically and partly explanatorily. The systematic search was conducted in six electronic databases [EBSCOhost; EBSCO; Google Scholar; Business Source Premier; JSTOR; ECON Lit] and results were sorted by relevance using an arbitrary ranking based on citations and publishing year. The exploratory part consisted of us using articles found through other sources, including colleagues, related literature, and exploratory interviews with professionals. Though the exploratory part of our literature search inevitably influenced our choice of key words used for the structured search, these findings were primarily treated as complimentary. We set off to catalogue all relevant articles in our own database where we filed them by keyword and topic, as well as included minor notes of content and findings. A glossary of terms and definitions were also maintained in order to avoid any conflicting interpretations of key concepts between articles used cited in our empiricism. The final list of keywords is reported below.

[Digital Transformation]; [Digital Business Transformation]; [Digitally-Enabled Business Transformation]

v

[Innovation Management]; [Corporate Entrepreneurship]; [Opportunity Recognition]; [Entrepreneurship]; [Digital Trends]; [Digital Evolution]; [Innovation Management Tools/Techniques/Methods]; [Ideation]; [Idea Generation]; [Knowledge Transfer/Sharing]; [Sources of Innovation]; [Innovation Management Strategies]; [New Business Creation]; [Business Model Innovation]; [Business Model Transformation]; [Operation(al) Transformation]; [Value Proposition]; [Value Proposition Transformation]; [Customer Experience]; [User Utility].

During the search, we discovered that valuable information from sources that are generally considered empirical (i.e. books, articles) were scarce. The most relevant literature for answering our research question was consultancy reports from various sources, and as such they came with a high risk of being biased due to commercial interests or being un-scientific due to a lack of peer-review (Bryman & Bell, 2011). Though these reports offered valuable insights into the topic, they were not relied upon for our empiricism. These reports of studies unavoidably influenced the direction of our continued search, but were at most treated as additional indicators of validity of our hypothesized framework.

2.3.2 Primary data

The interviews are semi-structured by design since it allows for questions to be re-phrased and adapted depending on the situational circumstances while the respondent is allowed a lot of freedom in expanding their answers. This attribute is crucial to us since the goal of the interviews is partially explorative and without it we would run the risk of missing out on vital information needed to construct the most accurate framework and to find out how companies recognize opportunities. It also serves the purpose of providing a degree of guidance that help to ensure the obtained data is exhaustive and comparative, thus limiting the risk of poor execution due to any inexperience of the researcher (Bryman & Bell, 2011).

Practical Design & sample selection

The execution of our interviews were held through different channels due to geographical differences. Ideal would have been to have every interview face to face in order to get exactly the same surroundings, where body language might have told us what was emphasised during the interviews. However, to mitigate this problem we have kept to the same semi-structured interview guidelines, ensuring that we collected data on the same topics from all the respondents. Further we tried to keep to a time-frame of one hour per interview, something that seemed like a suitable time frame after the interviews held during the pre-study. To get every valuable piece of information during the interview we took notes during, and simultaneously recorded every interview with the approval of every respondent, enabling us to summarize the interviews after being conducted.

We define a large company as an employer of more than 250 individuals (Zahra Ireland & Hitt, 2000). Firms can according to age be categorized with the threshold of 6 years, which implies that those firms younger than 6 years are founded as start-ups or new ventures (Zahra, et.al, 2000) and those that are older are expected to be categorized as established firms. How we define a digital transformation is covered in a previous section. What constitutes an opportunity in this context is part of our research and the topic will be covered in the following sections together with the ‘how’.

Participants

The initial search for case companies started with a search for large established companies, From these criteria we moved on to list potential case companies, as well as consulted our sponsor for further suggestions on potential companies. We also took help from an internal innovation network to expand our search horizon. After screening and identifying appropriate case companies, we started targeting individuals within the organization that were likely to possess the required knowledge, such as executive-level or innovation managers involved in areas such as innovation or IT strategy. The search for suitable individuals was performed through word-of-mouth, cold calling, and contacting through LinkedIn or email. Our final sample consisted of eight interviewees spread out over 5 case companies and one expert representative. A final list of interviewees is found in table 1.

Company	Industry	Size	Founded	Interviewee position	Length	Channel
Volvo Group	Manufacturing	92,822	1929	Innovation Manager	60	F2F
Volvo Group	Manufacturing	92,822	1929	Head of Culture	60	F2F
MAN	Manufacturing	55,900	1748	Innovation Manager	45	Phone
Stena AB	Logistics	20,500	1939	Chief Digital Officer	75	F2F
SKF	Manufacturing	46,509	1907	Innovation Manager	90	F2F
Volvo Cars	Manufacturing	24,124	1927	Innovation Manager	60	F2F
Volvo Cars	Manufacturing	24,124	1927	Innovation Manager	60	F2F
Tieto Sweden	IT	3,952	1999	Program Manager	45	Phone

Table 1. Table of Interviewees.

2.4 Data Analysis

Upon completing the initial stages of the literature review, we hypothesized a conceptual framework which validity was tested and specific content added after the collection of our primary data. When performing the analysis we compared our empirical data with our theoretical framework, then evaluated the accuracy and expanding upon our initial framework model to present the most accurate way our interpretation of how large establish companies can identify opportunities for digital transformation.

2.5 Quality of the Study

2.5.1 Validity

Validity is defined by to what extent you are measuring what you are supposed to measure. This often causes difficulties when conducting qualitative studies (Bryman & Bell, 2011). As mentioned earlier, our research seeks to create a generalized image regarding how traditional companies can recognize opportunities for digital business transformation. In order to increase the validity of a study it is of importance to make the research applicable in other settings, therefore a more generalizable research are preferred. Bryman & Bell (2011) refers to this as external validity. We accomplish this by finding a trade-off between generalizability and finding specific examples on opportunity recognition in our study we have chosen to investigate several different actors as opposed to performing a single case study. To further increase the validity we have a clear and well-formulated research question that will ensure the study is steered in the right direction throughout the entirety of the research project. Lastly, we attempt to ensure the quality of our study by selecting a participant sample consisting of individuals considered to be either innovation & digital specialists or executive-level managerial positions who are likely to all be very knowledgeable about the subject and how their company's activities relate to it.

2.5.2 Reliability

Ensuring reliability in qualitative studies is often problematic since strict replication of the study is practically impossible due to trouble recreating environmental settings and non-verbal communication during the interviews. To mitigate this issue we have described and motivated every step in our research process, as well as put our interview guidelines in Appendix A. This will make replication of our study easier and more likely to succeed. The advantage of being two authors also helps to mitigate this issue since we can get a second opinion on all interpretations and actions throughout the study.

3. Theoretical Framework

This chapter presents the creation of our conceptual framework and how it was constructed piece by piece. In later parts of this chapter we build upon this framework in order to present a more detailed description of how large established companies can recognize opportunities depending on their strategic rationale and what part of the business they want to transform.

3.1 Constructing the Conceptual Framework

The first thing we did was to set out to find a framework that we could base our research on. We quickly learned that no such framework exists, and therefore we needed to create one ourselves. Our goal was to create a simple and holistic roadmap of various tools, methods and techniques that companies can use in order to better recognize new opportunities to digitally transform. We decided that the simplest way to do this was to start with finding the output of our future model and work our way backwards to find and map the biggest determinants of that output. In our case, the output is the quality and the quantity of the recognized opportunities to improve the performance or the reach of the company with the help of digital technologies (figure 2).



Figure 2. The output of our conceptual model is the quality and the quantity of the recognized opportunities to digitally transform the business.

As the output in our model is ‘recognized opportunities’ and we work under the assumption that the quality and quantity of these can be enhanced through the use of certain tools and techniques aimed at improving the innovative capabilities of companies. This assumption is supported by research on the subject of innovation management (Balanchandra and Friar, 1997; Cooper, 1997; Ernst, 2002; Drucker, 2007) and entrepreneurship on both on a corporate (Covin and Slevin, 1989; Lumpkin and Dess, 1996; Miller, 1983; Zahra, 1993) and to some extent on individual level. (Henry, Hill and Leitch, 2005; Gompers, Kovner, Lerner and Scharfstein, 2006). Identifying these tools and techniques, what look like, and how they work are, is the key to understanding how companies can recognize new opportunities.

In entrepreneurial research, opportunity recognition is widely accepted as a key step in the processes of creating new business ventures (Shane & Venkataraman, 2000). In practice, grabbing opportunities is possible not only for new market entrants but also for incumbents, which puts a lot of pressure on existing enterprises to continuously fight to retain or grab market shares (Teece, Pisano and Sheun,

1997). However, opportunities are not something that simply falls into ones' lap, but rather the result of the entrepreneur's traits and actions. (Ardichvili, Cardozo & Ray, 2003; Barringer & Bluedorn, 1999). Though the research on opportunity recognition is mainly aimed at individual entrepreneurs, the fundamental theories are built upon corporate models of organization and should thus have applications to large businesses as well (Ardichvili, et.al., 2003). In the context of large corporations this would be translated into the traits of the individuals within the company that are involved in the process, and the tools, methods and techniques used to improve a company's ability to recognize new opportunities.

In entrepreneurial research, opportunity recognition and it's development is commonly acknowledged to consist of 3 main elements that determines the individual's ability to recognize patterns and "connect the dots"; i) the active search for opportunities, ii) the alertness of opportunities, and iii) and prior knowledge, (Baron, 2006). Commonly added to these three factors are iv) social networks (Timmons & Spinelli, 2009). Translated into the context of a large corporation, this would mean the company need to i) actively search for opportunities, ii) be alert to opportunities, iii) have access to information (knowledge or data), and iv) have knowledge-sharing mechanics and data analytics capabilities in place to make the most of the different sources of information. More specifically, a company would perform an active search through the use of certain tools, methods or techniques such as brainstorming or experimentation. Being alert to opportunities is about having the right people and the right culture in place that will be receptive to new opportunities and also to have the organizational agility to capture them and will likely be an important success factor for these tools, methods and techniques to have desired effect. Having access to information or data comes from hiring competent staff, collecting data or knowledge from the operations or customers, or hiring expert consultants. These are the sources of the knowledge required to effectively recognize opportunities in a corporate environment. Knowledge-sharing mechanisms and data analytics capabilities in the company can be argued to be both another type of tool, method or technique, or success factor. Therefore, we expand the conceptual framework to include the direct determinants of the recognized opportunities, i.e. the tools, methods and techniques that can be used by a company to improve the quality of the quantity of recognized opportunities (figure 3). In this part of the model we will also take into account the sources of the information and the key success factors related this improvement, but for simplicity we will leave that out of the title and label this element "Tools, Methods and Techniques".

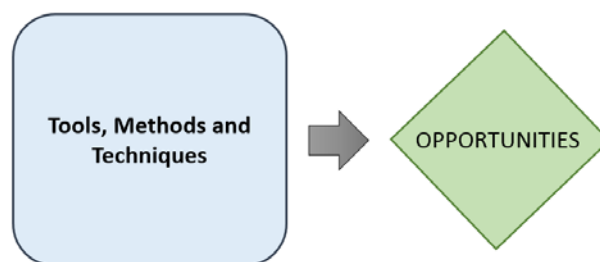


Figure 3. Stage two of the construction process of the conceptual framework includes the direct determinants of the recognized opportunities within a company; the tools, methods and techniques used to find new opportunities.

The next part of the conceptual framework tries to explain why different companies can benefit more from ones type of organizational construct than another. We hypothesize two main determinants of this; i) the level of pro-activeness in the digital transformation strategy and ii) the desired area of business impact.

The first determinant, the level of pro-activeness of the innovation strategy, can be described as a scale between two extremes. On one end of the digital transformation strategy spectra you have companies whose long term competitive advantage is dependent on staying ahead of the competition and using advanced digital features, while on the other end you have companies whose competitive advantage is found in something other than digital features and best practices. The first company would be required to continuously innovate and while the other company is likely to be satisfied with implementing tested and tried solutions and minimize risk. We hypothesize that the organizational constructs these two companies need to recognize the appropriate type of opportunities are different, but not necessarily mutually exclusive. For this reason, we expand further upon of conceptual framework by adding another element that determines the optimal tools, methods and techniques that a company should use (figure 4).

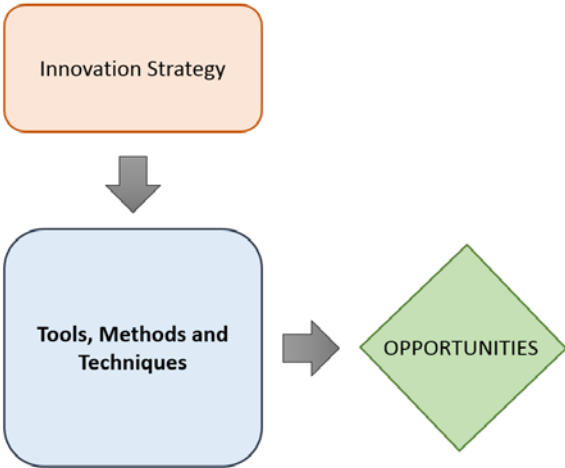


Figure 4. The third stage of the development of our conceptual framework adds the company innovation strategy as a determinant of the optimal tools, methods and techniques to be used in order to reach the best quality and quantity of recognized opportunitites.

The second determinant shows how the tools, methods and techniques used by the companies may also differ depending on the goal of their transformation strategy. For example, recognizing opportunities to digitally transform the value proposition is likely done through a customer-centric approach, while recognizing opportunities to improve operational efficiency is likely done by looking at established best practice solution or by getting feedback from the individuals directly involved in the operations. So the last part in our construction of a conceptual framework adds a second element that determines which tools, methods and techniques is preferable for companies that want to improve their ability to recognize new opportunities (Figure 5).

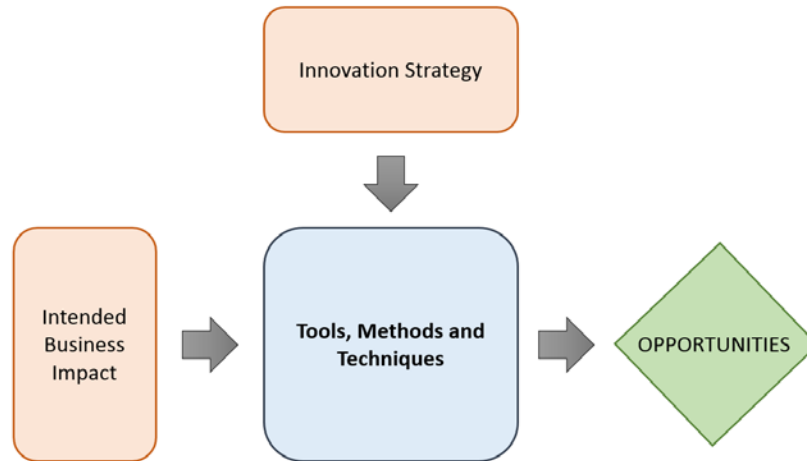


Figure 5. The fourth and final stage of the development of the conceptual framework adds a second determinant of the optimal tools, methods and techniques that should be used to recognize new opportunities for digital transformation.

Figure 5 shows our final conceptual framework that we arrived at by working our way backwards from the desired output (i.e. the quality and quantity of recognized opportunities to digitally transform the business). In short, it says that given the area of the business that the company wants to find opportunities to transform in, and the innovation strategy of the company, they will deploy a set of tools, methods and techniques aimed at recognizing new opportunities to digitally transform.

3.2 Innovation Strategies

3.2.1. Introduction to Innovation Strategies

One of the primary differentiators of the types of digital transformation opportunities companies look for is the level of activeness of their strategy. There is an abundance of literature on the subjects of transformation and innovation strategy, and the major theme among them is how the companies balance development against risk. For example, Dodgson, Gann, & Salter, (2008) presents four levels of innovation strategy that describes this rather well. Companies with a *passive* innovation strategy takes a ‘wait and see’ approach, allowing other to take the costs associated with developing innovation and the risks that follow the implementation of them. Most likely these companies are protected by high barriers of entry or some other competitive advantage, but it could also be that these companies simply lack the capability to innovate. On the opposing side you have the *reactive*, *active* and *proactive* have a greater focus on active innovation and the difference between them is mainly how much risk they are willing to take on.

Another related theory is four opportunity recognition strategies (Timmons & Spinelli, 2009). This theory is based on the element of opportunity recognition commonly known as *active search*, i.e. the individual’s attempt to actively find opportunities through a systematic search for opportunities or generating ideas by methods such as prototyping and brainstorming. But most importantly, it differentiates between two internally consistent theories of opportunity recognition called *discovery*

and the *creation*, where discovery of opportunities is based on the assumption that opportunities already exists, and where creation of opportunities is based on the assumption that it is the actions of the entrepreneur that create the opportunities (Alvarez and Barney, 2007). Though the debate often turns philosophical (i.e. are opportunities created or discovered?), one could make the argument that both versions exists. If you consider opportunities to be relative (i.e. that every potential improvement is an opportunity, even if the underlying idea or technology isn't innovative), then some opportunities are *created* by the innovative use of the idea or the technology, while some opportunities exists because you *discover* the possibility to mimic another actor. This is an important distinction since it can be directly applied to the two extremes of the digital transformation strategies for large corporation. It is reasonable to assume that since companies who are more active in their digital transformation have the desire to innovate, they are more likely to pursue the creation of opportunities and thus would need to use tools, methods and techniques best suited promote the type of actions that lead to *opportunity creation*. At the same time, companies who deploy a more passive digital transformation strategy are probably not as interested in developing new and untested ideas themselves, and thus they are more likely to benefit more from using the tools, methods and techniques designed to promote *opportunity discovery*.

On the basis of these theories we hypothesize two main archetypes of digital transformation strategies we call *followers* and *creators* (figure 6). This allows us to investigate how the tools, methods and techniques intended to improve the quality and quantity of a recognized opportunities for digital transformation differ between companies with different levels of activeness in their innovation strategies. This split of the strategic element has similarities with the classic '*lead of follow*' issue of corporate strategy (Perry and Bass, 1990) and the related concept of first mover advantages (Robinson, Fornell and Sullivan, 2006; Lieberman and Montgomery, 2007). If we take our example to the extreme, the *creators* would be the first movers that assume most of the risk and costs associated with being the first to *create* the opportunity and undertake a specific type of digital transformation initiative, while the late movers would be the *followers* who *discover* the opportunity to use a tested and tried method to improve their own business practices. In reality, most companies are likely to be somewhere in the middle of these two extremes, but by using these two archetypes of innovation strategy to categorize companies we may be able to give practitioners more insight while keeping the model simple and easily absorbed.

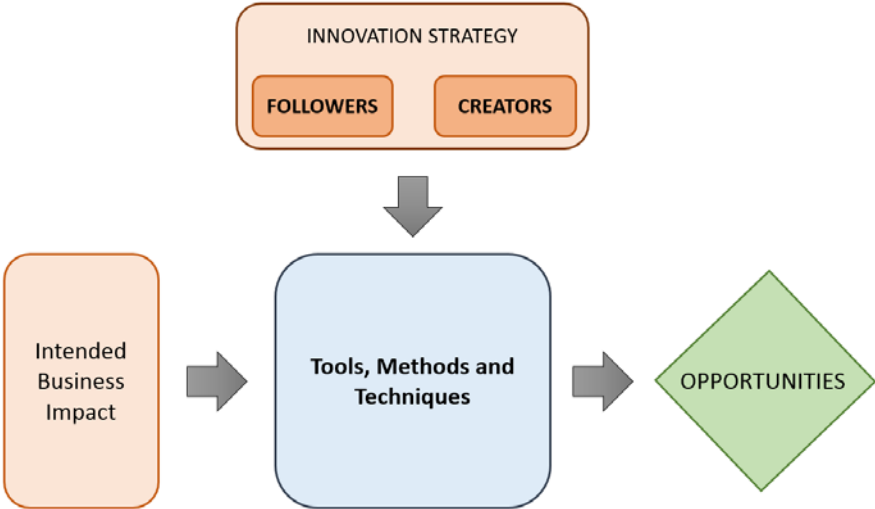


Figure 6. After investigating the academic literature on relevant to the "innovation strategy"-element of our conceptual model we hypothesize two archetypes of innovation strategies that indicate the level of innovative pro-activeness. We label these "Followers" and "Creators".

In the following sections of this chapter we will go into greater detail of the two strategic archetypes and discuss the strategic rationale a company may have for adopting either of these strategies. It is important to remember that there is no right or wrong and that the choice of strategy is likely dependent on the specific situation of the company in question. For example, if entering a market without sufficient capabilities a company will likely fail, as on the contrary, a company with significant capabilities that follows to market might not be able to appropriate the same returns as if they would have been first. Lieberman and Montgomery (1998) argues that it is primarily the strength and weaknesses of a firms' resource base that effect the timing of entry. When a firm's strength lies in new product development, early entry is desirable, while strong manufacturing and marketing capabilities suits for a delayed market entry. In the context of this paper, market conditions and the company's resource-base are important factors in innovation strategy, but we also need to consider the firm's capabilities for recognizing and capturing opportunities which might be both expensive and difficult to acquire.

3.2.2. Creators

As mentioned above the firms called creators are those who have a proactive approach to technological development and innovation with the primary goal to sustain a market leading position by leading the digital transformation in their industry. The benefits of being first to market is dependent on industry conditions such as market maturity and barriers to entry (Makadok, 1998). Although there are many factors depending on how successful a first mover or creator can be, the literature commonly presents a couple of fundamental advantages to being first to market (e.g. Schilling, 2013; Dodgson et. al., 2008). *Brand loyalty* is one of these and has to with the customers getting tied up to the brand associated with the offer, which can help sustain market shares even after competitors with similar offers have entered the market, either by loyalty (Schilling, 2013) or by exploiting switching costs (Dodgson et.al. 2008). In addition, a head start in moving along the *learning curves* may lead to lower costs with increased cumulative output and *future success in patent races* may come with future implicit advantages through the appropriation of subsequent patents (Lieberman & Montgomery, 2007). Another benefit of being a creator is the possibility to pre-emptively acquire scarce assets such as market shares, key geographical locations, access to distribution channels and suppliers, or government permits (Schilling, 2013). One could say that patents also is a scarce assets, but no matter which form the assets take, being the first to realize an opportunity may allow you to capture the high ground and force competitors to compete from a disadvantageous position (Lieberman & Montgomery, 2007). This is especially true in industries characterized by dominant design, where being a first mover is likely to yield higher returns due to a higher rate of adoption than late entrants (Schilling, 2013).

3.2.3. Followers

Most literature focus on the advantages on being first, however, there are just as many advantages with learning from early entrants and specializing in being a fast follower (e.g. Robinson, Kalyanaram, and Urban, 1994; Dodgson et.al 2008; Schilling, 2013). The most obvious advantage of late entry is the uncertainties of customer requirements and the decreasing costs associated with research, development and implementation of matured technologies and markets (Schilling, 2013). Especially companies with mature marketing and manufacturing capabilities may take advantage of licensing and become fast followers to a lower cost (Dodgson et. al. 2008). The costs associated with setting up or developing a supply and distribution network can also be largely avoided (Schilling, 2013), and the existence of existing network solutions can allow followers to time their entry to their benefit and secure a steady cash flow early on (Dodgson, et. al, 2008). Similarly, enabling or complimentary technologies in the ecosystem might have had time to mature or be adopted by the majority which allows for late entrants to make strategic choice in the development of their own offer (Schilling, 2013).

3.3 Business Impact of Digital Transformation

3.3.1. Introduction to Business Impact of Digital Transformation

The second element of our conceptual framework is about the potential business impact of the digital transformation initiative. It is logical that any transformation initiative has a purpose, and that that purpose is rational. That means that an initiative also always have a desired outcome that in some way will improve upon the current business. One possible approach is to try to find common themes among typical digitally-enabled business transformation trends. A quick shift through literature gives us shortlist of the most common types of major initiatives; i) the transformation from traditional commerce to e-commerce (Gloor, 2011) and v-business (Barnes, 2007), ii) the increased efficiency of marketing efforts (Quelch & Klein, 1996; Weber, 2009; Kalaignanam, Kushwaha & Varadarajan, 2008), iii) the ability to collect and analyse vast amounths of data (McAfee & Brynjolfsson, 2012; Kohavi, Rothleder & Simoudis, 2002), iv) the automatization of various processes (Rifkin, 1996; Davenport, & Short, 2003), v) the ability to rapidly communicate on a local as well as global scale between both people and machines (Lee, Siau & Hong, 2003; Holler, Tsiatsis, Mulligan, Avesand, Karnouskos & Boyle, 2014), vi) and the possibility to completely re-invent industries through new digitally-enabled business models (Amit & Zott, 2012; Berman, 2012). Some of these transformations are already internalized in the vast majority of all industries. There is no large and established company today that does not have the capability to use the internet to communicate, that does not have an ERP system, or that does not utilize their own data or that of an external partners for marketing purposes. This approach only provides us with a small piece of the puzzle. Even though many of these trends in their entirety represent radical transformations of the way that companies operate, the reality is that most of the improvements made today are incremental. If we have a look at business model canvas (Osterwalder & Pignuer, 2011) we can identify two areas that can continuously be incrementally improved by any company through various digital transformation initiatives. Disregarding the already widely internalized trends such as the move from physical stores to online commerce, and the ability to effectively communicate on a global scale through the internet, we find that the intended business outcome of those incremental improvements can be categorized into two major areas. The increased connectivity of the people and things indicates the possibility to

incrementally improve the customer’s experience or the customer’s utility through digital transformation, and the improvement of the internal processes within the company and their network of suppliers and partners due to automation of various processes corresponds to the cost structure. The only outlier among the trends are the increased efficiency of the marketing efforts, but it could be argued that this trend can be cut up into two different pieces that fit nicely with our model. The first being that improved reach and targeting of marketing is an internal processes, and the other being that the value proposition is improved when the customers require less effort to find the product. Other elements of the business model canvas, such as the customer channels and the key partners, are subject to digital transformation due to a radical change in the overall way the company conducts its business, and therefore will be considered a new or radically transformed business model. Other possibilities includes getting influenced frameworks developed by various consultancies, but since these are likely subject to bias and economic interests, we have actively attempted to disregard these to as large extent as we are able.

In conclusion, analysis of the literature indicated that the main areas of the business that can be subject to incremental digital improvements can be categorized into two major areas; the improvement of the customer’s experience or the customer’s utility, and the improvement of the internal processes within the company and their network of suppliers and partners. The radical transformations are more often related to the business model itself without being confined to improving either the value proposition or any operative process. In short, this means that there are three major areas of the business that the digital transformation initiative can aim at improving (Figure 7). These stem from an analysis of the most common types of digitally enabled business transformations based on the business model canvas (Osterwalder and Pigneur, 2011). Firstly, we have the intention to improve the value proposition. Secondly, the intention to optimize any internal process in order to make operations more efficient. Thirdly, we have a transformation of the entire business model or the creation of entirely new ones. In the rest of this chapter you will find a more detailed explanation of these three areas.

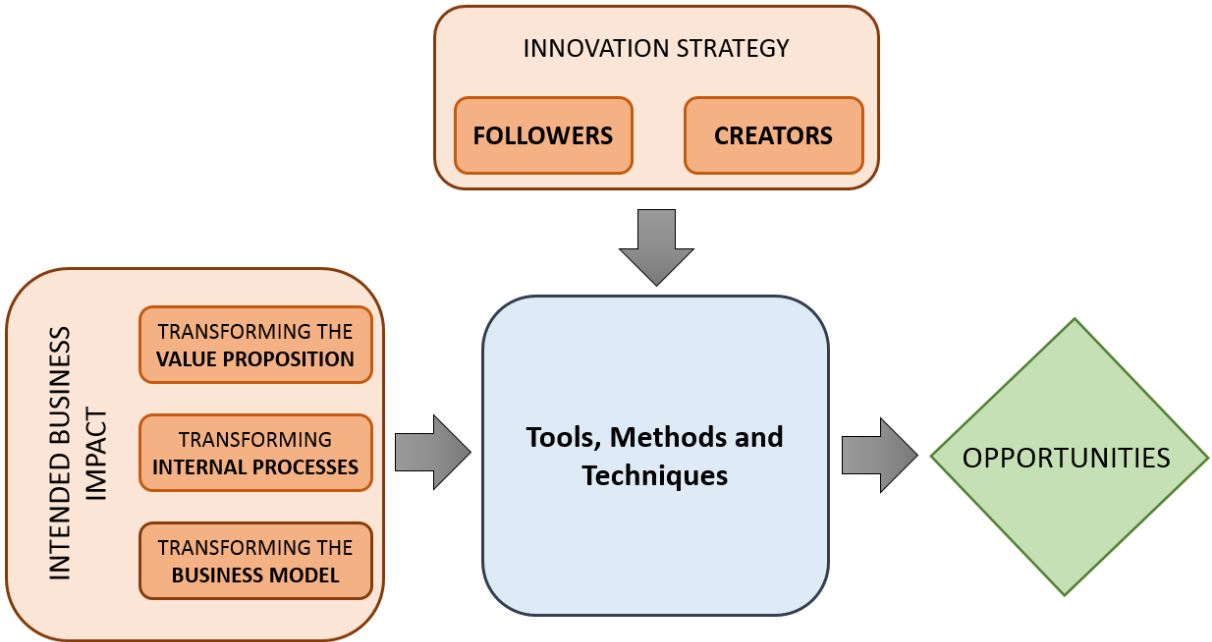


Figure 7. We build upon our framework by defining the areas of the business that can be targeted for improvement by capturing new opportunities. Any new opportunity can be aimed at transforming the company’s value proposition, at transforming one of their internal processes, or at transforming or creating entirely new business models.

3.3.2. Transforming the Value Proposition

The first of the three intended effects that a digital transformation initiative will have on the business is the improvement of the value proposition. Or in other words, the enhancing of the customer experience and user utility. This is the only of the three that has a directly applicable theoretical model. Its' two concepts are very similar but they approach the value proposition from two slightly different angles. Customer experience is the internal and the subjective response a customer have to any direct or indirect contact with a company (Meyer & Schwager, 2007). Or in other words it's the sum of all experiences the customer has along all the various touch points and throughout their relationship with the supplier of a service or a good. User utility is a more academic approach to describing the value proposition and a model of utility can help the supplier of a good or a service to understand the users perception of the service or good during the entirety of the customers relationship with the product, from the first intent of purchase to the disposal of the good or the termination of the service.

Customer Experience.

The literature offers a lot of different definitions of what the customer experience actually is. The common themes among them are *i)* the relationship between the expectations the buyer had on the service or the good before purchase and how these expectation were fulfilled, *ii)* the sum experience of the customers along any interaction with the selling company as well as the service or good itself, and *iii)* the indirect contact with the company that is communicated to at least one potential buyer (e.g. the word-of-mouth). The concept is complicated to analyse in a structured way and the only direct measures of it is self-reported customer referrals and various metrics of customer satisfaction. However, these metrics are enough to indicate a trend that spans most industries; that investment in customer experience management provides desirable benefits such as higher customer satisfaction and possible top-line growth through an increased customer retention and referrals (Strativity Group, 2009). While it is important to improve the customer experience, this is mainly done through brand management and by improving the availability and quality of the customer-representative interactions at various touch points. To find new ways of transforming the value proposition we need a more detailed framework explaining how the customer's impression of the service or the product can be improved.

User Utility

We use the term 'User utility' instead of the more common 'buyer utility'. This is to put a larger emphasis on the fact someone buying a good or a service is not always the same as the end-user. Their interest is however aligned in most cases. Unfortunately, this term makes it easy to overlook the strategic pricing component of the service or the good. This is a major drawback since the price is without doubt a major variable in any buy-decision. One model that we can use is the so called buyer utility map (Kim & Mauborgne, 2000), which combines the *customer experience perspective* and the *user utility perspective*, and allows us to categorize and explain the real life examples we encounter during our collection of primary empiricism. It can also be a tool that companies can use for structural search of new opportunities to digital transformation, to evaluate and tweak already recognized

opportunities from a user utility perspective, or to break down and explain how exactly the value proposition would change after the transformation.

The buyer utility map consists of two axes; one describing the different stages of the buyer's experience, and the other describes the different utility levers that can be improved upon. By using these to create a matrix you can in a structured way map out the strengths and weaknesses of both your own and your competitors value proposition, and using this to map out where potential improvements can be made. Combining this knowledge with a good understanding of new technologies and trends will allow companies to structurally exhaust the potential opportunities of transforming their current value proposition.

The buyer utility levers

The first dimension of Kim & Mauborgne (2000) buyer utility map is the so called utility levers. These are the different ways a service or a good can improve the utility for the buyer. Another way to think about it is that these levers show the different ways a selling company can unlock additional utility for their customer.

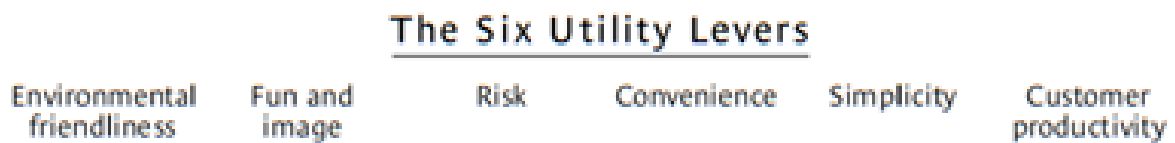


Figure 8. Source: Kim and Mauborgne, 2000. The buyer utility levers.

Environmental friendliness would indicate how much the product or the service fulfils the customers desire to be environmentally friendly. Since the green trend is one of the hottest topics today many customers consider this lever in their buy-decision (Laroche, Bergeron and Barbaro-Forleo, 2001), and hence most large companies have public strategies that is aimed at improving this value offer. *Fun and Image* represents how congruent the expectations of ownership is with the buyers' intrinsic and projected self-image. Or in other words how desirable the brand of the supplier and the reputation of the product or service are. Examples of this include how various luxury-clothing lines are able to charge a vast premium on the products, or how the label "made in China" for some people automatically brings up doubts about the quality of a children's toy. *Risk* is a lever that at first glance can be a bit confusing, but consider how an insurance company is able to mitigate a person's financial risk of ownership, or how airbags in a car can help reduce the physical risks associated with a collision on the road, and this lever is easy to understand. *Convenience* indicates how the buyer saves time and frustration. One example of this include how coffee shops located directly along the path of a person's morning commute tend to be the place they buy their coffee, even though the offer is practically the same in terms of quality and price in other, more distant, coffee shops. Other examples include how the life of the customer of a bank is made more convenient when they can do their banking online instead of having to visit a physical bank office every time, or how a company in the need of a certain type of low-cost service can accept the offer of another company actively pushing this service upon the market through cold-calls or aggressive relationship building in order to not have to spend time on searching for such a service provider themselves. *Simplicity* is strongly related to convenience is the essence that it reduces frustration and simplifies life for the buyer. Kim and Mauborgne (2000)

provides only one example of simplicity and it is the offer of Schwab, a discount broker, who launched a service that provided customers with a simpler methods of tracking the return of their dispersed portfolio of investments. Though it is unclear where the border between the simplicity lever and the two levers of ‘convenience’ and ‘customer productivity’ is, it is our understanding that it indicates the general impression of how much the product or service ‘makes life easier’ for the customer. *Customer Productivity* shows how the offer increases the user productivity by allowing them to perform a task in a “better, faster or different way” (quote, Kim & Mauborgne, 2000). Examples of this include how an induction cooker will allow faster heating of a pan and therefore decrease the time it takes to cook food, or how a web-based document processor such as Google Docs allow several people to simultaneously work in the same document and see each other’s edits in real time.

The buyer experience cycle

Whenever a person or an entity buys something, he, she or it goes through a series of experiences corresponding to the different stages of the interaction with the supplier and the good or service itself. Kim & Mauborgne (2000) have identified six separate stages comprising the buyer experience that run more or less in sequence. In each of these stages you have the factor of how well the utility levers are fulfilled and it all measures up to a measure of the customer’s experience. Firstly, we have the experience of the *purchase*. This stage includes the experience of both searching for and finalizing the purchase where that offer happens to be available. Normally in a physical store or an online marketplace. It is followed by *delivery* phase, which may or may not be a factor depending on what type of product or service you are buying. A product acquired over the counter can really only vary in the ease of which it is unpacked, but when something is bought online or if you purchase a service, any of the utility levers may be at play. For example, when you are ordering a taxi, factors such as the time until it gets there, the accuracy of the predicted arrival time and how close to your current location the taxi can get are factors that you will affect your experience of the delivery. The third stage in the buyer experience cycle is the actual usage of the good or the service which does not need further explaining. The fourth stage is called *supplements* and includes all complimentary products you need in order to gain the intended experience. Similarly, the fifth stage is *maintenance* and the utility associated with keeping the bought offer updated and functional can have a great impact on the total experience. Lastly, we have the *disposal* of the product or the termination of the service. As with all the other stages, the nature of the offer can make the importance of this stage differ heavily.

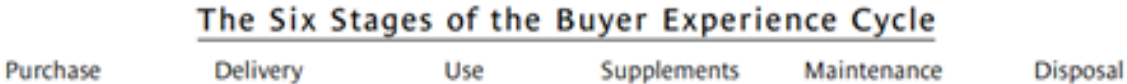


Figure 9: Source: Kim and Mauborgne, 2000. The buyer experience cycle.

3.3.3. Transforming Internal Processes

When a digital transformation initiative have the intended effect of optimizing one or a series of processes within the company we label it as a transformation of the internal processes. No matter what the initiative is, the purpose is always the same; to improve the efficiency or the company's operations. The most intuitive example of a transformation of an internal process would be the enterprise resource systems. These allow companies to analyse data and communicate between different functions, and thus profit from the reduction in wasted time and money. However, in this day and age there is to our knowledge no large and established company that does not rely on some sort of internal system for data management. So while this is a great example of a transformation of an internal process, it is not current one. Instead we find that the most frequent types of initiatives intended to improve upon an internal process fall under one of two categories.

Performance Management

Performance management, according to the literature, includes all activities that attempts to ensure that performance goals are met in a consistent and efficient manner (Otley, 1999). This includes facilitating the effectiveness of groups and individuals, as well as the efficiency of processes. The first one is difficult to tackle from the perspective of digital transformation, so in this thesis will be focusing on the latter. Every single action taken through a company's IT system is broken down into a series of transactions. These transactions are processed and stored for later retrieval or modification. This is the fundamental idea behind an information database, and when combined with an interface and more or less customized functions it creates an ERP system. With improved methods of data collection, management and analytics, companies are able to improve upon their processes or completely re-invent them.

The most hyped up tool available to large companies today is big data analytics. IBM (2014) defines big data as "a phenomenon characterized by the rapid expansion of raw data". The main reason for this rapid expansion of raw data is the increased number and decreasing cost of connected devices. Companies have begun to understand that the best way to increase efficiency of operations and marketing (and even sometimes to unlock additional utility for their customers) is to collect and process this vast amount of data. Big data analytics have the power to anticipate individual ambitions and detect patterns that are impossible to notice on small scale. Companies that can absorb this potential will have a great advantage over their competitors. Most executives understand this and are scrambling to develop big data analytics capabilities. One study from IDG Enterprise (2015) shows roughly 70 percent of companies are currently undertaking, or planning to undertaken, data-driven projects. However, investments in this field are costly and a vast majority of these companies are large businesses (in comparison to small or medium businesses). We would argue that there are two main types of data that can be analysed, and that these will allow the company to reach different types of outcomes. The first is the type of data that is collected within the company and its' processes. This includes transactional data such as sales figures and the performance of individuals, business units of product lines, and it is relatively simple for companies to collect. Transactional analytics are already performed on a smaller scale in most companies, but it puts a lot of emphasis on the manager's ability to interpret the data and attribute causality. The largely unrealized potential of big data analysis is what can best described as 'data mining' or 'data exploration' (Tan, Steinbach & Kumar, 2006), and these techniques can be used to perform more accurate analyses. Another type of data is the secondary data from third party platforms like social media tools and public institutions. This can potentially be analysed to improve upon the understanding of consumer pattern and global trends, as well as for marketing purposes.

Operating Procedures

In contrast to performance management, what we call operating procedures has to do with the actual way companies conduct their operations and the tools they use to do so. For example, Automating factories (Carlsson, 1995), putting RFID tags on goods in stock or transit to improve supply chain management capabilities (Veronneau & Roy, 2009), or more ambitious solutions along the same path (Mora, Suesta, Armesto & Tornero, 2003). More recently, hot topics include worker enablement tools such as incorporating cloud computing (Kamara & Lauter, 2010) and storage (Wu, Ping, Ge, Wang & Fu, 2010) and the ‘bring your own device’-concept (Bennet and Tucker, 2012). By taking a bird’s eye view on the types of operating procedures targeted by the literature, we can see that they can the technology involved can be categorized as either one that is already adopted by the vast majority of workers, or one that is either too expensive or complex for an individuals to have gotten accustomed to by themselves. The first category mainly includes enabling the workers by allowing them to use technologies that they are already familiar with in their daily work. As mentioned above, we have the cloud storage and cloud computing, which when taken to the extreme would allow many companies to have entire functions only existing virtually. This would greatly limit the need for office space and allow employees to utilize a great deal of the non-productive work time, such as during transit. The second category would be those operational procedures that are not possible for individual workers to absorb, such as automating a factory or putting sensors in products to receive real-time data of actual usage.

3.3.4. Transforming or Creating New Business Models

Now days, companies are not only trying to improve their value proposition or increase their operational efficiency. Most companies realize that if they do not change the way they do business to fit with how the world and the consumer patterns develop, they are soon going to suffer the consequences. It is hard to not think about classic examples such as how record labels lost customers to file sharing and music streaming services (Graham, Burnes, Lewis & Langer, 2004), or more recently how Airbnb is disrupting the hospitality industry (Zervas, Proserpio & Byers, 2014). This type of digitally-enabled disruptive business models are one of the absolute greatest threat to incumbents. It is also one of the hardest ones to guard against. A few arguments have been proposed as to why this is. For example, some researchers talk about how the existence of an established and proven business model acts as a mental trap for managers, making it harder for them to identify opportunities that lies outside of the boundaries of the existing company identity (e.g. Chesbrough, 2003; Bouchiki & Kimberly, 2003). This notion is well grounded in other fields of research as well, such as the concept of the cognitive heuristic known as availability (Tversky & Kahneman, 1973). It is also plausible that agency problems play a role in this, making managers risk averse and less likely to propose radical ideas due to the personal risk of being associated with a failed project.

One study by IBM (Pohle and Chapman, 2006) reveals that companies whose operating margin had grown faster than their competitors over the last five years are about twice as likely to emphasize innovation of the business model as their competitors. While this points toward business model transformation being an important element in the digital transformation, it is not entirely clear what type of innovation these companies did, or what size they were. In fact, the literature provides little to no direct explanations on how a large company should look for new opportunities to transform a business model. What is clear is that there are two types of business model transformation that

generally tends to be more successful than others. The first being the expansion of the top line growth through online sales (Gloor, 2011), and the other being the transformations that plays on the lock-in effect while adding new revenue sources, such as the case is with Apple's usage of complimentary product and services such as the iPhone and iTunes, or how Nespresso forces customers to use only their coffee capsule once you have bought the machine (Amit & Zott, 2001).

Unfortunately, we find no structured way to categorize or classify different types of digitally-enabled business model transformation in the literature. However, if we analyse the types of transformations that is mentioned, three types of trends appear. The first is the disruptive and entirely new digitally-enabled business models the likes of Airbnb or Uber (Zervas, Proserpio & Byers, 2014). The second is the increase of top line growth through engaging in new e-commerce (Gloor, 2011). Thirdly, we have a change in the revenue sources by either adding complimentary services to an already existing offer or by finding entirely new revenue streams (Amit & Zott, 2001).

3.4 'Tools, Methods and Techniques' for Recognizing Opportunities to Digitally Transform

The last element of our model is the one we named tools, methods and techniques. The two previous elements were the determinants of the organizational construct that companies use to recognize new opportunities, and they project a 2x3 matrix of different possible strategies on this, the final element. We are making the assumption that all companies want and need to transform in some extent, and as such they must make a choice as to how much of a follower or a creator they want to be for each of the three areas of intended business impact. These tools, methods and techniques may be related, but a company is not forced to choose either of the pro-activeness strategies for all the areas of business impact. For example, a company may want to be a creator for the transformation of the value proposition, and at the same time a follower for transforming internal processes and the business model. There is no right or wrong, but instead there can be several different strategic reasons for a company choosing to be a follower or a creator for either of these areas. We hypothesize that there the main differences lies in the actual tools methods and techniques used, but also in the sources of knowledge the company taps into. Given this, it is also likely that the key success factors, or typical challenges if you will, are dependent on these factors. Therefore, we will investigate how these differ between all of the six possible strategies derived from our 2x3 matrix (Figure 10). In the following section, we will briefly report on the empirical literature for each of the factors 'tools, methods and techniques', 'sources of knowledge', and 'key success factors'.

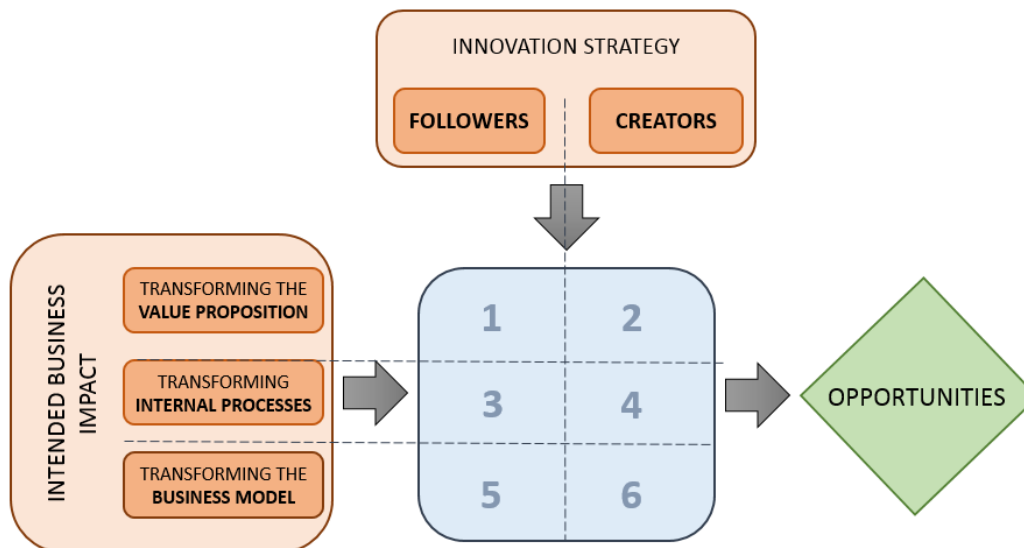


Figure 10. The two previous elements projects a 2x3 matrix of possible tactics companies can use to recognize new opportunities to digitally transform. We will investigate if and how these six tactics differ in regards of the tools, methods, and techniques used, the sources of knowledge they tap into, and the key success factors.

3.4.1. Tools, Methods, Techniques

As opportunity recognition is a widespread topic of discussion it is hard to define which tools and methods that are used to find opportunities to digitally transform. Instead, we have used a combination of exploratory interviews with experts and a holistic sift through the literature on innovation management and opportunity recognition to create a list of the most common tools, methods and techniques that will give the reader an overview of how companies can find new opportunities to improve their reach or performance. However we have decided not to go in to detail when describing the tools and methods, due to the different ways that companies work with opportunity recognition, mentioned by Zahra, Korri, and Yu (2004). Table 2 reports the full list of tools, methods, and techniques found through the literature search.

Tools, Methods, Techniques	Objective
Big-Data Analytics	By using large quantities of data, firms can through different analysis methods acquire insights on various topics, most often regarding customer preferences, and how the company performs. The main purpose for big data analytics are to get insights on performance and to see future opportunities and threats (McAfee and Brynjolfsson, 2012).
Foresight	Corporate foresight refers to a firms ability to detect discontinuities and change early. This includes both cultural and structural elements that has the ability to detect changes. When discontinuities are detected a firm interpret the consequences and from there excels to formulate responses in an efficient way (Rohrback and Gemunden, 2011).
Trend Watch	With the objective to identify future trends to find threats and opportunities, trendspotting has become a popular tool to stay ahead of competitors. This can be conducted through, trend Spotting, trend analysis, and patent-analysis, to mention a few (Martino, 2003).
Innovation Jam	By connecting users, employees, and sometimes even suppliers, the goal is to gather new ideas and then let professionals and users elaborate and build upon these, with the purpose of taking the ideas and develop them into real life solutions (Schilling, 2013; Bjelland and Wood, 2008).
User Collaboration	Engaging users in order to attract feedback and data are one of the most effective kinds of information gathering today. To be able to get feedback on functionality, perceived problems, and possible solutions can enable companies to find opportunities to develop their good to increase its value. (Schilling, 2013).
Technology Roadmaps	Technology roadmaps are used in industry in order to be able to portray relationships between technology and applications. The roadmaps functions most often as aids for decision making in complex situation. They are also used in order to interpret and analyse new technologies, therefore working as a tool for recognizing new opportunities (Kostoff and Schaller, 2001).
Workshops	Similarly to the innovation Jam, the traditional workshop is still an effective and commonly used way of attracting new ideas and finding solutions to existing problems. The concept consists of gathering people with expertise on different subjects in order to get as many points of view on the topic of discussion (Geschka, 1986).
Innovation Network	Since the complexity of new products and services increases firms have started to seek new opportunities and capabilities through collaboration. By getting access to new complements and new ideas that others possess it is possible to create new offerings through the use of these, either to use best practices or for further development (MacCormack, Forbath, Brooks & Kahaler, 2007).

Table 2. Tools, Methods & Techniques. Results from literature search

3.4.2. Sources of knowledge

Individuals

Individual creativity and idea generation are today one of the most important sources of obtaining internal knowledge for innovation (Schilling, 2013). Research indicate that it is not R&D personnel that creates the most novel and successful ideas, but that these actually are derived from management, production, and marketing staff, making individuals a crucial source in the process of opportunity recognition (Dodgson et. al. 2008). In a similar fashion, the buyers, users, or other individual within the company's network can be a source of new innovations. In order to deal with the absorption of this idea generation many firms have created internal idea boxes and shark tanks, enabling and encouraging individuals to submit and present ideas to management. Other firms have, such as IBM, created systems in order to reward individuals with points and bonuses in order to increase the internal idea generation (Bjelland and Wood, 2008).

Firm research and development

The most traditional source for developing new goods and technologies are the firm's internal R&D departments and its' exploratory or experimental activities. This includes all three steps in the development process, where both basic and applied research is conducted as the first two phases, and the third phase, development refers to the activities where application of knowledge in order to develop devices, processes or materials (Dodgson et.al, 2008).

Universities and government funded research

It is today common that universities engage their research towards innovative solutions. Most often universities direct their research towards innovations that can lead to both patented and unpatented solutions, and does often make these novel solutions public. Another governmental action that firms can benefit from are government funded research, most often in the form of science parks and incubators (Schilling, 2013). The main purpose of parks and incubators are to boost the national economy's development and to provide solutions to firms that struggle with funding. These initiatives allows firms to appropriate value in the form of synergy effects and getting cheap and easy access to intellectual property rights (Yam, Lo, Tang, and Lau, 2011).

Firm Linkages and collaborative networks

As globalization and technological disruption today are a reality for almost every major firm, alliances with suppliers, users, and often competitors are today a great source of new and innovative solutions. These kind of collaboration can come in many different forms and benefit firms to different extent, however, the main content is that by collaboration and pooling risks firms can benefit in the form of both capital and knowledge that otherwise would have been hard and costly to acquire. The most frequent collaborations are with suppliers and users, due to low risk and very beneficial information that can be obtained. Further the most frequent collaborations with the purpose of mitigating risks are to form an alliance with competitors, most often through joint ventures and collaborative research and development. The use of collaborative networks can enhance firms' innovative capabilities significantly. These networks are most often seen in the shape of licensing agreements, government sponsored joint research programs, and informal networks (Schilling, 2013). Through these agreements costs can be shared, allowing better and cheaper access to knowledge and know-how,

while simultaneously connecting firm individuals, therefore expanding the firms' collaborative network for future alliances (West and Bogers, 2014).

3.5. Conclusions on Theoretical Framework

After going through the theory trying to answer the research question 'how can large established corporations recognize new opportunities for digital transformation?' we have not able to find a perfect framework. Instead we developed the conceptual framework which we based the detailed literature search on. It is clear that further data needs to be collected and this will be done through interviews. However, some theories on entrepreneurship and innovation management can be applied to our research if we allow for a small level of interpretation by us, the researchers.

Firstly, it is clear that different companies can have different strategies in due to the different levels of pro-activeness of innovation they want. Developing novel solutions and applying unproven technology to improve the business generally results in a high risk-high reward kind of situation. For large corporations who are normally very rigid and under competitive pressure to maximize profits while keeping prices low, it is likely that going with tested and tried digital solutions is the best way to move ahead. However, it is also likely that different companies, depending on their unique situation, might want to mix the level of resources allocated to innovation and ideation depending on the type of business outcome it is expected to have. For example, some companies may want to compete by having the best possible value proposition while keeping the risks associated with transforming their internal processes such as creating automated factories or implementing a highly customized ERP system to a minimum. Other companies might worry about the risk of being disrupted by a completely new business model and want to guard against that or perhaps even get a jump start on their competitors.

According to the literature, the way that companies do this today is through various innovation and ideation management techniques, such as ideation workshops, foresight tools, and innovation jams to. However, the literature does not specify what methods are most appropriate for finding opportunities and ideas within the different areas of the business, but are instead described in a more general way. It is therefore of interest to further investigate which methods are most appropriate for each of the innovation strategies and the targeted areas of the business. The literature further present a number of common sources of knowledge that are drawn upon using these tools, but fails to present a more detailed view of which sources are most appropriate in which circumstances. The most common sources found are knowledge from individuals, from conventional research and development, from partner networks, and from universities and other government funded research.

From our research so far we can conclude that depending on which parts of the organization a company desire to change and the level of strategic pro-activeness the firm has, different methods and techniques for finding opportunities are likely to have varying success. The same applies for what sources to draw the necessary knowledge from. Further we have enough insights from the literature search to believe that there are different factors that contributes to firm's success in recognizing opportunities.

4. Results

This chapter report on the results from our six different case companies and the external expert consultation. We also present sample descriptive as well as some additional background regarding the companies represented. The results are organized according to themes to allow quick and easy comparison between subjects.

4.1. Introduction to Case Companies

Our sample of case companies consists of five large established manufacturers and one operating mainly in logistics but with a large numbers of side-businesses. Table 3 summarizes the six case companies.

Company	Size (Employees)	Revenues (SEK, billion)	Industry
Volvo Group	92,822	283	Manufacturing
Volvo Cars	24,124	130	Manufacturing
Stena AB	20,500	33,5	Logistics
SKF	46,509	70	Manufacturing
MAN	55,900	132,5	Manufacturing

Table 3. Descriptives of case companies.

Volvo Group

The Planning and Innovation department, a part of the Corporate Process and IT Headquarters, have the responsibility to improve Volvo Groups overall performance by leading the early phase of the innovation process. The responsibilities lies with long-term planning and prototyping, with the goals of creating new ways to improve the business and to challenge the old ways of working. As being initiators of innovation, this means that the responsibility to recognize new opportunities lies within the innovation function. Interviewee (1) works within the innovation department, mostly responsible for prototyping, and interviewee (2) is the head of corporate culture, with a background from the innovation team.

Department/Business Unit	Assigned Number & Position
Process & Innovation	(1) Innovation Manager
Executive Head Quarters	(2) Head of Company Culture

Table 4. Descriptives of Volvo Group Interviewees.

MAN Group

As one of the leading European commercial vehicle manufacturers, MAN Group is present around the globe with close to 56,000 employees (MAN, 2014). They have taken both a centralistic and a decentralized approach to innovation and digitalization. Within every area of the corporation they are proactively working with innovation, as well as having a central innovation department responsible for recognizing opportunities to transform the company. The interviewee works within the central innovation department as an innovation manager, working on a project basis.

Department/Business Unit	Assigned Number & Position
Line Function	(3) Innovation Manager

Table 5. Descriptives of MAN Group Interviewee.

Stena AB

Today active within multiple different industries, Shipping, drilling, and property to name a few, and currently present in all worldwide with over 20,000 employees (Stena, 2014). The interviewee are the head of digitalization, with a close team of five individuals they are responsible for digital transformation throughout the Stena sphere. Their main responsibilities lies within prototyping and experimentation to find new ways to digitally improve the performance of Stena AB. With a limited budget they aim their efforts towards smaller prototypes in order to guide further development efforts on the appropriate function.

Department/Business Unit	Assigned Number & Position
Corporate HQ	(4) Chief Digital Officer

Table 6. Descriptives of Stena AB Interviewee.

SKF

Currently active within 28 countries, SKF is a world leader within bearings (SKF, 2014). The interviewee works as an innovation manager within the innovation department, who have a centralistic approach to innovation. Innovation managers are responsible for ideation and opportunity recognition, while facilitation and development lies within the appropriate function.

Department/Business Unit	Assigned Number & Position
Innovation	(5) Innovation Manager

Table 7. Descriptives of SKF Interviewee.

Volvo Cars Corporation

With a presence in 100 countries worldwide, Volvo Cars today employs over 24,000 and are a part of the Zhejiang Geely Holding group since 2010 (Volvo Cars, 2014). The interviewee's work within the central innovation department, mainly focusing on innovations towards sales. Their aim is to move more focus towards digitalization in order to increase customer satisfaction. The innovation managers have an overlooking prototyping approach to the entire corporation, while smaller initiatives are conducted within the company's different functions.

Department/Business Unit	Assigned Number & Position
Innovation	(6) Innovation Leader
Innovation	(7) Innovation Manager

Table 8. Descriptives of Volvo Cars Interviewees.

4.2 Introduction to expert consultation

Our sample of expert consultations consists of one major Swedish firm providing IT- and business transformation solutions.

Company	Size (employees)	Revenues (EUR M)	Expertise
Tieto Sweden	3,953	1,522	Digital Transformation

Table 9. Descriptives of expert company.

Tieto

Tieto is one of northern Europe's leading IT system and consulting firms, with customers all over the globe. The last decade has been dedicated to decrease the gap between companies IT functions and the way the company conduct their business, i.e. digitally transform companies to use IT to their advantage (Tieto, 2014). The Expert is a program manager, currently working on a project within transformation of energy utilities.

Department/Business Unit	Assigned Number & Position
Energy & Utilities	(8) Program manager

Table 10. Descriptives of Tieto Interviewee.

4.3 What is digital transformation?

This section revolves around how the interviewees define what digital transformation is.

What is digital transformation?

Interviewee:	Response:
(1)	<ul style="list-style-type: none">- How various digital enablers change the way you do business.- Can be internal and enable us to change the tools we are working with, but also be about the way you are selling.- Digital Transformation is mainly about radical changes, but small incremental changes can be an enabler or a trigger for a radical transformation.- It is only useful to think about radical transformation within our own industry. What is new for us can already be a standard practice in another industry, but that doesn't mean it is not radical.
(2)	<ul style="list-style-type: none">- Digital technologies that can enable a transformation of the organization in some way.
(3)	<ul style="list-style-type: none">- Digital transformation is everything connected to digital devices that can create a change within the company. More exactly it is how digital enablers can impact the way an organization do business.- Digital transformation is a radical change, although it is often smaller incremental changes and incremental development that enables for a digital transformation.
(4)	<ul style="list-style-type: none">- How you can drive change by the means of digital enablers. Everything digital that can be used to change or transform the company in any way is considered digital transformations.- The digital changes are radical in its nature, but there might be incremental changes and transformations that underlie and enable the radical.
(5)	<ul style="list-style-type: none">- Considers digital transformation to be digitally enabled improvement of practices.- Digital transformation can encompass both radical and incremental innovations.
(6)	<ul style="list-style-type: none">- Means that a digital technology can enable transformations and improvements. This means that they use existing technologies that can enable them to digitally transform.
(7)	<ul style="list-style-type: none">- The definition is very hard and means that it is different things to different people. Means that digital transformation is anything that you can do with the help of technology.
(8)	<ul style="list-style-type: none">- Digital transformation concerns how a company move from their current position to their intended by the use of digital technology.

4.4 Digital transformation strategy

This section concerns the interviewee's and their companies approach to digital transformation strategy.

Digital transformation strategy

Interviewee:	Response:
(1)	<ul style="list-style-type: none">- No existing digital transformation strategy- Instead there is sort of an emerged DTS that originates from a clearly communicated long-term plan.- The lack of a digital strategy makes it hard for those tasked with identifying new opportunities to digitally transform to show the rest of the company the “big picture” and to communicate the benefits of these changes would have.
(2)	<ul style="list-style-type: none">- No strategy at the moment, but are trying to integrate digitalization within long term planning.
(3)	<ul style="list-style-type: none">- At the moment there are no outspoken digital transformation strategy, but they have a vision of how one would look.
(4)	<ul style="list-style-type: none">- No clearly communicated strategy throughout the concern, however they do have a digital strategy. This digital strategy only concern improving existing business initiatives and are therefore not considered a clear digital transformation strategy.
(5)	<ul style="list-style-type: none">- They have an emerged strategy, but not clear and outspoken. They have a vision of creating a strategy in order to be able to better innovate and build capabilities for foresight.
(6)	<ul style="list-style-type: none">- The IT department has a clear digital transformation, however, this strategy does not encompass the entire corporation. Therefore there is no clearly outspoken digital transformation strategy.- The innovation team and its efforts are more aimed towards accomplishing goals towards sales more than toward digital transformation.
(7)	<ul style="list-style-type: none">- No clear strategy, but they have a sense of urgency that this is going to be very important in the future.

4.5 The focus areas for digital transformation

This section revolves around the companies different areas that they aim to develop through the use of digital enablers. The three main areas are the value proposition, internal processes, and business models.

The focus areas for digital transformation

Interviewee:	Response:
(1)	<ul style="list-style-type: none">- Most new digital transformation initiatives are aimed at improving a current practice within the company, such as using Big Data and new technologies in the everyday operations.- Some of the new ideas are aimed towards finding entirely new business models, but they have only been discussed on a very small scale yet.
(2)	<ul style="list-style-type: none">- The value proposition is the most important one in the everyday efforts, however the business model are important in order to find new ways to reach out to new customer segments.
(3)	<ul style="list-style-type: none">- The main focus lies in developing new or existing business models in order to be able to increase revenue streams.- The different departments in the organization are always looking into how they can make internal processes more efficient.
(4)	<ul style="list-style-type: none">- The value proposition is the main area that improvement are focused towards, trying to change the entire business movement so that the entire concern moves towards the same direction.- Internal processes are always in focus as well, where they try to follow the money in order to find new digital solutions in order to be both more effective and efficient.
(5)	<ul style="list-style-type: none">- The biggest part of their efforts for transformation is aimed towards the customer value proposition. He further mentions that this effects the entire business model, but that the main focus are aimed at increasing customers' value.- Since their biggest advantage is economies of scale they have a focus towards transforming internal processes since efficiency makes significant changes when depending on scale.
(6)	<ul style="list-style-type: none">- Transforming the value proposition is always of great importance due to that the customer is last in the value chain.- Internal process efficiency are constantly under transformation, mostly within the different functions, but also from the innovation managers.- Recently they have transformed their business model, mainly focusing on selling directly towards their customers.
(7)	<ul style="list-style-type: none">- Most focus is aimed towards transforming the value proposition by constantly aiming efforts to make their cars better with regards to the users.- Constantly looking into new business models and have just done a significant digital transformation of their business model.- Internal processes are developed within the different functions, while the innovation department mostly focuses on new ways to sell cars.

4.6 Innovation strategy: Creator or follower

This section concerns how the interviewees define their company's strategic approach, i.e. if they see themselves as a follower or a creator within different areas of their industry.

Innovation strategy: Creator or follower?

Interviewee:	Response:
(1)	<ul style="list-style-type: none">- More proactive in transforming their internal processes, in this case referred to as prototyping.- Within smaller parts of the company they are being proactive within digital transformation, but as a whole, they are followers.
(2)	<ul style="list-style-type: none">- Trying to be a creator in the sense that they want to be first in developing new value propositions to their customers.
(3)	<ul style="list-style-type: none">- Mostly a follower when it comes to developing new technological solutions.- Considers them to be a follower regarding internal process transformation, where they like to wait and see in order to adopt best practices.- Regarding transforming the value proposition and transforming business models they are creators to some extent, emphasizing that they strive towards being creators. Learning from others in order to be able to become creators makes them both followers and creators.
(4)	<ul style="list-style-type: none">- Due to very high security restrictions it is hard to be the leading force within the industry. They have to follow restrictions, making almost every company on the market a follower.- They try to be leading within internal process efficiency, especially regarding fuel consumption.
(5)	<ul style="list-style-type: none">- Consider his company to be leading in some aspects, primarily when transforming their value proposition.- Overall considered to be a fast follower, but a high-end developer of technology and products for their market.
(6)	<ul style="list-style-type: none">- Within the manufacturing they are followers using existing technology, transforming it towards their best use.- Creators in the sense that some functions are very advanced and considered industry leading.
(7)	<ul style="list-style-type: none">- Striving towards being leaders in certain areas, but overall they are considering themselves to be followers. This in the sense that they often adopt existing technologies and best practices.

4.7 Recognizing opportunities to digitally transform

4.7.1 Organizing for recognizing new opportunities

This section regards how the different companies are structured and organized. More precisely which function of the organization that is responsible for recognizing new opportunities to transform.

Organizing for recognizing new opportunities

Interviewee:	Response:
(1)	<ul style="list-style-type: none">- The innovation department are responsible for ideation, foresight, and prototyping. They are involved in the early phase of the transformations but later on the responsibility is put on the functions and external consultants.- The lack of digital transformation is the main reason for Volvo not having a clear chain of responsibility when taking the next step in the development or transformation. They need to put a demand on the different domains so that the transformation can easily take the next step in order to go from prototype to actually being put to use. The lack of a digital strategy makes it harder for the innovation department to show “the big picture”, i.e. to communicate the benefits of change and transformation.
(3)	<ul style="list-style-type: none">- There are no central department that are responsible for coming up with new ideas and to find opportunities for transformation. The innovation managers have a centralistic innovation management structure, looking at new products, business solution innovation, and possibilities to create or transform business models. Digitalization is embedded as a part of this department, but is not an entity for itself. Top management have given the innovation managers mandate to create new ideas, enabling more freedom for the department to follow up on ideas and creating new solutions and prototypes.- The IT department are also involved in the digital transformation efforts. Their responsibilities lies primarily in IT efficiency and transforming current IT solutions for the better.
(4)	<ul style="list-style-type: none">- The main responsibility lies on the position of the Chief Digital Officer to gather ideas and solutions in order to digitally transform. Using his professional network to its full extent, meaning that this is the most efficient way of finding new ideas and solutions.
(5)	<ul style="list-style-type: none">- The responsibility to recognize and facilitate opportunities lies within the innovation function, while execution concerns the relevant part of the organization.
(6)	<ul style="list-style-type: none">- The innovation department have the responsibility for recognizing new opportunities.
(7)	<ul style="list-style-type: none">- The innovation department are responsible for coming up with new ideas and prototyping. They have a mandate for doing this themselves and can set up workshops and other practices in order to find new opportunities.

4.7.2 Budgets and financials

This section regards how the interviewees find their companies are financially structured with regard to budgets to find new transformation initiatives.

Budget and financials

Interviewee:	Response:
(1 & 2)	- The budget for specific types of ideation initiatives such as workshops and the Jam-IT are fixed, while prototyping and other small initiatives are on a budget but they are intentionally starved on both time and capital.
(3)	- The budget for the innovation department and the IT department are fixed, however the budget can be extended on a project basis when a new area of improvement or novelty arises.
(4)	- There are a very limited outspoken budget for ideation and prototyping, where the budget is divided to two different areas, namely prototyping and expert advisory in the form of consultancies. - Funding are available on an ad-hoc basis for further development, where “stealing” from other departments budgets are used to a great extent. Here Stealing means that you present an idea to an appropriate function with the hopes of finding someone interested to develop the idea. This kind of behaviour are beneficial for both parts involved as it can extend both skills and funding for a transformation initiative.
(5)	- The innovation function is financed on a case-by-case basis, by either the function itself or from the R&D budget.
(7)	- The unit have a fixed budget, but costs in the later stages of development in put on the functions

4.7.3 Tools, methods, and techniques

This section shows the different tools, methods, and techniques that companies use to find new opportunities, and how the interviewees find them effective.

Tools, methods, and techniques used for finding new opportunities

Interviewee:	Response:
(1)	- Constantly working with foresight in order to be able to recognize challenges and opportunities as early as possible. - Traditional ideation workshops where people from different or the same functions meet and brainstorm with the purpose of identifying problems and to find solutions to both the most urgent issues, but also to identify future opportunities. - Once a year an innovation jam called Jam-IT are held with the sole purpose of attracting and building on ideas by engaging users, suppliers, employees, and in some cases student. The targeted outcome of the jam is that the ideas submitted and built upon are to generate 3-5 ideas that will be developed into prototypes. - Frame some leading questions that other functions can answer, this mainly to provoke problems, then feed them some inspiration material, mainly what other industries are doing today or are trying to do. This will lead to a more outside perspective in order to find potential areas of improvement. - Engaging users through the use of feedback systems in different ways, all depending on the area of interest.

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- Using consultancies in order to get experts point of view. These insights often help to guide the search for new opportunities and towards what other industries that can be of interest.
- (2)
- Using cultural changes in order to create a more creative innovation climate, hence increasing the company's ability to find new opportunities.
 - Using foresight in order to plan for the future.
 - Workshops and innovation jam are annually held to find new opportunities to transform.
- (3)
- The use of an innovation cell are a successful concept when finding problems and solving issues through ideation. During eight days employees from different functions meet in order to discuss new ideas in order to get as many angles of a problem as possible. During these eight days they are going through three different stages, namely learning, creation, and development. After the end of the innovation cell they have a portfolio of new ideas to take further and then try to evolve on these ideas.
 - They have a future research department with the sole mission to look at future trends, foresight and forecasting. The purpose of this department is to find potential disruptive technologies, analyse what problems are urgent, and then prioritize.
 - The innovation department are responsible for prototyping, as well as hosting traditional workshops with other functions, both to spin off on new ideas and to generate new ones.
- (4)
- Trend spotting is considered the most efficient way of noticing new and innovative ideas, mainly through networking and attending technology fairs and similar events.
 - Working with their digital transformation by connecting people within the organizations different entities in order to bring forth new innovative ideas. They have created a vastly spread contact network throughout Stena and often bring these people together in order to discuss new solutions to existing and emerging problems through workshops.
 - Currently working with big data analytics in order to get industry insights, trying to find future trends.
 - Creating prototypes and finding opportunities by hand-on experimentation.
 - Trial and error is a commonly used way of working, with the motivation that following the money in order to find areas of improvement is the best way of finding new opportunities. Looking at where they have heavy expenses, following the money to see what they are spent on, and then trying to find new solutions on how to decrease the costs execute this. Failing fast and cheap is considered to be the way of approaching new opportunities.
- (5)
- Using foresight to be early on picking up trends and technologies that can be disruptive or in any way effects the company.
 - There are a widespread use of customer- & employee feedback systems that allow for idea generation, leading to the ability to identify potential areas for transformation.
 - Internal structures such as Shark tanks and innovation jams to generate ideas that can be built upon.
- (6)
- Workshops are constantly held throughout the corporation, with the purpose of discussing ideas and problems in order to find opportunities to improve the company performance.
 - Innovation events are held continuously, with one major event that is built on the principles on innovation-jams. The smaller events are held through their intranet when managers see it fit.
 - Seminars are held with the purpose of discussing burning issues and upcoming challenges. To get as much quality as possible they are always on a specific subject, involving people within different knowledge backgrounds.
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- (7) - Workshops around a certain theme are often held by appointment of innovation managers.
 - Internal research conducted by the innovation managers has turned out to be a great source of knowledge and ideas.
 - (8) - Having a clear business strategy can be seen as a tool in order to recognize what has to be transformed in order to reach the desired outcome.
 - Internal research conducted towards specific areas are highly likely to generate new opportunities. Pre-studies can be an efficient way to quickly see if there are any prominent opportunities within the area of interest.
 - Workshops and “dragon dens” are frequently used methods to recognize new ideas and to build on existing, as well as larger Jam’s.
 - Using consultants within the current area of interest can be a good way to get an external and experienced point of view.
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4.7.4 Sources of knowledge

This section revolves on the interviewee’s opinions on which sources of knowledge are most appropriate in order to find new opportunities.

Sources of knowledge

Interviewee:	Response:
(1)	<ul style="list-style-type: none"> - Other industries that are interesting are especially Retail and Banking due to them going through similar changes and challenges. The Aeronautics industry is interesting to see what a high-tech company are doing and to be able to early recognize new technologies. - Engaging users, employees and students through different collaborations, mainly represented by the Jam-IT - To always include the end user are of great importance. How does the end user benefit from this idea? This is the most important factor when recognizing new opportunities to transform.
(2)	<ul style="list-style-type: none"> - The user holds the most valuable information when transforming business models and the value proposition. - Partnerships can be a source of information in order to find new ways of working.
(3)	<ul style="list-style-type: none"> - Every employee knows that they are able to pitch ideas to their management, this behaviour is encouraged by top management. If an employee feels that they are running low on ideas in their portfolio, they have the possibility to set up traditional workshops or an innovation cell in order to attract and create new solutions and ideas. - The use of technology roadmaps and collaboration with universities are frequently used concepts. - Working with users is considered the best source of knowledge for new ideas. Different type of initiatives are conducted for the user collaboration, for example the “driving school” where they offer teaching/driving for users, and in return they get user feedback about the user’s opinions, problems they detected and what worked satisfying. - Lot of heavy industries are always monitored. The primary areas are where there are currently heavy technology investments, such as aerospace and the turbine industry. They have for example looked into how elevator industries

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- transformed digitally towards new elevators. Industries looking towards services and trying to learn from them are of great importance for future opportunities to create and transform business models.
- (4)
- To share information about opportunities that has been discovered to other firms are considered to bring more value than it costs. If sharing knowledge it is more likely that you will get knowledge on opportunities from others.
 - Employees are a great source of innovative ideas, and presenting ideas to managers are an encouraged kind of behaviour.
 - Traditional workshops with people from different functions are a frequently used method to discuss opportunities and challenges that lies ahead of the organization. The main purpose of these gatherings are to come up with new, and expand on existing ideas on how to transform the company.
 - Trying to create forums with knowledgeable people all around the world, with the aim of discussing many different subjects, with the purpose of sharing knowledge in order to receive quality input that may provide opportunities to digitally transform.
 - Customer interaction can provide great insight on how the company needs to transform their value proposition. Customers and users can provide feedback on problems, what is satisfying, and what they are missing regarding goods and services.
- (5)
- Close relationship and collaborations with universities in order to access their knowledge base.
 - Obtaining knowledge from users, customers, and employees are of great importance in order to identify problems and their possible solutions.
- (6)
- Relationships with universities in order to get another point of view on challenges and opportunities.
 - Using external networks to gain inspiration and in order to exchange knowledge.
- (7)
- University connections, in order to gain new knowledge and the point of view of talented students, which often differs from people within the organization.
 - Internal research conducted on many different functions.
 - Identifying problems through workshops and then following the problem to its origin is a proven effective way of finding potential areas of improvement.
 - Monitoring other industries as well as competitors in order to find new digital practices that can be adopted.
 - Searching for user and technology interactions to identify new opportunities that are yet unexploited.
- (8)
- Monitoring competitors as well as other high-tech industries can be important in order to find digital enablers that can help firms to recognize new transformation possibilities.
 - Looking for problems and then trying to find the source to the problem can be an efficient way of finding areas for transformation.
 - Searching for knowledge through collaborations and partnerships.
 - Searching both internal and external are of great importance. Depending on which part of the organization that transformation effort is aimed employees and customers are probably the best sources for knowledge.
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4.7.5 Key success factors

This section revolves around the interviewees opinions on which are the most important success factors in order to find new opportunities to digitally transform.

Key success factors for finding new opportunities to digitally transform

Interviewee:	Response:
(1)	<ul style="list-style-type: none">- The importance of following up on ideas are considered the largest success factor to be able do digitally transform. Letting the “creator” of an idea know that this kind of behaviour is accepted and preferred.- Champions within the company gives a higher success rate due to their efforts of facilitating new solutions and in that way develop even more ideas on how to transform.- Top management sponsorship are of great importance. Not only in order to delegate responsibility, but to mandate down the hierarchy and letting others take responsibility, something that drives up the pace of transformation efforts.- Including the end user by collaboration, asking how can the end user benefit from this idea? What possible problems are there? What solutions can we provide?- Organizations are always trying to solve “burning issues” which are happening right now. If you can get a trade-off between being proactive and patient, transformation efforts will be more frequent and successful.- The innovation department have a deficient communication with other department, which makes collaboration unsuccessful.
(2)	<ul style="list-style-type: none">- Leadership is fundamental for success, to get rid of the old traditional thinking of doing the same things better and instead increase the risk taking looking towards new solutions.- Creating a clear transformation strategy and a budget will help guide efforts towards recognizing new opportunities.- Partnering with companies that have other competencies in order to share experiences and technology.- Working close to customers in order to find preferences and upcoming needs.
(3)	<ul style="list-style-type: none">- Using the principle of total cost of ownership is applied, meaning that the development of an idea to transformation are owned by one function, instead of multiple stakeholders within the firm being involved.- Being able to bridge silos is considered to be a crucial success factor for recognizing opportunities to transform. This is due to that silos often only focus on their own efforts to develop, while bridging silos enables collaboration and getting involved in other opportunities than their own. This sort of collaboration engages people with different skills to work on the same problems and opportunities, which increase the likelihood of finding new opportunities to transform.- Top management commitment and delegation are the most crucial part for recognizing opportunities to transform. If responsibilities are not properly mandated downwards in the organization the company are most likely to miss out on finding opportunities to transform. If people in the organization have to seek permission upwards it is likely that this communication will go too slow, as well as employees won’t take as many initiatives as if they were able to steer new business development by themselves. If properly mandated downwards in the organization this can create an entrepreneurial culture, resulting in a more innovation behaviour.- Failing fast and cheap. Instead of measuring how many successful transformations they measure how many failures. Unless you have failed with

-
- (4) many transformation initiatives you won't have enough successful ones.
- Being surrounded by the right type of people. Creative people with an intrinsic motivation for digitalization are preferred. Further mentioned is that team diversity is important due to that cultural differences gives many different approaches to problems and solutions.
 - Top down managerial commitment is necessary in order to facilitate transformations. Mandate should be delegated downwards in the organization, which enables people to take decisions and initiatives by themselves. This can result in a more entrepreneurial culture that often results in more ideas and more creativity within the organization.
 - Attending fairs and other gatherings, instead of conducting internal education. This provides a wider network for individuals enhancing the chance for them to discover new opportunities.
 - There is a need for "innovation-facilitation" and that the role of the innovation team should be to facilitate and orchestrate the innovation efforts within companies.
- (5)
- Having a challenge/problem-based approach to innovation by engaging users and stakeholders.
 - Top-down commitment is crucial and must be committed to digital transformation and to see the benefits of it, delegate downwards, encourage and reward innovative behaviour.
 - Facilitations, and orchestration are highly important.
 - Having an open mind-set is of importance in order to receive impressions both internally and externally.
- (6)
- Bridging silos in order to create a more collaborative culture between functions.
 - Try to have a user and customer mind-set, trying to see everything from their point of view in order to find new opportunities.
 - Bridging silos in order to avoid silo-thinking, i.e. where every function only strives to develop themselves.
- (7)
- Having a more external point of view on innovation, meaning that more attention should be focused towards what is happening outside the company borders.
 - Top-down commitment are crucial in order to facilitate a creative environment. If mandate are given downwards in the company, more possibilities to find new opportunities are more likely to emerge.
 - Clear intentions and a clear digital transformation strategy will help guide the development. If directions and responsibilities are "fuzzy", innovation will likely be hindered.
 - Encouraging employees to work on side-projects.
 - Understanding that existing processes and value creators are becoming out dated is very important. This is the basis for any transformation possibilities to be recognized. Top down management must be the initiators by giving clear mandate downwards in the organization and in that way facilitate change.
- (8)
- Creating an iterative work environment, understanding that change is happening and not wait until an organization are forced to transform.
 - Ensuring that collaboration throughout the organization are working well. This will make opportunity recognition easier due to more different point of views on problems and how to transform.
-

5. Analysis

This chapter present and discusses our results of the previous sections. We test our hypothesized conceptual framework and make minor modifications based on the results from the case companies and the experts. The first section of this chapter analyses our primary data and the last section answers our research question in detail. Our main findings are summarized in table 18 for the reader's convenience.

5.1. What is Digital Transformation

As expected, digital transformation has different meanings across industries. The definition used in this research is *the use of digital technology to improve the performance and reach of enterprises*, encompassing both radical and incremental changes. As seen in the in table 11, our original definition correspond well with the interviewees opinions. All the case companies and the expert agree that digital transformation are digital enablers that can lead to change, and that it encompasses both radical and incremental changes. The only outlier is found in a single interview at the Volvo Group that is part of a set of two where one interviewee considered ‘digital transformation initiatives’ to be restricted to only radical changes in how the company conduct its’ business. This type of misunderstandings was expected, and thus noted in the first few minutes of the interview. The interviewee was asked to conform to the definition used by us which the interviewee accepted without any further objections. When discussing topics that could be misinterpreted as a results of this, we made additional effort to ensure that the answers were not affected by the interviewee’s initial attitude. As such, the results from that interview can be considered valid. We conclude that our definition is supported by all primary empirical sources, and that our results are not skewed due to varying understanding of the concept of “digital transformation”.

What is digital transformation?	Volvo Group	Volvo Cars	Stena AB	SKF	MAN	Expert
Digital technology to improve the performance	✓	✓	✓	✓	✓	✓
Digital technology to improve the reach	✓	✓	✓	✓	✓	✓
Radical transformations	✓	✓	✓	✓	✓	✓
Incremental transformations	✓	✓	✓	✓	✓	✓

Table 11. Defining digital transformation. Results from primary empiricism. ✓ = (yellow) Ambiguous support, ✓ = (green) Full Support.

5.2 Organizing for recognizing opportunities

When looking at the way our case companies are organized and how their recognizing activities are funded, we find that there is a great deal of variety among them. While Volvo Group, Volvo Cars and SKF have similar structures where their central innovation department are responsible for opportunity recognition and prototyping, the other three have different structures. The common pattern among them that is not reported in table 12 is that there seemed to be a similarity among all firms in the way that they intentionally starve the recognizing activities of funding, meaning that they force them to make decisions and cuts in their portfolio of ideas. At Stena the responsibility lies with their chief digital officer, who have the mandate to steer digital transformation efforts as he sees fit. Their budget for new initiatives are semi-fixed, meaning that it can be extended upon requests and needs. MAN has taken the approach to fund their transformation on a case-by-case basis, citing that ideas need different amounts of funding depending on the size of the potential project as the main reason for not having a fixed budget.

Functional ownership and funding	Volvo Group	Volvo Cars	Stena AB	SKF	MAN
Dedicated innovation unit	✓	✓	✗	✓	✗
Dedicated individual coordinator	✗	✗	✓	✗	✗
Dedicated functional responsibility	✗	✗	✗	✗	✓
Fixed Budget	✓	✓	✗	✗	✗
Semi-fixed budget	✗	✗	✓	✗	✗
Case-by-case funding	✗	✗	✗	✓	✓

Table 12. Functional ownership of innovating efforts and funding by case company. ✓= (green) True, ✗= (red) False.

5.3 Digital Transformation in Practice

Our hypothesized framework shows that the companies may consider themselves to be either a creator or a follower within the three areas those businesses can impact. We find that all case companies agree that is a reasonable structure, and no objections against it were made in any of the interviews. We consider this to indicate support of the validity of our framework Table 13 reports on the case companies' attitude to the creator/follower categorization within the three areas of intended business impact.

Intended business impact	Volvo Group	Volvo Cars	Stena AB	MAN	SKF
Value Proposition	✓	✓	✓	✓	✓
Internal Processes	✓	✓	✓	✓	✓
Business Model	✓	✓	✓	✓	✓

Table 13. Agreement of importance of digital transformation for improving the performance or reach in the three areas of intended business impact by case company. ✓= (green) True, ✗= (red) False.

As supported by the case companies' agreement with our categorization of innovation strategies, we find that their innovative approaches differs between the three areas of intended business impact, even within companies. As seen in table 14, the results vary greatly between the firms. Three companies identifies as a 'creator' of opportunities for transforming the value proposition, while one identifying as a creator for transforming internal processes, and two as creators of opportunities to transform business models. Table 15 shows that none of our case companies have a clearly defined digital transformation strategy, but two of them report having an emerged strategy that isn't being communicated well enough throughout the company.

Looking closer at the individual case companies, we see that the Volvo Group identifies as a follower within all three areas. This means that they do not consider themselves to be one of the industry leaders for creating additional digitally-enabled value in neither their value proposition, their internal processes, or in their business model. They also report a lack of a strategy for how they are to improve any of these areas with the use of digital technologies. However, from the interviews we do know that they have systems in place for recognizing new opportunities, such as a yearly innovation jam and various forms of ideation workshops, so in reality they are likely somewhere in the middle between our 'creator' and 'follower'- approaches. It is a limitation with such holistic frameworks that such nuances are sometimes lost, but when given an absolute choice between the two strategies, this how they identified. It should be mentioned that the company at the time of the interviews were subject to some turbulence due to an internal restructuring, and that this might have skewed the answers of our interviewees slightly. However, it is our interpretation that the Volvo group is correctly categorized. Volvo Cars, which is a completely separate entity from Volvo Group, reports being a 'creator' for transforming the value proposition and the business model, but at the same time they also lack a digital transformation strategy to guide efforts throughout the company. Possibly, this has to do with the competitive situation they are in, and the market position of their products. Volvo Cars manufactures cars in the premium segment, and as such they need to have a superior value proposition to live up to the customers' expectations. They also operate in an industry that is highly competitive and that anticipates potentially disruptive trends such as automated cars and large-scale car-sharing in the near future, and being pro-active when it comes to innovating the business model is likely to be very important for them, as well as for their direct competitors. This is especially interesting since it puts in questions the current strategies of Volvo Group since they are facing similar challenges in the near future. Stena AB is a large group of companies in various businesses, with their core businesses being in logistics, transportation and recycling. These are highly capital intense businesses and as such they neither have a great need for innovating their core business or a willingness to take large risks. Their immediate opportunities lies in smaller-scale supporting processes such as maintenance or 'decision support systems', and this reflects in our results by them reporting being a 'creator' for transforming internal processes and having an emerged strategy to direct the search for new opportunities. MAN, another manufacturer of trucks, is a direct competitor of Volvo Group. They report a higher level of pro-activeness in their innovative efforts for transforming the value proposition, as well as for transforming the business model. Unfortunately, due to secrecy issues we are not able to report many details on their activities other than a general categorization of activities. SKF is a manufacturer of various industrial products such as ball bearings, seals and lubrication systems. They also provide services related to these products to external companies. They report being a 'creator' for transforming the value proposition, but not for internal processes. For the area of transforming the business model, they currently identify as a follower, but at the same time expresses a desire to become a 'creator' in this field. They also claim to have an emerged strategy guiding their efforts towards this objective.

Only Volvo Group identifying themselves as being a follower in all three areas of intended business impact. It is therefore no surprise that they do not a digital transformation strategy. Stena AB are the only company considering themselves as creators within internal process. The main reason for this is due to heavy restrictions and regulations within the shipping industry, making internal processes the most promising area to transform. Stena AB's efforts are aimed to develop better and more efficient operating procedures in order to increase profits. For example, using drones to ease maintenance of vessels and other fixed assets. This type of improvement efforts is supported by theory on the subject of internal process improvement (Otley, 1999). The other companies have very different levels of pro-activeness in their transformation efforts. The results further indicate that transforming the value proposition and business models are tightly connected, as can be seen in the cases of MAN and Volvo. This indicates that increasing customer experience and utility is of high priority, in accordance with Kim & Mauborgne's (2000) theoretical contributions. As discussed by Gloor (2011) and Amit & Zott (2001), improving the business model efforts of Volvo Cars and MAN are mostly aimed towards finding new ways to sell existing products and services in order to lock in customers and to increase online sales through new channels.

Looking at the case companies' differences in reported digital transformation strategy, the results are a bit surprising. Neither of the companies have a clear strategy, however Stena and SKF have emerged ones. One could argue that in order to best be a creator, a clear transformation strategy should be in place. Without one, search efforts need to be guided on a case-to-case basis, meaning that passive search for new opportunities is not optimal. We have found that one of the best ways to improve the quality of the recognized opportunities to give clear directions into what areas of the business should be targeted for ideation. We also find that during our interviews, the strategic reasons cited for being either a creator or a follower is corroborated by the literature discussing the advantages and disadvantages of being first to market. For a creator the goal is to reap first mover advantages such as increasing returns advantages (Schilling, 2013), technological leadership (Dodgson et.al, 2008), or superior or different customer value (Porter, 2008). The rationales for being a follower has also been expressed by our interviewees as the minimization of risks or the lack of appropriate capabilities (Schilling, 2013; Dodgson et.al, 2008).

Companies identifying as 'Creators'	Volvo Group	Volvo Cars	Stena AB	MAN	SKF
Value Proposition	✗	✓	✗	✓	✓
Internal Processes	✗	✗	✓	✗	✗
Business Model	✗	✓	✗	✓	✗

Table 14. Company identifies as 'creator' for the three areas of intended business impact. ✓= (green) True, ✗= (red) False.

Digital transformation strategy	Volvo Group	Volvo Cars	Stena AB	MAN	SKF
No strategy	✓	✓	✗	✓	✗
Clear strategy	✗	✗	✗	✗	✗
Emerged Strategy	✗	✗	✓	✗	✓

Table 15. Type of Digital Transformation Strategy by case company. ✓= (green) True, ✗= (red) False.

The matrix below (figure 11) shows how the interviewees from the case companies perceive their company’s level of pro-activeness in each of the three transformation areas. While the sample is small, we may be able to spot some trends in our results model. For example, the innovation strategy for the transformation of the value proposition and the business model seems to be linked. All companies except SKF have the same ambitions for these two areas, and even SKF expressed a desire to become a creator in the area of transforming the business model. We also find that transforming internal processes is of less importance to be pro-active in according to a majority of the companies, while transforming the value proposition and the business model is more evenly spread out between them. More interesting to see is that only one company considers themselves a ‘creator’ for transforming internal, and this might be explained by the capital intensity of their core assets (large vessels, oil rig platforms, etc.).

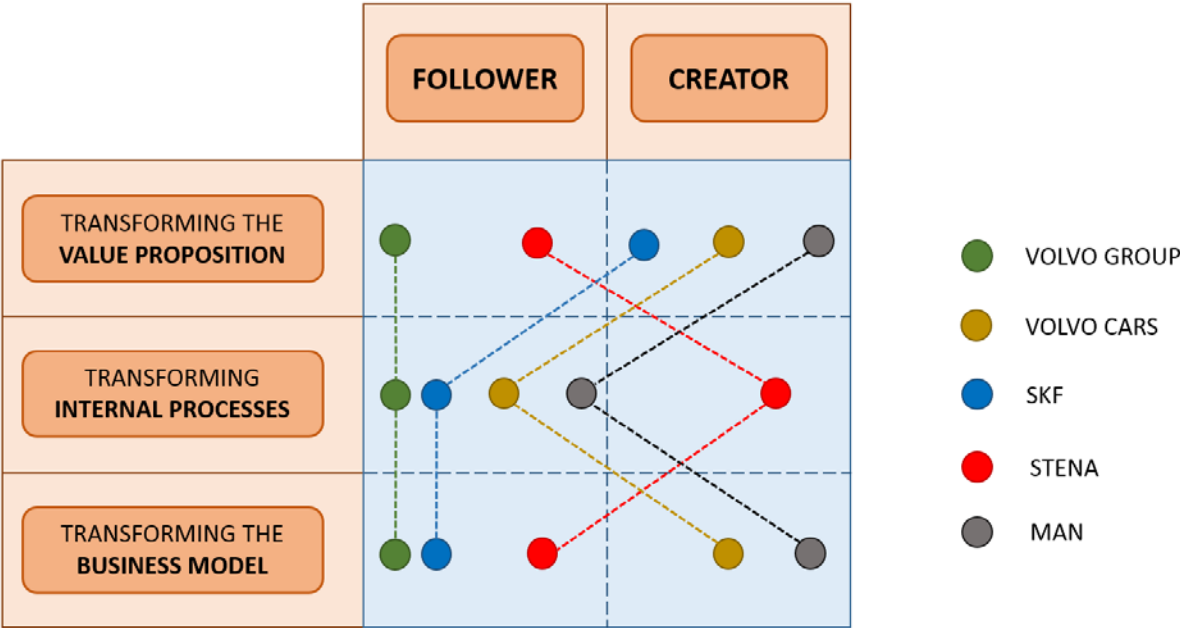


Figure 11. Plot of case companies on innovation strategy by area of intended business impact.

5.4 Tools, Methods & Techniques

Our results (table 16) on what tools, methods and techniques that can be used is dependent on both which area companies desire to transform and on the company’s level of pro-activeness. A full breakdown of the various tools, methods and techniques by type of empirical source is found in Appendix B.

As seen in table 16, there are three main ways that companies identifying as ‘followers’ recognize opportunities to transform; foresight/trend-watch, using external experts in the form of consultancies, and by collaboration through innovation networks. The use of foresight and trend-watch are mainly to recognize trends happening in- or outside the borders of the industry, something was expected after

analysing the literature (e.g. Rohrback and Gemunden, 2011; Martino, 2003). The use of consultants can be an effective method due to their extensive experience and knowledge as well. This finding was not supported by the literature, but strongly expected. The innovation networks is also a method of monitoring the industrial trends by enabling companies to find new practices from others (MacCormack et.al. 2007). These practices are all focused towards finding opportunities externally, not relying on internal ideation to any greater extent.

For the companies classified as ‘creators’ there are a number of practices that can improve corporate recognition capabilities. As seen in table 16, workshops, innovation jams, shark tanks, trend watch, and innovation networks are specific ways for companies to recognize opportunities, regardless of which business area that is desirable to improve. Some of these are in accordance with what methods are found in literature. What differs is the use of feedback systems, internal research, the use of big-data, experimentation, and mapping of start-ups. The best use of these methods are dependent on what area of the business that is to be transformed. User-feedback systems, big-data analytics, internal research, and mapping start-ups are best used when trying to find new opportunities to transform the value proposition due to the insights these methods can bring regarding the user and in that way find new ways to please the users and customers (Dodgson et. al. 2008). Internal process transformation opportunities are best found through the use of employee-feedback systems, internal research, and hands-on experimentation, Regarding business model transformation there are only the mapping of start-ups that differs from the other areas. By mapping start-ups it is possible to find new ways to reach out to customers by looking at how young companies operate. Another interesting finding is the large difference in amounts of practices used when being a follower and a creator, indicating increased complexity of creating novel ideas and being an industry leader compered to being and industry follower (Dodgson, et.al. 2008)

	Follower			Creator		
Tools, methods, and techniques	VP	IP	BM	VP	IP	BM
Workshop	✗	✗	✗	✓	✓	✓
Innovation jam	✗	✗	✗	✓	✓	✓
Shark tank	✗	✗	✗	✓	✓	✓
Trendwatch/Foresight	✓	✓	✓	✓	✓	✓
Consultants	✓	✓	✓	✗	✗	✗
Feedback system	✗	✗	✗	✓	✓	✗
Internal research	✗	✗	✗	✓	✓	✗
Innovation network	✓	✓	✓	✓	✓	✓
Big-data analytics	✗	✗	✗	✓	✗	✗
Hands on experimentation	✗	✗	✗	✗	✓	✗
Mapping start ups	✗	✗	✗	✓	✗	✓

Table 16. Tools, Methods and Techniques useful for recognizing opportunities to digitally transform. ✓ = (green) Cited by both case companies and expert, ✓ = (yellow) Cited by either case companies or experts, ✗ = (red) Cited by neither case companies nor experts.

5.5 Main sources of Knowledge

When looking at the best sources for finding the knowledge required to recognize opportunities we find a similar pattern as for tools, methods, and techniques (table 17). When being a follower we find four main sources where knowledge are to be drawn from. Interestingly, they make no difference of which area of the business the recognizing efforts is targeting. These four sources are external experts, employees, competitors, and partner networks. From our theoretical framework we find that these sources are in line with the literature. For the ‘creators’, there are five sources of knowledge that is not depending on which business area the transformation efforts are aimed at; the use of experts to gain new knowledge by watching start-ups and entrepreneurial activities, using partners to gain new knowledge, watching other industries, and using open knowledge and universities. All of these are as well covered in the literature. However external experts are not mentioned explicitly, but can be perceived as individual expertise as it is mentioned in literature (Dodgson et. al. 2008). The only two sources used explicitly for one area of business impact is the use of employees in order to find new knowledge to transform internal processes, and the users to gain the knowledge needed to recognize opportunities to transform the business value proposition. We make similar conclusion with the sources of knowledge as with the tools, methods and techniques, namely that followers use external sources to gain knowledge and idea, and that ‘creators’ use both internal and external knowledge sources to connect the dots (Baron, 2006).

	Follower			Creator		
Main sources of knowledge	VP	IP	BM	VP	IP	BM
Experts	✓	✓	✓	✓	✓	✓
Employees	✓	✓	✓	✗	✓	✗
Users	✗	✗	✗	✓	✗	✗
Competitors	✓	✓	✓	✗	✗	✗
Start-ups & entrepreneurs	✗	✗	✗	✓	✓	✓
Partner networks	✓	✓	✓	✓	✓	✓
Other industries	✗	✗	✗	✓	✓	✓
Universities & open research	✗	✗	✗	✓	✓	✓

Table 17. Main sources of knowledge drawn upon for recognizing opportunities to digitally transform. ✓ = (green) Cited by both case companies and expert, ✓ = (yellow) Cited by either case companies or experts, ✗ = (red) Cited by neither case companies nor experts.

5.6 How large established companies recognize opportunities for digital transformation.

Based on our conceptual framework we have investigated what three different sources of empiricism (i.e. the literature, case companies and experts) say about each of the elements. We used the literature to hypothesize the details of each element and the interviews with case companies and experts to test, complement, and add to the model. We find that the categorization of company’s innovation strategy by their level of pro-activeness as a ‘creator’ or ‘follower’ is valid due to it being supported by both

the literature and the case company interviews. The areas of intended business impact are divided into three parts; the transformation of the value proposition, the transformation of internal process, and the transformation or creation of business models. Though not explicitly supported by the literature we used our own existing knowledge and some exploratory interviews not included in our empiricism to hypothesize these. Our results from the interviews include no objections towards this structure of the element, only positive comments from the case companies. When also considering that the tools, methods, and techniques (table 16), as well as the main sources of knowledge (table 17), clearly differs between these areas we fail to find sufficient grounds for rejecting our initial hypothesizes for this element. The last element is the one labelled “tools, methods and techniques”, and we hypothesized a 2x3 grid including different strategic rationales, tools, methods and techniques, main sources of knowledge, and key success factors. We do find reasons to reject this initial hypothesis since there is no apparent difference between the three areas of intended business impact for companies that are ‘followers’. Therefore, we will adapt our model to better fit with our results by grouping these three sections together, leaving only four remaining (Figure 12). In the following parts of the analysis chapter, we will apply our results to each of these four strategies

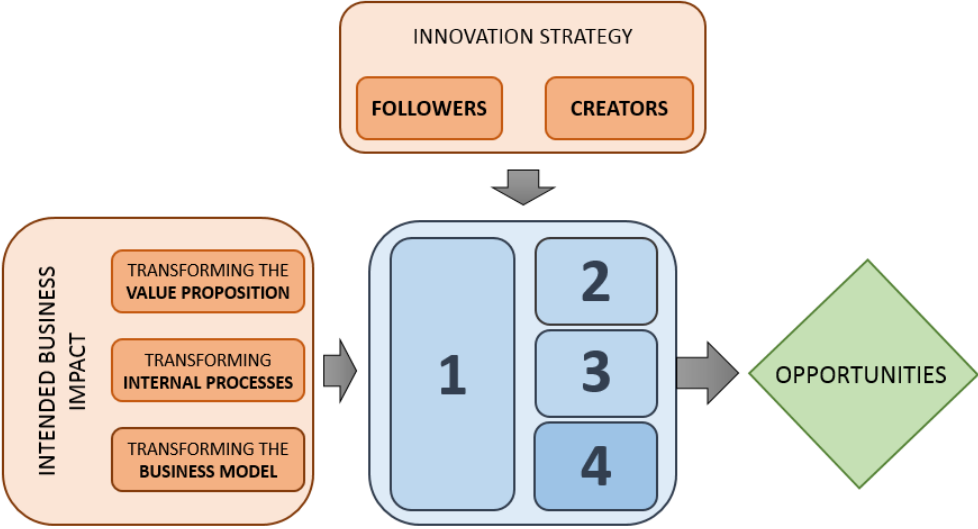


Figure 12. The final framework for how companies recognize opportunities to digitally transform. There are four main paths that companies can take in order to improve the quality and the quantity of recognized opportunities. These are dependent on the pro-activeness of the innovation strategy and the area of the business targeted for transformation.

5.6.1 Follower strategies

This section presents the strategic rationale of building recognizing capabilities in order to be a 'follower' of digital transformation for all three areas of intended business impact. We also present the main sources of knowledge, the most important tools, methods and techniques, and key success factors for recognizing new opportunities to digitally transform. It represents the content of box 1 in our framework.

A company that either lack the capability to recognize novel digital transformation opportunities or that do not wish to spend resources on this task can instead opt to look for opportunities that are already discovered by others. This approach has a number of benefits and is often advisable in rapidly developing industries. The most obvious one is that mature technologies are cheaper to deploy due to other's taking the risks associated with uncertainty in customer demands or efficiency. Using technologies or digitally-enabled opportunities that are already tested and tried allows companies to more accurately estimate the benefit of the initiative and by acquiring experience by hiring consultants or new personnel the initiative is likely to be more successful and cheaper than if the company goes through the effort of prototyping and developing a working solution by themselves. This approach is especially usual for companies that have a competitive advantage in something other than their value proposition or their cost-structure.

Since the follower strategy implies that the company does not attempt to recognize novel opportunities themselves on any larger scale, the sources of the opportunities are naturally of external origin. One obvious example is the management and IT consultancies that offers various best practice solutions derived from their vast experience. These firms work as an insurance of sorts for incumbent firms by making sure that every actor in the industry employing their services have a similar operational structure and it can therefore be considered a defensive measure to use best practice solution providers. The same effect minus the consultancies experience in implementation and customization of the solution can be reached through industry benchmarking. The use of external experts is a source of knowledge that we did not find in the literature search, but our personal knowledge as well as the results from the interviews strongly indicate that external experts is one of the major influences on the discovery of opportunities. This external knowledge can of course be acquired through other means than paying a consultancy for their services or benchmarking. New hires bring with them new knowledge, and existing employees may continuously acquire new knowledge through collaborative networks. The latter is extensively mentioned in innovation and entrepreneurship literature (e.g. Schilling, 2013; West & Bogers, 2014), and our results from the interviews with case companies and experts also indicate that these networks along with the monitoring of competitors are key sources of knowledge required to recognize an opportunity to digitally transform.

The tools, methods or techniques that are used by companies with the 'follower' approach to draw from these sources of knowledge and discover opportunities to transform the business consists of methods to acquire external knowledge and apply its' potential to the own company in order to recognize an opportunity. Using so called "best-practice" solution providers while drawing from their experience in or outside your own industry allows you to straight forward trade compensate for the lack of internal knowledge or recognizing capabilities with cash. While it comes with the price of not creating a new and novel competitive advantage for the buying company, they can ensure a similar proficiency of operations or level of customer experience as their competitors. Another method is the use of partner networks to identify these opportunities by sharing experiences and knowledge between

external individuals and the company's own employees. Tools like that is extensively referenced among case companies as valuable for recognizing new opportunities of all kinds. Similarly, the direct or indirect monitoring of the competition allows companies and benchmark practices and spot industry trends.

In addition to actual methods drawing from sources of knowledge our results indicate the existence of a number of key success factors for reaching the best possible outcome. We mentioned the use of external consultants as a primary tool for recognizing new opportunities for companies taking the 'follower' approach, and in order for this method to be successful it is naturally important to make sure that the consultants hired are well suited for the task. Variables include for example the area of expertise, the competence level, and the effort made by these external "experts". Similarly, when hiring new people to the firm with the aim of increasing the company's internal knowledge through additional experience and diversity, the company needs to make sure that the skills of these individuals are up to date and that it will add to the already existing knowledge within the company. Another success factor found in our results are related to the initial assessment of the opportunities potential and feasibility. Since the transformation undertaken by a company with the 'follower' approach likely is not a novel solution, they need to account for the time value of the transformation. For example, updating a warehouse with a solution for automation of a process might not be worthwhile if impending future technologies can offer even higher efficiency in a year or two. Instead it might be wiser to hold off investments and wait for another solution to appear. Of course, this is a question that should be asked before any major investment, but it is especially important to consider this when the proposed technology or solution is already mature and in higher risk of soon becoming obsolete.

5.6.2 Creator strategies

This section discusses the different creator strategies that companies can use. First in general and later in detail for each of the three areas of intended business impact. This will highlight the main differences between the 'follower' and the 'creator' approaches while still providing the reader with the details specific for each of the areas. The 'creator' approach to transforming the value proposition is represented by box 2 in our framework. The transformation of internal processes is represented by box 3, and the transformation or creation of new business models is represented by box 4.

Adopters of the 'creator' approach tend to have to spent more resources on their recognizing activities than the 'followers'. This is because completely novel opportunities require more effort to recognize than if the company simply monitor what others are doing. It also tends to come with a higher risk during development and implementation due to the immaturity of the underlying technologies or the digitally enabled ideas. Companies that actively seek to be 'creators' will instead have a higher potential for generating new competitive advantages through superiority (Strativity Group, 2009) or differentiation (Porter, 2008) of the value proposition, more efficient operations (Davenport, 2013), or innovative business models (Pohle and Chapman, 2006). Though works like these don't use the same definitions as we do, they evangelize innovative behaviours and therefore hint that the 'creator' approach would be preferable to the 'follower' approach. Our findings, however, indicates that the best choice for a single company is likely to be dependent on the specific conditions of their industry

and their current resources and capabilities. The direct costs associated with just the recognition of the opportunities is highly dependent on the skill of the individuals involved or the techniques used to acquire the data or knowledge that allows the recognition to happen. For example, organizing an innovation jam or having employees engaged in various innovation networks may require both money and time. In contrast, a consultancy may offer the opportunity for free while recouping the costs associated with the acquisition of the knowledge during the implementation phase.

In contrast to taking the strict ‘follower’ approach, this requires novel solutions rather than mimicking of competitors. In practice however, the ‘creator’ approach might be most useful as a compliment to a selection of tools and sources reported under the ‘followers’ section of this chapter. However, those wanting to be ‘creators’ tend to shift their focus from external experts and the competition as the main source of knowledge towards a more diverse knowledge base. Depending on the specific goals of the companies recognizing efforts, the best sources vary, but generally includes the people directly involved in the usage of the product, service, or process. Inspiration may also come from sources outside of the direct reach of the company. Entrepreneurs and unrelated industries are one frequently referenced source of new knowledge, and their innovative activities act as inspiration for companies that try to adapt or combine ideas into something that works especially well for them. External experts still play a role for ‘creators’, but their expertise is more focused on specific technologies rather than best practice solutions.

The main activity of companies taking the ‘creator’ approach is idea generation. There are extensive literature on this subject, and almost all of the ‘creator’ companies in our sample reference the classic workshops as the primary tool to reach this end. Innovation jams, innovation networks, and various forms of individual-enterprise feedback systems are common tools for recognizing new opportunities, and all companies in our sample engage in these activities to some extent. These feedback systems can be practically anything that passively allow individuals with ideas to briefly present them to someone with more decision making power. Examples range from the classic ‘suggestion box’ to more sophisticated digital solutions. Interesting enough, we thought big data analysis was going to be a more frequently used tool for companies to identify new patterns in customer, employee or market behaviour, but most of our primary empiricism does not support this. While we cannot reject big data as a possible tool, we do suspect that the reason for interviewees not discussing it is the complexity behind the technology, and our sample did not include anyone specializing in that area. With a larger sample, we believe we could have support for a more widespread inclusion of big data analysis as a tool for recognizing new opportunities. Another method that is generally applied for companies taking the ‘creator’ approach is the use of so called shark-tanks, where employees may pitch ideas to a board of decision makers, who can then stage-gate funding for development of this idea. No companies actually have one of these systems in place, but several expressed the interest in having one.

Naturally, the resources spent and individual skill are major determinant of the success of these methods for recognizing new opportunities. However, the companies we have spoken to highlight a few other factors as key to reaching the best outcomes. The single most common theme among companies taking the ‘creator’ approach is that the management must openly communicate support for individuals who express new ideas and think outside the box. If management doesn’t promote innovation or idea generation, the individuals who have the ideas will either keep them to themselves or soon lose interest in pushing the ideas to other people. And as we know from the literature on opportunity recognition; ideas are rarely created by single individuals. Knowledge- and idea-sharing mechanisms must be in place. The easiest way to do this is to facilitate social interaction between colleagues, and we have seen many trends, such as open office floor plans (Worthington, 2013) or enterprise social platforms (Patrick & Dotsika, 2007) towards this objective in workplaces around the world. Along the same line, companies should also create role models. If individuals who in the past have suggested good ideas were publically rewarded, innovative behaviour becomes evangelized and the company gets a potent and cheap type of incentive for future idea generators. Lastly, learnings

from our cases indicate that any type of activity aimed at generating new ideas, such as workshops or innovation jams, works best when they are clearly directed towards specific areas. For example, a general workshop directed towards no specific end but general innovation is less likely to yield any results than a workshop aimed specifically at generating ideas on how to better use technology X with product Y. By identifying the areas that are most strategic to create new opportunities in, the individuals involved in the effort have a clearly framed objective which helps the less motivated or skilled innovator to overcome the hurdle of abstractness.

As mentioned before, the ‘creator’ approach can effectively be combined with a ‘follower’ approach to target specific areas of the business. While the procedures and sources discussed above are the same for all three areas, there are clear differences in how companies should behave if they want to target just one of them. For example, finding opportunities to transform the value proposition makes use of knowledge sources that are less relevant for when the goal is to optimize operations. Attempting to be creator in all three of these areas are also more costly than targeting a specific strategic area. In the following sub-sections we will discuss how the ‘creator’ approach differs between the business goals and highlight our main findings for each specific area.

Transforming the Value Proposition

Our hypothesized framework states that a creator of opportunities to digitally transform the value proposition wants to compete with a superior or differentiated customer experience or user utility. We found that there are two similar, but complimentary, ways of looking at the value proposition. Firstly, we have the customer experience that encompasses the entire relationship that the customer have with the offering, and the key focus is usually to expand or improve upon the customer touch points. All interactions between the company and the customer can be improved and normally focuses on the customer’s initial collection of information about to product, the sale processes and support activities. One aspect that is often overseen is how the company educates the user on how to best utilize the product or service. Big companies with an active user base may set up product-centered forums where user and employees can collaborate to fix problems, test features, or help each other in other ways. The most classic example of this is the Apple’s forum, but this method is extensively used for computer games and high-tech niche products. The second approach is to create new opportunities to improve on any of the users utility levers in any of the stages of the buyer experience cycle (Kim & Mauborgne, 2000) While the direct improvement of an already targeted utility lever more often than not requires conventional R&D or product development, the more creative approach is to match new or existing technologies with a utility lever that is not yet exploited by current offers on the market (Kim & Mauborgne, 2000). This is also one potential area that can be target for analysis of big data. The famous misquote of Henry Ford: “If I asked the customers what they wanted they would have said a faster horse”, is commonly used to illustrate how the customer often don’t understand their own needs. While internal R&D or the creativity of the company’s own managers might do, one of our cases highlight big data as a tool that can be used to anticipate trends that can present an opportunity to exploit new utility levers.

The most obvious source for transforming the value proposition is naturally the users themselves. They are the ones who have the best knowledge of the offers actual function and performance, and the sheer number of customers that most large and established companies have produces a massive user base that can be incorporated in the recognizing process of new opportunities. Setting up user-enterprise feedback systems such as product-centred forums, easily accessible touch points via various social platforms, or other more or less direct channels of communication, will increase the number of user-driven ideas that surfaces.

Another interesting finding of ours is that many of the individuals we talked to in our case companies see a big potential in monitoring entrepreneurial activities outside of the firm. Several of the case

companies cite start-ups as a great source of insight into how they can improve the value proposition. One method of capturing these is to monitor and map the pain-relievers (Osterwalders, Pigneur, Bernarda & Smith, 2015) addressed by these start-ups. In other words, to keep a journal of the problems experienced by customers or users, and how new entrants help them mitigate these through their products or services. Entrepreneurs are among the most creative and innovative groups out there, and the trends in their approach towards their customers could give valuable insights that can be incorporated in the development of the company's own value proposition. It also serves as a pro-active defensive measure to guard against new entrants (Church & Gandal, 1996). Historically, we have seen many incumbents who have failed to evolve their value proposition with the market and subsequently they have been outperformed by competitors or new entrants (Hill & Rothaermel, 2003). The mapping of start-ups' pain relievers can provide a short-cut to insights on such future trends.

Transforming Internal Processes

Like with transformation the value proposition, the main source of knowledge should be the users, which in the case of internal process, happens to be the employees involved in the operations. By analysing the literature we found that there are two main areas that can be digitally transformed. These were performance management and operational procedures. Throughout our interviews, case companies have mostly focused on improving operational procedures by making employees more effective at performing their work, and removing and recreating chains of procedures to improve overall efficiency, for example by providing employees with new or more effective types of devices connected to various services that improve worker mobility. A more advanced type of digital transformation of operational procedures are the use of sensors or other connected 'things' (Ferber, 2013) in warehouses or other logistical processes. Performance management is the more expensive type of transformation efforts, and is the type of internal process that external experts and consultants focus on. Though there are economic interests at play, one could argue that enterprise resource planning- or decision support systems are major investments that require a lot of experience to develop, implement and customize, and that many companies lack the capability or the resources to do this themselves. Therefore, 'creators' of opportunities to digitally transform internal processes often have to engage in costly initiatives with a relatively high risk of not reaching the expectations. But those companies that are willing to take this risk do best in using the experience of their current workforce both to recognize areas where improvement is possible and to later create these opportunities. The main purpose of attempting these efforts is to improve upon operational efficiency in order to improve margins, out-compete rivals, or deter new entries by scale (Grant, 2010). The main types of internal processes that are common targets for transformation according to our sample is management of material flows, limitation of non-productive work time and facilitation of internal knowledge transfer and retention. Other than the own work force, the main sources of knowledge and inspiration referenced by the case companies in this study was other, more technologically intense industries, than their own. This knowledge was mostly acquired through new hires, technological insight experts, or driven individuals already within the firm.

This study investigate large and established companies, which is a sample that tend to come with an inherently large scale. This means that any digital transformation initiative that is supposed to have an impact on the overall operational efficiency generally is going to require heavy investments. The normal tactic to overcome this issue is to prototype the initiative on a smaller scale, but it is normally always riskier to invest in an internally developed initiative than it is to use a tested-and-tried practice. For this reason most companies identify mostly with being a follower. In fact, only one company did openly relate to the 'creator' approach for transforming internal processes, and this company operates in an especially traditional industry with very high initial investments costs that later is difficult to transform, and therefore they have few possibilities to be creative. They were structured in a way that they just had a single, but strongly empowered individual, and most of the internal processes that were

targeted were supporting activities such as maintenance routines and anticipation of their current customers' behaviour to improve asset utilization. These novel solutions were recognized mainly through hands-on experimentation, meaning that they acquired new and interesting technological solutions and "played with them to find operational uses". All other companies associated internal processes with heavy investments and rationalized their 'follower' approach with risk aversion, i.e. wanting to limit the uncertainty of implementing a processes that did not have previous success stories. One company did also mention agency issues of executive managers risking to be held accountable for expensive failures as the primary reason for not being more innovative in this area. This issue was common within our sample, and many of the interviewees agreed that there is a difficulty balancing short-term gains versus long-term goals, at least partly due to this problem.

However, many case companies offered insights to the tools that could be used by speculating. As mentioned before, employees are the users of any internal process, and as such they are the subject for user-enterprise feedback systems. Internally, these can take many shapes, ranging from classical suggestion boxes to large scale innovation jams or enterprise social platforms. One company full-heartedly supported using these feedback systems primarily to identify "problems" within the company's operation and then applying more conventional techniques such as directed workshops to find possible solutions to these problems. For example, traveling sales people saw a problem with potential customers losing interests in their offers during the time between the sales pitch and the hand-over of documents and other information. To combat this, the company started an initiative where the sales people were equipped with an iPad connected to a cloud-based internal storage solution that was updated in real-time, allowing them to send any document to their customers while speaking to them. The same solutions with a few undisclosed additional features had cut down the non-productive work time for these frequently traveling sales people by over 50 percent.

Transforming or Creating New Business Models.

How companies recognize opportunities to digitally transform or create new business models is the most complex part of our results, and as such, our findings are limited since our small sample of case companies have very different perspectives on the question. While all agree that one of the major benefits of being a creator of new business models is that you can aggressively defend against disruptive business models from competitors or new entrants, our framing of the creation of new revenue sources as a business model transformation seemed to overlap with their interpretation of the value proposition transformation at many times. The line become especially blurry when the new business model only complimented the current offerings without provided a clearly defined new revenue source. For example, a large manufacturer of capital goods who recently launched a new service to add to the total offering of a mobile platform related to their core product did not receive any additional revenues directly from this service. Instead the value lies in the additional total customer utility from the entire eco-system of complimentary services that this single service provided. Is this a transformed value proposition or is it a new business? Our analysis is based on a the existence of a slight overlap between the different areas and due to the limited sample size our definition of 'creating new business models' as the addition of new or complimentary services is relatively weak compared to the rest of our results. However, for all practical intents and purposes this should not be an issue for a reader looking for insights on how companies can recognize new opportunities to digitally transform.

The literature indicates that large and rigid organisations have a major hurdle to overcome since managers tend to lack peripheral vision and our interviews indicate that there is a lot of silo-thinking and agency problems at play. This means that the best methods to identify new opportunities for digital transformation of the business model would be to look for an outside perspective. The most commonly referenced outside sources from our case companies are universities and start-ups. The base of individual knowledge within these two sources are among the most diverse you can find. Neither

are affected in any major way by the company's existing culture or their inherent rigidity. For example, several companies in our sample are using senior researchers in universities as experts or as participants in workshops and innovation networks. Others are using university students as participants in innovation jams or in other tools with a competitive component. The monitoring of start-ups are also a highly important factor. Just as with the transformation of the value proposition (Hill and Rothaermel, 2003). One way to deal with this is to map the recent entrepreneurial trends in order to identify the innovative business models they use and anticipate how these can have an effect on their industry. This entire process is extremely complex and the only structured approach to this method referenced by our case companies is where a single individual within the company was charged with the responsibility to facilitate the recognition of future disruptive trends. Practically, this was done through frequent activity in various innovation networks and presence on entrepreneurial and technological events. Our interpretation of the results are that the anticipation of future disruptive business models is such a complex and abstract process that there is no perfect way to do it besides hiring and empowering exceptionally driven individuals to keep a constant eye on the environment both inside and outside of their own industry, a process known as foresight. These individuals may also benefit greatly from complementing their own efforts with external technological insight experts who generally possess greater resources to achieve this goal. However, they are costly, and the level of adaptation to the company's specific situation is generally limited.

	1	2	3	4
	<u>Follower Strategies</u>	<u>Creator Strategies</u>		
		<i>Transforming the Value Proposition</i>	<i>Transforming Internal Processes</i>	<i>Transforming or Creating New Business Models</i>
Strategic Rationale	Limiting exposure to risk by only looking to implement tested-and-tried solutions	Gaining competitive advantages by offering a great and/or novel customer experience and utility	Gaining competitive advantages through operational excellence and efficiency	<ul style="list-style-type: none"> - Identifying new potentially disruptive business models - Adding new or alternative revenue sources to existing business model
Tools, Methods & Techniques	<ul style="list-style-type: none"> - Using consultants to identify and assess best practice solutions - Monitoring of competition (directly or indirectly) - collaborative networks 	<ul style="list-style-type: none"> - Workshops - (BIG) Data analysis of customer behaviour trends - User-Enterprise feedback systems - Mapping pain-relievers address by start-up -Internal Research 	<ul style="list-style-type: none"> - Innovation jams - Employee-Enterprise feedback systems - Hands-on experimentation - Internal Research 	<ul style="list-style-type: none"> - Shark-tanks - Innovation networks - Monitoring new business models in other industries
Main Sources of Knowledge	<ul style="list-style-type: none"> - External Experts - Employees - Partner network - Competitors 	<ul style="list-style-type: none"> - Users - Customer experience experts - Entrepreneurs 	<ul style="list-style-type: none"> - Partner networks - Universities and open research - Employees - Technology insight experts - Other industries 	<ul style="list-style-type: none"> - Entrepreneurs - Foresight experts - Other industries
Key Success Factors	<ul style="list-style-type: none"> - Using the “right” experts - Accounting for the timing of the subsequent implementation of the opportunity when assessing the potential value - Hiring a diverse, competent, and updated workforce 	<ul style="list-style-type: none"> - Considering all aspects of the customer utility across all touch points and the whole experience cycle - Matching new technologies with customer pains 	<ul style="list-style-type: none"> - Directing Search Efforts - Evangelizing Innovation and creating role models - Top management sanctioning - Dismantling silos and building knowledge-sharing systems - Having a problem-based approach - Finding a balance between short- and long-term gains 	<ul style="list-style-type: none"> - Finding a balance between short-term gains and long-term strategy - Drawing inspiration from innovative start-ups and other industries

Table 18. Breakdown of i) strategic rationale, ii) tools, methods, and techniques, iii) main sources of knowledge, and iv) key success factors by the four paths of our framework.

6. Conclusion

This chapter presents our conclusions and summarizes our findings based on the conceptual framework we hypothesized in the beginning of our research.

This thesis investigates how large established companies can recognize new opportunities to digitally transform. Previous research directly on this subject is scarce, and what little is available is written by employees of various consultancies with economic interests, and therefore might be subject to bias. The purpose of our research is to investigate the research question by analysing related literature on fields such as *innovation management*, *ideation*, and *entrepreneurship* in the context of large established companies, and provide the same companies with insights on how to better recognize opportunities for digital transformation.

Research Question

'How can Large Established Companies Recognize Opportunities for Digital Transformation?'

In order to investigate the research question, we hypothesize a conceptual framework to allow a structured analysis of the literature. This hypothesis is tested through case studies on five large established companies, as well as with one IT- and business transformation consultancy acting as an 'expert'. Our findings indicate that few companies have an outspoken strategy for how they want to identify new opportunities to transform in the future, but many expresses a desire to have one due to the potential benefits of becoming a leader in the development of innovative use of technology.

Our findings did not support the hypothesized framework in full, but it did support a slightly modified version consisting of two elements determining the best suitable tools, methods & techniques that companies can use to improve recognition of new opportunities for digital transformation. These elements are the innovation strategies and the intended area of business impact of the transformation opportunity. The innovation strategy element consists of two archetypes of innovation strategies, where a company taking the 'creator' approach differs from the companies taking the 'follower' approach by being more pro-active in their innovative efforts. The intended area of business impact refers to the three main types of business outcomes a transformation opportunity may have. Or in other words, what the opportunity is supposed to transform; the value proposition, internal processes, or the business model. The final framework did not differentiate between the three areas of intended business impact for companies taking the 'follower' approach since we found no considerable differences between the practices used by companies identified as 'followers' in any of the three. Neither did results from the expert interview or the literature. However, the difference between these three areas was supported for companies taking the 'creator' approach. This gave us four different paths (figure 13) that companies can take if they want to improve their ability to recognize opportunities for digital transformation. None of them are mutually exhaustive, meaning that a company may follow all four path simultaneously if they willing to allocate the resources to do so. However, it is a core assumption of our research that companies need to continuously evolve with a changing market, which means that the 'follower' approach for how to recognize new opportunities to digitally transform is a basic capability that all companies need to have.

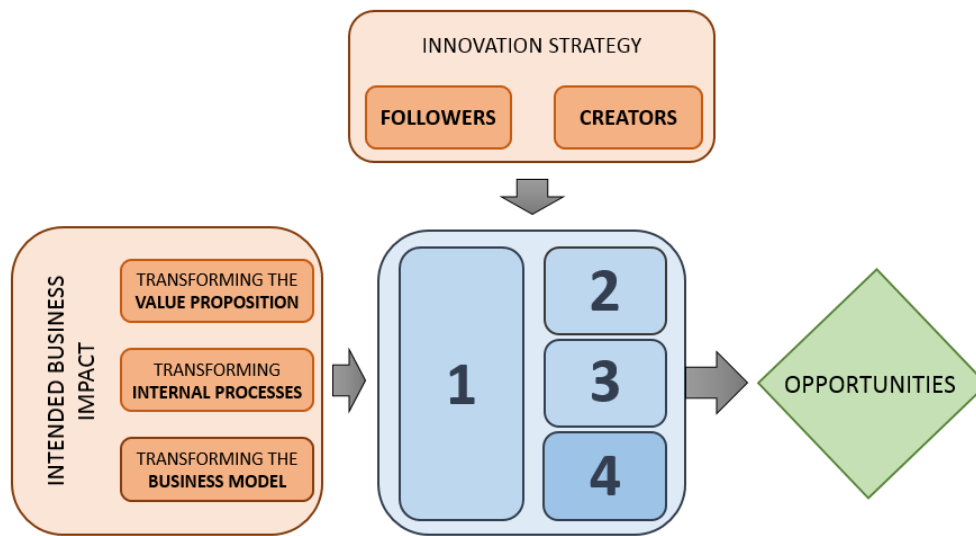


Figure 13. Our final framework for how to recognize opportunities. Detailed descriptions of the content of all four paths are found in table 18 in the analysis chapter of this paper.

Our findings indicates that companies taking the ‘follower’ approach should build capabilities to monitor their direct competition through for example benchmarking or collaborative innovation networks. In addition to this, external best practice solution provider’s offers companies a way of staying on-par with the rest of their industry. However, the choice of which external actor to hire is a key success factor and may drastically affect the outcome, and the technological maturity and future potential of their offered solutions must be accounted for, as with all major investments. Hiring a driven and knowledgeable work force is also key for making the best use of collaborative networks and to keep the internal knowledge on recent industry trends to a high level.

Companies taking the ‘creator’ approach need to consider what type of impact the opportunity to transform will have before deciding on the best ways to recognize new opportunities. Conventional methods to generate ideas, such as workshops, innovation jams, shark tanks and collaborative partner networks can be put to good use and their output may be even further improved by directing the search efforts towards strategic goals, and by including a wide range of individuals with varying experience, such as employees from different functions, business partners, or universities. Setting up knowledge mechanisms such as open office floor plans, social platforms and networks, or other ways of facilitating social interaction across functions may also greatly improve the idea generation throughout the company. These companies also have a lot to gain from creating role models and evangelizing novel ideas by setting up a corporate culture and incentive systems to reward individuals who engages in idea generation.

For transforming the value proposition, the main sources that companies draw knowledge from include users of their products or services, as well as start-ups and external customer experience experts. In addition to the techniques used by ‘creators’ independent of the intend area of business impact, as mentioned above, a few other ways of specifically recognizing opportunities to transform the value proposition has been identified. Data-, or ‘big data’, -analysis can be used to compliment direct user-enterprise feedback systems to anticipate future trends in customer behaviour or demand. Mapping the specific pain-relievers addressed by start-ups may also provide insight into these future trends, or to other innovative uses of technology.

When the company wants to transform internal processes, the ‘users’ turn into ‘employees’. Feedback- and knowledge-sharing systems can be used to identify new novel ideas for how the internal processes can be made more effective or cost-efficient just as well as R&D efforts can be directed towards goals with benefits to operational efficiency. Another very interesting techniques is the exploratory experimentation with new technologies. For example, companies can for a relatively low cost purchase various devices that are distributed to keen employees with the purpose of finding ways to utilize these in the everyday work. Our results also indicate that a ‘problem-based approach’ can be taken to direct the search of new opportunities through either of these methods, meaning that the first step in any idea generating effort is to locate ‘problems’ within the company and then try to solve or mitigate these. This approach makes the objective clear and tangible for a wider range of the work force who can then easily engage in idea generation while increasing their intrinsic motivation due to the personal relevance of the ‘problem’.

Lastly, transforming the business model or creating new business models, is the most difficult element to assign specific methods of recognizing opportunities to. The reason for this is the ambiguity of the concept of business models when put next to the value proposition. The transformation initiatives that is most often discussed by our case companies often overlaps both of these, and our findings may therefore be subject to the limitations of the interviewees understanding of the definitions used in this thesis. However, all agree that, in addition to conventional idea generation techniques, the active monitoring of start-ups coupled with the use of technological insight experts are vital to anticipate future disruptive business models.

6.1 Criticism of own research & suggestion for future research

The most obvious criticism of our thesis is the small number of interviewees at each company. Future research would be needed to validate our findings from this limited study. It would also be preferable to expand upon the number of case companies, and to choose a sample that spans more industries and cultural regions than ours. A larger sample may also allow a more detailed breakdown of the various tools, methods and techniques, and their associated sources of knowledge and key success factors. For example, the tool we labelled as “workshops” covers a wide range of different types of workshops. It would be useful to know more specifically which workshop techniques works best under wish circumstances, and future research on this level of depth would be highly interesting. It would also be interesting to investigate how recognition of opportunities differs between digital business transformation and normal business transformation. Future research could emphasize this difference in more detail than we were able to.

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Appendix A

Interview guidelines

This section of the appendix shows how our interview guidelines were phrased. The guidelines are presented below in the same format as it was when we sent it to our interviewees before the interviews. The interviews were conducted with a semi-structured approach to these guidelines.

Background

- Who are you and what position do you have at your company?

Digital transformation (DT)

- What does digital transformation mean to you? What does it mean for your company?
- Do you consider digital transformation to include radical/incremental/performance/reach

Digital transformation strategies

- Does your company have a digital transformation strategy? [No strategy / clear strategy / emerged strategy]. Follow up with details on how it is phrased, what it contains, how it is communicated, and how well it is followed.

Focus areas for digital transformation

- Who is responsible for coming up with/find new ideas? Especially in regards to digital technologies
- How do you finance this function? [fixed, semi-fixed or case-by-case]

Digital transformation strategies.

(If interviewee is not familiar with our framework or if they have a hard time understanding it, present it again in detail)

- Follower/creator:

Do you consider your company to be a leader of the development in your industry, or are you a follower? [follower / creator] of digital transformation

- VP/IP/BM:

Do you agree with this structure?

Can you recognize that you are engaging in any type of effort that can be categorized like this?

What are your main goals for transformation? What part of your business do you focus on transforming?

Ask for specific examples.

(Ask the interviewee to report their company's innovation strategy for each of the three elements)

Recognizing opportunities

- In what ways do you work with finding and discovering new ideas for Digital transformation? [tools, methods and techniques]

- What Sources can be used to identify this knowledge?

- What key success factors do you associate with recognizing new opportunities for digital transformation?

Follow up each of these by asking for more detail. Steer the conversation back on track if straying from our research.

Examples of digital transformation initiatives.

Attempt to find practical examples previous or current initiatives for all the three areas [value proposition, internal processes, and business model]

Ex. 1 (VP)

Ex.2 (IP)

Ex.3 (BM)

Appendix B

Tools, Methods and Techniques

Tools, Methods, and Techniques	Source of empiricism	Follower			Creator		
		VP	IP	BM	VP	IP	BM
Workshop	Theory				X	X	X
	Case companies				X	X	X
	Experts				X	X	X
Innovation Jam	Theory				X	X	X
	Case companies				X	X	X
	Experts				X	X	X
Shark Tank	Theory				X	X	X
	Case companies				X	X	X
	Experts				X	X	X
Trendwatch/foresight	Theory	X	X	X	X	X	X
	Case companies	X	X	X			X
	Experts				X	X	X
Consultants	Theory						
	Case companies	X	X	X			
	Experts	X	X	X			

Feedback-system	Theory	x	x	x	x	x	x
	Case companies				x	x	
	Experts				x	x	
Internal research	Theory				x	x	x
	Case companies				x	x	
	Experts				x	x	
Innovation network	Theory	x	x	x	x	x	x
	Case companies	x	x	x	x	x	x
	Experts				x	x	x
Big-data analytics	Theory	x	x	x	x	x	x
	Case companies				x		
	Experts						
Hands-on experimentation	Theory						
	Case companies					x	
	Experts						
Mapping start-ups pain relievers	Theory						
	Case companies				x		x
	Experts						

Sources of Knowledge

Sources of Knowledge	Source of empiricism	Follower			Creator		
		VP	IP	BM	VP	IP	BM
Experts (BP)	Theory						
	Case companies	x	x	x	x	x	x
	Experts	x	x	x	x	x	x
Employees	Theory	x	x	x	x	x	x
	Case companies	x	x	x		x	
	Experts					x	
Users	Theory	x	x	x	x	x	x
	Case companies				x		
	Experts				x		
Competitors	Theory	x	x	x	x	x	x
	Case companies	x	x	x			
	Experts	x	x	x			
Start-ups & entrepreneurs	Theory	x	x	x	x	x	x
	Case companies				x		x
	Experts				x	x	x

Partner networks	Theory	x	x	x	x	x	x
	Case companies	x	x	x	x	x	x
	Experts	x	x	x	x	x	x
Other industries	Theory	x	x	x	x	x	x
	Case companies					x	x
	Experts				x	x	x
Universities & open research	Theory	x	x	x	x	x	x
	Case companies				x	x	x
	Experts						