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# **Understanding & Managing Digital Transformation – A case study of a large Nordic retailer**

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<p>Defined as “<i>the use of technology to radically improve performance or reach of enterprises</i>”, digital transformation comes with many challenges for organizations. For example, US retailers reported a 50% decrease in foot traffic in just the last three years while more than 80% of consumers started their buying process online. The pace of technological development has put pressure on organizations to undergo digital transformation to answer consumer demand and to respond to competition.</p> <p>This single case study conducted in a large Nordic retailer, explores the research problem of “How could enterprises better understand &amp; manage digital transformation?” To answer this question, a systematic literature review was conducted as well as 15 semi-structured interviews of middle and top management across the organization.</p> <p>Digital Transformation is a complex phenomenon and to manage it, one has to first understand the concept. It can be seen from two different points of view, organizational, meaning the transformation happening inside a single organization, and contextual, meaning the transformation happening in the operating environment. The study proposed a new 5-stage model for representing the different stages of Digital Transformation of traditional organizations. The model can potentially help to understand the current situation and plan the future transformation. As Digital Transformation is such a broad concept, no single tool was deemed to be enough to manage it alone, but some evidence for several potentially useful tools, such as change management best practices and Enterprise Architecture was found during the study.</p>		
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<p>Digitaalinen transformaatio, <i>“tekniikan käyttö yrityksen suorituskyvyn tai ulottuvuuden radikaaliin parantamiseen”</i>, aiheuttaa organisaatiolle suuria haasteita. Esimerkiksi Yhdysvaltalaisten vähittäiskauppioiden kävijämäärä kivijalkakaupoissa on pudonnut puoleen kolmen vuoden takaisesta, kun jopa 80% kuluttajista aloittaa ostoprosessinsa internetissä. Teknologinen kehitys asettaa organisaatioille paineita muutokseen pystyäkseen vastaamaan kuluttajien kysyntään ja kilpailijoiden tarjontaan.</p> <p>Tutkimus suoritettiin yhden organisaation case-tutkimuksena. Tutkimusongelma kiteytyi kysymykseen “Kuinka yritykset voisivat ymmärtää ja hallita digitaalista transformaatiota paremmin?” Tähän pyrittiin vastaamaan kirjallisuuskatsauksen ja 15 avoimen teemahaastattelun perusteella, jotka toteutettiin korkeimmalle ja keskijohdolle eri puolilla organisaatiota.</p> <p>Digitaalinen transformaatio on moniulotteinen aihe ja pystyäkseen hallitsemaan sitä, täytyy ensin ymmärtää mitä se on. Digitaalista transformaatiota voidaan tarkastella kahdesta eri näkökulmasta: yksittäisen organisaation, tai laajemmin koko toimintaympäristön muutoksen kautta. Tässä työssä kehitettiin uusi 5-portainen malli digitaalisen transformaation vaiheiden kuvaamiseksi, joka saattaa olla organisaatioille hyödyllinen nykytilan tarkastelun tai tulevan muutoksen suunnittelun apuvälineenä. Koska digitaalinen transformaatio on hyvin laaja kokonaisuus, ei yhdenkään tarkastelluista työkaluista havaittu riittävän sen hallitsemiseen yksinään, mutta useampien potentiaalisten työkalujen, kuten muutosjohtamisen parhaiden käytäntöjen, sekä kokonaisarkkitehtuurin, havaittiin olevan mahdollisia osaratkaisuja aiheeseen.</p>		
Avainsanat: digitaalinen transformaatio, kokonaisarkkitehtuuri, vähittäiskauppa		Julkaisukieli: Englanti

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## **Abbreviations**

CIO	Chief information officer
EA	Enterprise architecture
ICT	Information and communications technology
ITG	Information technology governance
IT	Information technology
KPI	Key performance indicator
PM	Project management
SLR	Systematic literature review
DT	Digital transformation
TOGAF	The Open Group Architecture Framework
FEAF	Federal Enterprise Architecture Framework
BITA	Business-IT Alignment
ROI	Return On Investment

# **1 Introduction**

Traditional retail is in a crisis. During the 2013 holiday season, the foot traffic of US retailers was reported to be just half of what it used to be three years ago (Walker 2014). At the same time, 81% of consumers started their buying process online (GE Capital Retail Bank 2013). This digital transformation that has been, and still is, happening in so many industries is the focus area of this thesis. Defined as “*the use of technology to radically improve performance or reach of enterprises*” (Westerman et al. 2011), digital transformation brings with it many challenges that organizations have to consider more carefully than before (Westerman et al. 2011, Fitzgerald et al. 2013). Lately the pace of technological development has started to accelerate the pressure on organizations to undergo digital transformation since the competitors are constantly adapting new technology, which has also empowered consumers to demand, for example, better and faster service anytime, anywhere and with any device (Fitzgerald et al. 2013).

The research is conducted as a single case study. The case company in question is a large Nordic retailer. For the case organization, digital transformation affects the competitive situation for example in the form of new foreign competitors entering the domestic market. These changes could on one hand mean new business opportunities by utilizing new business models and service concepts. On the other hand, they also create new business requirements and challenges. Ensuring that the organization answers to the rapidly changing requirements of its customers in a digital domain while maintaining and developing existing businesses is a complex challenge.

## **1.1 Research background**

For example in e-commerce, technology can fundamentally change the traditional value chain of retail, in some cases cutting away all the middle-men between the producer of goods and the end-consumer, whereas in other cases, new players, such

as aggregators, each taking their own margin, can enter the value chain by the demand of the customers (Lin, Hsia & Wu 2009).

Digital transformation requires changes for both the central business processes of the organization as well as support processes (Lin, Hsia & Wu 2009) (Westerman et al. 2011). For example, whenever a customer a digital service instead of, or in addition to using the traditional offline services of the organization, it is possible to gather much more information about their behaviour and more easily customize the service the suit their specific needs. As an example of the requirements for support processes, the increasing and rapidly fragmenting customer interaction requirements make it very difficult for the organization to answer the demand with the limited resources available.

Considering that these were just a few examples of the challenges that are present for all organizations in the field, and that almost every strategic decision to be made in most organizations depends heavily on technology to succeed, the understanding and communication of technical requirements, challenges and capabilities would seem to be of great importance for the business decision makers to make educated decisions (Chan 2002) (Ross, Weill & Robertson 2006). However, based on previous research, the decision makers often have poor understanding of the big picture making the planning and developing of the, already very hard to predict, business that much harder (Luftman, Papp & Tom 1999) (Fitzgerald et al. 2013) (Westerman et al. 2011).

Many experts would agree that organizations should better bridge the gap between IT and business, especially in the context of organizations and industries in digital transformation (Westerman et al. 2011) (Ross, Weill & Robertson 2006) (Luftman, Papp & Tom 1999) (Henderson & Venkatraman 1993), and this is indeed one of the main focuses of this research. In the context of the case company the aim is to conduct research on what the current perceptions and thoughts on the topic are for people in different roles and in different parts of the organization. Understanding the different ways of thinking and levels of knowledge, as well as identified opportunities and challenges, in the area of digital transformation, might enable the case organization to make strides forward by better understanding their current situation in different parts of the organization.

## 1.2 Research problem and objectives

The larger research problem in question can be framed as a very high-level research question as follows: **“How could enterprises better understand & manage digital transformation?”**

Basically this means that the specific strategic choices of individual organizations are not all that interesting for the purpose of this research. However, the challenges organizations face when making those choices, as well as realizing them, instead are.

Based on the existing literature on the topic, which is represented in chapter 2, as well as the general knowledge in the field, some interesting concepts came up as being very much related to the concept of digital transformation, which leads us to the actual research questions.

The aforementioned research problem was broken down into four research questions:

1. What does digital transformation mean?
2. What kinds of challenges are there in digital transformation for a large enterprise?
3. How could enterprises tackle the challenges in digital transformation?
4. What kind of a role could enterprise architecture (EA) play in the digital transformation of large enterprises?

**Table 1. Research questions and sub-objectives of the thesis**

<b>Research questions</b>	<b>Sub-objectives</b>	<b>Method</b>	<b>Chapter</b>
1. What does digital transformation mean (DT)?	<ul style="list-style-type: none"> <li>a) DT as a concept</li> <li>b) DT in the context of the case company (retail)</li> <li>c) How is DT understood and depicted at the case company?</li> </ul>	SLR + Case	2.2.1 + 4.1
2. What kinds of challenges are there in digital transformation for a large enterprise?	<ul style="list-style-type: none"> <li>a) Identified challenges in literature</li> <li>b) Identified challenges in the case company</li> <li>c) How do the challenges from practice relate to the ones from literature?</li> </ul>	SLR + Case	2.2.2 + 4.2
3. How could enterprises tackle the challenges in digital transformation?	<ul style="list-style-type: none"> <li>a) Do good practices exist according to literature?</li> <li>b) Experiences from solving these challenges in the case company</li> <li>c) What described good practices does the case company utilize and what could it do better?</li> <li>d) Could the case company benefit from some of the other good practices from literature?</li> </ul>	SLR + Case	2.2 + 4.3
4. What kind of a role could enterprise architecture (EA) play in the digital transformation of large enterprises?	<ul style="list-style-type: none"> <li>a) EA definition and existing research related to EA in the context of DT and business strategy</li> <li>b) Most popular EA frameworks and models</li> <li>c) Identified EA challenges in both literature and practice</li> <li>d) Identified EA benefits in both literature and practice</li> <li>e) How does EA relate to DT and could it play a role in solving the identified challenges?</li> </ul>	SLR + Case	2.4 + 4.4

### 1.3 Research scope

There are a few limitations to the scope of the research in addition to those set by the topic and the research questions:

- The objective of the research is to figure out how to structure the phenomenon of digital transformation and how to handle it as a manageable entity, not only to investigate the phenomenon on a general level.
- Research is primarily focused on the B2C part of the case company's business.
- Focus is more on new business development and creation as opposed to optimization of existing processes.
- Empirical research is conducted in different parts of the case company with the primary focus being on the middle and top management of different business units of the organization. IT departments are a secondary focus.

## **2 Introduction to the problem area of the thesis**

In this chapter, we're going to explore the existing literature on the problem area of the thesis, namely business strategy and digital transformation as well as enterprise architecture. The chapter begins with an explanation on how the systematic literature review was conducted. After that, each of the key concepts is explored in the light of the findings of the literature review. Each subchapter begins with an explanation of the topic and is followed by other findings from the literature.

### **2.1 The method of systematically reviewing the literature**

The primary purpose of using systematic literature review for this thesis was mainly to help formulate interesting and suitable interview questions to support the interviews that form the majority of the case study. Secondly this literature review was used to compare and analyse the results of the study to that of the existing theory

The methodology chosen for this systematic literature review is based on the framework portrayed in the article "*Five steps to conducting a systematic review*" (Khan et al. 2003):

- Step 1: Framing questions for a review
- Step 2: Identifying relevant work

- Step 3: Assessing the quality of studies
- Step 4: Summarizing the evidence
- Step 5: Interpreting the findings

### **2.1.1 Step 1**

The first step of this process has already been touched upon in the previous subchapter *Research problem and objectives*. In practice, this meant that the search terms were derived from the research questions by selecting the most important keywords and their combinations. After that, 5 databases were chosen. 2 of these 5, Google Scholar and Web Of Science, are actually search engines for a larger collection of databases and articles.

### **2.1.2 Step 2**

The idea of the second step is to do an extensive search on many different databases and other sources and document not only the results of the research but even more importantly the rationale behind inclusion and exclusion of certain items. In the context of this research this meant that first each article matching the search criteria were evaluated based on their title and/or abstract and if they were found to be relevant for the purpose of this research, they were documented by search query and database along with the authors' own notes about the content.

### **2.1.3 Step 3**

The purpose of the third step is to assess the quality of the included material in order to “*be used for exploring heterogeneity and informing decisions regarding suitability of meta-analysis*” (Khan et al. 2003). So after all of the results were documented for a given database and search query combo, the results were again analysed and subjectively graded by the author with a grade from 1 to 10. The criterion for the

grading was twofold: relevance to the topic of the research and the subjectively perceived quality of the paper.

#### **2.1.4 Step 4**

In the fourth step the material is analysed. In this case, this was done in light of the applicable research questions. As the sample size was still rather limited, a thorough statistical analysis of the findings was not deemed to be all that beneficial. The author instead performed a qualitative aggregation of the study results for each of the related topics instead. Furthermore, interesting references from the qualified papers were investigated and analysed but these are not listed in the table below.

#### **2.1.5 Step 5**

The last step of the process is to actually interpret the findings, which is to be done considering the results from phase three and four while keeping in mind the original goal of the review. As mentioned before, the purpose of this literature review was first and foremost to help design the interviews that were to serve as the backbone of the case study. The literature review also provided the context for considering the results in the light of current research.

Aside from using the process by Khan, the author also went through additional material by using snowballing, e.g. the references of the studies that were deemed to be the most relevant were also investigated to gather some additional material.

Table 2 illustrates the systematic literature review process and the number of resulting papers in each phase. The complementary results column represents the articles found via snowballing and further complementary database searches used to fill gaps in the original literature review.

Table 2. Systematic Literature Review Results

Database	Google Scholar	IEEE	ACM	Elsevier Science Direct	Web of Science	Complementary results	Total
"Enterprise architecture" AND strategy AND "digital transformation"	48 results, 2 qualified	0 results	0 results	0 results	0 results		2 (48)
"Enterprise architecture" AND strategy (AND alignment for Google Scholar)	10600 results, 4 qualified	81 results, 17 qualified	338 results, 18 qualified	12 results, 3 qualified	108 results, 4 qualified	26 qualified results	72 (11139)
Strategy and "digital transformation"	3190 results, 8 qualified	0 results	0 results	1 result, 1 qualified	0 results	15 qualified results	24 (3191)
"Enterprise architecture" AND "Digital transformation"	50 results, 0 new papers qualified	0 results	0 results	0 results	0 results		0 (50)
<b>Total</b>	14 (14598)	17 (81)	18 (338)	4 (13)	4 (108)		57 (14428)

## 2.2 Digital transformation

The concept of digital transformation is on a high level easily understood: things that once were solely in the physical world are nowadays moving towards being digital. However, based on my literature review, there has been surprisingly little academic research conducted on the concept itself, only 11 qualified papers were found. This is despite the term "digital transformation" having existed at least since 2000 (Patel & McCarthy 2000).

The most thorough studies on the topic have been conducted in co-operation by MIT Centre for Digital Business and CapGemini Consulting. Westerman et al. (2011) interviewed 157 executives from 50 companies in 15 countries and across 8 industries over multiple years and Fitzgerald et al. (2013) surveyed 1559 executives from all over the world on the topic.

Furthermore, most of these studies from a very high level point-of-view of a larger phenomenon, not from the point-of-view of individual organizations, let alone from those of the different business units within those organizations. As a result of this, the best practices regarding digital transformation are not very thoroughly studied. In the context of the results of this literature review, they were mostly the opinions and perceived solutions to challenges by managers or consultants, not ones that have been scientifically proven.

### **2.2.1 Digital transformation as a concept**

Westerman et al. (2011) define digital transformation as “the use of technology to radically improve performance or reach of enterprises”. Another well-known, more holistic definition for the term is that “*digital transformation can be understood as the changes that digital technology causes or influences in all aspects of human life*” (Kaplan et al. 2010). Another interesting definition by Lankshear and Knobel (2008) defines digital transformation as the third and ultimate level of digital literacy that “is achieved when the digital usages which have been developed enable innovation and creativity and stimulate significant change within the professional or knowledge domain”. This explanation would seem to go deeper than some of the others in that it actually explores the motivation for and consequences of undergoing digital transformation.

As is evident in all three definitions, digital transformation is not so much about incremental improvements, for example in gradually improving the level of automation of core business processes with digital technology, but is a much more fundamental change towards a world where everything depends on digital information systems. In other words, it is a holistic and comprehensive shift towards

everything either being digital. The different definitions for digital transformation can however be categorized into two different points of view:

- **Organizational**
  - A change process that can be undergone and completed (for example by a specific organization)
- **Contextual**
  - A wider phenomenon affecting a specific operating environment, such as an industry, or, generally speaking, the world around us

Both points-of-view are used in this research, the first when considering the situation of a specific organization and the latter when considering the environment the company operates in.

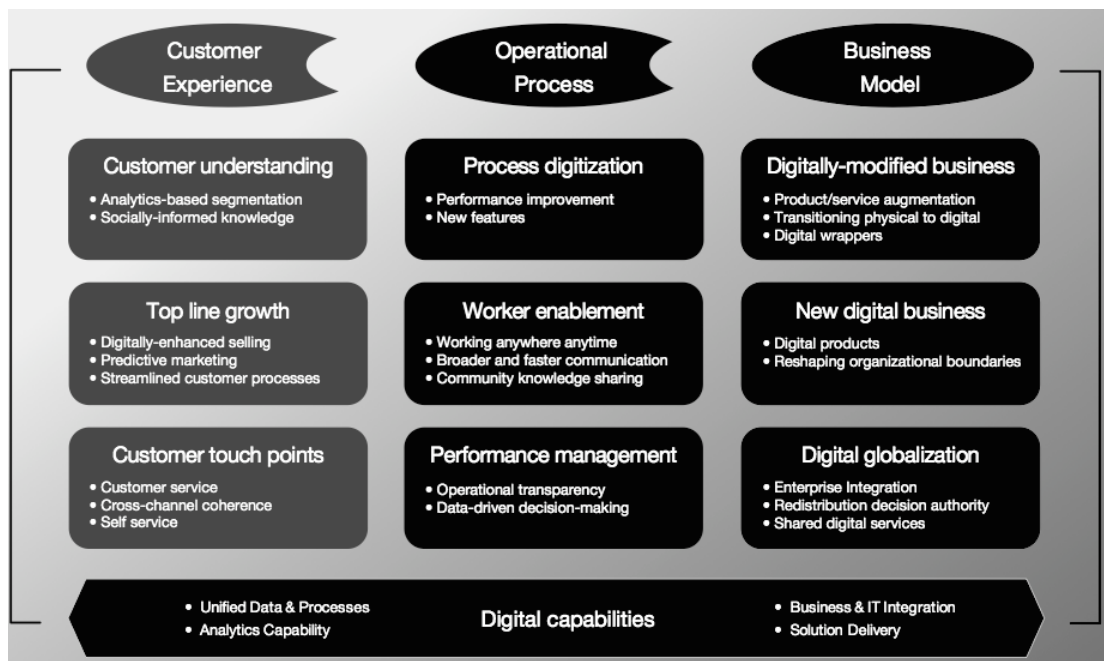


Figure 1. Building blocks of digital transformation (Westerman et al. 2011, p. 17)

The study by Westerman et al. (2011, p. 17), which focuses mostly on the first point-of-view, has identified that digital transformation touches organization in three main areas:

- Customer Experience
- Operational Processes
- Business Model

Each of these three was further divided into three sub elements that can be seen in Figure 1. This division helps explain how digital transformation is happening in the different parts of the organization.

**Customer Experience** was broken down into three sub segments: customer understanding, top line growth and customer touch points. An interesting notion about this division is that traditionally customer experience has only been seen from the point of view of the different touch points (Rawson, Duncan & Jones 2013). Here Westerman et al. paint a more comprehensive picture by adding the elements of digital sales and marketing and streamlining processes (top line growth), as well as new means of understanding customers in the digital domain.

While the most apparent changes are the new digital customer touch points that web and mobile have enabled, I personally see the part about better customer understanding and even value co-creation (Lin, Hsia & Wu 2009, p. 187) (Gray et al. 2013, p. 2) as an extremely interesting addition to the traditional picture of customer experience since digital provides entirely new tools for being able to more cost-effectively understand customers on a large scale and proactively develop the holistic customer experience based on those insights, as opposed to a narrow minded optimization of the existing touch points.

Organizations can also use digital technology to enhance and automate the **operational processes**. Westerman et al. divides the transformation of operational processes further down into three segments: process digitization, worker enablement and performance management.

Of these three, process digitization is the most obvious one. There's nothing new with this, after all companies have been purchasing ERP and other systems, exactly for this purpose, in large numbers ever since the 1990s (Rettig 2007). However, as the technology advances new possibilities are constantly opening up to develop and automate these processes further.

Once the processes and all of the data is in a digital format, that enables organizations to more accurately monitor and manage their performance with the help of Key Performance Indicators (KPIs) that can also be more easily shared across the organization to improve transparency and aid in decision-making.

However, personally I see worker enablement as the most interesting of these three. There are multiple parts to it. First, it's about providing the employees with the tools for being able to do their job better. From the authors' point of view, the most important part however is about being better able to share knowledge and communicate across organizational borders. This is a constant challenge in all large organizations and one that is crucial for the employees to be able to perform at their best.

The third area of transformation by nature is that of **business model(s)**. At its simplest form, digitalization can enable globalization and access to new markets. As a matter of fact, more than 600 out of the 1559 surveyed executives in the study by Fitzgerald et al. (2013, p. 6) state that they've already expanded to new markets with the help of digital technology. However, actually creating new business and business models with that technology seems to be much rarer as only 7% of the respondents to the same survey stating to have been able to create new businesses.

The third part of this area is the use of digital to provide something new to existing businesses, in the form of value-adding services or augmenting the products or services with digital components.

Underlying these three areas is a block called **digital capabilities**. This is the foundation for being able to execute any of the above-mentioned transformations in practice. These capabilities are not just about having the right IT systems, but is a much more holistic concept. It includes components such as how well IT & business are aligned, a topic that we'll explore further in Chapter 2.3.2, what the data and processes of the organization are like and are they unified, as well as the actual ability of the organization to deliver new solutions to emerging needs.

Together, the model paints a quite thorough high-level picture of Digital Transformation from the **Organizational point of view**. The model doesn't, however, link this high-level picture that well into the practice of an organization. Furthermore, one should be careful as not to think of these different areas separate entities. The author would argue that they are very much intertwined and should be considered together in the decision-making process. Changes to one part of the puzzle are bound to have repercussions to other parts of the model.

From a more practical point of view, an organization could use the model to perhaps plan their angle of approach when it comes to digital transformation, e.g. should you start from the customer experience and then later think of optimizing operational processes and fine tune the business model or perhaps the other way around.

### **2.2.2 Digital transformation challenges for organizations**

According to the study by Westerman et al., none of the 50 companies, most of which had a turnover of more than \$1 billion, had successfully transformed all 9 of the elements from Figure 1 above. (Westerman et al. 2011, p. 17). It would thus seem that companies are finding significant challenges in the area that we'll be briefly discussing in this chapter. An overview of the identified challenges in the area of digital transformation can be seen in Table 3. These challenges are sorted from top to bottom by the amount of appearances in the 4 studies.

In addition the studies by Westerman et al. and Fitzgerald et al. that were already introduced in chapter 2.2, a third study is presented in Table 3. It was conducted by Prahalad and Krishnan and is based on the responses of around 500 senior executives in the context of driving strategic transformation with IT (2002). The fourth study in the table is a classic article by Kotter (1995) is based on his personal experience in seeing transformation projects fail. In the article he presents an 8-step framework for managing transformation projects with each specific step answering to specific challenges. It isn't specific to digital transformation but gives an interesting reference to challenges in corporate transformation projects overall.

One interesting notion in these findings is the fact that Westerman et al. (2011) were the only ones to mention missing skills as a significant challenge, but in their study, it was actually the single most common challenge, listed by a whopping 77% of the respondents. This raises some questions regarding the other studies. Why wasn't this result found in the other studies? Is it the case that in those studies the respondents would still be struggling with some of the initiation challenges and haven't gotten to actual challenges of implementation? Or is there something else behind this?

**Table 3. Identified challenges in digital transformation**

<b>Challenge</b>	<b>References</b>	<b># Of studies (out of 4)</b>
Lack of urgency	(Westerman et al. 2011) (Fitzgerald et al. 2013) (Pralhad & Krishnan 2002) (Kotter 1995)	4
Conflicting roles & goals (coordination and leadership issues)	(Westerman et al. 2011) (Fitzgerald et al. 2013) (Pralhad & Krishnan 2002) (Kotter 1995)	4
Lacking a vision or failing to communicate it	(Westerman et al. 2011) (Fitzgerald et al. 2013) (Kotter 1995)	3
Cultural issues	(Westerman et al. 2011) (Fitzgerald et al. 2013) (Kotter 1995)	3
Ineffective IT, limiting legacy systems	(Westerman et al. 2011) (Fitzgerald et al. 2013) (Pralhad & Krishnan 2002)	3
Lack of collaboration, siloed business units	(Fitzgerald et al. 2013) (Pralhad & Krishnan 2002) (Kotter 1995)	3
Regulatory concerns	(Westerman et al. 2011) (Fitzgerald et al. 2013)	2
Unclear business case, not enough funding	(Westerman et al. 2011) (Fitzgerald et al. 2013)	2
Missing skills	(Westerman et al. 2011)	1

However, by analysing the findings, we can see that all 3 of the studies specifically about digital transformation identified three central challenges:

- Lack of perceived urgency to begin the transformation
- Coordination and leadership issues such as having unclear or conflicting roles, responsibilities and goals
- Ineffectiveness of IT to respond to change

In addition to these three, there were additional three issues that were mentioned by three of the four studies:

- Lacking a vision or failing to communicate it
- Cultural issues
- Lack of collaboration and siloed business units

If we look at these challenges one by one, we can see that all of the studies mentioned the **lack of perceived urgency to begin the transformation** as a key challenge, which shouldn't come as a surprise to anyone who's worked in a large organization. There are always those visionaries who see the need to change and those who see no reason to change. If the organization has too many people of the latter category, especially in leadership positions, it's quite likely that the organization also has **cultural issues** regarding change resistance rooted deep down into the everyday practices as well as minds of many employees.

The second challenge recognized by every study was that of **coordination and leadership issues**, specifically regarding unclear or conflicting roles, responsibilities and goals. Personally I would argue that this is very much linked to the issue of **lacking a vision or failing to communicate it**. The organization first needs a clear vision that is also clearly explained and communicated. It's really only possible to set clear and meaningful goals on different levels of the organization once the management clearly understands the vision and the rationale behind that. The roles and responsibilities can then be adjusted so that the organization can reach those goals.

This brings us to the next challenge of **lack of collaboration** and the business units being siloed. I would consider this to be to some extent a coordination issue, largely a cultural issue but most of all a result of not having clear roles, responsibilities and goals. If all of those are clear in the minds of employees, it's much easier for them to

ask for help regarding a specific hands-on challenge instead of trying to ask someone for help in understanding the big picture first.

The last of the challenges mentioned by at least three studies was the **ineffectiveness of IT to respond to change**. This is different from the previously mentioned challenges in the sense that's it's much more concrete. According to these studies, might be many reasons for the ineffectiveness of IT but often they are a result of either poor relationships between business and IT or stem from the organization having built a complex, interdependent network of legacy system after another, that results in change being slow (Westerman et al. 2011).

Interestingly enough, the vast majority of the challenges seem to be the same in the three digital transformation studies as compared to Kotter's. The challenges not mentioned by Kotter the ineffectiveness of IT, as well as regulatory concerns, unclear business case and missing skills. This is quite natural since these issues are specific to the actual operational execution and not about managing change per se.

One could thus argue that managing a digital transformation is for the most part like any other change or transformation process and tools like the Kotter framework can serve as valuable tools for that. Those challenges related to the operational execution of the transformation could be classified to belong to the fifth step in Kotter's framework: Removing obstacles for change. This is a quite vague definition but the author would consider that to be the case for a reason. The challenges differ based on the organization and transformation project in question.

While change management frameworks could perhaps provide a solid starting point for digital transformation, they provide no answers to the specific challenges of the operational execution of the transformation, which has challenges of it's own in along to the more generic change management ones, as we saw from above.

### **2.3 Business strategy and IT**

First of all, let's clarify the terminology: whenever the word 'strategy' is used in this paper, the author is referring to business strategy. Strategy, and even the more specific term of business strategy, is a very comprehensive topic and explaining it in

more detail than the very brief overview presented in chapter 2.3.1 was considered to be out of the scope of this research.

In this chapter, we'll be briefly exploring the existing literature about the relationship between business strategy and IT, commonly discussed as business-IT alignment (Strassmann 1998), and more specifically enterprise architectures role in the equation.

### **2.3.1 Business Strategy**

The term strategy is very diverse by nature and there are quite a few different definitions for it. It also exists on a number of different levels, such as corporate strategy and business strategy (Mintzberg, Ahlstrand & Lampel 1998, p. 16).

In the context of this thesis, the chosen term to be used is business strategy. Mintzberg has a very concise definition for the term: "*How shall we compete in each business?*" (Mintzberg, Ahlstrand & Lampel 1998, p. 16). Another interesting and slightly longer definition by Watkins (2007) gives a more thorough explanation on what this means: "*A business strategy is a set of guiding principles that, when communicated and adopted in the organization, generates a desired pattern of decision making. A strategy is therefore about how people throughout the organization should make decisions and allocate resources in order accomplish key objectives*".

Strategic management in turn is the process of formulating and implementing this business strategy in the form of strategic initiatives (Nag, Hambrick & Chen 2007). These two processes of formulation and implementation are usually seen as iterative and as providing input for one another (Mintzberg et al. 2002).

In the context of digital transformation and the rapidly shifting industries of today, an interesting angle towards business strategy is the concept of emergent strategies versus deliberate strategies. (Mintzberg et al. 2002, p. 5). The idea there is that external forces will shape the formulated strategies of an organization as they are in the process of implementing those. The end result is that the realized strategy of the company often is different to the one they previously formulated.

### 2.3.2 Business-IT Alignment

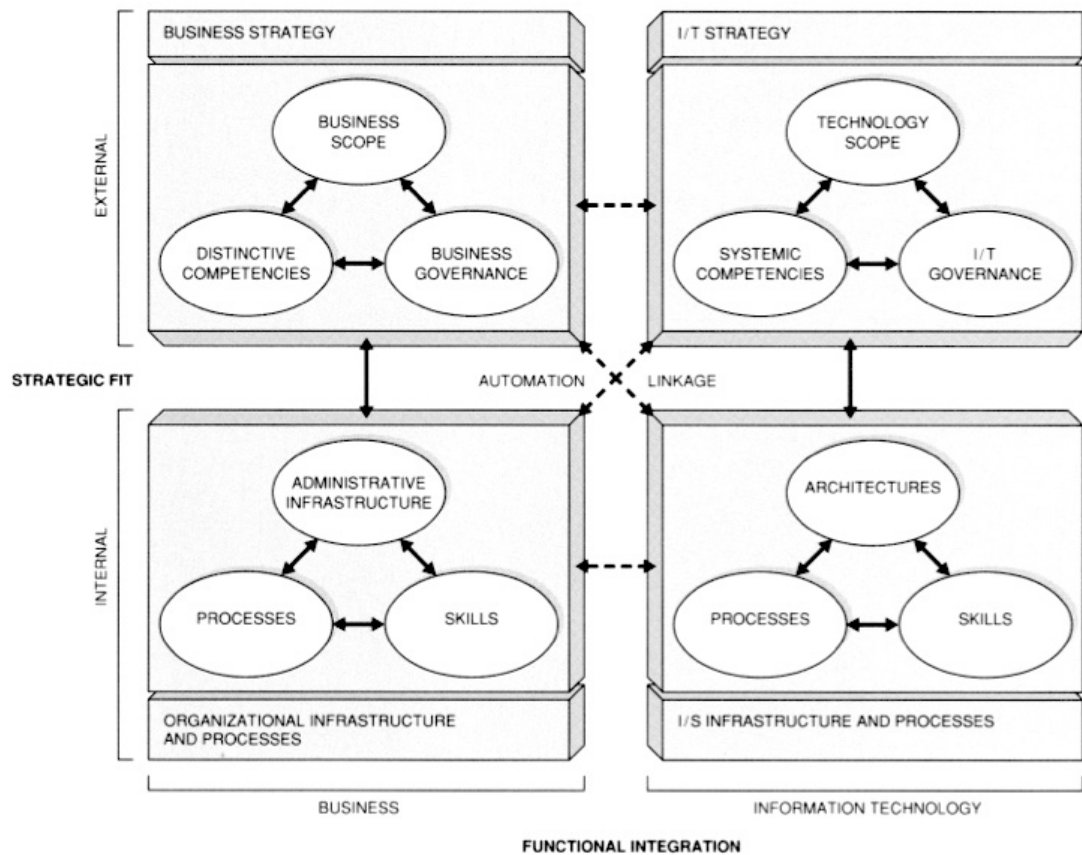


Figure 2. The strategic alignment model (Henderson & Venkatraman 1993)

The concept of business-IT alignment is an interesting one. It has been considered one of the top management issues since the 1970s (Luftman, Lewis & Oldach 1993).

and was for example the number one concern for CIOs in 2008 (Nash 2007), yet there still is no common definition for it (DeLisi & Danielson 2007). The term itself is considered to originate from Henderson & Venkatraman with the introduction of their classic strategic alignment model (Henderson & Venkatraman 1993), which is represented in Figure 2.

Henderson & Venkatraman define business-IT alignment as “*the degree of fit and integration between business strategy, IT strategy, business infrastructure, and IT infrastructure*” (1993). Other definitions include for example “*the capacity to demonstrate a positive relationship between information technologies and the*

*accepted financial measures of performance” (Strassmann 1998) and “Business Alignment, the degree to which IT applications, infrastructure and organization enable and support the business strategy and processes, as well as the process to realize this” (Silvius, de Waal & Smit 2009).*

The author would however like to point out that even though the concept of business-IT alignment is still a very hot issue, the term itself might be somewhat out-dated. For many companies, for example virtually all software vendors, IT is business and business is IT. These two are inseparable. Looking at some of the above definitions makes it clear that the term is often used more to describe the two sides having common goals than about them actually being one. The author thus views ‘alignment’ as only the first step in the path to leaving this age-old confrontation behind and actually deeply integrating both business and IT. Similar views about the term being misleading have also been presented by other parties (DeLisi & Danielson 2007) (El Sawy 2003), with El Sawy coining the term Business-IT Fusion, which I think is much better suited to describe the goal organizations should strive towards.

### **2.3.3 Challenges in achieving business-IT alignment**

The common challenges in achieving and inhibitors of business-IT alignment have also been researched to some extent. The most expansive of these studies was that by Luftman et al. (Luftman, Papp & Tom 1999). They surveyed executives in more than 500 firms to find out what were the main inhibitors in business-IT alignment. The study by Chan (2002) actually was actually about the preconditions necessary for achieving successful alignment, so the in the case of Chan, the challenges in Table 4 are the lack of these preconditions discovered by him.

The results of these selected studies discovered during the literature review have been documented in Table 4. The same format applies to this table as table 3, i.e. the results are arranged from top to bottom in order of the count of appearances of the challenge in the different studies.

**Table 4. Identified challenges in achieving business-IT alignment**

<b>Challenge</b>	<b>References</b>	<b># Of studies (out of 3)</b>
Lack of communication or communication being one-way only	(Luftman, Papp & Tom 1999) (Fiegenger & Coakley 2002) (Chan 2002)	3
Lack of close relationship between business & IT, plans not aligned (separate silos)	(Luftman, Papp & Tom 1999) (Fiegenger & Coakley 2002) (Chan 2002)	3
Business executives not understanding or supporting IT	(Luftman, Papp & Tom 1999) (Fiegenger & Coakley 2002) (Chan 2002)	3
IT lacking business skills, business lacking IT skills	(Fiegenger & Coakley 2002) (Chan 2002)	2
Lack of understanding between IT & Business	(Luftman, Papp & Tom 1999) (Chan 2002)	2
IT performance metrics not aligned with business or lacking altogether	(Fiegenger & Coakley 2002) (Chan 2002)	2
Poor IT prioritization	(Luftman, Papp & Tom 1999)	1
IT failing to meet commitments	(Luftman, Papp & Tom 1999)	1
IT management lacking leadership	(Luftman, Papp & Tom 1999)	1
Lack of appropriate career paths (for IT)	(Chan 2002)	1
IT unable to start strategic projects because of them not fulfilling strategic KPIs	(Fiegenger & Coakley 2002)	1

By analysing Table 4, we can see that some of the results are unique to specific studies, for example Luftman, Papp & Tom put great emphasis on the managerial issues of IT, e.g. prioritization, leadership and inability to meet commitments, whereas Chan found IT career management to be problematic with the lack of incentives and appropriate career paths. However, there were also themes arching all three studies. For example, the lack of business understanding by IT was seen as a challenge in all three, as was the lack of a close relationship between IT and business. The findings that were found in all three studies are listed below.

- IT and Business lacking in cross-disciplinary skills and understanding of each other
- Lack of communication or communication being one-way only
- Lack of a close relationship between IT and business (Silo effect)
- Lack of senior management support for IT

When comparing these challenges with those listed in chapter 2.2.2 as challenges for digital transformation, it is interesting that the same themes of cultural and collaboration related issues seem to pop up. As a matter of fact, all of these themes could be argued to fit within the 6 most common challenges of digital transformation, except for the notable exception of senior management support for IT.

It might be the case that this challenge has since eased slightly, since these studies regarding business-IT alignment are about a decade older than the digital transformation ones. As these findings are so similar, it could be derived that business-IT alignment is very closely linked to digital transformation in the sense that many of the challenges are similar.

I would personally argue that business-IT alignment is actually one important subset of the organizational point of view of digital transformation. Achieving business-IT alignment is one of those “obstacles for change” that should be accomplished according to the Kotter framework (1995).

## 2.4 Enterprise architecture

The roots of enterprise architecture can be considered to be in the systematic data modelling, such as ER (Chen 1976), and system analysis methods (DeMarco 1979) of the 1970s and 1980s. (Kappelman et al. 2008) The term itself was introduced in 1989 by the National Institute of Standards and Technology (Fong & Goldfine 1989). They presented the so-called NIST Enterprise Architecture Model, presented in Figure 3, which shows how Enterprise Architecture is driven by the business. Only then are information, data and systems architectures derived from those requirements step by step.

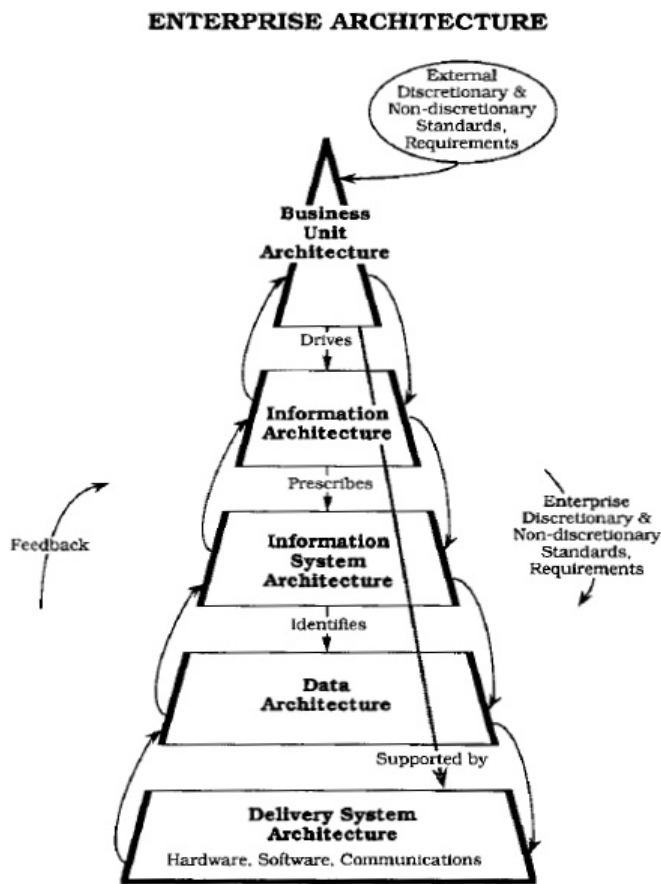


Figure 3. The NIST EA Model (Fong & Goldfine 1989)

The origins of enterprise architecture are, however, considered to be in a paper called “A framework for information systems architecture” written by Zachman in 1987, in

which he introduced the famous framework named after himself (1987). Even after more than 25 years, his framework is still the most widely used framework in practice (Aziz & Obitz 2007) (Simon, Fischbach & and Schoder 2013).

There are a number of different definitions for enterprise architecture. They can generally be categorized in two different categories (Hoogervorst 2004):

- Descriptive
- Prescriptive

Descriptive definitions typically consider architecture as a set of artefacts, documents and blueprints describing how the enterprise is built and how it works. An example of this kind of definition is that created by Op 't Land et al. (2009):

*”A coherent set of descriptions, covering a regulations-oriented, design-oriented and patterns-oriented perspective on an enterprise, which provides indicators and controls that enable the informed governance of the enterprise’s evolution and success”*

The prescriptive school in turn focuses on the process of building these artefacts and the rationale for doing so. An example of this category is the definition by the Federation of Enterprise Architecture Professional Organization (2013):

*“A well-defined practice for conducting enterprise analysis, design, planning, and implementation, using a holistic approach at all times, for the successful development and execution of strategy. Enterprise Architecture applies architecture principles and practices to guide organizations through the business, information, process, and technology changes necessary to execute their strategies. These practices utilize the various aspects of an enterprise to identify, motivate, and achieve these changes”*

In the following chapters we’ll be briefly exploring the need for enterprise architecture, the most popular EA frameworks and the benefits associated with EA, as well as the key challenges in implementing one based on the performed literature review. At the end of the chapter, the relationship of business strategy and enterprise architecture is briefly explored.

### **2.4.1 The need for enterprise architecture**

As we've already identified in chapters 2.2 and 2.3, many organizations have to consider IT in a more strategic role than before due to rapidly digitalizing world. However, as we discovered in chapters 2.2.2 and 2.3.3, organizations are facing many challenges in their attempts to achieve business-IT alignment and undergo this digital transformation. These challenges often stem from the increased complexity resulting from organization adding digital layers on top of existing business.

Enterprise architecture has been studied to be an effective tool for remedying these problems and succeeding in the aforementioned attempts (Ross, Weill & Robertson 2006) (Alaeddini & Salekfard 2013) (Winter et al. 2010) (Op't Land et al. 2009). According to Hoogervorst (2009), enterprise architecture is one of the key methods for enterprises to manage complexity. More information about the benefits of enterprise architecture can be found in chapter 2.4.3.

### **2.4.2 Enterprise architecture frameworks**

In this chapter, we'll be briefly introducing the most popular enterprise architecture frameworks according to recent studies (Scholtz, Calitz & Connolley 2013) (Simon, Fischbach & Schoder 2013) (Aziz & Obitz 2007): the Zachman framework, The Open Group Architecture Framework (TOGAF) and Federal Enterprise Architecture Framework (FEAF).

As mentioned before, the Zachman framework was the one that started it all in 1987 (Zachman 1987) and it's still the most popular EA framework among practitioners with 28% market share (Aziz & Obitz 2007). The Zachman framework is in his own words "*a two dimensional classification scheme for descriptive representations of an Enterprise*" (Zachman 2002) In other words, the idea is that the framework is a semantic tool providing an overview of the enterprise and is in fact agnostic to the processes or tools that then implement this big picture. (Zachman 2002). The framework is illustrated with a 6x6 matrix with the columns representing various abstractions of the enterprise and rows representing the different perspectives of the different actors involved. Zachman considers each of the cells to be primitive and the

whole set of cells to be comprehensive and normalized, meaning that the set of cells should always be fixed, independent of culture or any other factors (Zachman 2002). The matrix is illustrated in Table 5.

**Table 5. The Zachman Framework (Zachman 2002)**

	<b>What (Data)</b>	<b>How (Function)</b>	<b>Where (Network)</b>	<b>Who (People)</b>	<b>When (Time)</b>	<b>Why (Motivation)</b>
<b>Scope (Executive Perspective, contextual)</b>	List of Things Important to the Business	List of Processes the Business Performs	List of Locations in which the Business Operates	List of Organizations important to the Business	List of Events/Cycles Significant to the Business	List of Business Goals/Strategies
<b>Business Model (Business Mgmt. Perspective, conceptual)</b>	e.g. Semantic Model	e.g. Business Process Model	e.g. Business Logistics System	e.g. Work Flow Model	e.g. Master Schedule	e.g. Business Plan
<b>System Model (Architect Perspective, logical)</b>	e.g. Logical Data Model	e.g. Application Architecture	e.g. Distributed System Architecture	e.g. Human Interface Architecture	e.g. Processing Structure	e.g. Business Rule Model
<b>Technology model (Engineer Perspective, physical)</b>	e.g. Physical Data Model	e.g. System Design	e.g. Technology Architecture	e.g. Presentation Architecture	e.g. Control Structure	e.g. Rule Design
<b>Detailed representations (Technician Perspective, out-of-context)</b>	e.g. Data definition	e.g. Program	e.g. Network Architecture	e.g. Security Architecture	e.g. Timing definition	e.g. Rule specification
<b>Functioning Enterprise (Enterprise Perspective)</b>	e.g. Data	e.g. Function	e.g. Network	e.g. Organization	e.g. Schedule	e.g. Strategy

TOGAF was a very close second with a share of 27% (Aziz & Obitz 2007). However, among very large organizations (more than 50 000 employees) TOGAF was actually by far the most widely used framework with 58% adoption rate. (Aziz & Obitz 2007). The study found its' strength to be the fact that it in addition to the

high level overview into the enterprise, it also provides clear tools and process guidelines. It can be used in all phases of the EA process: design, evaluation and building (Leist & Zellner 2006).

The Open Group describes TOGAF as “a proven enterprise architecture methodology and framework used by the world's leading organizations to improve business efficiency” (2009). TOGAF consists of three major parts, the Capability Framework, ADM & Content Framework and Enterprise Continuum and Tools (The Open Group 2009). Of these, the Architecture Development Method (ADM, illustrated in Figure 4) is the central component. It outlines the process of actually defining and developing the enterprise architecture for the given organization. The ADM consists of 9 architecture development phases with the objectives, approach, inputs, steps, and outputs being described in a ‘narrative’ for each of the phases.

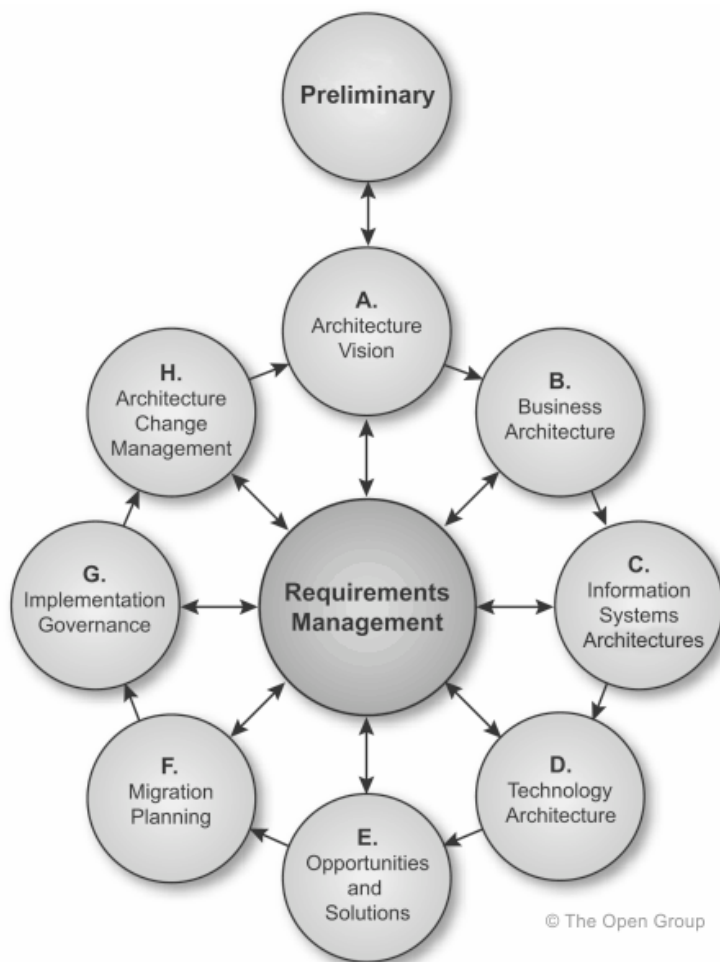


Figure 4. TOGAF ADM (The Open Group 2009)

The CIO council started development of the Federal Enterprise Architecture Framework in 1998 with the aim of maximizing the benefits of IT within the government. The CIO council defines FEAF as “an organizing mechanism for managing the development and maintenance of architecture descriptions. The Federal Enterprise Architecture Framework also provides a structure for organizing Federal resources and describing and managing Federal Enterprise Architecture activities” (CIO Council 1999).

The framework consists of eight different components and four different levels that depict the individual components with increasing level of detail. The basic process includes defining architecture drivers and a strategic direction along with the current and target architectures. Transitional processes, standards, architectural segments and models are then derived out of those components on each level of detail. Figure 5 illustrates FEAF at level III.

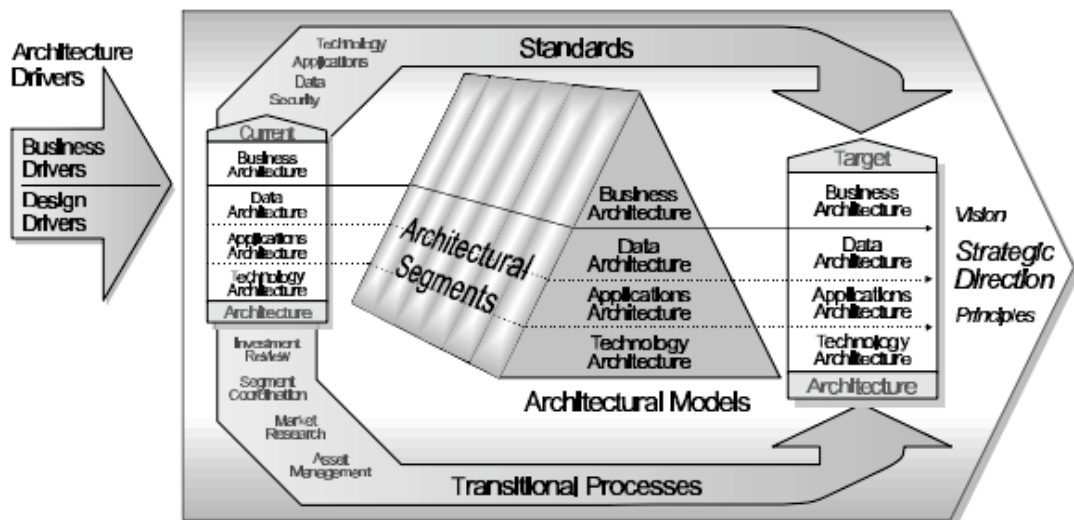


Figure 5. FEAF level III (CIO Council 1999)

However, the majority of EA practitioners, as many as 62%, (Aziz & Obitz 2007) claim to be customizing these industry standard frameworks. This is mainly because practitioners need to integrate the frameworks to the existing processes of their own organizations but half of the respondents to the Infosys 2007 survey also thought that the existing frameworks are too ‘heavy’ and were customizing the frameworks to make them more understandable and lightweight (Aziz & Obitz 2007).

### 2.4.3 Benefits of enterprise architecture

Studies over the years have associated a number of benefits that can be achieved by using enterprise architecture. These effects are typically indirect, far-reaching, enterprise wide and compound over a long period of time, which typically makes it difficult to calculate an exact ROI for Enterprise Architecture projects (Rico 2006).

However, in the very few cases where ROI has been calculated, the results seem to be spectacular to say the least. Rico for example reported the ROI of US State-level EA initiatives to be on average 4418% (Rico 2006) and the ROI of US Federal-level EA initiatives to be on average 2553% (Rico 2007).

As mentioned before, enterprise architecture has a wide range of claimed benefits. These claims were analysed based on a set of 7 studies on the benefits of enterprise architecture. This set of 7 studies contains both academic, such as those by Tamm et al. (2011) and Kappelman et al. (2008) as well as professional studies such as the Infosys 2007 EA Survey (Aziz & Obitz 2007). The benefits recognized by each study are listed in Table 6 with the order of the benefits being based on how many of the studies have identified the benefit in question. If the studies were found equally many times, they are sorted based on the importance of the benefit in question as interpreted by the author.

**Table 6. Benefits of enterprise architecture**

<b>Benefit</b>	<b>Reference</b>	<b># Of studies (out of 7)</b>
Increased responsiveness & flexibility (to change)	(Ross, Weill & Robertson 2006) (Tamm et al. 2011) (Salmans & Kappelman 2010) (Zachman 2001) (The Open Group 2009) (Aziz & Obitz 2007)	6
Increased business-IT alignment	(Tamm et al. 2011) (Salmans & Kappelman 2010) (Ross, Weill & Robertson 2006) (Zachman 2001) (Aziz & Obitz 2007) (Kappelman et al. 2008)	6

Reduced IT costs, more effective use of IT resources	(Ross, Weill & Robertson 2006) (Tamm et al. 2011) (Salmans & Kappelman 2010) (The Open Group 2009) (Aziz & Obitz 2007) (Kappelman et al. 2008)	6
Improved risk management	(Ross, Weill & Robertson 2006) (Tamm et al. 2011) (The Open Group 2009) (Aziz & Obitz 2007)	4
Improved integration/interoperability	(Tamm et al. 2011) (Salmans & Kappelman 2010) (Zachman 2001) (Kappelman et al. 2008)	4
Improved situational awareness & decision-making	(Tamm et al. 2011) (Salmans & Kappelman 2010) (Kappelman et al. 2008)	3
Improved communication & collaboration	(Tamm et al. 2011) (Salmans & Kappelman 2010)	2
Better outcomes from strategic business initiatives	(Ross, Weill & Robertson 2006) (Salmans & Kappelman 2010)	2
Improved business processes	(Tamm et al. 2011) (Aziz & Obitz 2007)	2
Improved utilization of IT	(Salmans & Kappelman 2010) (Kappelman et al. 2008)	2
Reduced complexity of IT	(Salmans & Kappelman 2010) (The Open Group 2009)	2
Increased re-use of resources	(Tamm et al. 2011)	1
Increased management satisfaction	(Ross, Weill & Robertson 2006)	1
Improve customer satisfaction	(Aziz & Obitz 2007)	1

Looking at the results, we can see that three of the benefits are found to be nearly universally applicable: flexibility and responsiveness to change, increased business-IT alignment as well as reduced IT costs and more effective use of IT resources. Interestingly enough, the first two benefits could actually be answers to the challenges of the topics of the previous chapters of this literature review: digital transformation and business-IT alignment.

The rest of the benefits are more specific than the three very high level benefits mentioned above, which might be one of the factors in them not being associated with enterprise architecture in as many studies.

Looking at the list of benefits further we can note that while many of the benefits are heavily associated with IT, these are not limited to just IT. As a matter of fact, enterprise architecture has been proven in the studies listed above to help in some of the key business challenges that businesses are facing today, such as the ones presented above, in chapters 2.2.2 and 2.3.2.

If we look at the ROI calculations by Rico (2007), it could actually be argued that that kind of ROI would not be possible if EA was merely a tool for IT to model and manage their systems with. According to the same study, the measurable benefits of EA came primarily from two sources: financial improvements and improved services. Here financial improvements meant cutting costs of the organization and enhancing the revenue collection and processing and improving services means that as a result, better service experiences were offered to all of the stakeholders of the organization, be they partners or customers. The impact of reduced redundancy from IT systems was actually only around 2% of what the aforementioned were put together. This would clearly point to enterprise architecture being first and foremost a business tool, not an IT one.

#### **2.4.4 Challenges in implementing enterprise architecture**

Despite there being many upsides to implementing enterprise architecture, as explained in 2.4.3, there is also a number of challenges organizations face in the process.

According to the Infosys 2007 EA survey (Aziz & Obitz 2007), 68% of organizations are having difficulties in justifying their enterprise architecture investments. Three major reasons for these difficulties were discovered in the study:

- Business not understanding the value of EA due to it being seen as too technical
- IT being too short term and time-to-market focused
- Business case too difficult to develop

The study explains these three to be very much intertwined in the same issues of being too IT-centric and not focused enough on providing measurable benefits to the actual business. (Aziz & Obitz 2007). The same issue was already discussed briefly in 2.4.3.

In a 2013 enterprise architecture study of 230 Finnish organizations and 351 decision-makers, QPR found that nearly 85% of the challenges in implementing were in 4 different categories (QPR Software 2013):

- Understanding (16%)
- Baseline (10%)
- Organizing (40%)
- Management (18%)

The study found it remarkable that 74% of all challenges were a result of organizations having internal difficulties understanding, organizing and managing enterprise architecture, which is again in line with the finding from the Infosys survey since all of the challenges identified in that survey would also fall under this same category, as do 6 out of the top 10 enterprise architecture landmines as defined by Rehkopf & Wybolt (2003).

Other challenges mentioned by Rehkopf and Wybolt (2003) included declaring the architecture done, as opposed to considering it as a continuous process, introducing technology before it's time and assuming that technical people make good architects.

#### **2.4.5 The relationship between enterprise architecture and business strategy in the context of digital transformation**

The relationship between enterprise architecture and business strategy has been explored in literature before. For example, Tamm et al. divide the benefits of enterprise architecture into two broad categories: benefits directly from the EA planning process itself and benefits achieved from an “EA-guided operating platform”. Tamm et al. further explain that their systematic literature review on EA benefits fails to have identified more than one benefit that would directly result from the EA planning process itself. The vast majority of the proven benefits were a result of this so-called EA-guided operating platform (Tamm et al. 2011). These findings would indicate that the role of enterprise architecture is seen in light of the current research as that of an operational enabler.

The most well known example from this school of thinking is the concept of enterprise architecture as a foundation for execution by Ross et al. (Ross, Weill & Robertson 2006). They explain the concept by comparing organizations to human beings. By doing many complex and critical tasks, such as breathing, automatically, humans can concentrate on “achieving greatness” as a result of not having to think about routine tasks. According to Ross et al., the same holds true for the best performing companies, they have automated mundane routines as well as core business processes and can focus on tasks with a higher order of importance.

The Foundation for Execution model (Ross, Weill & Robertson 2006), depicted in Figure 6, basically explains how a organization can better execute its strategy and facilitate continuous change with the help of enterprise architecture. Each company has its own operating model. That operating model sets some limits to the future strategies of the organization. When that strategy takes the form of strategic initiatives, they set priorities for the organization. To be able to execute those strategic initiatives, certain capabilities are required from the organization, such as IT infrastructure and business processes. Here Enterprise Architecture, which is derived from the operating model of the organization, defines these core capabilities and provides a basis for understanding them and their dependences as well as provide a basis for implementing the changes that are in practice unavoidable when executing strategic initiatives. These experiences on how the foundation has worked, provide a basis for the continuous loop of learning and exploiting strengths, which in turn lead to new strategic initiatives.

In that model enterprise architecture is part of a steering mechanism between the core business processes of the organization and its strategic initiatives. In this role enterprise architecture, along with the operating model of the organization, provide some limits for business strategy formulation but also define the core capabilities of the organizations, serving as the enabler for building and continuously evolving that foundation, providing a basis for strategy execution (Ross, Weill & Robertson 2006, pp. 4-5).

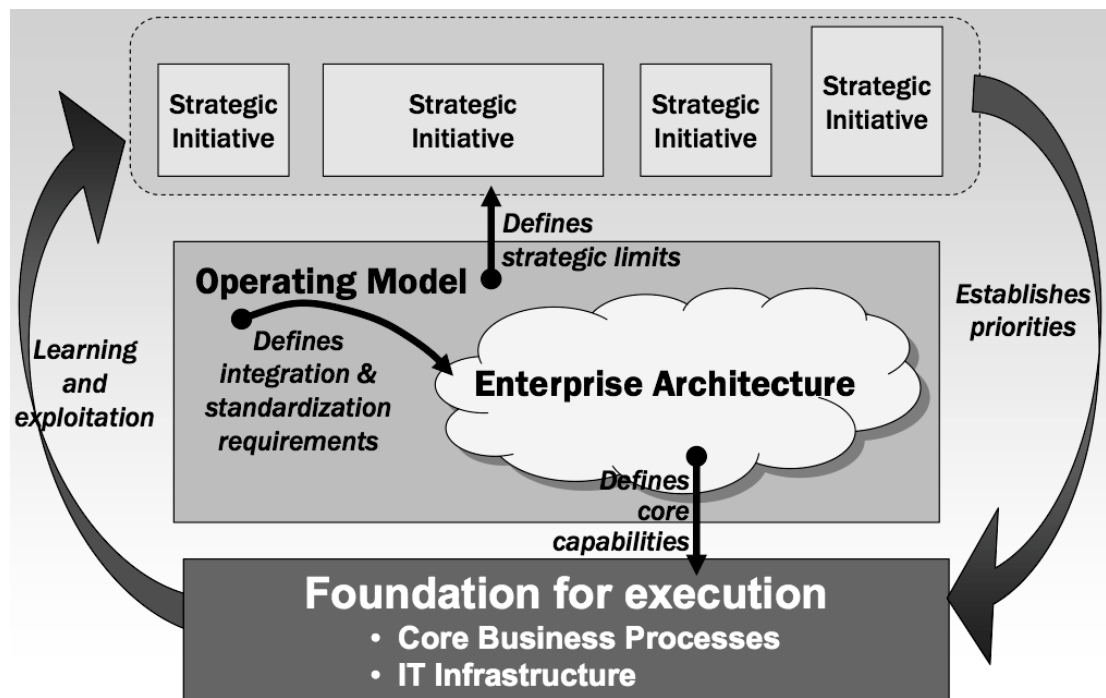


Figure 6. The Foundation for Execution model (Ross, Weill & Robertson 2006)

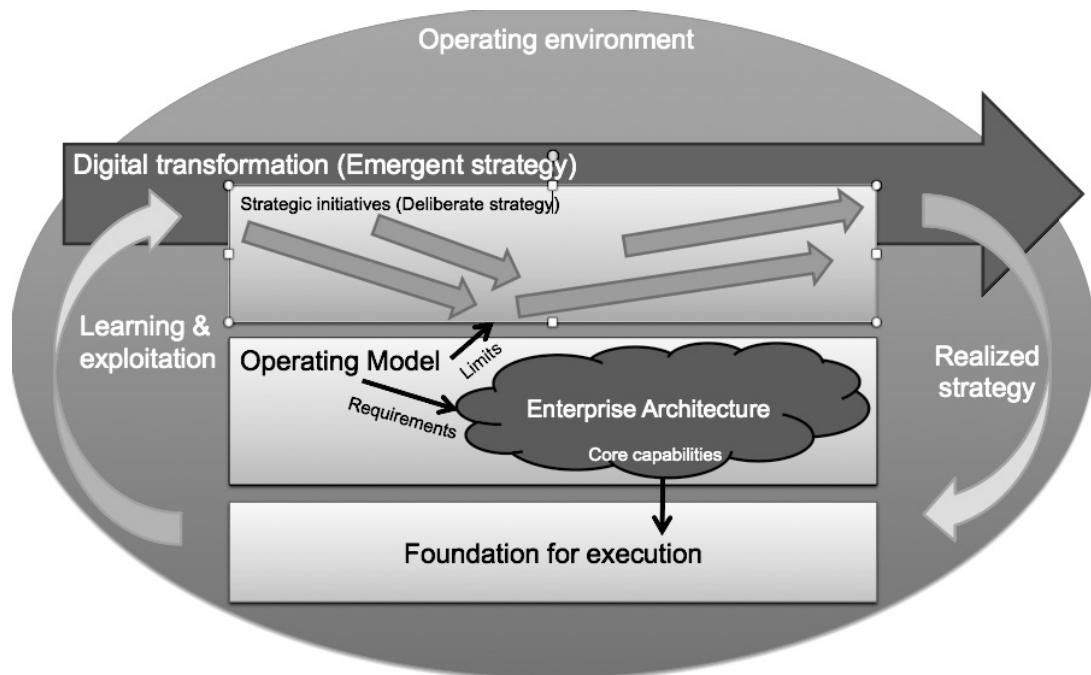
However, what the model by Ross et al. is missing, at least in the context of this research, is the link between their model and the larger context of digital transformation. The relationship of these terms is not all that well explained in any of the literature that was found during the systematic literature review.

From the **Organizational point of view of digital transformation**, an interesting finding is that when comparing the Foundation for execution model to the Building block of digital transformation (Figure 1, Westerman et al. 2011), they both have what Ross et al. refers to as the foundation for execution: a basis of business processes, organizational capabilities and IT infrastructure that together allow the organization to respond to emerging business strategy and requirements. In the Westerman model, these are referred to as the digital capabilities. It could thus be

derived that in the organizational context, enterprise architecture could serve as a tool linking these capabilities, emerging changes and the operating model of the organization together. That operating model could then be further broken down into the smaller areas represented in the Building blocks of digital transformation model, as well as other areas the business that it unavoidably has.

On the other hand, investigating the Foundation for execution model from the Contextual point of view of digital transformation leaves us with an interesting question. Since the Foundation for execution model only illustrates the internal workings of an organization, how does that model link to the operating environment of the organization and the digital transformation underway there?

Figure 7 attempts to illustrate this relationship by combining the Foundation for execution model (Ross, Weill & Robertson 2006) with the emergent strategy view by Mintzberg et al. (Mintzberg et al. 2002).



**Figure 7. The relationship between business strategy, digital transformation & enterprise architecture**

Here digital transformation is seen from the **Contextual point of view**. It's represented as a major force that heavily affects the strategies of the organization operating in this environment, very much according to the emergent strategies view by Mintzberg, which was briefly explained in 2.3.1.

Thus, during the strategy formulation process, enterprise architecture is a part of defining the limits, together with the operating model, of the business strategy for the organization, which in turn is under heavy influence from external forces, most notably digital transformation, resulting in a realized strategy that might be noticeably different than the previously perceived one. During the strategy implementation process, enterprise architecture then provides the core capabilities the organization needs to build the foundation for executing said strategy. Enterprise architecture can thus be seen as a bridge between the two parts of the strategic management process, as well as business and IT. Similar views have also been expressed in existing literature (Hoogervorst 2004) (Ross, Weill & Robertson 2006) (Lapalme 2012).

### **3 Research Approach**

The methodology for conducting the empirical part of the research is presented in this chapter. First some background information about the case organization as well as epistemological and ontological views of the author is provided to shed light into the rationale behind choosing the methodology in question. The research process is then outlined to give the reader an overview, followed up with the description of the data collection and analysis methods.

#### **3.1 Introduction of the case organization**

The case organization is a large Finnish retail conglomerate operating mainly in Finland but also in some Baltic countries. Having said that, the organization is still very heavily Finnish: even the official corporate language is Finnish.

The case company consists of a number of subsidiaries and a central governance unit. Central governance is responsible for strategic management of the group, new business development, management and steering of the individual business chains in the group, and a host of centralized services for the other subsidiaries, including virtually all ICT services.

The case study was sponsored by the IT services unit of the central governance organization. The majority of interviews were performed for people in top and middle management positions of business operations within the central governance organization. A number of interviews were however also conducted in the other subsidiaries within the organization, as well as the IT services unit within the central governance organization. A more precise table about the sampling of the interviews can be found in chapter 3.4.2.

### **3.2 Epistemological and ontological views of the author**

In the context of the aforementioned organization and the subject of the research, social factors and human interaction play a large role in how things work out. Taking into account the differing human perceptions of this organization, an interpretive research philosophy is the most resembling the epistemological viewpoint of the author. This viewpoint was well represented by Saunders (2009, pp. 115-116) “You may [...] argue that the world of business and management is far too complex to lend itself to theorizing by definite ‘laws’ in the same way as the physical sciences. ”

From an ontological point-of-view, the author considers the research area of the thesis, namely digital transformation and enterprise architecture, to be a combination of both subjectivist and objectivist areas. For example, the way different information systems exist and communicate inside the organization is very objectivistic. They exist independent of how people perceive them. The same can be said of some business processes and organizational structures. However, many of the most challenging issues within the context of digital transformation and enterprise architecture, at least from the point-of-view of the author, stem from the different views and motivations of the social actors that actually make up the organization. To take these issues into consideration, one has to look at the phenomena also from a more subjectivist, in the case of this example, social constructionist, point-of-view.

What these epistemological and ontological choices mean for the nature of the research conducted, is a matter of axiology, or the study of judgments about the values of the author. Saunders (Saunders, Lewis & Thornhill 2009, pp. 116-119) considers the axiological impact of an interpretive research philosophy to be that

*“Research is value bound, the researcher is part of what is being researched”*, which I would have to agree with. According to Saunders, the research methods to be used based on these values to be of qualitative nature.

As mentioned earlier, from the point of view of the author the most difficult challenges within the scope of this research are ones that are very difficult to research with quantitative methods since they, for example, require understanding the motives of social actors within the organization, as well as the context they work in, which both require a more qualitative approach. These factors form the author’s rationale behind choosing to use qualitative methods.

### **3.3 Research design**

Merriam (2009, p. 4) categorizes the motivation for conducting research into four different categories:

- Pure research
- Applied research
- Evaluation research
- Action research

According to Merriam the purpose of pure research is to contribute to the generally accepted knowledge in a particular field, whereas the other three are more concerned about solving particular problems, either to guide best practices (applied research), evaluate the suitability of a certain items or practices for a particular case (evaluation research) or to solve a very specific problem (action research). In many cases these motivations do overlap but the main driver is clear. In an organizational context, such as the one in this research, the latter three are prevalent.

In the scope of this paper, the motivation for conducting the research is twofold. As discussed in the previous chapter, the main motivation in this case is to be able to better understand how enterprises could better understand and manage digital transformation. Secondly this research aims to find suitable practices for the case company to use going forward in this area.

Considering these motivations, the research questions of why and how, and the philosophical views of the author, as explained in the previous chapter, qualitative research is a natural approach for conducting this research.

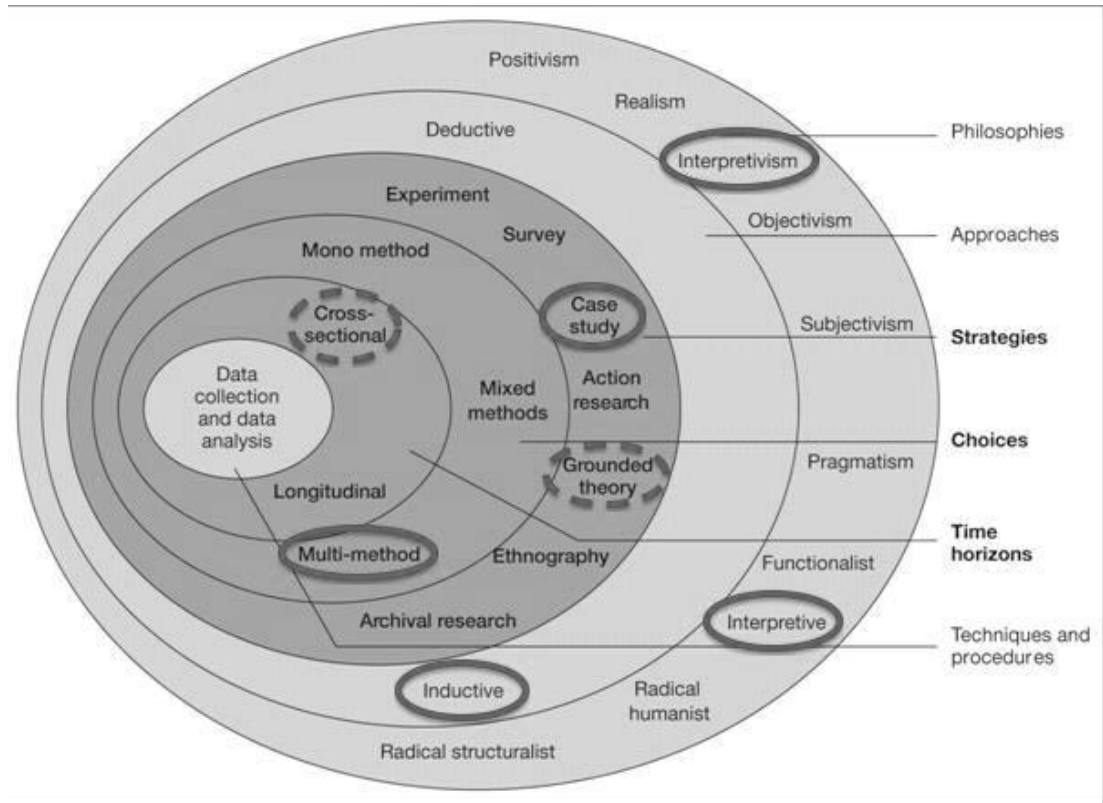
So what exactly is qualitative research? There are many different descriptions and definitions for this umbrella term. However, according to Merriam (2009, p. 14) there are four key characteristics that are present in the vast majority of these different descriptions:

- Focus is on the process, understanding and meaning
- The researcher is the primary instrument for data collection and analysis
- The process is inductive
- The product is richly descriptive

To explain the first of these characteristics, Merriam quotes Patton “Qualitative research is an effort to understand situation in their uniqueness as a part of a particular context and the interactions there.” I consider that quote to be particularly informative way to describe this particular characteristic of qualitative research, as opposed to traditional quantitative methods where the experiments and variables are isolated as far as possible. Qualitative methods are thus particularly suited for a case such as this, where it is impossible to isolate the phenomena from its context.

The second characteristic Merriam (2009, p. 15) describes as having both advantages and disadvantages. According to Merriam, “*the human instrument (which) is able to be immediately responsive and adaptive*” as well as “*can expand his or her understanding through nonverbal as well as verbal communication*”. To go with these definitive advantages, the obvious disadvantage is that humans always have a subjective view of what they experience. Thus Merriam stresses the importance of monitoring, identifying and documenting these biases as far as possible. The author has strived to keep this guidance in mind when conducting this research by making a list of these potential biases in the beginning of the study and returning to monitor them after the first round of interviews as, well as when starting to analyse the results. More analysis of these biases can be found in Chapter 3.7.

The third characteristic is about the goal of conducting qualitative research. Usually qualitative researchers “build toward theory from observations and intuitive understandings gleaned from being in the field” (Merriam 2009, p. 15), as opposed to the idea of testing existing hypotheses with quantitative methods.



**Figure 8. The Research Onion (Saunders et al. 2009)**

The final characteristic is very much a product of the third one. With quantitative methods one usually gets very precise numeric data as a result of the studies and experiments conducted, whereas with qualitative methods the results are much more descriptive and holistic.

After analysing the case in question and the nature of the different available methods and philosophies, the chosen methods and research path can be seen illustrated in Figure 8, the Research onion (Saunders, Lewis & Thornhill 2009). Except for Grounded Theory, these were briefly explained previously in Chapters 3.2 and 3.3. This is due to Grounded Theory not being applied as is. Only some elements regarding the analysis of data were borrowed from there, more specifically regarding the first six phases in the data analysis process presented in Chapter 3.6. Due to it

only serving as an influence, the author decided to leave explaining Grounded Theory out of the scope of this chapter.

### **3.4 Research process**

The research process began with a more specific selection of the topic and the initial scoping of the research in co-operation with the case company, based on which an initial SLR was performed. The SLR was used to formulate the research questions and interview questions.

After the initial design of the research to be conducted was done, the first round of interviews, consisting of three interviews, was performed and the results and questions analysed to identify areas of improvement in both the research and interview questions. The SLR continued during the first round of interview and the following analysis of the first results in order to improve the rest of the interviews.

After those were improved upon, the rest of the interviews were conducted with some alteration to the interview themes or questions done based on new insight gained in the process of conducting the first interviews as well as the results from the continued SLR.

The interviews were all audio recorded and transcripts of the interviews were analysed, with this part of the process being explained in more detail in Chapter 3.5. These results were then again compared to the existing literature to fuel additional analysis and reflection of the final results. In this phase, additional literature was also searched for to better answer to some of the questions that had risen during the interviews. The research process thus combined both inductive and deductive elements.

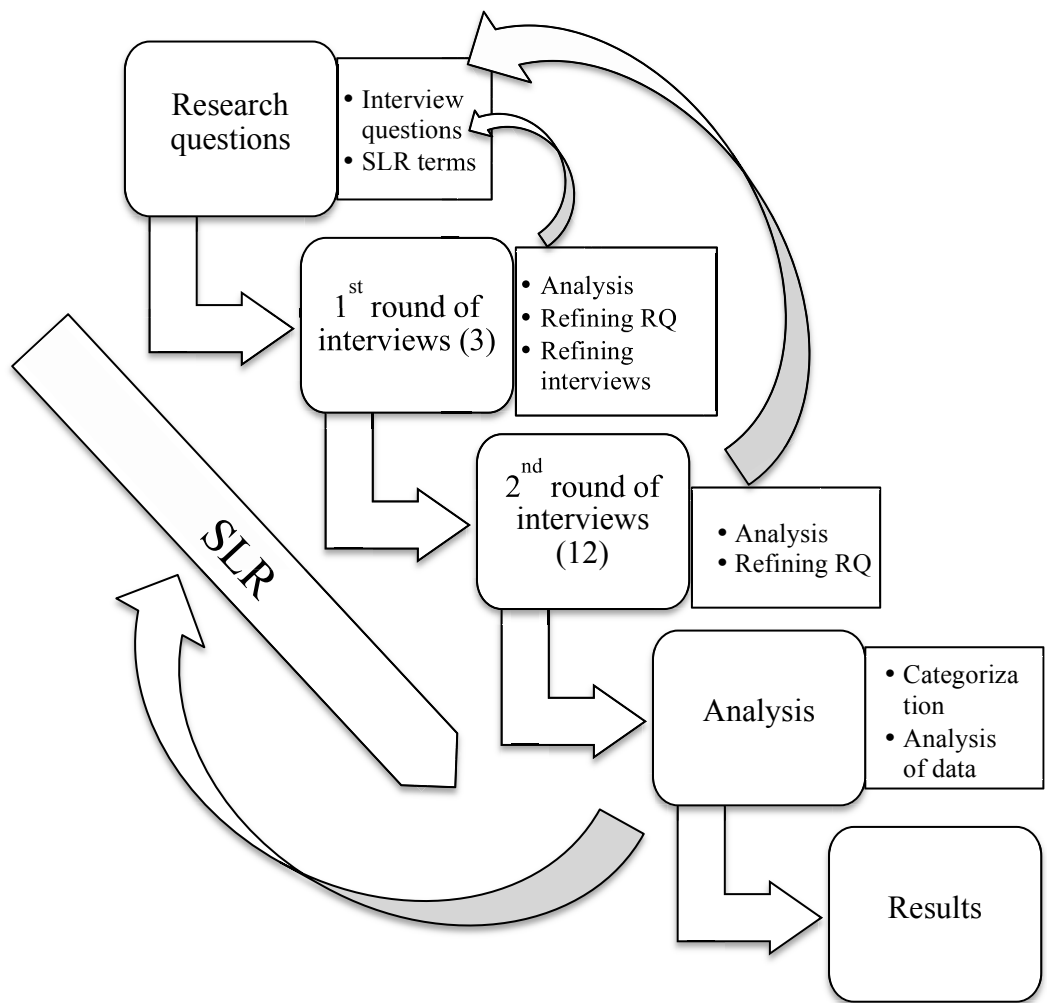


Figure 9. The Research process

### **3.5 Data Collection**

The majority of the empirical research, i.e. data collection, in the scope of the research was conducted in the form of a case study; more specifically the data was collected based on a number of interviews. The empirical results of these interviews were then analysed and combined with a systematic literature review, which will be discussed in more detail in the next chapter.

The rationale for choosing this method is well explained by Yin (2009, p. 2): “*case studies are the preferred method when (a) ‘how’ or ‘why’ questions are being posed, (b) the investigator has little control over the events, and (c) the focus is on contemporary phenomenon within a real-life context*“. All of these three criteria are met in the case of this research, as is explained in the previous Research Problem chapter. In this chapter we will be looking at the methodology used in more detail.

#### **3.5.1 Case Study**

After choosing the case study method, there were further design decisions to make. Due to the nature of the research problem, we were only able to use a single case approach to this case study. Investigating the same research questions in multiple organizations would be preferred to be able to analyse the findings in a broader context, the resources available for the research didn’t make this possible.

An important issue to consider in case studies is that while identifying the research questions very early on is preferred, the nature of building theory from case studies is that it’s impossible to know exactly what the interesting findings, and thus questions to ask, will turn out to be. (Eisenhardt 1989) As such, Eisenhardt (1989) suggests that one begin the research with as close to no hypotheses to test as possible and only later identify or induct the interesting hypotheses through analysis of the data.

As the nature of the case is to investigate the perceptions and understanding of certain issues of people within the organization in question, the natural way to conduct the data collection was interviews due to the interpretive epistemology of the

author, as explained by Saunders (2009, p. 324): “*Semi-structured and in-depth interviews provide you with a the opportunity to ‘probe’ answers, where you want your interviewees to explain, or build on, their responses. This is important [...] if you will be concerned to understand the meanings that participants ascribe to various phenomena*”.

Considering the research questions and epistemology as well as the other literature, the chosen interview method was one-on-one, face-to-face interviews. Furthermore, managers, whom form the majority of interviewees in the study, are according to Saunders (2009, p. 324) “*more likely to agree to be interviewed, rather than complete a questionnaire.*”

These interviews were conducted in two rounds with the first round being very open-ended semi-structured interviews based on Eisenhardt’s advice (1989) and the second round being conducted as somewhat more in-depth so that if the interviewee showed significant interest and/or knowledge towards a specific theme during the interview, that path was explored in more detail. The structure of the interview could still be considered to be semi-structured also in this context.

Saunders describes semi-structured interviews as follows: “*the researcher will have a list of themes and questions to be covered, although these may vary from interview to interview [...] given a specific organizational context*” (2009, p. 320).

All interviews were audio-recorded and later transcribed. The interview questions that were posed to the interviewees in each phase can be found in chapter 3.4.3.

### **3.5.2 Sampling**

The sampling of the interviewees was done so that first the relevant positions within the organization were identified based on the research questions. After that, the different positions were grouped based on two factors: their division, e.g. regional or central division or IT and the level of their job role, e.g. whether their job role was that of an executive (top management) or manager (middle management). Each of the 6 resulting subgroups was represented in the final list of interviewees.

A shortlist of interviewee candidates was chosen based on the perceived significance of the topic for the job role of the interviewees within the organization so that groups such as marketing managers, business development managers and top management were well represented. The final distribution was a result of the availability of the shortlisted candidates. That can be seen in Table 7. Here it's worth noting that Central means basically the central governance of the organization, located at the headquarters and responsible for the general strategic direction of the organization, as well as providing supporting functions for the regionals. These regionals are independent organizations of their own operating in certain specific geographical areas and are the ones that conduct virtually all of the business with the end customers of the organization.

**Table 7. Sampling of interviewees**

	<b>Regional</b>	<b>Central</b>	<b>IT</b>	<b>Total</b>
<b>Top Management</b>	2	4	1	7
<b>Middle Management</b>	2	4	2	8
<b>Total</b>	4	8	3	15

### **3.5.3 Interview questions**

As mentioned in chapter 3.4.1, the first round of interviews was conducted as a set of semi-structured interviews with a set of pre-defined themes that were derived from the research questions. These themes and their relationship to the research questions can be seen in more detail in Table 8. These were used in the first three interviews with minor variations to try to maximise the learning on what kind of a interview structure would best fit the research questions.

**Table 8. Interview themes during the first round**

<b>Theme</b>	<b>Sub-themes</b>	<b>Related research question</b>
Introduction	<ul style="list-style-type: none"> <li>• Introduction of both parties</li> <li>• Purpose of the research</li> </ul>	-
Digital Transformation (DT)	<ul style="list-style-type: none"> <li>• The persons own understanding of DT</li> <li>• How is DT seen in the case company in general</li> </ul>	RQ1: What does DT mean?
Effects of DT in case company	<ul style="list-style-type: none"> <li>• Impact of DT for the industry</li> <li>• References the person looks up to in the industry</li> <li>• Strategic importance of DT for the case company</li> <li>• Could the case company seize opportunities brought with DT better in some way?</li> </ul>	RQ1, RQ2: What kinds of challenges are in DT for large enterprises?
Roles and responsibilities regarding management of DT in case company	<ul style="list-style-type: none"> <li>• How does the person see the division of responsibilities?</li> <li>• Should it be done in some other way than it currently is?</li> </ul>	RQ2, RQ3: How could enterprises tackle the challenges in DT?
Management structures and processes in case company	<ul style="list-style-type: none"> <li>• How is strategic development conducted?</li> <li>• Who is responsible for strategic development and what structures and processes are used?</li> <li>• How does the person see the role of EA?</li> <li>• Are there problems, could these be improved?</li> </ul>	RQ2, RQ3, RQ4: What kind of a role could EA play in DT of large enterprises?

After analysing the results from the first round of interviews, some modifications were made to the set of interview themes. These can be seen in Table 9 with the changes **bolded**. This second interview structure was used for the last 12 interviews.

**Table 9. Interview themes during the second round**

<b>Theme</b>	<b>Sub-themes</b>	<b>Related research question</b>
Introduction	<ul style="list-style-type: none"> <li>• Introduction of both parties</li> <li>• Purpose of the research</li> </ul>	-
Digital Transformation (DT)	<ul style="list-style-type: none"> <li>• The persons own understanding of DT</li> <li>• How is DT seen in the case company in general</li> </ul>	RQ1
Effects of DT in case company	<ul style="list-style-type: none"> <li>• Impact of DT for the industry</li> <li>• References the person looks up to in the industry</li> <li>• Strategic importance of DT for the case company</li> <li>• Could the case company seize opportunities brought with DT better in some way</li> <li>• <b>Identified challenges in DT</b></li> </ul>	RQ1, RQ2
Roles and responsibilities regarding management of <b>DT &amp; New Business Development</b> in the case company	<ul style="list-style-type: none"> <li>• How does the person see the division of responsibilities when it comes to decision-making and new business development?</li> <li>• <b>Are there challenges in how new business development is conducted, especially for digital business?</b></li> </ul>	RQ2, RQ3,
<b>Challenges &amp; opportunities, EA, free word</b>	<ul style="list-style-type: none"> <li>• <b>How does the person see the role of EA?</b></li> <li>• <b>Key challenges seen by the person in the area</b></li> <li>• <b>Key opportunities and strengths for the case company</b></li> <li>• <b>Free word: what would the interviewee like to add that hasn't been discussed yet?</b></li> </ul>	RQ2, RQ3, RQ4

### **3.6 Analysis of the Data**

The analysis of the data was performed based on the interview transcripts and following the process outlined below.

1. Read all of the transcribed interviews
2. Highlight the key points from the interview on the second reading
3. Filter out the key points that weren't relevant from the point-of-view of the research questions
4. Initial coding of the relevant key points to categories
5. Adding all the coded key points, i.e. categories, to the rows of spread sheet with all of the interviewees being on the columns
6. Refining the categories, e.g. merging similar things and refining the choice of words to match as closely to the words of the interviewees
7. Adding a check to the appropriate cell if the interviewee mentioned the category during the interview
8. Analysing the findings on an aggregate level, i.e. how many mentioned a certain category for a given theme
9. Further analysing the findings per sub segments of interviewees, i.e. whether a specific category was mainly mentioned in the interviews of people in a certain job role or rank or by those from a certain part of the organization
10. Comparing the findings to the original text from the transcribed interview and choosing relevant quotes

The first step is quite straightforward, read through all of the interviews to get an overall sense of what the interviewees had been talking. Next came a second reading of all of the interviews. This time around, the author highlighted all of the points that either the interviewee seemed to consider important or the author considered to be interesting. The third step of the process was to go through all of these key points and filter out the ones that were clearly not related to any of the research questions.

The fourth step was arguably the most challenging in the process and was thus repeated twice in order to try to avoid mistakes or careless interpretations. In this step, the author coded each of the key points or statements from the interviewees mentioned to a category that was as concisely described as possible, in practice less than a sentence. Here the findings from literature were used to sharpen the descriptions of the categories, but were not used in the actual definition of the different categories. Next, all of these newly created categories as well as the interviewees and their meta information (business unit, job title, department) were put on the same

spread sheet, then duplicate categories were merged and the choice of words was refined to be as concise as possible but still representative of the original statement by the interviewees.

The categories and interviewees were then matched by putting an 'x' into the appropriate cell if the interviewee had mentioned the category regarding a given theme.

After this was done, formulas were created, charts drawn, and conditional formatting used to help the author understand the big picture of how each of the categories were mentioned regarding a given theme. After this was achieved, the interviewees were broken down into segments based on their job rank, part of the organization they were from and business unit and the same process repeated for each of them.

Last, these findings were compared back to the original transcripts in order to see that they were still valid considering the original statement of the interviewee, as well as to find relevant quotes to better explain the findings.

The entire process was then followed through another time to reduce the possibility of careless interpretation by the researcher.

The stages of digital transformation model that was a result of this analysis, actually came as a by product of the author recognizing some patterns in the data when it came to the challenges faced by interviewees from different business units, without specifically trying to look for those. After this was realized, the business units were classified into different stages formulated with the help of the literature and the different categories of challenges and perceived solutions aggregated from these specific business units and complemented with findings from literature.

### **3.7 Validity and Reliability of the Methods**

The fundamental problem with case studies, and many other forms of qualitative studies, is that they usually aren't guaranteed to be widely applicable because the sample isn't typically representative of any larger segment. (Saunders, Lewis & Thornhill 2009). And in this case, as the study was conducted as a single case study, the sample size is just one organization, which is hardly representative of the

industry let alone across industries. As the case organization is a co-operative, it is structurally quite different than most organizations in the field, further highlighting the previous statement. This basically means that one should be careful about generalizing the findings from this study.

Now 15 of the 800 plus members of the middle and top management of the case organization were interviewed, meaning that the margin of error can be as high as 25% if one were to statistically analyse the findings, which of course is not relevant in the case of a qualitative study, this statistic just serves to highlight the fact that the sample size quite likely isn't large enough to cover all of the different insights. This issue is especially apparent during the segmental analysis phase the sample sizes from specific parts of the organization or from a specific job rank were quite low, between 3 and 8, further highlighting that one has to be careful in consideration of generalizing the findings. As such, one should note that the absolute values presented during the systematic literature review serve primarily as a basis for comparing the values between themselves and thus finding interesting starting points for further analysis.

Furthermore, the role of the researcher always plays a role in the results of a case study. The interviewee was not a part of the case organization and was trying to remain as a purely passive observer as to not influence the interviews but interviews are always unique situations with many variables and interviewing the same person again might not lead to exactly the same answers. And even after that the analysis of natural language might often lead to different results with different researchers analysing the interviews. As such, the researcher has tried to clearly distinguish what stems directly from the data and what is a result of the researchers own analysis of the data.

Another issue worth mentioning is the language. The case organization is a strictly Finnish speaking organization and all interviews were conducted and transcribed in Finnish. The translation of the findings came in the categorization phase, as mentioned in chapter 3.5, but some of the richness of natural language is often lost in translation.

## **4 Results of the case study**

The results from the interviews of the case study are presented in this chapter. The results are divided into subcategories according to the research questions. As explained in chapter 3.5, the analysis of the empirical research data was limited with the help of research questions.

### **4.1 Understanding and the meaning of Digital Transformation**

This chapter presents the results from the case study regarding the first research question: “What does digital transformation mean?” To summarize, no explicit definition for the term was found based on the interviews but the meaning of the term and its effects were discussed in more detail and similar results were found as in literature.

#### **4.1.1 Understanding of Digital Transformation in the case organization**

The interviewees were asked to explain how they understand digital transformation both generally speaking as well as in the context of their own organization. The interviewees had generally speaking a good understanding of the term in general and the vast majority of interviewees were able to identify multiple areas affected by Digital Transformation. In total five different categories of areas were identified by the interviewees:

- Digitalization of the operating environment
- Process efficiency
- New business opportunities
- Customer experience
- Digitalization of the marketing

Digital Transformation (how is it seen?)		Overall	MiddleM	TopM		Regional	Central	IT	
Operating environment digitalizing	14	93%		100%	86%		100%	88%	100%
Process efficiency	8	53%		38%	71%		75%	38%	67%
New business opportunities	11	73%		63%	86%		100%	63%	67%
Customer Experience	11	73%		75%	71%		50%	88%	67%
Digitalizing Marketing	8	53%		63%	43%		75%	50%	33%

**Figure 10. Understanding of Digital Transformation**

The categories and the relative proportions of interviewees who identified the areas per job rank and per organizational division can be found in Figure 10. Overall, process efficiency and the digitalization of marketing were mentioned slightly less frequently than the other three, process efficiency especially so among interviewees belonging to middle management and the central governance.

Interestingly enough 4 out of these 5 categories map seamlessly to those identified in the literature. The digitalization of the operating environment is virtually the same as the contextual point-of-view, which was mentioned in multiple studies. Process efficiency, new business opportunities and customer experience map more or less one-to-one towards each of the areas of digital transformation as classified by Westerman et al. (2011) in their Areas of Digital Transformation model. The digitalization of marketing was the one area that wasn't specifically categorized in the existing literature on the topic but many of the components of digital marketing do fall under the umbrella of customer experience in the Areas of Digital Transformation model.

As for the exact definition of the term digital transformation, they were more or less quite fuzzy and diverse by nature. The majority of the interviewees explained digital transformation as meaning more or less "everything moving towards digital" and then listing out some examples on what that means in practice.

#### **4.1.2 Current state of Digital Transformation in the case organization**

The current state of digital transformation in the organization depended quite heavily on the part of the organization the interviewee was from. All interviewees identified the topic as being strategically significant, as has been emphasised by the top management. Furthermore, in most parts of the organization it was perceived that lately steps have been taken towards the right direction.

However, most interviewees established that they think they aren't yet where they need to be. It was perceived that compared to the domestic rivals, the organization is generally speaking on par or in some cases even slightly ahead of the competition. However, comparing to the international rivals it was, except for a couple of exceptions, seen that the case organization is significantly behind.

There were a few interviewees from three different business units who perceived to have taken digital as being a major part of their business and especially new business development going forward. These people also distinguished very clearly the role that digital plays in their specific business and had a clear view of the steps they need to take going forward. These people also considered their business units to be forerunners in their specific business, even internationally. Correspondingly these people also identified significantly fewer challenges than the people from other parts of the organization.

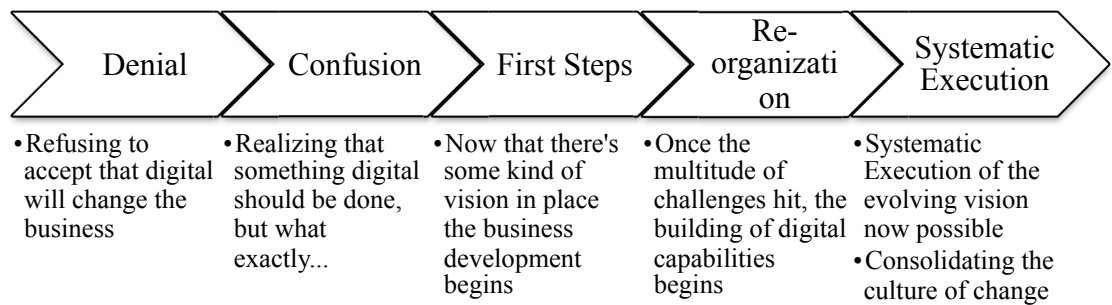
#### **4.1.3 Stages of Digital Transformation**

The challenges faced by business units seemed to be different for business units that were perceived to be in different stages of their digital transformation. This interesting finding lead to the creation of a model called the Stages of Digital Transformation model.

In the previous literature the challenges of Digital Transformation had mostly been considered on an aggregate level. Even the most accurate classification found by the author during the literature review classified the challenges into two categories, those of initiation and execution (Westerman et al. 2011).

Based on the findings from these challenges experienced in different business units from different parts of the organization, influenced with some of the findings from the literature, the author proposes a new model for classifying business units in different stages of Digital Transformation, which can be seen in Figure 11. More specifically the biggest influences on the model are the "8 steps to transforming you organization" by Kotter (1995), the study by Westerman et al. (2011) as well as the

Foundation for Execution model by Ross et al. (2006).



**Figure 11. Stages of Digital Transformation**

One should keep in mind that this classification is mostly based on the perceived stage of the 8 different business units of the 15 interviewees in this case study and has not been proven to be generally applicable.

The first stage is Denial. In this stage, the business unit might have internal processes and tools that are digital but don't consider digital to be a part of their core business. The business unit and people in it claim that their business has nothing to do with digital and while it might affect other businesses, it's not something they should be doing. As none of the business units from the case company are in the first stage, it was formulated based on the literature.

The first stage is very much about building a business case for doing digital, creating a vision and creating impetus for it.

The second stage is Confusion. After the organization has seen their competition go digital and might have difficulties in reaching customers, they've seen the light and know that they should do something with digital too; the problem is they don't really understand that world.

In this stage the organization is trying to create a clear vision on what they should be doing. This might prove difficult since organizations in this stage typically are lacking in understanding of and skills in digital business. One business unit within the case organization was categorized into this stage.

However, as the organization starts to take its first steps into creating digital business, it faces a multitude of execution challenges since the organization doesn't

have digital capabilities in place that would be required for successful strategy execution. Westerman et al. (2011) considers the four main building blocks of these capabilities to be deeper integration of business & IT, unified data & processes, solution delivery and analytics capability. The organization might still be lacking understanding and experience in these areas. Three of the business units within the case organization were categorized to be in this third stage.

The fourth stage is about creating the aforementioned digital capabilities and building the foundation for execution by removing obstacles. This might mean for example restructuring the organization to allow for deeper integration and communication between business and IT and people with different expertise areas as well as considering and questioning the existing business processes (Westerman et al. 2011). The challenges related to this stage are linked to communicating the vision as well as business goals and requirements as well as keeping the customer needs clear in mind to guide the change process. One business within the case organization was categorized to be in this stage.

The final stage of the transformation begins once the digital capabilities are in place. In this stage, it's all about systematically developing the business and executing the strategic vision that the organization has, which might evolve quite rapidly in the digital domain. Change is now business as usual and the foundation built in the previous stage makes it possible to adapt to those changes. The challenges in this phase are mostly about having enough time and money to execute the vision, as well as again keeping the needs of the customers in mind when reshaping the vision and further developing the business as well as adapting to constant change. Three business units within the case organization were deemed to have passed the majority of the challenges experienced elsewhere and were clearly already in this stage of systematically executing their vision. Two out of these three business units had the advantage of being quite recently created and directly with digital in mind, thus the issues of transforming the organization were not relevant for them. They had been able to build their unit without the legacy processes and culture of the older business units.

This ideal situation in the final stage was well explained by one interviewee. He explained how he thought that considering digital as a separate issue is harmful for

the business and that digital should be handled as just a part of the normal business development:

*“I think this [effects of digital transformation on new business development] is all about normal business development. There are now just more pieces to be considered, these digital solutions. I try to steer the thinking as much as possible towards a direction where we conduct normal business development and strategic planning and once we know the business goals, we start to think about the business architecture, which the strategy is a part of. In other words, what kind of operating models and processes those business goals and for example services for the customer are done with. And only then do we derive the required IT systems.” (Interview 4)*

The different challenges that the organization faces in the different stages and the focus areas the organization should pay attention to in each stage of the model are presented in more detail in their respective chapters.

## **4.2 The challenges of Digital Transformation in the case organization**

This chapter presents the results from the case study regarding the second research question: “What kinds of challenges are there in digital transformation for a large enterprise?”

To summarize, it would appear that middle management experiences more challenges than top management, many of which are related to strategy execution. However, the challenges related to lack of understanding and skills were also much more prevalent amongst them, which is apt to lead to many of the execution challenges mentioned before. When combined with the sense that a few interviewees had about top management leaving them alone without a clear enough roadmap, challenges are bound to appear. A common challenge the majority of interviewees from every segment seemed to face was the internal communication of business requirements. Apart from that exception, the challenges were also different for

business units that were in different stages of their transformation, a topic not very extensively covered in literature.

#### 4.2.1 Perceived challenges in Digital Transformation

Generally speaking the interviewees found quite a lot of different categories of challenges in the digital transformation of the case company, 17 altogether. These categories and the relative proportion of interviewees who identified these challenges per job rank and per organizational division can be found in Figure 12. The challenges are organized in the figure in the order they first came up in the interviews.

When investigating these findings on an aggregate level, there are a few interesting observations to be made. The first being that the perceived challenges are quite diverse by nature and no single challenge was mentioned by more than 60% of the 15 interviewees. As a matter of fact, only 4 challenges were mentioned by more than one third of the interviewees. That number rises to 7 if you count the ones that were mentioned by exactly one third of the interviewees.

Challenges	Total Count	Overall	MiddleM	TopM	Regional	Central	IT
Legacy systems not supporting new business reqs	6	40%	50%	29%	75%	38%	0%
Missing digital capabilities	4	27%	38%	14%	25%	38%	0%
Requirements changing too fast	4	27%	50%	0%	50%	13%	33%
Falling to communicate benefits to customers	3	20%	25%	14%	50%	13%	0%
Internal communication of business requirements	9	60%	63%	57%	75%	38%	100%
Organizational overlapping & inefficiency	4	27%	50%	0%	25%	13%	67%
Organization siloed (too little discussion and interaction about customer and business needs as well as own skills and resources)	7	47%	63%	29%	50%	38%	67%
Change resistant & risk-averse culture	5	33%	38%	29%	25%	38%	33%
Business being too system-oriented: "Let's first buy a system, then think about what to do with it"	5	33%	50%	14%	25%	13%	100%
Not understanding the possibilities technology brings	6	40%	50%	29%	25%	38%	67%
Not understanding business dependencies of decisions	5	33%	38%	29%	25%	25%	67%
Lack of technology skills and/or understanding of digital business	4	27%	50%	0%	25%	25%	33%
IT reactive, not a proactive value creator	3	20%	38%	0%	25%	13%	33%
No responsibility over customer experience	2	13%	25%	0%	50%	0%	0%
Lack of commitment and shared ownership of the business	1	7%	13%	0%	0%	13%	0%
Insufficient budget available for building digital capabilities (as ROI takes time to develop)	3	20%	13%	29%	25%	25%	0%
Legal challenges from the organizational structure	2	13%	25%	0%	0%	13%	33%

Figure 12. Challenges of DT

The rest of the challenges were mentioned so infrequently that they weren't considered relevant at the aggregate level. They are however still considered in the segmental analyses whenever applicable. The most widely recognized challenges are listed in Table 10 and sorted in descending order of how often they were mentioned in the case organization. The table also contains the aggregate findings from the

literature review so that these could be compared between the challenges in the case organization.

**Table 10. Comparison of DT Challenges between literature and the case organization**

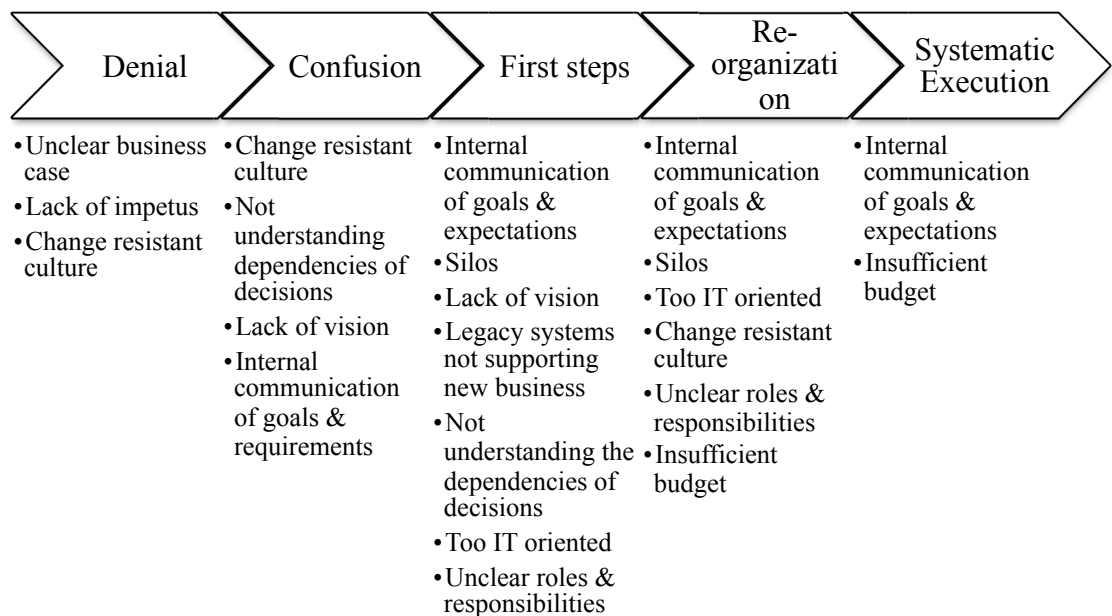
<b>Case Organization</b>	<b>Systematic Literature Review</b>
Challenges in internal communication of business requirements (mentioned by <b>60%</b> of the interviewees)	Coordination issues regarding unclear goals and expectations (Westerman et al. 2011) (Pralhad & Krishnan 2002)
Organization being too siloed ( <b>47%</b> )	Lack of collaboration (Pralhad & Krishnan 2002) (Fitzgerald et al. 2013)
Not understanding the possibilities that digital technology enables ( <b>40%</b> )	Lack of vision (Fitzgerald et al. 2013) (Westerman et al. 2011)
Legacy systems not supporting new business requirements ( <b>40%</b> )	Limitations of current IT (Fitzgerald et al. 2013) (Pralhad & Krishnan 2002)
Change resistant & risk-averse culture ( <b>33%</b> )	Cultural issues regarding change resistance (Fitzgerald et al. 2013) (Westerman et al. 2011)
Not understanding the dependencies of decisions regarding digital business ( <b>33%</b> )	-
Business being too IT-system oriented in business development ( <b>33%</b> )	-
-	Lack of impetus (Westerman et al. 2011) (Fitzgerald et al. 2013) (Pralhad & Krishnan 2002)
Organizational overlapping & inefficiency ( <b>27%</b> ), No responsibility over customer experience ( <b>13%</b> )	Coordination issues regarding unclear roles and responsibilities (Westerman et al. 2011) (Fitzgerald et al. 2013)
-	Unclear business case (Fitzgerald et al. 2013) (Westerman et al. 2011)
Legal challenges ( <b>13%</b> )	Regulatory concerns (Westerman et al. 2011) (Fitzgerald et al. 2013)
Insufficient budget available ( <b>20%</b> )	Insufficient funding (Fitzgerald et al. 2013)

Interestingly enough, most of the common challenges were also found during the literature review. There were, however, two exceptions to this: *Not understanding the dependencies of business choices* and *Business being too IT-system oriented in business development*, both of which could be categorized as execution/implementation challenges, something that the previous studies on the topic might have missed due to their nature of being very high level aggregate

studies of the topic itself, not so much about the specific challenges faced by individual organizations.

There were also challenges found in the literature that weren't mentioned by the interviewees of the case study: *Lack of impetus* and *Unclear business case*. These two could be categorized as challenges that organizations are facing when they are only contemplating about whether they should undergo a digital transformation or not. Since the interviewees all seemed to agree that it is a strategically significant area for the case organization, it would appear that the case organization has already passed these challenges.

Figure 13 maps these challenges faced by different business units to the stages of digital transformation, first presented in Chapter 4.1.3, as interpreted by the author for each of the business units.



**Figure 13. Challenges in each stage of digital transformation**

#### **4.2.1.1 Challenges by division**

When looking at the challenges from Figure 12 in light of the different divisions in the case organization, a number of interesting observations can be made. First of all,

there were only two challenges: *Challenges in internal communication of business requirements* and *Organization being too siloed*, which were widely recognized in the central and regional business divisions as well as IT. These two were also the most commonly mentioned challenges overall.

There were, however, also notable differences there between the divisions. For instance, IT didn't perceive legacy systems to be a challenge at all, whereas the people from the business divisions certainly thought so. They explained that by stating that making changes and developing new business often takes too long because the legacy systems are so difficult to integrate to.

On the other side of the coin, a very interesting finding was that every interviewee from IT mentioned challenge, *Business being too IT-system oriented in business development*, whereas it was only perceived to be a challenge by a few individuals from the other parts of the organization. As explained by a couple of the interviewees:

*“Another [challenge] is the business being too technology-oriented. It is a silly thing but it just happens quite often that the business people fall in love with some technical solution, not necessarily even a certain technology but for example a specific web service. So then the starting point is that “we’re missing this kind of web service and we got to have one”. And then once we [IT] try to ask what they’re trying to accomplish with that, the discussion never even takes place. In the best case scenario we can then implement it at some cost X but then after it hasn’t delivered the kind of benefits that they initially believed, the fault is that IT has cost too much...” (Interview 4)*

*“Now it is common in new system development projects that the way business people think is that “let’s do this same process as before but implement this new system and all these problems will sort themselves out” But the problem wasn’t in the old system in the first place but in the operating models and customs...” (Interview 1)*

Furthermore, the challenges of *Not understanding the possibilities that technology brings* and *Not understanding the dependencies of decisions made regarding digital*

*business*, were also more widely recognized in IT than they were in other parts of the organization. Both of these challenges are about the business decision-makers not having a good enough understanding of digital business and the interviews indicate that this was more commonly perceived to be a challenge by interviewees from the IT departments. However, one interviewee from the central organization who discussed the topic explained that he didn't consider it to be a challenge as the decision-makers typically can, or at least should be able to, rely on expert help in these situations.

Another interesting point was that 50% of the interviewees from the regional divisions, who work closest to the customers in their everyday business, stated the lack of responsibility over customer experience to be an important challenge going forward. This challenge wasn't mentioned by any of the other interviewees who typically deal less directly with the customers.

#### **4.2.1.2 Challenges by job rank**

When looking at these challenges from the point-of-view of the interviewees job rank, it immediately pops out that middle management perceives there to be significantly more challenges than the top management. As a matter of fact, there was only one challenge that was mentioned by more than 30% of the top management interviewees, which was *Challenges in internal communication of business requirements*. This is an interesting finding in itself because the top management themselves are the ones who should be responsible for communicating these requirements for their subordinates and if they don't have a clear picture themselves, the problem will only get worse as it drips down the organizational ladder. None of the other challenges were mentioned by more than 2 out of the 7 interviewees belonging to this segment.

Some of the challenges mentioned by the middle management are clearly execution related, such as missing digital capabilities and skills as well as the requirements changing too fast to keep up with. It's only natural that the middle management who

is responsible for the execution be more concerned about these challenges than top management.

Interestingly enough, half of the interviewees from middle management pointed out that there is a lot of unnecessary duplicate work going on in the organization due to inefficient digital processes, a concern that no one from the top management mentioned.

But in addition to those more execution related challenges, a notable proportion of the middle management was also concerned about the understanding of digital transformation and the related skills of their teams, themselves and even the decision-makers above them, as explained by one of the interviewees:

*“I admit that I have no clue about many things [digital], have only scratched the surface of others and would like to know more but I just don’t have the time. [...] The director of our unit, as she mentioned herself, doesn’t know anything about these things. And I dare say that nor do the others in our board of directors...”*

(Interview 14)

The interviews would indicate that some managers now feel quite insecure. They are charged with making digital transformation happen and don’t perhaps understand digital well enough themselves and the teams below them were mentioned by some to be lacking in skills, which is hardly an ideal starting point for executing a digital strategy. In this situation some interviewees belonging to middle management seemed to be waiting for clearer and more precise instructions from their superiors on how to proceed than what they currently had. One interviewee from a top management role explained what the essence of his role is:

*“One has to organize success. One can manage any entity, no matter how large, when the top management sees the big picture and can then break it down into reasonable chunks. After that, one can think about how to best model those chunks and then execute upon a plan.”* (Interview 10)

These results would indicate that perhaps that kind of leadership hasn't happened in all parts of the organization under the recent changes, which would be especially valuable in a situation where their subordinates don't feel comfortable taking over large responsibilities in an area they aren't very familiar with.

#### 4.2.2 Digital Transformation opportunities for the case organization

The opportunities the interviewees envisioned the organization to have going forward thanks to digital transformation, were also investigated. 7 categories of opportunities were overall mentioned by the interviewees. These can be found from Figure 14.

Opportunities		Overall	MiddleM	TopM	Regional	Central	IT
Cost-effectiveness (through automation and process efficiency)	7	47%	38%	57%	75%	25%	67%
Better targeting (tailored marketing and services)	5	33%	38%	29%	50%	25%	33%
Increased value for customers with additional services	11	73%	75%	71%	75%	75%	67%
New business models	11	73%	63%	86%	100%	63%	67%
Ability to react quicker to changing environment and customer needs	3	20%	25%	14%	25%	13%	33%
Strengthening existing competitive advantages	3	20%	13%	29%	0%	25%	33%
Customer acquisition for the brick and mortar	4	27%	25%	29%	50%	25%	0%

Figure 14. Digital Transformation opportunities

To summarize, new business models and value-adding services for the existing customers were seen as the two biggest opportunities with cost-effectiveness trailing behind these two.

The only significant segmental differences in perceived opportunities were the higher emphasis on cost-efficiency by the interviewees, who have larger financial responsibilities, i.e. top management as well as the bigger emphasis on customer acquisition for the brick and mortar business by the regionals, which is quite understandable since that is the focus of their business.

The marketing oriented interviewees also highlighted the value of being able to do smarter, more targeted and individual communication for customers instead of the one size fits all, spray-and-pray approach.

#### 4.3 Solutions to the challenges of Digital Transformation

This chapter presents the results from the case study regarding the third research question: “How could enterprises tackle the most common challenges in digital transformation?”

As explained in chapter 2.2, the previous literature on the best practices and solutions to the challenges of Digital Transformation is very limited in the sense that there isn't much of it in the first place and even when there is, they're by nature mostly the opinions of managers on how they should be tackling the challenges they are currently facing. The same limitation applies here since the perceived solutions and good practices presented in this chapter are in practice the opinions and insights of the interviewees based on the challenges they are currently facing and with the knowledge that they currently have.

To summarize, most interviewees saw the need for clearer communication and deeper interaction across organizational borders. In addition, the interviewees who were closer to the end customers in their daily work saw the need for a more customer-oriented approach to business development. In addition, especially IT saw the need to involve IT earlier in the decision-making process in order to better plan their work as well as be able to communicate the effects of the decision made. Furthermore, middle management wished to see more new talent with skills in and understanding of digital business.

#### **4.3.1 Perceived solutions to the challenges of Digital Transformation**

All in all, the interviewees identified 10 different kinds of solutions that they would like to see the organization do in order to tackle the challenges they are currently facing with digital transformation. These can be found in Figure 15, where the findings are sorted in the order they were first mentioned in during the interviews.

Solutions		Overall	MiddleM	TopM	Regional	Central	IT
Customer needs first	6	40%	50%	29%	75%	25%	33%
Talent with understanding of and skills in digital business	5	33%	50%	14%	25%	38%	33%
Clearer communication across organization (both current situation and plans)	12	80%	63%	100%	100%	63%	100%
Deeper interaction and co-operation across divisions	11	73%	63%	86%	75%	63%	100%
More agility to solve business problems flexibly (both business and IT)	3	20%	38%	0%	50%	13%	0%
Two-way interaction with customers	3	20%	25%	14%	75%	0%	0%
Willingness to take more risks and try new things	5	33%	38%	29%	50%	38%	0%
Proactive IT( should be involved already during decision making, also serve as a value co-creator)	4	27%	38%	14%	25%	13%	67%
The role of marketing has to change from an advertising focused model to a service-oriented direction	1	7%	13%	0%	0%	0%	33%
Restructuring the organization to more of a matrix format to support collaboration	1	7%	13%	0%	0%	0%	33%

Figure 15. Perceived solutions to the challenges of Digital Transformation

Looking at these suggested solutions, it is clear that two are above the rest:

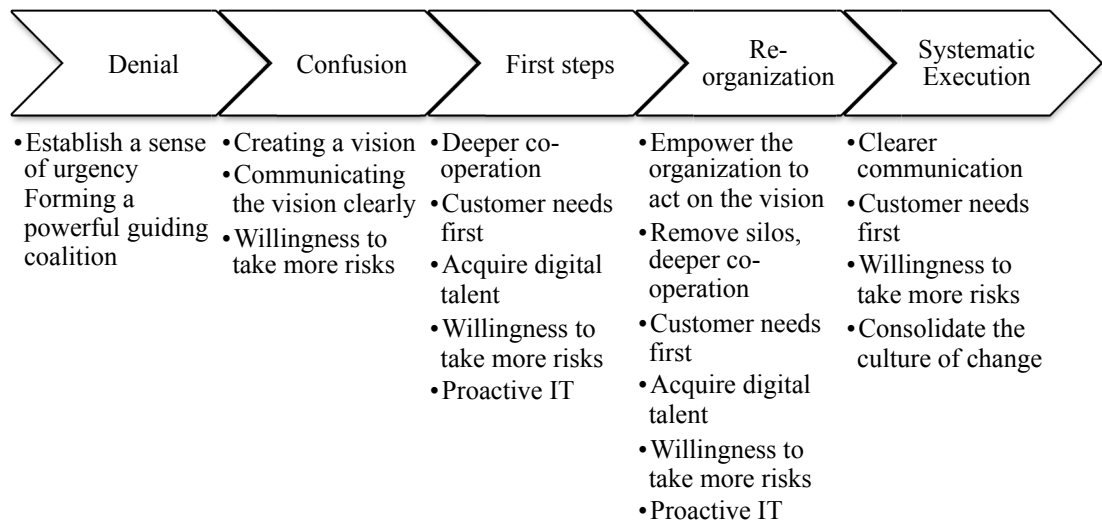
- Clearer communication across the organization about goals, requirements and expectations (**80%**)
- Deeper interaction and co-operation across the organization (**73%**)

These are clearly solutions to the two most commonly identified Digital Transformation challenges in the interviews, *Challenges in internal communication of business requirements* and *Organization being too siloed*. It's interesting that these both were actually mentioned by more interviewees than perceived the equivalent challenges.

After these two solutions, there is another group of suggestions that still received notable recognition:

- Customer needs first (**40%**)
- Talent with understanding of and skills in digital business (**33%**)
- Willingness to take more risks and try new things out (**33%**)
- More proactive IT (**27%**)

Figure 16 maps these suggestions to the different stages of digital transformation with the same estimation on the stage of each business unit, as was the case with the challenges. Good practices on change management, namely from Kotter (1995), were also combined with the suggestions from the case company to form a map of suggested focus areas for each stage of digital transformation.



**Figure 16. Focus areas during the stages of digital transformation**

#### **4.3.1.1 Solutions by division**

Looking at the proposed solutions in light of the part of the organization the interviewees were from, there are again a number of interesting points to be discovered.

First of all, the interviewees from the regional divisions of the organization, who are closest to the end customers in their everyday work, clearly value the customers more and would suggest putting a much higher emphasis on a more customer-oriented approach to business development than there currently is.

*“No matter how efficient the business processes are, it doesn’t pay off to do something when the demand isn’t there. One has to start with what the customers are interested in and build the operating models based on that.” (Interview 7)*

All but one interviewee from the regionals also expressed their desire to have more two-way interaction with the customers in order to better understand their customers and further deepen the connection they have with their customers. Interestingly enough, no one from the central divisions of the organization or the IT units expressed the same desire.

*"This kind of interaction via digital systems is an incredible opportunity, at least in the development of a specific service, for example e-commerce. The potential is mind-blowing. Modern interaction with the customer."* (Interview 9)

In addition, the interviewees from the regionals were hoping to see more agility, more experimentation and taking of more risks in new business development.

For the central parts of the organization, the proposed solutions were quite in line with the aggregate results with the most common suggestions being *Clearer communication, deeper co-operation across organization silos* and *talent with understanding of and skills in digital business*.

From the perspective of interviewees with an IT background, the proposed solutions were very clear: all of them also proposed *Clearer communication* and *deeper co-operation across organization silos*. The interesting point however is that these interviewees saw clearly that the role of IT should be more of proactive value creator instead of a passive executor, meaning that they should be involved earlier in the decision-making to be better able to plan their actions as well as explain the consequences of the decisions even before they are made. As one interviewee explained:

*"IT should be involved in that [decision-making in new business development] early enough. Not necessarily because we should be deciding about the direction the business development project should go towards but in order for us to get information about what is coming up. We in the IT have to make the interpretation about what that means in our system portfolio and what kind of ripple effect the decision might have in other solutions."* (Interview 4)

#### **4.3.1.2 Solutions by job rank**

If we look at the results regarding the two most commonly mentioned solutions, *Clearer communication* and *deeper co-operation across organization silos*, closer we can see that from the middle management exactly the same interviewees who saw the corresponding challenges proposed these as solutions. However, when it comes to the top management, a number of interviewees proposed these two as something the organization should do even though they didn't consider the organization to be too siloed or they didn't specifically mention communication as a challenge. As a matter of fact, these were the only two solutions proposed by more than two individual interviewees from a top management job role.

In addition to *Clearer communication* and *deeper co-operation across organization silos*, middle management also clearly saw the need for hiring new talent with skills in digital business to help them in the execution as well as the need for a more customer-oriented approach, perhaps in order to together better help them figure out what they should be doing in the first place.

#### **4.3.2 Cross analysis of the solutions & opportunities**

Looking at the suggested solutions in the light of the perceived opportunities, we can see that there are two distinct types of opportunities: creating entirely new businesses and developing the existing. As these two are fundamentally different, they will be analysed separately in this chapter.

If we first look at developing the existing businesses, the majority of the different perceived opportunities were in this area. It could be derived that there are a lot of things that could be improved in them to drive growth, customer satisfaction and cost-efficiency. However, the top three perceived solutions to the challenges of digital transformation all somewhat relate to issues with the existing organizational structure, processes and culture that have been cemented in the organization over the years.

These findings are consistent with the Stages of Digital Transformation model as the majority of business units with notable challenges were in the third stage, indicating that the next step for them would be to reorganize with digital in mind, which obviously is far from simple to achieve without losing the current competitive advantages of the organization.

In this light, it could be derived when looking at creating entirely new businesses or business models that the same organizational challenges also stand in the way of doing this. However, in the case of entirely new businesses, there is a shortcut for implementing these solutions that were most widely perceived as relevant, and that is to create entirely new, potentially independent, business units to develop those businesses. As we identified in the analysis of the different stages of digital transformation of the different business units, the business units that were created very recently to build business that are inherently linked with digital, were not at all or very little affected by the different challenges in undergoing digital transformation since they didn't have to transform but were born digital without the legacy of the processes or organizational structure of the older business units.

It could also be hypothesized that these business units are also better equipped for the digital era since they have been able to start from a clean slate and recruit people with sufficient skills and knowledge to succeed in this era.

#### **4.4 The role of Enterprise Architecture in Digital Transformation**

This chapter presents the results from the case study regarding the fourth and final research question: “What kind of a role could enterprise architecture (EA) play in the Digital Transformation of large enterprises?”

To summarize, the case organization has not yet fully adopted enterprise architecture but there have been some initial positive experiences from it. However, there have been challenges in getting business leaders to understand the value of enterprise architecture and buy in. It was also seen that there just isn't time to do something like enterprise architecture on the side. There should instead be dedicated resources for

that. When it comes to the actual role of enterprise architecture in digital transformation, an excellent definition was offered by one of the interviewees: enterprise architecture is actually a tool for communication. Considering the nature of the most widely recognized challenges found during the case study (Chapter 4.3.1.) this is a very interesting classification for the role of enterprise architecture.

#### 4.4.1 Current knowledge of Enterprise Architecture in the case organization

The first step in the discussion was to investigate what the level of knowledge of the interviewee was regarding enterprise architecture. The results can be seen in Figure 17.

Enterprise Architecture (level of knowledge)		Overall	MiddleM	TopM	Regional	Central	IT
Admits not knowing the term	0	0%	0%	0%	0%	0%	0%
Heard the term but used synonymously to IT systems architecture	5	36%	29%	43%	25%	57%	0%
Has a reasonable understanding of the term	5	36%	43%	29%	75%	29%	0%
Knows what it actually is and how to use it	4	29%	29%	29%	0%	14%	100%

Figure 17. Enterprise Architecture Level of Knowledge

To summarize, the majority of interviewees either had heard the term but used it only as a synonym for IT systems architecture or had a reasonably good understanding of the term itself but had no practical experience from using it. These interviewees naturally couldn't participate in the discussion of the other sub-questions regarding the research question, meaning that the sample size for those sub-questions was even more limited than previously, only 4.

#### 4.4.2 Experiences from Enterprise Architecture in the case organization

As was evident from the level of knowledge about enterprise architecture, it isn't yet widely adopted in the organization. Enterprise architecture has however been utilized to some extent in some parts of the organization with overall positive experiences. As explained by a couple of interviewees:

*“We have created a business architecture for our main business and described how that operating model results in this kind of solutions and even got to the point where the technical architecture and its next*

*generations have been planned derived from the business architecture.” (Interview 4)*

*“Some projects about it [enterprise architecture] have started and it is tremendously useful. Often a lot of money goes into someone buying something for a specific need and suddenly someone else, for example marketing, buys the same thing with just a slightly different concept. As a result we’re losing time and a lot of money and soon notice that ‘hey, wait a minute, that system could also serve those other guys...’” (Interview 11)*

#### **4.4.3 Challenges in utilizing Enterprise Architecture**

The interviewees had however also experienced a number of challenges in utilizing enterprise architecture:

- Enterprise architecture seen only as an IT thing (Interviews 4, 10)
- Enterprise architecture work for a large enterprise requires a lot of effort and current employees have no time to do that in addition to their current responsibilities (Interviews 1, 11)
- Too little co-operation and discussion across organizational borders (Interview 1, 11)
- Frameworks not practical and business-oriented enough (Interview 4)
- Inadequate tools for the enterprise architecture requirements of a large enterprise (Interview 1)

When comparing these to the challenges recognized in enterprise architecture literature, these seem to be very well in line with them. All of these challenges mentioned by the interviewees were also found during the literature review and vice versa, the most common challenges from literature were also found during the case study.

#### **4.4.4 Perceived good practices regarding Enterprise Architecture**

Some interviewees also mentioned their ideas about what kind of good practices one should try to strive for when implementing and utilizing enterprise architecture.

- Remove the “IT stamp” from enterprise architecture and get business leaders to see the value of architecture work and buy in (Interviews 1, 4, 10)
- Start from business architecture then derive the lower tiers from that (Interviews 1, 4, 10)
- Make it a continuous process, not a project, from which the results are outdated even before it’s being completed. (Interview 1, 4)

As one interviewee summarized his thoughts on the topic:

*“The most important thing is to remove the IT stamp from enterprise architecture and get business leaders to understand the value of the right kind of architecture work, which actually is just the same as systematically developing business. It’s nothing else than documenting the business plans and related thoughts in a way that can be communicated, be kept to and referred upon when the next tiers of managers and IT start to think what should result from all of that. How does some unavoidable [technical] change affect the business? That kind of demystification is important here.”* (Interview 4)

#### **4.4.5 Role of Enterprise Architecture in Digital Transformation**

The interviews didn’t provide a lot of data regarding this topic either but in general the interviewees saw that enterprise architecture could play a major role in reducing overlapping work and purchases, result in better utilization of existing systems and interfaces but above all it was seen as a tool for better understanding and communicating the business and its dependencies. Interviewee 4 introduced the term by stating that:

*“[Enterprise] architecture is actually a tool for communication, and an excellent one at that.”* (Interview 4)

As a matter of fact, the explanation of the essence of enterprise architecture from his previous quote is the new favourite definition of the author as I think it captures that essence of enterprise architecture and it's primary role more clearly than most of the definitions encountered during the literature review:

*“[Enterprise architecture is] nothing else than documenting the business plans and related thoughts in a way that can be communicated, be kept to and referred upon when the next tiers of managers and IT start to think what should result from all of that.”*

(Interview 4)

This proposed role could fit well into the third and fourth stages of the Stages of Digital Transformation model as one of the tools in helping organizations to build digital capabilities and prepare for the systematic business development and strategy execution of the final stage.

#### **4.5 Summary of the results of the case study**

Overall, the current state of digital transformation in the case company would appear to be such that everyone sees the strategic importance of digital business but the different business units are in different stages regarding the actual realization of that. The Stages of Digital Transformation model was created to try to model the different stages the different units might be at and the kind of challenges that are pressing for them during each stage.

The job role and division of the interviewee did play a role in the recognition of certain challenges. The challenges themselves were mostly in line with the existing literature with some of the initiation challenges explained in literature missing due to the organization having already passed those.

As for the perceived solutions and good practices regarding digital transformation challenges, they corresponded quite well with the perceived challenges. Table 11 presents a summary of the results for research questions 1-3 in the format of the Stages of Digital Transformation model. It's worth noting that in the table below, the part that was referred to as solutions to challenges of digital transformation, is now

called focus areas, as the author deemed that to be a more accurate term when the findings from the case study were combined with literature.

The role of enterprise architecture was unfamiliar to most interviewees but those who did understand it proclaimed it to be an excellent tool, especially in communicating business plans across the organization, a key challenge identified by most interviewees. It could potentially be a good fit as one of the tools to be utilized in the latter stages of the Stages of Digital Transformation model but isn't definitely a solution to all of the different challenges, such as forgetting about the needs of the customer.

**Table 11. Stages of Digital Transformation summary**

					
<b>Stage</b>	Denial	Confusion	First Steps	Re-organization	Systematic Execution
<b>Description</b>	Refusing to accept that digital will change the business	Realizing that something digital should be done, but what exactly...	Now that there's some kind of vision in place the business development begins	Once the multitude of challenges hit, the building of digital capabilities begins	Systematic Execution of the evolving vision now possible, accepting the change is constant
<b>Challenges</b>	<ul style="list-style-type: none"> <li>• Unclear business case</li> <li>• Lack of impetus</li> <li>• Change resistant culture</li> </ul>	<ul style="list-style-type: none"> <li>• Change resistant culture</li> <li>• Not understanding dependencies of decisions</li> <li>• Lack of vision</li> <li>• Internal communication of goals &amp; requirements</li> </ul>	<ul style="list-style-type: none"> <li>• Internal communication of goals &amp; expectations</li> <li>• Silos</li> <li>• Lack of vision</li> <li>• Legacy systems not supporting new business</li> <li>• Not understanding the dependencies of decisions</li> <li>• Too IT oriented</li> <li>• Unclear roles &amp; responsibilities</li> </ul>	<ul style="list-style-type: none"> <li>• Internal communication of goals &amp; expectations</li> <li>• Silos</li> <li>• Too IT oriented</li> <li>• Change resistant culture</li> <li>• Unclear roles &amp; responsibilities</li> <li>• Insufficient budget</li> </ul>	<ul style="list-style-type: none"> <li>• Internal communication of goals &amp; expectations</li> <li>• Insufficient budget</li> </ul>
<b>Focus Areas (Solutions)</b>	<ul style="list-style-type: none"> <li>• Establish a sense of urgency</li> <li>• Forming a powerful guiding coalition</li> </ul>	<ul style="list-style-type: none"> <li>• Creating a vision</li> <li>• Communicating the vision clearly</li> <li>• Willingness to take more risks</li> </ul>	<ul style="list-style-type: none"> <li>• First steps</li> <li>• Deeper co-operation</li> <li>• Customer needs first</li> <li>• Acquire digital talent</li> <li>• Willingness to take more risks</li> <li>• Proactive IT</li> </ul>	<ul style="list-style-type: none"> <li>• Empower the organization to act on the vision</li> <li>• Remove silos, deeper co-operation</li> <li>• Customer needs first</li> <li>• Acquire digital talent</li> <li>• Willingness to take more risks</li> <li>• Proactive IT</li> </ul>	<ul style="list-style-type: none"> <li>• Clearer communication</li> <li>• Customer needs first</li> <li>• Willingness to take more risks</li> <li>• Consolidate the culture of change</li> </ul>

The summarized list of main findings per research question can be found in Table 12. These will be discussed in more detail in Chapter 5.1.

**Table 12. Main findings of the study**

ID	Research question	Main findings
RQ1	What does digital transformation (DT) mean?	<ul style="list-style-type: none"> <li>• No unified description for DT was found from literature, thus a meta-analysis and categorization of definitions was conducted in order to compare findings to literature               <ul style="list-style-type: none"> <li>◦ Understanding of DT similar to SLR: both contextual and organizational point-of-views were recognized</li> </ul> </li> <li>• Recognized areas affected by DT close to the areas of DT model by Westerman et al. (2011)</li> <li>• Proposed a new model for modelling the different stages of digital transformation organizations might be in</li> </ul>
RQ2	What kinds of challenges are there in digital transformation for a large enterprise?	<ul style="list-style-type: none"> <li>• Challenges are different for business units within different stages of the transformation</li> <li>• Internal communication of business requirements a common challenge for interviewees from every segment</li> <li>• Middle management identified more challenges than top management, many of which strategy execution related</li> <li>• Challenges related to lack of understanding of and skills in digital more prevalent amongst middle management</li> </ul>
RQ3	How could enterprises tackle the most common challenges in digital transformation?	<ul style="list-style-type: none"> <li>• Need for clearer communication of business requirements and deeper interaction across organizational borders</li> <li>• Interviewees closer to the customers saw the need for a more customer-oriented approach to business development</li> <li>• Especially IT saw the need to involve IT earlier in the decision-making process</li> <li>• Middle management hoped to see new talent with better understanding of digital business</li> </ul>
RQ4	What kind of a role could enterprise architecture (EA) play in that?	<ul style="list-style-type: none"> <li>• EA not well understood by most, often seen as a synonym for IT systems architecture</li> <li>• Getting business leaders to understand the value of enterprise architecture and buy in a major challenge</li> <li>• One interviewee offered an interesting take on the role of EA: <i>“A tool for systematic communication of the business plans and related thoughts”</i></li> </ul>

## **5 Discussion**

This chapter begins with the discussion of the main findings of the study, followed up with the summary of the limitations, implications and contribution of the study. These limitations and implications of the study are discussed on an aggregate level whereas the contribution of the study is on a per research question basis.

### **5.1 Main findings**

The research problem for this study was presented in the form of a high-level research question:

**“How could enterprises better understand & manage digital transformation?”**

This research problem was broken down into 4 research questions. These as well as the related summaries of the main findings can be found from Table 12 in Chapter 4.5. The findings will be first discussed for each of the research questions separately, followed by a cross-analysis of what they mean together from the point of view of research problem.

#### **5.1.1 RQ1: What does digital transformation mean?**

Very early on in the systematic literature review, it became apparent that there's no single definition in the literature that would be commonly accepted for the term digital transformation, nor were any meta-analyses on the topic found, so understanding and categorizing the different definitions became an essential part of the SLR at that point. It was recognized that the different definitions fall into two different categories, named by the author as the contextual point of view and the organizational point of view. In practice this means that digital transformation can be looked at from either the point of view of the larger operating environment, or that of

a single organization, which is the main point of view used throughout this study because of its nature of being a single case study.

In the existing literature, the organizational point of view was already quite well modelled by Westerman et. al. in their Building blocks of digital transformation model (2011), which served as a basis for developing the understanding of digital transformation from that point forward.

It was interesting to see that in the case organization, the same three major categories in the Westerman model, as well as the contextual point of view, were recognized by most interviewees. However, many interviewees pointed out the digitalization of marketing, as a separate entity, not just as one piece related to customer experience, which raises additional questions. Is the Westerman model missing something? Should marketing be raised from one of the subareas into a larger area of its own?

Personally, I believe in marketing being primarily about understanding customer needs and fulfilling those, as originally defined by Peter Drucker (Mohr & Sarin 2009). In that mind-set, customer experience, one of three areas in the Westerman model, is one of the key components of marketing. So whether customer experience is a subset of marketing, or the other way around is a matter up for debate but it's still worth noting that these concepts would seem to be very closely linked in the context of digital transformation.

Another issue that I find interesting is the relationship between the organizational and contextual view of digital transformation. Figure 7 maps the contextual view to that of a single organization by using the Ross et al. Foundation for execution model (2006). That figure could perhaps be further expanded to take into account the different building blocks of digital transformation (Westerman et al. 2011) in the operating model of the organization, with the models being connected by what Ross et al. refer to as foundation for execution and Westerman et. al. as digital capabilities, since these form a similar set of organizational, process and IT capabilities. This could lead to an interesting topic for future research.

One hole in the existing literature was the lack of segmenting the transformation. If it's a transformation process, what are the steps on the way? Could we come up with

some kind of a baseline for organizations to map themselves against to see where they're currently going?

It was clearly evident when looking at the challenges faced by the different business units within the case organization that the challenges are quite different. They also seemed to be different if the unit in question was further along with their transformation. Based on these findings from the interviews, combined with some of the challenges and existing research, a new model for mapping this transformation process was created called the Stages of Digital Transformation. The purpose of the model is to give an organization a reference point to compare against and provide some guidelines on what kind of areas they should be looking at in each of the phases. This mental model could provide some structure to this vague phenomenon and concretize it so that it would be easier to understand for people at large.

As mentioned, it's based on the best knowledge from this study, along with existing research but should clearly be tested more thoroughly to see whether it's applicable for more organizations.

### **5.1.2 RQ2: What kinds of challenges are there in digital transformation for a large enterprise?**

The challenges of digital transformation were noticed to be very diverse. The identified digital transformation challenges from literature were compared to those of change management in general, as well as business-IT alignment. Most of the challenges found in change management, as well as business-IT alignment, were found in digital transformation, but it also had some additional challenges of its own, even in literature, but also in the case of the empirical findings. It could thus be derived that digital transformation is actually a superset of both change management and business-IT alignment.

Transformation is a change process and thus change management is quite a natural frame for that. However, the digital part of digital transformation, has many unique challenges of its own. Some are related to business-IT alignment, some are very concrete implementation related challenges.

As such a large and holistic phenomenon with a very diverse set of challenges that in the empirical part of the study were found to vary quite a lot for the different business units, it was apparent that some kind of a segmentation for those challenges would be required to make some sense out of them.

As mentioned in Chapter 5.1.1, the Stages of Digital Transformation model was created for this purpose and allows us to segment these challenges in at least some way. In the first stage of the model, the challenges are very much about initiation, which was the most common challenge mentioned in the literature. In practice this means that the organizations saw that digital is not a part of their business or something that they should strive towards. These challenges were non-existent in the case organization, suggesting that the impact of digital was already clearly visible there and people understood that it is something that they should definitely strive towards, which was also indicated by most interviewees.

After one has passed these initiation challenges, the next set of challenges are mostly about creating a concrete vision for the organization, communicating it and having people buy in on that vision. It's not enough that "you go digital" but one has to analyse carefully what the role of digital could be in the business that the organization is in, what that means in practice and having some sense of how to get there.

In the third stage, the organization starts to execute that vision and will unavoidably confront many challenges implementing those issues if they haven't really been doing digital before. These are concrete issues regarding legacy systems, business processes, skills and understanding of employees and so forth, which requires re-organization.

The fourth stage, re-organization is then about removing those obstacles for implementing digital. In this stage, the challenges are a varied mix of implementation challenges combined with people questioning the vision or at least the means to get there.

The fifth and final stage is a stage where the organization can again finally execute "normal" business development, of which a digital is now one part. In this stage the

challenges are quite concrete every day challenges such as insufficient budgets and so forth.

There are a couple of overarching themes that were seen throughout most stages, communication and co-operation. These are always difficult areas in a large organization but in difficult and abstract areas such as digital transformation, they require additional attention throughout the process to try to minimize their impact.

As the mapping of these challenges is primarily based on just the case company, it would be interesting to see how these play out in different organizations in the same industry, or in a completely different industry, since the model is quite generic in the sense that it doesn't really go into industry specific details.

If we look at the challenges from different points of view than just the stage of the organization, it's worth noting that middle management in general recognized more challenges than top management. This is most likely due to them seeing both the same strategic level challenges as the top management, but also the concrete operational challenges that often are not directly visible to members of top management. Another interesting finding regarding middle management is that they also more often expressed the need for more talent and understanding of digital, again a result of them having the responsibility for the operational implementation of digital initiatives. Many of them stated that they simply don't have the required skills themselves or in their teams to answer the requirements that are asked from them, leaving them in a very difficult position. To top it off, sometimes even the requirements were very vague and they sometimes were tasked with creating that digital transformation vision, since their superiors had no understanding of the topic. It could thus be derived that the top management could do a better job of removing at least some of those challenges from the middle management to better enable them to do their job.

Organizational change is always difficult. There are sociological, mental and physical barriers for it. Thus moving from any given stage to another will always be difficult. In the first couple of stages, it would appear that a visionary leader could be something that the organization needs to jumpstart the transformation. However, once the concrete operational challenges start to appear, a strong vision isn't enough

anymore. The organization has to also find ways to make that vision happen, which can be very tough if the organization isn't used to changing the way they work and how their processes and systems function, which leads to us to the next research question.

### **5.1.3 RQ3: How could enterprises tackle the challenges in digital transformation?**

Once we move to the question of how to solve the aforementioned challenges in digital transformation, the responses were again quite varied, and not surprisingly, related to the specific challenges that each interviewee was facing himself or herself. Thus the most common solutions were quite vague and abstract, such as “to communicate better”. However, one common suggestion was that the organization should work more closely across organizational borders, indicating that transforming the organizational structure more towards a matrix, or at least making sure that development projects have deeper involvement from different units, might be beneficial.

Some interesting findings that were common among certain sub segments of interviewees, but not in general, were also found. For example, the interviewees in the regionals, who are the closest to customers, saw that the customer experience was in many places quite bad, especially in regards to the digital parts of the business. This would suggest that the development might've been too much driven by the central organization without considering the customer needs more thoroughly. Thus it was suggested that new business development should be more customer-oriented.

A very concrete suggestion quite common amongst the middle management was the need for more talent with skills in and understanding of digital.

An interesting suggestion, voiced especially by those from IT, but also some individuals from elsewhere, was that IT should be involved earlier in the decision-making process. The rationale for this was twofold. First if IT is involved in the decision-making, they will know future requirements sooner and can plan their next steps accordingly. However, a more important point regarding this is the fact that when decisions are made regarding digital, it always has repercussions for the current

systems and those decisions are also dependent on these systems. Thus IT could help decision-makers better understand the consequences of their decisions since in the digital domain they usually aren't at all obvious. If those consequences are not considered in the decision-making process, bad decisions are bound to happen.

I'd see that the solutions for those challenges are again very much related to the different stages of digital transformation.

For that purpose, it would seem to make sense to use some kind of a change management framework, such as the one by Kotter (1995) as the basis for most of the management best practices. This can help the organization especially in the beginning and the end of the transformation process since it provides answers to the common challenges regarding for example initiation and culture.

This alone, however, is not enough since it doesn't take into account the specific challenges of digital transformation mentioned above, that are specifically related to understanding digital well enough to know what its role could be for the organization in question, as well as all of the implementation specific challenges.

Combining change management with some tools specifically designed to answer to challenges in the digital domain, such as enterprise architecture and business-IT alignment best practices would seem to be required in order to be able to answer to all of those challenges.

The goal after all is to enable the organization to consider change as a constant, which is virtually unavoidable in the digital domain and thus build their systems and processes to enable change as well as continuous learning and development.

#### **5.1.4 RQ4: What kind of a role could enterprise architecture play in the digital transformation of large enterprises?**

The fourth research question was the one that was most difficult to answer since there was no direct literature found regarding the question and the majority of the interviewees also didn't have experience from enterprise architecture or didn't understand the proper meaning of enterprise architecture but considered it to be a synonym for IT systems architecture.

Thus the findings are based on the insights of two of the interviewees along with the interpretations of the author of the previous literature and one should look at these findings as such.

One of the key challenges in implementing enterprise architecture that was mentioned by those who had experience in it was the difficulty in getting business executives to see the value of enterprise architecture work. This was a challenge found also in literature for example by Aziz and Obitz (2007). This is an interesting issue since enterprise architecture is not a tool for technology, but primary for business. For example the definition of the term by Op't Land et al. (2009) doesn't even mention technology.

One of the interviewees suggested that are at least a couple of different reasons for that, the other half of the problem would seem to be in rooted beliefs about EA being an IT thing and not relevant for them, and the other shortcoming of the existing frameworks. The interviewees considered the frameworks to be overly complex, too academically oriented and too IT-oriented. For example, the TOGAF ADM (The Open Group 2009), one of the most popular EA frameworks, is quite technology and solution oriented.

One interviewee stated that at best, enterprise architecture is a tool for systematically communicating and developing the business plans, which is a very interesting role for enterprise architecture especially in the context of digital transformation since that might help with some of the common challenges of communicating the vision but more importantly the more concrete business plans.

These findings would point to there being a need for a more simple to understand and practically oriented enterprise architecture framework for enterprises to utilize.

However, by comparing the proposed benefits of enterprise architecture to the challenges of digital transformation, it's quite clear that it's not a solution to all of those challenges, for example forgetting the needs of the customer.

Which leads us back to the research question of what could the role of enterprise architecture be in this context? Based on the analysis of the literature and the insights from the case organization, I would argue that the role suggested by one of the

interviewees as primarily a tool for communicating the business plans is a very enticing one. Enterprise architecture could also help in systematically developing the business by helping the organization to better understand the consequences of decisions, as well as the current strengths and weaknesses of the organization, thus empowering change in the organization.

### **5.1.5 The research problem: How could enterprises better understand & manage digital transformation**

So how do we piece all of this information together to be able to come up with some kind of guidelines for answering the research problem? How does one better understand and manage digital transformation?

Well the key lies in first understanding the phenomenon. After it is clearly understood, it can be managed. I would again like to quote one of the interviewees from top management explaining the essence of his role:

*“One has to organize success. One can manage any entity, no matter how large, when the top management sees the big picture and can then break it down into reasonable chunks. After that, one can think about how to best model those chunks and then execute upon a plan.”* (Interview 10)

When you take that methodology and apply it to digital transformation, it means that you first have see the big picture of what digital transformation is in general, what that means for your organization, you can then segment that big picture. In the case of digital transformation the Stages of Digital Transformation model could potentially help with that.

The model however only provides a generic framework to segment that big picture and some good practices regarding each of those stages but doesn't provide answers to difficult, case specific issues such as what the organization really should do with digital. This requires that the decision-makers not only understand their own business, but also the digital domain. They have to not only understand what's going

on around them, where the competition and customers are going, how each of them are using digital technology, but also deeply understand the competitive advantages, as well as weaknesses of their own organization, including how their organization could implement and execute certain digital business models, in order to be able to come up with strategies that make sense.

However, once that big picture is in place and segmented, the actual transformation begins. As in the end it's a change process, it might be beneficial to utilize a tested change management framework or best practice, in order to be able to manage that transformation process in itself.

The goal of digital transformation, as one interviewee put it, is after all, to be able to not focus on digital as a separate entity, but to be able to do systematic business development, in which digital is one additional component to consider.

In the digital era, change is a constant. Thus I would argue that in order to have successfully managed a digital transformation, one has to be in a state where the organization no longer thinks of digital as just business, and where the organization has enabled itself to adapt to change.

In order to achieve that state, organizations might benefit from utilizing tools such as enterprise architecture and business-IT alignment best practices, but this is something that would require additional research.

Another interesting issue is the connectedness of the different areas of the business in digital. This provides organizations with great opportunities but also challenges. In the case organization, there were examples of old processes that resulted in doing the same thing multiple times in different parts of the organization. This stems from the pre-digital era, where it was easier and cheaper to just do the task multiple times, but this is no longer the case these days since sharing information is easier and cheaper. Now both parts of the organization could just use the same data and save time and money. However, everything being connected also has its own difficulties. If one is to make a change to some system, what does it mean for other parts of the organization and other connected systems? This I think, is one of the key shortcomings of the Building blocks of digital transformation model (Westerman et al. 2011). It represents these building blocks as more or less separate entities. But, for

example, changing the business model almost certainly has repercussions for the customer experience. How does one model these dependencies? Which area does one begin from when looking to start a digital transformation? I think this would be another very interesting area for further research.

Personally, I would take the advice from those who in the case organization were the closest to the customers and argued that the business should in the future be developed in a more customer-oriented way. I think this is an excellent starting point to digital transformation, since it's all too easy to become enchanted of the new technology and start doing fancy things that provide no value for the customers and thus no revenue for the company.

## **5.2 Limitations of the study**

The biggest and most obvious limitation of the study is the generalizability of the results of the empirical part of the study. As was already discussed in chapter 3, the research method of a case study with a single case renders the generalizability of the results to be questionable at best. Further research would have to be conducted in order to prove the findings as generalizable even for other organizations of the same industry. The results can potentially be considered to be quite representative of the case company after paying attention to the shortcomings of qualitative research methods, such as researcher bias, skills of the interviewer, translation, room for interpretation and biases in sampling during the research process.

These issues were indeed something that the author tried to take into account the during the research process, for example by conducting all of the data analysis before translation and doing the translation only for the end results, performing the data analysis twice to ensure higher likelihood of accurate interpretations of the data, performing the majority of the interviews (second round) with the same structure and similar level of participation by the interviewer.

While the sample size of 15 semi-structured interviews can be considered quite large for a research of this scope, it is still not representative of the entire case organization either. Many business units and division were not represented at all, nor were all

levels of the organization since it was limited to top and middle management. This meant that for example board members and regular front line employees were left out of the scope of this research.

Whereas the systematic literature review can in turn be considered to provide a reasonably thorough meta-analysis on the current state of digital transformation literature. The related topics of business-IT alignment and enterprise architecture were also a part of the literature review, but those topics were not as thoroughly reviewed as they weren't the focus of the research problem but were instead seen as interesting tools that might provide some solutions to the challenges of digital transformation.

In any case, the analysis of the literature, especially on business-IT alignment and enterprise architecture, doesn't necessarily cover all of the literature because it was very much limited by the choice of the search queries and databases, even though additive research was performed later on in the study.

Research question 4 was left largely unanswered due to the lack of literature on the topic and the lack of knowledge and experiences on the topic from most interviewees in the case organization. Some discussion and conclusions were however made based on the views of just a couple interviewees combined with the analysis and interpretations of the existing literature by the author. The more thorough cross analysis between the findings about digital transformation and enterprise architecture, which was initially planned, was thus unfortunately not feasible with the amount of data gathered on the topic.

### **5.3 Academic contribution of the study**

For academia, the implications of the study at large are that the topic of digital transformation and how to better understand and manage it in large enterprises is not very extensively studied. The economic implications of the topic are massive as it affects so many companies in so many ways. For that reason it is a very challenging

endeavour, but one that should receive more attention in the future exactly for this reason.

Below the academic contribution of this study is considered for each research question individually and presented in the format of tables.

### 5.3.1 RQ1: What does digital transformation mean?

Table 13. Academic contribution of RQ1

Finding	Contribution
Understanding of DT similar to SLR: both contextual and organizational point-of-views were recognized	<b>(SLR) Categorization of DT definitions:</b> No previous meta-analysis on the different meanings or definitions of DT were found during the literature review so this was conducted as a part of the SLR
Recognized areas affected by DT close to the areas of DT model by Westerman et al. (2011)	<b>(Case) Limited confirmation of literature:</b> Collectively most areas of digital transformation according to the SLR were recognized in the case company, however due to the limitations of the study and sample size, calling them as generally verified would be a stretch to say the least
Proposed a new model for modelling the different stages of digital transformation organizations might be in	<b>(Case + SLR) Contributing to literature:</b> The new model tries to fill a hole in existing literature by providing a lightweight framework for guiding the transformation by analysing the stage of digital transformation on a per business unit basis. Does however require a lot of further research, as currently its validity hasn't been tested.

### 5.3.2 RQ2: What kinds of challenges are there in digital transformation for a large enterprise?

Table 14. Academic contribution of RQ2

Finding	Contribution
Challenges are different for business units within different stages of the transformation	<b>(SLR + Case) Pointing a hole in the literature:</b> The challenges for business units in different stages of their transformation were different, which has not been extensively researched in the literature. Further research on the topic could be very helpful for practisers since the solutions to the challenges are also different in each case. This finding combined with the stages of digital transformation model could be an interesting starting point for further research.
Internal communication of business requirements a common challenge for interviewees from every segment	<b>(Case) Some confirmation for the literature:</b> The challenge was also recognized in literature (Westerman et al. 2011) (Fitzgerald et al. 2013), providing some verification for those results.
Middle management identified more challenges than top management, many of which strategy execution related	<b>(Case) Pointing a hole in the literature:</b> The challenges recognized in literature were not segmented in any way but were on per organization aggregate level, which makes it very hard for individual managers to utilize those generic results. A more segmented approach to future research could be more beneficial for practisers.
Challenges related to lack of understanding and skills more prevalent amongst middle management	

### 5.3.3 RQ3: How could enterprises tackle the most common challenges in digital transformation?

Table 15. Academic contribution of RQ3

Finding	Contribution
Need for clearer communication and deeper interaction across organizational borders	<b>(SLR + Case) Pointing a hole in the literature and providing a starting point for future research:</b> The solutions to perceived digital transformation challenges have not been very extensively researched from the point-of-view of single organizations, let alone that of different business units or roles within. Some of these findings, such as the need for clearer communication and deeper interaction (Luftman, Papp & Tom 1999), have been explored in literature regarding topics such as business-IT alignment that might provide a starting point for further research.
Interviewees closer to the customers saw the need for a more customer-oriented approach to business development	
Especially IT saw the need to involve IT earlier in the decision-making process	
Middle management hoped for new talent with skills in and understanding of digital business	

### 5.3.4 RQ4: What kind of a role could enterprise architecture play in the digital transformation of large enterprises?

Table 16. Academic contribution of RQ4

Finding	Contribution
EA not well understood by most, often seen as a synonym for IT systems architecture	<b>(SLR + Case) Confirming the literature:</b> These points have already been presented in previous EA literature (Aziz & Obitz 2007; CIO Council 2001) (QPR Software 2013) and as such provide some confirmation for those studies.
Getting business leaders to understand the value of enterprise architecture and buy in a major challenge	
One interviewee offered an interesting take on the role of EA: <i>“A tool for systematic communication of the business plans and related thoughts”</i>	<b>(SLR + Case) Some confirmation for the literature:</b> Communication is already considered of the key roles of EA in literature. However, EA was sometimes seen as too complicated to be practical, as in the case organization. Could a more practical and lightweight approach under this role as a communication tool be further developed?

## **5.4 Practical implications of the study for the case organization**

With the business transforming ever more towards digital, the challenges faced by the case organization won't disappear unless something is done. The practical implications of the study can be considered from the point-of-view of what the case organization can take from this study and immediately use to help them combat these challenges.

This study has tried to accomplish some level of understanding of those challenges and analyse the reasons for them happening as well as provide a set of recommendations going forward.

Considering the size of the organization and the varying levels of digitalization in different parts of the organization, a model for classifying the business units into different stages of digital transformation was proposed. This model tries to provide the framework for understanding where each business unit is, what kind of challenges it currently faces, and more importantly, will face in the future.

Some good practices for tackling those challenges, based on existing literature of change management and digital transformation, as well as the insights of the interviewees from the case study, are also presented for each stage.

The model doesn't however go into too much detail on how those good practices should in practice be implemented, nor has the classification been proven to be generally applicable. It does however present a starting point for systematically evaluating the situation on a per business unit basis. Once the units in the case organization has a clearer view of their current situation, they can start to tackle the challenges they face in practice, for which the stages of digital transformation could be a starting point.

As for the immediate improvement suggestions, the author would suggest paying more attention to the difficult role of middle management at the moment. The research would indicate that they are very much tasked with the execution of

somewhat ambiguous goals of “going digital” with limited skills and understanding of the topic themselves and in their teams. As such, a couple of concrete suggestions are presented below:

- 1) Digital Transformation is an abstract concept that is difficult to understand, seek to model it and segment it into smaller, understandable steps using tools, such as the Kotter change management framework or the Stages of Digital Transformation model presented in this study
- 2) Hire more digital business talent.
- 3) Top management could be clearer and more specific about both the vision and the roles and expectations for their subordinates, especially if they are known to be somewhat confused about digital. This can, however, be quite challenging if top management doesn't yet have that clear and specific vision.
- 4) In situations where entirely new businesses or business models are being created, the research would lead the author to suggest those be created as new independent business units that wouldn't be constrained by the existing infrastructure or processes but could instead be ‘born digital’ directly to the last stage of digital transformation bypassing many of the challenges more traditional units are now facing.

## **5.5 Reflection**

In this chapter the author evaluates the study from the point-of-view of each of the three stakeholders. The first obvious stakeholder is the case organization. As the study was conducted as a part of a university research group, they were naturally one of the stakeholders as well. The third stakeholder is the author.

For the case organization, the primary objective was to provide the organization with an analysis of the current situation of digital transformation as well as challenges faced. Secondly solutions or good practices to those challenges could be explored in the study.

Having those objectives in mind, the first objective was quite well covered. Obviously the sampling does present its own challenges but as it's simply not

possible to interview all the relevant people in the case organization, the author would consider it to be satisfactory when keeping in mind the discussion with the case organization representatives at the beginning of the research project. Secondly, some good practices were identified in the study by utilizing both literature and the empirical evidence. However, these were not very extensively researched in the literature and in the empirical evidence only represent the point-of-views and best guesses of the interviewees, which might or might not be entirely accurate.

For the research group, the objective of the study was to gather research material for larger aggregate studies to be made later. This was accomplished in the form of both the raw and transcribed interviews but also a set of affinity maps created by all but one of the 15 interviewees that were left out of the scope of analysis of this study.

For the author, the primary objective was learning about both academic research and the topics of digital transformation, business-IT alignment and enterprise architecture. As I would consider my knowledge to have vastly increased in all of these areas, I would consider this objective to be fulfilled as well.

Generally speaking the scheduling of the work and planning of the research went very well and everything was accomplished in time and objectives met. My instructors at both the research group and case organization deserve a big thanks for supporting the process at all points and making me concentrate on the right things.

The biggest challenge in conducting the research was arranging the interviews and reaching people in the case organization. Since they are managers and executives, this is to be expected to some extent but if I were to conduct the project again, I would definitely want to have access to more internal resources of the case organization, such as organization charts and their MS Exchange directories to be better able to identify and contact potential interviewees.

## 6 Conclusion

Digital transformation is a large, abstract and complex phenomenon. As such, it's difficult to understand and even more difficult to manage. As a starting point, one should understand the concept itself. There are two ways to look at the phenomenon, the contextual point of view, which looks at the changes happening in the operating environment of an organization, e.g. customers are using digital technology more and more, as are the competitors, as well as the organizational point of view, which looks at the phenomenon from the point of view of an individual organization. From this point of view, the digital transformation can happen in different areas of the organization. Westerman et al. (2011) define these areas as customer experience, operational process and business model.

From the point of view of a single organization, digital transformation is unavoidably a change process. A new model was proposed in this study that further breaks down digital transformation into five different stages to help understand the phenomenon by breaking it down into more concrete pieces. These five stages are:

1. Denial
2. Confusion
3. First Steps
4. Re-organization
5. Systematic Execution

The model was created based on the realization that the challenges of digital transformation were different for business units that were in different stages of adapting digital. The challenges were then compared to those from existing literature and grouped to form these stages. In the first stages, the organization is primarily facing initiation challenges such as lacking a vision or failing to communicate it. Once the organization starts to execute the newly found vision, it will run into implementation challenges and notice that re-organization of the organization, processes and IT systems is typically required in order to accomplish the vision. In

the final stage of the transformation, the organization is back to doing normal, systematic business development, of which digital is now one part of.

How to best manage digital transformation is a difficult issue and requires new skills in and understanding of digital from many levels of the organization. However, since digital transformation is in the end a change process, using a change management process, such as the one by Kotter (1995), could potentially help with the overall management of the transformation process. Additional tools such as Stages of Digital Transformation presented in this study, can be used to help model, break down and communicate the process and other tools such as Enterprise Architecture or Business-IT Alignment best practices might be beneficial in the more concrete challenges faced along the way.

## **6.1 Recommendations for further research**

The author would consider the research problem of this study to be worth more attention in future research, mainly because of the significant economic impact of the topic, both for individual organizations as well as the society at large. Based on the findings of this study as well as the recognized shortcomings of it three major research areas are recommended for future research.

### **Digital transformation from the point-of-view of an individual business**

Surprisingly little research on the topic of digital transformation was found during the literature review overall and even the existing literature focused quite heavily on understanding the state of digital transformation of the larger context of the operating environment instead of the organizational point of view, let alone individual business units within. Generally those studies just provide a long list of challenges and potential solutions, which by no means are applicable to every organization across industries as they are in very different situations.

Going forward, the author would suggest researching the topic from a more practical point-of-view and especially segment those findings based on at least the stage of the transformation process the organization (or business units within) is in order to help organizations that are struggling with the topic to better understand it.

### **Further development of the Stages of Digital Transformation model**

As one of the main contributions of the study, the Stages of Digital Transformation model is naturally considered by the author to be an interesting research area going forward.

The model itself is very much in its infancy. It has not been tested outside the sampling of this case study, nor has it been used in practice yet, meaning there's no guarantee of it being generally applicable or valid so further research on this topic would be needed. Furthermore, even though the challenges faced as well as good practices and focus areas for each stage were investigated from both literature and the empirical evidence, they most likely are far from perfect and could be much refined in the future.

Also, the model could be taken a step further by also providing some more practical guidelines on how to implement the good practices in practice.

### **The role of Enterprise Architecture in regard to Digital Transformation**

The fourth research question about the role of Enterprise Architecture in the Digital transformation of large enterprises was left largely unanswered due to both a significant lack of literature on the topic as well as too little experience on the topic in the case organization.

By analysing the literature and the limited experiences from the case organization, the role of Enterprise Architecture as a very potent tool for helping organizations manage the difficulties in systematically communicating the business plans and related thoughts in an organization undergoing a challenging transformation towards digital was seen by the author as another interesting avenue for future research.

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## **Company documents**

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## **Interviews**

Interview 1. March 7, 2014, at 09:00 – 10:00. Case company, Helsinki. Position of interviewee: IT Architect. Semi-structured interview.

Interview 2. March 12, 2014, at 14:30 – 15:25. Case company, Helsinki. Position of interviewee: Managing Director. Semi-structured interview.

Interview 3. March 24, 2014, at 13:00 – 14:00. Case company, Helsinki. Position of interviewee: Development Manager. Semi-structured interview.

Interview 4. March 25, 2014, at 15:30 – 16:30. Case company, Helsinki. Position of interviewee: Corporate CIO. Semi-structured interview.

Interview 5. April 3, 2014, at 13:00 – 14:00. Case company, Helsinki. Position of interviewee: CFO. Semi-structured interview.

Interview 6. April 8, 2014, at 09:30 – 10:15. Phone. Position of interviewee: Marketing Manager. Semi-structured interview over phone, not recorded, only notes were made.

Interview 7. April 9, 2014, at 13:00 – 14:00. Case company, Helsinki. Position of interviewee: Development Manager. Semi-structured interview.

Interview 8. April 9, 2014, at 14:00 – 15:00. Case company, Helsinki. Position of interviewee: Marketing Manager. Semi-structured interview.

Interview 9. April 11, 2014, at 13:00 – 14:00. Case company, Helsinki. Position of interviewee: Regional Director. Semi-structured interview.

Interview 10. April 14, 2014, at 10:00 – 11:00. Case company, Helsinki. Position of interviewee: CEO. Semi-structured interview.

Interview 11. April 25, 2014, at 09:00 – 10:00. Case company, Helsinki. Position of interviewee: IT Manager. Semi-structured interview.

Interview 12. April 25, 2014, at 10:30 – 11:00. Case company, Helsinki. Position of interviewee: Marketing Manager. Semi-structured interview.

Interview 13. April 28, 2014, at 13:15 – 14:15. Case company, Helsinki. Position of interviewee: Development Director. Semi-structured interview.

Interview 14. May 7, 2014, at 12:30 – 13:30. Case company, Helsinki. Position of interviewee: Marketing Manager. Semi-structured interview.

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