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Digital transformation in the Swedish real estate sector

A study of digital maturity level and barriers to digital transformation

Master's thesis in Management and Economics of Innovation

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Abstract

The forces of digital development have by a varying degree transformed different industries and sectors for decades. The sector of real estate is often considered a laggard with regards to the adoption and utilization of digital technologies, which by extension limits its journey of digital transformation. Changes in the macro level with regards to customer demands together with technological advancements that enhance both availability and affordability are increasing the pressure on actors within the real estate sector. Yet, the current economic situation in Sweden does still allow for high returns from performing business as usual which reduces the sense of urgency for Swedish real estate companies. Historical examples of e.g. the retail and media industries indicate that relying merely on reaction may be insufficient. Instead, companies must act proactively and innovate and reimagine themselves to remain competitive.

This master thesis focuses on the current state of digital transformation through the execution of a digital maturity assessment followed by an analysis of the current endeavors to discover barriers to digital transformation. The thesis begins with a pre-study in order to gain knowledge and understanding of the subject. To identify the scope of this study, a series of 5 semi-structured interviews were held, and in parallel, an extensive review of existing literature, to get first hand information regarding what the incumbents have been doing, are currently doing and are planning to do in the future. From the pre-study, a clear scope was formulated and a set of frameworks adopted and adapted to fit the purpose of this study. Anchored in the findings of the pre-study, a digital maturity assessment was made to appraise the companies current undertakings. Subsequently, an analysis of the current efforts are made to identify barriers to digital transformation, i.e. factors that are hindering future development and transformation. Lastly, the thesis ends with conclusions regarding the findings followed by recommendations and discussion regarding future research.

The findings regarding the digital maturity assessment is providing insights on how the Swedish real estate sector is currently organized to deal with digital transformation. The absolute number of the assessment shall be given lesser attention and instead the real contribution lies in the average of each research question as it has the possibility to highlight weak areas. The findings on the second research question enlightens several barriers to digital transformation, yet the thorough literature study assists in displaying that there are no independent variables in digital transformation and each and every barrier to some extent relates to another. The clouded relationships hinders the possibility to give anchored recommendations of where or in which end to start to resolve the barriers. Some indications point towards it being favorable to start to review the digital strategy and the digital leadership first.

Key words: Digital transformation, Digitalisation, Digitization, Digital maturity, Barriers to Digital Transformation, Real Estate, Swedish Real Estate Sector

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The study concerned the very interesting topic of digital transformation. The topic, other than being highly relevant in modern research, was found to be highly aligned with our studies at the masters' programme of Management and Economics of Innovation which allowed for previously acquired knowledge to be applied. We would like to thank all the companies from the real estate sector, PropTech sector and the organization PropTech Sweden for their participation. Without your generous time, knowledge and openness, this study could not have been executed.

Finally, we would specially express our gratitude to Kamilla Kohn Rådberg who has actively supervised the research and has continuously been available for great discussion and guidance. Our shared interest in digital transformation provided the execution of this study with a joyfulness that we are confident positively affected not only the outcome of the study but also the experience itself.

Gothenburg, June 15, 2022

Andreas Eriksson

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John Scherman

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Vocabulary

DT Digital Transformation

ROI Return on investment

CDO Chief digital officer

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1. Introduction

This chapter gives a background to the subject of the master thesis as well as why it is conducted. Thereafter, the aim of the study is defined.

1.1 Background

Today, the completely analog world feels distant and almost unimaginable. Yet, the popularization and redefinition of the word *digital* in the mid 20th century due to the invention of the microchip and the semiconductor transistor unfolded just a fraction of a fraction ago in the context of human history (H. Menear. 2020; Oxford English Dictionary, 2020). The introduction of digital computerization and its rapid diversification and development, the latter accurately forecasted by Moore (1965), has proven to be one of, if not *the*, most influential and revolutionizing inventions in human history. Companies and even entire industries are continuously being disrupted and reinvented, often not by incumbents but by new entrants and innovators. Chandy and Tellis (2000) famously coined the expression “incumbent's curse” which refers to the phenomenon of incumbent firms tending to solidify their market positions with relatively incremental innovations rather than radical. Christensen, C. M. (2013) concept of “the innovator's dilemma” similarly explains the challenges incumbents face and that relying on incremental innovation is generally insufficient. Hence, if incumbents are to survive the wave of digital transformation, relying merely on reaction may be insufficient. Instead, companies must act proactively and innovate and reimagine themselves (Mutekwe, E. 2012). Remember your local music store? It is a fact that not only that one store but the entire music industry failed to not only take proactive measures but also to react when actors such as Napster and Spotify emerged. At present times, the metamorphosis of the music industry's business model, from customer relations and advertising to production, distribution and pricing policy, can at large be deemed complete (J. Montoriol-Garriga, 2015). The aforementioned changes to a business model show great resemblance the definition of digital transformation according to Vial, G. (2021):

“Digital transformation is the cultural, organizational and operational change of an organization, industry or ecosystem through a smart integration of digital technologies, processes and competencies across all levels and functions in a staged and strategic way.”

Whereas the music industry was an early victim of digital transformation, other sectors are yet to be, or are currently being, hit by the Darwinistic changes that digital technology gives rise to. The sector of real estate, often claimed to be a conservative sector that lacks the ability to drive change and transformation (e.g. Kytömäki, O. 2020; Andreasson, M., & Mattsson, F. 2019) is an industry that is currently facing the aforementioned irrefutable evolution. The collision of the real estate- and technology sectors has created a whole new industry, namely the *property-tech* industry, commonly and henceforth referred to as *PropTech* (Rice, 2019). As a causality of this collision, incumbents in the real estate sector

face both opportunities and threats. Threats are manifested as actors in the technology sector have started to recognize the possibilities of new value propositions that come from the use of digital technology in the real estate sector. These actors do not necessarily place themselves solely as a supplier but sometimes also move into the real estate value chain, thus starting to compete with the real estate actors. This has ultimately led to an increased presence of technology based companies in the real estate sector and these actors, in contrast to incumbents, do not need to radically transform their existing resources and capabilities to utilize new technology as they themselves often are the developers and innovators of said technology (Ilchenko, V. 2021). Possibilities are present due to the novelty of the PropTech sector which presently is highly scattered and is yet to consolidate and settle on its competitive direction. Nevertheless, mapping of the Swedish PropTech sector indicates that the sector predominantly aims to place themselves as a supplier of expertise and technology which implies great opportunities for the real estate sector.

Considering both historical and present disruptions and transformations of other sectors due to digital technology and the competitive advantages that digital transformation has proven to give rise to, it is of interest to understand why the real estate sector has become a laggard in terms of adoption of digital technology. To understand what is hindering development is the foundation for improvement and the explanatory power of theory without context is limited. To bridge the gap between theory and practice, there is a need to first understand the current state of the Swedish real estate sector. From the exploration of the current state, an analysis deeply anchored in literature aims to unearth context-specific barriers. Furthermore, digital transformation is a novel concept and the specific requirements are yet to be amplified by the academic community (Jacobi, R., & Brenner, E. 2018). This implies that this study is not only of interest for the business community but also has a scientific contribution as the relevance of the current state of the art literature is being evaluated in the practical context of the real estate sector.

1.2 Purpose

The sector of real estate is often claimed to be a conservative sector, lacking the ability to drive change, and in the context of this study, being unable to adopt technology and undergo digital transformations, henceforth referred to as DT (Kytömäki, O. 2020; Andreasson, M., & Mattsson, F. 2019; Baum, A. 2017). The reasons for the sectoral inertia is often left to general explanations such as the nature of the asset class and how it is traded or simply that the sector is conservative (e.g: Kauko, T. 2018; Siniak, N., Kauko, T., Shavrov, S., & Marina, N. 2020). While there is an extensive set of literature regarding how to organize for innovation and change generally, the requirements for digital transformation are yet to be amplified in scientific literature (Jacobi, R., & Brenner, E. 2018). There are deficiencies in the scientific literature regarding this subject as well as a poor connection between theory and practice. This study aims to contribute to the professional and academic community through first mapping and describing the current activities in the Swedish real estate sector with regards to DT and second, to analyze the current activities to unearth and describe barriers that hinders the transformational development. The purpose of this study is twofold. First, the study seeks

to contribute to the academic community through the appliance of relevant literature to distinguish the relevance of its content in the context of the Swedish real estate sector. Second, the study aims to contribute to the business community through identification and presentation of barriers to DT.

1.3 Delimitations

This master thesis is limited to the two research questions stated in chapter 1.4. In order to conduct a study with high quality within the given time, delimitations are necessary. The following chapter describes the delimitations of this study.

First, as the study aims to identify the sectoral digital maturity and barriers to DT, the thesis will not give any recommendations of how to progress or overcome the identified barriers. Instead, its intention is to guide further research within the area. As of this, the thesis will not include a thorough description of each participating company since it's simply beyond the scope of this study.

In addition, due to the timeframe of 20 weeks this thesis was limited to a total of 11 interviews with 7 of the largest actors in the Swedish real estate sector with regards to turnover. However, the number of companies together with the selection of companies may not yield findings that are representative for the Swedish real estate sector as a whole.

In order to not jeopardize the promised anonymity both companies and interviewees will be treated anonymously. In addition, as DT initiatives were shown to be performed in different departments and by people with different titles, the authors decided to not take any of the respondents' titles into account when analyzing the answers.

Lastly, In-depth scientific literature on DT in general and barriers to DT specifically are scarce and sometimes incoherent. When incoherences have been detected, both viewpoints have been taken into consideration.

1.4 Research Question

This study has utilized the most dominant approach to create research questions in organizational studies, namely the “gap spotting”, which as the name implies aims to discover research questions through spotting gaps in the literature. While there are different kinds of modes of “gap-spotting”, the most frequently used is the so-called “neglect-spotting” which seeks to identify deficiencies within a given research topic. Deficiencies can be that something within the area is overlooked, under researched or that statements and claims lack empirical support (Alvesson, M., Sandberg, J. 2013). Combining the insights from the “gap-spotting” with the FINER criteria, see table 1, provides a solid foundation for a good research question (Hulley, S. B., Cummings, S. R., Browner, W. S., Grady, D., Hearst, N., & Newman, T. B. 2007).

From the general topic of “digitalization of the real estate industry”, a gap was found regarding the explanations to *why* the real estate industry is inefficient in undergoing DT. The reasons for the sectoral inertia is often left to general explanations, i.e. the area seems to be overlooked and some statements lack empirical support. Additionally, the proptech sector’s role in the transformation is often left out. A great amount of studies have been conducted with regards to digital technologies' prospective impact on the real estate sector and there seems to be a greater focus on the final destination of transformation than the journey itself. Additionally, DT in the real estate sector is a novel phenomenon and the current state of digitalization is not well understood. From this, the authors identified the need to first identify and describe the current state of the Swedish real estate sector and second, analyze barriers negatively affecting the DT journey. Hence, the following research questions were formulated:

1. *What is the current digital maturity level of actors within the Swedish real estate sector?*
2. *What barriers are currently hindering the digital transformation journey for companies in the Swedish real estate sector?*

Feasible	Novel
<i>Adequate number of subjects; adequate technical expertise, affordable in time and money</i>	<i>Confirms, refutes or extends previous findings; provides new findings</i>
Interesting	Ethical
<i>Getting the answer intrigues the investigator and her friends</i>	<i>Amenable to a study that institutional review board will approve</i>
Relevant	
<i>To scientific knowledge; to future research</i>	

Table 1: The FINER criteria designed by Hulley et al. (2007), illustrated by the authors

2. Theory

The theory chapter is based on the findings from the pre-study and especially aims to synthesize information regarding the building blocks in the framework by Vial, G. (2021). The notion of DT is discussed through different theoretical lenses, followed by literature on the building blocks of DT according to Vial, G. (2021). The first research question of this study, "What is the current digital maturity of Swedish real estate actors? " is not extensively dependent on literature to be answered due to its exploratory nature. The same is not true for the second research question, "What are the current barriers to digital transformation in the Swedish real estate sector?". This research question builds upon the findings of the first question and aims to identify barriers to DT through the use of literature on DT.

2.1 Real estate

According to the Cambridge dictionary, the term *real estate* is defined as “*property in the form of land and buildings*”. Even though the aforementioned definition is highly acknowledged, it may induce a simplification that does not fully recognize the width of the sector. Mladenow, A., Novak, N. M., & Strauss, C. (2015) present a systematization of the real estate sector along four major dimensions: management, institutions, typology and interdisciplinarity, with each dimension containing a number of sub-dimensions, see table 1. The typology describes the different categories of real estate, where residential real estate refers to the purpose of private occupation and comprises everything from rental of small city apartments to mansions. Commercial real estate refers to buildings and land that are used by businesses to carry out their operations e.g offices and stores. Similarly, industrial real estate refers to assets that are aimed to be rented to industrial actors for industrial activities such as factories and warehouses. Independent of typology, there are a number of different institutions involved in the business, ranging from real estate brokers, investors and developers to construction companies. By extension, this entails the inclusion of a diverse range of disciplines. By analyzing the value chain of the real estate sector presented in figure 2, the wide range of disciplines and their activities become more clear. Whereas economics is a fundamental discipline throughout the value chain, it may be a particularly intensive economical focus in the initiation and compliance phase where the business appraisal, investments and fundings are made. Similarly, the architecture and engineering disciplines are probable to show a higher engagement in the development phase where the construction is executed.

DT is not limited to a particular phase in the value chain but instead has the possibility to affect all phases and ultimately even transform the value chain, creating new areas where value is added. Understanding the width of the real estate sector and that it stretches far beyond the popular belief of simply managing and renting properties is absolutely fundamental to also understanding the width of DT.

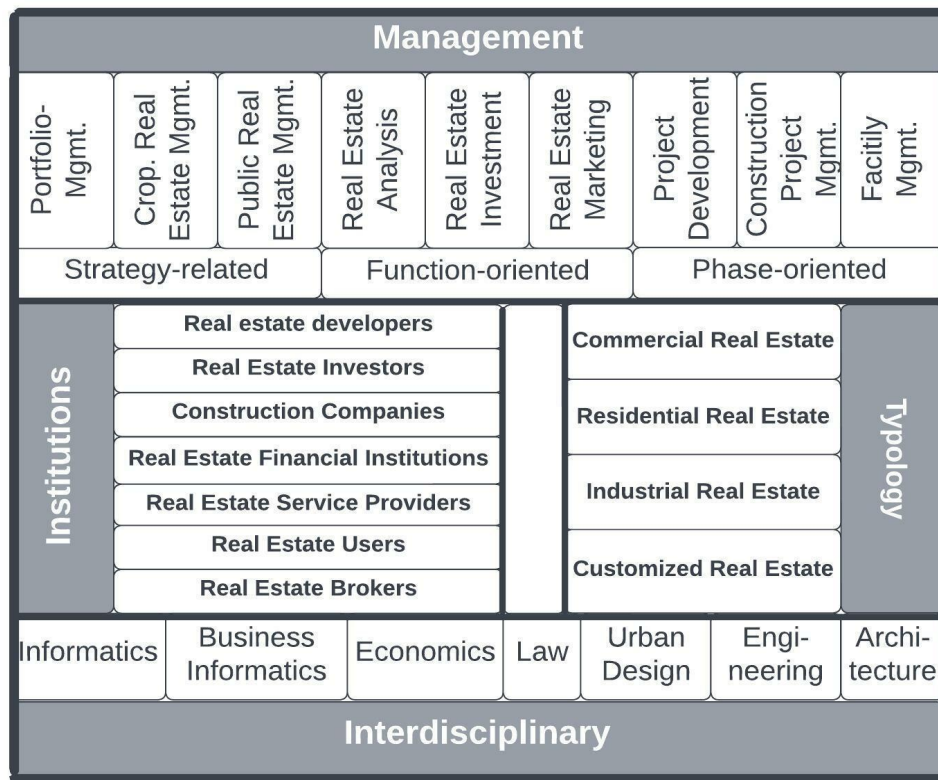


Figure 1: A systematization of the real estate sector along four major dimensions: management, institutions, typology and interdisciplinarity designed by Mladenow, A., Novak, N. M., & Strauss, C. (2015), illustrated by the authors

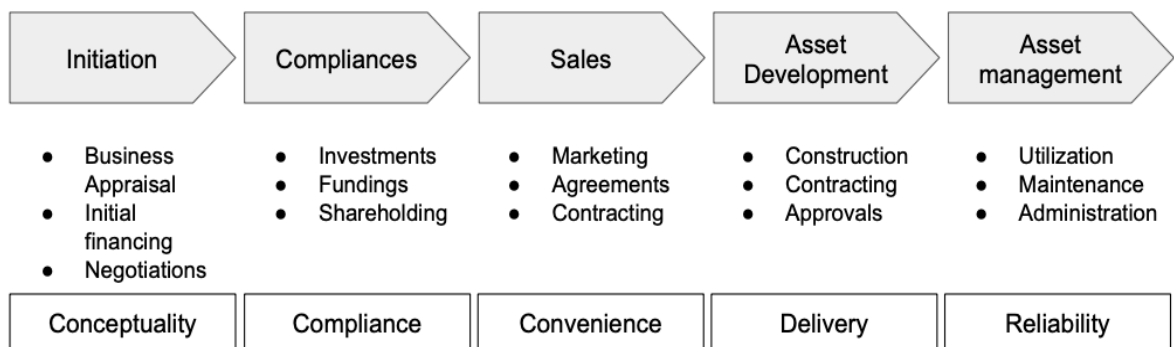


Figure 2: The Real estate value chain designed by Mladenow, A., Novak, N. M., & Strauss, C. (2015), illustrated by the authors.

2.4 Digitization/digitalization/digital transformation

Since the emergence of digital technology in the mid 20th century, digitization, digitalization and digital transformations have been subject to active discussions. Even though digital technology has existed for several decades there still lies little consensus, or atleast coherent use, of the terminology. Digitization and digitalization is especially subject of interchangeable use by academic scholars and business researchers alike and there is a need to make explicit distinctions between the different terms (Brennen, J. S., & Kreiss, D. 2016; Prause, J. 2016). This chapter aims to not only provide information regarding digitization, digitalization and digital transformations but also to display the general misuse and confusion that surround the terminology. This review does by no means aid the process of settling on a general definition, it simply reviews current definitions to make a well grounded and informed adoption.

Even though digitization is the less complex term out of the three, it is still subject to different definitions and use. Bloomberg, J. (2018) use the definition:

“Digitization essentially refers to taking analog information and encoding it into zeroes and ones so that computers can store, process, and transmit such information.”

Similarly, Gartner (n.d.-a) defines digitization as:

“Digitization is the process of changing from analog to digital form, also known as digital enablement.”

These definitions essentially refer to taking an analog asset and changing it to a digital form without any change to the process itself. Then again, Gartner, even though considered an industry expert, appears to be indecisive on its definition as they contradictory claim that:

“Simply replacing the paper forms with tablet devices is not in itself digitization.”
Barett, J. (2015).

This exemplifies the turmoil that surrounds the terminology. However, in this study, the former definitions, which may not be identical by words yet highly coherent in terms of meaning, have been adopted due to their more prevalent occurrence in literature (Gobble, M. M. 2018). According to this, the term digitization is foundational and something that traces back to the year of 1679 when Gottfried Wilhelm Leibniz developed the modern binary number system. A more modern and relatable initiator and diffusor of digitization is the world's first disk storage unit announced by IBM in 1956 that digitized United Airlines' reservations system (Press, G. 2016). To contextualize the adopted (and dominant) definition of this study, one can think of digitization as scanning a physical document to store it as a digital document thus enabling the asset to be handled by computers. It is simply the information that is being digitized, not the processes – that is where digitalization comes in.

Digitalization seems to be subject to even more confusion and incoherent use than digitization. Here, Gartner (n.d.-b) suggest the definition:

“Digitalization is the use of digital technologies to change a business model and provide new revenue and value-producing opportunities; it is the process of moving to a digital business.”.

Note that this definition has a profound business model focus whereas the following definition by Brennen, J. S., & Kreiss, D. (2016) instead targets social life:

“We refer to digitalization as the way in which many domains of social life are restructured around digital communication and media infrastructures.”.

Although the substance of these definitions may be interrelated, the different areas of focus may give rise to confusion as to what the goals with digitalization are. Ebert, C., & Duarte, C. H. C. (2018) describes this phenomenon in the context of digital transformation and displays different objectives depending on whether taking on social- or economic perspective. I-Scoop. (2022-a) explains that different meanings of terminology may arise due to the use by different people with different contexts. As this study relates to the sector of real estate (economic perspective), i.e. businesses with the goal to increase revenue and create value-producing opportunities the former definition by Gartner (n.d.-b) is more applicable and thus adopted.

The literature review enlightened a fourth term closely linked to the term digital transformation, namely “digital” in the context of being something. The adjective is described by Dörner, K., & Edelman, D. (2015) as:

“Creating value at the new frontiers of the business world, creating value in the processes that execute a vision of customer experiences, and building foundational capabilities that support the entire structure”

What it means to “be digital” does not really contribute to something of value other than it being an adjective thus allowing for the viewpoint of possession rather than the verb of digital transformation that rather describes an occurrence or action. The definition by Dörner, K., & Edelman, D. (2015) of “being digital” is highly coherent with the description of the same term by Hmeid, R. (2017) and Ross, J. (2017).

The final term of consideration is digital transformation. Once again, the literature review has unearthed indecisiveness among prominent technology companies as well as academic scholars. In the article by Vial, G. (2021), 23 different definitions of digital transformation were identified. From these definitions a new definition was systematically formulated with the help of different frameworks to minimize ambiguity and maximize clarity. The definition by Vial, G. (2021) reads as follows:

“Digital transformation is the cultural, organizational and operational change of an organization, industry or ecosystem through a smart integration of digital technologies, processes and competencies across all levels and functions in a staged and strategic way.”

Hence, digital transformation is far more comprehensive than digitization and digitalization with regards to impact. To contextualize the definitions above, the three terms can be put into a hierarchical order with digitization as the foundation, digitalization as the middle level and digital transformation as the top level, see figure 1. Each of the levels is necessary, yet not sufficient alone, to get to the next level (Bloomberg, J. 2018)

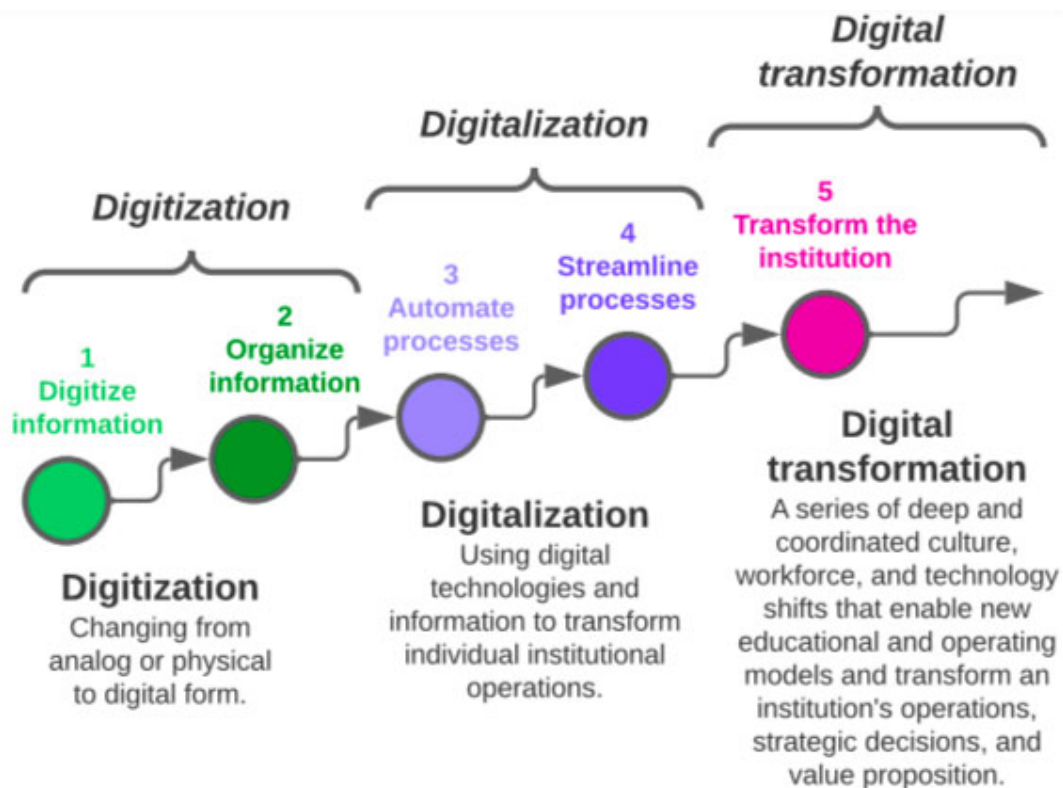


Figure 4: Digitization, digitalization and digital transformation hierarchical order designed by Reinitz, B. (2020), illustrated by the authors

To summarize, digitization refers to changing *information* from *analog* to *digital* which may give rise to incremental changes on e.g. internal efficiency and transparency. Digitalization utilizes the digitized data to impact *processes* which may give rise to changes in operation and business model. From the definition, digital transformation reaches “across all levels and functions” which essentially means that, from a business perspective, it transcends all traditional roles and requires reimagination of the business and culture. It is not about how to improve what is already done but instead to, through the use of technology with a customer centric focus, reinvent how you do business (Bloomberg, J., 2018; I-Scoop., 2022-b; Salesforce n.d.)

2.5 Theoretical framework

Vial, G. (2021) presents a framework for DT articulated over eight building blocks displayed in a sequential manner, see figure 5. The framework is built upon the analysis of 282 works related to DT and manages to bring great clarity to the complex phenomenon of DT. The first building block is “the use of digital technologies” which is depicted as the fuel for initiating the DT-journey. Technologies such as IoT or platform solutions may create disruptions in the competitive landscape and alter consumer behavior and expectations. These disruptions may give rise to strategic responses from the organization, i.e. they start to design and formulate a strategy for how to deal with the changes in the competitive landscape. The strategic changes allow the organization to adopt and utilize new digital technologies in a way that paves the way for changes in the value creation paths. However, a DT-strategy must contain adequate structural changes to be an enabler of new value creation paths. Similarly, the organization must also overcome organizational barriers that hinder the transformation effort. From the new value creation paths, a set of predominantly positive outcomes can be expected.

In the context of this research, not all parts within the framework are equally important. As the goal is to study barriers to DT, the focus lies on the building blocks that enable DT and not the one displaying outcome. Hence, the framework is reduced to not include the generative impact of DT, i.e. the positive and negative outcomes. The dotted arrows represent global trends, i.e. they are factors outside of the organization, thus limiting the individual firms possibility for manipulation. The solid arrows on the other hand, represent the interorganizational phases of the DT process and are thus under direct control of the organization. It is important to understand that this framework is not created for the sole purpose of identifying and analyzing barriers to DT and that the framework is presented with a limited amount of information regarding how to *manage* the different building blocks of DT. Hess et al. (2016) created another framework from the recognition that the building blocks of DT are known and that there is a gap in specified guidelines on how to approach DT. The framework presents 4 areas as follows:

- *Use of technologies*
- *Changes in value creation*
- *Structural changes*
- *Financial aspects*

From the four areas, which is highly related to the building blocks presented by Vial, G (2021), the framework presents a set of eleven key decisions, or questions, for a DT strategy, see table 2. It is important to understand that while the framework presents key questions that managers ought to answer for creating a successful DT strategy, it is the company specific answers that guide the strategy. The framework is merely a guide towards asking the right questions. In the purpose of this study, the identification of crucial elements for designing a DT strategy allows for analyzing real estate companies' endeavors. To bring more depth into the analysis, the building blocks of DT are disassembled and strengthened by deeper level

literature on the specific areas. This allows for a foundational and anchored way to assess the endeavors of real estate companies with regards to DT.

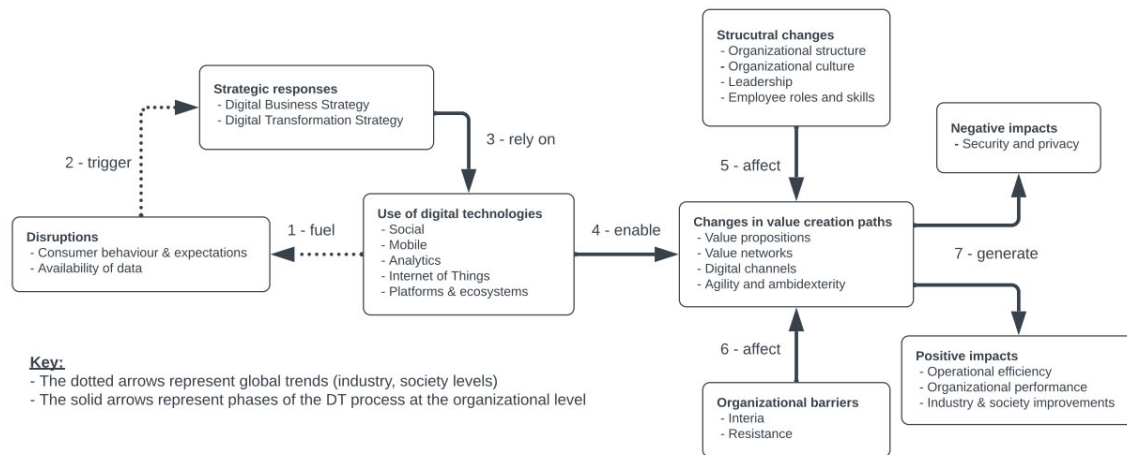


Figure 5: Digital transformation framework designed by Vial, G. (2021), illustrated by the authors

Question	Possible answer			
Strategic role of IT	Enabler		Supporter	
Technological ambition	Innovator	Early adopter	Follower	
Degree of digital diversification	Inter-organizational processes	External processes, e.g. with other institutions	Sustainability/maintenance solutions	New customer offerings
Revenue creation	Brand recognition and loyalty	Complementary services/products	Enhance forecasting and risk reduction	Maintenance and prevention
Responsibility of digital transformation journey	CEO	CEO of business unit	CDO	CIO
Organizational positioning of new activities	Integrated in current organization		Separated from current organization	
Focus of operational changes	Products and services	Business processes	Skills	
Building of competencies	Internally	Partnerships	Acquisitions	External sourcing
Financial pressure on core business	Low	Medium	High	
Financing of new activities	Internal		External	

Table 2: Own adaptation of the framework by Hess et al. (2016) to fit the real estate sector:

2.5.1 Digital technology as a disruptive force

Digital technologies in the context of DT are predominantly coherent with the SMACIT acronym, referring to technologies related to *social*, *mobile*, *analytics*, *cloud* and the *internet of things* - IoT. Even though some categories of digital technologies are more present in research regarding DT, there is no single archetype of digital technology in DT. Instead, literature depicts the combinations of technologies to be the characteristic that is particularly relevant. In context, the outcome of algorithmic decision-making, which categorizes under *analytics*, is often dependent on data collected from social media which categorizes under *social* (Vial, G. 2021). Whereas there is no archetype, the importance of technologies with regards to disruptive potential differs in the context of the real estate industry, see figure 6. According to Vial, G. (2021), these technologies can give rise to three kinds of disruptions which reads as follows:

- Consumer behavior & expectations
- Competitive landscape
- Availability of data.

Digital technologies have given rise to a number of trends affecting the competitive landscape as well as creating new customer expectations. The changes in customer behavior and expectations have been profoundly enhanced due to the pandemic of Covid-19. The post-pandemic “new normal” encompasses new ways of working and has increased the customer demand for flexibility. These needs have strengthened the sharing-economy trend that in the real estate sector is manifested as coworking and coliving (PwC & Urban Land Institute, 2022). Another growing macro trend is the increased awareness of the environmental crisis which calls for better environmental, social and governance (ESG) elements. The ESG performance will be an increasingly important factor for value creation in the real estate industry, be it through increased efficiencies, attracting low-cost cost financing or premium rents (PwC & Urban Land Institute, 2022).

These trends are only some examples of changes in the competitive landscape and customer expectations, and there are many more of varying importance. In this study, the goal is not to understand each and one of the trends but instead to highlight their existence and importance in DT. Acknowledging their importance as a trigger of DT allows for understanding, mapping and analyzing the Swedish real estate sector’s response to macro trends which lay the foundation for a transformation.

Real estate disruptors

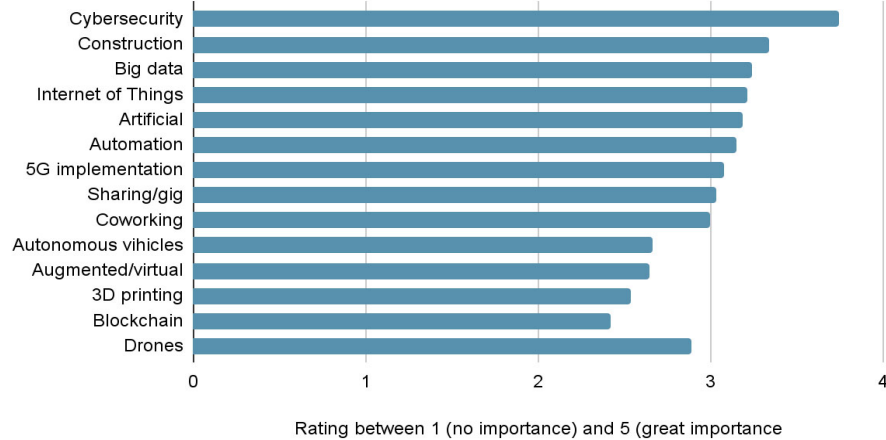


Figure 6: The importance of different disruptors in the real estate industry, illustrated by the authors. Statista Research Department, (2022).

2.5.2. Strategy

The disruptive force caused by digital technologies creates pressure as well as opportunities for incumbent firms. In order for organizations to remain competitive, action towards protecting the firm or exploiting the opportunities will be a necessity (Vial, 2021). According to Matt, Hess, and Benlian (2015), this involves transformations of an organization's key business operations which affects products, processes, organizational structure and management systems. This requires the firm to develop management practices to handle these complex transformations, where a key element is to formulate a strategy (Matt et al. 2015). However, Vial (2021) argues that the generic concept of strategy is unable to act on the force created by digital technologies and instead refers to the two concepts of *digital business strategy* (DBS) and *digital transformation strategy* (DTS). Kane, Palmer, Phillips, Kiron, and Buckley (2015) argues that strategy rather than technology drives the transformation, where lack of a digital strategy accounts as the biggest barrier for companies in the early phases of digitalization to evolve in the context of DT. Even though scholars are continuously underlining the need for a strategy specifically designed for DT, the literature on how to effectively undergo the process of designing and evaluating strategy remains limited (Brown, N., & Brown, I. 2019; Matt et al. 2015). The insufficient research on the aforementioned process seems to not only give rise to unspecified guidelines but also induce ambiguity as the scientific community displays an incoherence in findings and recommendations.

The incoherence is mainly manifested through an indecisiveness regarding the relationships between digital strategy and the more classic business- and IT strategies. Some scholars argue that a digital strategy can be implemented through enhancing the current IT strategy with digital elements and that the symbiosis between digital, IT- and business strategy compose a

holistic organizational strategy that allows for creating differential value (Bharadwaj, et.al. 2013). Scholars arguing for such a strategy represent the *digital business strategy* stand, which contradicts the recommendations of McDonald (2012), representing the side of a *digital transformation strategy*. McDonald (2012) instead claims that such a critical and highly demanding challenge as DT calls for a strategy unreservedly separated from the organizational or functional strategy, hence a digitally enhanced IT strategy is not the right solution. In the case study by Hess et al. 2016, the contestant views of integrating or separating the digital strategy from the organizational or functional strategy is analyzed through describing three German companies who successfully approached DT. Hess et al. 2016 concludes that the role of IT is highly dependent on the specific company. In some cases, the driver of DT is digital technology and digital technology alone due to the possibilities it may present, where IT will play a supportive, yet not a central role. In other cases, the transformation may be driven by business issues where instead IT may take on a central role in identifying digital technologies that adequately solves the issue. Due to the varying standpoints by researchers and backed by the findings by Hess et al. (2016), this study adopts the standpoint that a strategy for DT must exist, yet, whether it comes in the form of a DBS or DTS, i.e. if it is implemented in the current IT-strategy or is separated is left neutral.

2.5.3. Organizational structure

A supportive organizational structure is a necessity to pursue a new strategy and its activities. In many cases this requires structural changes of an organization to create a foundation for the new operations that digital technologies may give rise to (Hess et al., 2016). According to Matt et al., (2015), structural changes are referred to as variations in an organization's setup, which predominantly are manifested through the placement of new digital activities within the organization. Literature stresses the question of whether to integrate the activities within the existing structure or separate the activities into an own unit or subsidiary within the firm (Matt et al., 2015; Hess et al., 2016; Vial, 2021).

Hess et al., (2016) argue that the question of integrating or separating new digital activities is dependent on the distance between a firm's core activities and DT activities, where larger distance calls for a stronger boundary between new and old operations. Accordingly, for gradual business-transformations with distinctive synergies, an integration approach is preferred. In context, this implies that a firm in the IT-sector would benefit more from integrating DT activities than a firm in the construction sector due to the industry's nature and core activities. However, as DT efforts often involve change and innovation characterized by high levels of uncertainty and risk taking, it may be difficult to accommodate such activities into current structure (Hess et al, 2016). Matt et al., (2015) highlights the importance of assessing whether it is mainly products, processes or skills that are affected by the changes created by digital technologies. If the impact is considered limited, it may be better to integrate these activities in the current structure, whereas more substantial changes may

require a subsidiary within the firm. This is in line with Vial (2021), who also highlights the possibility of creating a unit separated from the core organization to achieve the objectives formulated by the digital strategy. A separate unit is allowed to operate with a higher degree of interdependence than an integrated unit, and is left with more flexibility while still having access to existing resources. Separating a business unit to deal with new activities also enables firms to handle the challenge of ambidexterity i.e combine exploration of new digital innovations while exploiting existing resources (Vial, 2021).

Another highly desirable element when approaching DT is the notion of cross-functional collaboration (Vial, 2021). Mirković, V., Lukić, J., Lazarević, S., & Vojinović, Ž. (2019) also argues that collaboration and speed are key factors in the context of DT, which are achieved through a reduced number of hierarchical levels, decentralization of decision making and greater collaboration among employees. The unfulfilling, often caused by unpreparedness, of the aforementioned cross-functional elements represent one of the major barriers for firms to evolve in the context of DT. Structures characterized by rigidity, silo structures, formalizations and rules are more probable to display slow development or even failure in contrast to an organization encompassing cross-functional collaboration (Mirković et al., 2019). Effective structures are expressed as being more flattened, decentralized, collaborative, flexible and knowledge transferable. Mirković et al. (2019) present in his study regarding key characteristics four organizational structures that support a DT, see figure 6.

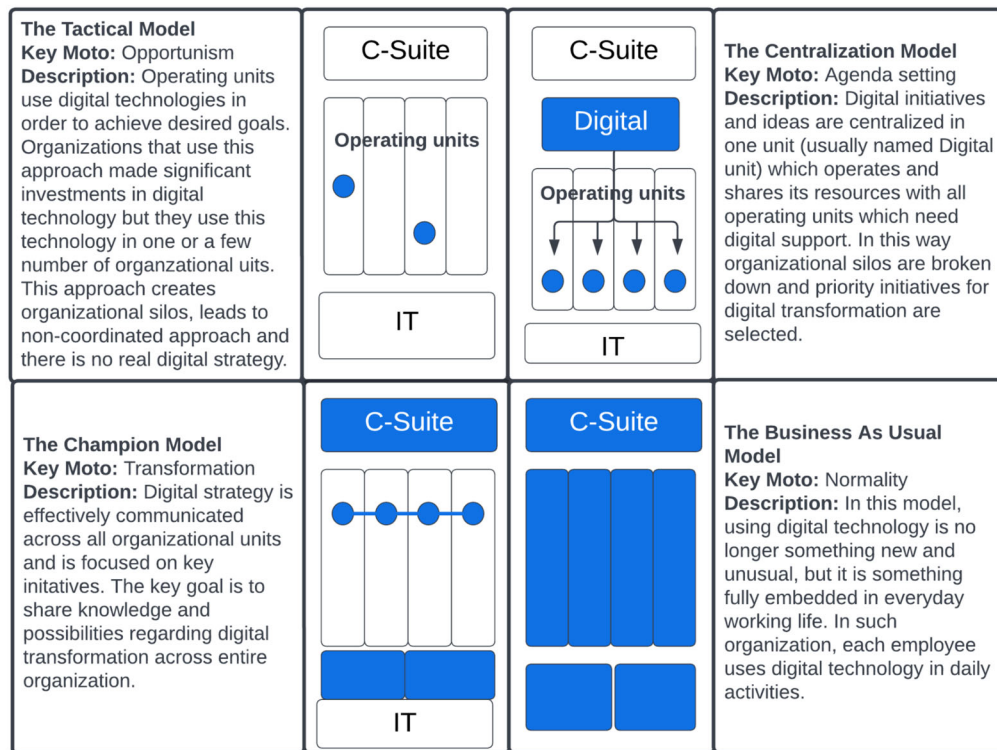


Figure 7: Four organizational structures that support DT designed by Mirković et al. (2019), illustrated by the authors.

The different models are dependent on a company's digital maturity. Chanias and Hess (2016), define digital maturity as “the status of a company's digital transformation”. The tactical model, which can be seen as an organization in the early phases of DT, uses digital technologies in a single unit in order to achieve the unit's objectives. In the centralization model, digital strategies are managed at the corporate level and central teams are established to work with the implementation through different business units. The Champion model is characterized by business units with their own strategies, budgets and teams focusing on knowledge sharing and learning regarding DT across the organization. The business as usual model has digital technologies embedded in all activities where the entire organization encompasses a digital culture, which can be seen as an organization that has achieved a DT. (Mirković et al. 2019)

In order for firms to determine which model to use, Mirković et al. (2019) presents two essential questions to guide managers:

- What are the key goals of digital transformation?
- What is the current level of digital maturity?

Whereas identifying the key goals is a relatively straightforward process, assessing a firm's level of digital maturity requires more attention.

2.5.4 Digital maturity

The notion of digital maturity is closely related to DT and sometimes even used interchangeably without considering the differences (Teichert, R. 2019). Digital maturity can be seen as a holistic concept describing how companies are currently organizing themselves to transform digitally. It is a tool that allows for assessing where a firm is located on their DT journey and creates insights on future direction and areas of improvement (Teichert, R. 2019; Becker, J., Knackstedt, R., & Pöppelbuß, J. 2009). The different organizational structures suggested by Mirković et al. (2019) in chapter 3.5.3. are examples of decisions that can be guided by insights from a digital maturity assessment. To create a practical usage, the holistic concept is often broken down into subcategories, where the maturity of each subcategory determines the holistic level of digital maturity (Teichert, R. 2019). There are a number of maturity models available with different sub-categories, yet, there is a high recurrence of the categories of *technology*, *digital strategy*, *digital culture*, and *leadership* (Teichert, R. 2019). Comparing the aforementioned constituents of digital maturity to the framework by Vial, G (2021), there is a high resemblance between the building blocks of DT and subcategories of digital maturity. As the building blocks of DT according to Vial, G (2021) are what enables DTon, it is natural for firms with a higher level of digital maturity to enjoy higher benefits from DT. This is backed by Brown and Brown (2019), Kane et al, (2015) Teichert, R. (2019) who all coherently argue that higher maturity is leading to an increased premium from DT. Practical differences between a firm with higher and lower digital maturity is often displayed

in the occurrence of a digital strategy, where digitally mature firms are five times as likely to have an established digital strategy compared to companies in the early phases (Kane et al. 2015). Similarly, whereas digital mature firms focus on business transformations, less mature firms tend to focus on specific operational technologies (Brown and Brown, 2019). Firms with a higher digital maturity are also more likely to have a dedicated person or team leading DTons initiatives as well as a culture more susceptible to risk taking and collaboration (Brown and Brown, 2019).

In the literature review by Teichert, R. (2019), 15 different areas of digital maturity could be identified from 22 different digital maturity models. As the models are *different*, they do not include identical sets of areas, although some areas are more recurring than others. There is no archetype or dominant design for digital maturity models, instead the areas of assessment are often based on the characteristics of the sector. For example, a digital maturity model for a company in the retail sector is probable to address customer insight and experience to a larger extent than a company in the pharmaceutical industry (Teichert, R. 2019)

As for this study, the areas of assessment within the digital maturity model are designed after the framework by Vial, G (2021) as the building blocks in the framework show high coherence with areas of high occurrence in digital maturity models. The assessment will by no means result in a definite answer regarding the holistic concept of digital maturity as it will not appraise all possible areas. Yet, it will provide an understanding for the chosen areas which are deemed as central for a general assessment. Normally, an assessment of digital maturity is done to discover weaker areas and to create actions to strengthen these areas. In this study, the step of creating an action plan to mend weak areas is left out.

The digital maturity assessment model presented in exhibit x is built upon the work of Kane et al. (2015) and Kane et al. (2017).

D1: Strategy	The consciousness for the digital transformation must be embedded in the company DBS
D2 :Leadership	The transformation needs digital leadership and should not be outsourced
D3: Products	Digitalization leads to new products and services with benefits for customers and new fields of business
D4: Operations	The digitalization of the core processes has to be forced by a new operating model which increases the agility inside the organization
D5: Culture	A change of culture inside the company is necessary which leads to an open innovation culture
D6: People	Digitalization needs experts and digital qualification for the non-experts
D7: Governance	Digital business strategy must become part of the objective agreement
D8: Technology	Replacement of older IT-structures is necessary

Table 3: Eight elements of digital maturity designed by Brown & Brown (2019), illustrated by the authors

2.5.5 Culture

To cope with the disruptive force caused by new digital technologies, firms have to change their organizational culture, as culture plays a role in encouraging employees to adopt new activities (Çetin Gürkan, & Çiftci, 2020; Vial, 2021). Schwertner (2017) depicts employee resistance as a common barrier to change within organizations, and it has direct implications on DT. Similarly, Hartl (2019) argues that cultural change has been essential for many successful business transformations, and a critical success factor of DT efforts. Hemerling, J., Kilmann, J., Danoesastro, M., Stutts, L., & Ahern, C. (2018) present in their study of 40 DTs that assessing culture explicitly may grant an increase of success by over 500% compared to when culture is neglected. Creating a digital culture that supports change, thus enabling the overall strategy of a company, is oftentimes challenging, yet highly important (Jacobi and Brenner, 2017).

As DT are characterized by a high level of uncertainty, Vial, (2021), Kane et al (2015) Jacobi and Brenner (2017) coherently argue that risk taking, experimenting and responsiveness to new ideas should be encouraged by the organization. In line with this, the organization should emulate a startup behavior where activities involving new digital technologies are to be tested on a minor scale where successful approaches are to be scaled up and integrated in the whole organization (Vial, 2021; Correania et al. 2020). To aid the creation of a digital culture, Jacobi and Brenner (2017) propose that firms ought to invest in their employees through digital training and education. To allow for the desired return on investment, i.e. knowledge creation, the leaders and top management must provide adequate incentives. Kane et al. (2015) similarly argues that a digital culture is often initiated by a top-down approach with a defined vision and articulated outcomes which shed further light on the importance of leadership in undertaking a DT. Whereas training of the current workforce is highly important, Jacobi and Brenner (2017) continues to argue for the need to be able to attract young talents with desired competencies. With DT hitting all industries and sectors simultaneously, although with different intensity, these talents are highly coveted. Returning to the characteristics of the desired culture, Hartl & Hess (2017) identified in their delphi study with a panel of 25 industry experts and researchers, a combination of organizational values that fosters innovation and concerns for people as ideal for DT. The values were ranked according to the panelists choice of selection, see table 4. It is important to understand that digital technologies are continuously developed, thus continuously disrupting organizations and industries. In this context, Vial (2021) and Hartl (2019) coherently argue that firms should create an adaptive culture aiming at constant learning to be able to undergo changes required by future disruptions.

Organizational Value	Rank		
Openness towards change: the organization's openness towards new ideas and its readiness to accept, implement and promote change	1	Entrepreneurship: the organization's intention to promote the empowerment of its members to act proactively and independently, and take responsibility	7
Customer centricity: the organization's orientation of all activities to meet customer needs: products and processes are designed with focus on customer needs and continuously adapted to changes thereof	1	Tolerance towards failure: the organization's tolerant attitude towards reasonable mistakes and support of learning from failure	8
Innovation: the organization's pursuit of improvement and growth through the development of innovations	3	Communication: the organization's intention to build internal and external networks for knowledge and information sharing	9
Agility: the organization's willingness to work, act and re-structure and be flexible and adaptable in order to react to change	4	Risk affinity: the organization's willingness to take risks and make decisions under uncertainty	10
Willingness to learn: the organization's pursuit of continuous advancement through the acquisition of new skills and knowledge	5	Participation: the organization's support of open, non-hierarchical discussion and democratization of decision processes	11
Trust: refers to the mutual trust between the organization, its leadership and members, as well as the organization's trust in its external partners	6	Cooperation: the organization's positive stance towards teamwork, cross functional collaboration, and readiness for cooperation with external partners (e.g. customers)	12

Table 4: Organizational values designed by Hartl & Hess (2017), illustrated by the authors

2.5.6 Leadership

According to McKinsey (2018), less than 30% of all DT's succeed. Kane (2017) argues that the transformations are destined to fail due to their magnitude without substantial support from the organization's leadership. McCarthy, Sammon, & Alhassan (2021) coherently argues that one of the most critical reasons for failure is deficiencies in top management and leadership. Jacobi and Brenner (2017) claim that leadership is the foundation that ought to drive DT. The importance of leadership in the context of DT is well recognized in the literature as well as in practice. Hartl (2019) stated in his multiple case study of 11 firms on culture and leadership in the context of DT: "*Change has to begin with top management – they need to be role models and enablers*". In practice, this has resulted in the initiation of new executive roles such as the Chief Digital Officer (CDO). The role has gained increased foothold in organizations to bring clarity and strength to the leadership of the transformation process (Vial, 2021; McCarthy et al., 2021).

In the review of 12 studies regarding digital leadership, Promsri (2019) presents specific characteristics that digital leaders should possess to successfully pursue a DT.

- Digital knowledge and literacy
- Vision
- Understanding of customer

- Agility
- Risk taking combat
- Collaboration

Jacobi and Brenner (2017) similarly claims that organizational commitment is a crucial attribute for leaders to possess which oftentimes is achieved and manifested through the promotion of digital initiatives. Leaders are likely to be presented with a number of digital initiatives, all of varying importance to the individual firm. To be able to assess what initiatives to support, a clear digital vision must exist that in turn is both integrated and aligned with the overall company strategy. They continue to argue, in coherence with Promsri (2019), that the leaders should possess adequate knowledge about DT as well as the courage to initiate and drive change and combat resistance. The executives must communicate a clear vision throughout the whole company, starting from the top yet covering all hierarchical levels. To effectively disseminate the vision also in the operational levels, lower level managers must also share and advocate the vision. Fitzgerald, Kruschwitz, Bonnet & Welch (2013) display lack of sense of urgency by leaders as a major reason for failed DT initiatives where the unresponsiveness often result in clouded visions and insufficient road maps for DT.

3.5.7 Employee roles and skills

The aforementioned changes in structure and culture will require employees to adopt roles traditionally not within their functions. Whereas recruiting talents and necessary competencies are crucial, companies can not rely merely on attracting new employees but must also train and educate their existing workforce (Vial, G. 2017). Especially highlighted in literature is how DT forces employees outside of the IT-function, which traditionally have the responsibility for technology-intensive projects, to become active leaders of digital projects. Hess (2016) argues that managers must carefully monitor and evaluate the digital capabilities within the organization and identify what competencies that are needed. To evaluate the competencies, Colbert, Yee and George (2016) suggest that the notion of digital fluency is the most notable competence due to its comprehensive impact. Being digitally fluent goes beyond that of being proficient in a software or program and instead refers to the status of competence that allows for constructing ideas from information to achieve strategic goals with the help of technology. They continue to explain that digital natives, i.e. younger generations that have been surrounded by digital technology for the majority of their lives, oftentimes are digitally fluent by nature. Yet, using generation as a determinant is displayed as naive as it is the exploitation of technology that fosters digital fluency, hence people of all ages can be digitally fluent or can be trained through exposure. In this context, Jacobi and Brenner (2017) claim that in most enterprises there is a wide demographic mixture, i.e. a mixture of people in the beginning of their careers and experienced employees.

2.8 Success factors

To synthesize the information regarding success factors of DT within the aforementioned areas, table 5 was created from the findings of Osmundsen, K., Iden, J., & Bygstad, B. (2018), Kraus, S., Jones, P., Kailer, N., Weinmann, A., Chaparro-Banegas, N., Roig-Tierno, N. (2021) and Jacobi, R., & Brenner, E. (2018). The table describes *success factors*, defined as vital capabilities and resources for managing and realizing DT. The exclusive fulfillment of success factors in table 5 are not mandatory to achieve a successful DT, yet, each and every factor has been proven to have a *linkage* to a successful DT. Hence, whereas unfulfillment of a particular factor may not necessarily act as a barrier in each and every context, it enlightens a possible barrier in a systematic way which allows for future assessment and actions.

<i>Success factors</i>	
<p>General</p> <ul style="list-style-type: none"> • Engage managers and employees • Align business and information systems • Reallocation of IT resources, technology, and infrastructures • Creation of human and digital networks • Adaptation to changes in product value propositions <p>Leadership</p> <ul style="list-style-type: none"> • Install credible digital leadership throughout the organization • Well-managed transformation activities • Modifying the decision-making process according to the DT strategy • Create a digital vision & mission • Develop a digital business strategy • Anchor digital transformation at board level <p>Organizational structure</p> <ul style="list-style-type: none"> • A supportive organizational structure • A structure encouraging collaboration • Flattened, decentralized, flexible and knowledge transferable 	<p>Culture</p> <ul style="list-style-type: none"> • A supportive organizational culture • Clearly-defined organizational norms and values • Establish a culture of open-mindedness and risk-taking • Become attractive to new talent • Make cross-functional teams the norm • Build strong partnerships with outsiders <p>Employee skills and roles</p> <ul style="list-style-type: none"> • Leverage external and internal knowledge • Grow Information Systems capabilities • Develop dynamic capabilities • Inform the entire organization about the DT strategy • Co-creation of value among people, organizations and sectors • Build a digital-savvy management layer • Integration of IT competences • Challenge and support existing workforce <p>Strategy</p> <ul style="list-style-type: none"> • Possess a digital strategy (DT)

Table 5: Success factors of DT based on the findings of Osmundsen, K., Iden, J., & Bygstad, B. (2018), Kraus, S., Jones, P., Kailer, N., Weinmann, A., Chaparro-Banegas, N., Roig-Tierno, N. (2021) and Jacobi, R., & Brenner, E. (2018), designed by the authors.

3. Approach and methodology

This section describes the methodology used to conduct this thesis. The section is structured by an explanation of the chosen research approach, followed by the research design including a pre-study, its steps and findings. Further presented is the data collection including semi structured interviews and self completion questionnaires.

3.1 Research approach

The approach of this study is of exploratory nature. According to Saunders et al. (2016), the purpose of exploratory research is to explore current conditions within a specific field. This fits the purpose of this study as the authors seek to assess the digital maturity level of the Swedish real estate sector followed by an analysis of sector specific barriers to DT. There are three principle ways of conducting exploratory research; literature review, interviewing subject experts and conducting focus groups interviews, where this study will focus on the first two as means of collecting information and data (Saunders et al., 2016). Experts from companies within the Swedish real estate sector were selected as interviewees as they are the ones possessing the most understanding of the sector and how it operates.

Due to the nature of the explorative research questions the authors have chosen to apply a qualitative research method, since this method, through its epistemological position, emphasizes the way in which individuals interpret their social world which allows concepts and experiences to be detailed explored (Bryman & Bell, 2011). Bryman & Bell (2011) further argue that a qualitative approach is favorable when the research question is of exploratory characteristic, which validates the choice of approach. As earlier mentioned, existing literature regarding DT is often general and left without a context. When contextualizing existing literature, there are evident deficiencies regarding the topic of barriers to DT. As of this, the topic is deemed relatively unexplored, especially in the context of real estate, which motivates a qualitative approach since this method can give a deeper understanding of the matter (Saunders et al. 2016). In addition, qualitative research differs from quantitative research in their way of threatening theories. While qualitative research is commonly concerned with generating new theories, quantitative research focuses on testing existing theories. Thus, a qualitative research method is in line with this thesis as the authors aim to, in detail, understand the barriers to DT in the Swedish real estate sector, where existing theories are generalized rather than specified. (Bryman & Bell, 2011).

3.1.1 Research design

An abductive approach was applied to this exploratory qualitative study. According to Dubois & Gadde (2014), an abductive approach is fruitful when the researcher's objective is to discover new things or relationships, which fits the purpose of this thesis. In addition, by applying an abductive approach the authors are able to move between empirical observations and theory to expand the understanding of both phenomena. This iterative process of an

abductive approach creates a good fit to this study, where interviews and literature was used and compared in an non-linear manner (Dubois & Gadde, 2014).

The execution of the study consisted of six phases. The first phase was that of a pre-study which consisted of an extensive literature study together with interviews with Swedish real estate companies as a means to create knowledge and identify challenges. The pre-study allowed the authors to delimit the thesis and specify the scope of research which ultimately resulted in the formulation of the research questions. With the research questions set, the authors moved on to design the approach and method to allow for a reliable data collection. With the method clearly defined, the next phase consisted of acquiring data according to the chosen method. When the data collection was complete, the authors moved on to analyze the data and compare the empirical findings with theory. Last, the findings were concluded to answer the research questions and recommendations for use of research as well as future research were stated. The process was by no means linear, instead it was highly iterative as enabled by the abductive research approach.

Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Pre-study	Purpose & question	Method	Data collection	Data analysis	Conclusions
<ul style="list-style-type: none"> • Identify challenges & opportunities • Literature study • Seminar and interviews 	<ul style="list-style-type: none"> • Define the scope • Define the purpose • Design research questions 	<ul style="list-style-type: none"> • Approach • Sampling method • Data collection method 	<ul style="list-style-type: none"> • Interviews • Questionnaire/s 	<ul style="list-style-type: none"> • Analysis of data • Compare with theory 	<ul style="list-style-type: none"> • Answer the research questions • Implications and recommendations

Table 2: An overview of the methodology process, designed by the authors

3.2 Pre-study

This study began with an extensive pre-study to gain a better understanding of the Swedish real estate industry. The following section describes the steps and the methods used during the pre-study phase including a literature study, interviews and seminars, sampling method, interview structure and data analysis. Lastly presented is the pre-study findings.

3.2.1 Literature Study

The topic of DT is highly relevant in the contemporary world of business in general and the real estate sector specifically. The real estate sector's conservativeness with regards to DT was the original prospect and "problem" for the area of study. Following this elementary insight, an initial review of existing literature was conducted with a two-fold purpose, first to collect information and get an understanding of the main theoretical area of this study - DT. Second, to narrow the scope and help formulate research questions as per the recommendations of Bryman, A. & Bell, E. s. 80 (2011). The main search terms are listed below:

- Digitization
- Digitalization
- Digital transformation
- Digital revolution
- Digital disruption

The sources examined in the pre-study were of three types: scientific sources, professional sources and media outlets. When the search was conducted, boolean operators were used to focus the search due to the need for multiple search terms as per the recommendations of MITLibrary (n.d.). When searching for scientific reports and articles, the search engines Google Scholar, Journal Citation Report and Scopus were used. Regarding professional sources, Google was the preferred search engine to obtain more general information from annual company reports, company brochures, homepages and newsletters. The aforementioned method was also used to obtain information from media outlets. When browsing for scientific literature, the process of determining relevance consisted of reading the abstract or equivalent of each work and evaluating with regards to the research topic of this study. Literature that had the *possibility* to provide useful information was stored in the software Mendeley Reference Manager for a second review whereas the rest were rejected. To minimize the risk of missing out on useful literature, the first screening round was allowed to be very inclusive, hence the emphasis on possibility. All sources were evaluated with regards to reliability. The general reliability of different sources were evaluated according to the recommendations of Nadal, J. O. (2018), where different kinds of sources, e.g. scientific books and media outlets, were graded differently due to their origin. The general reliability for e.g. media outlets were considered lower than that of scientific books, which implied that a more careful selection process needed to be utilized as well as the conclusions drawn from such sources. The inclusion of non-scientific sources in the pre-study was primarily to increase the authors general understanding for DT and was predominantly left out as sources of references. As the used professional sources are not necessarily scientifically reviewed, the extra consideration was taken in the form of reviewing the authority of the author and publisher as per the recommendations of Alexanderson, K. (2012). Furthermore, the amount of citations, in addition to the reputation of the publisher/-s, were used as a determinant for the level of reliability.

In the second round of screening, the goal was to identify key articles and applicable frameworks. In this phase, the collected literature was reviewed thoroughly and clustered. Categorizing literature according to their niches in the software program Mendeley Reference helped organize the literature and make it manageable which resulted in the identification of key frameworks and several key supporting articles.

3.2.2 Interviews & Seminars

Before the second phase of literature screening, a series of 5 semi-structured interviews were held, out of which four were with Swedish real estate companies and one with a company in the PropTech sector. The uneven representation of real-estate companies and companies in the PropTech sector is a result of the participation in a webinar held by the organization *PropTech Sweden* where the authors got the opportunity to talk to several companies in the PropTech sector individually. After involving the proptech sector, the authors came to the conclusion that the proptech sector does indeed have a role in the digital transformation of the Swedish real estate sector, yet they can not affect the digital maturity nor the organizational barriers within the real estate sector. Hence, the proptech sector was left out. The interviews were part of the pre-study with a two-fold purpose. First, to establish contact with companies and determine the level of accessible data, and second, to collect insights and first hand information from the two sectors in the form of what they have been doing, currently are doing, and what they are planning to do in the future with regards to DT.

3.2.3. Sampling

Naturally, the authors were unable to collect data from all actors within the Swedish real estate sector, hence the need for a sampling strategy. The sampling methods chosen for this study was a mix between convenience sampling and judgment sampling, the latter also known as purposeful sampling. Judgment- and convenience samples are non-probability methods suitable for qualitative studies, hence suitable for this study (Taherdoost, 2016; Bryman & Bell, 2011). Probability sampling refers to randomly selected units of analysis as opposed to non-probability sampling that allow for an uneven distribution of probability of selection. According to Marshall (1996), there are a number of factors to why probability sampling methods are not appropriate for this study due to its qualitative nature. In order to be able to conduct a random sample, the characteristics of the whole population i.e all actors in the Swedish real estate market should be known, something that may not be impossible yet highly resource draining. Nevertheless, the general characteristics of the real estate industry were mapped with regards to turnover where larger actors were found more invested in DT. This led to the assumption that targeting larger actors would allow for not only richer data but also data representing the forefront of what is happening in the Swedish real estate sector. Selecting participants out of criterion that warrants inclusion is according Taherdoost (2016) the method of judgment sampling and was accordingly used to delimit the target population to the top 25 Swedish real-estate companies with regards to turnover. The 25 companies were

contacted via identical emails containing a short presentation of the aim of the study together with a question of whether they were interested to participate. Out of the sample, 7 companies expressed their interest in participating in the study. Interestingly, out of the 25 contacted companies, the absolute majority who showed interest in participating were placed in the top half with regards to turnover which strengthened the initial assumption of larger actors being more interested in DT. The interested companies were enlisted whereas the rest were rejected, hence the method of convenience sampling was used which according to Marshall (1996) refers to when the researchers select units based on accessibility.

3.2.4 Interview structure

The rationale for conducting semi-structured interviews rather than structured or unstructured interviews was based on the nature of the desired data. The sought after data in the pre-study were not strictly defined, instead the goal was to allow the interviewee to elaborate on their situation and present state of DT to guide the research focus. These objectives match the ones of semi-structured methods according to Denscombe, M. (2010) who claim that semi-structured interviews allow for exploration of a complex phenomena through insights of the interviewee's feelings, experiences and opinions. Whereas the partly open nature of the method allows for elaboration which was desirable, it also created excessive data outside of the scope. This became evident when the interviews were transcribed and analyzed and could possibly be lowered if the interviewees had been sent the interview template, containing a clear list of issues to address, ahead of the actual interview to enable better preparation.

3.2.5 Data analysis

The data analysis was carried out in parallel to the interviews, allowing the researchers to continuously learn and gather new insights. To get an overview and make the data codeable, all interviews were manually transcribed. Coding in its most simple form is the process of labeling data according to its meaning and can be done through the use of e.g. colors or phrases that attribute for a segment of data (Linneberg, M. S., & Korsgaard, S. 2019). In this study, summative phrases were used to segment the data into clusters and consequently inserted into a table for cross-analysis.

3.2.6 Pre-study findings

The information gathered from the webinar, interviews and literature review shed light on several deficiencies in the current base of knowledge and issues in the world of practice which laid the foundation for the research questions. The literature review on DT resulted in the identification of an inductive framework by Vial, G. (2021), figure 8, summarizing the current knowledge on DT and displaying the relationships of the constituents of DT. To gain more information about the building blocks presented by Vial, G. (2021), yet another literature study was initiated only to soon be disbanded. The study by Vial, G. (2021) is a literature review which implies that the building blocks in the framework, e.g. *strategic responses* or *organizational barriers*, are thoroughly anchored in state of the art literature and

a secondary review on these subjects did not result in any major findings that was not already included in the review by Vial, G. (2021) nor the one of this study.

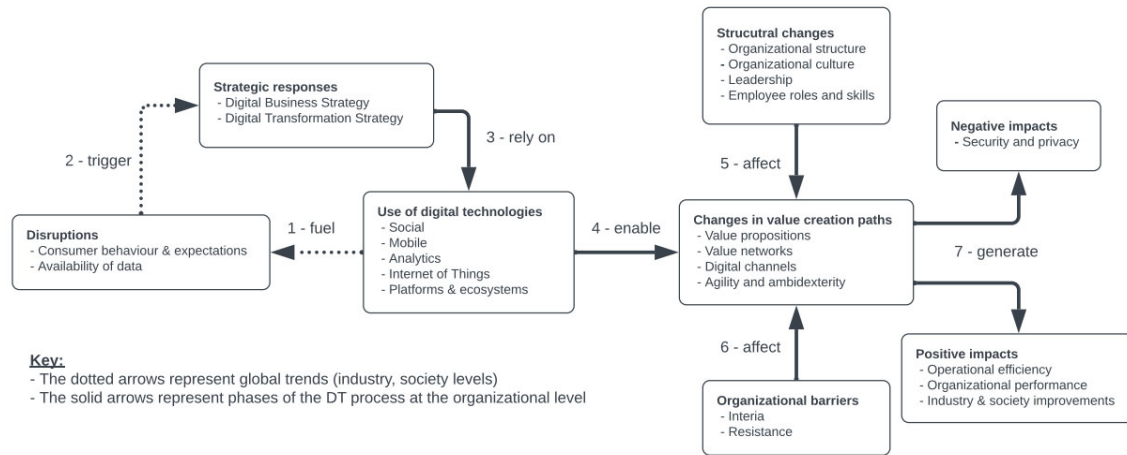


Figure 8: Digital transformation framework designed by Vial, G. (2021), illustrated by the authors

3.3 Data Collection

The data collection methods of this study can be divided in two categories; semi-structured interviews and self completion questionnaires. The methods chosen are a result of the study's explorative purpose as well as the chosen qualitative approach.

3.3.1 Overview of participants

The participants were, as mentioned earlier, collected through a mix of convenience sampling and judgment sampling. This resulted in 7 companies willing to participate in this thesis. The companies are all part of the top 25 Swedish real estate companies with regards to turnover.

Furthermore, the interviewees from each company were not selected by title as some companies showed to not have an CDO and digital initiatives were driven by different departments between the companies. As of this, the interviewees were selected after discussion with each participating company. This resulted in interviewees with different titles. However, they were viewed by each company as the ones with most knowledge in the area of DT, thus most prone to participate in this thesis.

3.3.2 Self-questionnaires

As the first question outlines, the level of digital maturity ought to be addressed. Digital maturity is a well known concept that both researchers and companies use to evaluate current endeavors. With digital maturity being an acknowledged tool, different measurement models

have been developed. The majority of models of said assessment are based on self-questionnaires including questions regarding the fundamentals of digital maturity. This study used self-questionnaires as means of data collection where questions were designed by following the work by Kane et al., (2016). However, as this study follows the framework by Vial, (2021), some questions were redesigned or deleted to fit the building blocks presented by Vial, (2021). The self-questionnaires were sent via email to the companies that during the pre-study either had participated or expressed their willingness to participate.

The self-questionnaires were created in Google form as it provides a great summarized overview of all answers. In addition, in order to increase the number of respondents the form should not be too extensive nor too complicated (Bryman and Bell, 2011). As of this, the number of questions was restricted, where the first ones were easy and quick to answer. By testing the self-questionnaire the authors could measure the time to execute the questionnaire, which proved to be around 15 minutes. The amount of text was also limited as longer questions can be perceived as more complicated and exhausting to answer. The form was reviewed by the supervisor and several times by the authors to assure the quality of the questions and that no unnecessary text was included.

Answers from the self-questionnaires were also used to guide the direction of where to start the semi-structured interviews.

3.3.3 Semi-structured interviews

Due to the qualitative research approach, semi-structured interviews were used to create a deeper understanding of specific barriers hindering the development of DT in the Swedish real estate sector. According to Bryman and Bell (2011), semi-structured interviews are a suitable method to collect data for qualitative studies where rich answers is preferred over quick and less detailed ones. A semi-structured interview usually consists of a list with predefined topics that are to be covered during the interview. In the case of this study, the predefined topics followed the building blocks in the framework by Vial (2021);

- Use of digital technologies
- Disruptions
- Strategic responses
- Structural changes
- Leadership
- Employee skills and roles

Each building block also had predefined subcategories to be covered during the interview. The topics and the predefined questions are used to guide rather than lead the interview. This leaves the interviewees with more room to freely answer the question but also enables the interviewers to guide the discussion to cover desirable subjects. In addition, the order of the question is not always following the interview template, instead it's more flexible and the

template is used when necessary. This approach is suitable for this study as the barriers to DT is a novel concept and in the context and endeavors of the Swedish real estate sector remain rather unexplored.

The interviews were conducted both face-to-face and through virtual video streamed meetings in Microsoft Teams. The author's intention was to have all interviews face-to-face as it allows for personal engagement and more nuanced discussions (Bell et al, 2019). However, Microsoft Teams were used when preferred by respondents due to geographical position, time or just preferences. In addition, Microsoft teams to some extent facilitated observations of the interviewees, thus allowing for some visual engagement.

The companies and employees that participated during the self-questionnaires were also asked to participate in the semi-structured interviews. The requests for participation were sent via email, together with the self-questionnaires. After respondents expressed their willingness to participate together with preferred time and date an email including an invitation was sent out to confirm and assure their participation. The respondents were also informed that the interviews were to cover subjects from the self-questionnaires which gave them time to prepare, thus enabling more detailed answers. In addition, each and every interview was recorded when permission was given by the respondent. This enabled the authors to replay the interviews, thus securing exact data.

Both authors were present during each, except one, interview. According to Bryman and Bell (2019), there are many advantages of being multiple interviewers as it enables one to take extensive notes and intervene when further explanation is required. Multiple interviewers also have the advantages of contributing to greater discussions where richer and more detailed answers can be reached. In this study, each author was assigned a specific role. One was responsible for leading the interview while the other took a more passive role responsible for taking notes and asking followup questions. As recommended by Bryamn and Bell (2019), each interview was conducted in a quiet and calm atmosphere which reduced the risk of interruptions.

Information regarding the interviews are summarized in table 7.

Company	Person	Date	Time
Company 1	Interviewee A	26/4	15:00 - 15:39
Company 1	Interviewee A	24/2	13:00-13:42
Company 2	Interviewee B	27/4	09:30 - 10:03
Company 2	Interviewee B	25/2	10:30-11:00

Company 3	Interviewee C	27/4	14:00 - 14:43
Company 3	Interviewee D	29/4	13:30 - 14:18
Company 4	Interviewee E	22/4	10:00 - 10:45
Company 5	Interviewee F	6/5	10:30 - 11:17
Company 6	Interviewee G	16/2	13:30 - 14:07
Company 7	Interviewee H	2/5	13:00 - 13:44
Company 7	Interviewee H	3/3	10:00-10:30

Table 7: List of interviews, date and time

3.4 Data Analysis

The semi-structured interviews were all conducted in Swedish as it was the preferred language of the respondent, thus the interviews were transcribed in Swedish shortly after the interview was held. According to Bryman and Bell (2011), transcribing interviews is time consuming, yet highly important. As of this, extensive resources were dedicated to transcribing interviews to assure an as good quality as possible. The self-questionnaires were, as mentioned earlier, automatically summarized in Google form. When all interviews were transcribed and reviewed, the initial analysis was conducted. According to Bell et al (2019), data analysis is a critical part of qualitative studies where the choice of analyzing method can impact the level of quality, validity, reliability and replicability. Furthermore, many authors end up describing the data rather than analyzing it, which is a common mistake (Bell et al, 2019). The authors of this thesis have chosen to apply a thematic analysis and follow restrictions to avoid such mistakes.

3.4.1 Thematic Analysis

A thematic analysis is a systematic approach of generating codes and themes for qualitative data, thus a suitable approach for this study (Bryman and Bell 2011). In addition, a thematic analysis can be used to identify patterns across data in relation to participants' experiences, perspectives and behaviors, which further validates the choice of approach as the authors seek to understand sector specific barriers to DT in the Swedish real estate sector rather than in a company alone (Victoria Clarke & Virginia Braun, 2016). The first step in the thematic analysis was, as described above, to transcribe and review the interviews. As the data was collected according to the building blocks of DT suggested by Vial (2021), a first level coding, i.e. labeling data according to category was unnecessary as the data was already organized according to the aforementioned building blocks. However, a form of second level

coding was conducted through comparing the data within each building block and selecting meaningful quotes based on similarities as well as differences.

3.4 Validity and Reliability / Research quality

The quality of qualitative research is usually dependent on its validity and reliability (Bell et al 2019). According to Bryman and Bell (2011), reliability is referred to as whether or not the measures that are applied to a concept are consistent whereas validity is referred to as whether a tool or a test is measuring what it is supposed to do i.e its accuracy. Both validity and reliability are important concepts to assess the quality of research and to increase its trustworthiness. According to Bell et al(2019), trustworthiness are made up by four criteria:

- *credibility*, which parallels internal validity;
- *transferability*, which parallels external validity;
- *dependability*, which parallels reliability;
- *confirmability*, which parallels objectivity.

Credibility is, according to Bell et al (2019), whether or not the members of the research community confirms what has been written in the study. This has been ensured in this study by both authors attending each interview. All transcribed and recorded interviews were also reviewed by both authors to ensure a shared understanding and perspective. This allowed for discussions as different opinions emerged.

According to Bell et al (2019), transferability is referred to as whether the result from a study can be transferred and applied to more than the original context. Achieving transferability in qualitative studies comes with some complexity as it often entails study of a small group of people or individuals that share the same characteristics. However, as argued by Bell et al (2019), providing a rich and detailed description of the circumstances under which the research was conducted increases the transferability since the result might be dependent on the investigated environment. To strengthen the transferability of this study the authors have provided an as detailed description as possible of how, where and with whom the study was conducted.

Dependability, which parallels reliability, entails the degree to which the results of the study can be replicated (Bell et al. , 2019). To strengthen the dependability of this study, as per the recommendation by Bell et al., (2019), auditing and peer review has been applied. As of this, all phases of the research process, including findings and data analysis, have been presented, stored and visualized in an accessible manner. To further strengthen the dependability, the research has continuously throughout the process been reviewed by the supervisor of this thesis. In addition, at the end of the research the thesis was peer reviewed by two other

groups at the university, also conducting a master thesis, thus the research has been audited from several angles.

Confirmability ensures that the research has not been influenced by the author's personal values nor theoretical inclinations (Bell et al., 2019). The authors have had this in mind while executing the study, thus striving to be as objective as possible. In addition, the peer reviews described above, has contributed to strengthening the confirmability of this study's results.

3.5 Research ethics

According to Bryman and Bell (2011), there are four main areas of ethics that have to be considered in order to conduct ethically correct research;

- whether there is *harm to participants*;
- whether there is a *lack of informed consent*;
- whether there is an *invasion of privacy*;
- whether *deception* is involved.

The authors of this thesis have followed the recommendations by Bryman and Bell (2011) to ensure avoidance from these areas.

First, all participants, both of the semi-structured interviews and the self-questionnaires, have been well informed, through email and face-to-face, that the authors of this study are students at Chalmers University of Technology conducting a master thesis within the Swedish real estate sector. To ensure prevention of invasion of privacy and potential harm, the participants will be treated anonymously. In addition, interviews were recorded only when permission was given by the respondent.

Furthermore, the authors also let each respondent that expressed their willingness to participate propose a suitable time, date and place of the interview. By doing so, the authors not only increased the chance of participation but also reduced the risk of creating stress or pressure i.e potential harm (Bryman and Bell, 2011).

Throughout the research the authors were transparent about the thesis, the purpose and the objectives, thus avoiding lack of informed consent. As mentioned, all participants were informed that authors were students at Chalmers University of technology conducting a master thesis with the purpose of identifying sector specific barriers to DT. In addition, all respondents were asked to participate, either in the self-questionnaires or the interviews or both, together with the implications of each choice i.e required time. Furthermore, each and every respondent participated voluntarily, thus having the right to leave at any time during the study.

Lastly, it is important that the research is not conducted for personal gain i.e deception (Bryman and Bell, 2011). Once again, the authors were transparent of their purpose and background and that the thesis was a part of their education with no other intentions.

4. Empirical findings

In this chapter, the empirical findings are presented. The interrelatedness of the research questions make the data needed to answer the questions also highly interrelated. Hence, the empirical findings are presented jointly instead of separated after a specific research question. As this study has adopted the framework by Vial. G (2021), the data collection has accordingly revolved around the building blocks in the framework. To in a structured way present the empirical findings, the presentation of data will follow the building blocks as follows: *Digital technologies as a disruptive force, strategic responses, structural changes and organizational barriers*. Presented percentages or quotas refer to data acquired from the questionnaire whereas quotes and other elaborations refer to data acquired from the semi-structured interviews.

4.1 Technologies as a disruptive force

The Swedish real estate sector seems to be especially prone to adopt technologies within the category of “Managing & Operating”, see attachment x. With 55.6% of the respondents stating that this category is the most important for their organization this year it shows a greater sectoral commitment than the categories of “Design & Build” and “Coliving & Coworking” which 33.3% and 11.1% of the respondents prioritized respectively. Whereas the companies display a relatively high coherence regarding the usefulness of investing in the category of “Managing & Operating”, it does not display an equally coherent view for *why* it is important. Interviewee E stated that “...*we have been driving it (energy optimization) very hard. Mainly motivated by environmental reasons but also because we want to brand ourselves as energy efficient*”. Interviewee B instead stated that their efforts within “Managing & Operate” are motivated by the need to increase the efficiency of internal processes: “*we can not manually collect our data for energy monitoring...it takes us 3 months each year.*”. Interviewee C presents yet another take for why they chose to prioritize the category of “Manage & Operate”: “*We are working with these solutions (energy optimization) to increase customer experience rather than to achieve a higher margin*”.

Interestingly, responding to the area of Coliving & Coworking is the top priority of company 1 and company 1 alone. The reasoning for making this area the top priority is according to interviewee A: “*We do a lot of market research and the customer demand for flexibility has and is increasing*” and “*The customer is our core and we must keep the end-user contact*”. The latter quote is given in the context of new entrants taking over the end user contact by renting entire houses from real estate companies and setting up co-working solutions. This is a direct contradiction to the reasoning by interviewee G that instead states “*we do not have that need (keeping the end-user)...if the market decides that other companies are doing a better job serving the end user we will not oppose this*”. Interviewee C had yet another foundation for why they entered the coworking segment: “*These small customers are a super small business for us, generating a few million versus our multi billion turnover. For us, it was more about learning a new business model and business logic as a company.*”.

Interviewee C continued to explain that their initiatives within coworking were motivated by learning and acquiring agile and flexible capabilities rather than generating revenue.

The preferred area of investment is reflected in the responses on whether the companies aim to utilize digital technology to enhance their traditional way of operating or if they are to use technology to do business in fundamentally different ways. Representative A, who stated that “coworking & coliving” were the prioritized area of investment is the only respondent who states that they are aiming for doing business in “mostly new ways”. The majority, 77.8%, claim that they are aiming for a mixture between new and old ways of doing business and 11.1% claim that they are focusing on enhancing their traditional business. The in depth interviews shed further light on this matter and verified the answer from company 1 as well as disputing others. Company 1 was the only company that could present explicit and extensive projects that illustrated their effort to do business in completely new ways in contrast to interviewee E whose projects were focused around increasing efficiency and enhance internal processes, hence lacking the aspect of “doing things in new ways”, even though they stated that they were incorporating said aspect.

4.2 Strategic Responses

The digital maturity assessment displayed high divergences between whether or not the organizations have a clear and coherent digital strategy. From the questionnaire, there was an even distribution of 33% each for “strongly agree” and “agree” whereas 22% and 11% answered “neutral” and “disagree” respectively. However, from the in-depth interviews, the answers could not always be motivated. When asked about the digital strategy, interviewee E who stated “agree” in the questionnaire, could not explain, describe or refer to a digital strategy and after adequate follow-up questions the respondent realized that they in fact did not have any formal digital strategy whatsoever. The following quote by the same respondent shed light on the strategic deficiency: *“If you were to ask someone (from our organization) about our strategy documents, they would wonder ‘where is that’? It does not exist”*.

Interviewee C and D, both for company 3, had different answers in the questionnaire for whether or not they had a clear and coherent digital strategy, stating “agree” and “disagree” respectively. However, once again, the in depth interview allowed for a deeper assessment where the individual answers became more coherent. They did in fact have a well formulated digital strategy, the problem is that it is unsuccessfully diffused and poorly followed by different business units within the organization as well as being outdated. Company 2 had a similar reasoning for why their digital strategy is deficient, stating that *“It (the digital strategy) is not integrated in the business plan, and it is only when it is that it can be diffused and followed by everyone”*. The only two companies that could thoroughly explain their digital strategy and describe how they actively worked with it was company 1 and 7, which also was the only companies that answered “strongly agree” on whether or not they have a clear and coherent digital business strategy.

4.3 Structural changes

The following presents the findings of the sub blocks of structural changes according to the framework by Vial (2021).

4.3.1 Organizational structure

The organizational structure of the Swedish real estate companies seem to be predominantly characterized by a hybrid structure with relevant cross-functional teams collaborating for large projects while day-to-day collaborations are limited. 44,4% of the companies stated that such structure and way of working are most similar to the one of their own organization. The second most chosen structure, with 33,3%, represented a more traditional top-down structure with independent silo teams while the remaining companies stated that they had a structure that reflects a flat organization with fully integrated cross-functional teams.

In addition, the majority of the companies state that they are increasingly organized around cross-functional teams and not necessarily functional or divisional teams, see exhibit x. Interviewee C from company 3 disagreed on the aforementioned and explained during the in-depth interviews that *“It is very much silo-thinking. It's an old organization and it's in the walls... We have no small and agile teams. Each silo has its own business planning for the year, and you sometimes get involved.”*. Company 1, 5 and 7 agreed to the statement that their organizations are increasingly organized around cross functional teams and the respondents for each company could describe processes that strengthened the claim and illustrated their efforts to become more agile. Company 1 and 7 did also to a greater extent than others stress the need for agile and cross functional teams and explained that it is a top priority for them. Respondent D for company 3 as well as company 2 and 4 all answered “neither agree nor disagree” and expressed a lesser need to enhance its agile capabilities. Company 4 explained that their small size of about 140 employees allows for high personal relationships that facilitates cross-functionality and opposes silos. Similarly, interviewee D for company 3 stated that: *“I think that as long as you have a will to work together, it does not matter how you are organized”*.

The Swedish real estate sector is organized relatively similarly with regards to what division or department that is formally responsible and drives the DT. Company 1, 3, 4, 6 and 7 have departments called or closely related to *“innovation and business development”* that are actively incorporating digital business and technology. Furthermore, they do, without exception, operate with a budget explicitly for DT. The creation of separate budgets is not a coincidence, instead it is expressed as highly desirable, or as company 1 stated: *“Otherwise, you compare a facade change to a digital project which most often will result in a facade change...”*. Company 1 has taken the notion of separation even further through the creation of a daughter company whose sole task is DT. This corporatization makes their structure notably different from company 2 and 4 who do not have a structure in place to deal with DT. Instead, these companies allow digital initiatives to be led and executed by different divisions dependent on the nature of the project. However, company 2 states that they are *“...trying to*

solve the question of how to structure it organizationally, should it be theirs (IT-department), mine (sustainability department or at someone elses? ”.

4.3.1 Organizational culture

The different organizational cultures in the sector are affecting digital development in different ways. Interviewee C from company 3 stated that culture is the most important factor contributing to the progress of digital initiatives whereas company 1 and 5 stated that culture currently creates the biggest hinder for the DT journey. Company 3 explains that their DT initiatives are driven by enthusiasts that do not necessarily have a role that formally incorporates said aspect. Company 1 and 5 have it the other way around and present formally appointed digital leaders.

In the self-questionnaires, the majority of the respondent also stated that they primarily drive digital business adoption and engagement internally through expecting employees to be motivated to embrace digital business opportunities. The second most chosen alternative, with 22,2%, was cultivating a strong digital business culture that strives for risk taking, collaboration, agility, and continuous learning. Naturally, the authors were interested in what each and every company had done with respect to their culture that made them convinced about their answer. Interestingly, company 1 and company 3 were the only companies to have taken active measures to strengthen the culture. Company 1 described how they actively work to strengthen the culture in order to become more supportive. In the in-depth interviews, interviewee A from company 1 explained: *“Encouraging risk-taking is about working agile. To work small before doing something big. If you do that, you dare in a completely different way. We evaluate initiatives every two or three weeks, then you can choose to go or kill depending on how it goes...”*. Similarly, interviewee B from company 3 explained that forums were created at different levels within the organization, where questions could be raised and answered. All, to enhance the collaborative environment.

In the context of new digital initiatives, the majority of the respondents argue that the organization encourages risk-taking. In the self-questionnaires, all of the respondents also state that projects usually start as either small experiments or both small experiments and enterprise wide efforts. However, many of the interviewees faced difficulties when they were asked to explain a project that failed or one that they decided to not pursue with. Interviewee D from company 3 were not able to mention a single project that failed. Company 7 was able to answer the question but did also state that *“We do not throw ourselves into everything and do not fail very much.”*. This quote together with some of the difficulties to explicitly answer the question somewhat raised the author's skepticism towards said level of risk taking. However, companies 1 and 7 were both able to describe and explain how they allow for risk taking in digital initiatives.

In the context of risk-taking and experimenting, company 2 and 4 stated that their organization's ownership structure had implications on how the company operates. As the

company manages pension savings, they are naturally more restrained towards risks. Interview B from company 2 continued to explain that the organizational culture is affected by the ownership structure and that the high focus on brand and trust inhibits a high level of risk taking.

4.3.2 Leadership

Overall, there seems to be a lack of a clear digital leadership among the Swedish real estate companies. Most of the respondents, 33%, states that there is a lack of a clear digital leadership at all levels in the organization. Only company 7 states that a senior digital leadership exists and are actively invested in while none of the respondents have stated that a digital leadership exists at all levels in the organization. Interestingly only one interviewee states that leadership is the predominant factor hindering the progress of digital initiative.

Regarding leadership, chose the option that best suits your organization.

9 svar



Figure 9: Result from self-questionnaires

As previously outlined, the different ownership structures have implications on how the companies operate, which to some degree seems to reflect the leadership, especially on the board level. As companies 2 and 4 manage pension savings, their focus is to leverage a stable and safe return rather than exposing the pension savers' money to risk. This naturally means that these leaders are more restrained towards risk taking, which they described as a factor hindering the progress of digital initiatives. Company 3, which is a state-owned company, has another focus. Instead of managing money they focus on managing real estates. As a state-owned company they have as a business objective to lead the development forward. Yet, interviewee C states that “...they (the board) are more reactive and risk minimizing and they are not driving digitalization issues. Traditional perspective”.

However, the companies coherently state that their organization is a for profit company, which makes return on investment (ROI) important in the context of lobbying for new digital initiatives. The following quote by interviewee B sheds light on the aforementioned “We presented it in a way that it was not possible to say no. We showed that this would be repaid in about 6 months.” Similarly, interviewee H states that “we have no problem making

investments as long as we can show what we think those investments will bring". Interviewee G, also states the focus on ROI but with another take *"should you spend 10 million on a system when you do not know what it provides or should you spend 10 million on a new house. What do you think the shareholders say?"*. Yet another, interviewee C, expressed concern regarding the need for heavy lobbying within the organization to start initiatives: *"We have to persuade the management who then has to persuade the board."*.

Whereas the leaders on the board level seem to play a crucial role in each DT journey, the respondents also express the importance of digital leaders on the operative levels. Interviewee D from company 3 stated: *"...you have to have leadership at all levels. It is not enough to have good business leaders."*. However, the data pointed out that digital leadership on the operative levels are highly scattered. Company 7 stated that *"someone has or gets it (leadership role) beside their ordinary role and then it's not easy"*. Interviewee D for company 3 expressed similar concerns: *"The responsibility, who has it? Who has the vision, the strategy and the business plan?"*. Company 2 explained that the quality of the digital lead varies within the organization depending on the department and its manager: *"...Some groups are really pushing, where we have creative and innovative and new thinking managers, it sets the spirit for the whole team."*.

Regarding what the leaders need more of, the questionnaire points towards an increased need of risk taking and to challenge the status quo. Whereas these traits are expressed as highly desirable by the respondents in the questionnaire, the data from the interviews pointed to resources in the form of time being a far more critical factor. Interviewee D for company 3 stated that people simply do not have time over for participating or leading digital initiatives - *"It is not like people are saying 'hurra', now I get to lead a digital project as well. It is hard to get people to take initiatives"*. Company 7 expressed a similar situation in their organization - *"One must have the time and energy to lead and know what mandate you have as a leader. All divisions but mine have it as an extra and partial task."*.

Which leadership attributes do your organization's leaders need more of to drive digital business transformation? (if multiple, please select top three.)

9 svar

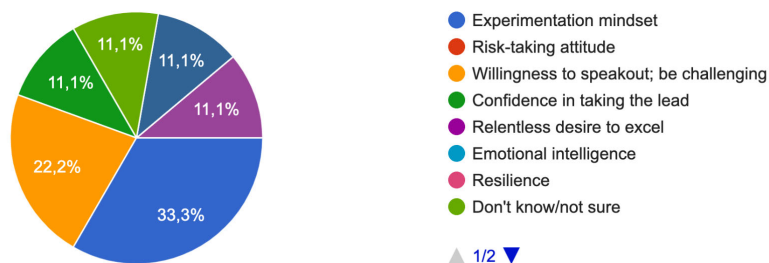


Figure 10: Result from self-questionnaires

4.3.2 Employee roles and skills

The internal belief whether or not the organization has sufficient talent to support the digital business strategy is fluctuating. With a relatively even distribution of answers between “agree” down to “strongly disagree”, the internal digital knowledge seems to vary. However, once again the in-depth interviews enlightened more nuanced answers. When asked questions regarding their internal digital knowledge, each and every respondent pressed that they needed to significantly improve their digital capabilities. Although all respondents pressed the need to improve their digital capabilities, not everyone experienced the current digital capabilities to be a hindrance to DT. Company 1 stated that: *“One of the factors that has made us succeed so far is that we have been working a lot with external competencies”*. Hence, company 1 addresses the insufficient capabilities through leveraging external competencies. The external competencies were not only of purely technical characteristics but also within planning and leading. Company 2 stated that they instead tried to acquire digital lead capabilities through employment but faced a major setback. *“...nothing happened during two years due to a lack of knowledge within project management and we had to let him leave. We wasted two years and we needed to employ a new recruitment”*. Whereas this is the only explicit example from the data collection regarding a failed recruitment, the majority of the companies raised the issue of acquiring the *right* competencies. Two different reasons for why it is difficult to acquire the right capabilities were continuously being brought up during interviews. First, the requirements are continuously changing due to different projects as well as technological advancements, and second, a lack the understanding to specify what knowledge they need and whether or not this knowledge is desired to keep in house. Company 7 stated that *“our requirements today are basically (Microsoft) Word and mail...”*. and continued to explain *“...you need to know a lot more than that to be able to utilize the digital solutions we have today”*. The latter quote is given in the context of the average employee not being able to utilize the full range of the implemented digital technologies, hence lowering their impact. This becomes evident for company 7 when employees complain about processes and work and there are in fact already solutions in place to amend said problems, only that the employees sometimes do not either know about the solution or how to use it. Interviewee D had a similar take: *“There is fear, an uncertainty, one does not know what things mean, one wonders ‘why should I be responsible for this?’ We need to build confidence, we have competent people, it is not that everyone is supposed to program but everyone needs to understand that it is a new part of our everyday life.”*. The data indicates that there is a lack of digital knowledge and experiences in all levels within the sector. Not only are explicit digital skills needed to execute digital initiatives deficient, but also the lower level capabilities that are needed to utilize implemented solutions. Interestingly, in the questionnaire, no one disagrees nor strongly disagrees on the statement of whether they effectively utilize their digital knowledge, skills, interest, and experience held by their employees which is contradictory to data from the interviews.

To evaluate the capabilities from yet another perspective, the interviewees were asked to what degree their organization’s capabilities allowed them to understand digital technologies and trends, the implications of different choices, and if they can make competent and

well-grounded decisions. The general attitude was that the resources and capabilities were sufficient to support the decision making.

To what extent do you agree with the following statement: My organization has sufficient talent today to support our organization's digital business strategy.

9 svar

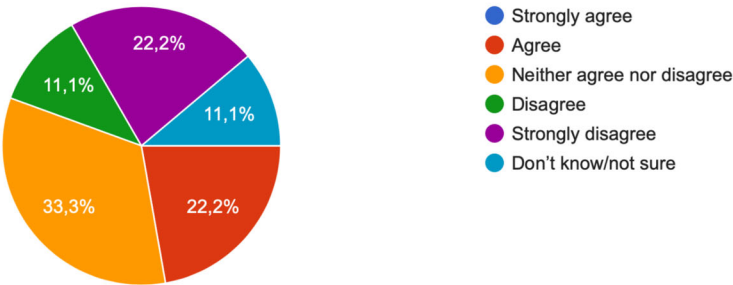


Figure 11: Result from self-questionnaires

4.4 Organizational barriers

The answers from the self-questionnaires show that the factors that hinder a continued digital progress are widespread among the Swedish real estate companies. As can be seen in figure 12, 22% states that strategy and vision are currently creating the largest barrier to a continued digital progress. Interviewee D from company 3 states regarding their strategy that “*it is outdated, it is no longer relevant. It has done a good job but is not enough.*” In addition, the same percentage did also state that culture is the factor that creates the biggest barrier to continued progress. Company 5 was one of the companies that during the interviews explained how culture has acted as a barrier: “*I find it difficult to get everyone involved and sometimes you may have to give up*”.

What factor/s is currently creating the most hinder/s to your continued digital progress?

9 svar

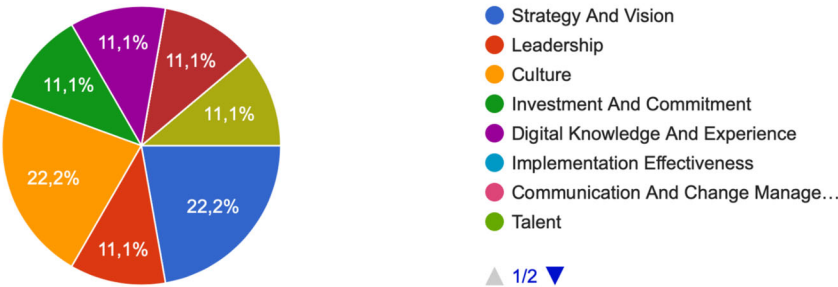
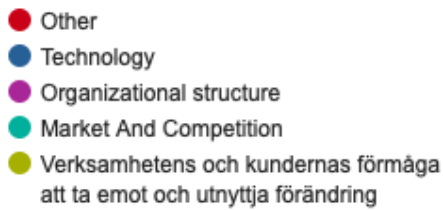


Figure 12: Result from self-questionnaires



▲ 2/2 ▼

Interestingly, the in-depth interviews did also shed light on yet another barrier to DT. The companies coherently state that there is a lack of sense of urgency to change due to an historical trend of increased and steady revenues in the sector. Many of the respondents did also compare the real estate sector to other sectors that have been exposed to threats or crises that naturally have forced a change. Company 6 explicitly expressed the above *“You still make a lot of money. There is no clear trigger for change that has existed in other industries.”* Similarly, company 2 explains: *“It has gone too well, it has worked to do business as usual. There have been no incentives to change.”* Whereas many of the respondents point to an historical lack of urgency to change, others state that the sector is currently being disrupted as a result of the Covid -19 pandemic. Company 2 explains how the sector has been and is being affected by the pandemic *“Now after the pandemic, we see new ways of living, sustainability warnings and megatrends that mean we can not do business as usual.”* The quote by company 5 does also sheds light on the aforementioned *“I would like to say that coworking is one such example that is a bit of a disruption in our industry.”*

In the context of change some respondents also point to organizational resistance. Company 2 describes that the organization has been slow to adopt new technologies, not only due to lack of urgency but also due to fear of change: *“There has been a lot of fear; people want power and control to feel competent. Changing the whole way of working means new grounds and people become uncomfortable.”* Company 5 states a quite similar quote *“...you feel safe in what you have and what you can and all of a sudden something you do not know comes and then you lose all your security.”*

5. Analysis of empirical findings

In this chapter, the empirical findings are compared to and analyzed through the theoretical framework. Figure 13 visualizes the process.

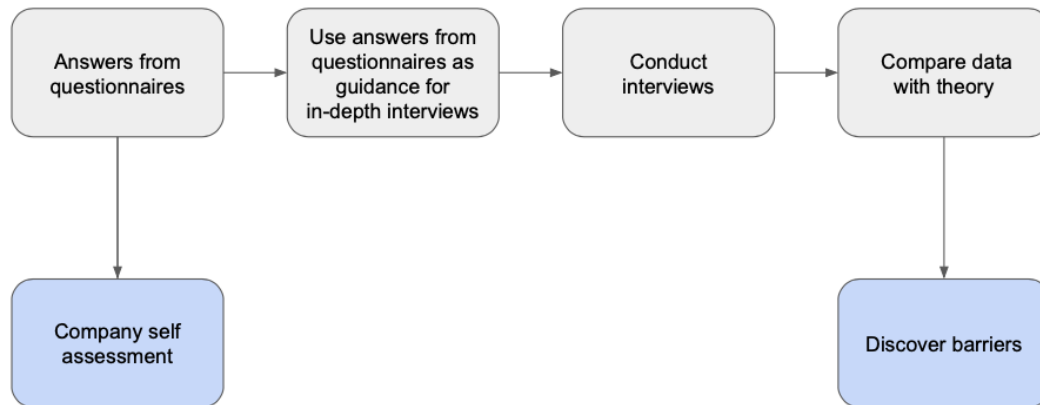


Figure 13: Workflow of analysis, designed by authors

5.1 Analysis of Digital Maturity Assessment

The digital maturity assessment, performed to get an insight of how the companies are currently organizing themselves to transform digitally, enlightened several interesting findings. Whereas the questionnaire was designed to be the main source of data, which it is, the following in depth interviews allowed for verification or dismissal of the answers from the questionnaire. The symbiosis of the data collection methods unearthed some unexpected findings beyond the original intention.

The assessment displayed a naturally dispersed level of digital maturity with scores ranging from 2.47 to 4.05. To put the numbers and their value in context, the value of three represents “neither agree nor disagree”, hence being neutral. Values below three are increasingly unsatisfactory as the value decreases whereas values above are increasingly satisfactory as the value increases. The distribution is relatively even with a mean- and median value of 3.28 and 3.41 respectively. Surprisingly, both values are above three which would indicate at least a slight general satisfaction of the studied areas. However, from analyzing the companies responses individually and comparing the responses from the questionnaire with the data acquired in the interviews, a possible explanation to the high score was found. True without exception was the recurring theme of overly positive responses in the questionnaire without the capability to support the statements in the interviews. The same was not true for the opposite way around, i.e. no overly negative answers could be identified when comparing the questionnaire data to the interview data. A clear example of an overly positive answer was the statement by interviewee E who stated “agree” to if they have a clear and coherent digital strategy and when asked questions about it they had in fact no digital strategy whatsoever. As

of this, the digital maturity score is probable to be too high and certainly not too low. Another enlightenment, yet of a more subjective character, was that there seemed to be a correlation between the respondents' answers and their own knowledge within DT. The more fruitful interviews, where the interviewee were familiar with different concepts, tools, processes and methods within DT, tended to be more restrictive in their answers in the questionnaire. The interviewees that showed a greater understanding for DT could to a greater extent point out what was deficient and had higher expectations and requirements to what could be considered adequately good. Whereas this finding makes the digital maturity assessment less reliable, it also indirectly gives an indication that the skills and capabilities within DT are in some cases deficient.

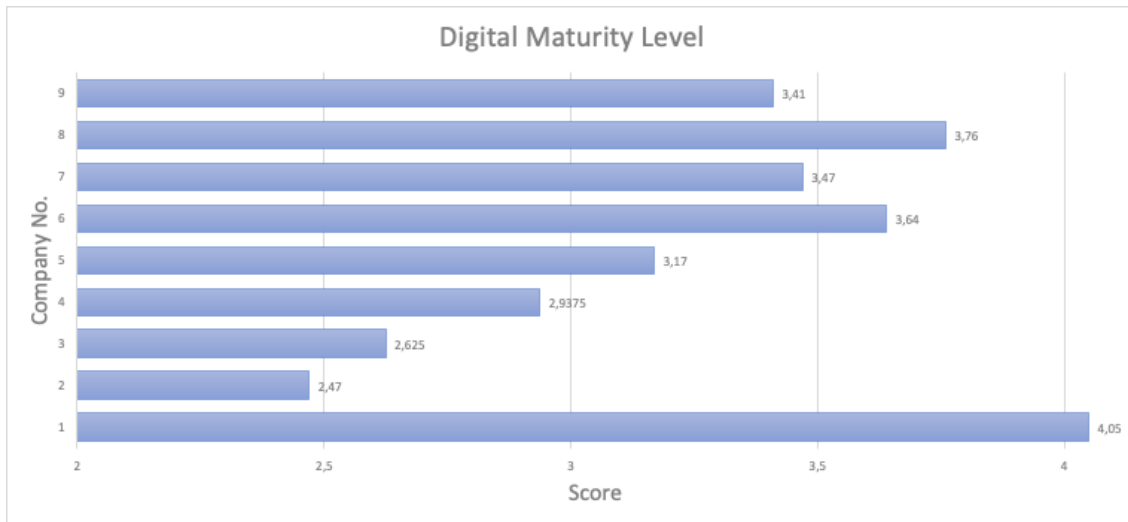


Figure 14: The companies result of digital maturity assessment, designed by authors

Beyond providing a general digital maturity score for the sector, the assessment also provides indications of specific areas of deficiency. From analyzing the questions and answers in the assessment individually, yet another table was created to identify particularly troubling areas, see figure 15. As previously outlined, the values below three are considered unsatisfactory. A total of seven questions had an average score below the value of three, hence deemed unsatisfactory. Question number 16, which regards the existence of a digital leadership, scores particularly low with an average value of 2.13. Question number 15, relates to the digital leadership's vision and also scores below par on 2.89. The remaining individual areas and their respective scores are visualized in figure 15. From the table it can be seen that there are large divergences between the scores of different questions. This implies that the sector seems to have a relatively coherent perception of their challenges as well as their strengths and creates a good indication to where to focus resources and development.

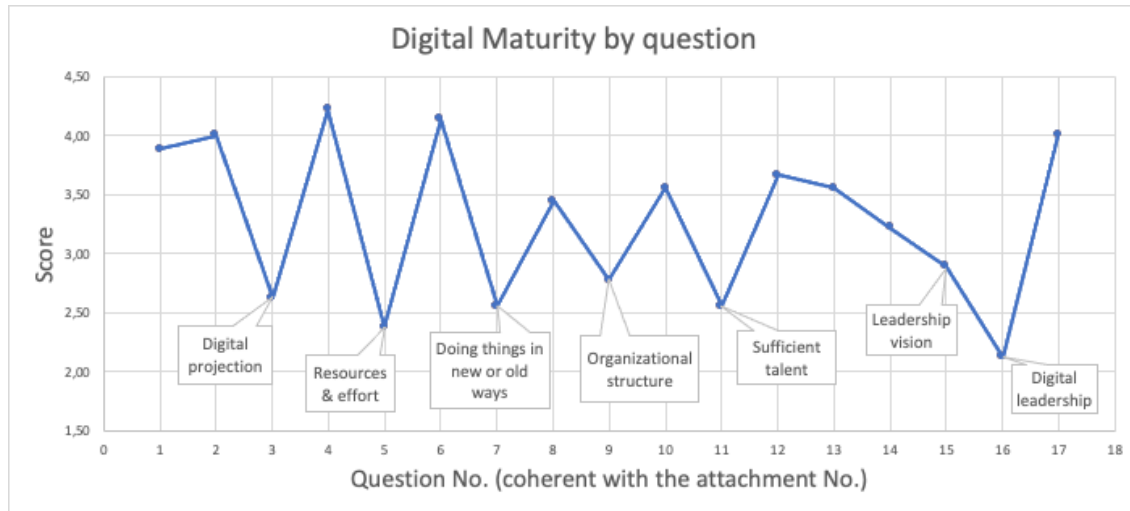


Figure 15: Average results of the questions in the self-questionnaire, designed by authors

When comparing the current endeavors of the Swedish real estate companies to the model by Reinitz, B. 2020, the data points towards a placement somewhere in between digitization and digitalization, yet more towards the latter. The majority of the studied companies are still actively transforming analog data to digital which relates to digitization as well as using digital technologies to transform individual operations and processes. Whereas this categorization provides a view over their current endeavors, the analysis in chapter 5.2.3 provides a categorization of how the sector organizes with regards to DT and how that relates to the digital maturity.

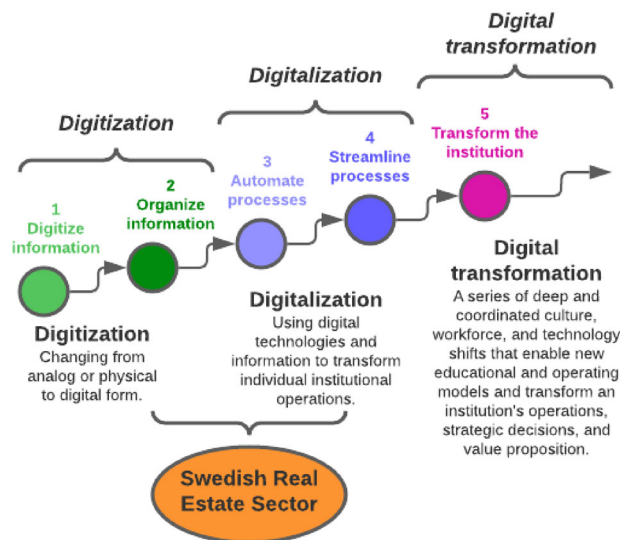


Figure 16: The placement of the Swedish real estate sector in the with regards to digitization, digitalization and digital transformation, designed by Reinitz, B. (2020), illustrated by the authors

5.2 Analysis of barriers to digital transformation

In this chapter the empirical findings regarding barriers to digital transformation are analyzed. The analysis is divided in chapters according to the building blocks of DT according to Vial (2021).

5.2.3 Technology as a disruptive force

According to the framework by Vial (2021), digital technologies and changing customer expectations and trends constitute the fuel and trigger of DT. Without knowledge and up to date information regarding both macro trends and more specific ones, a company may fail to adequately respond. The literature can not evaluate or guide *what* specific trends the real estate companies ought to respond to as a response is founded in the company strategy. Yet, it remains clear that they must understand the environment in which they operate in and what the customers want. To evaluate this, the data collection revolved around understanding *how* the companies gather such information and whether or not they are able to make competent decisions regarding what to pursue and not.

The data indicate that the sector is increasing its effort to understand digital technologies and its implications. The macro trends of ESG solutions and flexibility presented by (PwC & Urban Land Institute, 2022) is not only understood by each and every actor in the sector, but also in the majority of cases acted upon. From the questionnaire, 55.6 % stated that analytics were the prioritized digital technology with the majority referring its importance to energy optimization solutions. The trend of flexibility, manifested in the real estate sector mainly as co-working and co-living is also understood by all respondents. However, the strategic response to this trend varies largely within the sector, with some entering this segment mainly to generate revenue through new channels whereas others entered the segment not primarily to generate revenue but to learn a new business model. There are also actors that actively chose a passive action towards coworking, yet as a result of strategic action. Hence, these trends are understood and evaluated by all the studied companies. Beyond these macro trends, the companies could also present several other digital initiatives that come as a result of customer insight work and environmental analyses, i.e. the work with insights are highly prioritized.

The increased effort to understand digital technologies is manifested through increased focus on environmental analysis. The respondents were asked about how they scan the market and understand the customer needs and most companies have a formal process in place to deal with the collection of insights and the ones that do not have a formalized process rely on the department responsible for DT to do continuous evaluations. The interviewees repeatedly brought up the transparency of the sector as a contributing factor towards understanding the environment. The industry organization Real Estate Core illustrates the transparency through being a platform that facilitates coordination of DT.

The concluding remark on this block is that the data do not show any clear indications that the sector's understanding of customer expectations, trends and digital technology constitute a barrier to DT.

5.2.3 Strategic responses

The theory highlights the importance of having an established digital strategy in order to undergo DT (Matt et al. 2015). Whereas the literature on specific characteristics of such strategy is scarce, the importance lies in whether or not a digital strategy exists and is used rather than what the strategy contains (Brown, N., & Brown, I. 2019; Matt et al. 2015).

The questionnaire initially showed that the majority of the respondents had a digital strategy in place. The following in depth interviews allowed for a greater distinction of quality of the different companies digital strategies. As previously outlined, the literature can not guide the evaluation of a strategy based on its constituents, yet, distinctions can be made based on how the strategy is utilized, diffused and followed to guide digital initiatives and how often it is reworked and updated. The quality of the digital strategies can be categorized in three ways: first, a digital strategy exists and is diffused and followed throughout the organization, second, a digital strategy exists but is not adequately updated, diffused and/or followed throughout the organization, and third, there is no digital strategy. The digital strategies of company 1 and 7 belong to the first category, company 2, 3 and 5 to the second, and company 4 to the third category. The empirical data from company 6 was insufficient to make a clear distinction, yet they leaned towards the second category.

Buckley (2015) argues that strategy rather than technology drives the transformation, where lack of a digital strategy accounts as the biggest barrier for companies in the early phases of digitalization to evolve in the context of DT. The real estate sector is undoubtedly in the early phases of the DT journey, hence the digital strategy is especially important. An insufficiently updated digital strategy or a digital strategy not adequately diffused and followed may be slightly better than having no digital strategy whatsoever, but only by a small margin. These results raise the question of when a digital strategy is established. The theoretical findings state that a digital strategy must exist, but when it is not followed, updated and/or actively used, is it still a digital strategy or just a document? However, the problem of an insufficiently updated or poorly diffused digital strategy is not a finding exclusively made by the authors of this study. Instead, the respondents apart from company 4 were well aware of the deficiencies and in the case of company 3 they had taken active measures to resolve the issues.

It remains clear that the digital strategies of the sector are generally below par. Even though the digital maturity assessment displayed a score of 3.89, which would indicate a generally high presence of clear and coherent digital strategies, the interview data indicate that at least some of the current digital strategies constitute a probable barrier to DT.

5.3 Structural changes

The following chapter analyzes the sub blocks of structural changes according to the framework by Vial (2021).

5.3.1 Organizational structure

According to Vial (2021), organizational structure plays a crucial role in the DT process. The literature stresses the question of whether to integrate new digital activities within existing structures or separate the activities into an own unit or subsidiary within the firm (Matt et al., 2015; Hess et al., 2016; Vial, 2021). The empirical findings showed that most of the investigated companies had created a unit responsible for digital initiatives, yet keeping this unit integrated within the organization. Company 1 was the only company that had created a subsidiary to handle the challenge of ambidexterity as presented by Vial (2021). In contrast, company 5 was the only company that had digital initiatives integrated in the structure, without having a formally responsible unit. Hess et al., (2016) argue that the question of integrating or separating new digital activities is dependent on the distance between a firm's core activities and DT activities, where larger distance calls for a stronger boundary between new and old operations. In addition, 77,8% of the respondents stated that they use digital technologies both to improve current operations and to do business in fundamentally new and different ways. This indicates two things, first, most respondents to some extent use digital technologies for fundamentally new businesses and second, most respondents are faced with the challenge of ambidexterity. When considering the traditional real estate sector and its operations, it is evident that technology, especially digital technology, is not within the sector's core capabilities. The general digital technology competence requirements for recruitment are in many cases still extremely basal and it is safe to assume that it is at least a medium-high distance between the sectors core activities and DT. Hence, according to Matt et al., 2015, Hess et al., 2016 and Vial, 2021 it ought to be preferable to engage in separation of the digital activities. According to this assumption, the sector's structure of integration may constitute a possible barrier to DT.

When analyzing the current endeavors through the lens of Mirković et al. (2019), the current organizational structure and way of operating seem less like a barrier and more like a natural stage in the DT journey. As can be seen in figure 17, Mirković et al. (2019) presents different organizational structures dependent on digital maturity. As previously outlined, the Swedish real estate sector is novel with regards to DT and it can be seen that the majority of the companies have a unit responsible for DT activities, yet with a poorly diffused digital strategy. This correlates to the Centralization Model according to Mirković et al. (2019). While the Centralization Model is the most accurate model for the sector as a whole, there are some actors that are lacking the cross functionality that this model represents and are still working heavily in silos. The divisions responsible for the DT are predominantly operating with an separated budget for DT and this budget is to cover initiatives within all operating units, which also fits the narrative of the Centralization Model. This highlights two things, first, it strengthens the findings of the first research question that the Swedish real estate

sector in fact is at an early phase of DT. Second, by looking at “The Champion model” presented by Mirković et al., (2019), it becomes evident that the digital strategy, often described as poorly communicated throughout the organizations, most probably creates a barrier to a continued progress.

As discussed in the theory, the literature on DT are at times slightly contradictory, or at least not consistently coherent. This becomes evident in this analysis, whether or not the current organizational structure and way of operating should be seen as a natural stage in the DT journey or if it constitutes a possible barrier depends on the theoretical standpoint. What can be concluded with certainty is that the lense of Mirković et al., (2019) strengthens the findings of the first research question, i.e. that the Swedish real estate sector is in the early phase of the digital journey. Second, the viewpoint of Mirković et al., (2019) also strengthens the previous conclusion of digital strategy constituting a barrier to DT, as the diffusion of a clear digital strategy is key to reach the next level, i.e. the champion model. However, the findings based on the theory of Matt et al., 2015, Hess et al., 2016 and Vial, 2021 shall not be neglected and the question of ambidexterity is highly relevant, especially due to the sector's core activities distance to digital technology.

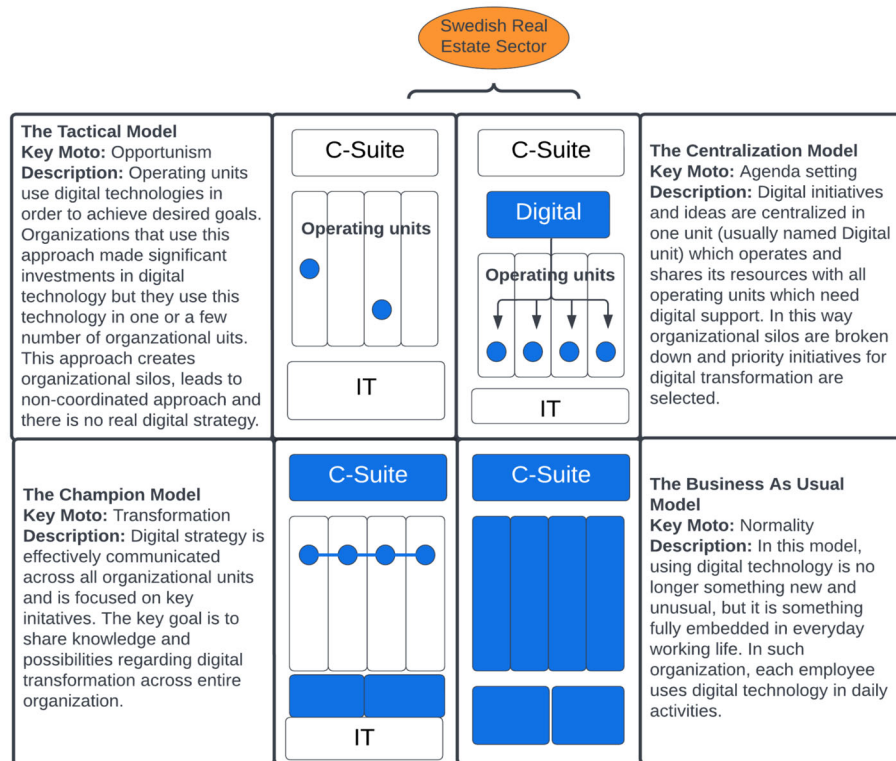


Figure 17: The placement of the Swedish real estate sector with regards to supportive organizational structures inspired by (Mirković et al., 2019), designed by authors

5.3.2 Organizational culture

The Swedish real estate sector's core activities have historically been distant from technology in general and digital technology specifically. Most respondents state that their digital efforts started around 2017, hence the familiarity with digital technology is still low, especially within divisions outside the one responsible for DT. Furthermore, the critical factors that constitute a successful digital culture such as innovation, agility and entrepreneurship are hardly the sector's historical strengths (Hartl & Hess, 2017). The organizational culture reflects the technological unfamiliarity in a stereotypical way through resistance, fear and difficulties of capturing the value of new solutions. The empirical findings indicate that digital culture has been given less attention than other aspects such as leadership or how to organize structurally. Few companies are able to present any active measures taken to strengthen the digital culture whatsoever and in many cases the companies rely on scattered enthusiasts to initiate, drive and push a digital agenda. Considering the findings of Hemerling, J., Kilmann, J., Danoesastro, M., Stutts, L., & Ahern, C. (2018) which indicates that assessing digital culture explicitly may grant an increase of success by over 500% compared to when neglected, it is evident that the Swedish real estate sector must increase their effort to strengthen the digital culture significantly. Schwertner (2017) depicts employee resistance as one of the most prominent barriers to DT within organizations and the empirical findings indicate that this phenomenon is also present in the sector. The employee resistance manifests itself in two ways, first, a resistance exists in the form of "why should I be responsible for this?" and second, there is a resistance in the form of inability to capture value of implemented digital solutions. As visualized in figure 18, the different building blocks of DT are highly interrelated which clouds the root cause. The question of responsibility may be a result of weak organizational structure and chain of responsibility, lack of resources in the form of time and availability or it could be due to insufficient skills and knowledge to understand *why* this actually is one's responsibility. Without the ability to conclude the exact reason for why this resistance occurs, it displays that there is resistance present and that it ought to be addressed. The other form of resistance, i.e. the inability to capture value from implemented digital solutions, is founded in the empirical findings that indicate that employees fail to utilize the full value of implemented digital solutions due to unawareness or incapability. Whereas the first example of resistance regards the execution of digital initiatives, this exemplifies the resistance in the utilization phase.

The digital culture in the Swedish real estate sector is by no means homogenous. Some actors have done a great deal to strengthen their digital culture and seem to have come a long way since the start and others have much work in front of them. Assessing the digital culture as a building block proved to be far more resource draining than assessing e.g. digital strategy or organizational structure. This due to the width of the notion of digital culture and it being less objective and more subtle than e.g. analyzing how a company is organized. Yet, resistance is found and the fact that few companies actively invest in the digital culture is alarming. The notion of risk taking is a highly central concept in digital culture, yet it is discussed in chapter 5.3.3 Leadership due to some interesting findings.

5.3.3 Leadership

The importance of leadership is well recognized in academic literature. DT efforts are destined to fail without support from the organization's leadership, including both top management and general leadership (Kane, 2017; McCarthy, Sammon, & Alhassan, 2021).

The popularized role of the CDO has gained foothold in the sector, with most companies having at least a similar position to lead the DT effort. The introduction of a CDO or equivalent is a step in the right direction, however, the mere role does not imply that the digital lead is sufficient. 33% of the respondents stated that there is a lack of digital leadership in all levels of the organization which implies that the role of the CDO must be nourished before it can be harvested. Many companies lack digital leaders in the operational levels and rely on scattered enthusiasts to diffuse the digital strategy and act on and support digital initiatives. Jacobi and Brenner (2017) presses the importance of leaders in the operational levels to act as the CDO's extended arm, advocating the digital strategy and vision. When assessing the leadership, most companies can present a division responsible for DT led by a CDO or equivalent, which at first glance can seem promising. However, the diffusion of operational leaders throughout the organization is generally lacking. An explanation for the lack of operational leaders according to the companies themselves is that there is a lack of resources in the form of time and availability to get involved in DT-initiatives, or as company 7 stated: *"One must have the time and energy to lead and know what mandate you have as a leader. All divisions but mine have it as an extra and partial task."* Whereas time and availability is a factor to consider, so is the cultural aspect. Hess (2016) explains that DT forces employees outside of the IT-function, which traditionally have the responsibility for technology-intensive projects, to become active leaders of digital projects. Considering the fear and resistance discussed in chapter 5.3.2 regarding culture, where employees take a questioning stand to why they should have a responsibility in DT initiatives, it may have a correlation. As long as people outside of the division responsible for DT stand questioning why they ought to be involved, the creation and diffusion of operational leaders will be limited.

When zooming out and analyzing the top management, a correlation between the ownership-structure and management practice can be identified. There are four different kinds of ownership-structures among the studied companies, private, listed, pension-owned and state-owned. The analysis unearthed a negative aspect of the pension-owned companies, they tend to take on a more conservative approach to protect their brand and have a high focus on ROI. Digital initiatives being dependent on ROI may inhibit the amount of risk taking and experimenting, which seem to be the case as the companies with this ownership structure claim that they have to engage in heavy lobbying for getting digital initiatives approved. Whereas the mitigation of short term risks are understandable due to the nature of these companies ownership, it may induce long term risks if the digital progression is not adequately followed. To deal with the question of safe ROI versus risk taking and experimenting, the organizational structure and budgeting become relevant. The companies

that have a separate entity operating with an own budget seem to have a lesser problem of initiating digital initiatives as they do not have to weigh it against e.g. a facade change. However, the phenomenon of high ROI-focus is not an approach exclusive for pension-owned companies, other companies express similar concerns, yet it is more prevalent in companies managing pension money. A possible explanation for the sometimes conservative approach may be the lack of sense of urgency that the sector displays. Without exception did the interviewees at some point refer to the fact that doing business as usual is still extremely viable and that no *real* trigger has forced them into engaging in DT. When considering the findings of Fitzgerald, Kruschwitz, Bonnet & Welch (2013) which states that a lack of sense of urgency by leaders is a major reason for failed DT initiatives and that the unresponsiveness often result in clouded visions and insufficient road maps for DT, one may find an explanation, yet no justification, for the approaches.

The leadership, being a key enabler of the building blocks of DT as displayed in figure 18, is especially important. With 33% of the respondents stating that they have no clear digital leadership whatsoever and 22% stating that it exists but is confined to being tactical, it must be given more attention. Especially important for future development is the creation of operational leaders that are given both time and formal mandate to lead. Scattered enthusiasts engaging in digital initiatives when time allows may not be a bad thing, yet not enough. Whereas the operational leadership is deficient in almost every organization, the tactical leadership is by no means perfect, yet more promising. In some cases, actors need to allow for more risk taking and experimenting and understand that a short term ROI focus may come at the cost of long term losses due to lagging behind on the DT journey.

5.3.4 Employees roles and skills

As new digital technologies give rise to new activities, they also require employees to adapt roles not traditionally within their firm, which in many cases requires a new skill set (Matt and Hess). It stands clear that the Swedish real estate sector, due to its traditional operations distance to technology and innovation, do not naturally possess a high level of digital skills and knowledge. However, the studied sector is not unique in having a low starting point with regards to digital capabilities, hence what is particularly important is the effort to acquire the desired skills through e.g. recruitments or training and education of the existing workforce.

The current digital capabilities seem to vary with regards to division. The digital fluency as defined by Colbert et al. (2016), tends to be higher in the division responsible for DT than in other divisions. Beyond each and every actor claiming that they need to increase their general digital capabilities, three specific scenarios regarding the varying capabilities were found that illustrate possible deficiencies. First, as brought up in chapter 5.3.2 Culture, there is a general problem of inability to capture value from implemented solutions due to employee unawareness or incapability. Second, the division responsible for DT do in the majority, yet not all, of cases claim that they have capabilities enough to identify different trends, understand their possible implications for the firm and assess whether or not it aligns with the

digital strategy. Third, concerns regarding specifying what is needed in different contexts have been brought up by some actors. The different contexts identified were either what kinds of skills and capabilities that are needed to support the digital journey, i.e. what are the competence requirements for new recruitments, or what to include in a requirement specification to either a supplier or an inhouse project group for a digital solution. The first issue relates to the general digital knowledge of the organization, especially divisions outside the one responsible for DT whereas the second and third illustrates the digital skills of the division responsible for DT. These examples shed light on the differences and deficiencies of digital skills, yet, it is not a surprising finding due to the nature of the sector, instead the issue of training and enhancing the digital skills is more pressing.

Whereas recruiting talents and necessary competencies are crucial, companies can not rely merely on attracting new employees but must also train and educate their existing workforce (Vial, G. 2021). Not only is the requirement of new recruits still highly inadequate which is illustrated by the failed recruitment of company 2 which implied that “...*nothing happened during two years*” or the situation of company 7 where “*our requirements today are basically (Microsoft) Word and mail...*” but the training of the existing workforce is highly passive. In the self-questionnaire, regarding whether the companies had the resources needed including talent, training, experience, and digital skills to operate as a digital-first company, no one answered that they recruit based on digital experiences nor focus on development of digital competencies internally, through e.g. training programs. When asked about it during the interviews, few companies could present any considerable measures taken to increase or train the digital workforce, or as company 3 stated: “*It (the training) is on a very basic level, it is scattered and on how to use (Microsoft) Teams.*”. The phenomenon of low digital capabilities is of course not a positive finding, yet the absence of training and education, hence trying to remedy the situation is far more concerning. With a generally low employee turnaround compared to other sectors, digital training is especially important and without any active measures it is naive to believe that the situation will change for the better. Once again, the poor digital capabilities of the workforce is probable to not be an isolated problem. The low diffusion of digital skills throughout the company is probable to have at least a partial correlation to the poor diffusion of the digital strategies as well as the cultural resistance. As discussed in chapter 5.3.2. Culture, there is a cultural resistance present, greatly illustrated by company 3: “*There is fear, an uncertainty, one does not know what things mean, one wonders ‘why should I be responsible for this?’*”. Employees not understanding why they ought to be involved in DT initiatives, which is depicted as crucial by Vial, G (2021), constitutes a barrier to development. By extension, the failure to understand why involvement in DT activities are necessary to some degree no matter division is probable to relate to a poor digital lead or diffusion of strategy. An illustrating example of this matter was provided by company 2 who could see clear differences in the willingness to engage and adopt digital initiatives depending on the division manager's competencies: “*It depends on the area manager, some divisions are really willing due to a creative and innovative manager that set the spirit for the whole team*”. According to Kane et al. (2015) it is the digital leaders responsibility to articulate the value of digital technologies to the organization's future, hence motivating why employees ought to be engaged in DT initiatives.

The digital skills and capabilities are not on par to support the digital strategy, yet the companies are well aware of this. Whereas this creates a momentary barrier to DT, the failure to increase the digital capabilities constitutes a permanent barrier. Interestingly, according to Brown & Brown (2019), this phenomenon is not uncommon for less digitally mature firms, instead they tend to be reluctant to invest in providing employees with the relevant skills needed. For the Swedish real estate sector to remove the permanent barrier, they must increase their effort in training the existing workforce and review their requirements on new recruitments (Vial, G. 2021). As permeated throughout the analysis, the way to alleviating this barrier may not be through exclusively focusing on training and education, but also reviewing the digital leaders role in motivating employees and creating awareness to reduce resistance.

6. Concluding discussion and recommendations

Throughout the research, many interesting findings were made. The Swedish real estate sector is still in the early stages of the digital transformation journey. The sector has started to realize the importance of investing in digital transformation, yet a number of barriers are currently hindering the progress. In this chapter the research questions are answered followed by a discussion regarding the implications and use of the research together with recommendations for future research.

6.1 Answering research questions

- *What is the current digital maturity level of actors within the Swedish real estate sector?*

The initial intention of providing a general digital maturity score for the sector according to the research question was found to be an ambitious goal, yet not of great value. The goal of a digital maturity assessment is to enlighten weak areas that can act as a barrier to continued development and when using an average score for the sector as a whole, the specificity is lost. However, the average maturity score for the sector, graded from 1-5 with 5 indicating a high maturity, was 3.28, which would indicate at least a slight general satisfaction. However, this number shall be given less consideration due to two reasons, first, it lacks specificity, and second, a theme of overly positive answers were found as explained in the analysis. The phenomenon of overly positive answers implies that the maturity level is probable to be too high and certainly not too low which by extension may cloud a possible area of weakness. Yet, the overly positive answers also implies that the identified weaknesses are certainly weaknesses, although possibly even more critical than displayed in this study. The real answer and contribution to and of this research question lie in the score of each specific question. For example, the highest scoring question in the digital maturity assessment, with a score of 4.22 related to the “*importance of being a digital business*”. Hence, there is a coherent view that investing in digital transformation is important and that becoming increasingly digital is desirable. As of this, a deficiency of the sectoral view of DT can not be detected. On the contrary, there were 7 questions whose answers were inadequate, i.e. having an average score of less than three, which indicates that they are areas in need of improvement. All possible barriers to digital transformation are presented in figure 15 and it can be seen that the two lowest scoring questions do both relate to digital leadership which indicates that the digital maturity of this matter is especially low in the sector. Not only do the low scoring questions indicate where increased effort is needed, but the high scoring questions have the possibility to display where increased effort may not be as critical.

- *What barriers are currently hindering the digital transformation journey for companies in the Swedish real estate sector?*

The analysis enlightens barriers in each and every building block of DT apart from the initiating block of *“Technology as a disruptive force”*. Whereas there are deficiencies within the other blocks, i.e. in the blocks of *“strategic responses”* and *“structural changes”*, the analysis unearthed a strong relationship between the different blocks and sub-blocks of DT. One barrier may be highly dependent on another barrier which creates a web of possible root causes. Several deficiencies within the current endeavors were found, yet deficiencies were especially prominent within the digital leadership according to the empirical data. Yet, simply stating that the digital leadership and the digital leadership alone is a barrier to DT in the Swedish real estate sector may to some extent be misleading. There is no doubt that the digital leadership constitutes a barrier to DT in the real estate sector, yet, it may be due to other factors. Analyzing through the lense of the framework by Vial (2021), it is evident that the strategic responses act as an enabler for the subsequent blocks, hence a poorly designed, diffused or followed digital strategy may be the underlying barrier for a deficient digital leadership. Similarly, the constituents of the building block of *“structural changes”* i.e. *organizational structure, culture, leadership and employee roles and skills* are also found to be highly interrelated which further clouds the root cause of a barrier. To amend a barrier, its root cause ought to be found and this cause can only be found when following the root all the way to its end. This study has enlightened several possible barriers to DT and started to follow some of the roots, yet, the end of the root is still buried in the earth. As of this, to minimize misinterpretation of the result of this study, the authors refrain from displaying one or a few detected deficiencies as barriers as the disentangling of the web is not complete. Portraying e.g. the whole or parts of the organizational culture as a barrier without having analyzed its root causes would misguide not only the business community in their targeted efforts but also mislead future scholars within this area to believe that the findings of this study are conclusive and final when they are not.

6.2 Discussion

The different building blocks of DT analyzed in this study shall not be seen as independent steps, instead they are highly interrelated. For example, according to Jacobi and Brenner (2017), a digital culture that supports change is foundational to enable the digital strategy. In the same manner, digital leadership is a key enabler of a successful digital culture according to Kane et al. (2015). As of this, it is the sum of the whole that creates a flourishing environment and an insufficient digital strategy may in fact be a result of a resisting digital culture or a poor digital leadership. The high interrelatedness of the different enablers of DT implies that it is impossible to state that e.g. a digital strategy and a digital strategy alone constitute a barrier to DT, i.e. a single variable analysis is insufficient in portraying the actual situation and enlightening root causes. Hence, founded in literature, figure 18 has been created to act as a map to be used to visualize the interrelatedness and contribute to both real estate actors and scholars in the understanding of organizational barriers. A common theme

according to literature is the predominant occurrence of top down influence rather than bottom up. Digital culture, digital strategy and organizational structure are all factors not exclusively but predominantly influenced by the top management. This implies that the digital leadership may play an especially important role in DT as an enabler.

Every company organizes independently, has an individual digital strategy and a different set of employees with different skills and culture, which implies that they have different challenges and different strengths. The findings of this study are not applicable for each and every actor, yet they are common occurrences in the sector. The findings are intended to shed light on possible barriers to DT and are intended to be used by the business community as a guiding star to where extra effort may be needed. For the academic community, the research is intended to act as a foundation for continued research. Furthermore, the accumulated theory on DT is yet another contribution that should not be neglected. As continuously brought up in the theory chapter, the literature on DT is novel and is yet to be amplified in the academic community. Different standpoints and views are still common and theory of DT displays a higher grade of incoherence than other more studied and mature areas. The theory of this study hopes to bring clarity to at least some areas within DT through the compiling of contrasting views and connection and visualization of different frameworks and their interrelatedness.

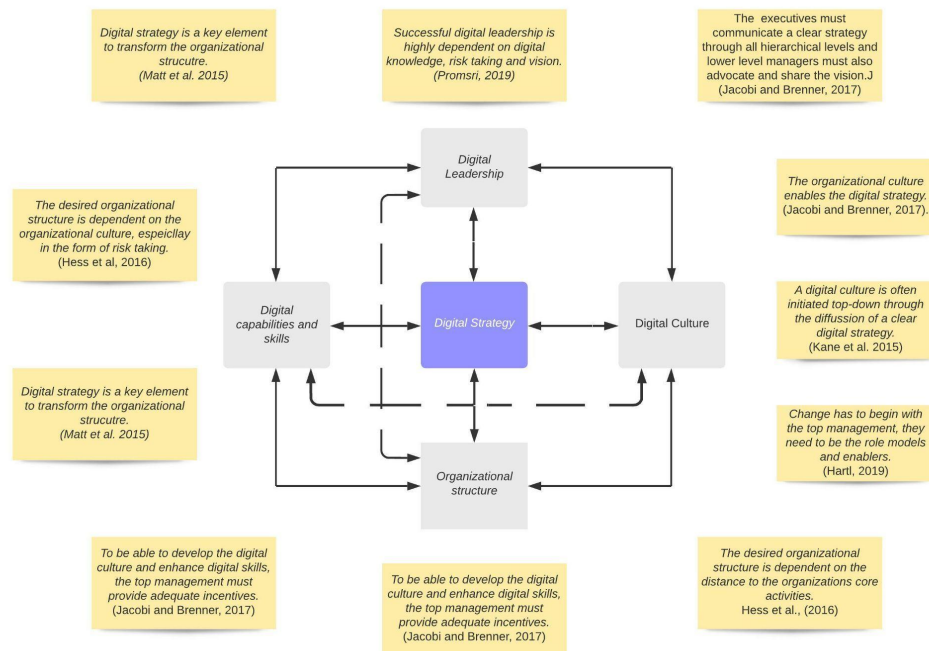


Figure 18: Visualization of the relationships between the building blocks of DT, designed by authors

6.3 Recommendations

For the business community, we have detected several barriers and among these barriers, there are indications that it could be favorable to begin with reviewing the digital strategy and the digital leadership, yet, these recommendations are not fully anchored and proved.

As of this, we recommend the academic community to continue the research on the relationships of building blocks of digital transformation to be able to determine where efforts are to start for organizations with low digital maturity.

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Appendix 1: Interview Guide

General

- *How do you work with digital transformation today?*
- *How is your digital transformation journey organized? Do you have a division that works with DT exclusively or is it diffused throughout the organization as an “extra task”? Is the division detached from the main organization?*
- *Can you tell us about some ongoing or implemented digital projects?*
- *When did you start working with digital transformation?*
- *What do you plan for ahead? Do you have a clear road map and objectives or is the work more floating?*
- *Is the main focus on improving internal efficiency or to create new customer offerings and experiences?*

Strategy

1. To what degree do you agree with the following statement: Our organization has a clear and coherent digital business strategy - **(ANSWER FROM SELF-QUESTIONNAIRES)**
 - *Can you describe your digital strategy?*
 - *Do you have a roadmap and objectives? Can you tell us about them?*
 - *How does your digital strategy align with your business and corporate strategy?*
 - *How do you work and use your digital strategy? Is it actively used in the daily work?*
 - *How did you create it? How old is it? How often do you review it? How long do you forecast/plan?*
2. How would you characterize your organization's efforts to develop as a digital business? -**(ANSWER FROM SELF-QUESTIONNAIRES)**
 - *What is your ambition? to be a e.g. a fast follower/slow adopter etc*
 - *What do you do to place yourself where you are?*
 - *Why do you want to be a “e.g. laggard or leader”.*
 - *Do you have any examples that illustrate your level of adoption?*

3. Is your organization planning to invest a higher or lower amount in digital business initiatives in the next 12 to 18 months? **(ANSWER FROM SELF-QUESTIONNAIRES)**
- *Is it planned in the next budget?*
 - *What does the increase depend on?*
 - *Can you tell us about the trend from a few years back until now?*
 - *Do you deal with digital transformation differently now than a few years ago?*
 - *What do you want to achieve with this increase?*
4. We are using digital technology essentially: to do what we've always done, but faster and cheaper OR to do business in fundamentally new and different ways? **(ANSWER FROM SELF-QUESTIONNAIRES)**
- *Can you give an example of something you are doing in new and different ways?*
 - *Can you give an example of something that you are doing to improve what you have always done?*
5. When my organization implements digital business initiatives, they tend to start as: (mostly small, enterprise wide, mixture) **(ANSWER FROM SELF-QUESTIONNAIRES)**
- *Do you have a process for how to initiate digital initiatives?*
 - *Can you give an example of the process in use or how one of your projects started?*

Organizational Culture

6. My organization primarily drives digital business adoption and engagement internally through: **(ANSWER FROM SELF-QUESTIONNAIRES)**
- *How have you worked to strengthen your digital business culture? / what are you doing to cultivate this culture?*
 - *How do you experience your culture with regards to risk taking and experimenting? Are you allowed to fail?*
 - *What do you want your culture to bring about?*
 - *Can you give any example of when you have been experimenting with digital solutions?*

- *Can you give us any example of when you have failed or decided not to continue with a digital project?*
7. Which of the following best describes your organization's strategy for digital transformation? - **(ANSWER FROM SELF-QUESTIONNAIRES)**
- *Can you give examples of things you have done/are doing to improve internally?*
 - *Can you give examples of things you have done/are doing to create new and better solutions for your customers?*
 - *How do you do your environmental/competition analysis? How often?*
 - *Do you know the results of your last environmental analysis?*
8. Which of the following best describes how business objectives and goals are set? - **(ANSWER FROM SELF-QUESTIONNAIRES)**
- *What does the process look like?*
 - *Do you have any KPIs for digital initiatives?*
 - *How do you use them?*

Strategic Responses

9. You answered that **(ANSWER FROM SELF-QUESTIONNAIRES)** is the most important technology for you right now but that **(ANSWER FROM SELF-QUESTIONNAIRES)** will be of more importance in 3-5 years.
- *What do you base your answer on?*
 - *Why do you think xxx is the most important right now?*
 - *Why do you think that xxx will be more important in the future?*
 - *Is there an analysis behind your answers or is this your personal thoughts?*
10. To the best of your knowledge, what area do you consider most important for your organization with regards to digitalization? -**(ANSWER FROM SELF-QUESTIONNAIRES)**
- *Please explain why this area is important for your organization?*
 - *Can you give an example of what you will do or are doing within this category?*

Organizational Structure

11. To what extent do you agree with the following statement: Our organization is increasingly organized around cross-functional project teams, not necessarily functions and divisions, to implement digital business priorities- **(ANSWER FROM SELF-QUESTIONNAIRES)**

- *What have you done to increase the cross functional collaboration?*
- *What was the effect of these actions?*
- *Can you tell us about any time when it has helped or hindered you?*
- *What units are involved in your current digital initiatives? Do you include people from different functions or is it e.g. only the IT department involved?*
- *Do you think you have to change the structure in order to achieve more cross-functional teams?*
- *Exempel?*

12. What were the most important factor/s that contributed to the progress of your organization's digital business initiatives? **(ANSWER FROM SELF-QUESTIONNAIRES)**

- *Can you give an example of when this factor supported or guided a specific digital initiative?*

13. What factor/s is currently creating the most hinder/s to your continued digital progress? - **(ANSWER FROM SELF-QUESTIONNAIRES)**

- *Can you give an example of when this factor hindered a digital initiative?*
- *What specific part of xxx is hindering digital initiatives experimenting, mindset, fear of change etc?*
- *Are there any other factors that you feel are hindering your digital initiatives? e.g. culture, knowledge or investments?*
- *If you were in charge, what would you do about it?*

14. To what extent do you agree with the following statement: My organization has sufficient talent today to support our organization's digital business strategy - **(ANSWER FROM SELF-QUESTIONNAIRES)**

- *How do you notice this?*
- *How do you experience that your current talent and skills affect your digital journey?*
- *Is there any specific talent your organization is lacking and how would possession of these skills contribute to your progress?*
- *How do you attract or develop talent and skills?*
- *Can you explain your latest efforts to increase your digital skills?*

- *Do you spend sufficient resources on training and development of digital skills?*
- *How did you acquire this talent?*
- *Do your capabilities allow for detection of trends, analysis of their implications and whether or not it is desirable to engage?*

15. How much time, energy, and resources does your organization spend implementing digital business initiatives? **-(ANSWER FROM SELF-QUESTIONNAIRES)**

- *How does this manifest itself?*
- *Can you say something concrete about when this was an issue?*

16. To what extent do you agree with the following statement: I expect my job to change considerably over the next 3 to 5 years as a result of digital business trends.-
(ANSWER FROM SELF-QUESTIONNAIRES)

- *How do you expect your job to change?*
- *why?*

Leadership

17. You answered that your leadership is **(ANSWER FROM SELF-QUESTIONNAIRES)**

- *Can you give an example of when the leadership enabled or hindered a project? What was it that was lacking from the leadership?*
- *What do your leadership need more of to support your digital journey?*
- *What are the most common and biggest mistakes from the leadership?*
- *Is the strategy well defined (then the vision should be clear), is the communication of the strategy and vision insufficient? Is the skills and knowledge of the leader not adequate?*
- *Is your digital leadership diffused throughout the organization? operational leaders?*

18. What are the biggest mistakes managers make with respect to digital business?
-(ANSWER FROM SELF-QUESTIONNAIRES)

- *Why do you think that?*
- *What do you think it depends on?*

Concluding questions (if needed)

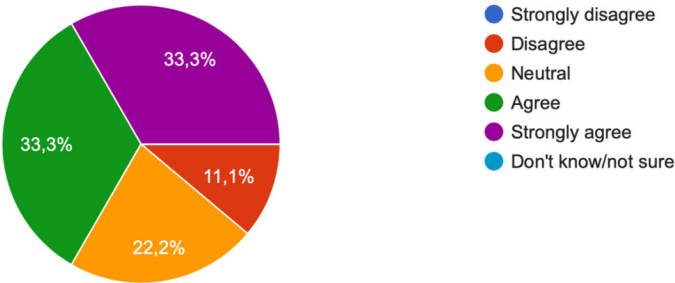
- *What do you see as the biggest hinder towards a continued digital transformation?*

- *Can you say something about where the typical digital projects get stuck or aborted? why does it happen?*
- *Do you know about any company in the sector that is doing well with regards to digital transformation?*
- *What would you like to do more of?*
- *What do you need to be able to do this?*

Appendix 2: Results from digital maturity assessment

To what degree do you agree with the following statement: Our organization has a clear and coherent digital business strategy

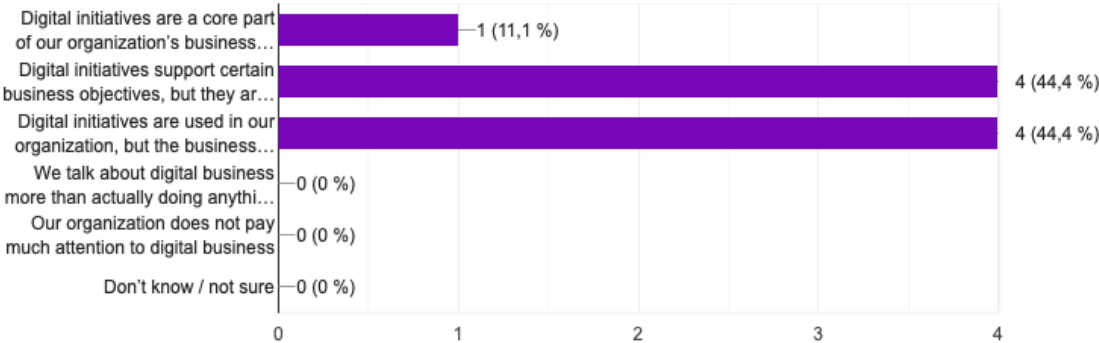
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To the best of your knowledge, how would you best characterize the primary role of digital business within your organization:



9 svar



My organization primarily drives digital business adoption and engagement internally through:

9 svar



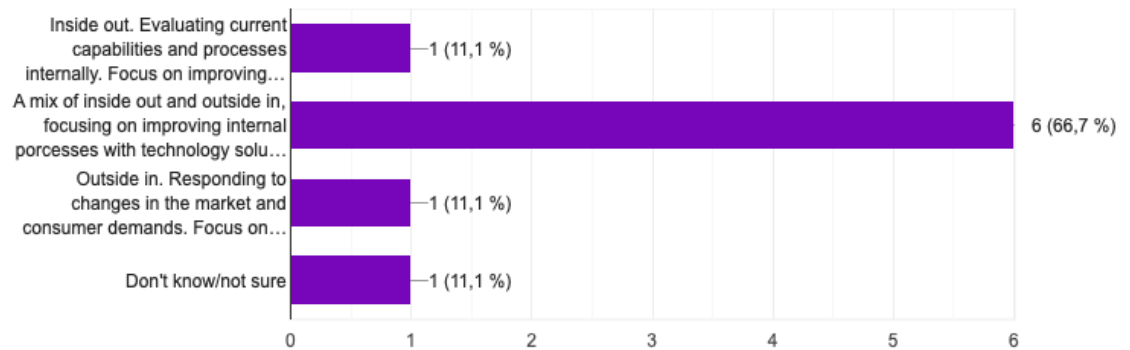
- None: My organization doesn't encourage digital adoption and engagement
- Other (please specify)

▲ 2/2 ▼

Which of the following best describes your organization's strategy for digital transformation?*

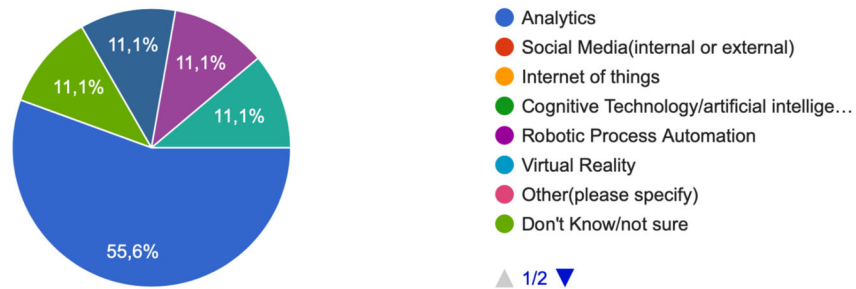
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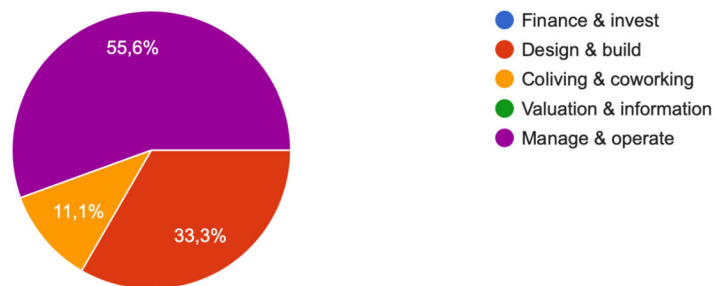
To the best of your knowledge, which specific technology is the most important to your organization this year?

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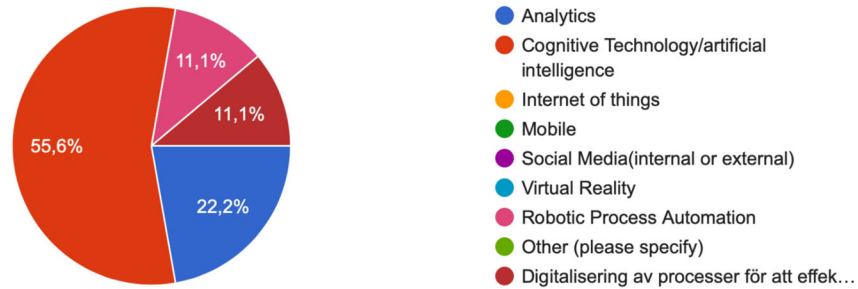
To the best of your knowledge, what area do you consider most important for your organization with regards to digitalization?

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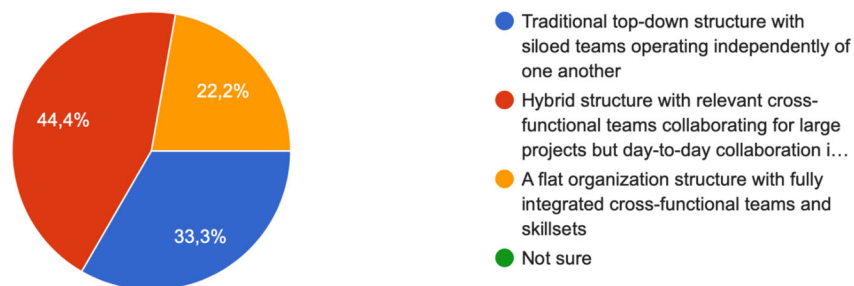
To the best of your knowledge, which specific technology will be the most important to your organization in the next 3 to 5 years?

9 svar



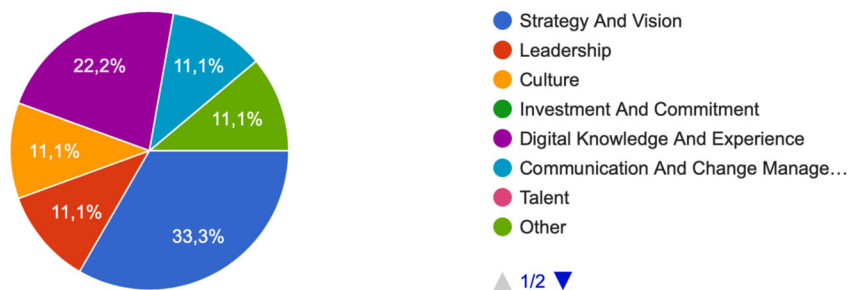
Which of the following best describes your organization's structure and way of operating?

9 svar



What were the most important factor/s that contributed to the progress of your organization's digital business initiatives?

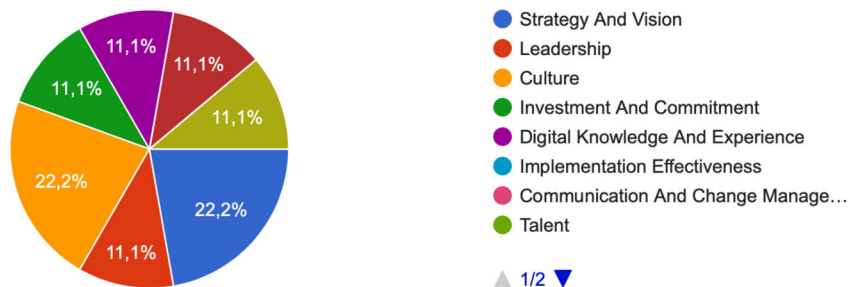
9 svar



- Technology
- Organizational structure

What factor/s is currently creating the most hinder/s to your continued digital progress?

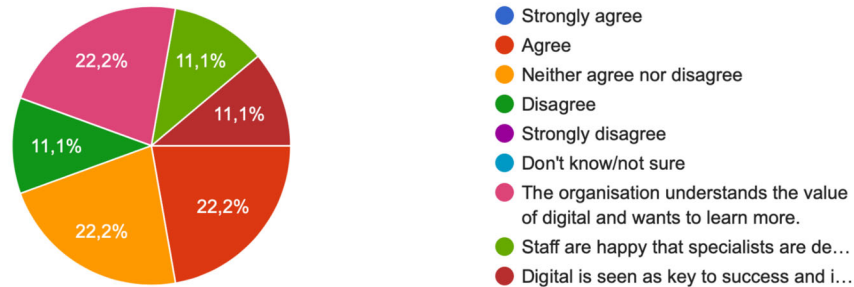
9 svar



- Other
- Technology
- Organizational structure
- Market And Competition
- Verksamhetens och kundernas förmåga att ta emot och utnyttja förändring

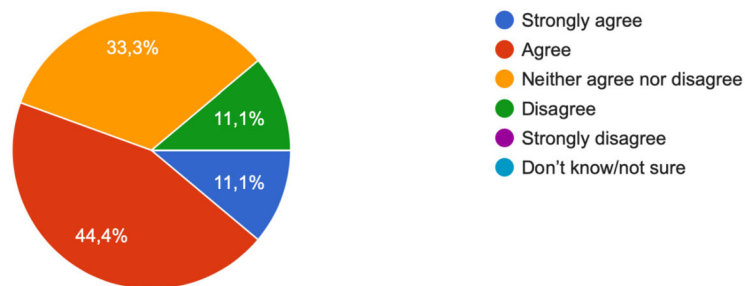
To what extent do you agree with the following statement: My organization accepts risk of failure as a natural part of experimenting with new initiatives.

9 svar



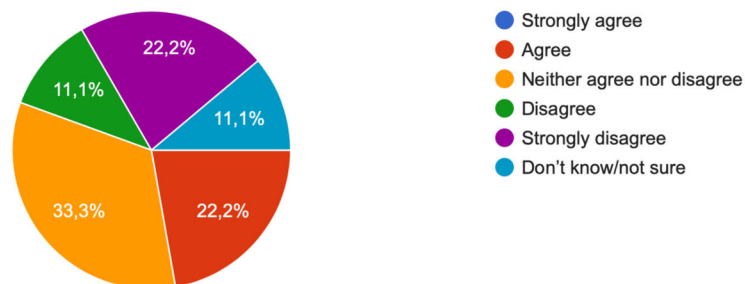
To what extent do you agree with the following statement: Our organization is increasingly organized around cross-functional project teams, no...ivisions, to implement digital business priorities

9 svar



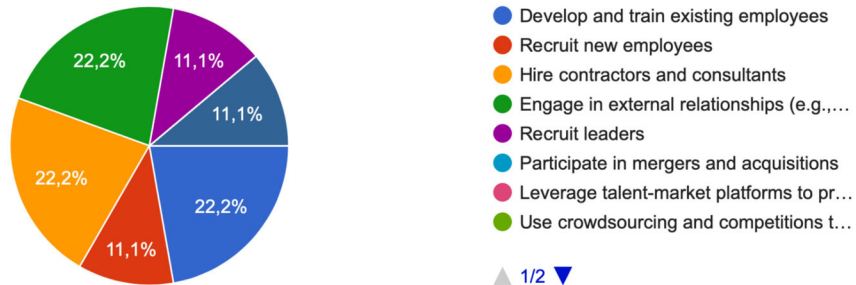
To what extent do you agree with the following statement: My organization has sufficient talent today to support our organization's digital business strategy.

9 svar



My organization uses the following approaches to get sufficient talent to support our digital business strategy: (if multiple, please select top three.)

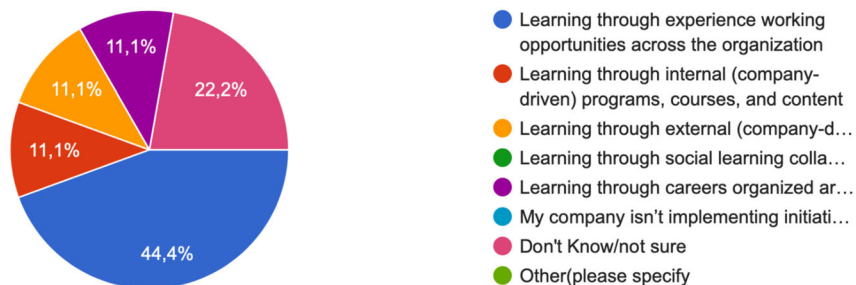
9 svar



- I don't believe my organization plans to get this talent
- Don't know / not sure
- Other (please specify)

My organization is implementing initiatives to develop our talent to succeed in a digital business environment and drive continuous learning using: (if multiple, please select top three)

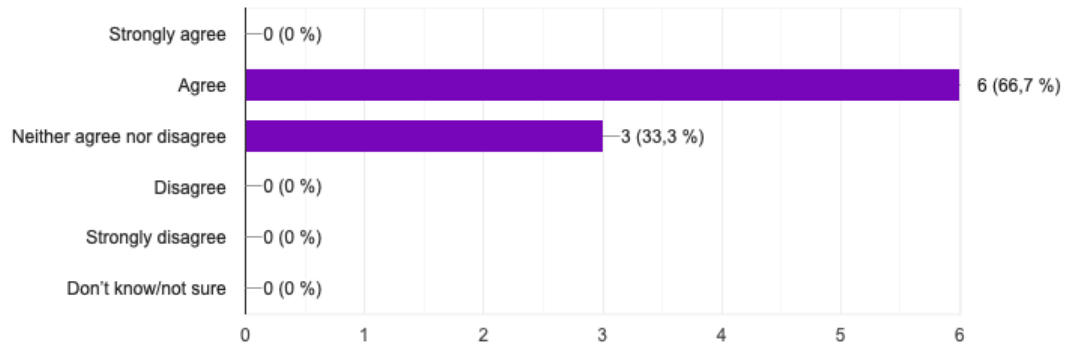
9 svar



To what extent do you agree with the following statement: My organization effectively utilizes the digital knowledge, skills, interest, and experience held by our employees.

 [Kopiera](#)

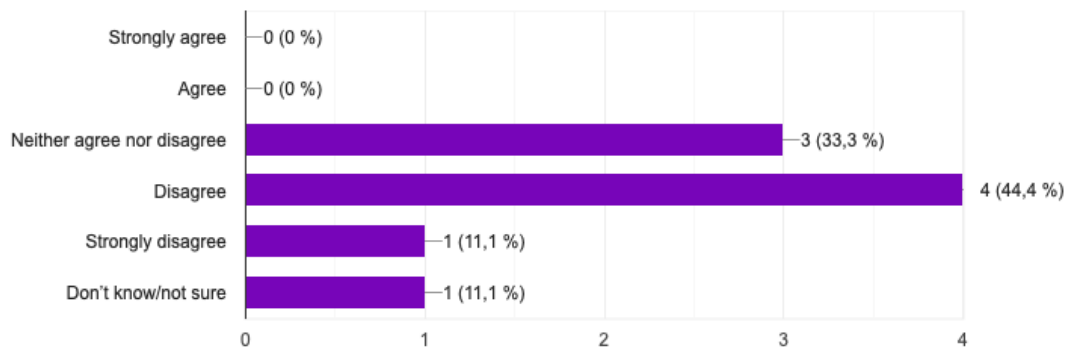
9 svar



To what extent do you agree with the following statement: The geographic location(s) of my organization hinders our ability to acquire sufficient digital talent to accomplish my organization's digital business initiatives.

 [Kopiera](#)

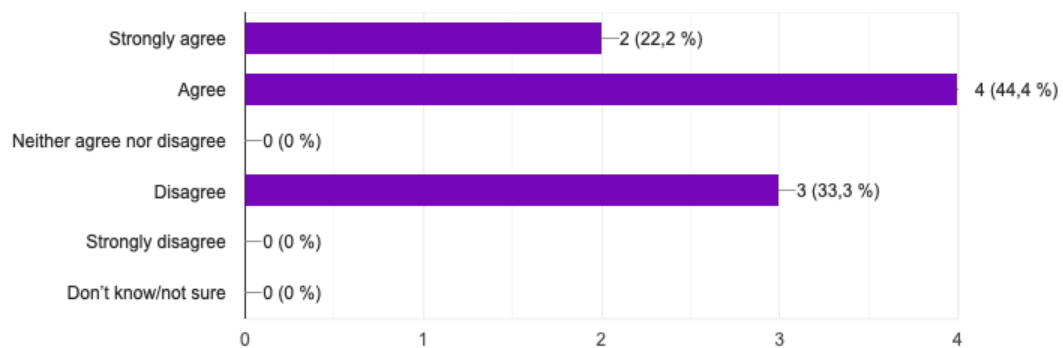
9 svar



To what extent do you agree with the following statement: I expect my job to change considerably over the next 3 to 5 years as a result of digital business trends.

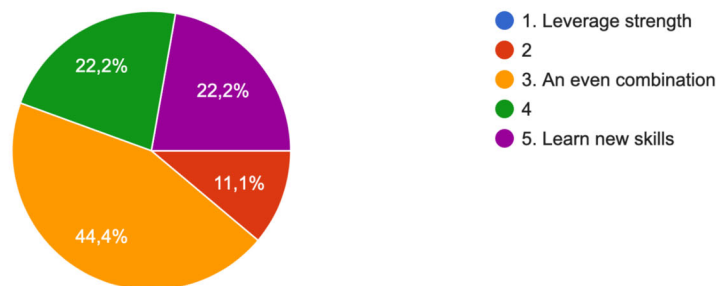
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9 svar



Do you tend to take on projects or assignments that leverage your existing strengths OR take on projects or assignments that require learning new skills?

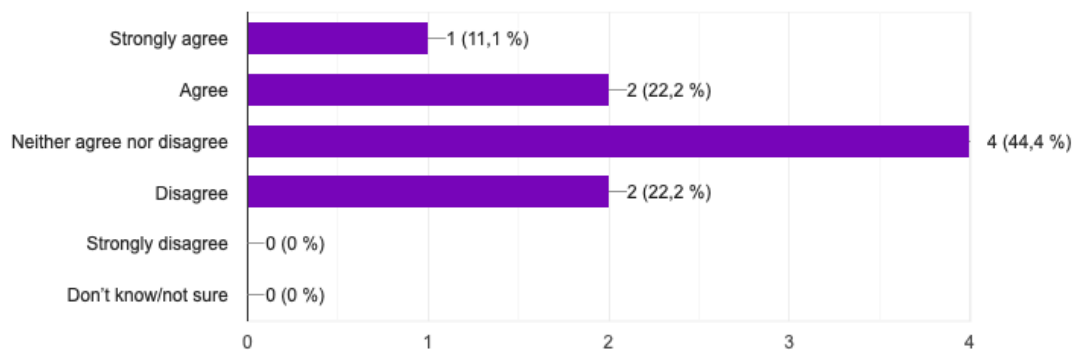
9 svar



To what extent do you agree with the following statement: My organization provides its employees with the resources and/or opportunities to develop skills and opportunities to thrive in a digital business environment.

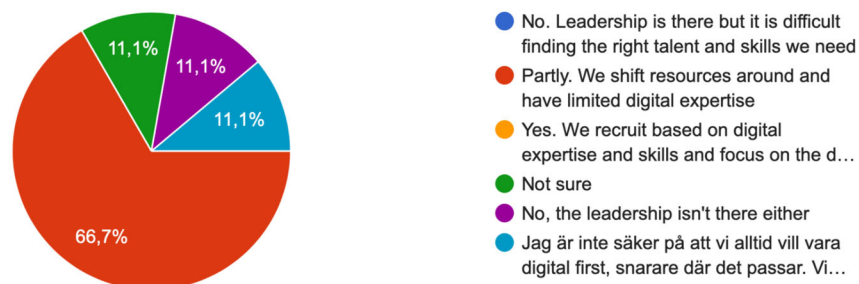


9 svar



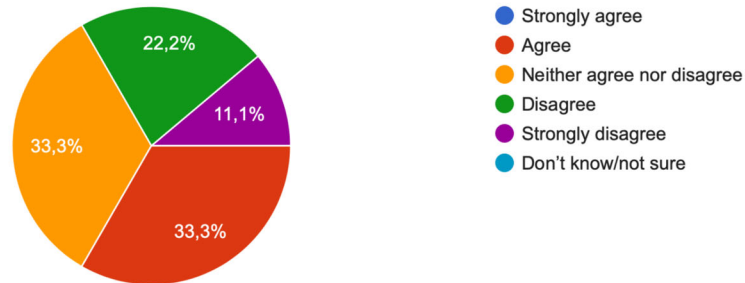
Do you have the resources needed including talent, training, experience, and digital skills to operate as a digital-first company?

9 svar



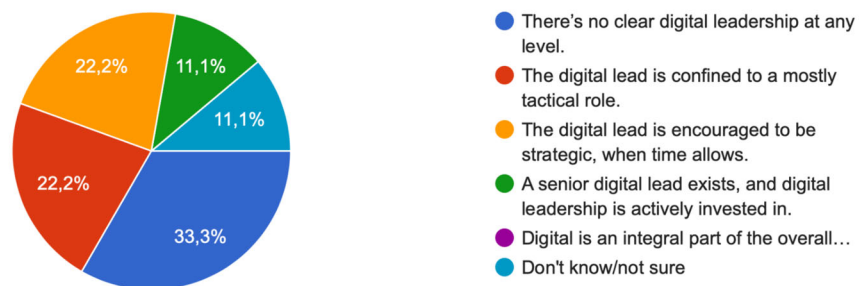
To what extent do you agree with the following statement: Our leaders have the vision necessary to lead our digital business efforts.

9 svar



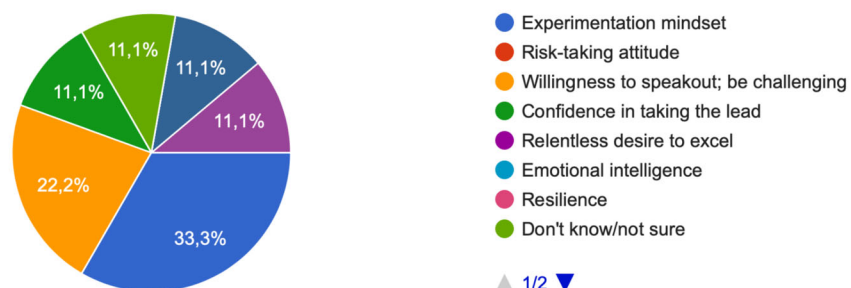
Regarding leadership, chose the option that best suits your organization.

9 svar



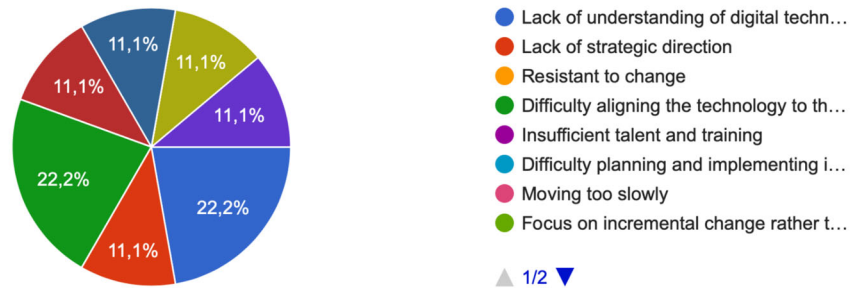
Which leadership attributes do your organization's leaders need more of to drive digital business transformation? (if multiple, please select top three.)

9 svar



What are the biggest mistakes managers make with respect to digital business?

9 svar



Which of the following best describes how business objectives and goals are set?

Kopiera

9 svar

