



CHALMERS

Digitalization and Technological Change in the Commercial Office Industry

Challenges, implications and prospects for the future

*Master of Science Thesis
in the Management and Economics of Innovation Programme*

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ABSTRACT

The trend of digitalization has influenced many industries to adopt new technologies, the residential real estate industry being one of them. Not as forward as the residential industry is the commercial real estate office industry, whom in recent years has started to become interested in the new marketing technologies that are available. Even though the interests towards these technologies seem to be high, the adoption has been limited. It is also believed that the new technologies will impact the industry and the organizations within, possibly altering the way business is conducted. Therefore, the purpose of this thesis is to investigate what factors that affect the adoption of new technology in the Nordic commercial office real estate industry, as well as how the sales and marketing process, and value propositions may change following a technological change. Three research questions were formed:

- What factors in the Nordic commercial office industry and market may affect the willingness to adopt new technology?
- How may technological change affect the sales and marketing process in the Nordic commercial office market?
- How may value propositions evolve or adapt/change due to technological change in the Nordic commercial office industry?

A theoretical framework related to the stated purpose was formed out of a literature review. The framework has a funnel approach, beginning with an industry and market perspective, followed by literature concerning the organization, individual and technology. A quantitative data collection is combined with findings from qualitative interviews. The quantitative data collection is aimed to contribute to understand the industry as a whole. The interviews are aimed to create an in-depth knowledge about the organizations, individuals and technologies. The insight gained from the literature review and the empirical findings has been analysed and compared with each other in order to answer the research questions.

The factors that affect the technological adoption varies between the technologies. However, some factors, such as culture, traditions and organizational experiences, seem to generally affect the adoption. The most common blocking mechanisms are price in relation to value gained, and quality. It is possible that the value chain of the sales and marketing process becomes leaner, and that some steps in the current value chain will be removed or integrated with each other, following a technological change. Finally, the value propositions of organizations may adapt to new technologies by allowing the customer to use less time and effort, as well as increased flexibility of customization when searching for and renting offices.

Key words: Digital marketing tool, virtual reality, technological acceptance model, innovation of diffusion, technological acceptance, commercial real estate, digitalization.

PREFACE

This Master's thesis has been carried out in Gothenburg, spring of 2016. Inputs and findings were collected mainly from companies located in Gothenburg, Oslo and Copenhagen. The thesis is the final part of the Master's degree in Management and Economics of Innovation at Chalmers University of Technology.

We would like to express our gratitude to all persons and companies involved that made this thesis possible. A special thanks to those of you who have agreed to being interviewed and continually answered our questions.

Our warmest appreciation goes to our supervisor and examiner Professor Erik Bohlin at Chalmers University of Technology for all the support, valuable time and inspiration to continue in the right direction.

Finally, we hope that our findings and results may be helpful for the actors within the Nordic commercial office industry and for the suppliers of digital marketing technology.

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Henrik Berglund & David Hoffström

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1. INTRODUCTION

This chapter will provide an introduction to the thesis. The subject will briefly be described and an insight and background to the real estate industry will be provided. Further in this chapter the purpose, scope and delimitation of the thesis will be declared.

The real estate industry is a competitive industry and new marketing solutions have become important the recent years in order to stay ahead. Digital marketing tools such as; 3D illustrations, 360-views and 3D floor plans have entered the business and more advanced technologies are now about to break through. Digital marketing tools have from the beginning been the focus of the residential real estate industry. However, recently the interest for this sort of products has also started to grow in the segment of commercial real estate office market.

The commercial real estate industry is perceived to be old fashioned and known for not embracing new technologies. This is confirmed by Jacobsohn (2016) who points out that the industry is hard to influence, but it seems that something is about to change. It has taken some time for the new technologies to enter, but they are now on the way to become implemented in a greater extent. Another indication is, for example that Facebook recently invested 2 billion dollar in the company Oculus VR that develops and produces virtual reality solutions. Partly this investment was made for the potential of the technology in the real estate industry. It is believed that virtual reality and other digital marketing tools will be a game changer for the industry the coming years (Brandon, 2015).

1.1 DIGITAL MARKETING TOOLS IN REAL ESTATE INDUSTRY

The commercial real estate business has grown more and more and the development of digital technologies has increased the opportunities to market an object significantly (Motion, 2016). Perry (2015), who is director of marketing and communication at one of the larger real estate companies established in the US, states that there is no doubt about that the new technologies will change the industry completely in the future. It might therefore also be more important to invest in these kinds of technologies to not fall behind.

Several of these digital marketing tools, including virtual reality, have been known for some years in the industry and one can ask why they have not been adopted in a greater extent? The somewhat slow technological development has delayed the commercial use and it has also been complicated to find application areas for the broader market (Deloitte, 2016). The willingness to adopt the new technology has also been affected of that the expectations of the technology somehow have been significantly higher than what the current technology can deliver (Jacobsohn, 2016). Furthermore, the willingness to adopt these digital marketing tools is not only about the technological development, it can also be affected of the resistance from the organization or management as well as an inability to see the economic value from such an investment.

Maybe it is not until now, in the middle of the 21st century, that the technology will hit the mainstream and break through within the commercial real estate industry. This is also supported by the predictions of Deloitte (2016) believing that the technology, especially the virtual reality, will find a wider range of use within different enterprises over the coming years.

One of the major reasons for using the digital marketing tools may be in order to help an architect or a real estate agent to explain for the customer how a property might look when it is completed or rebuilt. In many cases it is difficult for the customer to imagine how the final result will look like. There may be major changes in terms of removing or inserting walls, change colors or add different furniture when a tenant is replaced and a new move in. The buyer often believes that they understand what the seller explained but in the end, the buyer and the seller have two different views of how the object should look like. This technical approach to customization may be both more efficient and cost effective than building physical models or hiring architects to create visualizations (Brandon, 2015). Currently, there are several tools available that could strengthen the marketing efforts of real estate organizations, as well as granting the customers visualizations that may increase their understanding of an object.

This thesis will primarily focus on the application area and adoption of digital marketing tools such as; Virtual Reality technology, 3D-illustration tools, 3D-planning tools, videos and 360-views in the commercial real estate segment used when marketing a property or a vacant office space.

1.2 PURPOSE AND RESEARCH QUESTIONS

The purpose of this thesis is to give a profound understanding of factors that positively or negatively influence the adoption of new digital marketing technologies at industry and firm level within the Nordic commercial office industry. This study also aims to investigate how future value propositions for real estate firms may change following an increased adoption of new marketing technologies.

In order to perform this study following research questions have been constructed:

- What factors in the Nordic commercial office industry and market may affect the willingness to adopt new technology?
- How may technological change affect the sales and marketing process in the Nordic commercial office market?
- How may value propositions evolve or adapt/change due to technological change in the Nordic commercial office industry?

1.3 SCOPE AND DELIMITATIONS

The scope of this thesis is to evaluate factors that affect technological change, as well as the effect technological change may have on the industry and the organizations within. By conducting this study the researchers aims to present different value propositions for firms within the new digital marketing technology industry, that will fulfil the needs of the customers in the Nordic commercial office market.

This study has been delimited to only cover the Swedish, Norwegian, and Danish commercial office market. Furthermore, only major actors in each Nordic market have been considered when constructing the value proposition. These actors are considered to be the most valuable potential customers that will allow access into the mainstream market.

Moreover, it should also be mentioned that the outcome of this thesis will not be a generalizable framework that should be followed in order to access the mainstream market within the new digital marketing tool industry, the thesis will instead lead to recommendations.

1.4 DISPOSITION

Chapter 1 - The first chapter provides a background and introduction to the topic, followed by the purpose and the research questions of the thesis. After this, a declaration of the scope and delimitations are stated.

Chapter 2 - In the second chapter the theoretical framework will be presented containing an industry analysis, market analysis and different concepts essential for the further analysis of the research questions in chapter six.

Chapter 3 - Chapter three will give the reader an understanding of the methodologies used for the thesis and needed in order to answer the questions. The chapter will also dive deeper into different methods for data collection and structure of interviews. Moreover, the quality and the reliability of the thesis will be questioned.

Chapter 4 - In the fourth chapter a brief summary of the digital marketing tools will be described. In essence, five tools are chosen to get an overview of the solutions available and used within the industry.

Chapter 5 - The fifth chapter presents the empirical findings. This chapter is divided into further subgroups; the industry, technological adoption in the industry, the organization, barriers to adopt and the prospects for the future.

Chapter 6 - The findings are here analysed based on the current industry state and structure. Furthermore, a glimpse of the future scenarios as well as changes in the structure and in the value chain/sales process will be provided.

Chapter 7 - In the last chapter the thesis will come to a conclusion and sequentially answer the research questions.

2. THEORETICAL FRAMEWORK

In this chapter the theoretical framework will be presented and explain the concepts relevant for the further analysis within this thesis. At first, the industry and market analyses will be explained. Thereafter, different concepts such as diffusion of innovation, technology acceptance and the product life cycle will be declared. Lastly, different barriers towards this sort of technological change and change agents will be discussed as well as the value propositions.

2.1 INDUSTRY ANALYSIS

Schumpeter (1934) described industry change as an evolutionary process where the old structure is destroyed, and from the old a new structure is created in a disruptive and radical manner. While structures may be renewed due to technological change, industry factors may have impact on the future trajectory and technological adoption (Dosi, 1997).

As described in the above section understanding of the industry and market structure is important for understanding how it may affect technological change. Porter's five forces framework can be used to understand the industry structure, and will be explained below.

The business environment can best be described as the relationship and the synergy between customer, suppliers and competitors in the industry environment (Grant, 2013). In order to stay profitable in the industry the firm need to relate to three factors; the product value to the customers, the level of competition and the bargaining power from the players in the industry relative their suppliers and buyers. This will be explained further in the following sections.

2.1.1 PORTER'S FIVE FORCES FRAMEWORK

In contrast to the macro-level perspective, the influences from the micro-level affect the profitability and the attractiveness of the industry, thus resulting in the attractiveness of the industry for a firm. The most well known and used tool for analysing the industry attractiveness is Michael Porter's framework; Porter's Five Forces of Competition (Grant, 2013). According to Porter (1979) the framework is used mainly to analyse the competition within the industry but also to predict the potential for profitability in an industry, Porter defines this as industry attractiveness. The base of Porter's framework can be identified as five competitive forces; *competition from substitutes*, *threat of new entry*, *rivalry among existing firms*, *bargaining power of suppliers* and *bargaining power of buyers*. Grant (2013) also stresses that in some cases it might be good to take a sixth force into account, namely *complements*. The following paragraphs below will more deeply explain the forces.

Competition from substitutes. What the customer is willing to pay for a specific product or service may vary depending on the competition from substitute products (Grant, 2013). It may also be that your customers solve the problem or the need they have in other ways than can be predicted from the beginning. For example, an automated process solution can be solved manually or eventually be outsourced. Competition from substitutes can be prevented by having a complex product where it is difficult to precisely discern the performance of the product in comparison with, for example price.

Threat of entry. The power of the firm can be affected by new entrants into the industry (Grant, 2013). If it is easy for other firms to establish themselves with relatively low costs and in a short timespan the profit within the industry will eventually decline to a competitive level. Most often the already established firms

have advantage in form of entry barriers that can differ in difficulty to getting across. The barriers can consist of capital requirements, economies of scale, absolute cost advantage, product differentiation, access to channels of distribution or other barriers such as governmental or legal barriers.

Rivalry among existing firms. One of the major forces that a firm encounters within the industry is the competition and rivalry from the other players (Grant, 2013). The players in the industry are trying to find the best position and manage their best way to the top (Porter, 1979). This can be done using several approaches and tactics like; competition in price, bringing in new products and aggressive marketing. There are also some other known factors affecting the intensity of rivalry. One of these factors is the concentration ratio, the competition will go up the more and bigger players competing in the industry. It is also linked to the diversity of competitors and their differentiation of products.

Bargaining power of buyers and suppliers. In the industry the firm competes in two types of markets; the market for inputs and also the market for outputs (Grant, 2013). In the market for inputs the firm manage the purchase of raw material, financial services and other components needed. In the opposite side the firm would like to sell their goods and services in the market of outputs. The firm must function well in both of this market in order to maximize their profit. The power of the firm can vary in this different markets depending of the bargaining power of the suppliers and the buyers (Porter, 1979). Say for example that there are few suppliers resulting in that they raise the price or deliver a lower quality of the purchased goods or services. This will eventually cause that the profitability in the industry are squeezed and minimized. Likewise, the buyers have the power of forcing down the price or demanding a higher quality. This resulting in a more expensive cost of manufacturing and declining profits.

Complements. Porter (1979) describes five forces that plays an important role in the evaluation of the attractiveness of an industry. And as mention, Grant (2013) would like to bring in a sixth force in that framework. The sixth force, complements, is important to take in consideration when evaluating the competition and profitability. It could be described that complements have the opposite effect on a product or a service than what a substitute has. The complement has the ability to increase the value of the industry's product, and it is therefore necessary to take this force into account when analysing the business environment.

2.2 MARKET ANALYSIS

Gilbert (2006) discusses incentives for organizations to innovate, which also relates to the incentives to adopt innovations. The incentives can be either strong or weak depending on what type of market it is and what the inherent market structure is like. Incentives to innovate can occur when innovation give an actor the opportunity to increase profits, leapfrog ahead of another actor, differentiate, protect a market position or lower production costs.

To create a deeper understanding of factors affecting adoption of new technology, and to complement the industry analysis, a market analysis can be conducted. There are several ways to conduct such an analysis and one way to approach it will be explained in detail below.

2.2.1 DETERMINING THE SIZE OF THE MARKET

Steenburgh (2010) uses an established toolkit for describing the market size that provides an overall picture of the current market situation. The very first step in that approach is to identify all the potential customers and buyers in the market. The advantage of having control over the potential buyers is that they

can later easily be categorized and segmented in different groups, regarding of the outcome of the analysis.

The market itself can be divided into different subgroups, the part of the market with customers that shows some interest, or a potential interest, in the product is called the *total potential market* (Steenburgh, 2010). An overview of the subgroups of the market can be seen in *figure 1*. Worth knowing is that it can be difficult to transform the total potential market into direct sales. Although the product would be reasonable to sell to the customers, they would probably be unaware of it existence unless the marketing is very extensive.

The next level, after the total potential market is the *available market* (Steenburgh, 2010). This part of the market is the one that has an interest in the product and capital to invest in the product. Following, the *target market* is that part of the market where the company decides to carry out marketing activities.

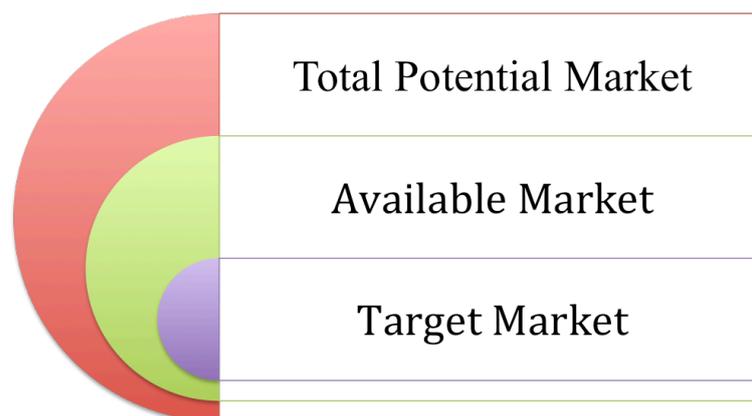


Figure 1 - Subgroups of the market (Hoffström et al., 2016)

2.2.2 SEGMENTATION

Market segmentation is a business strategy and is a rather broad concept used in different businesses (Falonius, 2013). The concept can simply be described as dividing a bigger target market into submarkets with some kind of similarity or commonality (Thomas, 2007). By dividing the market into submarket it is easier to see the concentration within a specific market. Another explanation may be that segmentation is a part of the established market structure (Grant, 2013). Grant (2013) also points out that segmentation is important when it comes to analysing the competition in a particular market. Usually, market segmentation is the first step in the process of determines and analyse the target customer in a specific market.

Market segmentation can be divided into a wide range of segments such as geographical, channels of distribution, price, demographical, time and lifestyle (Thomas, 2007). The most common segment is likely the geographical, where companies focus on different geographical areas to establish themselves or expand their sales. Geographical segmentation itself may have several different meanings and focus can be urban or rural, coastal or inland, north or south, and so on. Another very common segment is the demographical and it usually have a central role in the segmentation process. A less common segment to mention anything about is the time segment.

2.3 TECHNOLOGY ACCEPTANCE MODEL

A widely used model for determining attitudes and behaviors of individuals that influences the adaptation of new technological systems is the Technology Acceptance Model (TAM) developed by Davis (1986).

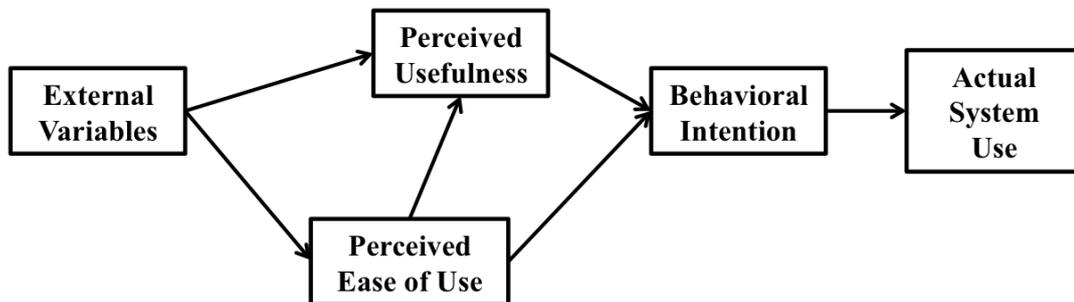


Figure 2 - Technological Acceptance Model (TAM) (Davis, 1986)

The model, see *figure 2*, assumes that perceived usefulness (PU) and perceived ease of use (PEOU), influences the behavioral intention (BI) to accept a new technology, which in turn will influence the actual use. The external variables directly influence the usefulness and ease of use, but only indirectly influence the behavioral aspect of the model. The external variables refer to all possible variables, for example: characteristics of the individual, peer pressure, and quality of output.

In a study conducted by Davis et al. (1989), they found that (BI) is the major determinant for actual system use. And the major factor impacting (BI) was perceived usefulness. However, criticism against the TAM-model has occurred. For example, the TAM framework does not consider if the use of the system is voluntary or mandatory. According to Brown et al. (2002) the factor perceived ease of use may be more influential in mandatory settings than was thought earlier. Further, Bagozzi (2007) questions the use of (BI) as the major determinant. He states that the period between intention and adoption might be long and may be influenced by external variables that may alter the (BI) and lead to another decision. As a result TAM should, according to Bagozzi (2007), not be used to predict system use.

2.4 INNOVATION OF DIFFUSION THEORY (IDT)

TAM and IDT are not related or based upon each other, but they do however have some similarities (Lee et al., 2011). Relative advantage is similar to perceived usefulness, and complexity is similar to perceived ease of use. According to Lee et al (2011), it is often recommended to complement TAM with additional frameworks in order to cope with rapid changes and increase the robustness of the research. In their paper, Lee et al. (2011) found that the IDT framework had impact on PU and PEOU of the TAM framework in all but three instances: Observability does not support neither PU nor PEOU, and compatibility does not support PEOU.

Lindmark (2006) stresses that the diffusion theory links the technology and innovation with the economic aspect. The theory is based on how new technology spreads between different groups of people, potential adopters. In particularly the theory points out that only if the user adopt the new technology it will have an positive relevance to future economic. The theory "*Diffusion of Innovation*" was established by Everett Rogers and first published in his book with the same name 1962. Lindmark (2006) explains the concept as to what degree information about an innovation spread over time through different information channels

and in the social system, which in turn affects different categories of adopters and their decision processes. Rogers (2003) define the social system as units that somehow are connected with each other and have the need of solving a problem in order to achieve a common goal. He divides the potential adopters in five categories; *innovators*, *early adopters*, *early majority*, *late majority* and *laggards*.

Innovators. This group of adopters are easiest recognized through their risk-taking or initiative to try new technologies (Lindmark, 2006). As shown in the *figure 3* it represents 2.5% of the population. The innovators can easily work and are capable to handle a product that is underdeveloped and complex. As the curve shows in the *figure 3* this is not the category that influence others and thus spreading the innovation. But they are important for the establishment of the product and the new technology. The innovators, or lead users according to Von Hippel (1998), are users of a product or services that will be a need for the majority in the future, but for them these needs are still unknown.

Early Adopters. At this stage the adopters are more aware and more integrated with the information channels giving them the opportunity to lead the diffusion of the innovation in a better and more efficient way (Lindmark, 2006). They easily spread information and share their opinions with other potential adopters.

Early Majority. This group usually adapts an innovation slightly before the means population (Lindmark, 2006). They are not opinion leaders of the innovation like the early adopters, but by their size they have a greater chance of connecting with the larger mass on a more powerful way.

Late Majority. By this time, this category adopts to the innovation because they must, more or less (Lindmark, 2006). This may simply be because they will see economic consequences if not adopting to the new technology and eventually profit losses.

Laggards. This category will be the last to adopt the new technology. The laggards are isolated from the social system and will only adopt if they absolutely must. A major reason for this is the perception of high risks and the scarce resources in relation to adoption.

The five categories are then scattered in a graph showing the adaptation curve over time, as can be seen in *figure 3*. The figure does not only shows adopter categorization based on innovativeness, it also shows the approximated percentage of individuals that are distributed in the different categories under the graph.

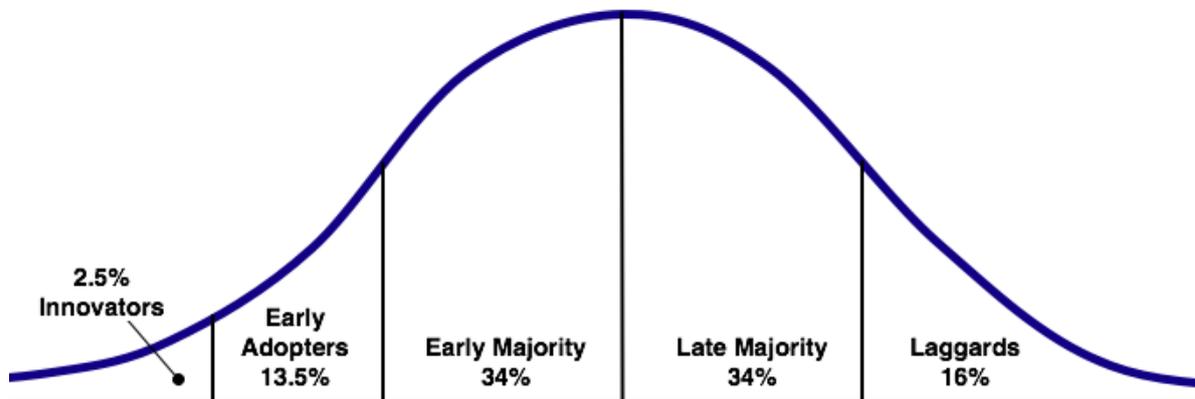


Figure 3 - Categories of innovativeness (Roger, 2003)

To get a better insight into the various adopter categories this will be described below. As can be seen in the graph it is not symmetrical. There are three categories to the left of the mean and consequently two to the right.

In a compendium written by Lindmark (2006) he points out the factors written by Rogers that affect the rate of diffusion of an innovation, namely; *relative advantage*, *compatibility*, *complexity*, *trialability*, and *observability* of the innovation. Rogers (2003) mentions that he thinks one of the main elements for diffusion of innovation is the innovation itself. Rogers (2003) argues that an innovation is an idea, practice or object, perceived as new by the user. In order to be adopted, the innovation has to go through a diffusion process, which is influenced by the five factors mentioned above. According to Rogers (2003), the factors that have the largest impact on the adoption rate are relative advantage and compatibility.

Relative advantage. The relative advantage of an innovation is the user's perception of what advantage the innovation has over the previous counterpart (Rogers, 2003). Economic and social terms, convenience, and satisfaction are all important factors determining the relative advantage of an innovation. Rogers argue that the greater perceived advantage, the greater the rate of adoption will be.

Compatibility. This factor refers to how aligned the innovation is with existing values, norms, and needs. A deviation in compatibility will result in a slower rate of adoption. The reason for the slower rate of adoption according to Rogers is because often a new value system must first be in place in order for the adoption to occur.

Complexity. The perception about how difficult it will be to understand or use an innovation, determines the complexity of the innovation. A high degree of complexity will decrease the adoption rate.

Trialability. The ability to be able to experiment prior to adopting an innovation will generally increase the adoption rate. This may reduce uncertainty by potential users, and they get to know the innovation better.

Observability. This factor relates to how visible the results and outcome of an innovation is available for other individuals. This factor facilitates the peer-to-peer sharing of information, which may lead to an increased adoption rate.

2.5 THE CHASM AND CHANGE AGENTS

The chasm, described by Moore (1999) as the difference between the early market and the mainstream market, is seldom acknowledged by firms when introducing new technology. The transition between these very different market types may cause a hazard for firms trying to penetrate the market, which will allow the company to become successful. Moore (1999) argues that a failure to cross this chasm may cause the technology or firm to perish. As Moore (p.7, 1999) puts it “...*high-tech products start out as a fad...no known market value or purpose...generate a lot of enthusiasm...within...early adopters*”. The product will become successful if the mainstream market can find a purpose out of the existing value proposition.

Moore uses the diffusion of innovation theory to describe the different customer types, from innovators to laggards, and where the chasm exists, between early adopters and early majority. The difference between these two customers is what they are buying and for what purpose they are buying it. The early adopter customer wants to be the first in the market and hope for some kind of competitive edge, Moore (1999) refer to these customers as change agents. On the other hand, the early majority wants to increase the efficiency of existing operations without the risk of encountering problems. Furthermore, they want the product to be integrated into the already existing processes and operations of the firm. The existence of reference customers is of high importance for the early majority, they hesitate to buy a product that has not yet proven its functionality and performance.

The mainstream market consists of early majority, who are seen as first movers by the late majority, and finally the laggards who are suspicious to new technology and thus not influenced by either early majority or late majority. For the developers of the new technology, the access to the mainstream markets goes through the early majority customers. Long-term relationships and long-term reliability is valued high, which means that quality must be good, and that the surrounding systems and interfaces must work. Even though these customers are willing to pay a relatively high price for a product of good quality or where extra services can be offered, they are still price-sensitive and demand a fair price.

The other half of the mainstream market consists of the late majority. This customer type is holding onto the old technology that has been used, and is not very keen nor fast in changing to a newer technology. The late majority has two major prioritizations when it comes to buying new products, low price and high quality. In addition to these demands, the late majority rank ease of use higher than the performance of the product.

2.6 PRODUCT LIFE CYCLE

A well-known concept associated with the industrial revolution is the product life cycle (PLC) (Porter, 1980). If the company has a good insight into the PLC they also got a better chance to manage the lifecycle and the marketing of their products in a better way. The concept is based on that a product is predicted to have a specific lifespan consisting of four different phases; *introduction, growth, maturity* and *decline*, as can be seen in *figure 4*. The PLC concept has been developed through comprehensive quantitative analyses and case studies looking at different industries (Klepper, 1996). The curve, which is formed during the various phases, can be visualized by a S-shaped curve plotted over a length of time

depending on the sales volume (Porter, 1980). A classic S-curve begins quite flat and then shows a rapid exponential growth for a period of time before it subsides after a while.

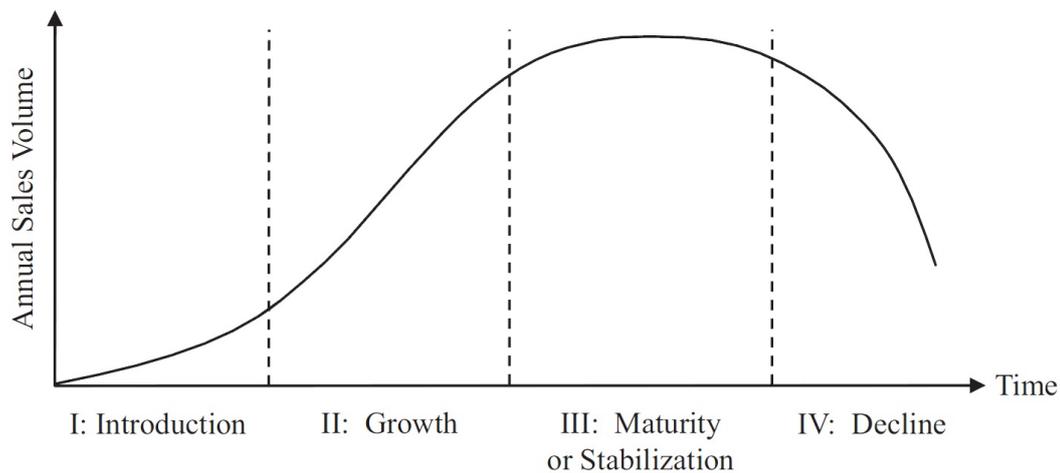


Figure 4 - Product life cycle at different stages (Klepper, 1996)

Introduction. According to Porter (1980), the flat period of the S-curve in the beginning of the PLC is the introduction phase. In this phase there is certain inertia at the market and it can be hard to break through and make the industry aware of the product. To overcome this inertia the buyer must be convinced to try the product, even if the product initially have poor quality and a basic design. To increase product awareness the company will have to have an extensive marketing and advertising, which also leads to high marketing costs in comparison with sales volume. Although it initially may be some major costs related to the product this could be the best period to increase the market share. This because, there are still few companies established to compete against. However, also to mention is that the risk of bringing a new product to the market in the very beginning of the introduction phase is very high.

Growth. The second phase in the product life cycle is the growth phase. The growth phase can be recognized by the company's attempt to establish the product at the market, increasing the sales and at the same time improve the profit margins (Porter, 1980). This is usually done by finding a wider buyer group and differentiate the product from the competitors' solutions. In this phase the S-curve starts to go quite steep upward as a result of the increase in sales. The reason for the sales increase can be improvements in the quality and the increased number of distribution channels used. In this phase the marketing costs are still high but also extremely important in order to raise awareness of the product. When looking at the overall strategy in this phase the marketing can be described as a key function. The number of players at the market is many and more competitors will enter during this phase.

Maturity. The third phase of the PLC, maturity, is said to be a little harder to get through than the first two phases. In the phases before this one the aim has been to establish the product at the market and try to take as much market shares as possible. In this third phase the company will meet some resistance. The product has now reached the mass market and saturation at the market can be noticed (Porter, 1980). The quality of the product is superior and the company has stopped to differentiate and make changes in the product, except for a few times a year. In this phase, it is not time for increase the market shares. Focus should instead be in maintaining the market shares that already are established and be prepared for the price competition that will occur. As a result of the falling prices the profit as well as the margins will be lower and the company will earn less on the product.

Decline. The final phase; the decline phase, is the end time for the product at the market and both sales and profit margins decrease significant (Porter, 1980). The S-curve is now slowing and falling back down in line with declining sales due to overcapacity and inadequate margins. Many companies will choose to exit and there will be fewer competitors at the market and it is now only a matter of time before the remaining companies must do the same.

However, it is important to notice that the PLC vary widely in design and scope between different industries (Porter, 1980). It can also be a little unclear exactly where the different phases differ and changing shape. It may also be the case that some industries skip a specific phase, going for example directly from growth to decline. With this in mind it is considered hard to use PLC as a reliable planning tool.

2.7 BARRIERS TOWARD TECHNOLOGICAL CHANGE AND ADOPTION

Switching costs are what the customers feel that they have to give up or how they will be penalized when switching from a product or service to another (Matzler et al., 2014). The penalties which occur during a switch can be categorized in positive and negative constraints, which in turn is translated into gain-related and loss-related switching costs. Gain-related switching costs are benefits that the customer will enjoy by staying with the current product, and the loss-related switching costs refer to the losses that will incur if the customer switches to another product. Molina-Castillo et al. (2010) suggests that a customer may face any of these, and of combination of these costs when switching products:

- Search costs
- Transaction costs
- Learning costs
- Loyal consumer discounts
- Consumer habit
- Emotional cost and cognitive effort
- Financial, social and psychological risk

As a result, if the switching costs for the consumer are high enough, it is more likely that the consumer will keep using the old product rather than testing a new. Further, proposed by Matzler et al. (2014), the switching costs described above can be categorized even broader:

- Financial switching costs, are switching costs that can be measured in financial terms. For example costs that will occur if a contract is broken or cost benefits from a long term relationship is lost.
- Procedural switching costs, are switching costs related to time, effort, and risk. For example learning a new product or the time and effort in searching for a better alternative.
- Relationship switching costs, are switching costs that include personal relationships with individuals, brands or other aspects of a supplier.

All types of switching costs can be defined as a “give” or “take” dependency (Lam et al., 2004). For example, financial switching costs refers to a customer giving measurable financial resources to a

provider, who gives a product which will provide the customer with a value, thus financial resources are taken while customer value is given. This scenario is also applicable to the other types of switching costs where the financial aspect is replaced with either procedural, or relational switching costs.

Price sensitivity often renamed as consumer willingness to pay, measures when a customer perceives a product being too expensive or too cheap (Roll et al., 2010). A popular tool of measuring this is the price sensitivity meter (PSM), developed by Van-Westendorp in 1976. This model is based upon four questions and the aim is to find the optimal pricing point. The questions primarily refer to the financial aspects of a product, but may also consider the perceived value. According to Lam et al. (2004) the perceived value of a product from the current supplier may induce relational switching costs unless competitors can increase the perceived value of their product. Supporting this view, Yang and Peterson (2004) further argues that the perceived value in relation to competitors is one of the main drivers for customer retention. Furthermore Yang and Peterson (2004) argues that customer value is the dominant factor when customers decide whether they should stick to the current supplier or replace it with a new,

Even though, at a first glance, price sensitivity may be perceived to only relate to the financial aspect of switching costs, it may also relate to the procedural and relational categories. A well-known competitive strategy for organizations is differentiation (Grant, 2003). Organizations can induce switching costs by creating a relationship with their customers through unique products or services that creates relational ties between the organization and its customers. Consumers may experience uncertainty and a risk associated with switching provider (Caruana, 2003). Furthermore, several studies have shown that some consumers choose to stay with the same brand, even though the price increases (Han et al., 2002). Thus, the consumer may see no gain in investing time, effort and risk in finding a new supplier.

Consumer loyalty and satisfaction with the current supplier-buyer relationship is argued to have a major impact on willingness to put time and effort to evaluate and adopt new products and services from another supplier according to Matzler et al. (2014). Further, the more experience in switching a buyer has the higher the expectations will be on new potential suppliers. Several authors argues that habits and routines seem to be a strong factor that impact consumer loyalty and increases switching costs, and Lam et al. (2004) expanded this theory when they found support that perceived value is a factor that has a positive effect on customer satisfaction. Continuing, Matzler et al. (2014) found support that customer satisfaction and customer loyalty had impact on financial and relational switching costs, but also dismissed that satisfaction and loyalty would have an effect on procedural switching costs.

Switching costs are an important factor when discussing lock-in effects. Lock-in effects can originate from a variety of sources, for example as suggested by Williamson (1981), from transaction-specific assets where the value of these assets in this transaction surpasses the value if the assets would be used for another purpose. This creates a lock-in effect where the transaction partner is to some degree forced to participate. Further, Nelson & Winter in 1977 coined the term technological regimes, which was renamed by Dosi in 1982 to technological paradigms. These theories suggest that companies become path dependent or “locked-in” to a specific path of technological advancement, and where the cognitive abilities are constrained by boundaries (Perkins, 2003). As a result of these cognitive constraints, solutions and ideas, even though superior to the incumbent technology, that lie outside the boundaries are not investigated. A common definition of these types of innovations is incremental innovations, where new discoveries follow the charted paths established by previous experiences in technological advancement.

According to Hellmer (2010) there is a dispute whether lock-in effects should be considered good or bad. On one side, theory states that lock-in effect gives rise to loyal customers, while on the other hand lock-in

effects occur because customers, in spite of incentives to change, are forced to stay with the current supplier due to market failures. Hellmer distinguishes between a loyal customer who voluntarily stays with a supplier, and a locked-in customer who is involuntarily stuck with the current supplier. Hellmers definition of a locked in customers resembles the definition provided by Williamson (1981), where market failure , for example, could represent transaction specific assets.

Klitkou et al. (2015) has identified several lock-in mechanisms that prevent new entrants to gain market shares from incumbent even though their product may be superior. Some of the identified lock-in mechanisms are described in the following paragraphs.

Learning effects. When production is increased and cost lowered as a result of increased adoption or learning-by-doing, the effects are considered as learning effects.

Network externalities. Compatible products or standard settings that emerge from adoption of a product or technology are defined as network externalities, and may cause lock-in effects through e.g. infrastructure requirements.

Informational increasing returns. Increase in adoption may result in an increased attention, which in turn will increase the observability of a new innovation.

Collective action. The creation and development of norms, customs and institutions between organizations and individuals are referred to as collective action.

Technological interrelatedness. Technologies that are not compatible with the incumbent technology are locked out, while complementary technologies are encouraged.

Institutional learning effects. Institutions may become rooted in the trajectory of technological advancement. As a result the institutions may become hard to change. On the positive side, the institutional learning effects may improve coordination and adaptive expectations.

Differentiation of power and institutions. Powerful actors may impact how institutions are formed by influencing policymakers. As a result they may enhance their own position while putting constraints of smaller actors that try to entry the market with radical innovations.

While Klitkou et al (2015) acknowledges that incumbents have an advantage over new entrants due to more widely diffused and adopted technology and established lock-in mechanisms, they do not discuss in a great extent why new entrants may face resistance and how they should organize to overcome it.

Ram and Sheth (1989) discuss innovation entry barriers, which relates to the lock-in effects and switching costs presented above. For example, innovations that require customer changes in routines, risks associated with the change, cultural barriers in terms of social norms and traditions, and unfavourable perception of quality and value may face resistance and a rejection mentality. Furthermore, Ram and Sheth (1989) proposes five strategies to overcome these barriers: *Marketing and Product Strategy*, use a well-known brand name, bundle or improve positioning; *Communication Strategy*, educate and inform; *Pricing Strategy*, lower price; *Market Strategy*, increase trialability and influence the market by gaining support from strong actors or policy makers; and *Coping Strategy*, understand and respect traditions.

2.8 SCENARIO PLANNING

A scenario may be defined as “a possible future situation... paths of development which may lead to that future situation” (Kosow & Graßner. p.11, 2008). Why scenario planning then? A scenario planning may enhance the ability for organisations to act proactively and alter the strategy to be able to handle disruptive changes in the industry (Alänge & Lundqvist, 2014). Scenario planning allow the firm to develop several plausible scenarios, categorized in e.g. impact on industry or predictability. Conducting this type of planning does not only make the organisation aware of what might happen in the future, it also stimulates the organisation to come up with innovative strategies to cope with possible future changes. Furthermore, traditional planning often fails to cope with situations that have poor controllability and high uncertainty. This is where scenario planning may be applied successfully. Alänge and Lundqvist (2014) summarizes when scenario planning is used:

- When uncertainty is high
- When a medium to long-term perspective is considered
- When risks are to be identified and illustrated

As described above, scenario planning may be a useful tool for organisations however, it is also important to be aware of the limitations of a scenario analysis. Kosow and Graßner (2008) argue that we as individuals have cognitive barriers when it comes to predicting an uncertain future. Furthermore, a scenario analysis is not certain, and should thus not be treated as fact. A common misunderstanding according to Kosow and Graßner (p. 21, 2008) is that “*It nevertheless occurs time and again that scenarios are misunderstood as representing the only possible future*”. Also, due to the fact the scenarios are describing a possible future situation, some questions may be raised about the robustness of the research. While scenario methods may risk being undermined by weak predictions and illogical assumptions, the researcher has much responsibility in determining the scope, explaining arguments, and explaining the reasoning behind the analysis.

The scenario analysis can be conducted by either a qualitative or quantitative method, in contrast to traditional planning methods which most often use quantitative methods for forecasting and predicting possible outcomes (Alänge & Lundqvist, 2014). A scenario planning activity could be approached by using a step-by-step method. Alänge and Lundqvist (p. 78, 2014) proposes a 12-step process:

1. Define the issue
2. Identify and involve stakeholders
3. Define the future
4. List the main forces that impact step 3
5. Rank and combine the forces in step 4
6. Tabulate the forces by rank, number and predictability
7. Map out the forces on a white board
8. Regroup the forces by potential scenario and trend
9. Select the most important uncertainties and plot them
10. Sense-check plausibility in the group
11. Create a story-line
12. Act on the scenario

2.9 VALUE PROPOSITION AND THE CUSTOMER

The value proposition of a firm is essential in order to gain customer interest in a new product or service (Osterwalder, 2010). There are usually different reasons why customers choose a particular product or service over another. The value proposition will play a major role in that decision and can be described as something that solves a problem or satisfies a customer need. The value proposition can also be described as something that helps the customer to get the job done (Johnson et al., 2008). Something that the customer really needs to solve, like a problem or a situation that needs a good solution. Blank et al. (2012) stresses that the value proposition of the product or services is very important and can be what determines the product's survival at the market, therefore they must be well designed and developed.

A value proposition can be something totally new and disruptive, or very similar to the already established products, but with some minor change or innovative solution (Osterwalder, 2012). Except from newness and performance a value proposition may also consist of customization, the offer is tailored to the customer and thus enhancing the value. Other possible value propositions can be an advantageous price, design or accessibility. Making the product or services easy for the customer to access will probably result in that more customers start to use it. Further, improving and simplifying the usability of a product may lead to an increased use.

Barnes et al. (2009) has developed a six step value proposition model which can be seen in the *figure 5* and includes; *the market, value experience, offerings, benefits, alternatives and differentiation and proof*. The purpose of the model is to provide a framework for developing value propositions through an iterative process. The steps consider 1) finding out which customer group to target 2) the perceived product value from a customer perspective 3) determine how to bundle the product offering 4) actual value delivered to the customer through $\text{Value} = \text{Benefit} - \text{Costs}$ 5) how the company differentiates from other competitors and 6) confirm for the customers that the offering is believable.

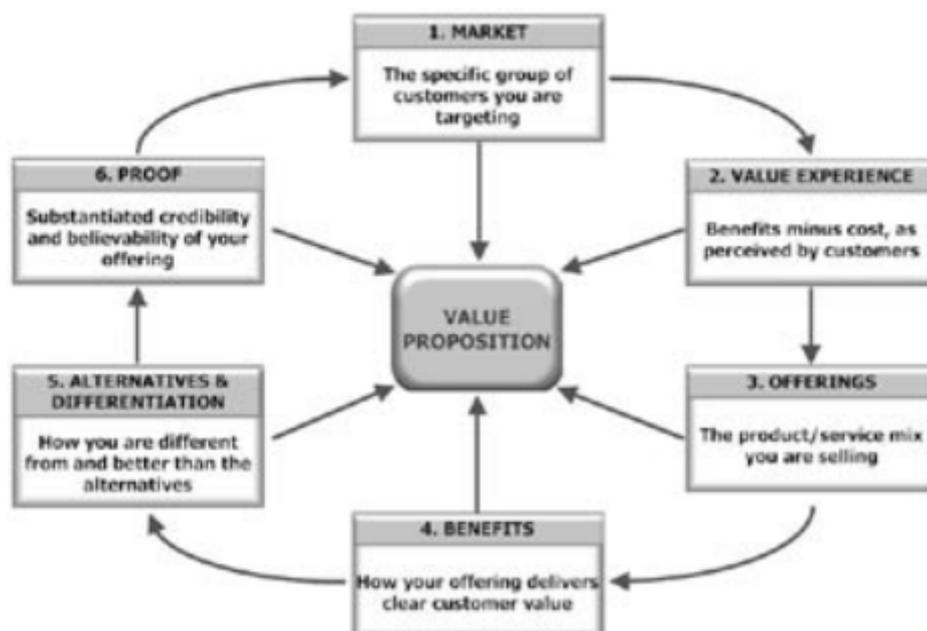


Figure 5 - The value proposition builder (Barnes, 2009)

The value proposition builder requires substantial analysis of perceived value in various situations. The first three stages in the model relates to a *deconstruct* process where the offering is analysed in detailed,

while the last three stages represent a *reconstruct* process which is the process of turning all the gathered knowledge into a well-constructed value proposition. According to Barnes et al. (2009), the value proposition should differentiate and focus on different levels. From an overall value proposition, focused down to e.g. a single stakeholder, see *figure 6*.

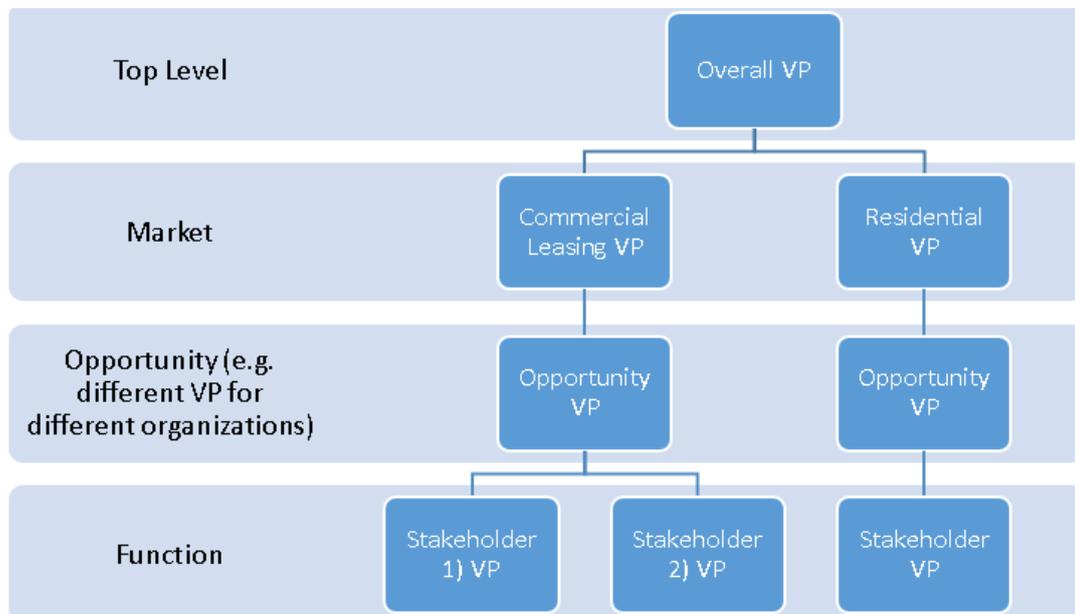


Figure 6 - Levelled focused value proposition (Barnes et al., 2009)

Osterwalder (2012) provides a model for describing the product-market fit of an offering, see *figure 7*. The model shows; the customer needs, customer pains and customer gains from a customer segment perspective, these are then connected with the value proposition of the product/service. These value propositions will give knowledge about how well a product or service will meet the customer segment's needs, wants and expectations. A more detailed view about the different aspects of Osterwalder's model are explained below. The customer jobs, pains and gains are included within the customer segment and the products and service, gain creators and pain relievers belong to the value proposition.

Customer jobs can be described as what functional, emotional, and social job has to be done for the customer? For example; solve problems, give social status or provide security. When talking about *customer pains*, the aspects of the current solutions that are not satisfying the needs of the customer are reviewed. Are the current solutions too costly? or; Do they not perform very well? Furthermore, *customer gains* are related to the needs that have to be fulfilled in order to make your customer satisfied. For example; lower costs, higher social status, or an increased service.

Products and services refer to what your offer is and how it provides value to the customer. The *gain creators* declare how the offering is better than current solutions in terms of performance, complexity or exceed customer expectations. And finally, the *pain relievers* that will answer how the offering will save customer time, money or effort, or maybe give them a higher social status.

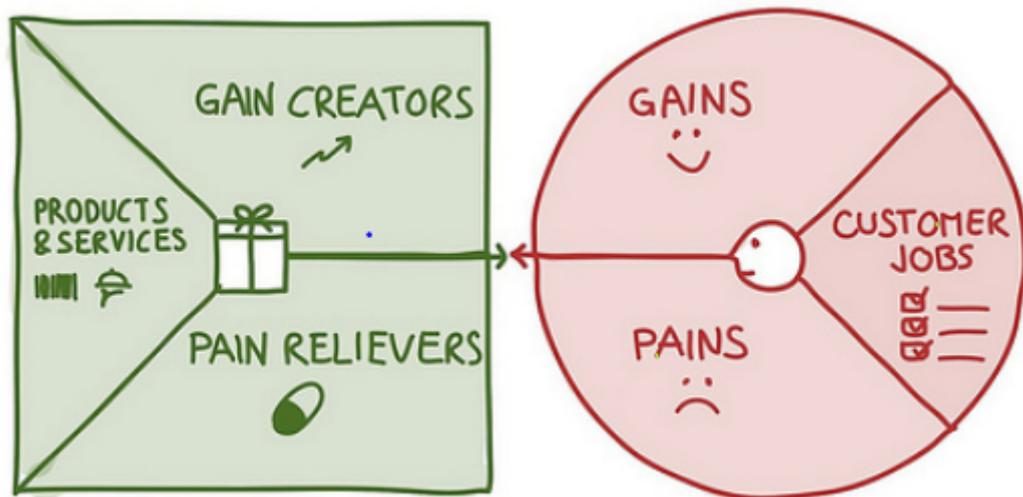


Figure 7 - Shows the product-market fit, value proposition to the left and customer segment on the right side (Osterwalder, 2012)

3. METHODOLOGY

In this chapter the objective is to describe the overall methods and approaches used during the study and also describe the mind-set and issues that have come up along the way. To begin with, the choice of method and the data collection will be described. Furthermore, a discussion regarding the analysis and the quality of the research will be presented.

3.1 RESEARCH DESIGN

The research paradigms considered in this thesis are *positivism*, *constructionism* and *pragmatism*. There are several other paradigms, such as feminism, postmodernism and critical theory but the researchers have limited themselves to the paradigms mentioned earlier in the section (Carlgren, 2015). Further, positivism and constructionism can be seen as the opposites of each other, while pragmatism is somewhere in between. The choice of methodology comes from the researcher's assumptions about what exists and how to study what is assumed to exist (Carlgren, 2015).

Positivism assumes a realist's perspective that one truth exists, where time and context is not accounted for when explaining how things are (Guba et al., 1994). Furthermore the researcher is considered to be independent, e.g. the researcher should not be influenced or influence the subject of research since this may give reason to question the validity. The aim of positivism is to be able to correctly explain why things are as they are. Propositions and hypotheses should be validated and used as laws or facts, or disregarded as being false. Objectivity is an important aspect in positivism. The researcher should observe distant from the object, and values should be excluded. However, a positivistic approach to research can be seen as an iterative process where the researcher proves a hypothesis and then refines the claims for further research (Creswell, 2003).

Constructionism, according to Creswell (2003), assumes that the researcher creates an understanding of the situation by using the viewpoint from a participant. The researcher is, during the data gathering process, close to the object and develops an understanding as the process moves forward (Guba et al., 1994). Furthermore, the researcher should not have a narrow perspective in order to allow the participant to have the freedom to construct their own story about the situation as they perceive it (Creswell, 2003). Research from a constructionist's point of view should use an inductive reasoning, where a result is not certain as it is when using a deductive approach (Easterby-smith et al., 2012). Creswell (p.9, 2003) states that the researcher uses the information to "...inductively develop a theory or pattern of meaning".

Pragmatism focuses on the problem and the researcher gains an understanding by gathering data about the consequences of actions, instead of measuring outcomes dependent on conditions (Creswell, 2003). Also the researcher can choose between quantitative and qualitative approaches to fit the current need, instead of being locked to a specific approach. The underlying logic of a mixed method approach is that the researcher should not limit herself to a single method, but instead apply the method that will provide the greatest understanding of the researched object. As described by Creswell (p.12, 2003) "... pragmatism opens the door to multiple methods, worldviews... assumptions... data collection and analysis".

In *table 1* below a summary of the most important aspects of the different philosophies used in this study is presented and briefly explained.

	POSITIVISM	CONSTRUCTIONISM	PRAGMATISM (Creswell, 2003)
ONTOLOGY (Assumptions about the nature of reality (Carlgren, 2015))	<ul style="list-style-type: none"> ● Realism ● One truth ● There are facts that can be revealed 	<ul style="list-style-type: none"> ● Relativism ● Several truths ● The observer's viewpoint determines the facts 	<ul style="list-style-type: none"> ● Reality is shaped depending on the world we live in ● Consequences of actions
EPISTEMOLOGY (Assumptions of how to study the world (Carlgren, 2015))	<ul style="list-style-type: none"> ● Objective ● Observer is independent ● Random sampling need to be large enough so that results can be generalized ● Hypothesis creation 	<ul style="list-style-type: none"> ● Subjective ● Observer is a part of the object ● Goal to understand constructions and meanings ● Create a general understanding 	<ul style="list-style-type: none"> ● Objective & Subjective ● Problem-cantered ● Takes its starting point in the real-world
METHODOLOGY	<ul style="list-style-type: none"> ● Deductive ● Quantitative 	<ul style="list-style-type: none"> ● Inductive ● Qualitative 	<ul style="list-style-type: none"> ● Mixed method

Table 1 - Summary of important aspects of different philosophies (Hoffström et al., 2016)

3.1.1 QUANTITATIVE APPROACH

Quantitative approaches are considered to be a positivistic research design (Easterby-smith et al., 2012). It is associated with strategies such as: experiments through true experiments and non-randomized quasi-experiments as well as surveys were cross-sectional and longitudinal studies are considered (Creswell, 2003).

Experimental methods are conducted by randomizing samples to an experimental group or a control group (Easterby-smith et al., 2012). The settings for the experimental group is then, upon initiative of the researcher, changed and the effect is measured in order to establish differences. It is important that the different groups are treated in the same way except for the changed setting in order to get a valid result. The experimental approach provides clarity and should rule out other possible explanations to the outcome. Experimental methods are also easier to replicate which implies that the outcome of an experiment can be examined further. An experimental approach raises questions about the ethicality and practicality of the experiment. For example, if used for a medical experiment it raises the question about how harmful for the test objects the drug may be. Also, it is sometimes not possible to make a random sample, in for example organizations, which renders this approach less applicable.

Quasi-experimental designs are not, in contrast to experimental, using random assignment of individuals to experimental and control groups (Easterby-smith et al., 2012). Instead, multiple measures are used over time and the groups should be equivalent, except for the variables that differentiate them. An often used method is to conduct an initial test on both the groups, where one group will be the subject to a variable, and a second test after some time has passed. The differences between the groups will show the result that the variable has on the experimental group who were subject for the variable. A difficulty when

conducting such an experiment is that it is assumed that the control group has not been subject to any changes during the test period, which is almost impossible to achieve in a real-life setting.

Surveys allows for large sample sizes that can measure several variables at once (Easterby-smith et al., 2012). This is useful when researching human and organizational behavior, which can contain complex variables to measure. *Factual surveys* are aimed to gather factual data from e.g. polls, questionnaires, structured interviews, or market research. *Inferential surveys* aim to find relationships and identify causation between variables and concepts. Inferential surveys are often cross-sectional, results are achieved by measuring variables in different settings in order to see differences. *Exploratory surveys* are e.g. a huge set of questionnaires in order to discover patterns to predict behavior of individuals in an organization.

3.1.2 QUALITATIVE APPROACH

Creswell (2003) states that there are many strategies concerning a qualitative approach to research. Qualitative research most often falls under the constructionist's research design where the researcher does not limit herself to one truth, in fact several truths may exist (Easterby-smith et al., 2012). Easterby-Smith et al. (2012), and Creswell (2003) both mention case studies, grounded theory, and narrative methods as strategies to qualitative research.

Case studies often focus on one or a few objects and studies these over time to get an in depth understanding (Easterby-smith et al., 2012). Critics argue that the results are not generalizable and are time consuming and inaccurate due to the large amount of data that is gathered that allows for fabrication of results. In response these issues can be avoided by putting time in designing the research prior to gathering the data. Further criticism towards case studies is that the uniqueness of each object that is investigated is not transferable to other settings. However, the results generated from case studies could be used as inspiration for innovation, even though it may not be generalizable. When conducting a case study research, as in most constructionist research, the researcher is close to the objects of investigation. Interviews in person together with observations are a common approach to gather data in case studies.

Grounded theory is a comparative method that distinguishes differences or similarities between objects in different settings (Easterby-smith et al., 2012). Grounded theory is subject to some controversies. Several approaches to grounded theory has been developed over time, and some has expressed concern over that not all approaches are suitable. For example some approaches are considered to be objective, which likely will result in failure to capture the experiences of the individuals. Also, a concern for researchers operating in the commercial sector may be that they cannot freely choose their interviewees. Instead they may have to direct their request to top manager who will then be the person in charge of finding a suitable person. This aspect may distort the data and provide the researcher with an inaccurate picture of the situation.

Narrative method is a method where the researcher becomes a part of the organization and the stories related to the individuals of the organization (Easterby-smith et al., 2012). This may provide a holistic view of organizational behavior, while critics argue that the narrative method does not contribute in a great extent to already existing qualitative methods. However, the narrative approach may be useful to determine relationships between individuals and organizations, as well as understanding the context of specific developments.

3.1.3 MIXED METHOD

Lately, a mixed method approach towards research has been more widely adopted (Easterby-smith et al., 2012). This type of method involves using both quantitative and qualitative approaches, and combining them to neutralize biases and triangulate data sources (Creswell, 2003). Further argumentation in favor of a mixed method approach is that validity, generalizability, and theoretical contribution will increase (Easterby-smith et al., 2012). Greene (1989) lists five purposes of using a mixed method approach; *Triangulation*, seeking for similarities in the results; *Complementarity*, refers to clarification of results; *Development*, using the methods to inform each other and further develop the research from the results; *Initiation*, finding contradictions between the results; and *Expansion*, increasing the scope of the research. Furthermore, Johnson and Onwuegbuzie (2004) argues that a pragmatic approach should be used together with the mixed method. By doing so, the researcher can choose the best option for answering his or hers research question.

When designing the research, using a mixed method approach, Creswell (2003) argues that three general strategies can be used:

- *Sequential* is an approach where either the quantitative or qualitative method expands or elaborate on the other. Here the researcher chooses to either start with a quantitative or qualitative approach in order to explore or test concepts, prior to generalize or going into deeper into research area.
- *Concurrent* is a procedure where a quantitative and qualitative approach is converged to complement each other, and increase the comprehensiveness of the analysis.
- *Transformative* where a theoretical lense is used when interpreting the quantitative and qualitative data. Both a sequential and concurrent approach can be used. However, the theoretical lense should guide the research in terms of methods, outcomes and choosing topics.

While, as mentioned earlier, the mixed method approach can in fact increase the validity and credibility of results, replication may be difficult (Easterby-smith et al., 2012). Also, it is of importance that the design is relevant to the questions, since the researcher will have no use of the design if the wrong questions are asked. However, the mixed approach may discover other dimensions that would not have been found by using a single method, also numbers and words from either a quantitative or qualitative method can strengthen the other and vice versa (Johnson & Onwuegbuzie, 2004). Furthermore, it is of importance that the researcher has the knowledge and ability to conduct two different methods. It is possible that the researcher will not be able to perform the task by herself, and that a research team is needed. This will increase the need for human resources and will also be more time consuming.

In *figure 8*, a proposal made by Johnson and Onwuegbuzie (2004) is shown on how to structure the research process. Johnson and Onwuegbuzie points out that the first step is the only step that most likely is fixed in that order, the other steps may vary and even be iterative and interactional.



Figure 8 - Structure of the research process (Johnson & Onwuegbuzie, 2004)

This thesis uses a mixed method approach where both quantitative and qualitative data sources are used. The approach described has been the template for how to structure the research process. Initially three different research questions were formulated, and it was determined that a mixed method approach with a pragmatic philosophy was suitable. Quantitative and qualitative data was used to complement each other and to provide the researchers with data to make interpretations about the real world situation.

3.2 DATA COLLECTION

For this thesis, both primary data, in form of interviews, and secondary data has been collected and used. In essence, the primary data is collected from several interviews with persons who have good knowledge about the industry. The secondary data is collected from a number of different sources giving the opportunity to gather a large quantity of data. The different sources used for collecting data has mainly been; official statistical reports from institutions, independent marketplaces online, industry reports and company websites. The following *table 2* shows the sources used in the various countries, excluding company websites.

SWEDEN	Statistiska centralbyrån (SCB), Objektvision.se, JLL Sweden, Datscha AB, Fastighetsägarna, NAI Svefa and CBRE Sweden
DENMARK	JLL Denmark, CBRE Denmark, Oline.dk and EDC Erhverv Poul Erik Bech
NORWAY	JLL Norway, Statistisk sentralbyrå (SSB), FINN-statistikken, CBRE Norway, Eiendom Norge and NAI Norway

Table 2 - Shows the different data sources used in each country (Hoffström et al., 2016)

There is a large amount of secondary data available and numerous sources, therefore it is important to determine in advance which one to use (McCaston, 2005). Large amount of secondary data can easily be accessed and McCaston (2005) stresses that it is beneficial method when having scarce resources, in term of time and funding. Actually, secondary data that is thoroughly selected is often of good quality due to the fact that it is collected by experts and analysts (Saunders, 2009). However, both McCaston (2005) and Saunders (2009) underlines the importance of the selection process as this otherwise will affect the quality of the data.

3.2.1 LITERATURE STUDY

In order to compile the theoretical framework a literature review was conducted to gain a deeper knowledge and understanding about the relevant concepts for the study, such as; technological acceptance, diffusion of innovation, the cost of switching technologies and price sensitivity. These concepts and several others will be explained and can be found in the theoretical framework chapter. Varvasovszky and Brugha (2000) point out that it in many cases may be advantageous to work with the literature study and the empirical study as an interactive process, thus increase the understanding.

To find the proper literature needed several different sources and databases have been used, this was considered important in order to expand the variation of the retrieved literature. The major academic databases that have been used are; Google Scholar, Pro Quest, Science Direct and also to some extent Chalmers University of Technology Library's search engine Summon. In a few cases Chalmers University of Technology's librarians have proposed appropriate litterateur relevant for the study.

3.2.2 INTERVIEWS

To be able to collect primary data and gain a greater knowledge about the real estate industry and understand the use of digital marketing tools within the industry, interviews were conducted. Interviews are the most common way to carry out a qualitative research method according to Easterby-Smith et al. (2012) and have therefore been done with some pre selected persons. Interviews usually contribute with information such as; behaviour, thoughts, ideas, values and other important data useful for the further analysis. Creswell (2003) emphasizes that interviews with people that have historical knowledge and understanding about a specific company or industry can be hard to find elsewhere and therefore finding these people can be valuable. Easterby-Smith et al. (2012) points out that interview are considered to be the best way of gathering information and can be more complex than one might think.

Interviews can be of varying scope and have different structure depending on what sort of interview it might be and what sort of information the interview wants to get out (Easterby-Smith et al., 2012). Interviews for market research are to a great extent more structured and formalized in comparison to interviews hold more like a discussion, when obtaining answers from open-ended question and adopt the interview according on what sort of answers are obtained.

The interviews conducted in this thesis have been of a semi-structured approach, a combination of structured and unstructured approach (Easterby-Smith et al., 2012). The interviews are then structured with certain guidelines and the respondent may answer freely but within a specific subject or area. Totally unstructured interviews without guidelines will most likely result in little data that is difficult to interpret. The approach of conducting semi-structured interviews will lead to a flexibility, which in turn generate more and deeper information from the interviewee (Creswell, 2013).

Further, it is common that the answers given by the interviewee are biased as a result of leading questions or that the interviewee for some reason lie in the answer (Easterby-Smith, 2012). To avoid interview bias and other misunderstanding several interviews in this thesis are performed in the same region or country to better understand the big picture. There has also been in mind to perform the interviews face-to-face and use the web-tools such as Skype and Lync as little as possible. Newton (2010) stresses that if it is important to have a deep understanding and insight from the interviews they should be face-to-face. In this way, the interviewer get closer connection and can thus get a better understanding of the context.

The interviews were held with a wide selection of companies around in the Nordic countries as follows: 7 in Sweden, 5 in Norway and 2 in Denmark. The companies were of varying size and the people interviewed had various positions within the company. It was of importance to have a wide selection of different companies, geographical positions and persons. The interviews held in Sweden and Norway have been conducted face-to-face but the interviews with Denmark have been held via Skype, this due to priority of resources and time. All of the interviews held face-to-face have been carried out at the respective interviewees home office. The reason for this is that it has been perceived that the interviewee feels safer and speaks more freely in their own home environment. It also sends a message to the interviewee about the seriousness of the interview, when spending valuable time getting there to meet them in person.

The distribution of resources from the researchers has been 40 % respectively between Norway and Sweden while Denmark has got the last 20 %. The reasoning behind this decision was that the willingness from actors in the different countries to distribute data was higher in Norway and Sweden. Thus, the researchers decided that the study would receive a better outcome by focusing on Norway and Sweden. Added to this argument, the researcher made an assumption, after talking to experts within the new digital marketing technology industry, that the Norwegian and Swedish markets, for now, have proceeded further in technological advancement in comparison to the Danish market.

The following *table 3* will present the interviewed companies, the company names are anonymized according to the agreed.

CODE NAME	POSITION	ASSETS 2014 (MILLION)	TURNOVER 2014 (MILLION)	TYPE OF ACTOR
Company 1	Sweden	32 000 SEK	1 500 SEK	Property Owner
Company 2	Sweden	25 700 SEK	1 600 SEK	Property Owner
Company 3	Sweden	31 000 SEK	2 500 SEK	Property Owner
Company 4	Sweden	28 000 SEK	2 300 SEK	Property Owner
Company 5	Sweden	8 500 SEK	520 SEK	Property Owner
Company 6	Sweden	97 200 SEK	5 900 SEK	Property Owner
Company 7	Sweden	7 100 SEK	560 SEK	Property Owner
Company 8	Norway	33 NOK	38 NOK	Broker

Company 9	Norway	141 NOK	100 NOK	Property Owner /Broker
Company 10	Norway	14 000 NOK	44 NOK	Property Owner
Company 11	Norway	9 NOK	5 NOK	Broker
Company 12	Norway	28 000 NOK	2000 NOK	Property Owner
Company 13	Denmark	3 600 DKK	180 DKK	Property Owner
Company 14	Denmark	-	140 DKK	Property Owner

Table 3 - Compilation of the interviewed companies' geographical position, financial status and type of actor (Hoffström et al., 2016)

3.3 ANALYSIS

Usually, quantitative and qualitative data is analysed without combining them (Easterby-Smith et al., 2012). However, when doing a mixed method approach it is possible to use respective analysis method on the opposite research method, e.g. quantitative data analysed in a qualitative manner. This however, is not the only strategy you can apply when using a mixed method approach to research. Caracelli and Greene (1993) describe four different types of analysis methods for a mixed method approach; *Data transformation*; *Typology development*; *Extreme case analysis*; and *data consolidation/merging*.

None of these strategies are the same as the one described by Easterby-Smith et al. (2012). However, data transformation and data consolidation/merging are similar. Data transformation includes transforming either quantitative or qualitative data into the other, and then analyses them together in order to get a broader understanding of the factors that may yield a certain outcome (Caracelli & Greene, 1993). Data consolidation on the other hand, is a strategy where both quantitative and qualitative data is merged and jointly used for the purpose of founding a basis for further analysis. Caracelli and Greene (p.200, 1993) states that this strategy could be suitable to “...*uncover fresh insights or new perspectives*”. The simultaneous use and combination of several data sources may enrich and strengthen the outcome of studies.

Typology development involves using quantitative or qualitative data prior to the other in order to create a framework that can be used when the other data type is analysed. Caracelli and Greene (1993) argues that this strategy may be suitable for several mixed method studies and that it allows the researchers to continuously use new frameworks in order the analyse the data from different types of data collections.

Extreme case analysis is in some ways similar to the typology development strategy. The strategy follows a similar process where the data from either quantitative or qualitative data is analysed and then sequentially analysed by the other (Caracelli & Greene, 1993). In similar fashion with the typology strategy this method allows the researcher to get an enhanced view and a deeper understanding of the outcome.

3.4 QUALITY OF THE RESEARCH

3.4.1 VALIDITY AND RELIABILITY

Drost (p. 114, 2011) describes *validity* as “...*meaningfulness of research components*”, e.g. is the correct thing measured? Further, it is impossible to completely validate research, but it is possible to claim that the study has strong validity. Drost (2011) argues that there are four types of validity that should be considered; *conclusion validity*, is there a relationship?; *internal validity*, e.g. is it a causal relationship?; *external validity*, e.g. is the causal relationship generalizable?; and *construct validity*, e.g. how well the measurements apply to the actual research.

Easterby-Smith et al. (2012) argues that the concern for a positivist should be internal and external validity. Internal validity concerns the possibility to rule out different explanations to the outcome of the study. If the study groups diverge, their personal situation changes or that individuals falls of the experiment, there may be a concern for the internal validity of the study. External validity concerns how the outcome of a study is generalizable. It is important for the external validity that the selection of individuals is randomly chosen and that the outcome cannot solely be explained as a result of the participants. It is also important to acknowledge that there are limits of how generalizable a result can be. For example, a study conducted in one country may not be applicable to another country. According to Easterby-Smith et al. (p.71, 2012) the main question concerning validity for a positivist is “*Do the measures provide a good approximation to the variables of interest*”

In contrast to a positivists view upon validity, the constructionist should be concerned about *authenticity, plausibility, and criticality* (Easterby-Smith et al., 2012). The aim for the researcher is to convince the reader that a profound understanding about the situation that has been investigated has been created, that the study can relate to a current research subject for other researchers, and that readers should question the assumptions made by the researchers. According to Easterby-Smith et. al. (p. 71 2012) the main question concerning validity for a constructionist is “*Have a sufficient number of perspectives been included?*”

Reliability can be defined as how repeatable a result is (Drost, 2011). If the same variable is measured but with different methods, in different settings or by another person, and the same result is obtained, the test is considered to be reliable. The biggest concerns for reliability are the occurrence of random errors. These errors are generated when a random element is added to the test, e.g. accuracy inconsistency when reading measurement data. Easterby-Smith et al. (2012) agrees with this view when it concerns both a positivists approach and a constructionist approach. The main questions that should be asked are; “*Will the measures yield the same results on other occasions?*” and “*Will similar observations be reached by other observers?*” (Easterby-Smith et al., p.71, 2012). One main take-away from Easterby-Smith et al. (2012) points of view is that the positivistic approach concerns measures made by a researcher, while the constructionists approach concerns observations by the researcher. As in the case for validity, there are differences between the different approaches that have to be acknowledged when conducting research in the area of social science. If these differences are not taken under consideration, there is a possibility that either the reliability or validity of the study will suffer and render the outcome weaker.

3.4.2 CREDIBILITY OF THE SOURCES

It is essential to evaluate the credibility of sources used for a thesis like this and as Carlson (p.39, 1995) express himself, it is worth considering that “*good decision depend on starting with good information and then reasoning with it logically*”. There is a lot of information to take in and it may be worth to be a

critical when analysing the information. Carlson (1995) also expresses that much of the information distributed may have been misinterpreted and influenced by the sender and the next receiver.

The persons who have been selected for interviews for this thesis have been asked to be as open and honest as possible without revealing strategic plans or business secrets. They have in the beginning of the interview been informed that they will be treated completely anonymous in order for the interviewees to feel comfortable and able to express themselves freely. It may be useful to bear in mind that the interviewees may be biased and this must be taken into consideration when evaluating the collected information. Bryman and Bell (2011) also points out that the collected information should be shared with and validated by the interviewees.

Furthermore, not only the information collected from the interviews has been carefully validated but also the information used for the data compilation and the theoretical framework. To the greatest extent possible only well-cited articles and literature released by reliable sources have been used.

3.4.3 ETHICAL CONSIDERATION

It has nowadays become more and more common to take the ethical aspects into consideration when forming a study (Polonsky, 2014). This has proved to be particularly important when involving persons from business or other form of agencies. Ethical considerations are a broad and rather complex concept and may most easily be described as; norms of conduct that distinguishes between performing a study or process in an appropriate or inappropriate manner (Resnik, 2015). Resnik (2015) and Polonsky (2014) describe why it is crucial to have these guidelines in mind when forming the study, a selection are listed below:

- Established norms promote that correct data is obtained and that the truth is told, it can also to some extent prevent fabricating.
- Ethical guidelines usually lead to a better collaboration between the various parties and involved participants due to increased trust and respect towards each other.
- Overall, it appears that people trust what they read in a greater extent if it is clear that there have been established ethical guidelines.
- Without any guidelines the study can harm the involved persons and organizations.

In this study ethical considerations have been included in the design of the project from the beginning, and more specifically been important when conducting the interviews and handling information to all participants involved. Three ethical guidelines have been chosen to be prioritized and form the basis within this study. All involved have been well informed about; (first) the aim, goal and background of the study, (second) that their participation is completely voluntary, and (third) that they may participate anonymously if desired. These commitments were made to get the participants and interviewees to feel more comfortable and talk more freely. Further, information has been sent out in good time and any problems have been sorted out. There has been opportunity to contact and edit information afterwards. In order to respect the interviewed and the fact to be treated equally the companies in the study will be anonymous. Easterby-Smith et al. (2012) states that there might be a concern when conducting research in companies, e.g. unveiling unethical or illegal behavior. The relationship between the researchers and the companies that has been studied is considered to not be close enough to be able to unveil such

information. Also, the study has focused on the technical aspects of marketing and the process of marketing within these firms, and no concern about the content of the information has been expressed to the researchers from the interviewees. Thus, there is no reason to believe that the issue expressed by Easterby-Smith et al. (2012) should exist in this study.

4. DIGITAL MARKETING TOOLS

In this section the different types of digital marketing tools handled in the thesis will briefly be described. This to give a general overview and understanding of the tools available and used by the actors in the market. The tools that are described below is a selection and a generalization of what is used, there are many other different solutions and combination accessible.

4.1 3D FLOOR PLAN

Today there are a large number of talented photographers and other professional actors, who can create professional photo illustrations and 3D floor plans. Even amateurs can with computer programs create decent illustrations and digital prospects.

When an object is listed a floor plan is one of the most common and popular tools to add to the marketing material (Cohen, 2007). A simple 2D floor plan is more or less a minimum requirement when publishing an object. Recently, it has become popular with the more advanced floor plans in 3D. Cohen (2007) describes a 3D floor plan as a virtual model of the sales object seen from a bird's eye view, see *figure 9* where a 2D floor plan is compared with a 3D floor plan to put it into perspective. The 3D floor plan is a simple but very useful tool when marketing the object for potential customers.



Figure 9 - 2D floor plan compared with 3D floor plan (Roomsketcher, 2016)

4.2 3D ILLUSTRATION

Property owners and brokers produce, in some cases, 1-3 illustrations to use during the sales process (Dellborg, 2016). These can be sent out to interested customers in advance, published on the Internet, printed in prospects or be printed at larger boards and be used during the viewings. In *figure 10* such a 3D illustration can be seen and in *figure 11* is the same room with a regular photo. In this way it is possible to illustrate an unfinished object to give an indication about how it will look. It can also be a good way to illustrate possible future layouts both regarding the interior and the exterior. Many customers have poor knowledge about the real estate industry and architectural design, thus these 3D illustrations can help visualize for the customer to show how different colors and furnishing may fit in. It is also possible to visualize major changes such as removing a wall, put in a staircase or repaint.



Figure 10 - 3D illustration, see regular photo in figure 11 (Kungsleden, 2016)



Figure 11 - Regular photo, see 3D illustration in figure 10 (Kungsleden, 2016)

4.3 360-VIEW

This digital photo tool can be mentioned or named with several of names; *360-photo*, *360-spin* and *360-degree photograph*. The 360-view tool is a combination of regular photos and 3D-photos (Learn360, 2016). Via a computer screen or a mobile phone, there is a possibility to see views of a room or a specific object in a 360-degree rotation. By sweeping the cell phone in front of you, or by using a computer mouse to click around, there are possibilities to discover the object from different views and angles.

There are several companies that are able to produce these visualizations or that provide cameras as well as software for own use. A well-known company that make these types of photographs are Matterport Inc.. They are specialized in indoor scanning for the residential and commercial real estate industry. The basic principle for producing these kinds of visualizations according to Matterport (2016) are to place a 3D camera at a various number of positions throughout the space and take a large number of photos. The camera rotates one full revolution and sometimes at several axis. By merging these images into one single, with special software, this will result in a creation of a 360-degree photograph. Furthermore, it is also common to merge several 360-degree views and create a sort of visualization tour, which enables to move from room to room.

4.4 3D-PLANNING TOOL

A *3D-planning tool*, a *Photo-styling tool* or *interior customization* enables the user to create their own exterior or interior customization design. With a drag and drop solution the user can for example change furniture and colors of the object (IKEA, 2016). In this way it is possible to easily rearrange and try different combination. There are opportunities for the tenants to use the tool themselves but also for the broker or the property owner during a viewing or tour in the property. The tool itself can be used on a variety of platforms such as computers, smartphones or tablets.

4.5 VIDEO

Another popular digital marketing tool, which can be used when promoting a property object or office space, is video. A video can show the property's interior or exterior, as well as aerial photos of the building and the surroundings. Videos of this kind are usually between 30 seconds up to 2.5 minutes and have the intention to capture the interest of potential customers.

According to BarnesCreative (2015) the idea derived from the hotel business industry who uses this to brand the hotel experience for their customers. The quality often varies in terms of these videos, and depends on how much time, resources and money spent on it. A video can cost anywhere from around 1 200\$ - 12 000\$ to produce (Colliers International, 2016).

4.6 VIRTUAL REALITY

Virtual reality is one of the more complex tools that are in the forefront of the digital marketing technology within the commercial real estate industry. Virtual reality is often associated with the gaming industry and other similar businesses. Major actors in the digital industries such as Google, Facebook and Apple have high expectations and are optimistic about the technology's future (Jacobsohn, 2016). There are currently several different industries that have become aware of the technology and are trying to find areas of application within their business such as; real estate, medicine, manufacturing, engineering and education.

The desire to build virtual environments and give us the opportunity to create something out of the real world has been with us for some time (Deloitte, 2016). One purpose for this is to increase the understanding in complex problem, visualize ideas and simulate visions. The origin of virtual reality emerged for the first time in the 1950's, but it may be much earlier than that (Virtual Reality Site, 2016). It was not until the 1990's virtual reality became popular and attracted the attention of the public and industries. According to Whyte (2003) the early adopters of the technology were the military, advanced manufacturing industries and gaming/entertainment industries. However, the technology at that time was not sufficiently developed, and therefore did not meet the public's expectations.

Counting from the year 1990, it would take about twenty years before the technology began to meet the high expectations and fulfil market requirements (Virtual Reality Site, 2016). The development during these years has been enormous and a large number of players have developed and improved the technology over the years. In the present day, in the 21st century, the development has come a long way and the technology is now considerably easier to use and more applicable in different industries. The broad mass today use powerful mobile phones, laptops and other advanced devices. This resulting in that ordinary people can get access to the technology and utilize it in a good way. The advantage is also that the costs of development and the price of the equipment constantly are driven down.

The technology of virtual reality can be explained as a technical solution providing an interactive, spatial 3D-visualization that can be modified, changed and interact in real-time (Whyte, 2003). The idea is that the user should experience a sense of reality in a digital environment. This sort of solutions can be displayed either through a computer, phone, tablet or other technical advices.

5. EMPIRICAL FINDINGS

In this chapter of the thesis the findings from the market research and the conducted interviews will be presented. These findings will form a basis for the analysis later in this thesis. The empirical findings will be divided in two different sections; the industry level and the organizational level.

5.1 THE INDUSTRY

This part of the empirical chapter will consider the industry structure, the actors, buyers and suppliers. As well as how the general value chain and sales process may look within the industry.

5.1.1 INDUSTRY STRUCTURE

The commercial real estate industry is considered to be a slow moving industry, holding onto traditional ways of doing business. There are however indications that the industry is currently undergoing a digital transformation and a generation shift, which may positively affect the transformation speed. The fast digital development in the residential real estate sector, is considered to be a source of inspiration and several actors in commercial real estate is observing what is going on there. However, even though a digital transformation seems to be close, the overall perception in the industry is that commercial office will need 5-10 years to adopt the technology that is used in the residential sector right now.

Even though most of the actors agree that a digital change is imminent, traditional ways of doing business will still be a success factor. There seem to be a divide in the industry where some actors have been more willing to try on new technologies, while others more sceptic organization, are still solely holding on to traditional approaches such as phone calls, emails and personal meetings. The sceptics towards the technology argue that organization not yet have the abilities to absorb the new technologies, and that is required to change before the new technologies can be implemented. Such a change may take more time than one think.

In all three countries, the commercial office market is currently prospering, especially in the inner city areas. The vacancy rates are low, and the rents are increasing. The average rental growth, *figure 12*, between 2009 and 2014 has been above 3% for all larger cities, except for Copenhagen. Meanwhile, there is a lack of new office space being built, which causes the vacancy rates to drop further and rents increasing. Currently the industry consists of many actors of varying sizes. Smaller property owners who only own one or two properties, may still be profitable due to the current market situation. The situation gives low or no incentives for organization to adopt new marketing technologies, mostly because the demand is high and properties rent out themselves. It is believed that keeping personal relationships rather than advertising in innovative ways is what gives the most competitive advantage.

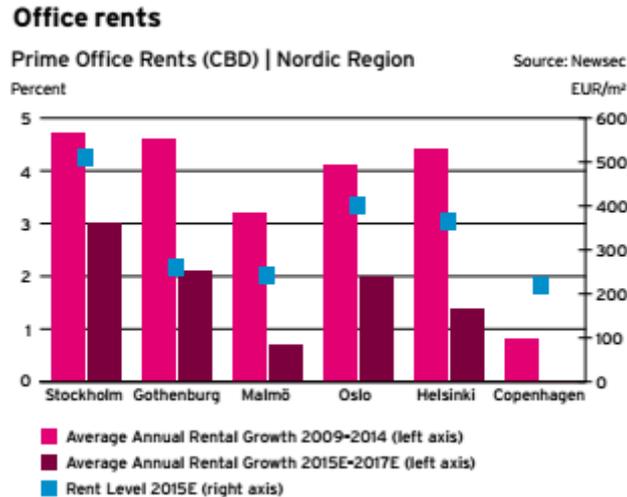


Figure 12 - The average rental growth (CBRE, 2016)

The market situation may however change in the following years. In Gothenburg, Sweden, a lot of office area is currently under development and will be finished 2018 - 2020. This major increase in demand will probably result in higher vacancy rates, which might enhance the need for adoption of new marketing technologies in order to gain the customer's interest. It is likely that smaller property owners, who may not have the capital requirements to buy such solutions will suffer due to the toughening competition and as a result be forced to sell their properties to the larger actors. The industry will thus become more consolidated and the barriers to entry may increase due to increased need of capital requirements and marketing knowledge.

5.1.2 ACTORS

The Nordic commercial office market is divided between property owners and real estate brokers. The usage of brokers varies a bit between the different countries, e.g. it seems to be more common in Norway to use brokers in comparison with Sweden. Denmark seems to have a similar structure as Norway, using brokers as middlemen between the property owner and the end customer. Also, the major property owners in Denmark is primarily banks and pension funds, while the major private actors are fewer and owns less office space.

A commonality in the Nordic market is that there is a wide spread of actors. A large quantity of smaller property owners, result in quite small market shares for the major actors. As an example the eight major actors in Stockholm account for about 30% of the total office area in this region, the rest is divided between municipality and small property owners. This is also confirmed by the organisations participating in the interviews who points out that in Sweden there are a large quantity of actors who only own one or two properties. In Denmark the situation is similar, but here it is common for the small actor to hire a larger firm to manage everything related to the properties.

The structure of actors in the broker segment seems to be similar to the property owners. Depending on what region it is, there are different brokers that are active. Also, knowledge about the local environment and customs is considered to be important. For example, in Norway the sales process in central Oslo compared with just a few miles outside the city can differ. It is not always easy to establish a new business

in local areas and there have been problems when moving from Oslo and try to start new sales in e.g. Bergen.

In Sweden, the large amount of different actors on the property owning side of the market doesn't seem to, for now, to result in fierce competition between the actors. Many of the actors focus on different areas and have property clusters. Even though all actors are following what their competitors are doing, the environment seem to be quite friendly. The industry is a bit like a herd and that could in some cases be useful as it allows and give the opportunity to benchmark.

The Norwegian market is more offensive. Reaching out to the customers ahead of their competitors is an important factor to maintain positions. To be "*first on the ball*" by keeping track on customers leasing contracts and maintaining relationships is considered by both brokers and property owners as the way-to-go approach when it comes to competition.

5.1.3 SUPPLIERS OF MARKETING MATERIAL

All companies that have been interviewed are currently outsourcing parts of the marketing activities to architects, professional photographers, or 3D visualization companies to a varying degree. Who they hire is often object or project specific, even though several admits that they prefer to use people they have some kind of knowledge about. Sometimes the companies have access to old pictures that are still eligible for marketing of the object.

Only one participant is fixed to a single supplier of marketing material. The choosing of a supplier is based upon skill, previous relationship, quality of work, reputation, and price. However, there is a common perception that a long-term relationship probably would benefit both sides.

Lately more and more firms have realized that they have to increase their marketing efforts. Those who have not had an established marketing department have now started to invest and adding more resources into departments like that. Several firms have also expressed the need for a presence on social media in order to increase the attractiveness of the firm. As an example a Norwegian property owner had recently hired personnel whose sole responsibility was to manage social media and come up with new ideas related to that forum. However, some of the actors are further ahead in using social media as an advertising tool, and the actors use the social media channel to a varying degree.

5.1.4 BUYERS

The customer or buyer is very much in focus for both property owners and brokers. As mentioned earlier, the relational aspect is considered to be important in the industry, and the property owners are the ones that mainly are the instigators to contact. Furthermore, all organisations that have been interviewed keeps their customer in focus and offers some kind of adaptation of the office to fit the customer needs. The important aspect for many organisations is to capture the interest of the customer. Many times, the companies have to widen their perspective and look for customers outside their usual business area.

Compared with a couple of years ago the demands and requirements from the buyers have increased. It has become more important for them to brand themselves with good looking and designed office spaces, so that they in turn can attract talent employees. Furthermore, the customers often search for a specific object that fit their needs, and thus it is a challenge for the property owners or brokers to provide their customers with the "right" object.

As a result of the above factors the buyers have gained an increased bargaining power. This is of course beneficial for the buyers but has increased the pressure on the property owners and brokers in terms of competition and the importance of better marketing. There are a large number of actors in the market and the buyers and the customers therefore have the possibility to choose supplier from a large selection.

5.1.5 THE CURRENT VALUE CHAIN AND SALES PROCESS

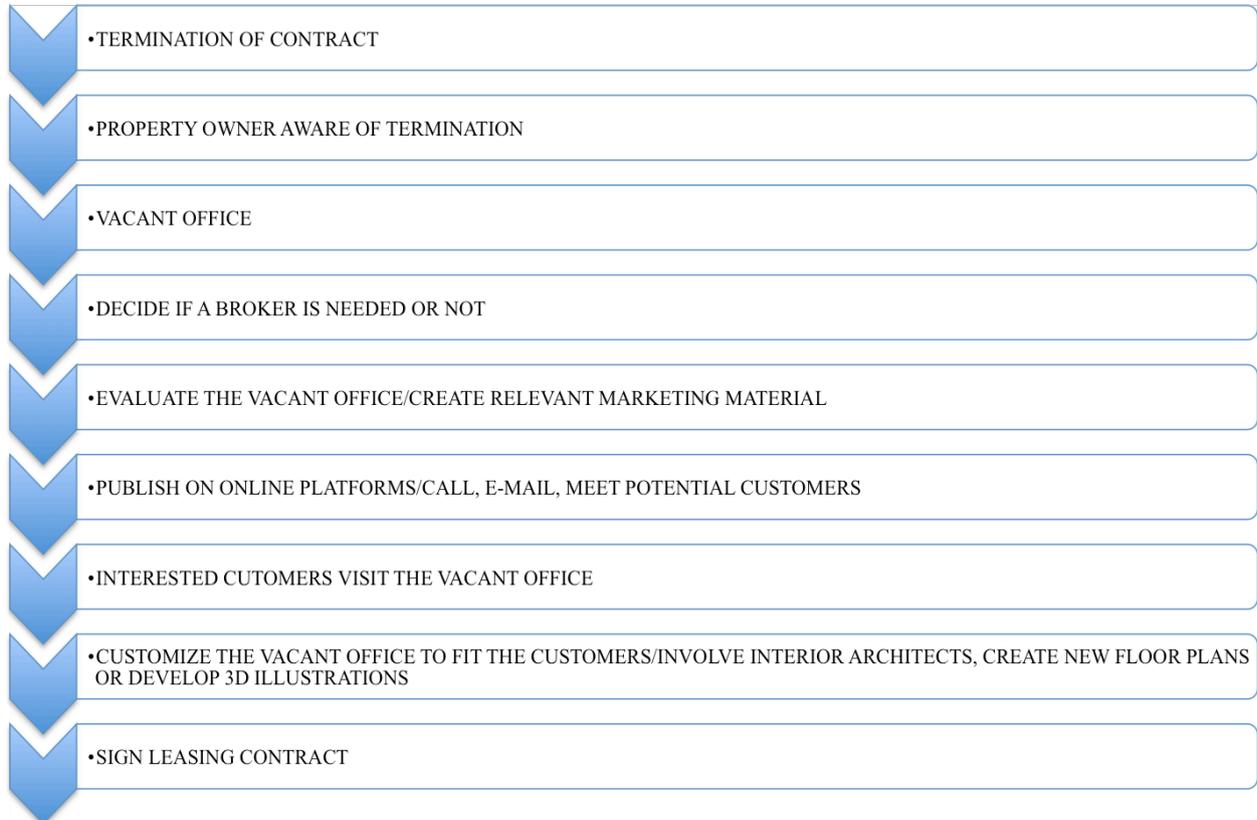


Figure 13 - Shows a generalized approach to the current sales process concerning a vacant office in the Nordic commercial real estate sector (Hoffström et al., 2016)

The current value chain in *figure 13* contains nine steps:

1. *Termination of contract:* The customer decides that they do not longer desire the office, and terminates the contract
2. *Property owner aware of termination:* The property owner becomes aware of the termination of a contract, and that the office will become vacant
3. *Vacant office:* The office is now vacant. The general lead time for the vacant office is between 9 - 12 months, but can be shorter and longer depending on the object
4. *Decide if a broker is needed:* A broker may be responsible for the whole sales process, and sometimes the property owner is solely responsible. Also, in Norway and Denmark it is more common to use brokers when compared to Sweden.

5. *Evaluate the vacant office, and create relevant marketing material:* In almost all cases the office is evaluated and decision is made whether it needs to be renovated. Depending on the type of object, a decision is made what type of marketing material has to be created. Some parts may be outsourced to external suppliers, while some activities are kept in-house. For example most of the interview participants say that they create their prospects by themselves while they hire professional photographers to take pictures. In some instances, depending on the value gained, 3D visualisations or videos are created to further increase the exposure and attractiveness of an object
6. *Publish online, call, e-mail or schedule meetings with potential customers:* The channels used to communicate with customers are websites, phone calls, e-mails or meetings with potential customers. The potential customers may be found through databases that keep track of the end-date of current leasing contracts. The created market material is available on the websites, and in the prospects that has been created for the specific object
7. *Interested customers visit the vacant office:* In this step the interested customers visit the vacant office and decide whether to proceed with this object or find another one
8. *Customizations of the office:* The customer and the property owner have entered negotiations about how the office should look in order to fit the customer. What are the demands? What are nice-to-haves? The property owner may include interior architects who can developed detailed 2D floor plans, sketches, or 3D visualizations in order to show the customer how the office will end up looking
9. *Signing of leasing contract:* The last step of the value chain is where all terms has been negotiated and the signing of a leasing contract take place

It has become clear during interviews that the sales process varies a lot depending on what type of object it is. For example, high value objects may receive greater attention and thus have greater prospects, marketing material and larger budgets, which may result in additional steps in the value chain. Also, offices in attractive areas may need less marketing and rent out themselves quickly. Thus, some of the steps in the value chain described above may disappear depending on the organization, country and current situation.

5.2 TECHNOLOGICAL ADOPTION IN THE INDUSTRY

The *figure 14* shows the distribution of different marketing tools used of the commercial real estate actors within the Nordic countries. The graph is conducted through a randomly chosen sample of digital marketing tools selected from various companies' websites at a particular time. The figure intends to show the distribution of digital marketing tools used in the very first stage of the sales process only. Later in this section a table will show a more in-depth view of the digital marketing used conducted from the outcome of the interviews.

Regular photos are most common in all of the chosen countries, often in combination with 2D floor plans. This combination seems to be some sort of standard or unwritten rule within the industry when marketing. In some instances 2D floor plans are not used for marketing, but is available upon request.

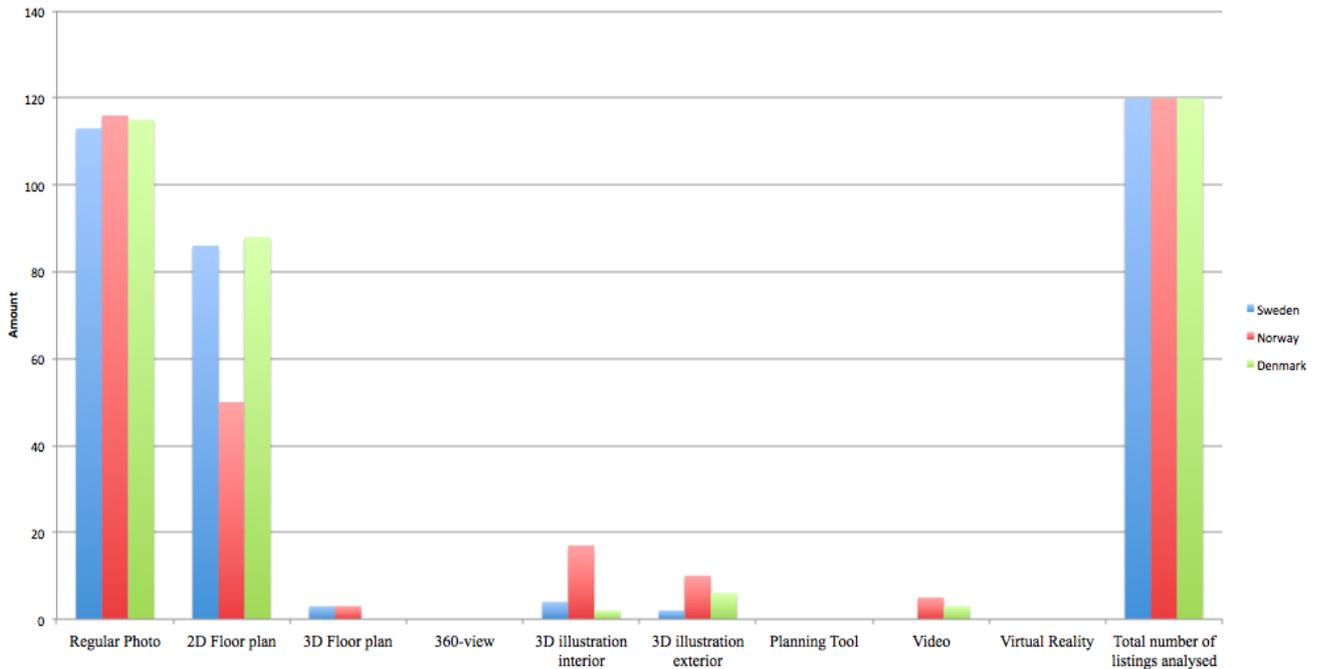


Figure 14 - Showing the distribution of digital marketing solutions within the industry (Hoffström et al., 2016)

The usage of more advanced digital tools for marketing is more common in Norway, in comparison to Sweden and Denmark. Norway had the highest amount of 3D illustrations of the interior and exterior, and also the highest amount of videos. However, it is possible that the usage of these tools are more common than what is shown in this data collection, but in a later stage in the value chain mentioned in *figure 13*. Several interview participants mentioned that they, in collaboration with the client, develop illustrations of the interior in order to customize the object to fit the specific customer.

Furthermore, the usage of 360-views, planning tools and virtual reality amounted to zero. None of the objects that were listed at this particular time and within this selection had this option for the customer. The use of planning tools may be done in a later stage in collaboration with architects according to several of the interviewed companies. However, as it looks for the moment this is mostly done in the old fashioned way by using pen and paper, or sometimes by developing 3D illustrations. Also the result shown in the *figure 14* was confirmed by the interviews, where several participants expressed that they would like to see these kinds of planning tool solutions but they did not believe that anyone was using it in the market today.

3D floor plans only occurred in Sweden and Norway, but the usage was very limited and only a total of 6 objects were marketed with this tool. This result aligns with the result from the interviews where a common belief was that the 3D floor plans did not contribute with much value, and a simple 2D floor plan was preferred, by both the customer and the firm marketing the object.

As part of the outcome from the interviews *table 4* below was compiled containing a list of the interviewed companies and what sort of digital marketing tools they use more or less frequent in their sales processes. To find more information of the chosen companies, see *table 3*.

It appears from the information given during the interviews that the most commonly used digital marketing tools are 3D illustrations and videos. These two technologies seems to have been adopted to the greatest extent and are also believed to be the most useful tools currently. Just a few actors use the more radical digital tools such as; virtual reality and planning tool. The reasons why the other tools are not used will be further discussed in the analysis.

CODE NAME	VIRTUAL REALITY	3D ILLUSTRATION	3D FLOOR PLAN	360-VIEW	PLANNING TOOL	VIDEO
Company 1	NO	NO	NO	NO	NO	NO
Company 2	NO	YES	NO	NO	NO	NO
Company 3	NO	YES	YES	NO	NO	YES
Company 4	NO	YES	YES	NO	NO	YES
Company 5	NO	YES	NO	NO	NO	YES
Company 6	NO	YES	NO	NO	NO	YES
Company 7	NO	YES	NO	NO	NO	YES
Company 8	NO	YES	YES	NO	NO	YES
Company 9	NO	YES	NO	NO	NO	NO
Company 10	NO	YES	NO	YES	NO	YES
Company 11	NO	YES	YES	NO	NO	NO
Company 12	NO	YES	NO	NO	NO	YES
Company 13	YES	YES	NO	NO	NO	NO
Company 14	NO	YES	NO	NO	NO	YES

Table 4 - List of interviewed companies and what sort of digital marketing tools they use frequently (Hoffström et al., 2016)

5.3 THE ORGANIZATION

This part of the empirical findings will take a organizational level perspective and focus on the marketing solutions used today and the perceptions of the new technologies.

5.3.1 TODAY'S MARKETING TECHNOLOGIES

The most common marketing technologies used by the different organizations is photos and 2D floor plans, these are used in almost all of their advertises on their websites or their prospects. All organizations have produced and used 3D visualizations at some point, but the use is most often limited to specific objects. 3D floor plans have rarely been used, mostly due to the fact that they provide little or no value

compared to the 2D floor plans. In a few rare occasions videos have been used, but the costs for these is considered to be too high to use at a regular basis.

When it comes to marketing budget, it varies a lot between the organizations. The budget can vary from 1 000 \$ up to 20 000 \$ and above if it is believed that the income from the object can justify such an investment. For most of the actors it comes down to the specific object and estimations, common sense and previous knowledge when it comes to setting an advertising budget.

5.3.2 PERCEPTION OF THE TECHNOLOGY

Within the industry today there is a varying perception of the different new technologies among the interviewees. It differs between persons with different positions and also between the interviewed organizations. The awareness of what technologies that are accessible and what value it can bring to the organizations is also of different view, as well as the theories of how these technologies are expected to be used in the next few years. Even though differences have been identified, similarities also exist between the participants. For example, there is a consensus of how to approach the customers today in comparison with a few years ago, and also that the new technology will probably be widely spread within the industry in the future.

The different views that could be found among the interviewees might be influenced by everything from preconceptions and bad experiences from the past, to those who recently had a good experience from the technology e.g. when demonstrated at a business fair. Both positive and negative perceptions of the new technologies have been identified, and the findings will be explained below.

Although most of the organizations in the commercial office industry have not yet completely adopted the new technologies, as far as example the residential property industry, there is an overall a positive attitude to this form of innovations and digital tools. However, as some of these digital marketing tools, in one way or another, change the traditional working process there may be some resistance in the organization preventing from seeing the actual value of the technology. It is not always everyone who find new working processes as something good. Most often, these types of investments seem to be introduced from the management level. Thus, if the persons at the management level is comfortable with the traditional routines and cannot see the value in new technologies and lacks interest of the new methods, a change is unlikely to occur. However, these attitudes seem to have softened in recent times though.

Even though, as mentioned earlier, the industry is perceived as a slow moving and traditional, the organisations have changed the process of how the approach the customers. The traditional approach was to wait for the customers to call the property owners and ask for a new office, today it is the opposite and the organisations have to call the customers and be faster than their competitors. As a result of the tougher competition the importance of marketing has increased and been further developed. The organization spends more time and resources in this part of the sales process than a few years ago. Generally, the companies know that they must marketing themselves, their services and products far better than before due to the increased competition and demands of the customers. They need to stand out in terms of creative images and smart texts.

Although, resistance against new technology may exist in the organisations the raised awareness of the importance of marketing has resulted in a belief that new marketing technologies are needed to improve and change the way of working. Overall, is a good attitude to these kinds of technologies in the industry. The technology could result in that they become more efficient and profitable in the longer run, some even

believe that it may be essential for closing a deal. The implementation may take some time as well as changing the mind-set within the business. Also, as the price goes down and the quality gets better it will probably become more digital images and prospects in the future.

Furthermore new marketing technologies, according to several actors, should not only be limited to marketing purposes. Visualizations is believed to be a great tool to have when the customer has a hard time to understand or imagine how an office will look once it is finished. Several actors describes that just a few customers have the ability to imagine how an object will look like when it is completed for rent out. Then, 3D technology has proven to be a very good tool helping visualize and transform thoughts and ideas into something comprehensible.

A few actors have started to implement the use of digital marketing tools to a certain extent. Their perceptions of the technology aligns with the above statement that new technology may be crucial for closing deals in the future. Among these players, there is a belief that the renting process had probably not had the same positive results without the visualization.

As mentioned earlier, the overall attitude towards the technology is positive, but there also seem to be certain scepticism towards these kind of tools and new technologies used in the industry. A major reason for the negative attitudes against these kinds of tools might simply be that they currently not needed them. The business within the industry the recent years has been lucrative and there has been no reason to invest in expensive marketing technologies, in some organisations the incentives have been non-existent. There have also been indications of inertia within the organization that prevent this kind of implementations and introductions of new tools. This inertia goes hand in hand with the barriers discovered at the management level mentioned earlier.

5.4 BARRIERS TO ADOPT

In *table 5*, a compilation of the barriers to adopt new technology is shown. The barriers are inherent in different levels of the context that surround the commercial office market. The levels that have been identified are industrial, organizational, individual and technological.

	LEVEL	BARRIERS
TOP LEVEL	Industrial	Vacancy rates Economic situation of the industry
	Organizational	Management Budget Traditions - inertia Lack of resources Organizational culture
	Individual	Technical know-how
	Technological	Price Quality Realistic representation Usability - Complexity
BOTTOM LEVEL		

Table 5 - Illustration of barriers to adopt and the contextual level (Hoffström, 2016)

Interdependencies between and inside the different levels exist. Also, trade-offs between the different barriers is an important aspect that has to be considered when determining the actual importance of the specific barrier.

At the *industrial level* the barriers to adopt new digital marketing technologies are low vacancy rates, and the positive economical situation of the industry. The currently low vacancy rates, especially in the inner city regions, are a major barrier towards adoption. It is also interrelated with the positive economical situation. Low vacancy rates reduce the need for marketing, since many of the attractive vacant offices are easy to rent out as they are. Thus, there is a lack of financial incentives and questions about the gained value from using new digital marketing tools. These two barriers affect several other barriers in the levels below the industry level, such as the price, management initiatives, budget, traditions and culture. This macro-perspective of the industry is important to understand in order to comprehend how the industrial situation may affect the overall perceptions towards new technology, as well as how the technology itself and the suppliers of the technology have to adapt to gain market acceptance.

There seem to be several barriers affecting the diffusion of the new technology at the *organizational level*. The traditions of how to do things in both the industry and the organizations are strong, even though there are indications that something is about to change regarding this. It seems like the traditions have shaped the perceptions of the management team of how valuable the new technologies might be. The organizational culture also seems to be a factor that determines whether adoption of new technology is likely to occur or not. Some organizations have a cultural acceptance towards individual marketing initiatives, while others have a more restrictive approach and rely on well-established processes and procedures.

A major barrier towards adoption, which relates to the abilities of the supplier of the technology itself, is that the organization do not have enough human resources to assign to the creation of marketing material with many of the new technologies. Often a detailed knowledge about for example the interior is needed as input in order to create a good visualization. If the supplier lack the ability to create material without the need for input from the buyer, it is likely that this relationship is not sustainable for long. The lack of resources from the organization's side may be a result of the pressure from the market as the resources are tied up to handling vacant office areas. The increasing rents also puts a pressure on the leasing managers to get the customers to sign the leasing contract as soon as possible, and for now the overall perception in the organizations is that customers are found through relationships and networking by phone, e-mail or meetings. Thus, there is low willingness to assign resources to the creation of marketing materials.

From an *individual perspective*, technical know-how is limiting the willingness to adopt new technology. This barrier might be influenced by the cultural beliefs, and the inherent traditions in the organization and industry. At some times the technology may just be complicating things, making it harder instead of simpler for the customer. Simplicity is an aspect that is considered to be very important for the buyer of new solutions, especially when it comes to solutions that require some kind of device. A digitalization of the industry requires the individuals in the real estate industry and their customers to understand how these new solutions function. Often their customers are of an older generation and may not be familiar with the use of digital devices, for example a Norwegian actor invested in a video solution, which received no attention because their customers were not familiar with this type of advertising. Furthermore, there is a concern that the technology may malfunction during display which requires the leasing agent to have the expertise in how to solve this problem. A malfunction may reduce the credibility of the organization unless it is solved. It is therefore important that the technology is simple to use for everyone and that suppliers of the technology can to some extent guarantee that the technology will not fail.

There are several *technological* aspects that may affect the adoption rate of new technology. One of the main factors is the price. There is an overall consensus in the industry that in order to achieve good quality products you have to pay for it. Some organizations are willing to pay a price premium for the quality, while others are willing to move in the different direction and accept lower quality if the price is right. One possible explanation to the high price is that several organizations hire architects to develop visualizations, which in turn may outsource the task to a third-party supplier. Even though the prices have decreased and the quality has improved, the overall consensus is that the prices are too high in order to use new solutions at a regular basis.

Regarding the quality of a product, the authenticity is important to not deceive the customer, or decrease the credibility of the organization. A common concern is that suppliers based abroad, especially in Asia, may not understand the importance of showing a realistic representation of the environment around and within the office. For example the people in a visualization have to be dressed as people in the Nordic, and the lighting has to be accurate so that the customer can relate to the reality. This is one aspect to why real estate actors prefer to pay a price premium for high quality products.

Some of the suppliers of the new technologies have launched their products too soon and have had poor quality, which have caused the actors in the real estate industry to get a negative perception of the new technology. As described by a Norwegian actor “*I tried VR-technology at a fair, but the quality was low and the overall impression was bad*”, this reduced the willingness to use this solution. Furthermore, even though this was an example of a recent encounter with the technology, encounters several years ago may still affect how organizations perceive the new technology. A negative perception that was created several years ago when the technology was new and of lower quality, may have resulted in an increased scepticism towards the solutions today. It is therefore important that the solutions are flawless and that the suppliers of the technology can fulfil all the needs and demands of their customers.

5.5 PROSPECTS FOR THE FUTURE

The future is always uncertain but in many cases often exciting as it offers many opportunities. The future outlooks for the commercial office industry is interesting and the industry may face changes that might impact on how business is done. There is a shared belief that the industry will take 5 - 10 years to change and become more digitalized. However, before a radical change can occur there are several unanswered questions that need to be answered, for examples doubts about; whether the quality will be good enough? and how much the technology will cost? When these questions are becoming clearer it can be interpreted that technologies like; Virtual Reality technology, 3D-visualization tools, 3D-planning tools, videos and 360-views have a great potential to succeed in the longer run.

There are high expectations within the industry of what value tomorrow’s technologies will bring to the organization and a hope that the quality will be even better, the usability more simple and the cost of implementation lower. If so, this will probably lead to that the spread of technology will increase significantly. The technology is partially scalable and there are several dimensions to develop and add to the current performance. According to some actors it would be useful to add light studies and wind studies integrated with the virtual reality technology in a couple of years.

In contrast to the question marks that most likely have to be solved before a change will occur, there are also factors that may accelerate the adoption. The high demand for new technologies in the residential

sector may put pressure on the suppliers to create better solutions, which may in turn answer the questions marks that consider the commercial real estate industry. Also, since the residential industry is somewhat considered as a role model for the commercial industry, the transition between the two might not be great. In fact, a few actors have already implemented solutions that are widely spread in the residential sector. Also, several of the major actors in the commercial real estate industry own residential properties as well. Thus, there should be a lot of in-house knowledge about how to properly adapt and implement new technology or transfer it between different divisions. However, it is possible that other factors, such as customer demands, increased competition or attitudes from the actors, have to change prior to this or simply that a major organization adopts the technology and others feel forced to follow.

Even though there is some enthusiasm about new technology, not many believe that the technology completely will replace the human relationship and interaction in the sales process, as it is described to be an invaluable and important factor. Regardless of how much the technology advances it will probably never entirely replace the personal relationship. The personal interaction with the customer is too complex to digitalize. There are also doubts whether the technology ever will replace the feeling of bringing the customer to the actual location of the property, and show the customers around in the real environment. To conclude, there are dimensions that are difficult to visualize and replace with virtual reality and other technical tools, since they are important factors in the sales process.

6. ANALYSIS

In this chapter an analysis of the empirical findings, with inputs from the theoretical framework, will be stated. The analysis chapter will be divided into five different parts; diffusion of the digital marketing tools, current industry structure, future scenarios, future changes in industry structure and value chain and finally future value propositions. This is to get a good picture of the current situation and an understanding of future scenarios, and their impact on the industry. The analysis will act as a basis in order to answer the research questions in the next chapter.

6.1 DIFFUSION OF THE DIGITAL MARKETING TOOLS

The diffusion of different marketing technologies varies from organisation to organisation, and country to country. The gathered data from interviews in combination with the quantitative product analysis indicates where on Rogers's diffusion curve the technologies currently are positioned, *figure 15*. The placements of the different solutions consider to what extent organizations actually use the different solution on their vacant objects, and not how many firms that use them. This would provide a misleading view, since e.g. almost all firms have used videos at some point, but they do not use this solution on all of their objects.

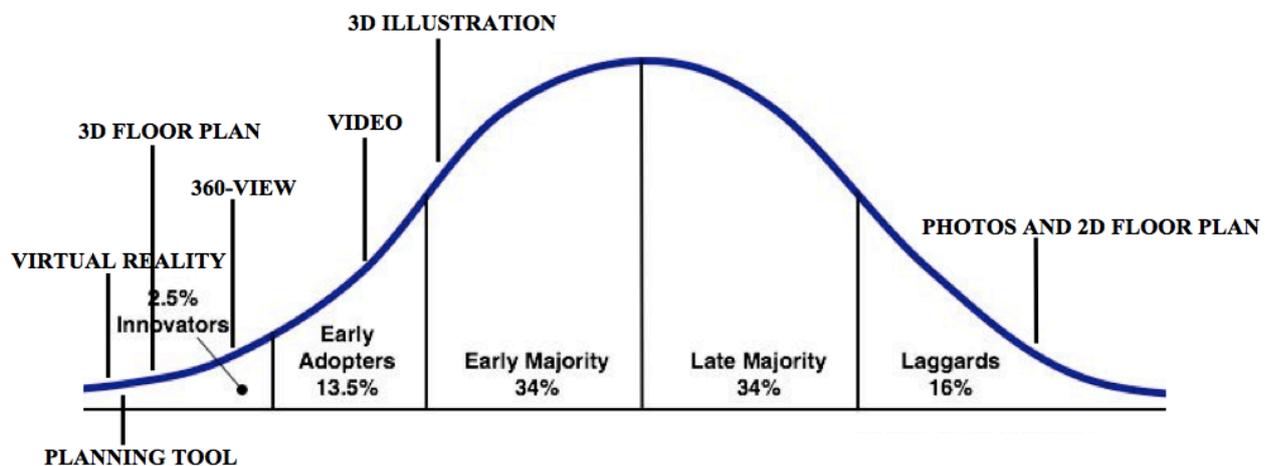


Figure 15 - The digital marketing tools used of the commercial real estate industry spread at the diffusion curve (Hoffström et al., 2016)

6.1.1 VIRTUAL REALITY

VR and interior customization are the least used technologies, and seem to only be attractive to the category innovators for the moment. The majority of the industry is sceptic towards the use of VR, while they are more positive towards interior customization. This indicates that the VR technology is still in the very early stages of the diffusion process, and that several blocking factors have to be solved before an implementation is considered. Several factors that are described by Lindmark (2006) may negatively affect the diffusion of VR in the commercial real estate industry. Currently the perception is that the quality is not optimal, the tool itself seem to be complex to use for customers lacking knowledge about it, the price is too high to incentivise implementation, and that it is unreliable and may malfunction at times. Also, the VR technology has not yet been fully implemented in other areas, which results in a lack of information about the outcome of using such tools. It has been possible for real estate firms to test VR solutions prior to adoption, but the ability to experiment with the technology seems to have been limited.

Even though there exist a belief that this type of technology may be relevant further ahead, the current perception is that this solution may be used for PR purposes of the firm instead of marketing for offices. As the development precedes it is however likely that VR solutions may be implemented to additional areas, for example for marketing purposes of offices.

6.1.2 3D PLANNING TOOL

3D planning tools or interior customization, also falls under the category innovators when only the commercial office industry is considered. It is however likely that the diffusion of this solution may go faster since references are available in other industries, a factor important for capturing the early and late majority. It is known that these solutions exist in the residential industry, which means that the chasm may be easier to overcome in comparison with VR. The overall positive attitude from the majority of actors regarding this solution, further implies that the knowledge about this technology is great, and that actors to a greater extent have seen the outcome and results, and tried out such a solution. The relative advantage for this product is considered as quite high since it may reduce the need for showrooms, ease the customization process, and visualize for the customers. Factors affecting the diffusion negatively are concerns about the complexity of such a tool. It may be hard for customers in a traditional industry to understand such a tool without any education of how it works. Also, the technology may not be developed enough to replace architects, who currently are preferred when customizing offices for customers.

6.1.3 3D FLOOR PLAN

Similar to the interior customization, the 3D floor plans are used to a greater extent in the residential industry. However, even though references are available the majority of the industry is sceptic towards this solution, and as shown in the product analysis few actors use this solution. The main reason for this is that the value gained is non-existent when compared to a 2D floor plan that is considered to be much more useful. This relates to Lindmark's (2006) argument that the relative advantage for a product is an important factor that may negatively or positively affect the diffusion.

6.1.4 360-VIEW

The implementation of 360-view solutions is unusual in the industry. The use of such a solution has only been implemented on a few high value objects, but none of the objects investigated in the product analysis presented an office with a 360-view. The use of 360-view solutions is not considered to be complex since, it basically is a variation of using several photographs. However, there is a concern for malfunction of the technology that is used for presenting, such as tablets and that the personnel may lack technical know-how to solve such problems. Also, since offices may be thousands of square meters it would cost a lot to cover the whole office with such a solution, and thus the value of the solution would decrease if only one room could be presented. There are a lot of references available in the residential industry, and several suppliers present their solutions online which makes the ability to try out this solution high. The advantage of the 360-view solution is believed to be that it allows the broker to offer the customer a complete visualization of entire offices and how it might look when everything is in place.

6.1.5 3D ILLUSTRATION

3D illustrations are the most used new technology solution in all countries. Even though all organisations seem to use this solution, it is not used on all objects, thus it is considered to only be adopted by the early adopters. Due to price in relation to value concerns, 3D visualizations are too expensive for smaller objects and thus only applicable to objects that will bring in substantial amounts. The relative advantage

described is mainly that it allow for the broker to create an understanding for the customer how an office will or can look when it is customized. In comparison with the use of 2D floor plans, or hiring architects to sketch, this is simpler and more efficient, and if the price was not as high this solution would have been implemented on far more objects. Even though good quality is delivered most of the times, there have been occasions when the quality has been deficient. The poor quality may lead to reduced perceived relative advantage, deviation from existing needs, increased uncertainty relating to the solution itself, and also a negative attitude transferred to the other actors in the industry, all relates to Lindmark's (2006) arguments on decreased diffusion. The complexity of using 3D illustrations is low, it differs little from using a regular photograph. However, customers not used to this technology may find it confusing when they compare the 3D illustrations with the reality. Especially if the environment in the illustration deviates from the reality.

6.1.6 VIDEO

In terms of usage, videos have been used by most of the actors at some point, but to a limited extent and to specific objects which most often have high yields. Videos may capture the surrounding environment in a better way than the other tools, as well as showing customers how the surroundings will look like once a project has finished for example. Furthermore, it allows for a guided tour in the office, pre-visit to give the customer a perception about the lay-out and possibilities of the office. As for many of the other marketing tools, the price is a major concern. Quite large investments have to be made in order to create a video that have high enough quality, and for smaller objects it is hard to justify that investment. A drawback that has been identified is that customers may lack the understanding or knowledge about these types of solutions, and simply avoid or miss that videos are available.

6.1.7 GROWTH OPPORTUNITIES

Table 6 includes the considered growth opportunities for the technology in the industry, the uncertainty related to this growth, blocking mechanisms affecting diffusion negatively, and inducement mechanisms affecting the diffusion positively.

TECHNOLOGY	GROWTH OPPORTUNITIES	UNCERTAINTY	BLOCKING MECHANISMS	INDUCEMENT MECHANISMS
Virtual Reality	High	High	<ul style="list-style-type: none"> ● Unsatisfactory quality ● Not valuable for marketing offices ● High costs ● Complex ● Unreliable ● Technological Interrelatedness 	<ul style="list-style-type: none"> ● Informational increasing returns
3D Planning Tool	High	Medium	<ul style="list-style-type: none"> ● Complexity ● Under-developed ● Path dependent 	<ul style="list-style-type: none"> ● References available

3D Floor Plan	Low	Low	<ul style="list-style-type: none"> • No perceived value 	<ul style="list-style-type: none"> • References available • Observability • Low complexity
360-View	Medium	Medium	<ul style="list-style-type: none"> • Uncertainty about the reliability • Price 	<ul style="list-style-type: none"> • References available
3D Illustration	High	Low	<ul style="list-style-type: none"> • Price • Shifting Quality 	<ul style="list-style-type: none"> • References available • Observability • Compatible • Low complexity
Video	Medium	Medium	<ul style="list-style-type: none"> • Price • Low value for small objects • Technological Interrelatedness 	<ul style="list-style-type: none"> • References available • Observability

Table 6 - Considered growth opportunities for the technology in the industry (Hoffström et al., 2016)

Following the reasoning of Moore (1999), the different technologies are facing different challenges regarding further diffusion. Some of the technologies are adopted by the very early markets, while others are on the verge of the mainstream market. Several of the technologies that are currently considered being in the innovator segment face the same issues; the perceived value of the solution is low. The technology have been implemented in other industries, and are also common in e.g. the residential industry, this implies that there is a knowledge gap in the commercial office industry, which negatively affect the diffusion. According to Ram and Sheth (1989) a strategy to overcome this issue is *communication strategy*, where the suppliers of the technology have to educate and inform in order to change the perceptions already created. Furthermore, even though references are available in other industries, it is likely that there is a lack of references from the commercial office industry, which results in scepticism. Thus, for diffusion to accelerate, results that the industry can relate to have to be published. However, even though the early majority customers are willing to pay a higher price, guaranteed that the quality is good, it is possible that the price is still considered as too high for adoption to occur. It is possible that the technology have to advance further in order for the early majority to consider adoption.

Virtual reality is the technology surrounded by the most uncertainties, but it is also one of the technologies that is considered to have the highest growth potential, mainly because the other technologies could be integrated into this solutions. The diffusion of this technology is only in the early stages, but the buzz surrounding VR may cause the diffusion to take off earlier than expected. Klitkou et al. (2015) talks about *informational increasing returns* where an increased adoption may result in increased attention and increased observability. Currently VR is on everybody's lips, which puts the technology in the spotlight, and innovators and early adopters may be interested in adopting to gain some sort of competitive advantage. However, it is still very likely that the other blocking mechanism have to be sorted out before an adoption may occur within the early majority segment. Therefore, the uncertainty whether VR will succeed and grow in the commercial real estate industry is high.

Looking at the other technologies, currently attracting the early adopters, both seem to have encountered the chasm, described by Moore (1999). According to Moore, the early majority are captured by providing quality, reliable systems, and long-term relationships. Once again, following the reasoning of Moore, the main barrier for 3D illustrations seem to be the shifting quality of the products delivered. Also, since only a few of the actors have long-term contracts and relationships, it is likely that this aspect has been a barrier blocking further diffusion for 3D illustrations. For videos, the blocking mechanism that directly relates to Moore is the price. However, a major blocking mechanism, described by Klitkou et al. (2015) could be that the video technology, at least for some of the actors, diverge from the existing technology that is used. As a result this technology is locked out by a part of the mainstream market, and thus the diffusion has not been as effective as it could have been. A factor strengthening this argument is that the perception about video solutions varies between actors, some are very positive while others are sceptic and find it hard to see the purpose with these solutions.

6.1.8 TECHNOLOGICAL ADOPTION AND AFFECTING FACTORS

Applying and relating the above analysis to Davis (1986) technological adoption model, the results in *table 7* are obtained. Instead of, as Davis suggest, using actual system use Rogers diffusion of innovation theory have been combined with Davis’s framework. Actual system use is replaced with extent of use to correctly apply boundaries relevant for the topic of investigation. In this case the actual use of the system considers the actual use on all vacant listings posted by organisations.

	VR	PLANNING TOOL	360-VIEW	3D FLOOR PLAN	3D ILLUSTRATION	VIDEOS
Perceived Usefulness	LOW - MEDIUM	HIGH	LOW-MEDIUM	LOW	HIGH	MEDIUM
Perceived Ease of Use (Complexity)	LOW	MEDIUM	MEDIUM	HIGH	HIGH	MEDIUM
Behavioral Intention to Use	LOW	HIGH	LOW	LOW	HIGH	MEDIUM
Extent of Use (Applied on vacant listings)	LOW	LOW	LOW	LOW	MEDIUM	LOW

Table 7 - Technology acceptance model applied on marketing tools (Hoffström et al., 2016)

Perceived usefulness seem to be the major determinant affecting the behavioral intention to use, while perceived ease-of-use seem to be of less importance. This is somewhat confirmed by the empirical findings where ease-of-use seem to be a topic of concern, but not as important as the actual value in relation to price. Also, products with low complexity are not adopted solely based upon that.

Bagozzi’s argument that behavioral intention must not be a major determinant for actual system use is confirmed in this thesis, see *figure 16*. Even though the intentions to use are high or medium, the actual system use is lower. This indicates that other factors, not directly related to the technology itself, may be present and affect the actual use of a technology. For example even if the perception of a technology is

positive, there is a value in implementing the technology, and that it is easy to use, it is still not certain that the extent of use is high.

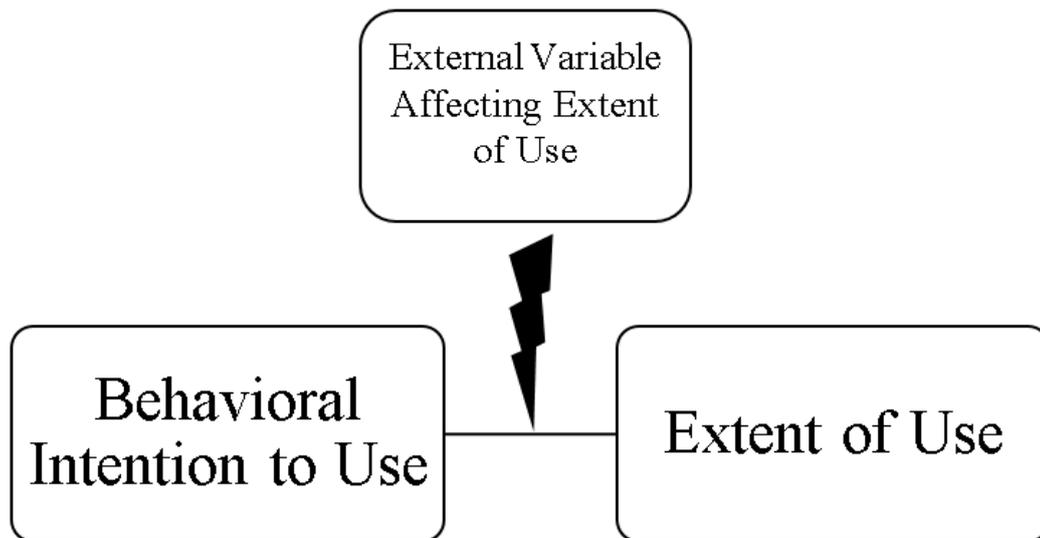


Figure 16 - Shows that external variables affects the extent of use (Hoffström, 2016)

In an organizational setting two different perspectives needs to be acknowledged in order to understand the extent of use, the organization and the individual. The individual and organization may have different experiences, perceptions, and cultures, all shaping a positive or negative attitude towards implementation of new technology. The individual itself may have great perceptions about the advantage of a solution, and have a high intention to use it. However, the organization's culture, values, beliefs, and processes may not align with the positive individual's intentions. These factors may restrain the positive individual to implement the technology and instead hold on to the previous traditions because it would not deviate from the organizational norms and the risks would be lower. What is important to highlight is that this suggests that TAM could be divided into two or possibly even more phases. The first phase is where the individual may create a positive attitude towards a new technology and create the intentions to adopt it. The second phase is that external factors cause the individual to reconsider and choose to not implement the technology. Instead of, as Davis (1986) suggests, that the adoption is a sequential process. This would suggest that there exists an iterative and evaluative process between the behavioral intention and the actual use of a technology. Thus, a high behavioral intention to use may not result in actually using the technology.

The likelihood of technological adoption also seem to depend on the individual's freedom to act, e.g. not be dependent on involving managers higher up in the hierarchy. A manager high up in the hierarchy may be more path dependent and believe in the traditions that are established in the organization. Therefore, a new technology deviating from the previous ways of doing business will fall under the category technological interrelatedness (Klitkou et al., 2015), where non-complementary technology is locked out.

Furthermore, as described by some of the companies, they have tried the technology previously and gained a negative attitude because of bad suppliers. Thus, as Matzler et al. (2014) suggest, the willingness to put time and effort into searching and implementing new technology may be reduced. Managers who have been in the company or industry for a while may therefore have a different attitude and perception about the new technology compared to those who have recently started. There are empirical findings that would support this argument, e.g. there is an on-going generation shift in the industry, and that the

industry may look different in a few years as a result. This suggests that the perceptions and attitudes of the individuals within the industry and within the organizations deviate from each other and that new industry values, norms, and cultures may originate as a result.

6.2 INDUSTRY ANALYSIS

A Porter's five forces analysis is conducted below to give a view of the current situation regarding the competition within the commercial office industry and to analyse its attractiveness. This will clarify the current state of the industry and give an explanation of the forces that affect it. This also provides an in-depth knowledge about the industry that can provide the basis for understanding the adoption of new technologies and change of marketing processes.

The *rivalry among existing firms* is considered *high* in the commercial office industry, due to several reasons. Firstly, the industry is largely affected by the global economy, in recent years there has been a good economic growth and not least in the larger cities of the Nordic countries. This advocates for good and growing business. Currently the vacancy rates are considered low and competition increases as a result.

Secondly, there are many actors in the industry competing with each other. There are a number of large players and a plethora of smaller actors which together create this competitive market. The competition often varies from place to place due to the geographic location and is intensified in the inner cities and within the central business areas. There is also a trend that shows varying attractiveness in the different city areas depending on the situation and future prospects in the economy. Thirdly, a reason which has led to the high rivalry among the firms is that the customers have become more aware in recent years and more picky when looking for a vacant office. There are numerous of different factors that influence a purchase and the "high-yield customers" are rare, those who sign contracts for prime location offices, where the prices are above the average.

The risk of *substitutes* cannibalizing on the real estate office industry is *low*. Offices as a product are complex to replace, but there are however some options available. Close at hand is to work at home. However, it is not so common to work in a home office today when it is of value to work in a community and with a social presence. This resulting in that small corporations or start ups rent spaces in a office hotel or similar instead.

Capitalizing on the trend of shared economy, a new start-up similar to Airbnb has been established targeting the office industry named WeWork (WeWork, 2016). WeWork designs and builds physical and virtual communities. The space can then be rented from each other and gives the possibility to fill vacant area from a few days up to a longer period.

The *threat of new entry* is not that easy to evaluate but is for the moment considered *medium*. What speaks for that the threat should be lower is that the initial need for capital requirements when investing in a property are high, but this also varies a lot due to the geographical location. There are possibilities for new actors to invest in properties for a decent sum of money and the high demand creating incentives to establish within the business.

For the moment the market is booming and the commercial office industry may in some cases be a lucrative business. The risk of entering the commercial office industry may vary depending on where the

new actor buy properties. High capital investment is required in the central business district but may reduce the risk since the likelihood of reduced property value is lower. On the other hand a new entrant may acquire properties for lower capital further away from the inner cities, but the risk of reduced property value may be increased as a result.

To enter this industry as a new player without previous experience in managing and operating rental properties also be a risk factor. There is nothing that guarantees a financial gain and industry conditions can rapidly change. But to add is however, that currently there are many companies providing services related to the industry and help those companies without further knowledge. They can provide everything from financial advisory to totally managing of the entire property.

Since the amount of actors in the industry is high, the buyers can freely choose from whoever they want and thus not be locked into one or a few suppliers. The *bargaining power of buyers* is therefore considered as *high*. If the client has no knowledge about the industry there are several middlemen and brokers that can provide the insights that the customer lack.

In regions where the vacancy rates are high this may require that the real estate companies have to rent out the vacant space to a lower price. It is expensive to have a vacant office during a longer period and the buyer have this chance to bargain, knowing that they must rent out. The potential customer also have a high switching cost moving from their old offices, resulting in that the supplier must come up with a good deal in order to get the tenant to move to another location.

The last force is the *bargaining power of suppliers*, which is considered *low*. The actors who supply material and services to the commercial real estate industry have some disadvantage as the property owners often negotiate with large volumes at a high value. This may result in a sort of dependence where the suppliers loses their bargaining power.

The low bargaining power is also due to the existence of a large number of suppliers that offers the same services at a different price and quality. Regarding the suppliers of marketing material and digital marketing tools there are a number of similar products resulting in squeezed margins. From the commercial real estate actor's' point of view this is obviously good.

6.3 SCENARIO PLANNING

The current state of the commercial office industry and the value chain of the sales process is described earlier in this thesis. The industry seem to be undergoing a change, and to analyze how the industry and value chain will be affected, and also to see the growth opportunities for the digital marketing tools, a scenario analysis has been conducted. This analysis will show four potential future scenarios equally plausible to occur but with different grades of uncertainty and impact related to them; A, B, C and D (see *figure 18*).

The main issue in the scenario planning is defined as; *How will the commercial real estate industry look like in 5-10 years?* Using the scenario planning framework, ranking driving forces on impact and uncertainty, a number of trends and key uncertainties could be identified. The outcome of the scenario planning and also the most important uncertainties affecting the future will be described and analysed in-depth later in this section, to begin with, all the *trends* and *key uncertainties* are explained.

6.3.1 TRENDS

The use of technical products, Internet, and digital tools has increased as a result of technical development and digital transformation. The latest generations have grown up with the technology close at hand and thus have a better understanding about the technology and the impact from digitalization. A *generation shift* is soon to take place and it can be assumed that a deeper understanding of digital product's potential will increase the usage within the industry.

The frequent use and awareness of Internet is also common for the new generation. The *digitalization* has changed the way of doing business and how customers consume, leading towards buying and selling more online. This growing trend will put high demands on the use of Internet as an ever more important marketplace in the future. It is difficult to say how this in turn will affect the commercial office market in the long run, but there are few things indicating that it could be negative.

It can be difficult to determine whether the *technological advancement* can be referred to as a trend or not, but after consideration it will be stated here. The development of the technology in the following years, in addition to new applications and better quality, may change the perception of digital marketing. In line with the technological development the user experience will be better and complexity reduced. At the market today complements such as; VR headsets, tablets and phones are important when using the technology and an increased number of complements in the future may influence the technology positively.

Today's customers tend to increase the *complexity of the customization* when planning and designing a vacant office. Clients and investors want to evaluate the potentials of the vacant office before signing a contract. This trend indicates that the customization will become more complex and thereby increase the demand for more advanced technology and planning methods in the future. As the demand of more complexity increases, the value of the digital marketing products will increase as visualised in the *figure 17*.

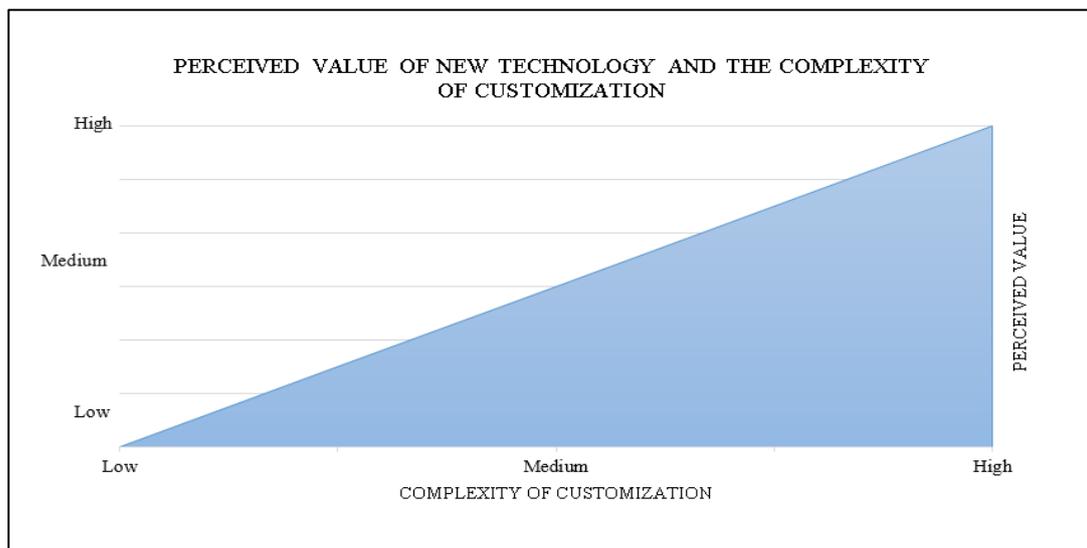


Figure 17 - Perceived value from new technology in relation to complexity of customization (Hoffström et al., 2016)

If, or rather when, the price of these digital products falls, the investment cost for these kind of technologies will be lower. The *reduced capital needed* will probably result in more actors using the tools. Increased use can also occur if there is a growing trend from the real estate industry-side to *brand*

themselves towards customers with these technologies. At the moment VR and similar technologies are a popular when branding the company or creating PR, but currently in a small scale.

As mentioned before in this thesis, the new marketing solutions are well implemented in the residential industry and they are probably a few years ahead of the commercial office sector. Thus, a further increased use and development here may lead to an extended use in the commercial office industry. The trend of *shared economy*, such as WeWork and Airbnb, may also affect the industry when marketing the vacant office space through different digital media, communities and marketplaces. The competition within these industries becomes tougher and this will require bolder marketing methods.

6.3.2 KEY UNCERTAINTIES

Beside trends affecting the industry there are also key uncertainties influencing the upcoming future and the outcome of the scenario planning. These are difficult to evaluate and predict as they can affect the industry in several dimensions.

The *change in customer demand* is a key uncertainty that plays a major role in the commercial office industry. As the trend of digitalization is growing, it is likely that consumer behaviors and how they make their purchases will change, this is however not guaranteed. A large part of all business in the sector today is done through personal contacts and relations between the buyer and seller. Most of the buyers are satisfied with the traditional prospects made of paper and the illustrations drawn by architects. There are many indications that the customer will demand digital marketing and planning tools in the future, but it is only a prediction. However, there could also be a reduced need for a close relationship between the buyer and the seller. The digital marketing material could be so informative and well designed that a personal contact is not a must in the same extent as today.

The actors who uses some of the technology today would like to see an *increased ease-of-use*. While new tech-savvy generations who can handle the new technologies enter the industry, there is still a large percentage who are not used to the new solutions. These older generation will need an increased ease-of-use in order to be tempted using the technology and understand its full potential. The technological development and the increased demand will hopefully accelerate this development towards a more easily managed tool. Over time, the development costs will probably fall

Currently the supplier side of the new technologies offer varying quality both in terms of technological quality, but also service quality. It is possible that this industry will become more specialized, either in providing the whole range of technologies, or just becoming experts on a single solution. Either way, this *specialization* would improve the overall quality of the products and increase the likelihood of implementation in the commercial real estate industry.

The industry has over the years created different *traditions* and specific ways of working. There are certain norms within the industry that are not easy to change. To start working with new methods or implement new technologies is likely to take time. The personal meeting and interaction between seller and buyers are one of those factors that have been shown to be important. In a short-term perspective there are no indications that for example VR should replace traditional methods such as personal meetings. However, in the long run it is possible that the technology will have that impact on the industry. The key uncertainty is whether it will be a technological change in the commercial office industry alongside a change in the buying behavior.

Future adoption of the technology is likely be affected by the *economical development* in the commercial office industry. Assuming that the vacancy rates remain low, it is likely that a change from traditional ways of doing business to a new, will take more time. As long as the vacancy rates are low, the incentives to change marketing methods are limited. With increasing vacancy rates, the competition for customers will become more intense, and creative ways of marketing will be needed.

6.3.3 FUTURE SCENARIOS

Based upon the above driving forces, trends and key uncertainties, the scenarios A, B, C and D have been identified and visualized in *figure 18*. The model answers the question; *How will the commercial real estate industry look like in 5-10 years?*

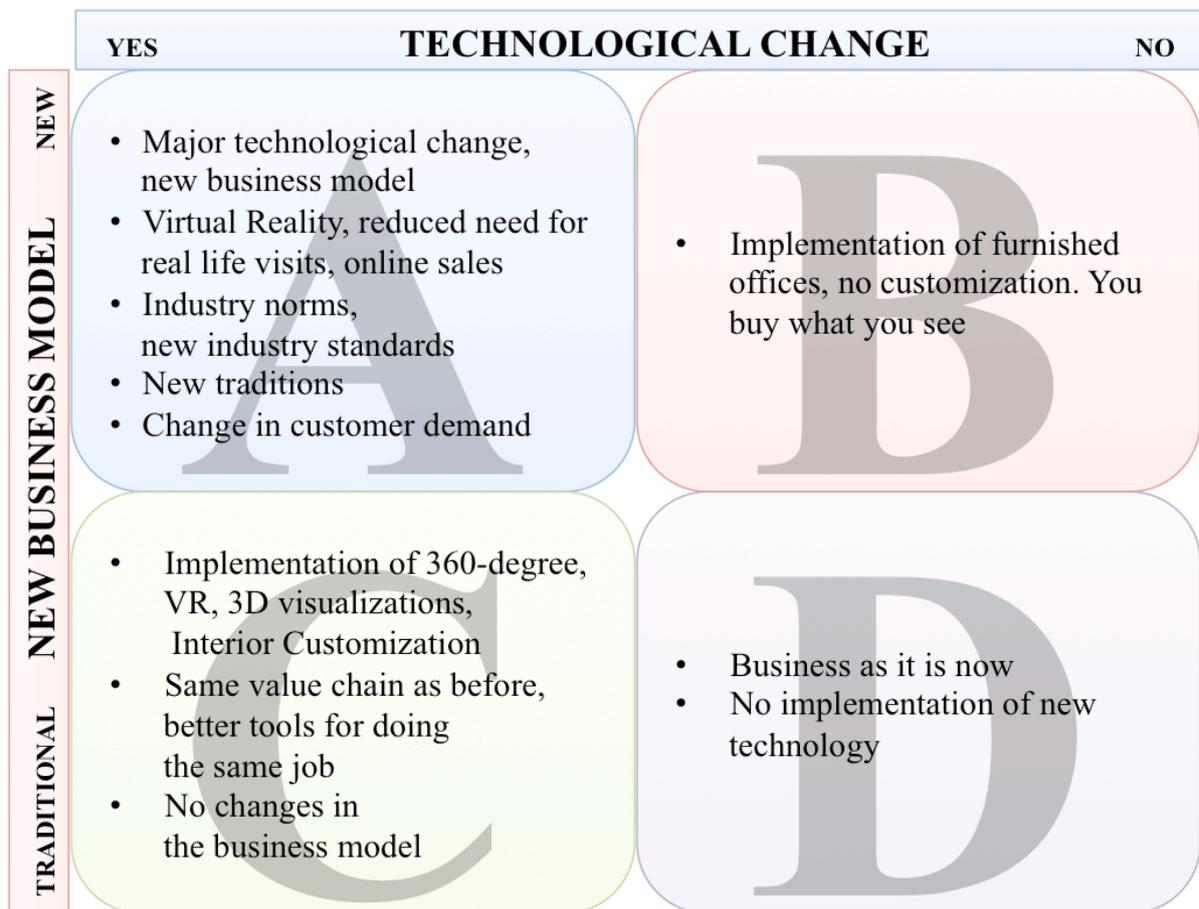


Figure 18 - Scenario planning model with different future scenarios A, B, C and D (Hoffström et al., 2016)

The scenarios; A, B, C and D are an outcome from the most important key uncertainties plotted on the axes and weighted against each other. The results and combination in each and one of the possible scenarios are different, but equally plausible to occur. The difference between the scenarios is mainly that scenario A has the most optimistic view of the future and scenario D the least.

In *scenario A*, there has been a technological change and introduction of a new business model. This has resulted in a major implementation of new digital marketing tools and a change in the way business is done in the industry. Industry norms and the traditional approach of working have changed and the need to

physically visit the object has decreased. All details, information and possibilities to virtually redesign and plan the vacant office will be available in the digital material. However, this requires not only a change from the industry-side but also a change in customer demand and buying behaviour.

In *scenario B* the industry will not undergo a technological change, but a new business model will be introduced. This could lead to a number of different outcomes, closest at hand is the implementation of finished offices. This concept is based on that the property owner designs the office in accordance with the targeted buyers, and they buy or rent the vacancy as more or less as it is. The main marketing method will then be regular photos and 2D floor plans, as it is today.

The third scenario, *scenario C*, shows a technological change but the current business model is the same. In practice this would mean that digital marketing tools are implemented and probably used more widely than today. Technology has improved and has better quality, ease-of-use and is not as costly. Despite these improvements the business is as usual and the current value chain and sales process are still the same. It can be summarized by saying that the same job made but with more advanced technology.

The most pessimistic scenario of these four is *scenario D*. If this occurs, it would more or less mean that there is no major change in the industry in the following years. The current way of doing business will run as it use to do without support from any better technology than today. It is still important with good personal relations and detailed viewings at the premises.

6.4 FUTURE INDUSTRY STRUCTURE AND VALUE CHAIN DEPENDING ON THE SCENARIOS

How the industry will be affected by technological change is by no means certain. However, depending on how disruptive the change is, it is possible to make hypothetical predictions for how the structure and value chain will be adapted to cope with the new technology. This chapter will present a hypothetical suggestion for how the industry structure may change following a disruptive technological change, as well as how the generalized value chain may be affected by such a change.

Implementation of virtual reality may, as shown in the scenario analysis, cause the greatest transformation in the industry. A technological change will occur, and as a result the business model will be revamped and adapted to the new situation. The span of value adding implementation, will have impact on how the industry will be re-structured.

As shown in *figure 19*, the current perception is that VR technology requires large capital and high yield for the organization to gain a lot of value from implementation. Also, as with most of the new technologies, VR is considered to not be applicable on the smaller offices.

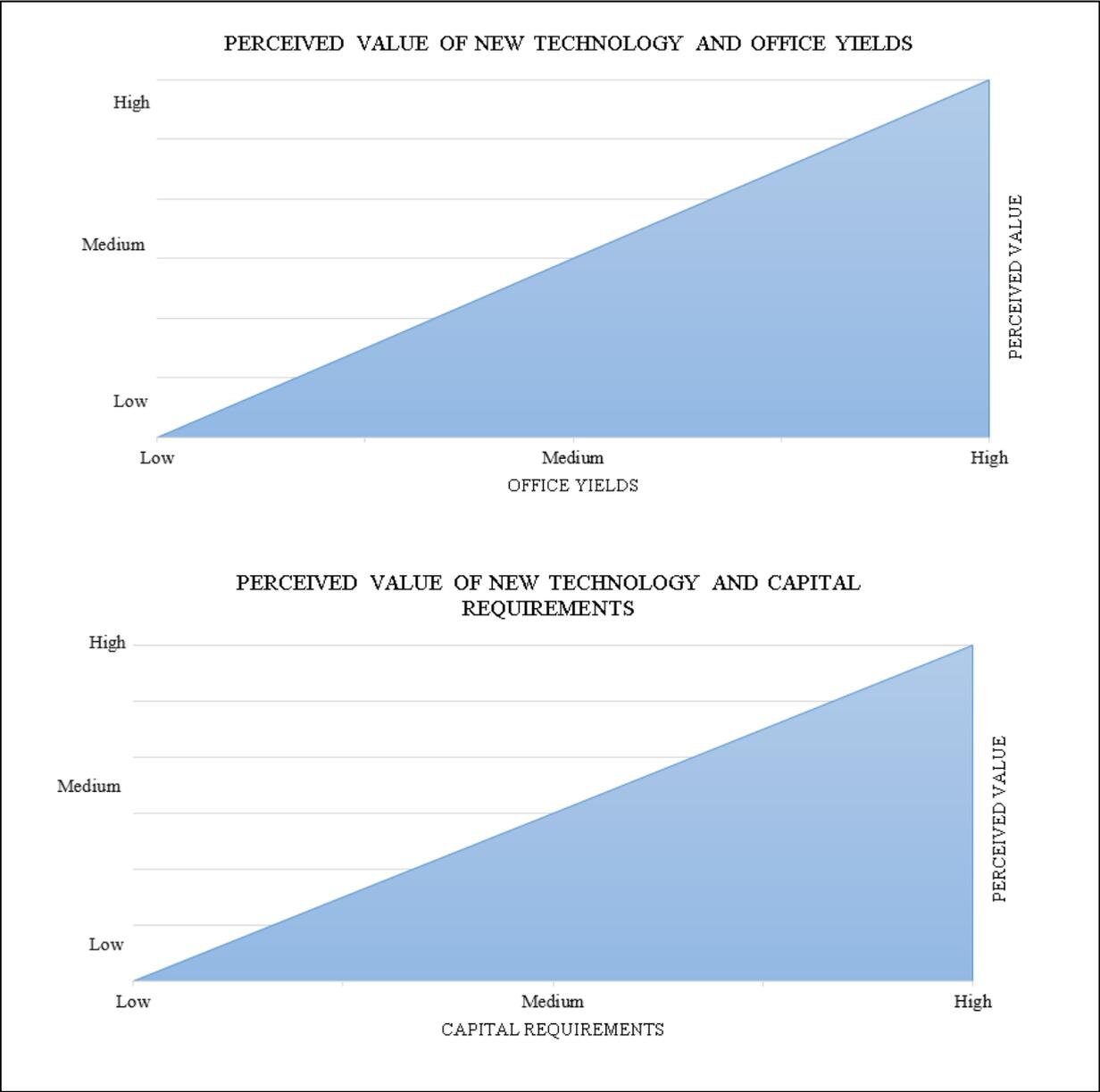


Figure 19 - Current perception of value added from new technology in relation to capital and yield (Hoffström et al., 2016)

Assuming that the technology will develop and that the price will decrease, thus increasing the span of value-adding implementation to include medium capital and yield offices, the implementation of such a technology will most likely still incur a notable investment.

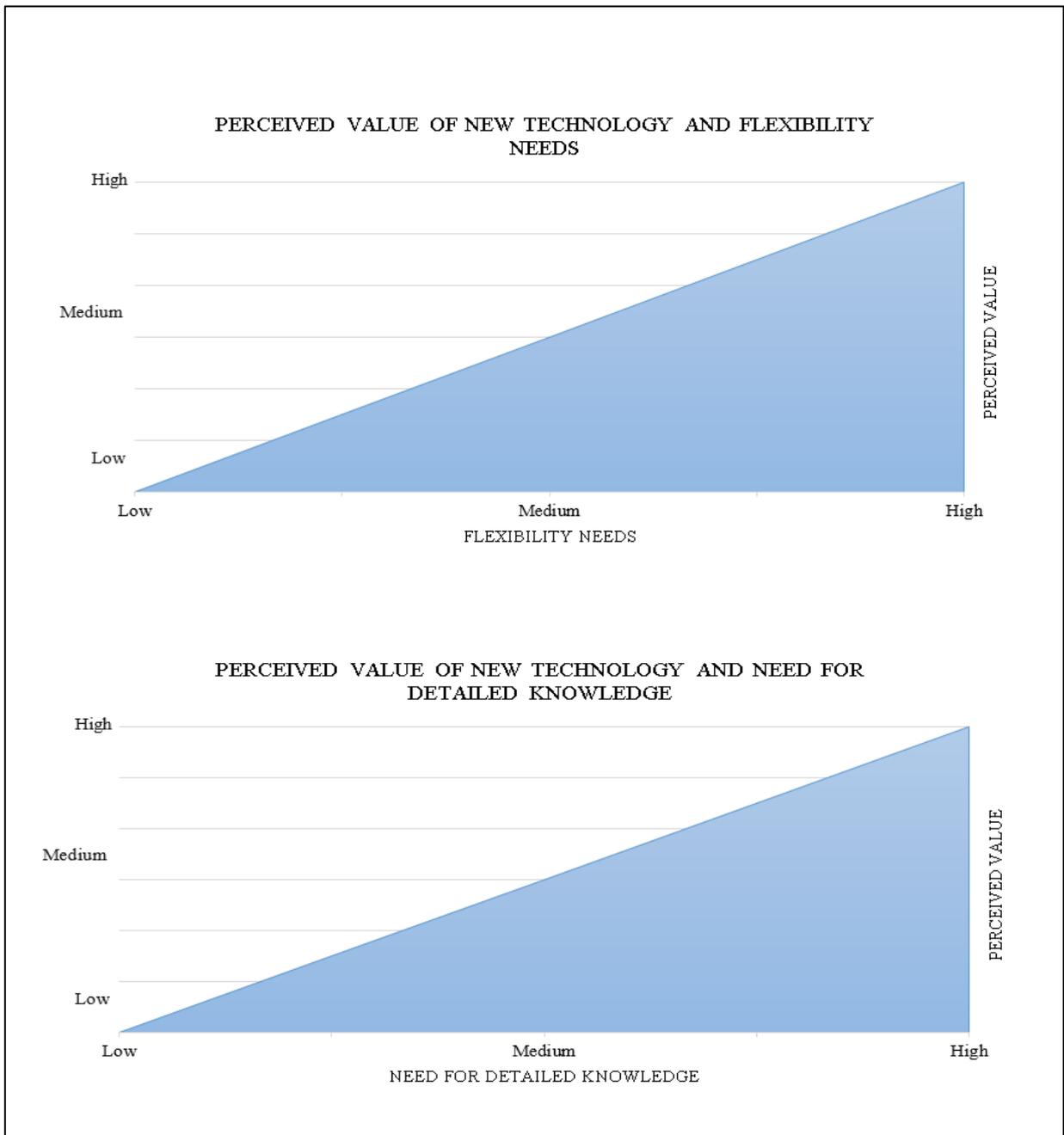


Figure 20 - Value added from new technology depending on need for flexibility and details (Hoffström et al., 2016)

The customers in the commercial real estate industry has become more aware and educated about how their office should look and what the supplier of offices should provide them with. Customization is becoming more and more important as the offices are becoming a branding tool for organizations to capture the greatest talents for their firm. As shown in *figure 20* the value added from new technology may increase as the need for details and design flexibility increase. It is likely that the suppliers have to be flexible towards their customers in the future, and be able show alternations of their offices for customers. The development of new technology will most likely be able to provide the suppliers with just that. Furthermore, beside the need for flexible tools, the smaller details will probably become more prominent. As the need for standing out amongst competitors increase, so will the need for customization of smaller details. As an example activity based offices today, require long processes of mapping out details in and architects have to be involved in the process in order to sketch the final results. It is likely that these processes may be simplified and become more efficient with the implementation of new technologies.

6.5 FUTURE INDUSTRY STRUCTURE - HYPOTHETICAL

The *rivalry* in the industry will remain *high* due to decreasing number of actors, competition about the customers, and using new technology to stand out. As described earlier the economical situation will most likely still be a major determinant for high rivalry in the industry. Depending on if the economical situation is positive or negative, the customers may look for properties in the inner city or in the more suburban areas.

The trend of sharing economies, alongside with the technological development of VR-solutions may increase the presence of substitutes. If the prices for VR-technologies decline, less capital will be needed to use VR-solutions on office hotels, or sites such as WeWork (2016). This will allow these substitutes to increase the exposure of their solutions and offer a holistic view to their potential customers. The fact that these businesses is not dependent on marketing vacant offices, but rather has single offices for a long period of time, result in that their capital requirements for implementation may be lower. Thus, the *threat of substitutes* may increase to *medium*.

The implementation of VR-solutions will increase the capital requirements for the organizations within the industry, adding on to the already relatively high requirements for acquiring a property. As a result the industry may become more consolidated with a withdrawal of the smaller actors, being acquired by the larger ones. If the current positive economical situation in the industry is present in the future as well, it will be easier for new entrants to justify investments, but if the situation is the opposite the threat of new entry can be considered as low. However, under the assumption that prices for VR-solutions decrease, the value gains may increase for medium- and low yield office. The result is an increased threat of entry since the technology required to compete in the business is not only limited to those who have substantial revenues. Thus, the *threat of new entry* is considered as *medium* in a hypothetical future.

The *bargaining power of buyer* will most likely remain *high*, even though the industry may become more consolidated. It is likely that the smaller actors may be outcompeted, but there will still be a large number of major actors as well as an emerging threat of substitutes that the buyer can choose from.

The *bargaining power of suppliers* may increase to *medium* since it is likely that this industry may become consolidated as well. Similar to the commercial real estate industry, increased competitive pressure may result in that smaller actors are no longer able to compete against the larger counterparts. Also, the increased demands on these products may result in that smaller organizations are not equipped to handle the increased volumes, thus the larger organizations that have the capabilities will become the preferred supplier for many of the actors in the commercial real estate industry.

6.6 THE FUTURE VALUE CHAIN AND SALES PROCESS

The above analysis is a hypothetical view upon on how the industry structure will change. However, it is possible that the major change will occur inside companies and value chain. The implementation of VR technology may eliminate some of the steps in the value chain, e.g. interested customers visit the office, and customization of the office may be conducted in earlier stages and interplay with the creation of marketing material.

In the future it is likely that 3D planning tools and VR-solutions will be integrated and allow the companies to create customizable environments, where the customer immediately can alter the design of an office and customize the office themselves without the need of architects. This may remove the stage in

the value chain where architects are hired and 3D illustrations are created to visualize for the customer how the office may look.

Furthermore, following the trend of digitalization and e-commerce, the implementation of VR solutions in the marketing and sales process may provide the customers with all the information they need online in order to make a purchase decision. As a result it is possible that the stage in the value chain where customers visit the office is removed, and all sales are handled through online platforms.

Figure 21 illustrates how a modified value chain may look like in the future, following a major technological change where the current technologies have been developed and also integrated in each other. The most obvious change is that the sales and marketing process has become more streamlined compared to the previous value chain. The first three steps are the same as before, but it is believed that the brokers in the industry will either disappear completely from the value chain, or have a more prominent role than before and handle everything related to marketing to sales for the real estate companies.

All the conclusions of the valuation of offices will be integrated in the new technology that is now the main market material. E.g. the current condition of the property can be shown in virtual reality, but can also be changed to show the future state of the office. The need for advertising through e-mails and calls will disappear and online platforms will be the main channel for advertising. Thus, even though the evaluation, publishing, and customization stages are separate, the boundaries between these steps in the value chain will be more blurred than previously.

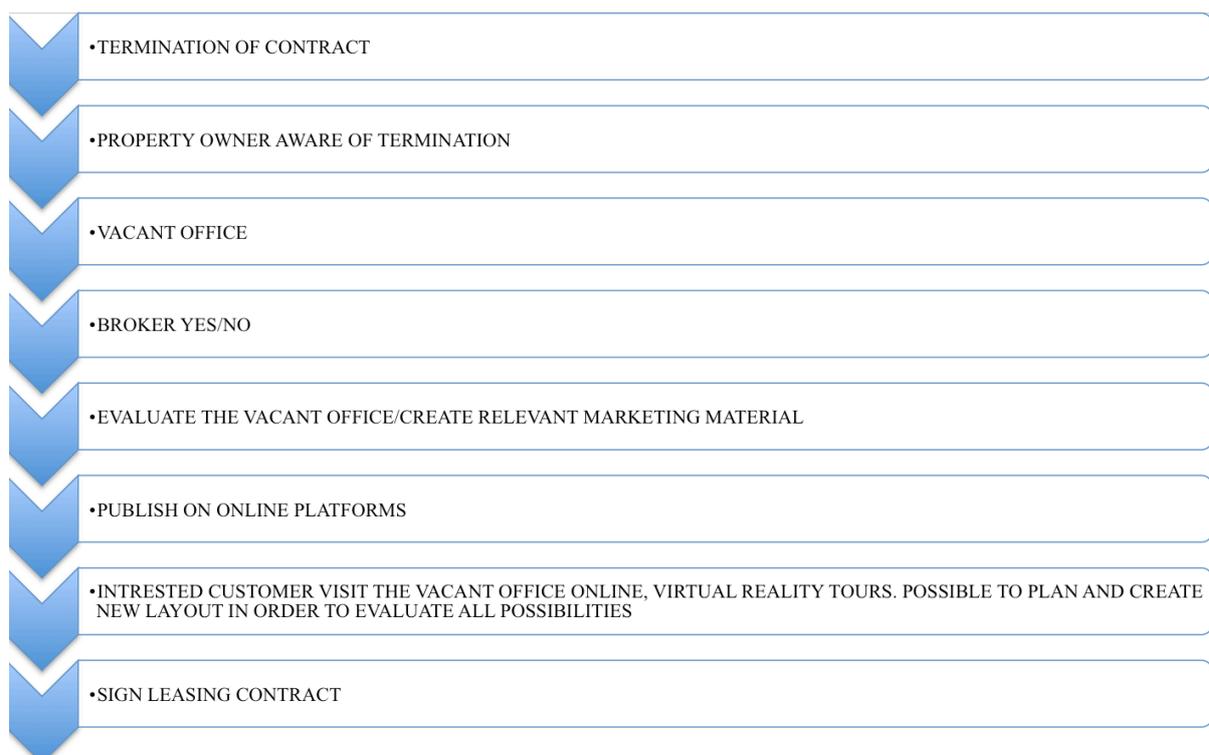


Figure 21 - Shows a generalized approach to the future sales process concerning a vacant office in the Nordic commercial real estate sector (Hoffström et al., 2016)

6.7 FUTURE VALUE PROPOSITION

As technology advances and the use of digital marketing tools within the industry are becoming more common, the current value propositions for the customer segment will most likely change.

When looking for a new office the cost of searching is high, such as; time and money spent when visiting physical locations. The commercial office companies will be able to reduce this cost for their clients by providing virtual tours. This will result in reduced cost of both; time, money and environmental impact. There will be possible for the clients to visit a larger number of viewings virtually and the freedom of choice offered will thereby be larger.

The commercial real estate companies will have the opportunity to offer customers a better solution when evaluating the vacant offices. It will be easy to work with the digital planning tools and there will be no need for a third party 3D illustrator or architect. This will in turn result in shorter lead times and reduced need of resources, otherwise spent on discussing the layout. The clients will be offered a more flexible solution than before where they will have a greater chance to be involved into the making process and handle the planning tool themselves, but in the same time have the opportunity to choose an complete solution. The value of flexibility will thus be significantly higher than now. Moreover, there will be a higher degree of possibilities for customization and opportunities for increased complexity in the illustrated and visualized layouts.

The brand awareness and the importance of having a strong brand will certainly be more important in the future, partly to do good business but also to attract talent employees. The office and its geographical position has been shown to be an important factor when recruit employees. Providing VR tours and other digital marketing material to the tenants, in order for them to brand themselves in a better way, may eventually, in turn, generate increased profitability for them.

In conclusion, the value offered to customers in the following 5-10 years will probably be higher than today. This with support of e.g. fully implemented VR and other technologies.

7. CONCLUSION

In this chapter conclusions are drawn based on the empirical findings and analysis, in order to answer the research questions and to achieve the purpose of the thesis.

The commercial real estate industry is currently facing a generational shift and possibly a technological change. The industry is described as traditional and as a few years behind the more technical advanced residential industry. This thesis has had the aim to investigate factors affecting the adoption in the commercial office industry, and how a technological change may affect the industry and the organization's sales and marketing processes.

Understanding the factors that affect implementation of new technology may provide real estate companies with the knowledge needed to successfully implement new technology and reconsider the perception of the value that the new technology may bring. During this thesis preconceived perceptions have been identified, and this thesis provides more information, not only to real estate organization, but also to suppliers of the new solutions that can serve as a basis for evaluation of preparation for future challenges. Furthermore, understanding that individuals may go through an iterative process being affected by managers, traditions and cultures, when implementing and using new technology provides the suppliers with insight about the process of adoption, and real estate organization insight on the different parts that are important for actual system use.

In short, industry, organizational, individual and, technological factors affect the implementation of new technology. The industry is likely to go through a structural change following a technological change. The value chain is likely to become shorter and more efficient, and some of the steps may become integrated in each other. Real estate organizations are likely to change their value proposition towards customers following a technological change.

7.1 FACTORS AFFECTING ADOPTION

The first research question considered the factors that affected adoption of new technology and was formulated as: *What factors in the Nordic commercial office industry and market may affect the willingness to adopt new technology?*

The factors that affect implementation somewhat vary between the different technologies. However, there are some factors that seem to generally affect the implementation process for all technologies. Factors, such as culture, traditions, and organizational experiences may affect the individual's actual use of a technology. Furthermore, managerial influence may also affect the individual's actual use.

The blocking mechanisms related to the technologies themselves cannot be concluded into a general compilation. As mentioned above these differ between the technologies. However, the most common blocking mechanism seem to be price in relation to value gained, and the quality of the products.

Virtual Reality is the technology with the most uncertainties and blocking mechanisms attached. Also the perception of this technology is that it might not be useful for marketing offices as it is now. The blocking mechanisms for virtual reality are concerns about the quality, no perceived value for offices, high costs, high complexity, unreliable, and that it deviates from the norms and traditions in the industry.

7.2 TECHNOLOGICAL CHANGE'S IMPACT ON SALES AND MARKETING PROCESS

The second research questions considered the impact technological change would have on the sales and marketing process and was formulated as: *How may technological change affect the sales and marketing process in the Nordic commercial office market?*

Following the results obtained in this thesis it can be concluded that the generalized value chain in fact may be affected by a technological change. The sales and marketing process may become more lean compared to how it is currently, and a few steps may be removed. At the same time, the boundaries between the different steps may become blurred and more transparent. The evaluation of vacant offices, the publishing on online platforms, and the customization processes may become more or less integrated with each other, since the new technology will allow for it. Also, instead of hiring an architect for conducting the customization, the customer may be given the opportunity to design the office by themselves if they wish.

Furthermore, it is believed that the real estate companies will either completely use brokers or not use them at all. If the real estate owners choose to have a broker, the broker will probably more or less handle all the activities related to the sales and marketing process instead of just handling some specific activities as it is now.

7.3 ADAPTION OF VALUE PROPOSITION

The last and final research question concerned the adaptation of the value proposition of real estate organizations and was formulated as: *How may value propositions evolve or adapt/change due to technological change in the Nordic commercial office industry?*

The implementation of new technology will likely change the value proposition that real estate organizations present to their customers. Companies will, unlike now, be able to offer their customers online tours through virtual reality. This reduces the time and effort that customers have to assign when searching for a new office. Also the new solutions will make it possible for real estate companies to offer an easier and more flexible process when customizing the offices. The customer can choose to just be involved by themselves or, if they want, include others. The flexibility will also allow the real estate owners to create offices in Virtual Reality that are already furnished and offer the customers a complete solution.

7.4 SUGGESTION FOR FURTHER RESEARCH

This thesis is divided into two parts, a current situation and a hypothetical future.

Regarding the current situation it is suggested that future research focus on different hierarchies in the organizations in order to further investigate the managerial impact on technological adoption. Such an investigation could also include different perspectives on different levels in the organizations, to evaluate if the conclusion regarding diffusion and blocking mechanisms made in this thesis are accurate.

For the hypothetical future we suggest a longitudinal study, where the effects of technological development are measured in terms of how the organization's willingness to adopt new technology change

as the technology improves. This could also give indications of how the industry and organizations changes as new technology is implemented.

Finally, we suggest that more case studies are conducted in order to identify differences between regions. There have been indications that e.g. division located in Stockholm may be more willing to try new technology. It would be interesting to see if this is true. That could increase the diffusion rate of new technology since industry references would be available.

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