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SCHOOL OF BUSINESS, ECONOMICS AND LAW

Master Degree Project in Innovation and Industrial Management

How is a Modern Technological Tool Accepted by Individuals throughout a Hybrid Organisation in a Slow Moving Industry Exposed to the Digital Revolution?

A study of the Nordic real estate industry

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Abstract

Studies show that in today's digital society, many organisations and industries are subjects to new technological tools provided by external players. These players are committed to take place in the value chain of the existing industries and add value to the existing value proposition. This thesis aims to research the Nordic real estate industry and the players revolutionising it with their technological tools, in this study specifically visualisation tools. The main purpose of the thesis is to gain understanding of the determinants of accepting the visualisation tools in real estate companies. It has been identified that real estate industry has been exposed to gaps of interest internally in organisations. Therefore, two perspectives are emphasised in the thesis, the individual and the organisational one, this in order to cover all insights and interest areas. Empirical findings specifically identify the gaps of interests between different actors in the industry as well as they show the need for more effective implementation and introduction of technology tools in real estate organisations. Additionally, findings show that successful implementation requires customised approaches when it comes to different attitudes and group of actors. Other identified needs for effective implementation are aspects such as detailed education and continuous follow-up strategies.

Keywords: *real estate industry, visualisation tools, technology acceptance, implementation process, diffusion of innovation, franchise organisation*

Table of content

1. Introduction 8
1.1. Background 8
1.2. Problem formulation 10
1.3. Purpose 10
1.4. Research question 10
1.5. Delimitations 11
1.6. Disposition 11
2. Theoretical framework 12
2.1. The structure of a franchise organisation 12
2.2. Technology acceptance model and its characteristics 12
2.2.1. Technology readiness 13
2.2.2. Technology readiness and post-adoption behaviour 13
2.2.3. Connection of technology acceptance model and technology readiness 14
2.3. Diffusion theory and its characteristics 14
2.3.1. Combination of technology acceptance and diffusion theory 16
2.3.2. The influence of age and gender in technology acceptance model and diffusion theory 18
2.3.3. Diffusion theory and intra-organisational issues 18
3. Methodology 20
3.1. Research design 20
3.2. Research strategy and methodology 20
3.2.1. Quantitative data 21
3.2.2. Qualitative data 22
3.2.3. Deductive research 23
3.3. Formulation of questions and selection of firms and respondents 24
3.3.1. Questions 24
3.3.2. Data analysis 24
3.3.3. Interviews 25
3.4. Quality of the research 26
4. Empirical findings 27
4.1. Descriptive statistics 27
4.2. Implementation of visualisation tools in a franchise organisation 27
4.3. Introduction to TAM-model 31

4.3.1. Technology readiness 34
4.3.2. Technology readiness and post-adoption behaviour 36
4.3.3. Connection of technology acceptance and technology readiness 37
4.4. Diffusion theory 38
4.4.1. Technology acceptance and diffusion theory 39
4.4.2. The influence of age and gender in the TAM 40
4.4.3. Diffusion and intra-organisational issues 42
5. Analysis 44
5.1. Implementation of visualisation tools in a real estate organisation 44
5.2. Technology acceptance in the real estate industry 44
5.2.1. Technology readiness in the real estate industry 45
5.2.2. Technology readiness and post-adoption behaviour 46
5.2.3. Connection of technology acceptance and technology readiness 46
5.3. Diffusion of innovation in the real estate industry 46
5.3.1. Combination of technology acceptance and diffusion of innovation 47
5.3.2. The influence of age and gender 48
5.3.3. Diffusion of innovation and intra-organisational issues 48
6. Conclusion 50
6.1. How is a modern technological tool accepted throughout a hybrid organisation in a slow moving industry exposed to the digital revolution? 50
6.2. Can the different attitudes towards new technology amongst the actors in an organisation be explained by the individual's demographical and geographical factors? 51
6.3. How can the implementation of new technologies be made more efficient in order to reach consistency throughout the whole organisation and decrease the detected gap in interest? 53
6.4. Suggestions for future research 54
7. Sources 56
Books and journals 56
Electronic sources 58
Appendix 1 – interview guide 59
Appendix 2 – Survey questions 65

Figures and tables

Figure 1 Disposition of the research. 11

Figure 2 Adopter Categorization on the Basis of Innovativeness 15

Figure 3. Combination of the diffusion theory and technology acceptance model. 17

Figure 4 Structure of the report. 20

Figure 5 Factors that affect the choice of external visualisation partner (1 lowest and 5 highest) 28

Figure 6 Division after position of what is most important when using visualisation tool. 29

Figure 7 Division after position of what is most important when not using visualisation tool. 30

Figure 8 Distribution of individuals' attitude towards new technology 39

Figure 9 Differences in attitudes between organisation and individual 51

Figure 10 Visualisation of the implementation process of a new visualisation tool today. 53

Figure 11 Suggestion of an implementation process in order to capture attitudes and values from all parts of the organisation 54

Table 1. General characteristics for the Nordic market. 9

Table 2 Combination of the diffusion theory and the TAM. 17

Table 3 Summary of the responses from the surveys. 22

Table 4 Description of the interviewees included in the thesis 24

Table 5 Descriptive statistic over the independent variables. 27

Table 6 Division after position of perception on following up and education from HQ. 30

Table 7 Influence of age, gender, country and position in the company on the perceived ease of use of new technologies. 32

Table 8 Division after country on the perception of ease of use. 32

Table 9 Division after position on the perception on ease of use. 33

Table 10 Influence of age, gender, country and position in the company on the perceived usefulness of new technologies. 33

Table 11 Division on countries of perception on the usefulness. 34

Table 12 Division on position of perception on the usefulness 35

Table 13 Division on position of most important argument for using visualisation tools 36

Table 14 Division on position of perception on following up and education from HQ 37

Table 15 Influence of age, gender, country and position in the company on the attitude towards new technologies. 40

Table 16 Effect of age on attitude towards new technology. 41
Table 17 Effect of gender on attitude towards new technology. 41
Table 18 Effect of country on attitude towards new technology. 42
Table 19 Effect of position on perceived consistency in the organisation 43
Table 20 Summary of the independent variables effect on attitudes and technology acceptance 53

1. Introduction

In this section the research is concentrated on the background discussion of the topic, which is later on formulated into the research question(s) of the thesis. Contemporary phenomenon in the area of interest are introduced in order to formulate and capture an interest for the communicated research question(s) as well as gain knowledge to enable further exploration of the topic.

1.1. Background

Today, we are facing an extremely disruptive time with a paradigm shift towards the Internet of Things, where interconnected and smart devices and services are changing the way we make business (Feki et al. 2013). Just like the World Wide Web changed many industries in the 90's, the Internet of Things is prognosticated to change a lot of industries today and we have already experienced industries becoming fully connected and it is just a matter of time until more will follow the upcoming change (Nayak, 2014). Disruptive innovations are constantly revolutionizing industries and firms such as Airbnb and Uber are continuing to gain market shares as they are changing entire business models in their respective industries (Hayden, 2014). Airbnb and Uber are both information-driven companies that change the business with their connected services and the real estate industry is another industry that has been identified as vulnerable to this transformation (Ibid).

A diminishing value proposition is only one of the reasons why disruptive solutions are needed for the real estate agents in order to offer something extraordinary to the industry, as the sellers' and the buyers' expectations are rising. The digital revolution in the real estate industry enables a movement towards empowering the consumer and giving him or her access to more data and therefore enabling more informed decisions. Some real estate actors will have the dynamic capabilities needed to embrace the new technology and turn it into their advantage, while others might not be as keen in adopting the new ways and approaches. (Hayden, 2014)

The real estate industry has been relatively slow in adopting new technologies and innovations, a notion that can partly be explained by the importance of the relationship-aspect in the industry. For sure, the real estate market has been created through decades of trust building between individuals. However, it is important not to forget that it is also an information-driven business where the efficiency of transactions depend on the flow of the data between different actors in the value chain. The reality is also that the brokers with the best data access and knowledge how to use it ultimately make the most money. Today the emergence of a second wave of innovation in the real estate industry is starting to take place. The first wave mainly focused on bringing real estate data online, whereas the second wave is more focused on equipping real estate agents with the right software, enabling them to make their business more efficient. (Nakache & Fenton, 2015)

According to Fuary-Wagner (2016), the generation Z and Y and their desire for convenience and efficiency will fuel the emergence of new technologies within the real estate industry. Virtual

reality is successfully starting to enter the real estate industry and within a decade hyper realistic home showings can be utilised (stuff.co.nz, 2016). According to Snowden and Riggs (2015), 94% of millennials and 84% of baby boomers are using online websites in their search for homes to buy and the same number for individuals in the ages between 69 and 89 only reached 65%. 46% of the real estate brokers are arguing that keeping up with technology has been one of their biggest challenges the past years and it is also prospected to be a challenge in the future (Snowden & Riggs, 2015).

Real estate brokers are struggling with finding techniques that have the power to decrease the number of listing days of their objects, in order to look attractive on the market and to increase their revenues and cash flows (Fialk, 2011). Already in 2006, 80% of the customers were using internet to search for potential homes themselves and this put pressure on the real estate agents in order to not lose potential customers to their competitors (Federal Trade Commission, 2007). Even if the real estate industry is highly competitive, brokers tend to compete less on price and more on services according to the Federal Trade Commission (2007), and as the industry is facing the digital revolution they need to find a way to provide their services online in an attractive way. According to Snowden and Riggs (2015), 43% of home buyers use online channels as the first source when looking for an apartment or house and realtors are therefore aware of the importance of staying up to date with new technology, but it is also referred to as being one of the biggest challenges in the next few years. As a consequence, almost half of the realtors in the American Association of Realtors would like the amount of technology offered on the market to expand (Snowden & Riggs, 2015). When looking at the Nordic market, there are some common characteristics affecting the market constellation. The private ownership of the majority of the residential properties is one of the main characteristics according to a Nordic Market Study conducted by Deloitte (2015). The existence of the private ownership opens up for a considerable market for property trading related services as well as services and products connected to the buying process of real estates (Deloitte, 2015).

Table 1. General characteristics for the Nordic market.
Deloitte (2015)

Denmark	Sweden	Norway
• Concentration among major cities • Financial upswing, low interest rates as well as unemployment rate causing a price upswing • Price stabilisation expected	• Highest number of privately owned apartments in Scandinavia • Concentration on three main metropolitan areas • Huge migration to the urban areas driving the prices	• Stricter banking regulations • Limited number of new builds • Low oil prices expected to cause substantial real estate price decline

1.2. Problem formulation

As can be understood from the background, the real estate industry is facing large changes, which are challenging the actors in a couple of complex areas. According to Federal Trade Commission (2007), there is an evidential need for the existing actors to keep their competitive position regarding services, which can include shortening their sales time and increase the prices per square meter. Sales time is measured in terms of the number of days the object is on the market and by decreasing this number real estate agents can increase their reputation as successful and also increase their own and their customers' cash flows. The number of listing days is therefore an important measure variable for real estate agents in order to show their customers that they are an attractive choice when selling their apartment or house. To enable a faster sale on a property, which is extremely important for real estate agents according to The Urban Developer (2014), new companies have emerged on the market offering modern high technological solutions in order to enable a good visualisation of the object. The authors however mention that a resistance can be noticed among the sales people who do not see any necessary requirement for changing their sales approach, since it already works. At the same time a positive attitude can be seen amongst the developers of the tools and the decision makers in the real estate companies. This gap in interest might lead to an inconsistent approach towards new technology and visualisation solutions in a real estate organisation. The purpose of this study is therefore to investigate how organisations as well as the different actors within accept digital solutions in the real estate industry and how the acceptance might differ. Due to the identified gap regarding the digital revolution within the industry, there is a large need of additional research in the area in order to be prepared for the disruptive time to come.

1.3. Purpose

The purpose of the research is to get a deeper understanding of which determinants that are important in the acceptance of new technology, which henceforth also will be referred to as visualisation tools. The aim is to investigate the phenomenon both from an individual and organisational perspective, and identify if the gap of interest between different actors can be explained. There is also a need to investigate if there is any relation between individuals' demographical and geographical differences, in order to enable an easier understanding of how decisions are made and how they should be made in a hybrid organisation.

1.4. Research question

How is a modern technological tool accepted throughout a hybrid organisation in a slow moving industry exposed to the digital revolution?

- *A study of the Nordic real estate industry*

Sub questions:

1. Can the different attitudes towards new technology amongst the actors in an organisation be explained by individuals' demographical and geographical factors?

2. How can the implementation of new technologies be made more efficient in order to reach consistency throughout the whole organisation and decrease the detected gap in interest?

1.5. Delimitations

Since the aim of this thesis is to study the Scandinavian real estate market, most insights will be gathered from the actors in the Nordic countries, namely Denmark, Sweden and Norway. Existing time constraints and combination of qualitative and quantitative methods has limited the number of conducted interviews to six. Another impact of time and access constraints is that exclusively actors using visualisation tools have been studied.

Moreover, this study has focused on the reasons and incentives of acceptance and usage of a visualisation tools. The thesis does not include improvement areas of diffusion or approaches to streamline it, rather it concentrates on the situation today and the attitudes and differences among different players in the industry. It however touches upon how the implementation process could be made more efficient in relation to the technology acceptance amongst individuals within an organisation. Thus, the concentration is on the overall status quo in the industry and the role of the visualisation tools in it, as well as their future potential.

1.6. Disposition

The figure below is an illustration of the different stages of this thesis as well as their respective highlights.

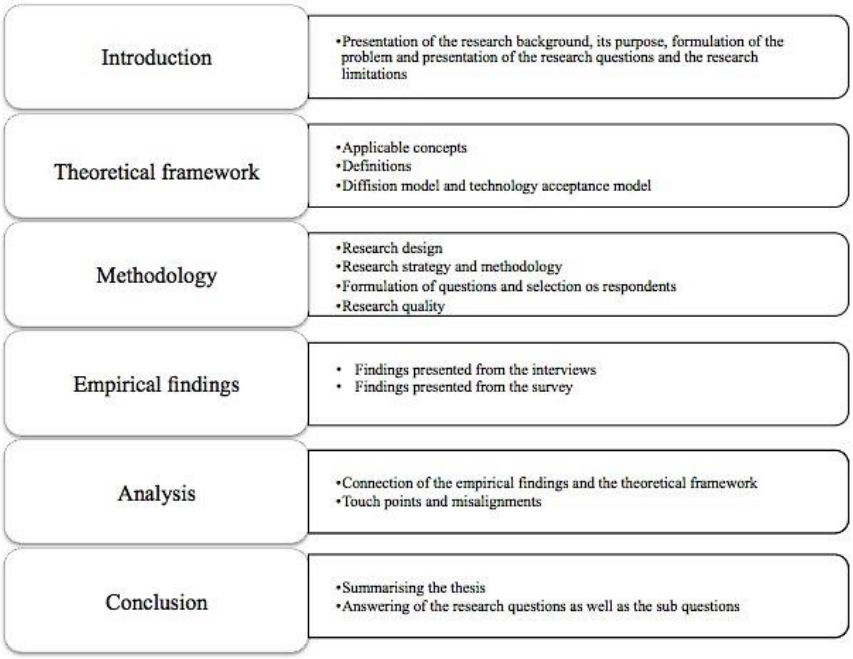

Figure 1 Disposition of the research.

2. Theoretical framework

The purpose of this section it to explore and introduce topics and theories that will work as a fundamental core of the paper. Two major frameworks are discussed, Technology Acceptance Model (TAM) and Diffusion of Innovation Model (DIM). The first model is introducing determinants towards new technology acceptance, the second one is discussing factors prominent for an innovation's diffusion as well as its adoption. Further on, the models are being extended and connected to additional, smaller models relevant for the research topic.

2.1. The structure of a franchise organisation

In a hybrid organisation, which is based on franchising and independent owners, the individual entrepreneurs get the right to use a company's trademark and run the business themselves (Michael, 2002). One problem regarding the franchise organisation is the "spill over" effect between different franchisees according to Michael (2002). He claims that this phenomena tends to lead to under-investments in advertising costs and marketing efforts from the individual actors. Franchising can be defined as an inter-organisational system which comprises two independent organisations and therefore it is of great importance to understand the attitudes of the two parties (Spinelli & Birley, 1996). According to Michael (2002) it is almost impossible to coordinate in a franchise organisation and Spinelli and Birley (1996) add that an organisation cannot be reified and therefore the individuals' different values and goals must be considered. Simon (1964) pp 2. states that "Either we must explain organisational behaviour in terms of the goals of the individual members of the organisation, or we must postulate the existence of one or more organisation goals, over and above the goals of the individuals.". As the franchise organisation is a constellation of individual entrepreneurs (Michael, 2002) the first alternative stated by Simon (1964) seems to be the natural situation which an organisation can overcome with clear policies and directives in order to create one goal for the entire organisation.

2.2. Technology acceptance model and its characteristics

TAM was first introduced by Davis (1989), in order to predict the likelihood of a new technology being adopted within a group or an organisation and the author describes the phenomenon as follows: the model is based on the hypothesis that the technology acceptance and use can be explained in terms of the user's internal beliefs, attitudes and intentions. This can lead into another hypothesis, that it can be possible to predict future technology usage within a group of individuals by applying TAM when introducing new technology. There are four major variables in the original TAM, these are *perceived ease of use, perceived usefulness, attitude towards use* and *behavioural intention to use.*

In general there are two variables that are suggested to be fundamental determinants of user acceptance and these two are hypothesised to be *perceived usefulness* and *perceived ease of use* (Davis, 1989). Davis (1989) highlights how research has been constrained by shortages of high-quality measures of user acceptance. Also, the research showed that the associations were lower

for objectively measured technology usage, than for the subjectively measured usage. With this being said, the author claims that the awareness of the distinction between perceived use and actual use are highly important when researching technology adoption.

Pfeffer (1982); Schein, (1980) and Vroom, (1964) are defining *perceived usefulness* as the degree to which an individual believes that usage of a particular system would enhance his or her job performance. In cases with a high degree of perceived usefulness the user believes in a positive relationship between the use of a tool and its performance according to Davis (1989). The author further explains that *perceived ease of use*, however, refers to the degree to which a person believes that using a particular system is free from an effort. This leads into the hypothesis that in cases where everything else is equal, an application which is easier to use is also more likely to be accepted by users (Davis, 1989).

2.2.1. Technology readiness

Parasuraman (2000) is stressing the importance of technology readiness and its embrace in organisations. He is describing technology readiness as individuals' propensity to adopt and use new technologies in the daily life and at work. The construction of technology readiness has been studied for many years and evidence has showed that even though high rates of penetration of new technologies has been present, the rates of consumer frustration has been growing (Parasuraman, 2000). The inverse relationship can been explained in two ways according to Parasuraman (2000). First, individuals that adopts to the technology later may not be as savvy as the early adopters, which causes a decline in the usage satisfaction rate and the second reason is the product complexity in combination to the lack of instructions for usage and support.

Parasuraman (2000) is highlighting customers' propensity to embrace technology as a result of an interplay between drivers and inhibitors. The two drivers of technology readiness is explained by the author as *optimism* and *innovativeness* and the two inhibitors of technology readiness are *discomfort* and *insecurity.* Optimism is referred to a positive attitude towards technology and a belief that it offers increased control, flexibility and efficiency. Innovativeness refers to the tendency to be a pioneer when it comes to technology. Discomfort is explained as a perceived lack of control over technology and insecurity is the distrust of technology and scepticism of its ability.

2.2.2. Technology readiness and post-adoption behaviour

Research conducted on the diffusion of products is often concentrated on the adoption stage of technology. However, the long term success is to be based on the continuous usage of the products and therefore it is strongly connected to the consumers' post-adoption behaviour according to Son and Han (2011). The authors are introducing three types of usage patterns relevant to high-tech products, these are the usage rate of basic functions, the usage rate of innovative functions and the variety of usage of innovative functions. They claim that this typology is highly applicable for high-tech products, mainly because many of them are capable of performing several func-

tions. Their study shows that consumers that score high in the optimism and innovativeness behaviour tend to use innovative functions more variously and frequently. Further it shows that consumers scoring high in the discomfort dimension tend to employ basic functions more frequently. This indicates how essential careful examination of advantages and disadvantages when promoting the products as advanced and the overall lesson is to promote the right offer to the right customer (Son & Han, 2011).

The importance of the manager's role in the post-adoption period should also be emphasised. Managers should consider extending their marketing communication strategies and to encourage usage behaviour, managers should communicate the perceived benefits of additional services in detail. It should also be natural to approach different attitudes differently, for instance, people who feel strong discomfort about new technology should be offered basic models incorporating only the core functions. More advanced models, involving various functions can be offered to the more innovative and optimistic individuals. (Son & Han, 2011)

2.2.3. Connection of technology acceptance model and technology readiness

In the past few decades, research combining TAM and technology readiness has emerged. The result is the Technology Readiness Acceptance Model (TRAM). TRAM was first introduced by Lin et al. (2007), who made an attempt to merge personality traits of technology readiness with more specific dimensions of TAM. Their suggested combination of the two models provides a holistic view, emphasizing the importance of both individual and system specific factors when a new technology is introduced. Walczuch et al. (2007) identified an evident connection between the two models and they were able to prove that both personality and characteristics of technology affect the adoption of new technology. The aim of their research was to find the impact from the personality traits on the two technology acceptance variables, perceived ease of use as well as perceived usefulness. The research showed that employees' optimism had the highest impact on perceived ease of use and perceived usefulness and that innovativeness, however, had a negative impact of perceived usefulness. This could be explained by the fact that innovative individuals have tendencies of being more critical and have higher expectations when it comes to new technology according to Walczuch et al. (2007). Further the study showed that the discomfort dimension had a negative impact on perceived ease of use, employees scoring high in this dimension did not feel comfortable with the complexity of the new technology. However, there were no evidence of a connection between discomfort and perceived usefulness. The insecurity had, as expected, a negative impact on both factors, as insecure employees perceived technology as less useful and more complicated to use.

2.3. Diffusion theory and its characteristics

In the 60's and 70's most of the attempts to explain the product adoption and the diffusion of innovation was made and models were constructed (Mahajan & Muller 1979). DIM aims to explain how an innovation is accepted among specific receivers with a simple mathematic equation

forming an S-shaped curve (Ibid). According to Scheirer (1990) there are three different approaches that are trying to explain the diffusion of innovation and those can be defined as the classic model which focuses on individuals, the organisational model which focuses on agency structures and the political model which examines the advocacy of interest groups as the drivers of adoption within an organisation. She further claims that the classical approach can explain the content of the decision making as all individuals that are making any kind of decision regarding the adoption of an innovation represent themselves in a rational way. According to the author it is therefore of a greater interest to study the adopters and continuers than the ones that does not use the innovation. However, even if the decision to adopt an innovation is made in an organisation it is no guarantee that it will be adopted throughout the whole chain as the implementation generally will not be a linear process (Greenhalgh et al., 2004). In an organisation there is not only one individual that should be willing to adopt to the innovation but there can be several stages that need to be passed, and therefore a great level of coordination is required in order for the adoption to be as successful as possible in the entire organisation (Sáenz-Royo et al., 2015).

Rogers (1995) defined five categories of adopters in order to enable a standardised way to compare and explain the normal distributed adoption curve. This categorization was based on the innovativeness as a relative dimension of an individual or organisation. The categories that Rogers (1995) decided to divide the adopters into was; innovators, early adopters, early majority, late majority and laggards and they are presented in the graph below.

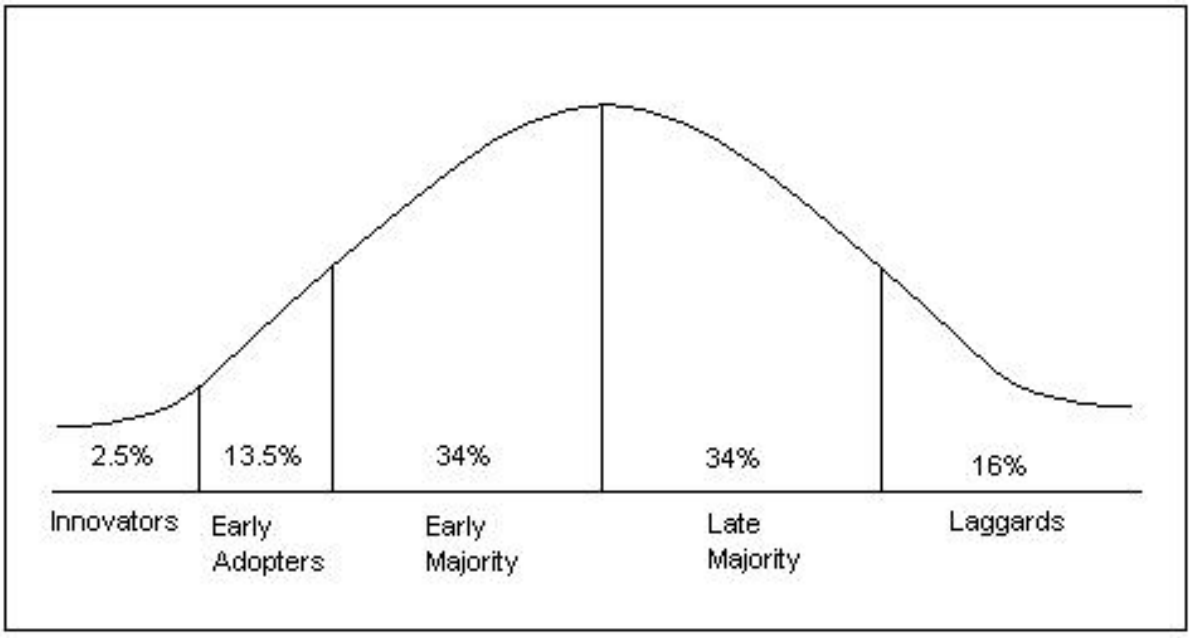

Figure 2 Adopter Categorization on the Basis of Innovativeness
Rogers (1995)

These categories of adoption can also be presented in an S-shaped curve where the accumulated users are on the Y-axis and time is on the X-axis. As there are different kinds of personalities that

represent the five categories it is natural that the innovation generates different value for the users. What this specific value is needs to be determined in order to understand why there is a distinction in the time perspective regarding the adoption between individuals and within organisations. (Rogers, 1995)

Rogers (1995) chose to distinguish the personalities as ideal types and explains them in the following way:

Innovators are driven by new ideas and they often build special networks including innovators only. Value for an innovator can be defined as venturesomeness and they are often risk lovers as they never know if the innovation will be successful or not.
Early adopters are often a part of the social system and they do often have a high degree of opinion leadership. The early adopters are figuring as a role model and they are gaining respect by using new ideas and they know that they need to continue to adopt early to new innovations in order to keep this respected position as they value.
Early majority are adopting to new ideas right before the average user and right after the opinion leaders and this makes them important in the diffusion process. The early majority need longer time to decide if they will adopt to new ideas than the early adopters as they value deliberated and more collateral decisions.
Late majority adopt right after the early majority and the reason for them to follow can be economical reasons or networking pressure. For the late majority to adopt to new ideas a pressure from their peers is required and they wait longer to adopt as they value safety and aims to remove as much insecurity as possible before adopting.
Laggards are the last to adopt to new ideas and they tend to be suspicious to innovations. They do often have an insecure economic position and they are extremely careful in their decision process. Laggards value traditions and they base their decisions on the past.

2.3.1. Combination of technology acceptance and diffusion theory

An extension of this model was created by Zhou (2008) who distinguishes between voluntary and forced adopters in order to enable an understanding of intra-organisational adoption. The author is combining the old diffusion theory by Rogers (1995) and the technological acceptance model by Davis (1989) in order to involve both individual characteristics, such as age and gender, and institutional in a new framework. When an organisation adopt to an innovation there is an invisible pressure on the individuals to adopt to it as well according to Zhou (2008) and he therefore defined four different categories of adopters after combining the two models which are explained as follows:

Voluntary adopters are the individuals that are adopting to a new idea before the organisation adopts.
Dormant non-adopters are the individuals that do not adopt to a new idea and are a part of an organisation that has not adopted.

Forced adopters are the individuals that are adopting to a new idea only after the organisation has adopted and which then are forcing the individual follow.
Resistant non-adopters are the individuals that are refusing to adopt to a new idea even if the organisation adopts it.

Table 2 Combination of the diffusion theory and the TAM.
Zhou (2008)

Intra-organizational adoption categories		Individual's adoption of the innovation	
		Yes	No
Organization's adoption of the innovation	Yes	Forced adopter	Resistant non-adopter
	No	Voluntary adopter	Dormant non-adopter

Zhou (2008) further distinguishes these categories as voluntary decision making, which is related to individuals and therefore DIM, and forced decision making, which is related to the organisation and therefore to TAM. If the adoption is related to DIM or TAM is contingent on the individual's perception of the innovation and how the organisation is handling the implementation of it according to Kim (2015). Zhou (2008) tested the new model on internet adoption amongst journalists in China and was able to reconfirm that Rogers (1995) personal attributes are the most powerful predictors when adopting innovations.

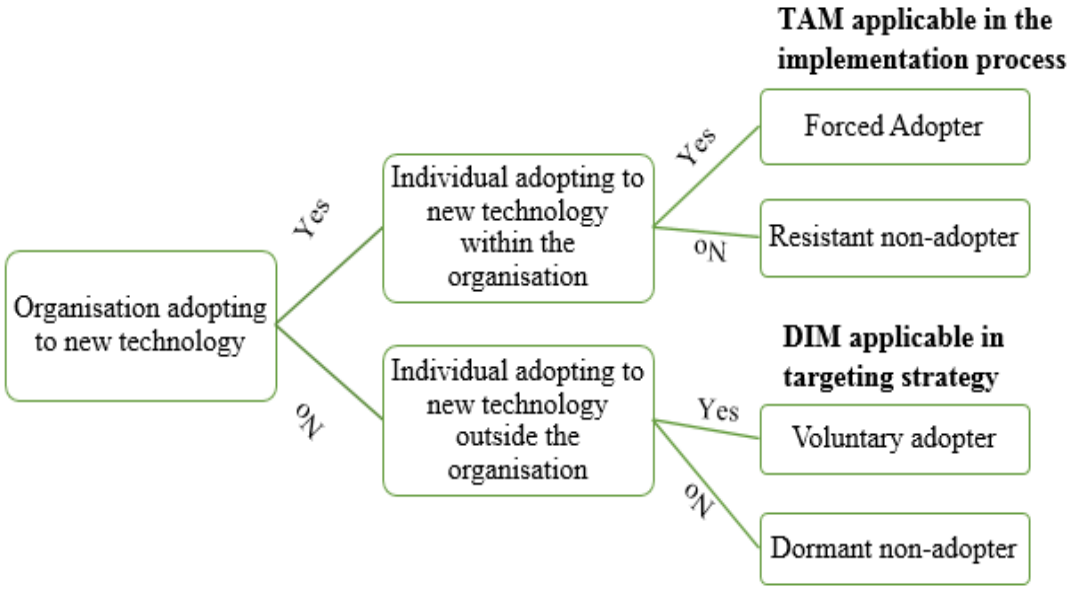

Figure 3. Combination of the diffusion theory and technology acceptance model.

2.3.2. The influence of age and gender in technology acceptance model and diffusion theory

As an extension to Davis (1989) findings that perceived ease of use and perceived usefulness are important factors influencing the decision of adopting a new technology, Morris and Venkatesh (2000) investigated if there are any differences in those two related to the prospective users' age and generation belonging. They found that younger users tend to be more willing to use new technologies and that older individuals valued behavioural control to a larger extent. A larger need of behavioural control means more careful research in order to decrease insecurity around the new technology which might indicate that older users can be positioned more to the right on the diffusion of innovation curve (Morris & Venkatesh, 2000). Further they found that older individuals value the ease of use more than their younger colleagues and therefore also have higher expectations on training and support. Kumar and Lim (2008) extended the research and included values in their study of different generations' perception of new technology. They claim that younger individuals' satisfaction rate is more related to emotional values and that older individuals' satisfaction rate is related to economic values. Because of these findings it is important to realise that the service or product provided might need customisation and that one service does not necessarily fit all if the users belong to different generations. Morris and Venkatesh (2000) also found that the need of opinion leaders are of greater importance when older individuals shall accept new technologies and therefore it can be crucial to find those champions when implementing an innovation within an organisation. They further stress the importance of having the different ages of the users in mind when developing and introducing new technology in organisations in order to be able to manage the implementation in a successful way.

Venkatesh and Morris (2000) extended TAM by studying if gender had an effect on the acceptance of technology. They found that men are more influenced by the perceived usefulness and that women value the ease of use when evaluating the adoption of a new technology. It was also a difference in how subjective norms influenced the two genders, men was not affected at all while women was influenced to a larger extent. This goes hand in hand with Morris and Venkatesh (2000) previous findings that older individuals are more affected by subjective norms and are in greater need of strong opinion leaders than younger users. With this in mind theory suggests that young men could be positioned to the left of the diffusion curve, while women and older individuals could be positioned more to the right as they value more collateral decisions and existence of opinion leaders to follow.

2.3.3. Diffusion theory and intra-organisational issues

Technical innovations are generally the ones generated in the technical core as the expertise is to be found there, and to these, a bottom-up process is usually applied. Administrative innovations are the ones origin from the administrative core and usually following a top down process. These innovations do often affect the technical core as well, hence will they be most successful when there is a close collaboration between administrational and technical cores. (Daft, 1978)

Improvements in administrative techniques, as well as improvements in economic activities can be referred to as administrative innovations. Administrative innovations often involve high set-up costs as well as a high degree of organisational disruption. Major reassignment of tasks are often required when administrative innovations take place, which is why one might expect that diffusion of administrative innovation often is expected to be slower and more haphazard than diffusion of technological innovations. (Teece, 1980)

Organisations continuously innovate internally and the success of the implementation of internal innovations depends on the continuous decisions of organisational members to use the innovation (Choi & Chang, 2009). The largest difference between market-oriented diffusion models and intra-organisational diffusion models is the latest's consideration of characteristics such as employees' incentives of using or neglecting technology and employees' heterogeneity with respect to their team and management's efforts to make the innovation successful (Wunderlich et al., 2014).

Wunderlich et al. (2014) found that the position of organisational groups in the intra-organisational network is highly important regarding which groups to influence and approach when implementing new technology. They explain that for managers, in order to realize a quick resource-efficient diffusion, there are two rules in the decision for which group to approach. The first rule is that the selected group needs to be protected from too many non-supporting groups, commonly dominated by non-adopters and the second rule to be applied is that the selected groups need to be close enough to each other, this in order to stimulate and increase the level of adoption. The analysis by Wunderlich et al. (2014) also showed evidence that the power of non-adopters' negative word of mouth can damage the diffusion of an innovation, due to its ability to convert adopters into non-adopters.

3. Methodology

The purpose of this section is to explain and motivate the chosen methodology. It will provide the reader with arguments and understanding of why certain methods have been applied in the study, as well as it will explain the different steps in the process of gathering data.

3.1. Research design

This study started with a comprehensive literature review in order to gather knowledge and information about the acceptance of technology and innovations in an organisation. This relatively broad gathering of information was conducted in order to gain an understanding of how and where digital visualisation solutions can create value for the real estate companies and how crucial innovativeness can be in order to be market leading in the industry. A well conducted literature review is of great importance in order to not redo already existing studies (Bryman & Bell, 2015) and therefore the final research question(s) was formulated after the literature review was completed.

After the research question(s) were formulated an interview guide was conducted for both in-depth interviews with employees active in the real estate industry and for a survey sent out to users of visualisation tools. Two prominent theories, namely TAM and DIM functioned as building blocks for the in-depth interview questions as well as the survey questions. The aim with the survey was to get a broader understanding of the value a high technological tool can create on the market and how it is interpreted by its users. The in-depth interviews were conducted during the time the survey was open and they aimed to get a deeper understanding of why certain decisions are made. The survey mainly investigated individuals' attitudes inside and outside an organisation and the interviews were conducted in order to investigate if there was any difference in the grade of acceptance and interpretation within an organisation and therefore different actors in the value chain were interviewed. The result from the survey and the interviews was later used as fundamental for the analysis and the comparison with the theoretical framework constructed in the literature review.

Figure 4 Structure of the report.

3.2. Research strategy and methodology

There is a distinction between qualitative and quantitative research approaches which is based on what kind of information that is being used in the analysis. Qualitative analysis is based on soft information such as words and narratives and the quantitative analysis is based on hard facts such as numbers and figures. None of the mentioned methodologies can be said to be better than the

other as it should be defined for each study which one that is most suitable to use. (Blumberg et al., 2011)

Combining qualitative and quantitative, which is also referred to as triangulation of methodologies, can result in a study with high quality and novel perspectives (Eriksson & Kovalainen, 2008). In this research both methods were able to be employed, however, some limitations had to be made regarding the conduction of interviews, where time constraints only allowed for six interviews. Blumberg et al. (2011) claim that combination of methods is rather unusual, as most researchers tend to be willing to use either one of them. He explains that this origins in the epistemology of knowledge, thus the way we chose to acquire knowledge, and which way to go is based on whether the researchers has a positivist or interpretivist approach. Eriksson and Kovalainen (2008) however stress that the researchers can employ both methods in a way that is appropriate considering the posed research questions. According to Blumberg et al. (2011) a researcher which is positivistic favours a deductive approach while interpretivist researcher favours inductive approaches.

3.2.1. Quantitative data

In a quantitative study numbers and figures are being studied and according to Blumberg et al. (2011) this approach is the most common in economic research. Data that has been collected by someone else is called secondary data and it can be found in both internal and external databases (Buglear, 2012). Buglear (2012) argues that one advantage of using secondary data is that it is cheaper and more time efficient than collecting primary data. Additionally he mentions that the disadvantages by using secondary data is that it could be out of date or not perfectly suitable for the study that the researcher has in mind. Because of this it is of great importance that the researcher has a good understanding of what is being studied and what type of data that is needed (Buglear, 2012). When data instead is collected for the specific study by for example questionnaires it will contribute to the study as primary data formulated after the requirements from the research questions according to Buglear (2012). That the data suits the specific requirements and that it is up to date are both advantages with primary data mentioned by the author. He however argues that primary data is time consuming to collect and that it requires a significant larger amount of resources than secondary data and therefore becomes less cost efficient. According to Blumberg et al. (2011) there are not many other ways than by surveys that we can learn so much about attitudes and opinions and therefore primary data can be of great importance in order to conduct a proper research.

A relatively cost efficient and controlled way to gather important information is to conduct targeted web surveys which the respondents can answer themselves (Blumberg et al., 2011). One large drawback of conducting the survey online instead of face to face or by telephone is according to Blumberg et al. (2011) the increased risk that the participant will postpone their answer or not answering at all, which probably occurred in some of the cases in this paper. Some kind of non-response error will be faced, which means that no knowledge about the part of the

population that chose to not be involved in the study will be present (Blumberg et al., 2011). According to Bryman and Bell (2015) there are techniques to increase the response rate and they suggest that the interviewer should have a good cover letter explaining the purpose of the study, send reminders to those who have not responded and keep the questionnaire short and time efficient to answer in order to reduce the non-response error.

Bryman & Bell (2015) are arguing that surveys are the best approach in order to gain knowledge about individuals' beliefs and attitudes. The survey in this paper was conducted in a program called SurveyMonkey and it was sent out as a link to actors using some kind of visualisation tool in the real estate industry with the aim to study their motivation and beliefs. Sending it out by email is both time and cost efficient and it enables a large geographical scope to be covered. One week after the survey was sent out, a reminder was sent to those who have not yet conducted the survey and one week after the reminder the survey was closed. In order to increase the response rate an explanatory text was written in the beginning of the survey to explain the aim of it and also the estimated time to complete the survey was mentioned. The questionnaire was also translated into three different languages, Swedish, Norwegian and Danish in order to not lose participants because of any potential language barriers. The questionnaire was sent out to the Swedish and Norwegian markets on the 7th of April and it was closed on the 21st of April. A reminder was sent out on the 18th of April, both for the Swedish and the Norwegian market. Due to practical reasons there was a delay in the Danish send-out, which resulted in the Danish survey only being open for one week and therefore no reminder was utilised.

Table 3 Summary of the responses from the surveys.

	Before reminder	**Responses before**	**After reminder**	**Responses after**	**Total**
Sweden	80 answers	64%	45 answers	36%	125 answers
Norway	25 answers	52%	23 answers	48%	48 answers
Denmark	26 answers	N/A	N/A	N/A	26 answers

3.2.2. Qualitative data

One of the major interests of many qualitative research approaches is the understanding of reality as socially constructed, meaning produced and interpreted through cultural meanings (Silverman, 2001). A common way to use qualitative methods in business research is to use them in order to provide a better understanding of issues that have remained unclear in the quantitative part (Ibid). In this study the qualitative method will be used to increase the understanding, test the existing

hypothesis and gain a holistic view of the issues that are aimed to be study. An exploratory study will be particularly useful in the qualitative field of research, due to the fact that the investigated area is very new. Important variables may not be known or may have to be defined and hypotheses for the research have to be formulated.

Interviews are a widely used technique within qualitative research even if it often is a time-consuming methodology (Bryman & Bell, 2015). The qualitative approach of interviewing is often conducted either as an unstructured or semi-structured interview (Ibid). The interviews held with different actors in the real estate organisations was of semi-structured character in opposite to the survey sent to the existing users of visualisation tools, as this was of a structured character. Semi-structured interviews are often more general than unstructured interviews but they allow following up questions in contrast to structured interviews (Bryman & Bell, 2015). The semi-structured interviews were used in order to find patterns and to enable the interviewees to explain their own experiences from the usage of visualisation tools. This approach was used in this stage of the study in order to collect results that facilitated comparison between the different actors in the real estate industry.

Face to face interviews was used throughout the whole study in order to increase the ability to compare the answers and to enable full interaction with the interviewee. In two cases, where the interviews were not possible to be conducted in person, telephone interviews was used as a substitute. All the interviews was recorded and notes were taken during the meetings in order to easily gain access to the old interviews in a later stage if needed.

3.2.3. Deductive research

The questions in the interviews and survey in this study were based on the theoretical framework and according to Bryman and Bell (2015) this approach is called deductive research. Deductive character on a study refers to research that origins from theory and from there different hypothesis are being conducted and tested later on (Bryman & Bell, 2015). Deductive approach is the most common way to compare the relation between theory and reality and it can be visualised in the following way.

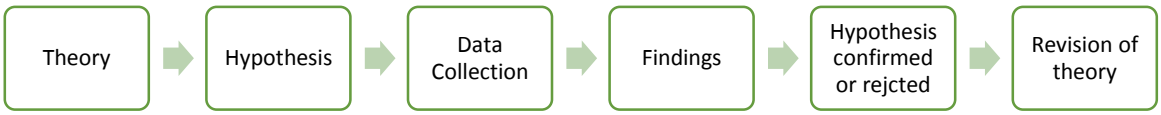

Figure 5 Deductive approach.
Bryman and Bell (2015)

3.3. Formulation of questions and selection of firms and respondents

In this study the topic was analysed in both a quantitative and a qualitative approach and therefore both a questionnaire and an interview guide was conducted. Blumberg et al. (2011) claim that quantitative research often is used after a qualitative study in order to verify the result. However, he adds that it is important to remember that quantitative research also can be explorative and that qualitative studies can be used to test the result as well.

3.3.1. Questions

The formulated survey questions concerned identity, personal and organisational questions in order to analyse the individuals' position in TAM as well as in DIM. The aspects and variables considered in the two models were included in the interview guide as well, in order to get a proper result of the actors' position and attitude. General questions concerning age, sex and the position within the firm was also included in order to enable an analysis of the variables connection to the level of technology acceptance and the position in the diffusion model.

The interview questions were developed with a clear focus on the research questions as well as the theories and models addressed in the literature review. To prevent any biases, the questions were as open as possible in order to encourage more speech and gain more information and insights. One of the objectives of semi-structured interviews is to find out whether the informant can confirm or decline insights and information that the researcher holds (Blumberg et al., 2011).

Table 4 Description of the interviewees included in the thesis

Position and company	Country	Interview	Date and time
HQ representative - EDC	Denmark	Face2face	15/4 – 40 minutes
Broker - EDC	Denmark	Face2face	15/4 – 30 minutes
Store Owner - EDC	Denmark	Face2face	15/4 – 35 minutes
HQ representative - Krogsveen	Norway	Phone	12/4 – 30 minutes
Broker - Länsförsäkringar	Sweden	Face2face	7/4 – 50minutes
HQ representative - Mäklarhuset	Sweden	Phone	7/4 – 35 minutes

3.3.2. Data analysis

As there is an interest in understanding why individuals chose to adopt to new technology, an ordinal regression analysis was used to investigate if an individual's age, gender, position and country of origin had an effect on the factors that theory says are crucial determinations when accepting technology or not, and also on how new technology is being valued. The independent variables were therefore perceived usefulness and perceived ease of use in order to analyse an individual's acceptance when an organisation has chosen to adopt to new technology. Additionally the different personal attributes that are claimed to affect the diffusion of innovation were analysed to get a deeper understanding of the choice to implement new technology in the organisation or not. Before any comprehensive analysis took place frequency tables were conducted in

order to get a good overview of the data collected. When this was completed ordinal regression analysis and explaining cross-tables were conducted.

The ordinal regression formula was formulated as follows.

$$\ln\left(\frac{Y_{ij}}{1-Y_{ij}}\right) = \beta_{0j} + \beta_{age} + \beta_{gender} + \beta_{country} + \beta_{position}$$

Where Y_i are the different independent variables that will be tested and β_0 is the intercept of the model.

Dependent variables:
Intra-organisational factors:
Ease of use - how the individual interprets the ease of use of the new technology.
Usefulness - how the individual experience that the new technology helps to increase the value of an object.
External factors:
Attitudes - how the individual values being the first one to try new technologies or not.

Independent variables:
Age - age of the respondent
Gender - gender of the respondents
Country - country where the respondent has an active role in the industry
Position in the company - the respondent's current position in the company

When analysing the output, the significance level of 0.1 was used. This means that the significant result will be true 90% of the times when applying it to the population (Wooldridge, 2003).

3.3.3. Interviews

As this part of the research aimed to study technology acceptance among individuals at different levels in an organisation the selected interviewees were connected to four different levels in the organisation, HQ, local store owners (franchisees), real estate agents and assistants. Denmark, Sweden and Norway were the three markets to be researched and therefore representatives from each country and different organisational level were interviewed. The interview guide was formulated slightly different for the different roles in the company in order to get a better fit and more valuable insights between the questions and the individual being interviewed. The result from the interviews was used together with the questionnaire in order to get more in depth information about the industry and its characteristics to increase the validity of the research.

3.4. Quality of the research

The most common measurements of the research quality are reliability and validity (Bryman & Bell, 2015). Reliability is often divided into external and internal reliability (Ibid). External reliability measures to what extent a study can be replicated by another actor and result in a high correlation by the first and second test according to Bryman and Bell (2015). The authors however claim that a common critique of qualitative studies is that they can be hard to replicate as they take place in a specific setting. To achieve higher reliability, proper interview guides were created, ensuring the same structure throughout the interviews. The collection of quantitative data through the survey also enhanced the external reliability, as each setting was specific in its own case.

Internal reliability measures if there is consistency in the indicators in a test and is of importance when there are multiple answers aggregated to one score (Bryman & Bell, 2015). To achieve internal reliability the interviews were recorded and discussed in between the authors, in order to ensure the same interpretation of the cases. The collective writing of the empirical part as well as analysis was also a way to increase the internal reliability and reduce the risk of misinterpretations.

Validity, which also can be divided into internal and external, on the other hand highlights if what is aimed to be measured in the study is what is actually measured (Bryman & Bell, 2015). External validity aims to measure if the findings can be generalized to times, settings and people and this can be seen as a problem to reach in qualitative studies, which often are based on single case studies (Ibid). However, in this study the qualitative method has been combined with the quantitative one, the validity can therefore be argued to be higher than in cases where only qualitative research is applied. At the same time, this research has been concentrated on a specific industry with a complex organisation structure, which can make generalisation to other industries more difficult.

4. Empirical findings

In this section, empirical findings from the interviews as well as from the survey will be presented. The findings from the conducted interviews will be presented first and citations will be used to clarify some statements. The findings from the survey will thereafter be presented mainly through statistical tables and figures. The presentation will be disposed in accordance to the two major frameworks, discussed in the theoretical framework, TAM and DIM, as well as additional theories introduced in a previous section.

4.1. Descriptive statistics

The three main measurements of technology acceptance and attitude towards new technology was based on the three following statements and questions and some descriptive statistics are being present in order to understand how the data is distributed. "It is easy to use visualisation tools provided from external parties" has been answered with a ranking scale from 1 (lowest) to 5 (highest) and the mean value is 3.51 with a standard deviation of 0.952. "Visualisation tools increase the value of the object" has been answered on the same scale and has a mean of 3.5 and a standard deviation of 1.055. "What is your attitude towards new technology?" had four different alternatives, which later could be ranked from 1 (value least) to 4 (value most) and had the mean of 3.19 and a standard deviation of 0.901. There are 24 missing values of the total 199 respondents and the explanations for these are either the choice not to answer a question at all or choosing an alternative answer that was not suitable to fit on the above-mentioned scale.

Table 5 Descriptive statistic over the independent variables.

Statistics

		It is easy to use visualisation tools provided from external parties	Visualisation tools increase the value of the object	What is your attitude towards new technology?
N	Valid	175	175	175
	Missing	24	24	24
Mean		3,51	3,50	3,19
Median		4,00	4,00	3,00
Mode		3	4	4
Std. Deviation		,952	1,055	,901
Minimum		1	1	1
Maximum		5	5	4

4.2. Implementation of visualisation tools in a franchise organisation

The individuals being interviewed were all actors in a franchise organisation and therefore the implementation process of the visualisation tools is of interest to study. Five of the six respondents stated that all decisions are made at HQ level and are then implemented further down in the organisation. One respondent did not have the same experience and stated that it is up to each store owner or franchisee to decide what provider to use. The interviewees operating on a HQ level described the procurement process as very careful and stated that the two most important factors are the level of trust to the photographers and the product range offered by the suppliers.

One representative explained that the reason for the central decision-making is the relatively short-term strategy thinking at the local level and he added that brokers usually plan for 3-4 weeks ahead, partly due to the commission constellation of the salary. In order to be more long-term oriented, the company takes many decisions centrally, however decisions are taken in collaboration with insights from market council representatives, who often come from more local levels. All representatives from HQ claimed that they value a provider that is able to offer all the different products that they aim to use as a part of the visualisation strategy of an object. The respondents further down in the organisation had mixed feelings about how the implementation is being realized but the overall experience is that it is just something that is being told and not followed up.

"They just told us that this was the new provider." and *"Most of my colleagues didn't like the change, because they were very happy and very satisfied with […]"* - Store owner, EDC, Denmark, when talking about the change of visualisation supplier.

The respondents that are operating on the HQ level and that have a top-down decision process regarding the procurement of visualisation providers said that they value using the same supplier throughout the whole organisation and that they apply several strategies to make this work in practise. One uses technical solutions that force the users to employ the chosen supplier and one states that they have a clear policy in the organisation which values consistency. The respondents from HQ further mentioned that the consistency is important in order to build good relationships and trust with the photographers and also as a long-term collaboration strategy. One of the interviewees also stated that a close collaboration with the provider is crucial as they value the opportunity to elaborate with new technological solutions together with the supplier in order to be in the frontier of using new technology.

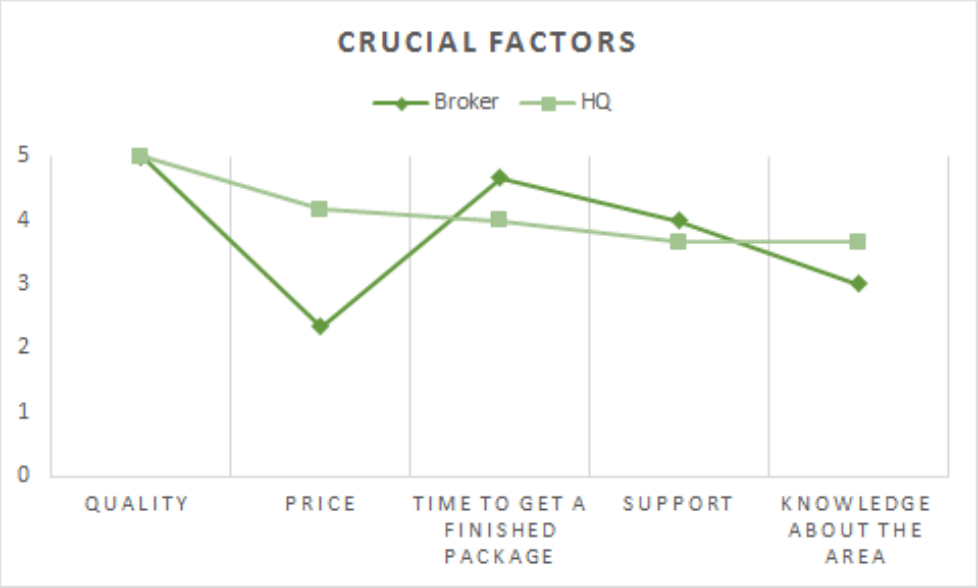

Figure 6 Factors that affect the choice of external visualisation partner (1 lowest and 5 highest)

Presented in the figure are however some differences in what factors that are seen to be crucial when choosing an external visualisation provider between the different actors in the organisation. The respondents were asked to rank five different factors from one to five where five is most important. All of the respondents stated that quality (HQ 5/Brokers 5) is by far the most important factor and that it cannot be neglected when negotiating with potential collaboration parties. When it comes to price the respondents from HQ (4.17) were almost twice as much price sensitive than their colleagues at a local level (2.33). The time it takes to get a finished package (4/4.67), the support from the supplier (3.67/4) and the knowledge about the geographic area (3.67/3) are valued approximately the same by all respondents.

"As long as the quality is good the price is not that important" - Broker, Länsförsäkringar, Sweden

One HQ representative explained that the price of the service is of great importance when finding visualisation tool suppliers and that they perceive high prices to be the greatest obstacle when implementing the solution to the local stores.

"The price of the product is the primary, the secondary is the quality." - HQ representative, EDC, Denmark, when talking about brokers' perception of price.

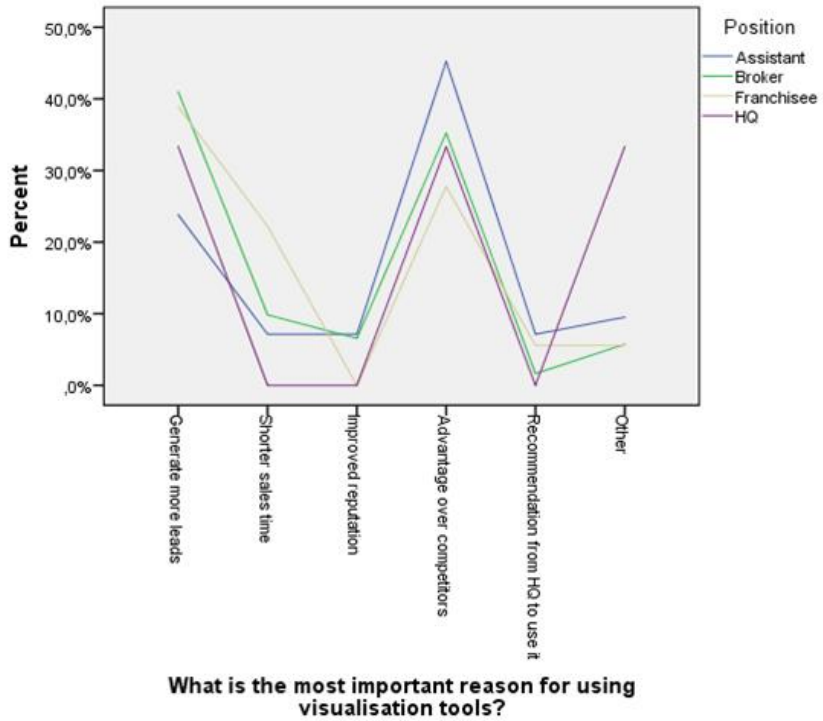

Figure 7 Division after position of what is most important when using visualisation tool.

Data from the survey states that the most important factor when deciding whether to use visualisation tools or not are somehow equal between the individuals from the different positions in an organisation. The ones from HQ answering "Other" specified this as an advantage over competitors in combination with strengthening of the brand.

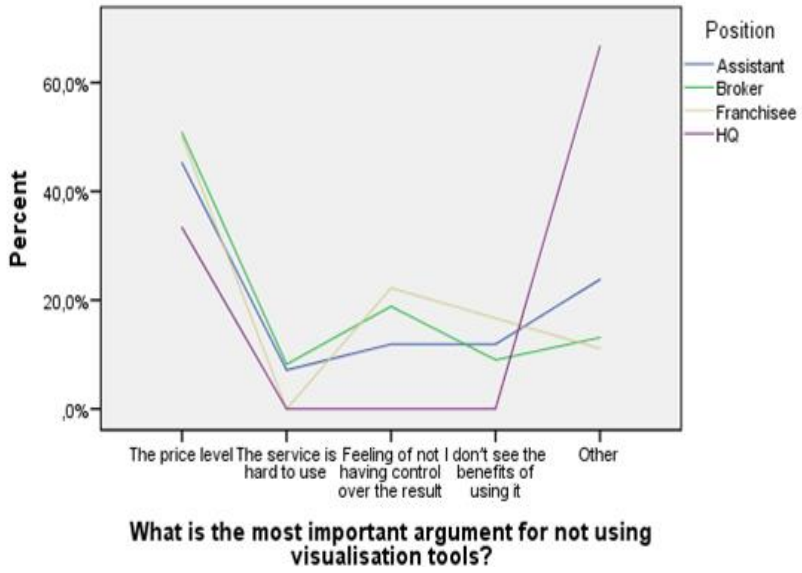

Figure 8 Division after position of what is most important when not using visualisation tool.

When it comes to arguments for not using visualisation tools we can see the same equal pattern. Price level and lack of control are the most common together with "other". "Other" can however in most of the cases be translated to that they could not find any arguments for not using the service.

Table 6 Division after position of perception on following up and education from HQ.

Position * HQ provides education and follows up when introducing visualisation tools Crosstabulation

			HQ provides education and follows up when introducing visualisation tools					
			Not at all	2	3	4	Very much	Total
Position	Assistant	Count	7	3	8	5	3	26
		% within Position	26,9%	11,5%	30,8%	19,2%	11,5%	100,0%
	Broker	Count	21	17	40	17	6	101
		% within Position	20,8%	16,8%	39,6%	16,8%	5,9%	100,0%
	Franchisee	Count	3	1	5	4	2	15
		% within Position	20,0%	6,7%	33,3%	26,7%	13,3%	100,0%
	HQ	Count	0	1	1	0	1	3
		% within Position	0,0%	33,3%	33,3%	0,0%	33,3%	100,0%
Total		Count	31	22	54	26	12	145
		% within Position	21,4%	15,2%	37,2%	17,9%	8,3%	100,0%

When analysing the implementation of the visualisation tools in the survey the question of whether HQ educates and follows up the introduction of new tools or not was asked. In this case,

40% of the franchisees 22.7% of the brokers and 30.7% of the assistants agreed that the HQ followed up the implementation. 25.7% of the franchisees, 37.7% of the brokers and 38.4% of the assistants however stated that HQ does not follow up or offers education related to the new visualisation tool.

4.3. Introduction to TAM-model

When asking the interviewees about the fundamental determinants of accepting new technology in the organisation, a shared belief could be identified that it is attributes such as how the tool can be used in terms of value creation and how easy it is to use that are mostly highlighted. All six respondents stated that the modern tools provided by external suppliers were enhancing their job performance and making their job more productive. Job performance in the industry is closely connected to the value of the object, as the commission paid is based on the sales price of a property. Only two respondents believed that the technology tools give direct effect on the increase of an object's value, both in terms of price and the time it takes to sell. One HQ representative claimed that it is very difficult to illustrate and derive in practise, which is why it sometimes can cause resistance among brokers.

"There is a high pressure for speed in the industry and I believe that visualisation tools truly are speeding up the process" - Broker, Länsförsäkringar, Sweden

The respondents also agreed regarding the ease of use and the absence of an effort when using the tool. All the interviewees, to which the question was posted, stated that it was easy to use the tool. However, one respondent claimed that the ease of use can be correlated to the age of the user, meaning that the usage can be easier for the younger generation of brokers. One respondent at HQ level, which is one of the policy makers regarding the visualisation tool providers, stated that the systems provided by the external companies are crucial for a smooth usage of the tool.

"Everything is kind of already set in the computer system, brokers just need to log into the system and click OK" - Sales and Market Director, EDC, Denmark

He further stated that the easiness of the computer systems is an important determinant in the acceptance of the tool within the organisation.

"Usage of visualisation tools absolutely creates suppleness and easiness" - HQ representative, Mäklarhuset, Sweden

Table 7 Influence of age, gender, country and position in the company on the perceived ease of use of new technologies.

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[Easy_to_use = 1]	-8,020	1,490	28,977	1	,000	-10,940	-5,100
	[Easy_to_use = 2]	-6,688	1,426	21,989	1	,000	-9,484	-3,893
	[Easy_to_use = 3]	-4,302	1,386	9,636	1	,002	-7,018	-1,586
	[Easy_to_use = 4]	-2,315	1,345	2,963	1	,085	-4,950	,321
Location	Age	-,012	,013	,911	1	,340	-,037	,013
	[Gender=0]	,026	,331	,006	1	,938	-,623	,675
	[Gender=1]	0[a]	.	.	0	.	.	.
	[Sweden1=,00]	-1,718	,548	9,824	1	,002	-2,793	-,644
	[Sweden1=1,00]	0[a]	.	.	0	.	.	.
	[Norway1=,00]	-1,367	,570	5,760	1	,016	-2,483	-,251
	[Norway1=1,00]	0[a]	.	.	0	.	.	.
	[Denmark1=,00]	0[a]	.	.	0	.	.	.
	[Denmark1=1,00]	0[a]	.	.	0	.	.	.
	[Positionranked=1]	-2,385	1,194	3,988	1	,046	-4,725	-,044
	[Positionranked=2]	-2,489	1,160	4,607	1	,032	-4,762	-,216
	[Positionranked=3]	-1,053	1,256	,703	1	,402	-3,515	1,408
	[Positionranked=4]	0[a]	.	.	0	.	.	.

Link function: Logit.

a. This parameter is set to zero because it is redundant.

It is significant that individuals from both Sweden and Norway think it is harder to use new technology than the ones from Denmark, Swedish users find new technology harder to use than Norwegians. What position an individual has in the company also has a significant effect on the perceived ease of use. The more responsibility an individual has in the company the easier he or she defines the usage of new technology. Position is being ranked in this regression analysis as assistant → broker → franchise → HQ and it is based on the level of responsibility and decision rights that the individual has. The step from assistant to broker, and from broker to franchisee has a clear and significant positive effect on the perceived ease of use.

Table 8 Division after country on the perception of ease of use.

Country * It is easy to use visualisation tools provided from external parties Crosstabulation

			It is easy to use visualisation tools provided from external parties					
			Not at all	2	3	4	Very much	Total
Country	Denmark	Count	2	1	2	12	7	24
		% within Country	8,3%	4,2%	8,3%	50,0%	29,2%	100,0%
	Norway	Count	1	2	21	12	9	45
		% within Country	2,2%	4,4%	46,7%	26,7%	20,0%	100,0%
	Sweden	Count	4	7	47	38	10	106
		% within Country	3,8%	6,6%	44,3%	35,8%	9,4%	100,0%
Total		Count	7	10	70	62	26	175
		% within Country	4,0%	5,7%	40,0%	35,4%	14,9%	100,0%

As showed in the crosstab above 79.2% of the individuals in Denmark found the new technology easy to use. In Norway the same number was equal to 46.7% and in Sweden 45.2%.

Table 9 Division after position on the perception on ease of use.

Position * It is easy to use visualisation tools provided from external parties Crosstabulation

			It is easy to use visualisation tools provided from external parties					
			Not at all	2	3	4	Very much	Total
Position	Assistant	Count	4	0	14	9	9	36
		% within Position	11,1%	0,0%	38,9%	25,0%	25,0%	100,0%
	Broker	Count	3	10	45	41	11	110
		% within Position	2,7%	9,1%	40,9%	37,3%	10,0%	100,0%
	Franchisee	Count	0	0	6	7	3	16
		% within Position	0,0%	0,0%	37,5%	43,8%	18,8%	100,0%
	HQ	Count	0	0	1	0	2	3
		% within Position	0,0%	0,0%	33,3%	0,0%	66,7%	100,0%
Total		Count	7	10	66	57	25	165
		% within Position	4,2%	6,1%	40,0%	34,5%	15,2%	100,0%

50% of assistants found new technology easy to use but at the same time 11.1% state that it is really hard. Out of the brokers 47.3% thought it was easy to use new technology and 62.6% of franchisees and 66.7% of HQ representatives agreed.

Table 10 Influence of age, gender, country and position in the company on the perceived usefulness of new technologies.

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[Increase_value = 1]	-2,007	1,037	3,747	1	,053	-4,039	,025
	[Increase_value = 2]	-,793	,997	,631	1	,427	-2,747	1,162
	[Increase_value = 3]	,871	,991	,772	1	,380	-1,072	2,814
	[Increase_value = 4]	2,611	1,014	6,631	1	,010	,624	4,598
Location	Age	-,004	,012	,088	1	,766	-,027	,020
	[Gender=0]	-,123	,311	,156	1	,693	-,733	,487
	[Gender=1]	0[a]	.	.	0	.	.	.
	[Sweden=0]	1,042	,500	4,344	1	,037	,062	2,022
	[Sweden=1]	0[a]	.	.	0	.	.	.
	[Norway=0]	1,218	,527	5,338	1	,021	,185	2,252
	[Norway=1]	0[a]	.	.	0	.	.	.
	[Denmark=0]	0[a]	.	.	0	.	.	.
	[Denmark=1]	0[a]	.	.	0	.	.	.
	[Position=1]	-,462	,664	,485	1	,486	-1,763	,839
	[Position=2]	-,055	,607	,008	1	,927	-1,244	1,134
	[Position=3]	,649	,798	,661	1	,416	-,915	2,213
	[Position=4]	,871	1,211	,517	1	,472	-1,503	3,244
	[Position=5]	0[a]	.	.	0	.	.	.

Link function: Logit.

a. This parameter is set to zero because it is redundant.

When testing how useful the individuals perceived the new technology as, it was showed that individuals from Sweden and from Norway found the tool less useful than individuals from

Denmark. Norwegians were the ones finding the tool least useful. None of the other tested factors had any significant effect on the perceived usefulness of the technological tool.

Table 11 Division on countries of perception on the usefulness.

Country * Visualisation tools increase the value of the object Crosstabulation

			Visualisation tools increase the value of the object					
			Not at all	2	3	4	Very much	Total
Country	Denmark	Count	1	3	5	6	9	24
		% within Country	4,2%	12,5%	20,8%	25,0%	37,5%	100,0%
	Norway	Count	3	5	16	14	7	45
		% within Country	6,7%	11,1%	35,6%	31,1%	15,6%	100,0%
	Sweden	Count	5	9	36	41	15	106
		% within Country	4,7%	8,5%	34,0%	38,7%	14,2%	100,0%
Total		Count	9	17	57	61	31	175
		% within Country	5,1%	9,7%	32,6%	34,9%	17,7%	100,0%

The significant result is also presented in a crosstab table. 62.5% of the respondents from Denmark found the new tool very useful in order to increase the value of an object. 46.7% from Norway and 52.9% from Sweden answered that the tool was useful in increasing an object's value.

4.3.1. Technology readiness

Five out of six respondents had a positive and optimistic view on the new technology provided by external visualisation suppliers, however they found it difficult to derive the link between the technology applied and the increased value of the objects. One interviewee representing a store owner did not believe that the new technology available on the market today could increase the value of an object and was therefore not willing to use it in the daily work. He also added that the end-customers do not see the difference in technological skills or tools between real estate companies, unless you tell them exactly what the difference is. Another broker was sure that the tools had a positive effect on the value and the third one was not convinced that it increased the value directly, but she valued the usage of the tools as a good marketing strategy. Neither one of the HQ representatives believed that there were any positive relation at all between visualisation of an object and the value of it. One interviewee rather stressed the fact that it can be a negative relation if the visualisation is of bad quality. Further on, another HQ representative found it hard to answer if the value of an object increases with visualisation tools because of the market situation today. When it is as easy to sell objects as today, he says that there is no spoken need of knowing where the value is created and it is hard to derive the original source of an object's increasing value.

Table 12 Division on position of perception on the usefulness

			Visualisation tools increase the value of the object					
			Not at all	2	3	4	Very much	Total
Position	Franchise	Count	3	4	11	12	6	36
		% within Position	8.3%	11.1%	30.6%	33.3%	16.7%	100.0%
	Broker	Count	4	13	35	40	18	110
		% within Position	3.6%	11.8%	31.8%	36.4%	16.4%	100.0%
	Assistent	Count	2	0	4	7	3	16
		% within Position	12.5%	0.0%	25.0%	43.8%	18.8%	100.0%
	HQ	Count	0	0	1	1	1	3
		% within Position	0.0%	0.0%	33.3%	33.3%	33.3%	100.0%
	Other	Count	0	0	6	1	3	10
		% within Position	0.0%	0.0%	60.0%	10.0%	30.0%	100.0%
Total		Count	9	17	57	61	31	175
		% within Position	5.1%	9.7%	32.6%	34.9%	17.7%	100.0%

When looking into the survey results the percentage of the respondents that believed that the visualisation tools increase the value of the object was 52.6%, the number for the brokers was 52.8%. 30.6% of the franchisees and 31.8% of the brokers had no opinion regarding the relation between visualisation tool and the overall value of an object.

"Theoretically, definitely yes, probably from a customer perspective as well"... "The broker does not need to reflect over the reason for increased value"... "It is hard to derive." HQ representative, Mäklarhuset, Sweden

One of the interviewees at HQ level also stressed the importance of investigating if the end-users are ready to accept the new technology. The degree to which the end-users are demanding new technologies should be a guideline for the brokers' usage of them.

"The consumer's mindset regarding technology is central, some tools just don't sell commercially and if the consumer isn't ready, neither are we" - HQ executive, EDC, Denmark

There were also differences in the attitudes toward the usage of new technologies in the future between the respondents. Two respondents at HQ level believed that it is important to constantly embrace and try new technologies to be up to date with the latest tools. The third explained that there are divergent attitudes towards new technology. HQ on one hand values being the first mover but the ones responsible for the funding do not dare to jeopardise future cash flows.

Table 13 Division on position of most important argument for using visualisation tools.

			What is the most important argument for not using visualisation tools?					
			The price level	The service is hard to use	Feeling of not having control over the result	I don?t see the benefits of using it	Other	Total
Position	Franchise	Count	19	3	5	5	10	42
		% within Position	45.2%	7.1%	11.9%	11.9%	23.8%	100.0%
	Broker	Count	62	10	23	11	16	122
		% within Position	50.8%	8.2%	18.9%	9.0%	13.1%	100.0%
	Assistent	Count	9	0	4	3	2	18
		% within Position	50.0%	0.0%	22.2%	16.7%	11.1%	100.0%
	HQ	Count	1	0	0	0	2	3
		% within Position	33.3%	0.0%	0.0%	0.0%	66.7%	100.0%
	Other	Count	5	1	2	2	4	14
		% within Position	35.7%	7.1%	14.3%	14.3%	28.6%	100.0%
Total		Count	96	14	34	21	34	199
		% within Position	48.2%	7.0%	17.1%	10.6%	17.1%	100.0%

From the table above it can be derived that the main argument for not using the technology is the price level, with 48.2% of the answers. The other arguments are not as evident, with less than 20% believing that it is the most important factor to not use external visualisation tools.

4.3.2. Technology readiness and post-adoption behaviour

When asking the respondents at HQ level how they follow up adoption of technology throughout the whole organisation it was clear that the strategy of following up new tools is rather absent. The policies and decisions taken at HQ level are simply expected to be utilised at the local level as well. One HQ representative expressed that as there is one process to be followed in the whole organisation there is no need to have any following up strategy. Also the respondents at the local level agreed that there is no examination of following up new tools, rather just an assumption that these are being used frequently. The actors on the local level are not involved in the procurement process of the visualisation tools provider and have therefore no judgements to add in the process.

One broker expressed his dissatisfaction with a change of visualisation tool provider managed by HQ. The change was implemented without any feedback from local stores and their experiences were not taken into account when negotiating with potential suppliers. The change was not followed up and there was no evaluation of how the new tools were being used or executed.

Table 14 Division on position of perception on following up and education from HQ

Position * HQ provides education and follows up when introducing visualisation tools Crosstabulation

			HQ provides education and follows up when introducing visualisation tools					Total
			Not at all	2	3	4	Very much	
Position	Franchise	Count	7	3	8	5	3	26
		% within Position	26,9%	11,5%	30,8%	19,2%	11,5%	100,0%
	Broker	Count	21	17	40	17	6	101
		% within Position	20,8%	16,8%	39,6%	16,8%	5,9%	100,0%
	Assistent	Count	3	1	5	4	2	15
		% within Position	20,0%	6,7%	33,3%	26,7%	13,3%	100,0%
	HQ	Count	0	1	1	0	1	3
		% within Position	0,0%	33,3%	33,3%	0,0%	33,3%	100,0%
	Other	Count	3	0	3	3	0	9
		% within Position	33,3%	0,0%	33,3%	33,3%	0,0%	100,0%
Total		Count	34	22	57	29	12	154
		% within Position	22,1%	14,3%	37,0%	18,8%	7,8%	100,0%

In the table the result from the survey is presented and there is a broad spread of answers. Only 26.6% expressed that HQ follows up and educates when they are implementing a new system. 37% did not have any specific opinion regarding the following up and 36.4% stated that HQ does not follow up or offer education in a proper way.

The respondents at HQ level stated that they do not have any specific strategies in the implementation process between different offices and local stores. They neither segment the employees nor the customers according to their attitudes towards new technologies and implementation methods are similar no matter where or to whom. None of the respondents expressed that they have a clear strategy on how they market properties to different customer segments but they did however state that they use different strategies depending on the object's attributes. One respondent at the HQ level said that a lot of freedom is given to the individual broker, within given identified boundaries.

"There are no musts in using any specific technologies or marketing strategies, the property is often the indicator of what to use and how." - HQ representative, Mäklarhuset, Sweden.

The brokers being interviewed stated that they are free to use any type of marketing strategy to their respective objects. What might differ is dependent on the object and it is mainly the type of communication channel being used rather than the decision of what type of technology to use when visualising the object.

4.3.3. Connection of technology acceptance and technology readiness

Two of the brokers showed an optimistic attitude towards new technologies that were provided to them and they expressed eagerness in trying new things. Both brokers stated that visualisation tools make their job much easier and that it saves them a lot of time. They also stated that the support provided by the supplier works well and that they get the help they need. One of the bro-

kers estimated the error rate to approximately 20% which he did not see as a problem as he easily can correct the mistakes himself.

"There are not that many errors in the deliveries, I would say that I have to correct maybe 1 out of 5" - Broker, EDC, Denmark

The third broker and store owner however, had a slightly more negative attitude towards the new technologies available on today's market, stating that he cannot really see the value in them. Additionally, he estimated the error rate to be approximately 20% and a completely different attitude could be noticed, as it according to him was a way too high percentage.

"Approximately 20% of the packages has some kind of error and the new photographers are really bad. Because of that I cannot promise my clients a good result." - Store owner, EDC, Denmark

4.4. Diffusion theory

There are different opinions regarding the importance of being in the frontier regarding new technologies. Two of the representatives from HQ level stated that it is closely connected to their brand strategy to always be one of the first movers when it comes to new technologies in the industry. Even if the brokers are not in the frontier of using new technologies themselves this is being managed by a clear top down implementation of new technologies. One HQ representative stated that as a company, it is much easier to be in the technological frontier if there is a consistency in the usage of technological tools, due to a higher level of control. Another representative also said that the company values an entrepreneurial spirit connected to innovations in the organisation and that it is created by letting the franchisees be owners with equal voting rights which creates engagement amongst them.

"Our core values are braveness, strength and flow. Braveness is about being the first one that dares to question new things"- HQ representative, Mäklarhuset, Sweden

Another representative from HQ level stated that they do not differ that much from their competitors in the usage of new technology but that they are aiming to continuously introduce new tools. They however experience a certain resistance from the brokers who they believe value more traditional courses of actions. The HQ representative further claimed that it is important to show that the end-users are ready for the new technologies as an incentive for the brokers to use the tools. In a way, he means that evidence are somewhat absent at the moment. The brokers tend to value traditions in their work and therefore they need clear evidence that the new technology is demanded in the market before they voluntarily try something new. Additionally, another HQ representative means that the resistance can be connected to a pretty stable business environment, which doesn't force the brokers to go outside their comfort zone and try new things. Another mentioned explanation for the existent resistance is the generation issues, however, the HQ repre-

sentative means that as a generation shift is approaching the resistance among brokers might be diminishing.

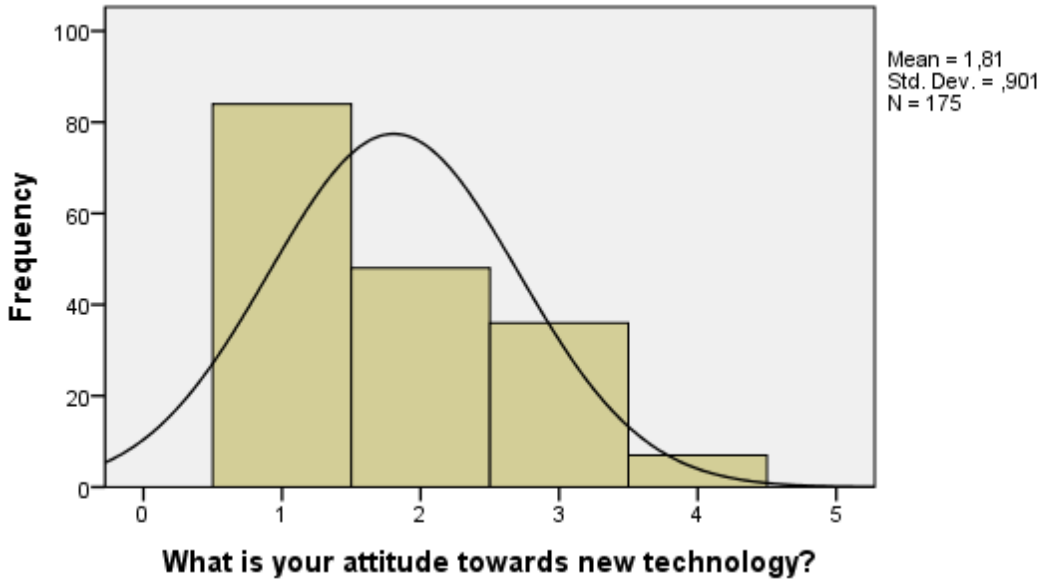

Figure 9 Distribution of individuals' attitude towards new technology

As can be seen in the table there is a clear majority of the individuals that frame themselves as valuing new technology to a large extent. One is defined as "I value being the first one trying new technology", two is "I value doing research before trying new technologies and visualisation tools", three is "I value others experiences when trying new technologies and visualisation tools in order to remove insecurity", and four is define as "I'm not interested in new technology and visualisation tools".

4.4.1. Technology acceptance and diffusion theory

All the interviewees at HQ level explained that they practice a top down decision-making and implementation process and two of them also stated that they want their firm to be recognised as a first mover when it comes to new technology. However, one of the HQ representatives claimed that the need of technology and IT-solutions has not been that high, however, this may change in the near future as the industry is changing and becoming more and more competitive. The same respondent said that he would like brokers to be more absorbing regarding new tools and technologies. When the procurement process is finalized they are implementing the new tools downwards in the organisation in various ways. Two of the respondents explained that HQ does only tell the brokers and store owners that a new supplier will be used and the users are not allowed to use any other suppliers, if they cannot clearly show that the chosen provider is not suitable in their region or business. The third company is also using agreements which limits the use of supplier to one, but they are communicating it down in the organisation by developing their own

technological solutions which force the employees to use the chosen supplier as it is by far the easiest and most time efficient way for the brokers to work.

Two of the brokers were happy with how the visualisation tools are working, as they are easy to use in the system and they do not question the usage of it. One of the interviewees representing a store owner was however not as pleased with the implementation of the system. The respondent stated that more integration from the actual user of visualisation tools, for example brokers, could be valuable in the procurement process as he and his colleagues are not happy with the latest change of provider. However, all the brokers at the firm in question use the provider that they are told to use by HQ whether they are pleased with the supplier or not.

4.4.2. The influence of age and gender in the TAM

Two of the respondents stated that there might be some differences in how the new technology is accepted throughout the organisation related to the user's age. The interviewees agreed that most young brokers are eager to use new technologies, because it is fun and it does not take any additional time for them to learn how to use it. However, for the older generation it can be harder and more time-consuming to approach new ways of working and new visualisation tools. One of the respondents even stated that he sometimes needs to act as a teacher to his older colleagues in the organisation. Also one of the HQ representatives mentioned that the resistance of new technology can be correlated to the age of the brokers and he said that it might be a diminishing problem because of a new generation entering the position as realtors today.

Table 15 Influence of age, gender, country and position in the company on the attitude towards new technologies.

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[Suits2 = 1]	-6,814	1,464	21,654	1	,000	-9,683	-3,944
	[Suits2 = 2]	-4,781	1,406	11,557	1	,001	-7,537	-2,025
	[Suits2 = 3]	-3,458	1,380	6,277	1	,012	-6,163	-,753
Location	Age	-,044	,013	11,145	1	,001	-,070	-,018
	[Gender=0]	-,592	,346	2,932	1	,087	-1,271	,086
	[Gender=1]	0[a]	.	.	0	.	.	.
	[Sweden1=,00]	-,986	,639	2,380	1	,123	-2,239	,267
	[Sweden1=1,00]	0[a]	.	.	0	.	.	.
	[Norway1=,00]	-1,685	,664	6,448	1	,011	-2,986	-,384
	[Norway1=1,00]	0[a]	.	.	0	.	.	.
	[Denmark1=,00]	0[a]	.	.	0	.	.	.
	[Denmark1=1,00]	0[a]	.	.	0	.	.	.
	[Positionranked=1]	-,657	1,158	,322	1	,570	-2,926	1,612
	[Positionranked=2]	-,424	1,120	,144	1	,705	-2,619	1,770
	[Positionranked=3]	-,153	1,240	,015	1	,902	-2,584	2,278
	[Positionranked=4]	0[a]	.	.	0	.	.	.

Link function: Logit.

a. This parameter is set to zero because it is redundant.

When analysing the influence of different factors on an individual's attitude and values regarding new technology age, gender and country have an effect at a significance level of 0.1. Age has a negative effect on how technology is valued which means that the older an individual is the less

he or she values being the first one to try new technology. Gender does also have a significant effect on the result and it indicates that women (coded 0) value being the first one to try new technology less than men do. Individuals in Norway value new technology less than individuals from Sweden and Denmark and it is indicated that individuals from Sweden values it less than those from Denmark but it is however not statistically significant at the chosen level. The position an individual has in the company has no significant effect on how new technology is valued.

Table 16 Effect of age on attitude towards new technology.

Age * What is your attitude towards new technology? Crosstabulation

			What is your attitude towards new technology?				
			I value being the first one trying new technology	I value doing research before trying new technologies and visualization tools	I value others experiences when trying new technologies and visualization tools in order to remove insecurity	I'm not interested in new technology and visualization tools	Total
Age	20-29	Count	24	10	7	0	41
		% within Age	58,5%	24,4%	17,1%	0,0%	100,0%
	30-39	Count	28	7	10	3	48
		% within Age	58,3%	14,6%	20,8%	6,3%	100,0%
	40-49	Count	12	13	5	0	30
		% within Age	40,0%	43,3%	16,7%	0,0%	100,0%
	50-59	Count	5	9	8	2	24
		% within Age	20,8%	37,5%	33,3%	8,3%	100,0%
	60->	Count	8	6	4	2	20
		% within Age	40,0%	30,0%	20,0%	10,0%	100,0%
Total		Count	77	45	34	7	163
		% within Age	47,2%	27,6%	20,9%	4,3%	100,0%

When it comes to age groups there are also differences in the attitude towards new technology. 58.5% of individuals between 20 and 29, 58.3% between 30 and 39, 40% between 40 and 49, 20.8% between 50 and 59 and 40% over 60 values to be the first one to try new technology. The percentages for the ones valuing research are in the same order, 24.4%, 14.6%, 43.3%, 37.5% and 30%.

Table 17 Effect of gender on attitude towards new technology.

Gender * What is your attitude towards new technology? Crosstabulation

			What is your attitude towards new technology?				
			I value being the first one trying new technology	I value doing research before trying new technologies and visualization tools	I value others experiences when trying new technologies and visualization tools in order to remove insecurity	I'm not interested in new technology and visualization tools	Total
Gender	Female	Count	29	26	16	1	72
		% within Gender	40,3%	36,1%	22,2%	1,4%	100,0%
	Male	Count	55	22	20	6	103
		% within Gender	53,4%	21,4%	19,4%	5,8%	100,0%
Total		Count	84	48	36	7	175
		% within Gender	48,0%	27,4%	20,6%	4,0%	100,0%

When looking at differences between genders it can be seen that men to 53.4% value to be the first one trying new technology and only 40.3% of women do the same. 21.4% of men value doing research before they try new technology and 36.1% of women values well researched decisions.

Table 18 Effect of country on attitude towards new technology.

Country * What is your attitude towards new technology? Crosstabulation

			What is your attitude towards new technology?				
			I'm not interested in new technology and visualization tools	I value others experiences when trying new technologies and visualization tools in order to remove insecurity	I value doing research before trying new technologies and visualization tools	I value being the first one trying new technology	Total
Country	Denmark	Count	0	5	4	15	24
		% within Country	0,0%	20,8%	16,7%	62,5%	100,0%
	Norway	Count	1	14	10	20	45
		% within Country	2,2%	31,1%	22,2%	44,4%	100,0%
	Sweden	Count	6	17	34	49	106
		% within Country	5,7%	16,0%	32,1%	46,2%	100,0%
Total		Count	7	36	48	84	175
		% within Country	4,0%	20,6%	27,4%	48,0%	100,0%

62.5% of the respondent individuals from Denmark stated that they value being the first one to try new technology and the corresponding numbers for Norway and Sweden are 44.4% and 46.2% respective.

4.4.3. Diffusion and intra-organisational issues

The top down implementation of the visualisation provider is being connected with the unique in house IT-department in one of the organisations in order to make sure that the implementation is managed in a smooth way and that it results in an easy usage of the solution. The HQ representative that stated this is also explaining that they are the only ones in the market that have their IT in-house and are able to customise the solution themselves. They use this type of process in order to make sure that the same procedure is being used throughout the whole organisation in order to secure the quality of the final products. This is also a way to make it easier for the employees to use the new tools and to make sure that they save time, in order to evoke a positive attitude to make the implementation smooth in the organisation. All the representatives at HQ level claimed that there are no specific differences in how to approach different groups of employees regarding the introduction of new tools. One of the brokers also added that HQ representatives do not approach groups in any way at all, as they do not have any following up strategy when implementing a tool.

Table 19 Effect of position on perceived consistency in the organisation

			We use our visualisation tools in the same way throughout the organization					
			Not at all	2	3	4	Very much	Total
Position	Franchise	Count	5	3	12	4	12	36
		% within Position	13,9%	8,3%	33,3%	11,1%	33,3%	100,0%
	Broker	Count	13	16	35	26	22	112
		% within Position	11,6%	14,3%	31,3%	23,2%	19,6%	100,0%
	Assistent	Count	3	0	3	6	4	16
		% within Position	18,8%	0,0%	18,8%	37,5%	25,0%	100,0%
	HQ	Count	1	1	0	1	0	3
		% within Position	33,3%	33,3%	0,0%	33,3%	0,0%	100,0%
	Other	Count	3	1	3	4	1	12
		% within Position	25,0%	8,3%	25,0%	33,3%	8,3%	100,0%
Total		Count	25	21	53	41	39	179
		% within Position	14,0%	11,7%	29,6%	22,9%	21,8%	100,0%

There were spread answers in the survey regarding the consistency in using the same visualisation tool throughout the whole organisation. The combined result is that 25.7% does not think that they use it in the same way, 29.6% state that they have no opinion and 43.7% responded that they can see a consistency in the usage of visualisation tools in the organisation. Different attitudes can however be noticed between individuals with different positions in the organisation as shown in the table above.

5. Analysis

This section aims to connect the empirical findings from the survey and the interviews with the theoretical framework. Touchpoints as well as misalignments will be identified. The presentation of the analysis part has the same constellation as the empirical findings, to ensure better flow throughout the sections.

5.1. Implementation of visualisation tools in a real estate organisation

As representatives from different positions in the organisation seem to have different focuses on what they value, it is important for the company to have a clear implementation process. Simon (1964) stated that it is important to either understand or listen to all individual members' goals or to establish clear organisational goals that are weighted over the single individual's opinion. The last one describes the structure in the real estate industry as they are following a top down decision process in most of the companies in this study. This technique is used to avoid different individuals' personal opinions taking over the organisation's goals and to express a clear brand strategy to their customers. Some resistance from the brokers was however observed regarding the lack of influence when deciding which visualisation tool provider to collaborate with. The brokers are the ones using the tool in the end and therefore some of them would like to have more control over the final decision.

Brokers and representatives from HQ also seem to have different opinions regarding what is most important when choosing visualisation provider, which needs to be considered when making a final decision. This is the main reason for resistance from the brokers as they perceive that their opinions are not taken into consideration. Both brokers and HQ representatives stated that quality is the most important factor when choosing visualisation tool provider but representatives from HQ also claim that brokers value low prices more than high quality. This leads to a large amount of frustration clearly expressed from one of the brokers as he felt that quality is being jeopardised in account for the price level. Generating more leads and getting an advantage over competitors are however a common attitude towards the usage of the tool but the main divergence in attitude is related to the price level were representatives from HQ values a low price more than the brokers, which might seem contradictory as the brokers are the ones paying for the tool in the end. A clearer two-way communication can be useful when setting the common goal of the organisation to ensure that the different parts are aware of what their colleagues actually value.

5.2. Technology acceptance in the real estate industry

In the interviews it could be identified that the actors believed that the visualisation tools provided were enhancing their job performance. Davis (1989) identified this variable as the positive relationship between the use of a tool and its performance. Specific examples of how the performance is enhanced could be extracted from the survey answers, where there were some evident regional differences between countries. Danish users were the ones finding the tools most useful. This is illustrated through the answers regarding the increased value of an object when using vis-

ualisation tools. In Denmark the number of users that agreed was 62.5% and the same number for Norway was only 46.7%. There were no other variables having any specific effect on the perceived usefulness. However, one can argue that in Norway and Sweden the link between implementation of the tools and its deliverables after is weaker than it is in Denmark. What seems to be a source of resistance is the absence of evident results and the complexity of deriving the outcomes to the actual sources.

There are no evident indications of doubt regarding the ease of use of visualisation tools when conducting the interviews. All interviewees agree upon the fact that the usage of the tools provided to them is smooth and easy. However, when analysing the results from the survey it could be derived that there are some regional differences, which were not identified from only the interviews. It was noted that Danish users are the ones that find the technology usage easiest and that Swedish users find the use of technology hardest. Another variable that has a significant effect on the ease of use is the hierarchical position in the company. From the survey it could be identified that the higher position an individual has in the organisation and the more responsibility an individual has, the easier he or she perceives the use of the visualisation tools. Davis (1989) highlighted that the awareness of the distinction between perceived use and actual use is extremely important, however it can often be overlooked as the objectivity is not complete. With this in mind, the question can be whether the objectivity regarding the actual use is higher at the lower levels of the hierarchy, as those are the actors actually using the visualisation tools in their everyday life.

5.2.1. Technology readiness in the real estate industry

When asking the interviewees regarding the concept of technology readiness, they are introducing many explanations for the differences in the technology readiness. Factors such as end-users attitudes, as well as the brand's reputation seem to be determinants of the commitment to technology and its embrace. Parasuraman (2000) is highlighting product complexity in connection to the lack of instructions for use and support as one of the reasons for non-readiness for new technologies. However, when analysing the survey it is evident that the complexity of the visualisation tools is low, and therefore complexity is not one of the major reasons for not using the tools. As it can be extracted from the survey result, only 7% of the respondents agree that complexity or "service is hard to use" is the most important argument for not using it. What is interesting is that only one of the interviewees mentions the technology readiness of the end-users and how it can be a guideline for the approach that the brokers should use in their marketing strategy. Parasuraman (2000) is also discussing optimism and innovativeness as the two inhibitors of technology readiness and the perception on the error rate mentioned in the empirics is an interesting illustration of differences. Both brokers mentioned the exact same error rate, approximately 20%, however one of the brokers was extremely dissatisfied and the other one stated that the error rate did not bother him. It can be argued that this difference which origins from personal attitudes, where one broker was optimistic and the other one was not, also affected their technology readiness.

5.2.2. Technology readiness and post-adoption behaviour

In the interviews as well as in the survey the post-adoption behaviour was studied by looking into however the implementation of tools is being followed up by representatives from HQ. The results in the survey and in the interviews were pretty homogenous, as the majority of actors believed that following up the implementation of visualisation tools was not utilised to a large extent. Among brokers, which are the ones actually using the technology only 22.7% agree that HQ follows up on the implementation of visualisation tools. This is not in consistency with the recommendation by Son and Han (2011) regarding the importance of manager's role in the post-adoption process. One of the interview respondents stated that there is no specific education of new visualisation tools, as these are mostly only introduced and expected to be used throughout the organisation. Son and Han (2011) further argue the importance of continuous detailed communication of the perceived benefits in order to keep up the frequent and effective usage of new tools and functions. Further on, there is no evidence of managers approaching different attitudes in different ways, however, for an effective implementation customised approaches to target different attitudes are suggested by the authors.

5.2.3. Connection of technology acceptance and technology readiness

An attempt of connecting the technology acceptance model and technology readiness was made when conducting the interviews. Walczuch et al. (2007) suggested that employee's optimism had the highest impact on perceived ease of use and perceived usefulness and that innovativeness, however, had a negative impact of perceived usefulness. The negativity was explained by the authors as the fact that innovative people have tendencies of being more critical and have higher expectations when it comes to technology. Some patterns of this could be identified in the interviews. Two out of three brokers identified themselves as optimistic towards new tools on the market, they were eager to try new things and identified usefulness in them. The third broker however had a slightly more negative attitude to new tools, he did not see the usefulness related to them and complained about the error rate of the deliveries. Even though the optimistic broker identified the error rate being on the same level, approximately 20%, he did not recognise it as an obstacle for using the tool and identified it as a completely reasonable rate that could easily be solved in-house. It is evident that personal attitudes can control how the visualisation tool is perceived. This is why, in order to have an effective implementation of a tool, it can pay off to approach people in different ways, as suggested by Son and Han (2011).

5.3. Diffusion of innovation in the real estate industry

In the interviews there have been indications from HQ that they perceive themselves as more innovative than their colleagues at a lower level in the company. They however mentioned that they solve this problem by having a clear top down implementation process of new technological tools in order to spread the value of having an innovative core in the company. Representatives from HQ level stated that they have faced resistance from brokers when implementing new technological tools. When visualising the attitude towards new technology it can however be noticed

that most of the respondents in the study frame themselves as individuals that value being in the frontier when trying new technology. When testing if position has any effect on the attitude no significant result could be found and the divergent experiences can therefore not be explained by the different positions in the company.

Another explanatory factor that might be important is the current industry environment. Even if the majority of the respondents perceive themselves as early adopters and in the frontier when testing new technology it is nothing that necessary need to correspond to their attitude when doing business. Scheirer (1990) claims that it is the individual that are important to study as they all represent themselves in a rational way even if they are a part of an organisation. This seems however not to be the case in the real estate industry as there is a divergence between how individuals say that they perceive themselves and how they act in a business environment. Greenhalgh et al. (2004) however clarified that the implementation does not follow a linear process and therefore it is important to ensure that more than one individual are willing to adapt to the new technological tool. This could indicate that there are a lot of possibilities when it comes to new technology in the industry as most of the actors value to be in the frontier. They however need to find a good way to communicate the change in the organisation to enable a smooth implementation process to take advantage of the employees' attitudes.

5.3.1. Combination of technology acceptance and diffusion of innovation

HQ representatives that are being interviewed all claim that they are using a top down decision model and that all changes are directed from HQ. This means that the brokers in the companies cannot affect the choice of visualisation provider. When using a top down structure it is the organisation that is the first one to adapt to new technological tool and then the individuals within the organisation who need to comply with the decision. In this case, as it is HQ that decides when the organisation shall adapt to new technology, they can be recognised as voluntary adopters or dormant non-adopters and the individuals in the organisation can be seen as either forced adopters or resistant non-adopters depending on their decisions to adapt or not. Because of this it is more important to focus on how the new technology are perceived by employees in terms of ease of use and its perceived usefulness, rather than how they are valuing being recognised regarding new technology, as soon as it has been implemented. From the interviews it can be observed that there are different opinions regarding how new technological tools should be valued in the procurement process throughout the organisation. There are no divergence in how quality is valued in the organisation but when it comes to price there are contradictions in how important it actually is. Quality is the most important factor for all representatives but individuals at HQ level value price higher than brokers, which seems contradictory since it is the brokers that pay for the service in the end as it is deducted from their provision.

Another important takeaway when it comes to top down decisions is how the new tool is being introduced further down in the organisation. Regarding experiences about how new technologies are being followed up and how much education HQ is providing, the attitudes differ a lot depend-

ing on where in the organisation the respondents are positioned. The representatives from HQ have the understanding that they are providing the organisation with education and that they follow up the implementation to a large extent. This can however not be seen when looking at the answers from representatives further down in the organisation such as brokers and assistants. It seems like the distance in attitude between positions also can be recognised as a distance in communication as HQ representatives claim that they are aware of brokers and assistants opinions, which cannot be seen in the answers from the questionnaire.

5.3.2. The influence of age and gender

As showed in the ordinal regression with both age and gender as independent variables and ease of use and usefulness as dependent variables, no significant effect was to be recognised. As no significant effect on how individuals perceive the ease of use and usefulness of technological tools can be related to differences in age and gender there are probably other explanations. The individuals answering the questionnaire are focusing on how they perceive the tool and the interviewees, showing differences in technology acceptance related to age, are talking about other individuals' perception. The differences in attitudes from the interviewees and the individuals answering the questionnaire are therefore related to how the respondents perceive other actors in the organisation more than how they perceive new technology.

One of the brokers that was interviewed stated that he sometimes had to teach his older colleagues how to use the visualisation tool as they perceive the usage as more complicate in relation to himself. The same attitude could be recognised from one of the HQ representatives that stated that there is a resistance towards new technology from an older generation of brokers but that it however can be seen as a diminishing problem as a new generation is entering the industry. That the older generation should find it harder to accept new technology is nothing that is significantly proven in the ordinal regression and therefore it is important to investigate if it is a distorted self-perception from the older individuals or if it is their colleagues that under-value their technological knowledge.

5.3.3. Diffusion of innovation and intra-organisational issues

Administrational innovations are often the ones following a top down process and they do often also affect the technical in the end. This is the case in one of the companies where they have developed their own in-house IT system to enable easier access to the visualisation tools and to make them more useful for the brokers. One of the most important reasons for a successful administrative innovation is the level of usage in the company according to Choi and Chang (2009). The company having their own IT system is using it mainly to force their brokers to use the contracted visualisation tool provider because of the employees' willingness to use it because of its efficiency.

None of the respondents mentioned that they had any kind of champions when it comes to implementing new visualisation tools even if this is something that theories highly recommend in order to reach a consistent positive attitude throughout the company. Wunderlich et al. (2014) also argue about the importance of taking care of the non-adopters in an organisation, which none of the respondents are doing today.

6. Conclusion

The conclusion section is summarising the main parts of this thesis as well as it is aiming to answer the research question and the posed sub questions. The research questions are also functioning as the main headlines of the section, ensuring coverage of all aspects and increasing the easiness of reading the thesis.

6.1. How is a modern technological tool accepted throughout a hybrid organisation in a slow moving industry exposed to the digital revolution?

The majority of the individuals in this study choose to describe themselves as early adopters when it comes to new technology. As this attitude and valuation mainly are connected to the organisation's choice to adapt or not there should be a large willingness to use visualisation tools in the industry today. Even if organisations are willing to be in the frontier in using new technologies there are cases when resistance has been faced after implementation and the reasons to this divergent attitudes need to be understood in order to reduce the numbers of individuals not accepting the new technology. One can argue that because of individuals' positive attitudes new visualisation tools should be well accepted in an organisation when implemented, but as mentioned in the sections above there are other variables, such as ease of use and usefulness, affecting the level of technologies. Therefore the individuals that value new technology and has decision rights when choosing visualisation provider always need to have those variables in mind to avoid transforming their employees into resistant non-adopters when implementing new tools.

Due to some clear differences in how useful and easy the technology is to use it is important to identify the reasons for this and use them as an advantage. When analysing the survey, the complexity of the service could for instance not be seen as the main source of resistance, however individuals at a lower position in the organisation find the tools more complex to use. It would most probably be a long shot to say that that the actors within the industry are technology-ready, however the reasons for a possible non-readiness within the organisation can be identified as factors other than the complexity of the product or the service of matter. In order to access the sources of resistance and increase the perceived usefulness, more clear links of the tool's' usefulness should be introduced and well-communicated to the final users. In case like this, word of mouth is not enough, as users in the industry do not believe in the progress until they see it themselves. Also, a more continuous approach of implementation from the decision makers is recommended, as the users have a strong desire to influence the choice of visualisation provider in order to see the potential results and efficiencies of a tool before using it and fully believe in it.

Parts of the resistance that has been noticed origins from inter-organisational problems due to the lack of influence from those who actually are using the product or service and due to divergent views on individual attitudes. Quality can however be recognised as one of the by far most important factors when choosing visualisation tool provider and as long as they can deliver products of a high quality the level of acceptance is high. Regarding the price of the product or service,

different views on its importance have been noticed and even if it is the brokers that pay for the tools in the end they are the ones that are willing to accept a higher price. In order to reach consistency regarding the acceptance of new technology within the organisation, the departments in the organisation need to achieve a mutual wavelength in order to understand what to value and look for when sourcing visualisation tools providers.

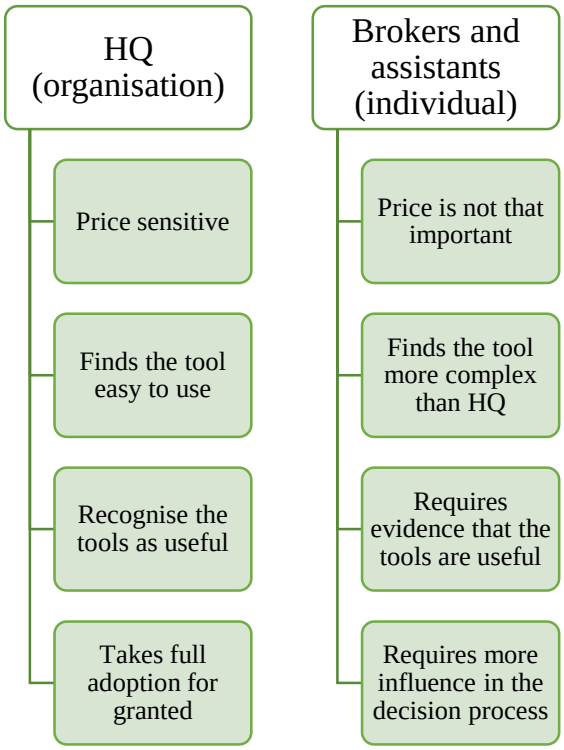

Figure 10 Differences in attitudes between organisation and individual

6.2. Can the different attitudes towards new technology amongst the actors in an organisation be explained by the individual's demographical and geographical factors?

As it has been noticed that both age, gender and geography have an effect on how individuals value new technology, it is important for the organisation, as well as for the visualisation tool provider, to make sure that they use a proper strategy to get everyone to strive towards the same goal. Since almost all organisations in the study are of a franchise structure and HQ has the overall decision rights, they need to utilize a clear communication with the employees in order to reduce the possible rate of frustration from actors feeling that they are not involved in the decision process. The visualisation tool providers might need to promote their products in different ways as it is clear that individuals from Norway value new technology less than the other Nordic countries and therefore more common product offers might be the best to penetrate the Norwegian market with. However, the geographical differences between different countries can also be connected to the existing market conditions. The Norwegian market is the market that has the slow-

est growth comparing to Denmark and Sweden. As the market is not as “hot” in Norway as it is in Denmark and Sweden, the interest in new technologies and valuation of them might not be as high among individuals in the market. One could argue that in a market with slow-moving conditions, the actors should take the opportunity to emphasise technologies and make attempts to improve the static status quo of the industry conditions. This can however not be noticed to affect the individuals in the specific market as there is no attempts to take advantage of visualisation tool to outperform competitors in the slow moving Norwegian market. According to Deloitte (2015) the Norwegian market are facing declining prices due to the oil crisis and this could on one hand lead to the need of better visualisation to increase the attraction to an object or on the other hand even more resistance as it will be more costly to add extra services.

Age and gender have a significant effect on how much an individual values new technology but as this has a greater importance when it comes to organisations that has not yet adopted to a new technology it is not that crucial for the implementation process. It can however be important for the visualisation tool providers when deciding who to target when introducing new tools as males and younger individuals seems to value new technology to a larger extent than females and older individuals. Also individuals from Denmark seems to value new technology more than those from Sweden and Norway and therefore the introduction of new products can tentatively be tested on the Danish market first, as the interest appears to be higher there.

At the individual level the country of origin has a large effect on how the tool is perceived within the organisation. Individuals from Denmark are by far the ones that perceive the tools as most useful and easy to use. In Norway the perceived usefulness is reaching the lowest level and therefore, the focus from HQ should be on proving that the tools actually are bringing value to the objects. In Sweden on the other hand, the perceived ease of use is lower than in Denmark and Norway and therefore it is important for HQ to provide support and feedback in order to increase the level of easiness for the individuals to use the visualisation tool. Denmark scores highest on those variables, but as it only shows that they are perceiving the tools as more useful and easier to use than the other Nordic countries it is important to find ways to increase the acceptance even there.

Age and gender do not have any significant effect neither on an individual's perceived ease of use nor on the usefulness of new technology and therefore that is nothing that the organisation needs to have in mind after implementation of new systems. Regardless age and gender the managers should be able to use the same strategy within the company but it can however be other factors that affects the perception. Even if the organisation does not need to have age and gender in mind when implementing the new tool, a comprehensive implementation strategy is to recommend in order to reduce the number of resistant non-adopters.

Table 20 Summary of the independent variables effect on attitudes and technology acceptance

Independent Dependent	Ease of use (individual)	Usefulness (individual)	Attitudes (organisational)
Gender	**No effect**	**No effect**	**Male +**
Age	**No effect**	**No effect**	**Older -**
Position	**Higher level +**	**No effect**	**No effect**
Country	**Sweden - -** **Norway -**	**Sweden -** **Norway - -**	**Norway -**

6.3. How can the implementation of new technologies be made more efficient in order to reach consistency throughout the whole organisation and decrease the detected gap in interest?

As there has been a lot of indications of misalignment between the HQ's perceptions of brokers and how the brokers perceive themselves, the communication between the different departments in the organisations need to be re-considered and evaluated. It is HQ that has the final decisions right and as they are not including brokers in the decision process they need to be aware of, and understand what the brokers really value before making any rushed changes. As most of the companies in this study are franchise organisations with an organisational goal instead of individual goals it is important to make sure that the individuals can relate to the common values in order to increase the level of acceptance and usage of the new tools. To enable this the decision makers need to make a major effort in order to understand the attitudes of their colleagues.

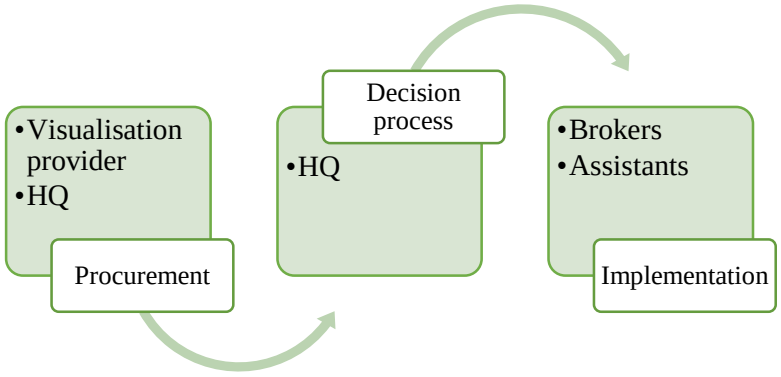

Figure 11 Visualisation of the implementation process of a new visualisation tool today.

When the organisation decides whether to use the new technology or not, the managers need to put focus on how they can enable their employees to perceive the tool as easy to use and to prove

that it is useful. This should be one of the main tasks to make the implementation smooth, increase the number of forced adopters and decrease the amount of the resistant non-adopters. This is something Mäklarhuset has managed with in an effective way by creating their own IT-system to, as the respondent from HQ expressed. As the brokers are forced to use the system it makes it so much easier to stick with the chosen provider and eliminates the risk of sourcing others. By doing this they increase the number of actual users in the organisation which is one of the most crucial factors towards a successful implementation.

Both from the survey and from the interviews, it was clear that there were no efficient follow-up or education strategies in place. As some of the interview respondents declared evident dissatisfaction with the absence of strategies, this is probably a channel which could be made more efficient and from which consistency can be reached through. A continuity in the process should also be emphasized, creating short-term strategies and wins for individuals using the technologies. Feedback loops are essential not only in order to make the implementation more effective, but also to create collaboration throughout the company and to enable all parts to influence the decisions.

In a business where the end-customers have different levels of technology acceptance and technology readiness it can be essential to make attempts to customize the offer in one way or another. Making the solutions more customized can also mean assessing the attitudes and technology readiness of the end-customers as they are the ones dictating the marketing strategies that realtors are using. The resistance among employees might get eliminated, as the focus will be on the technology readiness of the end-users, rather than on the technology readiness of themselves.

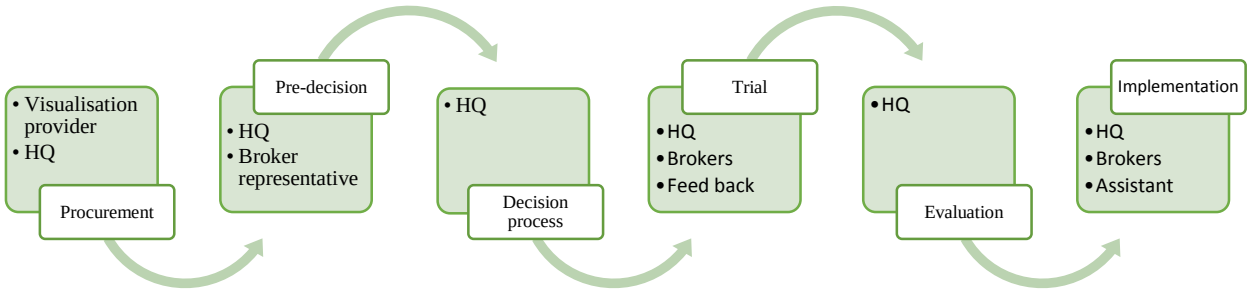

Figure 12 Suggestion of an implementation process in order to capture attitudes and values from all parts of the organisation

6.4. Suggestions for future research

As this thesis primarily has concentrated on the investigation of the Scandinavian real estate market, future research can include other geographical areas, with other market conditions and regulations affecting the status quo. As this thesis has been limited to the real estate industry, a benchmarking study would most certainly add more value and enable more general conclusions. Industries similar to the real estate industries, focusing on relationship - and trust building, could

have been included in a possible benchmarking study. Also industries and markets, which are exposed to visualisation tools, could be included in a future benchmarking study.

The survey as well as the interviews have been primarily concerned with objectives and attitudes of the customers. However, in the future it would be interesting to include the aspects of the end-users, in this case buyers and sellers of houses and apartments. Their perspective would have provided valuable insights and perhaps explanations for the behavior of customers themselves. To derive future trends and build future company strategies it can be interesting to include the end-user into the consideration.

A higher number of respondents in the interview would have added more value to this study. Due to the time constraints the number of interviews was limited and could have contributed to a more limited perspective than if more respondents were interviewed and people with additional positions would have been included.

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Appendix 1 – interview guide

Interview questions to HQ

Implementation

How would you describe the implementation process in the organisation when a new decision is made at HQ?

When you make new decisions on HQ level, how do you support the implementation throughout the organisation?

Would you say that you have any kind of opinion leaders in the organisation that you use in the implementation process?

How do you follow up an implementation of a new idea in the organisation?

What is the largest obstacle in implementing/introducing a new tool throughout the whole company?

Does the usage of an external visualisation provider decrease your effort in the sales and marketing process?

Do you think there is a clear relationship between usage of visualization tools and the firm's/object's value (generation of new leads, sales time, square meter price etc.)? If yes, how is it expressed?

Are you willing to pay for a service that could increase the value, as mentioned in the previous question? If yes, how much?

What is the most important factor when deciding what visualization provider to use?
(1=not so important, 5=very important)

	1	2	3	4	5
Quality					
Price					
Time to get a finished package					
Support					
Knowledge about the area					
Other:					

Strategy

Same tool/products throughout the whole organisation?

Do you value usage of consistent tools in the different processes within the organisation? Why/why not?

How would you identify your brand and what do you do to communicate that to your customers?

How would you say that you differ from your competitors? What is your competitive advantage?

Do you have different marketing strategies when targeting different segments? If yes, give examples.

Technology

Do you value the firm to be recognised as a pioneer in the usage of high technological solutions? Why/why not?

Do you perceive your firm being in the frontier regarding the technological tools and implementation of them? Why/why not?

Would you say that the visualisation tools provided by external parties are useful for your organisation? How?

Do you think that you get enough support/education from the provider of the solution in order to get the maximum value out of the tool?

Interview questions to local store owners and franchisees

Strategy

What is most important for you to communicate to your customers in order to feel that you keep a competitive position?

How do you control the ordering process regarding visualisation of objects in your store(s)?

What is the most important argument/driver behind the usage of professional photo service/3D floor plan provider?

Do you use different visualization solutions / packages for different objects/customer segments and how do you decide which to use?

Technology

Do you perceive your firm being in the frontier regarding the technological tools and implementation of them? Why/why not?

Do you think that you get enough support/education from the provider of the solution or the organisation in order to get the maximum value out of the tool?

Would you say that it is easy to use the visualisation tools provided by external parties?

Would you say that the visualisation tools provided by external parties are important or even critical for your organisation? How?

Does the usage of an external visualisation provider decrease your effort in the sales and marketing process?

Do you think there is a clear relationship between usage of visualization tools and the firm's/object's value (generation of new leads, sales time, square meter price etc.)? If yes, how is it expressed?

Are you willing to pay for a service that could increase the value, as mentioned in the previous question? If yes, how much?

What is the most important factor when deciding what visualization provider to use?

(1=not so important, 5=very important)

	1	2	3	4	5
Quality					
Price					
Time to get a finished package					
Support					
Knowledge about the area					
Other:					

Implementation

When HQ is implementing something new in the organisation, how do they communicate the change and how do they support it?

Do you think that HQ follows up in a good way when implementing something new to the organisation?

What is the largest obstacle that you face when the organisation is implementing a new technology?

Interview question to brokers

Implementation

Do you think that introduction of new tools is well-communicated from the management's/HQ's side?

How do the directives look like from the store owner/HQ regarding the marketing/listing process?

Do you think it is easy to use external visualisation providers and do you get the support you need (both internal and external)?

How does the HQ follow up the use of new tools/strategies?

Strategy

Are you aware of HQ's brand image strategy? What do you do to live up to it?

What do you believe are the key criterias for sellers when choosing a broker?

Are you using the same marketing strategies for all your customers/potential customers?

In what extent can you decide what provider you want to use to visualise the objects that you are listing?

How do you choose a professional photo/floor plan provider and what do you value most when choosing one?

What role does price play when you choose a photo supplier?

For what reason would you NOT use the same photo/floor plan provider as HQ does? Do you know what provider HQ has?

Technology

How do you perceive your customers' attitude towards new technological visualisations of an object (for example movies)?

Would you say that a good visualisation of the object is adding any value to the listing? How?

How do you perceive your own attitude towards new technology tools?

Do you have any barrier using the visualisation tools provided on the market?

Does the usage of an external visualisation provider decrease your effort in the sales and marketing process?

Do you think there is a clear relationship between usage of visualization tools and the firm's/object's value (generation of new leads, sales time, square meter price etc.)? If yes, how is it expressed?

Are you willing to pay for a service that could increase the value, as mentioned in the previous question? If yes, how much?

What is the most important factor when deciding what visualization provider to use?

(1=not so important, 5=very important)

	1	2	3	4	5
Quality					
Price					
Time to get a finished package					
Support					
Knowledge about the area					
Other:					

Appendix 2 – Survey questions

Dear Broker,

We at X value the input and opinion of our clients. We would therefore like you to take 2 min of your time to answer this questionnaire about how you use our products and see the value of our service.

Thank you for your help,
X.

Introduction

The usage of visualisation tools, such as professional photo and 3D floor plan have become a natural part of the real estate industry. These tools are assumed to have the ability to revolutionise the industry and change its processes. This survey is aiming to find out how different factors and attitudes impact the view on these visualisation tools and their role in the industry.

General questions

Age
Scrolling list

Gender
- Male
- Female

Role in the company
- Assistant
- Broker
- Store owner
- HQ
- If other, please specify …

Would you be willing to pay extra for services that can shorten an object's sales time? (*Excluded in Denmark*)
- Yes
- No
- I don't know

How do you attract customers to choose you?
- Low price and commission fees
- Breadth of offerings
- Visualisation solutions, ex. Movies, 3D application tools etc
- Reputation (brand)
- Contacts and network, customer base

- Specialised in the geographical and business area
- If other, please specify

What is the most important reason for using visualisation tools?

- Generate more leads
- Shorter sales time
- Improved reputation
- Advantage over competitors
- Recommendation from HQ to use it
- If other, please specify

What is the most important argument for not using visualisation tools? (Confirmed)

- The price level
- The service is hard to use
- Feeling of not having control over the result
- I don't see the benefits of using it.
- If other, please specify

Organization

	Strongly disagree 1	2	No opinion 3	4	Strongly agree 5
We use our visualisation tools in the same way throughout the organization					
HQ provides education and follows up when introducing visualisation tools (*Excluded in Denmark*)					
The organization is in the front regarding using visualisation solutions					
Usage of visualisation tools are important to be competitive as a broker					
Tradition is a natural part for the organization when doing business					
Visualization tools generate more leads / generate more					

clients

Personal

	Strongly disagree 1	2	No opinion 3	4	Strongly agree 5
It is easy to use visualisation tools provided from external parties					
Visualisation tools increase the value of the object					
Visualisation tools makes it easier to sell objects					
Visualisation tools attract more clients					

Which of the following statement best describes you:

- I value being the first one trying new technologies and visualization tools
- I value doing research before trying new technologies and visualization tools
- I value others experiences when trying new technologies and visualization tools in order to remove insecurity
- I'm not interested in new technology and visualization tools

How often have you used DIAKRIT as a photo or floor plan provider?

- Always
- Often
- Seldom
- Never (who do you use, optional)