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Embracing digitalisation with chatbots

A qualitative study of Danish companies' adoption of chatbot technology

Master's Thesis
M.Sc. Business Administration and Information Systems

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Abstract

This thesis set out to investigate what impacts the decision to adopt a chatbot. A chatbot is a computer program developed to converse with humans using natural language as in- and output. This technology is part of a broader discussion regarding automation of processes. Automation is widely believed to create an impact on the business industries and our daily life as we know it. Companies are eager to make things smarter, reduce cost and build the best service for their customers. Danish companies have not been late to understand this big potential in digital technologies and have invested heavily into the area in recent time. However, the functionality of the chatbot is currently very limited, and most of them still function as “hard coded decision trees”. We were thus driven by the contradiction between companies wanting to adopt the chatbot and that the technology is still very immature. Our research question thus became:

Why do Danish companies decide to adopt the chatbot technology despite its immature state and how can this be explained by using the theory of IT innovation adoption?

- *What are the barriers and drivers to the adoption of the chatbot technology?*
- *How does a company’s market strategy influence the adoption rate of the chatbot technology?*

To answer our research question, we created a conceptual framework based on IT innovation adoption theory. We then conducted a multiple-case study where we collected data from two different sources: semi-structured interviews and documentations.
We found that companies saw far more drivers than barriers, which also supports the enthusiasm about the chatbot technology. We stressed, however, that every case organisation still had a unique combination of both drivers and barriers. We investigated these unique combinations by looking at the case organisation’s market strategy. We found that depending on how the organisation creates value and interacts with the environment, it can influence how an organisation approaches an innovation. It can influence it to approach an innovation faster, or to refrain from approaching it altogether. Lastly, we found that companies changed their perception of some adoption factors through the adoption process. This indicated that a factor, that initially was a driver, later turned into a barrier for the adoption. We argue that these insights explain that the companies that perceive the adoption as complex have not adopted a chatbot, meanwhile, those companies that do not perceive it as complex have already implemented the technology.

Our answers imply that a positive attitude towards an innovation influences how organisations perceive the technology. They therefore approach the innovation quickly, leading some to not be prepared for the implementation. We confirm the IT adoption theory, that when many drivers are present, the organisation will likely adopt the technology. We imply that by using a qualitative approach, we are able to highlight gaps, where we could not explain the empirical data and thus recommend to expand the theoretical foundation.
We did not claim that our findings could be applied outside of our domain without any reservation. We did however, argue that our findings could be generalised to similar settings as long as they share similar approaches to customer engagement and the chatbot stays a homogeneous technology.

Keywords: Chatbots, IT Innovation Adoption, Automation, Multiple-case study

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1 Introduction

"*Up to 800 million global workers will lose their jobs by 2030*", "*Robots will take our jobs. We'd better plan now, before it's too late", "Take the test now! Will a robot take your job?"* (Robot automation, 2017; Elliott, 2018; Will a robot take your job, 2015). Shuffling through recent news articles, there is no doubt that automation and Artificial Intelligence (AI) is widely believed to create an impact on the business industries and our daily life as we know it. This is not a futuristic scenario, but is something that is happening right now. Companies are eager to make things smarter, reduce cost and build the best service for their customers. The global spending on robotic process, intelligent process, and AI automation worldwide was in 2016 6 billion USD and is expected to reach over 13 billion USD by the end of 2020 (Total automation, 2018). Further a survey by Deloitte, made in 2017 among 250 US executives, showed that "*three-quarters of them believe that AI will substantially transform their companies within three years" (Davenport & Ronanki, 2018, p. 2).*

Automation is not something new and, depending on the source, the concept goes all the way back to 1914, when Ford introduced the assembly line (Drucker, 1999). Since then processes that are very rule based and considered routine work have been automated. What is different today however, is that technologies now can begin to replace more non-routine based processes. Brynjolfsson and McAfee (2014) argue in their book "The second machine age", that we now stand in a time where cognitive tasks are substituted by digital technologies. They argue that, *"there's never been a worse time to be a worker with only 'ordinary' skills and abilities to offer, because computers, robots, and other digital technologies are acquiring these skills and abilities at an extraordinary rate"* (Brynjolfsson and McAfee, 2014, p. 10).

These big beliefs and investments in automation and AI are also something that is evident in Denmark. In April 2017 McKinsey Denmark released, in collaboration with Aarhus University, a comprehensive report covering how automation will impact Denmark. Among other things, the report found that: *"Some 40 percent of working hours in Denmark are automatable based on demonstrated technologies."* (McKinsey & Company, 2017, p. 2) Further, the report also found that, even though the automation potential is significantly different, all sectors of the Danish economy will be affected by automation (McKinsey & Company, 2017).
Danish companies have not been late to understand this big potential in digital technologies and have invested heavily into the area in recent time. Finans.dk reports that Danish companies invested 400 million DKK in AI related projects in 2017 and that this is a 50% raise compared to the year before (Andersen, 2018). A more general inspection shows that Danish companies spend a lot of money. A recent study from the global consulting company KPMG shows that Danish companies spend relatively more on Robotics and AI compared to the global average (KPMG, 2017).

1.1 Focusing on the chatbot technology

This big drive towards automation means many different things to different people. It is a concept established already in early 20th century, and has over time branched out into many different fields. Recently, however, automation has been centred around AI solutions - replacing more non-routine based processes. Under the topic of AI many different solutions and concepts exists. In an attempt to make an overview over the AI solutions, Davenport and Ronaki (2018) group them into three different types: *Process Automation*, *Cognitive Insights* and *Cognitive Engagement*. Under these categories different solutions can be found. This overview is displayed below:

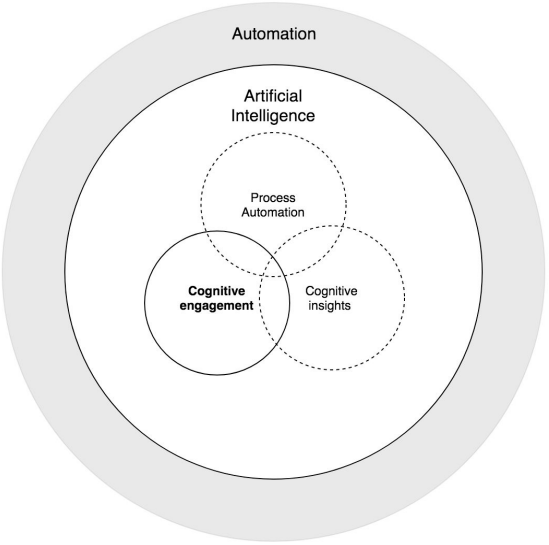

Figure 1 - Types of automation solutions

Under *Process Automation* a technology used to automate administrative desktop processes called Robotic Process Automation (RPA), can be found. Under *Cognitive Insights* one can find predictive analysis used to predict e.g. customer churn. Most importantly *Cognitive Engagement* contains an old invention (Weizenbaum, 1966) that recently has received a lot of exposure, and is said to *"fundamentally revolutionize how computing is experienced by everybody"* (Weinberger, 2016). The technology in question is the chatbot technology, sometimes also referred to as chatterbot, intelligent agent, virtual assistant or digital assistant. A chatbot is a computer program developed to converse with humans using natural language as in- and output (Brennan, 2006, p. 61). As mentioned this is a quite old technology dating back to 1966, however the recent development in Natural Language Processing (NLP), Machine Learning and AI in general means that the topic is more hyped than ever (Dale, 2016).

Today many people know chatbots from their smartphone, where Siri is ready to assist users on their iPhone, while Google Now is available for Android users. On top of this, the big tech companies from Silicon Valley have recently introduced home assistants, most noticeably Amazon's Alexa and Google's Google Home (Pierce, 2018).

These big tech companies focus their efforts on making their customers' daily routines more convenient and want to be the preferred choice for people's' digital interaction. Many other companies are however, using the technology to improve the interaction between the customer and the company. Their goal is to enhance their customer service, and drive cost down. This is for instance the case in Swedish SEB Bank where the chatbot Amelia has been implemented in the chat communication channel, acting as another employee in the company's customer service department (SEB Amelia, 2016). SEB Bank is not the only company that sees potential in the chatbot technology. In fact, the research institute Forrester found from a survey among 128 Fortune 500 companies, that while only 4% of the companies had implemented the chatbot technology, 31% are piloting or planning to implement it (Ask & Hogan, 2017). Furthermore, Oracle found, from a survey among 800 decision makers, that 80% of the businesses expected to have implemented a chatbot by 2020 (80% of businesses, 2016). Lastly Gartner has placed "virtual assistants" at the top of their 2017 hype-cycle of emerging technologies (Panetta, 2017).

The eagerness to implement the chatbot technology is also evident in the Danish market where Danish chatbot suppliers are experiencing a very high demand for the technology (Larsen, 2018). This high demand was also confirmed by Jørgen Steines who is partner and chatbot expert in Deloitte Denmark. He said that the actual number of chatbot implementations in the Danish market is low, however they saw a huge interest and willingness to adopt. He anticipated that the adoption most likely will increase in the coming year (Chatbot experts, Interview).

Even though a lot of companies want to adopt the chatbot technology, the technology is still considered immature. Currently the functionality of the chatbot is very limited, and most of them still functions as "hard coded decision trees" (Krauth, 2018). This means that chatbots are good at having conversations with humans as long as it follows a linear progression because its answers are predefined. However, the chatbot begins to fail when it needs to go beyond answering simple questions and follow an expected pattern of conversation (Besnoy, 2016). Examples of this can be seen below. On the left the Facebook Messenger assistant Poncho, and on the right an IBM chatbot used to order pizza.

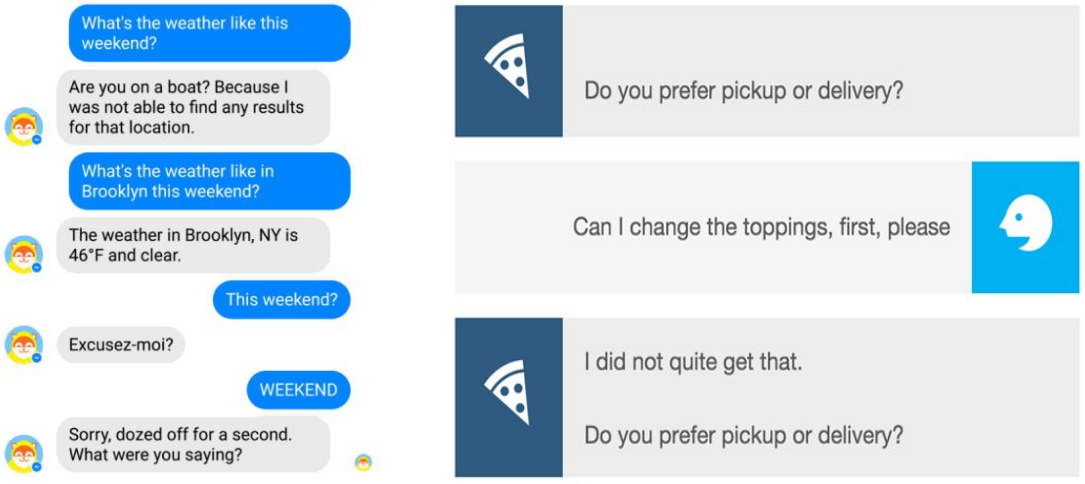

Figure 2 - Examples of chatbot conversations

In fact, Facebook found that their chatbots could not answer correctly on requests 70% of the time, without human intervention (Bot backlash, 2017). These immaturities were also confirmed by chatbot experts as being just as present in chatbots using Danish language. Furthermore, the development of chatbot technology with Danish language capabilities, is still not as advanced as the English one (Chatbot experts, Interview).

1.2 Problem statement

That a lot of companies want to adopt the chatbot technology, even though the technology is still very immature, creates a contradiction we find very interesting. On one hand, the chatbot technology is something that a lot of companies want to adopt and they have high beliefs in the technology. On the other hand, the technology is still immature and needs more development before it is effective. We are left wondering: how come so many companies want to spend time and resources on a technology that is very limited in its capabilities to deliver value. The focal point of our problem statement is thus this emphasised contradiction and we seek to uncover what can explain this. To investigate this contradiction, we will use the theory of IT innovation adoption to find out what drives the adoption of chatbot technology. Even though the technology can be dated back to 1966, we define the chatbot technology as an innovation, because of the resurrection it seems to be having, both in the media and with the new possibilities created from new advancements in technology.
We have also highlighted how eager organisations are to invest in the automation of processes, and thus wonder if the companies' eagerness to be digitalised is reflected in their market strategy. Therefore, we also find it interesting to investigate how companies' market strategies influence the adoption of chatbot technology.
With the above mentioned in mind, our research question becomes:

Why do Danish companies decide to adopt the chatbot technology despite its immature state and how can this be explained by using the theory of IT innovation adoption?

- *What are the barriers and drivers to the adoption of the chatbot technology?*
- *How does a company's market strategy influence the adoption rate of the chatbot technology?*

1.2.1 Relevancy

Academic value

Looking into current scientific literature it is hard to find existing research that investigates within the field of implementing chatbot technology in a commercial setting. Some articles mention cases where one company has implemented a chatbot as an assistant in online flight booking and another as a virtual assistant on an online shopping site (Shawar & Atwell, 2007; Dale, 2016).

However, there clearly resides a lack of literature covering the adoption of innovation in commercial setting. Our thesis, covering the adoption of chatbots in businesses, will thus add new research in this field.

Practical value

Our thesis does not only add academic value because of the lack of literature in the field, it is also interesting because it can help explain why companies are driven towards adopting automation and AI technologies in this second machine age we are standing in. We will be one of the first researchers describing, explaining and simply put the adoption of chatbots in business into words. We have found that this is a new event taking place and companies are therefore treading new ground, exploring the possibilities and basing their decision making on experiences not completely comparable to the adoption of a chatbot. By putting this event into words, we may help business in learning from others and realising new ways of exploiting this new technology.

Researchers' value

Finally, the topic of choice is deemed valuable to us as Master's Thesis candidates. Our study programme has enabled us to identify a gap in knowledge, address this gap academically and answer it thoroughly. On the receiving end, conducting this study also widens our knowledge about IT adoption and increases our capabilities of structurally answer a comprehensive research question. Our Master's programme focuses on how companies bridge information technology with the rest of the organisation, and looks at how IT can add value to the business. An important aspect of this is to understand which IT solutions companies find valuable, and why this is the case. Our research thus fits the focus of our study programme, MSc in Business Administration and Information Systems.

1.2.2 Methodological approach

To answer our research question, we will create a conceptual framework based on IT innovation adoption theory. This enables us to operationalise the theory in a structured and concise manner. We will then conduct a multiple-case study where we will collect data from two different sources: interviews and documentations. When the data is collected we will apply the data on our conceptual framework to answer why Danish companies are adopting the chatbot technology.

1.3 Delimitations

Our thesis is delimited in two important aspects. Firstly, we will only consider the organisational level of the adoption decision. Secondly, the cases used in our thesis will only be from the financial industry and the telecommunications (telecom) industry.

IT innovation adoption theory proposes that the adoption decision is impacted by both individual traits and organisational traits. The individual traits often focus on how the technology is adopted by individuals after the organisation has implemented the technology.

We are however interested in answering why the organisation makes the adoption decision to begin with, and the individual traits thus become less relevant. We have therefore excluded this aspect from our thesis.

We ask why *Danish companies* are adopting the technology. This alludes to us studying the full picture of Danish companies, which would require us to include companies from all industries in Denmark - however, this is neither feasible nor realistic within the timeframe of this thesis. This leads to another delimitation for how we choose to address the research question. We have chosen to include case companies from the financial industry, and the telecom industry. One reason that support our choice of industries is that companies within these industries often are in direct contact with their end-customers as part of their daily operations. This is exactly one of the operational activities that the chatbot seeks to alleviate and this is therefore two fitting industries. We will therefore answer the research question by only addressing the financial and the telecom industry and we will not consider other Danish industries.

1.4 Advanced organiser

Our thesis is structured as followed. Firstly, we will present the results we found from a sentiment analysis of the media coverage surrounding the chatbot phenomenon. Further, the concrete cases we have investigated will be presented in a comprehensive case presentation. After the case presentation, two literature reviews will cover the existing material that exists on the topics of chatbot technology and adoption theory. Following this, the theory used will be presented where choices for including the selected theories are covered. Based on this we will create a conceptual framework that incorporates these choices. This leads into the methodology where our qualitative approach is outlined and it is described how we collect the data. In the next section, the analysis, we present the gathered data and on the base of this start to answer our research question. The analysis creates the base for the discussion where our findings and its implications are covered. Finally, we conclude the thesis by revisiting the research question and highlight our most important takeaways.

2 Media coverage of the chatbot phenomenon

Our introduction to our thesis indicates a massive media attention on the chatbot phenomena. This left us wondering if we could see the same attention if we investigate how the chatbot technology has been covered by the largest Danish media outlets ourselves[1]. By looking into how the media has covered the chatbot technology, we gain a better indication of how exposed the technology is in the Danish everyday life. Study suggests that the media coverage of the chatbot technology may influence the investigated companies' perception of the technology since the degree of focus as well as the sentiment in the articles either portray the chatbot positively or negatively (Shao, 1999).

Through the last 18 years, the chatbot technology has been mentioned in 39 news articles from the investigated media with the first article being written back in 2000 (see table 1).

Table 1 - Overview of media outlets

Media	2000	2006	2007	2008	2015	2016	2017
Dansk Industri							3
Computerworld	1	1	1	1		1	7
Børsen		1				1	2
DR					2	4	7
Berlingske						2	
Politiken						1	2
TV 2						1	1
Total	1	2	1	1	2	10	22

Most of the articles are, however, written in the last two years, 2016 and 2017, as illustrated in figure 3. The figure shows the distribution of articles with either a positive or negative sentiment.

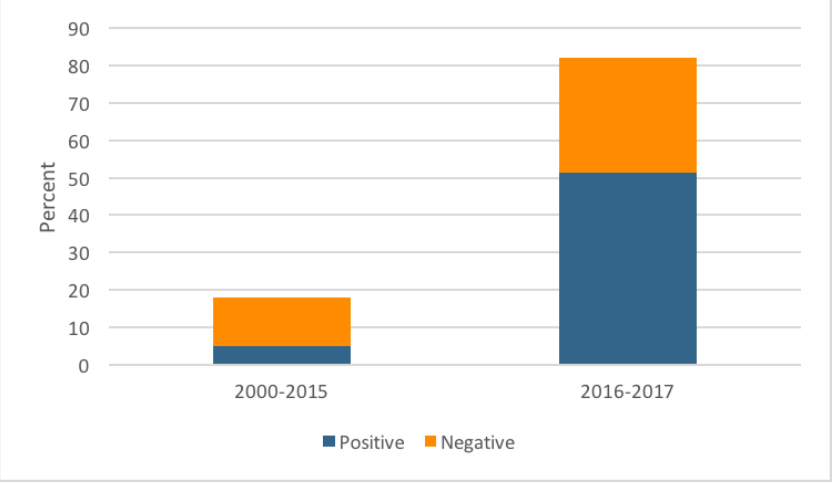

Figure 3 - Distribution of positive and negative sentiment

[1] The media's coverage of the chatbot technology was performed by a manual sentiment analysis. The process for the sentiment analysis is described in appendix 1.

Between 2000 and 2015, a minor amount of the articles displayed a positive attitude toward the technology and explored a curiosity for how the technology can be used to entertain end-users. An example was how a chatbot was used to entertain 300.000 young people over a service called Spleak (Thomsen, 2006). The rest of the articles from this period were focusing on the dark side of the technology by exploring how the technology can used to trick end-users in different settings from online dating to online reviews of companies (see for example Skøt, 2007; Allingstrup, 2015). In those article words like *'unsafe'*, *'false'*, as well as *'cheating'* were used in relation to the chatbot technology.

In the period from 2016 to 2017, a significantly higher number of articles were covering the chatbot technology compared to the previous period. In fact, the number of articles mentioning the chatbot technology increased from seven articles in period between 2000 and 2015 to 32 articles in the 2016 to 2017 period. In this period, the media changed their focus from how the chatbot technology is used by end-users to how Danish companies, like Nordea, Alka, and Spar Nord, as well as global giants, like IBM, Microsoft, and Amazon, are using the technology to their advantages and challenges they were encountering. Companies were in this period announcing how they were working on chatbot projects and showing their progress regarding the technology, and how they will use it to achieve huge savings by automating processes with a chatbot. Headlines such as '*Nordea fires thousands of employees - The robot Nora becomes your new banking adviser*' and *'Robot investments provide record profits for Alka'* were used as well as words like *'Reduce cost*', '*Increase the efficiency* '*Chatbots is the future*' was highlighted in the positive loaded articles (see for example Zigler, 2017; Wittorff, 2017; Hagemeister, 2017).

However, even though most of the articles had a positive attitude towards the chatbot technology, other articles were also focusing on the negative aspect of chatbots. The negatively loaded articles concern two different topics. Half of those articles are about a chatbot called Tay, who Microsoft launched on Twitter in 2016 in order to interact with Twitter's more than 300 million users (see for example Wittorff, 2017; Allingstrup, 2016). The chatbot turned into a "*holocaust denier and a women hater within the first 16 hours"*, which created lucrative headlines for media outlets worldwide. The other half of the negatively loaded articles were focusing on a much more important topic when considering our statement about the immature state of the chatbot technology. Those articles focus on the massive hype the chatbot receives but that the technology however has limited functionalities and that it will take many years before the technology is mature enough to actually replace human employees (see for example Nissen, 2016; Ingvorsen 2017a; Krautwald, 2017).

In conclusion, our investigation of the Danish media coverage of the chatbot technology it first of all shows that the media has started to increase their focus on the technology within the last two years. This fits well with the massive media attention that we presented in the introduction and indicates that the chatbot technology has, within the last two years, won impact on the Danish business agenda.

From the articles, we see that the media emphasises prominent companies within the financial industry such as Nordea, Spar Nord and Alka. This supports our decision to include the financial industry as one of the two industries in our thesis.
From a company's perspective, the media's coverage has been generally positive. It has focused on how businesses can use the chatbot technology to achieve a more cost-efficient business. Even though some of the articles in the period between 2016 and 2017 were negatively loaded, a big part of them focused on Microsoft's chatbot scandal. This does not affect how a chatbot is used in Danish business context. In addition, the other topic regarding the chatbot technology being a hyped technology and not being mature enough also supports our problem statement.

3 Case presentation

As mentioned before, our thesis will build on data from 12 Danish companies. In the following section, we present the business lines included in this thesis followed by a short presentation of the associated companies in order to create a solid understanding of the investigated companies. The companies we have included are either suppliers or adopters of the chatbot technology. First, the adopters of the technology will be presented followed by a presentation of the suppliers.

3.1 Adopters

Generally, the adopters can be grouped into either being bank, insurance, pension or telecommunication companies. In the following each group will be presenting with a description of the business and a brief presentation of each company in this business.

3.1.1 Banking business

In the Danish banking marked a total amount of 101 banks are operating - a handful of large players and many small players. The clear leader is Danske Bank which sits on a 29% market share[2], following by Nykredit, Nordea, Jyske Bank and Sydbank which all are considered big players in the market (Denmark's Banking sector, 2018). In recent years the big players have lost a lot of customers to smaller banks in the market. It is estimated that around 50,000 customers changed from a larger bank to a smaller bank in 2017 (Danske storbanker, 2018). This development is due to the fact that customers experience a better customer service and a more trustful relationship with smaller banks (Brahm, 2018). At the same time, Danish banking customers experience relatively low switching cost when changing bank, and because of this Danes are switching banks more than ever (Iversen & Brahm, 2016). The banks are thus currently experiencing a lot of competition and fight to capture the Danish customers.

Besides the fierce competition between the traditional banks, new players in form of startups are entering the scene. These new startup companies, called fintech companies, are riding on the wave of the digital revolution, and want to disrupt the financial sector (Fintech i Danmark, 2017).

[2] Measured in total assets

One of the most known is the Danish fintech company Lunar Way, which is stealing customers from traditional banks by only offering the bank experience through their app (Boye, 2016).

The digital forces that drives the fintech companies onto the market, are also creating new demands for banks in the way they operate and interact with their customers. As already mentioned, companies see themselves invest in more digital technologies the coming years. This is both in terms of cost reduction with for instance RPA and improved customer service with predictive analysis.
Collectively we argue that there is a high amount of competition in the Danish banking business due to low switching cost, and a high demand for excellent customer service. Further the market is characterised by being disrupted partly by new fintech companies entering the scene, and partly by a demand for digital competencies.

The companies we investigated in relation to our thesis, are two of the big players: Danske Bank and Nordea. Compared to Danske Bank which is, as mentioned, the market leader with 29% market share, Nordea is considered the third largest bank in Denmark with a 6% market share. Even though Nordea is not the biggest player in the Danish banking business, they are the biggest bank in the Nordics and one of the largest in Europe (Nordea, 2018). Nordea is founded in 2000 as a fusion between a number of large Nordic banks. They employ over 30,000 people and have a yearly revenue of around 9 billion euros. Danske Bank operates in the Nordic countries, Ireland and the Baltics. It is founded in 1871, employees just shy of 20,000 people and had in 2017 a total revenue of 3,2 billion euros (Danske Bank, 2018).

3.1.2 Insurance business

Examining the Danish insurance business, it can be described as being relatively stable in terms of competitive landscape compared to the banking business. This is due to two major factors: the nature of the product and industry regulations.
The core product in the insurance business is a contractual agreement, where the provider (insurer) will insure the consumer on specified terms, e.g. an insurance of the consumers car or house. This agreement, the insurance, can by the consumer be perceived as being complicated to understand and for the majority of the time not being relevant. In sum, this means that the product is of low interest for the consumer, and he or she is inclined to stay with the same company throughout his or her life (Okholm et al., 2013). Secondly the insurance business is relatively highly regulated. This creates weaker competition because only a limited amount of insurance providers is allowed on the market, and because the high number of regulations drive up the administration costs. This means that there are high barriers of entry and, it is therefore difficult for new companies to establish themselves in the market (Okholm et al., 2013).

That being said the Danish market is relativity more competitive compared to other European countries. The Danish consumers switch insurance provider more often and with the introduction of tools like “forsikringsguiden.dk”, where consumer can compare prices and terms and conditions across the business, the battle is on for being the preferred choice for the Danes (Rasmussen, 2013). This battle has only become more intense in recent years. In 2017, 35% of insurance customers had only had their insurance provider for four years or less, a number which was only 22% in 2013. Besides price and the specific terms and conditions, customer service is valued highly when customers have to choose provider (Stenvei, 2017).

As in the banking business, the Danish insurance business is also affected by the digital revolution that is currently happening. A global survey made by PwC in 2016 among 101 CEOs from the insurance business showed that over 70% of them believed that digital technology would change the way they operate in the market (PwC, 2016). Like the banking business, the companies know that they have to act on this digital trend in order to provide the best customer service at the lowest cost.

In sum, we argue that the competition and uncertainty in the Danish insurance business is not as high as in the banking business due to lower interest in the product and higher regulations. However, Danes are beginning to switch their insurance company more often and the rise of the digital agenda demands new competencies from the companies.

In regard to the actual players in the business, it is characterised by having four major players, sharing around 60% of the total market share[3], while the remaining market is divided by 14 minor players (20 største forsikringsselskaber, 2018). In our thesis, we have interviewed three companies from the business: two of the four major players, Tryg Forsikring and Topdanmark, and one of the minor players, Alka Forsikring. Tryg forsikring is one of the largest insurance companies in the Nordics (Tryg, 2018). It is the market leader in Denmark with a market share of 18%, has around 3300 employees and a yearly revenue of 2,4 billion euros. Topdanmark is a close second in terms of market share, sitting on 17,4% of the market. They operate exclusively in Denmark and have around 2500 employees with a yearly revenue of 2 billion euros (Topdanmark, Annual Report, 2018). Alka has a market share of around 5%, has 500 employees and around 400,000 Danish customers. Their yearly revenue is 666 million euros (Alka, Annual Report, 2018).

[3] The market share are based on total income from insurance premiums

3.1.3 Pension business

In the pension business in Denmark, the firms are generally divided among two types of pension firms. Firms that manage pension plans for employees in a specific company (company pension), and firms that manage pension plans for all employees which work under specific collective contractual agreements across industries (industry pension). The industry pension firms are co-owned by all its members (Fakta om pension, 2018).
Like the insurance business the pension business is in Denmark relatively stable in terms of competition, and is arguably less competitive than the insurance business. The stability in the industry is due to the nature of the product. The product in this case is a pension scheme which the pension firm sets up for their customers and hereafter to manage their customer's saving. Once the customer retires the pension firm pays back their savings which, in the meantime, has grown to a larger sum. As with insurance the product can seem complicated to understand and since the payments for the scheme happens automatically every month, many consumers do not care much about the product (Fakta om pension, 2018). On top of this, the fact that 90% of all pension schemes are chosen and administered by peoples' employer (Kristensen, 2015) means that the end consumer does not influence which pension firm they are a member of. This fact also reduces mobility in the market.

Even though the end consumers do not have much influence on the pension firm they want to use, the firms still compete to be the employers preferred choice, when they have to set up pensions for their employees. The firms are competing on having the lowest administrative and investment fees which is the parameters employers look for, when choosing a company pensions scheme (Svendsen, 2016). On top of the competition already mentioned, pension companies also stand in a situation where they have to become more digital and innovative, like the banking and insurance businesses already mentioned. Experts in the pension business believe that digital competenties are an important competitive factor, and even though digitalisation traditionally has not been in focus, all companies are currently trying to create the best digital service for their customers (Juel, 2014).
All in all, we see that competition is beginning to rise in the pension business and the focus on being digital are starting to evolve. However, we argue that this industry is the least competitive due to the fact that 90% of end consumer do not have influence on the pension they are members of, and the traditionally low competition.

In terms of market share, the largest player, PFA Pension, has a market share of 19%[4] while the second biggest, Danica Pension, has around 12% (Pensionsselskaber, 2017). The rest of the market is divided among other smaller players (Fakta om pension, 2018). In our thesis, we have conducted a case study with three of the smaller players: Sampension, Pensiondanmark and SEB Pension Denmark. Pensiondanmark has the largest market share of the three with 8% of the market (Pensionsselskaber, 2017).

[4] The market share are based on income from gross premiums

The company is an industry pension and is co-owned by its more than 700,000 members. The company employees 200 people and had in 2017 an income from premiums of 1,8 billion euros. Sampension has a market share of around 6% and is the fifth largest pension company in Denmark Pensionsselskaber, 2017. The company provides primarily industry pension, but has since 2016 operated in the market for company pensions as well (Johansen, 2016). The company had in 2016 an income from premiums of 1,2 billion euros and employees 300 people (Sampension, Annual Report, 2017). While Pensiondanmark and Sampension solely operates as Danish pension firms, SEB Pension Denmark is a smaller branch of the large Swedish conglomerate SEB Group. The conglomerate is one of the largest financial groups in the Nordics, offering a wide variety of financial services (SEB, 2018). In Denmark, they have two branches: SEB Pension and SEB Bank. The pension branch provides company pension, and is sitting on a 5,4% market share (Pensionsselskaber, 2017). Their income from premiums in 2016 was 1,1 billion and the company employees 275 (SEB, Annual Report, 2017).

3.1.4 Telecommunication business

Looking at the market player in the Danish telecom business it is dominated by four large players: TDC, Telenor, Telia and 3, which together have around 90% of the market. The market share for these four large companies, based on the mobile phone market, also includes their subsidiaries, for instance Telia that owns Call Me and TDC that owns Telmore (John G, 2017). Many of these subsidiaries where formerly operating as independent companies. These companies were the ones that since the beginning of 2000's have challenged the big players in the market by offering better service and lower prices, and they stole a lot of customers from the traditional companies. An example of this is the company Telmore, which in a relatively short time period captured 500.000 Danish mobile customers, and was bought by TDC in 2003 (Jensen, 2003). Another example is CBB Mobil which was bought by Telenor in 2004 (Breinstrup, 2012).

Because products like broadband, phone calls and text messages are becoming commodities, telecom companies are beginning to find new products to differentiate themselves with. Within recent time big companies in the business have shown interest in content providers that can help them expand their product portfolio. An example of this is Telenor who has made a collaboration with the streaming service Viaplay, which means that their customers get access to Viaplay when they sign up for a Telenor subscription (Olsen, 2016). Another example is Telia that provides free access to the music streaming service Spotify when you buy a subscription from them (Spotify i Telia, 2012).

In addition to feeling the pressure from the high competition among telecom companies in Denmark, the companies also experience pressure from the digital revolution like the financial industries. This revolution both raises expectations from customers to get a flawless digital customer experience and at the same time creates new opportunities (Caylar & Ménard, 2016). With the introduction of digitalisation and the recent increased focus on Machine Learning and advanced analytics, the telecom companies can for instance begin to predict potential subscription churns and try to prevent them for happening (Huang et al., 2015).
Collectively, the traditional big companies in the Danish telecom industry have felt an ever-increasing pressure, first on their core products and later a pressure from expanding their offerings and the digital disruption. Because of this we see the business as highly competitive and with a relatively high degree of uncertainty.

In this thesis, we have conducted case studies in TDC and CBB Mobil. TDC is the oldest Danish telecom company still operating, and has the majority of the market with a 37% market share. They have 8,000 employees and had in 2017 a revenue of 2,7 billion euros. CBB is a small player mainly focusing on low price mobile subscriptions. As already mentioned CBB, which initially operated as an independent company was in 2004 bought by Telenor and today employees around 120 people. Because CBB today is owned by Telenor there is not released any numbers in regard to CBB financials, and their market share is counted under Telenor. However, CBB reportedly had around 625,000 mobile customers in 2012 which, in regard to today's total market would give them a market share of approximately 6% (John G, 2017).

3.2 Suppliers

The businesses we have described up until now, under the adopter section, are all traditional businesses that have been around for decades. The chatbot supplier industry on the other hand is rather new business, especially in Denmark.
Looking at the landscape of chatbot suppliers it can generally be divided into Chatbot Frameworks and Commercial Chatbot Providers. Chatbot frameworks are platforms that function as a Software as a Service product. The adopting company subscribes to this platform, which gives them access to a basic chatbot technology foundation from where they can build their own customised chatbot. An example is Google's Dialog Flow which is hosted through Google Cloud, and subscribing companies pay a certain fee depending on their usage (Google Cloud, 2018). If companies choose to adopt the chatbot technology this way, they are responsible for the development, integration and maintenance of their chatbot.
The commercial chatbot providers on the other hand, sell platforms that are customised specifically to the individual customer's needs.

This means that the commercial provider does not sell access to a foundation platform, but rather sell the technology as a “full package” product, which fits the specific customer. If companies choose to adopt from this type of chatbot provider, the integration and setup is handled in cooperation with the provider, and the adopter pays an upfront setup cost together with a recurring license fee. The maintenance will in most cases be handled by the customer. An example of such a provider is the American company IPSoft which sells their chatbot called Amelia as a full package solution (IPSoft, 2018).
Looking at the markets for chatbot frameworks and commercial chatbot providers, they are both occupied with many players. Since the market for supplying chatbot solutions is still relatively new, it is hard to get a full overview of market share and other characteristics. However, one thing is certain - there is a lot of players in the field. In the figure below we have listed some of the most known frameworks and commercial providers (Davydova, 2017).

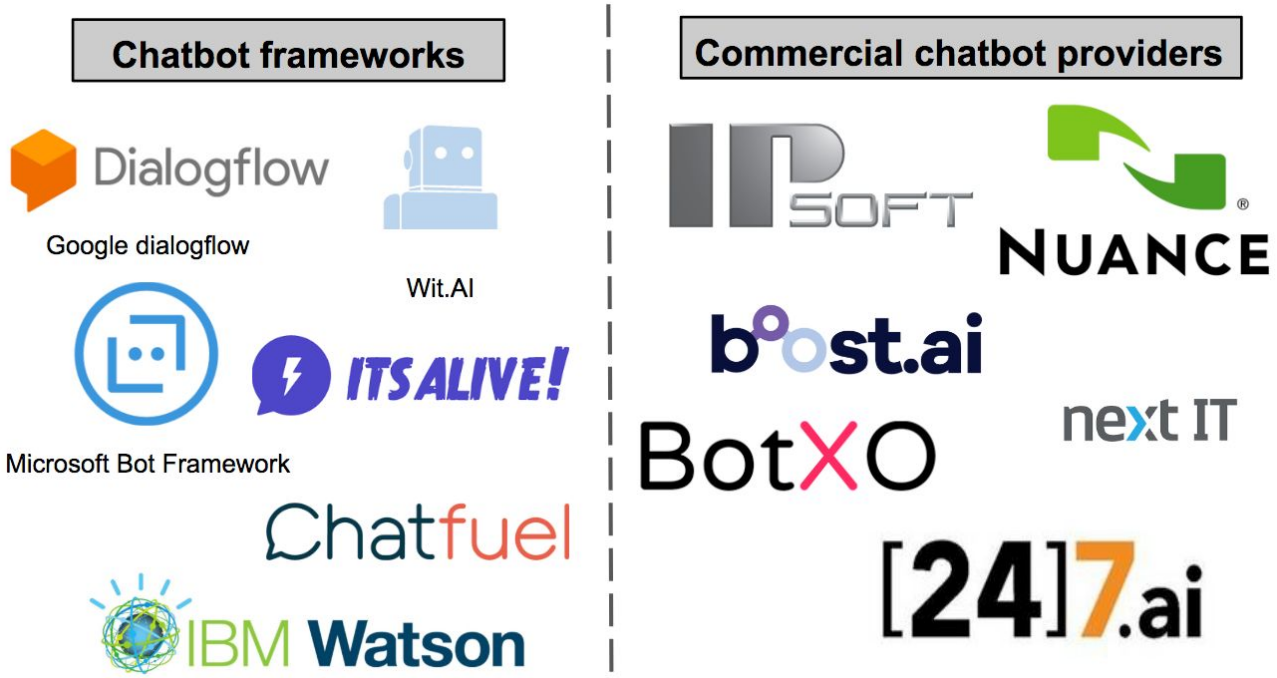

Figure 4 - Overview of chatbot providers

Looking at the chatbot supplier market from a Danish point of view, many of the companies seen in the figure above are capable of serving Danish companies. However, they do not support the Danish language and using these chatbot providers would therefore require the adopter to accept an English speaking chatbot. In terms of chatbot *frameworks* none of the big companies, IBM, Microsoft and Google, support the Danish language (IBM Cloud Docs, 2018; Microsoft Azure, 2017; Dialogflow, 2018). On the other hand, there are a few *commercial* chatbot providers that offer chatbot technology with Danish language capabilities.
Through our research we found four providers that currently deliver their chatbot with Danish language. From Denmark there are two companies, BotSupply and BotXO, which both were founded in 2016 and employ a small amount of people. The two others are Boost.ai from Norway and the already mentioned company, IPSoft, from the US. Compared to their Danish counterparts, these two companies are bigger in size and have more customers.

In our thesis, we have included BotXO and Boost.ai. As mentioned is BotXO founded in Denmark in 2016. Today they have around 20 people employed and have a handful of Danish customers, primarily smaller companies within the financial and e-commerce industries (BotXO, 2018). Boost.ai was founded in April 2016 in Norway and employees 50 people. The company has recently experienced a lot of interest in their product and have many larger customers. They primarily serve companies in financial and telecom industries, focusing on Norway and other Nordic countries (Boost.ai, 2018).

4 Literature review

With the introduction covered and the selected cases in this thesis presented, the first thing we would like to dive into is a literature review which laid the foundation for our primary research. We conducted the review in order to get a deeper understanding of our research topics and to identify areas where our research could contribute to existing literature. First of all, we did a literature review about chatbot technology and secondly a review on existing research in the field of innovation adoption within organisations. It is worth noting that the search for literature was conducted in January 2018, which means that literature published hereafter was not included in the review. The two reviews were conducted independently.

A formalised and structured process was defined in order to ensure a coherent and consistent result. This process was used for both reviews. By doing this we make an audit trail of the decisions, procedures and conclusions we made, and in that way, minimise bias. Further, this makes the reviews more reliable and replicable which strengthens the confidence of the information (Rousseau, 2012). Lastly it is important to note that the goal of our literature review is not to produce recommendations and answers for the projects research question, but rather to present information and broaden our knowledge about the topics (Briner et al., 2009). In the following section the process and method for the reviews will be described.

4.1 Literature review method

In this section, the overall process for the two literature reviews is described. The decisions made specifically to either the first or second review will be described in its associated section.

4.1.1 The overall structure

When conducting the literature review, we chose to follow an overall process inspired by Rousseau (2012). Even though we conduct a *literature review* and the process provided by Rousseau is originally developed for *systematic reviews*, which is a much more comprehensive piece of work, we still follow the steps in order to produce the most reliable and confident results. These steps are presented below.

- Planning the review, including the definition of problem formulation and keywords
- Locate and select relevant studies
- Critically appraise the studies
- Analyse, synthesise and present the review findings

Besides using these steps, we also incorporated Rousseau's (2012) principles to ensure the validity of our review. These principles dictate that the review should be *organised*, *explicit*, *replicable*, and *able to summarise one's findings*. In the following subsections, the method and approach for each step will be elaborated and described in detail.

4.1.2 Planning the review

In the following section, the overall process for creating the problem formulation is described followed by the process for defining keywords and a presentation of the used tools.

Problem Formulation

The goal for the two literature reviews was to uncover existing research about the chatbot phenomenon as well as existing research about the adoption of innovation. In order to ensure a clear direction for the literature reviews we based them on well-formulated and answerable questions (Counsell, 1997). The questions were defined as problem formulations prior to the search for relevant research. By creating the problem formulations, we created a structured literature review and avoided spending unnecessary resources.

Rousseau (2012) mentions a number of approaches to guide the formulation of the review question. We have chosen to use the CIMO framework (Rousseau, 2012) because it is developed specifically for management research, and we find it a good practical approach. The CIMO framework was used to make the research questions more specific and focused on the goal for the reviews and to avoid being too diffused. The CIMO framework includes context (C), interventions (I), and outcomes (O) as well as considerations of the mechanisms (M) through which the intervention may affect outcomes (Rousseau, 2012). Below each of the elements of CIMO is described. In each literature review the CIMO will be specified.

Table 2 - CIMO Framework

CIMO
Context Which individuals, relationships, institutional settings, or wider systems are being studied?
Intervention The effects of what event, action, or activity are being studied.
Mechanism What are the mechanisms that explain the relationship between interventions and outcomes? Under what circumstances are these mechanisms activated or not activated?
Outcome What are the effects of the intervention? How will the outcomes be measured? What are the intended and unintended effects?

Tools and keywords

We chose to rely on online research databases as our sole search technique. Two online databases were used to locate relevant articles: the *CBS Library* and the *Business Source Complete*. The two databases were chosen based on their access to academic publication as well as their access to articles regarding IT topics.

In order to investigate our topic of interest, keywords were defined before both reviews and were used to search for relevant research. While formulating the keywords, it was important to phrase them in a way that gave as many relevant results as possible while still having the specific review question in mind. Keywords for each review is described further in section 4.2.1 and 4.3.1. Keywords were used to perform a keyword search in online databases in order to find the relevant studies.

To manage and share the selected papers across the group we used the software program *Mendeley*. Besides keeping track of our research papers, it also provides a citation export function, which makes it easy to include citations in our thesis.

4.1.3 Locate and select relevant studies

Using the mentioned databases and the formulated keywords returned a large number of papers for each search. In order to increase the focus of the research, we applied a number of general selection criteria for each literature review. The criteria were agreed upon among the researchers and stated clearly.

Below are the general selection criteria we chose to use for both literature reviews.

- The papers must be written in English
- The papers must be peer-reviewed
- Papers build on empirical data from Europe and North America are favoured

The first criteria is pretty self-explainable since we have to use paper in a language that we understand. In regard to the second criteria, we decided to use peer-reviewed articles in order to ensure a high quality of research even though it might mean that we sort out potential relevant studies. The third criteria was chosen because we wanted to find research, which was comparable with our Danish research domain.

Based on the above defined selection criteria, papers from the two databases were selected and further examined to judge the quality of the paper. This will be covered in the next section.

4.1.4 Critically appraise the studies

In this step of the review we have selected a large number of papers to appraise. In the appraisal process all papers were examined by reading the abstract, looking at the number of citations and the quality of the journal where the paper is published. Lastly its relevance to the review question was also included as a high weighting factor. Since the process for both literature reviews were complex the findings through the process were documented in a concept matrix (Webster & Watson, 2002) to create an overview. We used the concept matrix to keep track of connections between the relevant studies and to identify opportunities of synthesis. Based on these attributes a decision on whether or not to finally include a specific study was made.

4.1.5 Analyse, synthesise the review findings

Once the final selection of papers is decided the review moves into the final analysis of the literature review. The foundational literature was read very carefully and analysed in order to make a synthesises of the articles. Synthesising the articles meant putting the individual parts *"into a new or different arrangement and developing knowledge that is not apparent from reading the individual studies in isolation"* (Rousseau, 2012, p. 123). Rousseau (2012) mentions in his paper a number of methods to follow when synthesising one's findings and argues to choose the method which best fits the concrete research. In both our reviews we chose to follow a narrative synthesis approach which attempts to take different aspects of the same phenomenon and put into a bigger picture. At the same time this method also tells a story and builds a narrative around the topic being studied.

This concludes our description of the approach we followed during our literature reviews. In the following subsection, each review will be touched upon in detail.

4.2 Literature review - Chatbot technology

This section covers the first leg of two literature reviews in this thesis namely the chatbot technology. Before we could investigate the chatbot technology in real life settings, an examination of current literature on chatbots was important. By examining existing literature, we were able to identify how the technology has been researched so far.

Setting out on the journey of examining the current literature on chatbots we used the method described in section 4.1. The review was initiated by planning the direction for the review by developing a problem formulation as well as define used keywords.

4.2.1 Planning the review

In the following section, the problem formulation for the literature review on chatbot technology as well as the used keywords are further described.

Problem Formulation

As described in section 4.1.2, the CIMO framework was used to set the direction for both of the literature reviews. This literature review was initiated based on a desire to understand what research has been conducted about the chatbot technology including the history and application. It is interesting to investigate what kind of settings researchers have used to conduct their studies and to investigate potential outcomes of using the chatbot technology. Our considerations prior to the literature review were captured in the table below based on the CIMO framework.

Table 3- CIMO for chatbot review

CIMO	Paper specific
Context	Chatbot technology, its history and application.
Intervention.	The development and implementation of the chatbot technology in various settings.
Mechanism	When researchers choose to explore the topic of chatbots.
Outcome	New perspectives on the technology. New ways of solving challenges.

From the CIMO framework, we constructed the following research question, which was used to guide the location and selection of relevant studies.

How has the chatbot technology evolved over the years and what has been the focus of research regarding the technology?

Keywords

Even though the chatbot technology has its roots in the early 1950's it still is a concept where a relatively limited number of studies have been conducted, compared to the second half of our literature review on 'adoption of innovation'. In order to capture as many articles as possible, we did not try to limit the number of studies by combining different keywords. Instead, we did only use one keyword, *chatbot*, in this review. As we also mentioned in section 4.1, the keyword was used in the databases *CBS Library* and *Business Source Complete.*

4.2.2 Location and selection of relevant studies

Based on the keyword search in the databases, we got 186 articles in total (see table 4). The first selection criteria 'Peer-reviewed articles' was already applied here since it was possible to search only for peer-reviewed articles in the databases.

Table 4 - Raw keyword search chatbot review

Raw keyword search	N =186	
	# of articles from Business Source complete	# of articles from CBS Library
Chatbot	22 peer-reviewed articles	164 peer-reviewed articles

From that point, we carefully read through the abstracts in all the found articles, considered the language as well as geographical settings of the studies to make a final decision on which papers to use for the review regarding the chatbot technology. This step reduced the amount of articles to 52. The last step was then to read the articles so we could critically appraise, analyse and synthesise the studies. The final number of articles used for the literature review ended up being 36 articles.

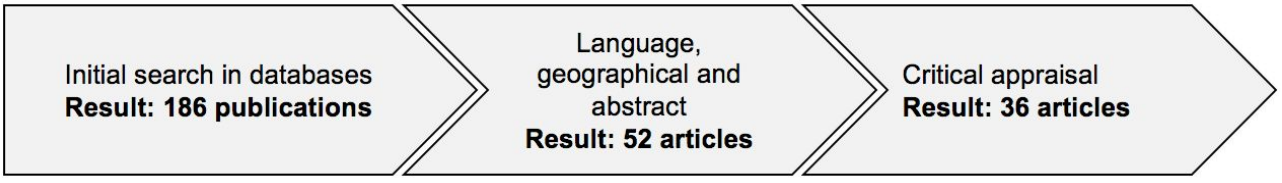

Figure 5 - Process model chatbot review

4.2.3 Critically appraise the studies

As we read through the papers, the review question was always used to appraise the relevance of the papers. When we appraised the studies, a number of recurring themes were found relevant for the research question. Every article was therefore appraised and categorised based on the themes as followed:

- Definition of a chatbot
- From ELIZA to Cleverbot and A.L.I.C.E
- Turing's impact on the development of chatbots
- The applications of chatbots
- Expectation to the chatbot technology

As described in section 4.1.4, a concept matrix was used to keep track of the found studies. In table 5, the number of papers found under each theme is illustrated. It is important to note that an article can cover more than one theme. A full concept matrix can be seen in appendix 2.

Table 5 - Summary of concept matrix results from chatbot review

Theme	Papers in each category
Definition of a chatbot	24
From ELIZA to Cleverbot and A.L.I.C.E	13
Turing's impact on the development of chatbots	5
The application of chatbots	20
Expectation to the chatbot technology	3

4.2.4 Analyse and synthesise

From the themes mentioned above we were able to build a narrative that could showcase our review and analysis of the literature. The themes from the table above will be used as headings in the following subsections. First, we will define chatbots and the chatbot technology. Hereafter, we will present the remaining four themes. Each theme is based on common focal points in the literature, which we found necessary to highlight.

The definition of a chatbot

Going back to the first introduction of a chatbot program, we find Weizenbaum's development of ELIZA. ELIZA is credited as the first chatbot program, however Weizenbaum (1966) at the time did not define the program as a chatbot program. In his article from 1966 he simply calls it *"a program which makes certain kinds of natural language between man and computer possible."* (Weizenbaum, 1966, p. 36). The term "chatbot" can be dated back to 1994, where it was used for the first time in a research article by Mauldin (1994), here he presents a self-developed program and calls it Tinymud, a chatterbot.

"*We created a computer controlled player, a "Chatter Bot," [...] the main service is chatting*" (Mauldin, 1994, p. 16).

Newer articles give a more concrete definition of a chatbot. For instance, Brennan (2006) defines the term as:

"A chatbot is an artificial construct that is designed to converse with human beings using natural language as input and output." (Brennan, 2006, p. 61).

This “artificial construct” is a computer program built with the specific purpose of conversing with humans. This definition is widely agreed upon and used, with minor modifications, in several articles (Reshmi & Balakrishnan, 2016; Crutzen et al., 2010; Hill et al., 2015).

Apart from defining the term, the intrinsic concepts and functions that build the foundation of a chatbot have to be covered. In an article by Vincze (2017), he categorises chatbot programs into two categories: the ones that are based on predetermined rules, which tends to be very limited, and the ones based on Machine Learning algorithms. The latter type is able to learn from experience and get smarter with each conversation (Vincze, 2017). These two types of chatbots are elaborated on below.

Natural language processing (NLP) is the field in computer science that deals with enabling computers to use and understand human language. There are two types of NLP: Traditional NLP - the rules based approach and empirical NLP - the Machine Learning approach (Bill & Mooney, 1997). The traditional view is similar to the first category that Vincze (2017) describes. The traditional view was popular from 1960 to the 1980 and was mainly inspired by Noam Chomsky’s work in the late 1950’s (Chomsky, 1957; Lee, 2004). This approach uses predefined rules from which the computer’s understanding of human language is based on. The argument for using this approach is that language simply is too complex to base a machine’s understanding on statistical calculations on previous data (Bill & Mooney, 1997; Lee, 2004).

The other NLP approach, the empirical approach, however, does exactly what the traditional NLP cannot. Supporters of the empirical approach argue that a sentence can be understood by creating algorithms that use a corpus of previous data and make statistical decisions based on this (Bill & Mooney, 1997; Lee, 2004). This approach suffered from the problem of sparse data, a problem that arises because of the fact that there will always be sentences that are unique and will thus not have enough statistical support (Bill & Mooney, 1997; Lee, 2004). As processing power in computers has increased the sparse data problem has become less significant. However, even when using really big corpuses human language is still so complex and unique that sentences exceeding five words, may have never been spoken or written before (Lee, 2004).

Understanding human inputs is, however, more than just deciding to use a statistical or rule-based approach. A machine must understand the context of the words and sentences in order to react properly. According to Bill & Mooney (1997), three types of analysis are used to achieve this understanding of the context:

Syntactic analysis

The goal of this analysis is to understand the grammatical structure of the sentence, such as nouns and the verbs. Sentence such as “I saw a house today” and “I used a saw today” illustrate the challenge; the word “saw” can both be a noun or a verb.

Semantic analysis

The semantic analysis is about creating a meaning from the sentence that matches the context of the sentence. A word such as pen can both be an instrument for writing but also an enclosure where pigs are kept.

Discourse analysis
Lastly, the discourse analysis concerns finding out what parts of a sentence refer to the same thing. A sentence such as “Ford bought 100 acres outside Nashville; the company will use the land to build a factory,”. Here “the company” refers to Ford, and “the land” refers to the 100 acres.

These are the fundamentals of the chatbot technology. With these fundamentals covered we now understand what a chatbot is and how it achieves its purpose.

From ELIZA to Cleverbot and A.L.I.C.E
The first actual chatbot, was developed by the aforementioned Weizenbaum (1996) and is regarded as the pioneer in this field. **ELIZA**[5] is referred to as the first chatbot in many articles (Coniam, 2008; Reshmi & Balakrishnan, 2016). The purpose of ELIZA was to act as a psychotherapist helping patients with psychological problems by interacting through natural language. This chatbot was built on a very simple system, which took a user’s input and compared each word in the input with a predefined keyword database, and then returned an answer when a matching keyword was found. For example, if a person wrote an input with the key “mother”, ELIZA would respond by asking “Tell me more about your family” (Weizenbaum, 1966). This approach is typically called a stimulus-response architecture (Wallace, 2009). This chatbot thus follows the traditional NLP logic of basing the chatbots language capabilities on rules created by the developer.

After the release of ELIZA, a number of new chatbot programs with both similar and different architectures have been developed. Looking through the existing studies, one of the most notable and mentioned chatbot is **Cleverbot** developed by Rollo Carpenter and was first introduced to the internet in 1997[6] (Hill et al., 2015; Shah et al., 2016; Wallace, 2009). As opposed to ELIZA, Cleverbot wasn't built on a static keyword database but rather on previous conversations. In 2005 the chatbot had a database of 5 million entries in form of full sentences and it is still learning today (Carpenter & Freeman, 2005). However, it is worth remembering that the sparse data problem is still a limitation in these types of chatbots (Lee, 2014). The Cleverbot, as opposed to ELIZA, is built on the empirical NLP approach, using a big corpus and statistical inferences to simulate human language.

Another notable chatbot is the **A.L.I.C.E** (Artificial Linguistic Internet Computer Entity) chatbot which is mentioned in several of the articles found (Shawar & Atwell, 2007; Allison, 2012; Burden, 2009). The A.L.I.C.E chatbot system, which was developed and released by Richard S. Wallace during 1995-2000, was built upon the ELIZA architecture but was optimised in a number of ways (Wallace, 2009). Like the ELIZA, A.L.I.C.E is based on a simple stimulus-response architecture.

[5] Eliza is available at http://www.masswerk.at/elizabot/
[6] Cleverbot is available at http://www.cleverbot.com/

However, the supporting knowledge database for A.L.I.C.E holds more than 40,000 categories of responses where ELIZA only holds about 200 (Wallace, 2009). A.L.I.C.E follows the traditional NLP approach like ELIZA, but is significantly more advanced than ELIZA.

The chatbots ELIZA, Cleverbot and A.L.I.C.E are the most famous systems and many chatbots are built using the ELIZA and the A.L.I.C.E architecture. Collectively Reshmi & Balakrishnan (2016) sum up the development of chatbot programs into three generations, starting from ELIZA followed by Cleverbot and ending with A.L.I.C.E. They identify the first generation of chatbots as the ones based on the ELIZA architecture with a simple technique of pattern matching. The second generation is identified as the development of Chatbot programs which possess empirical NLP techniques like Cleverbot, and the third generation as the introduction of the A.L.I.C.E architecture that is built on more sophisticated pattern-matching techniques (Reshmi & Balakrishnan, 2016).

Turing's impact on the development of chatbots

In the previous section, different categories of chatbots have been defined based on articles from this literature review. Now we are moving into the next theme regarding the testing of the performance of chatbots. Looking through the findings, many scholars take Alan Turing and his famous Turing Test as point of departure when investigating the chatbot phenomenon (Shawar & Atwell, 2007; Reshmi & Balakrishnan, 2016; Burden, 2009). Turing (1950) was arguably the first scholar to introduce the concept of machines acting like humans. In his famous paper from 1950, Turing theorised how machines possibly could act as humans, and also defined how to test this phenomenon with the well-known "Turing Test" (Turing, 1950). According to Turing three entities are required when testing a chatbot: a person, a computer and a test person exchanging information with these two. All three entities would be separated but the test person is aware that one of the entities that he is conversing with is a computer. After the text-based conversation, the test person guesses which entity he conversed with was a computer. If the test person cannot correctly guess who was the computer in 70 percent of the cases, then the computer passes the Turing Test (Gilbert & Forney, 2014).

A Turing Test competition, called Loebner Prize competition, is held annually where chatbots are tested in how successful they are to imitate a human according to the guidelines created by Turing. This competition was first held in 1990. In the literature review, it has been difficult to find studies about chatbots passing the Turing Test. According to a study conducted by Coniam (2008), the chatbots have become more sophisticated due to the different NLP strategies as mentioned earlier. However, Coniam argued that existing chatbots were a long way from passing the Turing Test. Even though Coniam's study was conducted several years ago and a lot has happened with the chatbot technology since then, it has been difficult for us to find more recent studies regarding chatbots having passed the Turing Test. However, a chatbot called Eugene Goostman was claimed to have passed the Turing Test by presenting itself to the judges as a 13-year-old Ukrainian boy (Warwick & Shah, 2016). The claim about Eugene having passed the Turing Test was, however, criticised by many researchers.

They especially criticised the fact that the chatbot excused its grammatical and structural errors by posing as a 13-year-old boy who had English as a second language, rather than the chatbot having lacking language capabilities (Savin-Baden et al., 2015).

According to the literature, even though the Turing Test has not led to a highly developed chatbot, the test has still impacted how chatbots are being developed today. Lessons from the Turing Tests is that chatbots have been found to be more effective when it is designed to fill a specific role for example as a teaching assistant (Savin-Baden et al., 2015). The case of Eugene Goostman is a good example of the Turing Test's impact on how developers focused on creating chatbots for specific purposes but in the process thus limiting its capabilities in other fields (Savin-Baden et al., 2015).

The application of chatbots

The fourth theme, we want to highlight from the literature review is about how the chatbot has been applied in different use cases in order to understand what practical impact the technology has had. Through the selected articles we found a noteworthy trend regarding the specific use cases of the chatbot technology. Out of all the papers investigated we found that 20 papers were either conducting its own case study or referring to other specific case studies. In table 6, the different types of use cases and the articles studying it is shown. These case studies investigate the application of the chatbot in a real-world setting.

Table 6 - Overview of case studies regarding the chatbot technology

Type of use case	Articles
Commercial	Dale (2016), Shawar & Atwell (2007)
Educational	Benotti et al. (2014), Fryer et al. (2017), Jia (2009), Kerly et al.(2007), Kerly et al.(2008), Reshmi & Balakrishnan (2016), Savin-Baden et al. (2015), Tandy et al. (2017)
Healthcare	Crutzen et al. (2010), D'Alfonso et al. (2017), Lewis (2014)
Information retrieval	Shyam Sundar et al. (2016)
Library	Allison (2012), Calvert (2017), Fernandez, (2016), Rubin et al. (2010), Vincze (2017)
Social media	Xu et al. (2017)

The noteworthy trend is that, with nine of 20 cases (e.g. Jia, 2009; Fryer et al., 2017; Savin-Baden et al., 2015), the majority of the use cases were investigated in an educational setting and secondly in a library setting, with six of the 20 cases (e.g. Vincze, 2017; Calvert, 2017; Rubin et al., 2010).

Other case studies focused on the usage of chatbot technology in e.g. healthcare and information retrieval in natural languages from databases (Crutzen et al., 2010; Shyam Sundar et al., 2016). Interestingly, only two out of the 20 articles study the chatbot technology in a commercial setting. One article investigates how an e-commerce site has implemented a chatbot to help visitors while shopping on the website (Shawar & Atwell, 2007), while the other article investigates how an online chatbot can assist people with booking flights (Dale, 2016). This means that relatively few articles are covering the technology's use in a commercial context. This goes hand in hand with this thesis' motivation of investigating the technology in a commercial context. One possible explanation for the limited research conducted in a commercial setting may be because of the confidentiality arising from e.g. industry competition.

Expectation to the chatbot technology

In this last section of the literature review we move the focus away from literature about previous events and instead investigate what the literature expects of the chatbot technology in terms of further development. A number of articles talk about an envisioned future where the chatbot technology is more advanced and has a much higher presence than it has today. A concrete example is an article written by Calvert (2017) where it is argued that it is reasonable to believe that chatbots will take over most of librarians' daily tasks related to customer service within the next decade (Calvert, 2017).

Other articles are more driven by expectations to the technology behind the chatbot. One article mentions how chatbots in the future can be fine-tuned with big-data-driven artificial intelligence in order to understand the users' needs in ways that human intuitions could never grasp (Reeves, 2016). Another article expresses the expectation that end-users have to the technology. From the HCI perspective it is envisioned that chatbots, in a *'not-too-distant future'*, would be the preferred user interface for many of the activities that end-users normally perform through a web page or a dedicated application. In addition, the study also highlights that Facebook's CEO Mark Zuckerberg believes chatbots are the solution to simplify the interaction with digital devices (Følstad & Brandtzæg, 2017).

The expectations to the chatbot technology described in these articles can either be interpreted positively or negatively. A potential positive impact of chatbots is that people move away from a role of information seeking to a role of information demanding. People would not be forced to go through webpages and applications seeking the right information, but instead they will be able to ask for the right information. On the other hand, chatbots may become experts in optimising our daily lives that people end up following every advice that the chatbot makes thus losing some of our free will. In regard to this discussion, there is no fixed truth, only philosophical guessing. It is still uncertain how impactful the technology will be in the future and how advanced it will end up being.

4.2.5 Conclusion

In conclusion, we have covered the chatbot phenomenon and its underlying technology in this section. First, we defined the chatbot term, where we found that a chatbot "*is an artificial construct that is designed to converse with human beings using natural language as input and output"* (Brennan, 2006, p. 61). Next, we covered how the phenomenon started with Weizenbaums development of the chatbot ELIZA in 1966. At the time however, ELIZA wasn't called a chatbot, and it was first in 1994 that these programs were recognised as chatbots. Since ELIZA the technology has evolved and it now incorporates advanced forms of natural language processing (NLP) and semantic and discourse analyses. Moreover, in the beginning of the century Wallace (2009) developed the chatbot A.L.I.C.E. which has led to the development of many similar bots. We found that chatbots have in very small degree been researched in a commercial setting, thus indicating a gap in knowledge. Lastly, the coming impact of chatbots is expected to be positive. They will get more advanced and are expected to replace webpages and applications as the preferred information tool. Only time will tell what level of advancement future chatbots will hold, with the fast-paced development we see in Machine Learning and AI.

4.3 Literature review - Adoption of Innovation

This next section of the literature review focuses on the second leg of the two topics that drive this thesis. The curiosity that triggered this literature review is rooted in the main topic of the thesis - adoption of chatbots. Based on this we created a review question which will guide the literature review of innovation adoption from selection to synthesis of literature.

4.3.1 Planning the review

In the following section, the problem formulation for the literature review on chatbot technology as well as the used keywords are described.

Problem formulation

As described in section 4.1.2, the CIMO framework was used to guide the literature reviews and more precisely, to define the problem formulation. A completed CIMO framework, specific for the adoption literature review, is presented below. Using the CIMO framework helped us scope the review which enabled us to focus on relevant literature and discard irrelevant aspects of the literature.

Table 7- CIMO for Adoption of Innovation Review

CIMO	Paper specific
Context	The relationship between a new technology and an organisation will be studied.
Intervention	The introduction of a new innovative technology in the field of IT
Mechanism	Organisations have to make a decision to adopt the innovation or ignore it altogether. The mechanism is activated when new IT solutions enter the market
Outcome	The intervention will shed light on the organisation's capability and willingness to adopt to new innovation.

The anticipation was that by reviewing existing literature dealing with adoption of innovation factors we could create a pool of knowledge about what considerations go into the decision process and apply this knowledge in a different context, in this case the adoption of chatbots.

Below is the overall research question for this literature review.

How do organisations adopt innovation and how is this decision affected?

Keywords

Adoption of innovation is a well-researched topic dating back to the 1970's. This has also created a lot of branches and sub genres relating to this topic. We thus had to be more precise in our search for literature in order to not become overwhelmed with literature that was out of scope. It thus was not enough to just use 'innovation adoption' as a keyword. We needed keywords that could more precisely specify the sought-after research. We therefore used 'Organisation' and 'information technology' as supporting keywords. In addition to using 'innovation adoption' as a main keyword we also used 'innovation adoption model' as a keyword, because we were interested in research that had created a model for how innovation is adopted. This would provide us with inspiration for our conceptual framework that we intended to build, as mentioned in the introduction of our thesis in section 1.2.2.

The keywords used were therefore:

- Innovation adoption
- Innovation adoption model
- Organisation
- Information Technology

4.3.2 Location and selection of relevant studies

With these keywords, we started locating and selecting relevant studies. As stated already, the databases used were *CBS Library* and *Business Source Complete*. We first made raw keyword searches, secondly, we combined the keywords to narrow the search. When conducting the keyword search, some of the selection criteria are already applied. They are peer-reviewed and written in English. After this we applied the search criteria, which led us to the final collection of studies used for the literature review.

Table 8 - Raw keyword search innovation adoption review

Raw keyword search	N > 2.500.000	
	# of articles from Business Source complete	# of articles from CBS Library
Innovation adoption	3.068 peer-reviewed articles	5.276 peer-reviewed articles
Innovation adoption model	8 peer-reviewed articles	80 peer-reviewed articles
Organisation	368.261 peer-reviewed articles	2.084.973 peer-reviewed articles
Information Technology	48.999 peer-reviewed articles	206.643 peer-reviewed articles

The raw keyword search was used as a preliminary measure to gain an overview of how much literature was available in total. It is however worth noting that the numbers in table 8 contain a high number of duplicates. It evidently also shows the need for a narrower search which also could increase the number of relative articles. The keywords were thus combined by using the command 'AND' in the databases. The result of the search when combining the keywords can be seen in table 9.

Table 9 - Overview of combined keyword search

Combination of keyword search	N = 6.962
"Innovation adoption" AND "Information Technology"	2.213 peer-reviewed articles
"Innovation adoption" AND "Organisation"	4.665 peer-reviewed articles
"Innovation adoption model" AND "Information Technology"	33 peer-reviewed articles
"Innovation adoption model" AND "Organisation"	51 peer-reviewed articles

We did not read the abstract of all 6.962 articles. We found that the two combined keyword searches *“Innovation adoption” AND “Information Technology”* and *“Innovation adoption” AND “Organisation”* ended up being too broad and covered aspects that was out of scope for our intended goal. We therefore excluded these keywords from our literature review and focused on the other two keyword searches, which we found to be more focused. We therefore chose to continue the literature review based on those 84 articles.
We started collecting studies by considering the abstract and the geographical location of the study. This reduced the number of articles to 67 articles, which were found to be potentially relevant for the scope of our review. The last step was then to read the articles so we could critically appraise, analyse and synthesise the studies. The final number of articles used for the literature review ended up being 36 articles. Those 36 articles were used to build the foundation for the collective knowledge of this study about adoption of innovation.

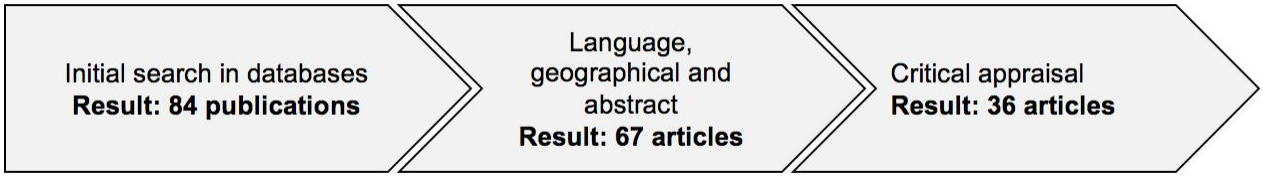

Figure 6 - Process model innovation adoption review

4.3.3 *Critically appraise the studies*

As in the previous literature review, a number of themes recurred in the found relevant studies, which we captured in a concept matrix similar to the one in section 4.2.3. The themes in this literature were as follows:

- Defining an innovation or an adoption
- Concepts, frameworks and theories
- Defining the adoption process
- The different levels of adoption

In table 10, the number of articles related to each theme can be found. However, it is important to clarify that an article can cover more than one theme. This means that the sum in table 10 therefore is higher than 36, which is the total number of articles included in this study. A full concept matrix can be seen in appendix 3.

Tabel 10 - Summary of concept matrix results from innovation adoption review

Theme	Papers in each category
Defining innovation or adoption	23
Defining the adoption process	12
Concepts, frameworks and theories	16
The different levels of adoption: Environmental	7
The different levels of adoption: Organisational	12

4.3.4 Analyse and synthesise

From the themes presented above, we structured a narrative that presents the literature in a concise and precise manner. This section will not follow the themes precisely, but they will be incorporated into the narrative. We start of by defining the adoption of innovation, then the adoption process will be discussed and lastly how the decision to adopt innovations is affected on different levels will be presented and discussed.

Why do we adopt innovation?

Innovations can often be a great headache for many organisations. On the one hand innovations are one of the key drivers to corporate success (Kamal, 2006). They can give a competitive advantage and can be a source to economic growth (Damanpour & Schneider, 2006). On the other hand, they can be a tricky task for a company to implement successfully and secure adoption (Kamal, 2006) especially for small businesses (Nguyen et al., 2015). However, organisations are often either forced or required to go forward with an innovation adoption project. This can be initiated by changes in the environment, such as changing customer preferences or keeping up with competitors, or it can be initiated by the organisations management who aim at bringing improvements to organisational performance (Hameed et al., 2012a; 2012b). In an age where technological change is rapid and the market is ever-changing the adoption of innovation becomes all the worthier of a study (Damanpour & Schneider, 2006).

Why we study adoption of innovation is thus evident in the research presented above, the goal of this literature review, however, is to look at *how* organisations choose to adopt innovation and how this decision is affected. However, before delving into the *how* of innovation adoption, the term and its underlying terms will first be defined.

Defining adoption of innovation

Defining the topic at hand may seem simple at face value. There are, however, many nuances to the term. At face value the topic “adoption of innovation” presents itself as an umbrella term that covers a plethora of theories and concepts that try to answer the same vein of answer - typically, how and why to adopt innovation.

The term ‘adoption of innovation’, is, however, a combination of the words adoption and innovation. These words require an understanding before the full term can be understood. “Adoption” as an isolated term, is fairly easily understood and does not require much discussion. In an IT context, it is defined as the decision to make use of an innovation (Frambach & Schillewaert, 2002). Hameed et al. (2012b) define adoption as *a process that results in its introduction and use that is new to the adopting person or organization.* “Innovation” is, however, a more complex term to define. Continuing Hameed et al.’s (2012b) definition they connect innovation and adoption by stating that innovation is either an idea, product, program, or technology that is new to the *adopting unit*. Volkoff and Strong (2013) define innovation as a mechanism that starts with a ‘space of possibilities’ that enables the emergence of new ideas for services. In turn, external partners develop these ideas into innovations. An innovation can, however, be many things to different people. Clayton Christensen has been the leading man in this field and has developed the Disruptive Innovation Theory, first time presented in 1995 (Bower & Christensen, 1995). Together with Bower, Christensen propose two types of innovations, sustaining and disruptive innovations. Sustaining innovations focuses on improvement of processes and product that are already in use. Disruptive innovations on the other hand introduce new ways of delivering value and often initially perform poorly. This theory has become widely used among scholars (e.g. Yu & Hang, 2010; Bagno et al., 2017; Carlo et al., 2014).
Another relevant way of looking at innovations is to define the innovation based on its purpose. Damanpour & Evan (1984) argue that different innovations have different factors that influence the rate of adoption. They therefore define two different categories of innovations - technological innovations and administrative innovations. Technological innovation are innovations that directly affect the organisation’s core work activity, for example a new product or service. On the other hand, administrative innovations affect the way people interact when accomplishing a task or goal (Damanpour & Evan, 1984).

This leads us back to where we started; the term adoption of innovation. In summary,
Adoption is defined as the decision to make use of an innovation (Frambach & Schillewaert, 2002). Innovation is an idea, product, program or technology new to the adopting unit (Hameed et al. 2012a). With these insights, we are now able to understand what concepts and discussions precede the overarching term adoption of innovation.

The adoption process

In the previous section innovation of adoption was disassembled, discussed, defined and reassembled again. Adoption of innovation implies that there is some sort of a process for the adopting unit. There is a starting point and an ending point. However, there are many different versions of this process. This will be examined further in this section.
The adoption of innovation process is widely described as a stage-based process (Hameed et al., 2012a). One of the most recognised researchers regarding adoption and diffusion of innovation, Everett Rogers, defined the adopting unit as moving from knowledge of the innovation, to attitude towards innovation formation, to decision to adopt or reject, then implementing the new idea and finally confirmation of the decision (Rogers, 1983; Hameed et al., 2012a; Kamal, 2006).

However, numerous other researchers have tried to define the stages of adopting innovation and this has led to many different innovation adoption models that both vary in numbers of stages and starting- and ending point.

Hage and Aiken (1974) developed a four-stage model consisting of *evaluation*, *initiation*, *implementation* and *routinization*. Zaltman et al. (1973) built a two-stage innovation adoption model which he split into the primary adoption - *knowledge*, *awareness* and *attitudes formation* - and the secondary adoption - *decision*, *initial implementation* and *sustained implementation* (Kwon and Zmud, 1987). Researcher Kamal (2006), made an extensive look at the diversity in IT adoption models and presented a figure with 14 different adoption models developed by various researchers. Kamal's findings shed some light on the massive amount of literature found about innovation adoption processes and how differently it can be presented.

Although there are many versions of it, the innovation adoption model is most widely considered a three-stage process (Hameed et al., 2012a). From Kamal's (2006) summary of adoption models four out of the eleven mentioned models had a three-stage process (Lewin, 1952; Pierce & Delbecq, 1977; Agarwal & Prasad, 1998; Gallivan, 2001). However, as complex as the process may be, researchers often group it into a standard general set of three phases: initiation, adoption-decision and implementation (Damanpour & Schneider, 2006; Hameed et al., 2012a; Kamal, 2006).

A final comment on the adoption process considers the concern about defining innovation adoption as a single-event phenomenon. Adoption innovation is most often studied as a single-event phenomenon but some scholars have conceptualised it as a multi-event phenomenon; often called a multiphase process (Damanpour & Schneider, 2006). An innovation adoption process is often a complex process containing many different decisions. One way to minimise the risk of adopting an innovation is thus to implement the innovation stepwise, taking a more iterative approach. Thus, moving away from the binary approach of defining an adoption process as "implemented" or "not implemented" and instead implementing the innovation stepwise (Huizingh & Brand, 2009).

Investigating innovation adoption

This section will discuss *how* the decision to adopt innovation is affected by various aspects. Following Damanpour & Schneider's (2006) previous statement about innovation being multiphase, they also point out that innovation adoption is multi*dimensional*. Meaning that there is not one single dimension, such as the organisational dimension, that influences the adoption process, but instead there are a multitude of dimensions that influence this process (Damanpour & Schneider, 2006). Historically, predicting the probability of an organisation adopting a new innovation was based on the proportion of organisations in the industry who had already adopted. This, however, tells nothing about the individual adoption decision and why the organisation adopted earlier or later compared to others in the industry (Jensen, 1982).

Karahanna et al. (1999) points out the necessity of choosing the opposite approach. Finding the organisations' individual criteria for adopting can lead the adopting unit to make a more targeted implementation and focus on only the relevant factors at each phase (Karahanna et al., 1999). A study of innovation adoption becomes multidimensional once the research includes several approaches to explaining the adoption process. A lot of research has been conducted to find out what dimensions should be included. What seems to be consistent across the research is that there are three general dimensions. These dimensions are referred to as characteristics and each characteristic consists of several factors that enable more precise measurements. The characteristics that are most often mentioned are organisational, environmental and technological characteristics. These three traits can be seen as being divided into a hierarchy of levels where the environmental level is on top, the technological level follows second and on the lowest tier is the organisational. Some scholars mention all three characteristics (Hameed et al., 2012b; Frambach & Schillewaert, 2002; Tornatzky & Klein, 1982), while others only mention technological characteristics (Karahanna et al., 1999; Backer et al., 1986), organisational characteristics (Moch et al., 1976; Malecki, 1977; Frambach, 1993) and some combine specific characteristics (Berta et al., 2005; Azadegan & Teich, 2010). Each characteristic is operationalised by the underlying factors that mostly are the same throughout the research.

Environmental characteristics comprises everything around the organisation. *Competitive pressures* and *external pressures* are considered here as well as *environmental uncertainty* (Damanpour & Schneider, 2006).

Technological characteristics deals with the artefacts itself. It mostly follows Rogers' Diffusion of Innovation theory (Rogers, 1983) and thus uses factors such as *competitive advantages, complexity* and *compatibility* of the innovation (Backer et al., 1986).

Organisational characteristics both considers the structural aspect of the organisation and also the organisations prioritisations. *Organisation size* and *infrastructure* as well as *IT expertise* and *readiness* are factors relevant here (Frambach, 1993).

Apart from these three characteristics research also suggests other subjects to be included when investigating adoption of innovation. Damanpour & Schneider (2006) propose that top managers affect the innovation process because they control the official response to environmental changes. Research done by Martins & Kambil (1999) and Hameed et al. (2012a) supports this argument. Lastly, research also highlights the impact the supplier of the innovation has on the adopting unit. Frambach (Frambach, 1993; Frambach et al., 1998; Frambach & schillewaert, 2002) included the supplier side as a characteristic for innovation adoption.

It is proposed that the innovation speed and rate is positively related to how much support the supplier has provided during the process (Frambach, 1993; Azadegan & Teich, 2010).
A final factor that may affect adoption decisions is the role of the media and the IT fashion trends. Abrahamson (1991) is the biggest contributor to this take on the diffusion of innovation and through his article argues that researchers spend too much time trying to answer what affects diffusion rates and should instead focus on when and how innovations are diffused or rejected (Abrahamson, 1991). From his point of view the diffusion of innovation theory, and its supporters, assume that organisations are rational adopters - calling it an efficient-choice perspective. This is, however, not always the case. Organisations are uncertain about their goals and therefore tend to imitate others, be it mass-media trends, consulting firms or other organisations. Imitating mass-media or consulting firms is called the *fashion perspective.* This means that adopting organisations are influenced by entities outside of the organisations group. Imitating organisations is called the *fad perspective* which means being influenced by entities inside the industry (Abrahamson, 1991). Shao (1999) tests the effect that media has on adoption decisions, and posits that positive mentions in news outlets and similar places create a reaction in organisations who spend time gathering information from their environment. The caveat, although, is that there, often times, is a three years lag from the first mention of the technology to when organisations truly start implementing it (Shao, 1999). Some organisations build their image around always having the hottest IT trends in the organisation. This tactic is to attract talent and to be considered as an organisation on the forefront of digitalisation. These organisations, however, usually do not see any benefit from adopting the innovation until several years later, when the technology finally matures (Wang, 2010).

4.3.5 Conclusion

In conclusion adoption of innovation is a complex term that can be studied using various approaches. Research shows that scholars have many different takes on how the adoption process unfolds but the general consensus is that the process evolves over a three-stage process. Investigating the drivers behind organisation’s decision to adopt involves taking a multidimensional approach in order to know the individual decision process. Typically, three types of characteristics are used: environmental, organisational, and technological. Other researchers, however, also highlight the necessity to include how top management affects the process and lastly what role the suppliers of the innovation play in the adoption of innovation.

5 Theory

We set out to explain the adoption decision by using the theory of IT innovation adoption. We see this theory as being a broad term describing many different theories, all aiming to explain IT innovation adoption. For us there are three main aspects:

- Investigating *when* an innovation is adopted. This includes the Diffusion S-curve and Innovation Adoption Lifecycle presented in Rogers DOI theory (1983)
- Investigating *how* an innovation is adopted. This includes the many types of adoption process models as presented in the literature review
- Investigating *why* an innovation is adopted. This concerns investigating adoption factors, as presented in the literature review.

We will be investigating *why* an innovation is adopted. We will be doing this by using the literature review concerning innovation of adoption. This makes us able to build our conceptual framework. Even when narrowing the theoretical focus down to the *why,* there are still many different perspectives the adoption of a new technology can be perceived from. We consider the adoption of chatbot technology as a multidimensional phenomenon and it is therefore not possible to describe and explain using a single theoretical lens (Damanpour & Schneider, 2006).
We will mainly be using three theories to serve as the basis for our conceptual framework. This chapter will describe these three theories: Rogers' Diffusion of Innovation theory (DOI) (Rogers, 1983), the Technology-Organization-Environment framework (TOE) (Tornatzky & Klein, 1982), and Frambach's supplier aspect (Frambach, 1993). In the following sections, the process for adoption will be defined and three key theories will be presented. Hereafter, our conceptual framework will be presented by showing how we combine the different approaches from the three theories in order to build it. Lastly, we will present how we theoretically approach the question of how a company's market strategy influences the adoption decision.

5.1 The process for adoption of innovation

As stated already, we use a combinatorial approach to develop our conceptual framework in order to assess different aspects in regard to organisations' adoption of the chatbot technology. This means that we identify and combine theoretical perspectives provided by different theories regarding innovation adoption. Through the literature review, it is clear that the phenomenon 'adoption of innovation' has been studied in many different settings and researchers have found many new aspects to explain adoption of innovations. Even though the theoretical base for explaining adoption of innovation has been expanded, the new aspects in most cases originate from Rogers' DOI theory (Rogers, 1983). In this section, we see this theory as a starting point to create our conceptual framework.

In previous research, researchers have interpreted the term innovation in many ways. In order to create a common understanding of ‘Innovation’, we use Rogers’ definition in our thesis. We therefore understand an innovation as:

> *“An idea, practice, or object that is perceived as new by an individual or other unit”*
> *(Rogers, 1983, p. 11)*

Besides defining the term ‘Innovation’ it is also important to clarify that we define the diffusion of an innovation as a process. This means that an innovation is perceived by an organisation over time and not in a single moment (Rogers, 1983; Hameed, 2012a). In our study, we consider the process for an IT adoption to be in three stages: *initiation (pre-adoption), adoption-decision* and finally *implementation (post-adoption)* (Hameed et al., 2012a). These three stages are a simplification of Rogers’ (1983) definition of the five-stage process and incorporates his stages. The three stages are described below, as presented by Hameed et al. (2012b) and are illustrated in figure 7.

Initiation (pre-adoption)*: consists of activities related to recognising a need, acquiring knowledge or awareness, forming an attitude towards the innovation and proposing innovation for adoption.*

Adoption-decision*: reflects the decision in order to accept the idea and evaluate of the proposed ideas from a technical, financial and strategic perspective, together with the allocation of resources for its acquisition and implementation.*

Implementation (post-adoption*): involves acquisition of innovation, preparing the organisation for use of the innovation, performing a trial for confirmation of innovation.*

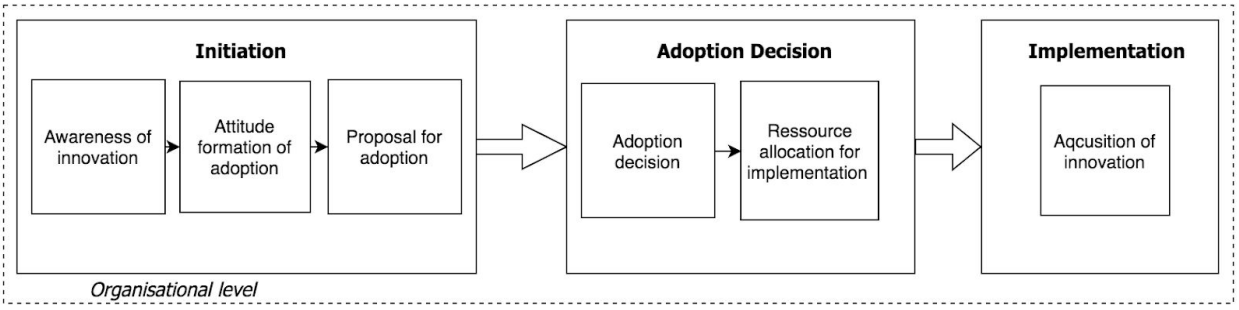

Figure 7- Adoption process model

5.2 The fundamentals of our conceptual framework

In the previous section, we defined the process for adopting an innovation. In this section, we will present the theories that affect this process. Firstly, Rogers’ DOI theory (Rogers, 1983) has a big impact on our conceptual framework, hereafter we will present how the TOE framework (Tornatzky & Klein, 1982) Frambach’s supplier perspective (Frambach, 1993) and Hameed et al.’s (2012) adoption factors all play a part.

5.2.1 Diffusion of innovation

In our thesis, we focus on the aspect of the DOI theory that seeks to define and explain the characteristics that affect the adoption decision. According to Rogers (1983), the adoption of innovation can be assessed from two perspectives: *individual* and *organisational*. In our thesis, we limit the use of the DOI theory to only consider the organisational perspective. From the organisational perspective, we use two groups of characteristics that influence the decision to adopt: innovation characteristics and organisational characteristics. These are shown in figure 8.

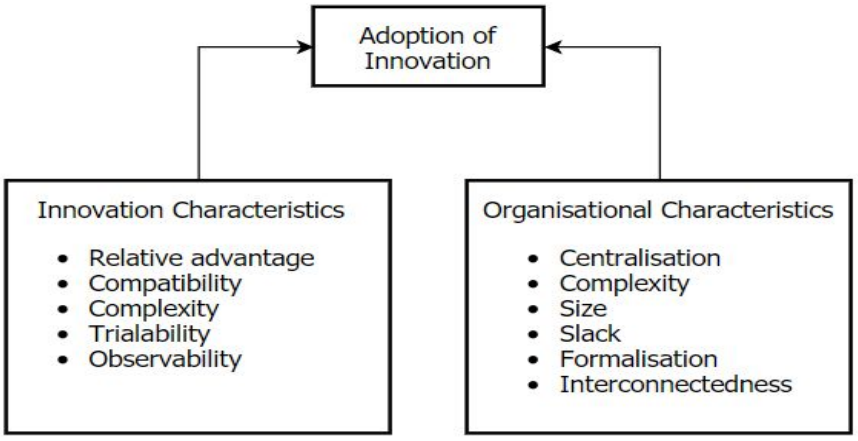

Figure 8 - DOI theory (Rogers, 1983)

Through the years, Rogers DOI innovation has become widely recognised in the IT innovation field. Prescott and Conger (1995) conducted a review and found over 70 IT articles that relied on the DOI theory in the period between 1984 to 1994. Although Rogers' DOI theory has been used significantly to explain adoption of new technology, the theory has been criticised for its simplicity. According to Rogers (1983) all kinds of innovations can be characterised with the same six attributes - but is it fair to characterise innovations, such as a chatbot and a television, with the same attributes? In addition, it has been criticised for its lack of detailing the role of other influential factors (Lyytinen & Damsgaard, 2001). Rogers' theory does not seem to note the effect of factors that are outside the boundaries of an organisation. It can be argued that since organisations do not operate alone, their willingness to adopt new technology are affected by their competitors, Partners and other social surroundings (Azadegan & Teich, 2010). To accommodate these limitations regarding Rogers' DOI theory, we have added more perspectives to our conceptual framework.

5.2.2 TOE framework

One aspect that Rogers' DOI theory neglects to consider is the market and industry surrounding an organisation. Those aspects are captured in the TOE framework developed by Tornatzky and Fleischer (1990). The TOE framework explains innovation adoption through three aspects: *Environment, Organisation* and *Technology*.

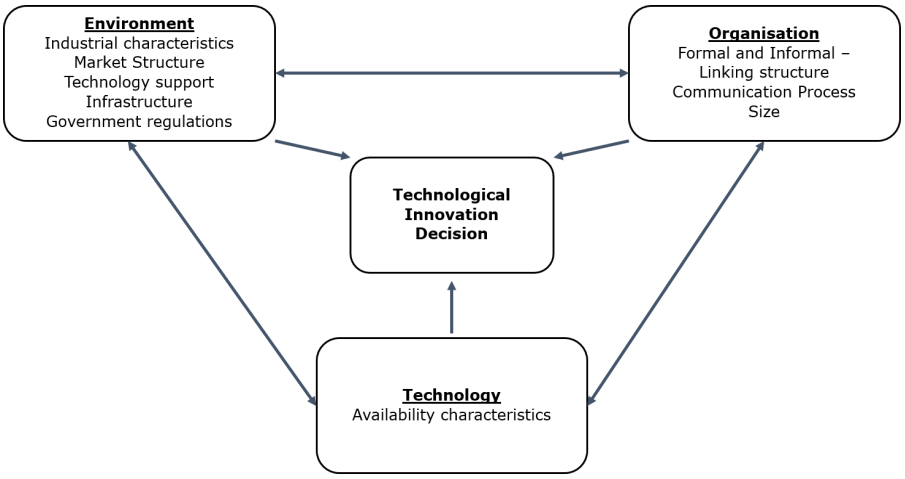

Figure 9 - TOE theory (Tornatzky and Fleischer, 1990)

The first two aspects, the technological and organisational contexts, cover the same characteristics that we use from Rogers' DOI theory. We will therefore concentrate on the third aspect from the TOE framework which is the environmental context. This aspect addresses the surroundings of an organisation that consist of various stakeholders such as trading partners, competitors, suppliers, customers, the government, the community, etc. An organisation's interpretation of an innovation can be influenced by these surroundings. The stakeholders can either influence the technological innovation positively or negatively.

Contrary to the DOI theory by Rogers, the TOE framework allows us to investigate the relationship between an organisation and its stakeholders. We believe that especially the third aspect from the TOE framework will enrich our study. Without this aspect, we will not be able to investigate the full picture of the adoption of the chatbot technology. In our research, we will use the TOE framework as a third characteristic, in addition to the organisational and innovation characteristics.

5.2.3 Supplier aspect

Another aspect that Rogers (1983) does not consider is the role of the innovation supplier. Rogers does however, consider social systems as one of the elements that affect the diffusion of innovation, in where he mentions opinion leaders as key players (Rogers, 1983). This supports the choice to explicitly include the supplier's affecting role when adopting innovation.
Especially Frambach (Frambach, 1993; Frambach et al., 1998; Frambach & Schillewaert, 2002) has investigated the supplier-side role in innovation adoption. From him we learn that suppliers can influence the likelihood of an innovation being adopted by an organisation. By including Frambach's research into our conceptual framework it enables us to investigate suppliers with rigour and it will ultimately give our results more explanatory heft.
What makes Frambach's research especially interesting to combine with the other chosen theories is that he agreed with Rogers' research in many aspects and therefore structured his theory to be compatible with Rogers theory. Frambach developed a conceptual model in 1993, establishing two sides to the innovation adoption process: a supplier side and an adopter side.

Most times only the adopter side has been researched and thought to have an impact on the adoption decision but Frambach argued that the supplier also plays a vital role (Frambach, 1993). In 1998, he quantitatively tested his hypothesis where he could show that the supplier side variables had a significant effect on the result (Frambach et al, 1998). This resulted in several factors that could be used to include the supplier marketing efforts when researching innovation adoption in organisations. In our research, we are thus using Frambach's conceptual framework in order to include a fourth characteristic in our conceptual framework.

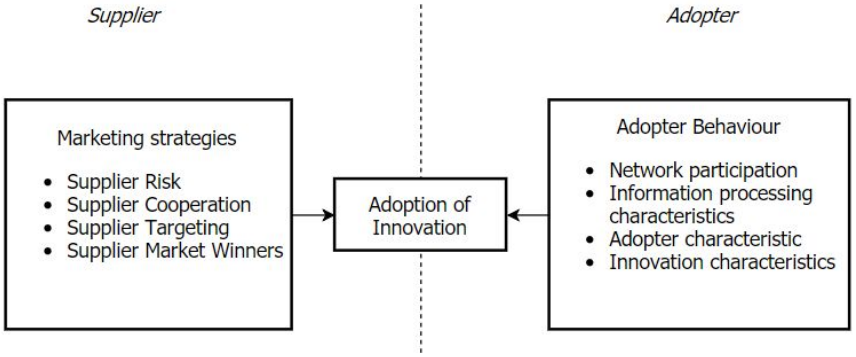

Figure 10 - Supplier-side aspect (Frambach, 1993)

Throughout the preceding sections we have combined three theories. However, they all originate from Rogers' DOI theory. Rogers' work has influenced a lot of researchers to build upon, support and challenge the theory (Lyytinen & Damsgaard, 2001). Adding the TOE framework and the supplier-side concept should therefore not be seen as adding new theories but, in fact, merely adding new perspectives to Rogers' DOI. We do this to fill in gaps that literature suggests Rogers' theory has. This highlights a strength of our theoretical foundation. The theories seek the same truth; this being understanding the decision to adopt an innovation. They are therefore epistemologically compatible.

5.3 Conceptual framework

With the theoretical foundation, we now have the fundamental building blocks for creating our conceptual framework. We have established four characteristics, but in order to complete the framework we will select and define the adoption factors that belong to each characteristic.
As mentioned many researchers have conducted significant studies in regard to the adoption of innovation theory. This has resulted in the creation of many additional adoption factors, which are not part of the three theories presented so far in this chapter.

Hameed et al. (2012a) has conducted a comprehensive review of existing studies about the adoption of innovation. They have identified and collected 129 adoption factors from these studies and indicated how often these factors have been found significant in regard to the adoption decision of innovations. An example of their research can be seen in figure 11.

Innovation characteristics	Studies found significant	Total studies	Percentage significant
Relative advantage	64	81	79
Cost	12	31	39
Complexity	21	44	48
Compatibility	29	54	54

Figure 11 - Example of Hameed et al. (2012a) findings

Hameed (2012a)[7] identifies five perspectives: *Innovation characteristics*, *Organisational characteristics, Environmental characteristics*, *Top Management characteristics* as well *User Acceptance characteristics*. As already clarified in our delimitation, our thesis will be focusing on the organisational level of adoption decision, and therefore will not investigate the User Acceptance characteristics. However, Hameed (2012a) identify a new perspective, Top Management characteristics, which they find to be a significant characteristic. We therefore added this perspective as a fifth characteristic in our conceptual framework. The five adoption characteristics, are presented as influencers on the innovation adoption process in the bottom of figure 12.

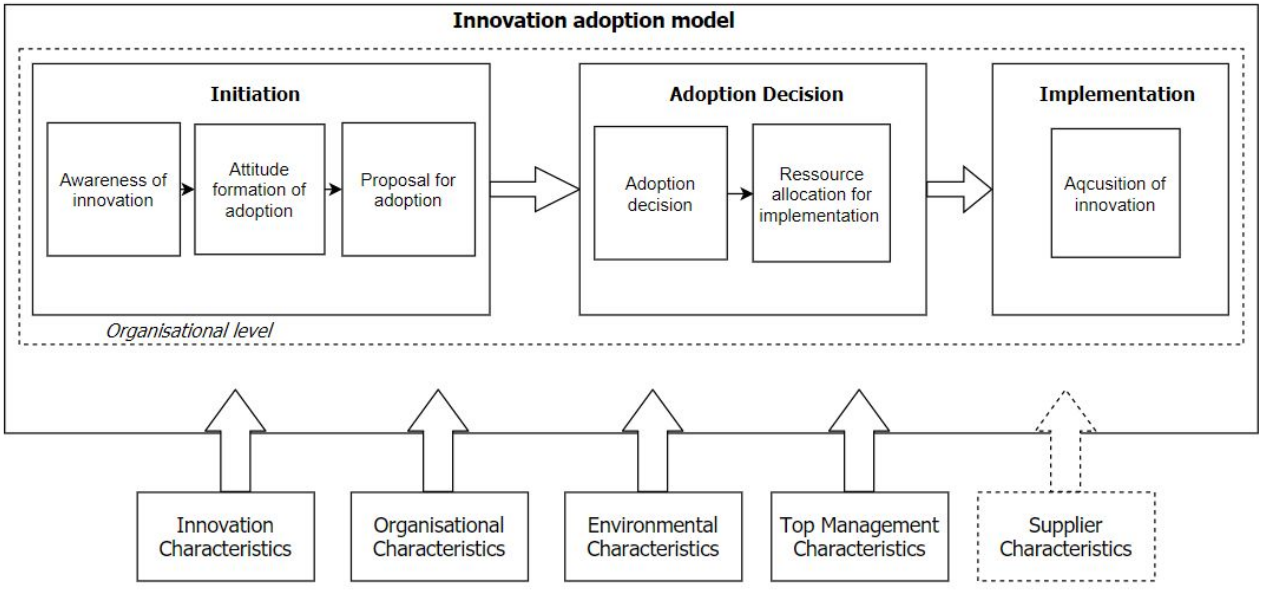

Figure 12 - Adoption process model with characteristics

We have to acknowledge that we cannot investigate 129 factors. Following Hameed's work (2012a) we only include factors that have been found significant in 10 or more studies. This decision also impacts factors that belong to the already presented theories. This means that if factors from one of these theories were not found to be significant, then they are not included in our conceptual framework.

[7] Hameed et al. will be referred to as Hameed in the rest of the thesis for the sake of readability

This is for example the case with the two factors *Trialability* and *Observability* from Rogers' DOI theory as they both have only been found significant in seven studies.
In total, 19 factors were included in our conceptual framework. In the following we will present these factors and its proposed effect on the adoption decision.

5.3.1 Innovation factors

Relative advantage

Relative advantage is defined as the degree to which an innovation is perceived as better than the idea it supersedes (Rogers, 1983). The degree of relative advantage may be measured in economic terms, but social-prestige factors, convenience, and satisfaction are also often important components. It is reasonable to claim that organisations take into consideration the possible advantages the chatbot technology can generate compared to the best alternative technology. Companies which perceive a higher relative advantage in chatbot technology are therefore more likely to adoption the technology.

*P1: **Relative advantage** will have a **positive** effect on chatbot technology adoption*

Cost

Besides the relative advantages of an innovation, organisations do also consider the cost related to the adoption of the chatbot technology. This might include costs such as setup and maintenance of the technology, training cost associated with the use of the technology as well as the administrative and change management related cost (Thompson et al., 2009). Cost of an innovation reflects organisational commitment of financial resources dedicated to the adoption. Therefore, companies that perceive the cost as high may find it more difficult to adopt the theory.

*P2: **Cost** will have a **negative** effect on chatbot technology adoption*

Complexity

Complexity is the degree to which an innovation is perceived as difficult to understand and use (Rogers, 1983). Complexity of a certain innovation can affect a company's success of the innovation in a negative way (Tornatzky & Klein, 1982). Regarding the chatbot technology, existing experiences and established competencies with similar technologies like RPA or Machine Learning may reduce companies' perception of the degree of complexity.

*P3: **Complexity** will have a **negative** effect on chatbot technology adoption*

Compatibility

Compatibility is the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of the potential adopters (Rogers, 1983). High compatibility has a positive influence on adoption (Cooper & Zmud, 1990).

As mentioned in the introduction, chatbot technology is often associated with digitalisation and automation of processes in a company. This may be against existing values in some companies and therefore creating resistance to change in a company.

*P4: **Compatibility** will have a **positive** effect on chatbot technology adoption*

Security

Security regards the degree to which an organisation perceives the chatbot platform as insecure when exchanging data. The lack of security in relation to an innovation can be caused by perceived risk, lack of control and privacy or lack a trust for the innovation (Ostlund, 1974). In previous studies, lack of security or privacy with an IT technology is seen as an obstacle for the adoption of the technology (Cockburn & Wilson, 1996). Therefore, we believe that companies perceiving the chatbot technology as secure are more willing to invest and implement the technology.

*P5: **Security** concerns will have a **negative** effect on chatbot technology adoption*

An overview of the innovation factors and their effects can be seen in table 11.

Innovaition characteristics	Effect
Relative advantage	Positive
Cost	Negative
Complexity	Negative
Compatibility	Positive
Security	Negative

Table 11 - List of innovation factors and the effect on adoption

5.3.2 Organisational factors

Organisational size

According to Hameed's (2012a) findings several studies have found a relation between organisational size and ability to adopt innovations. The size of an organisation is measured in terms of number of employees (FTE). In regard to defining the organisational size in a given company, we have chosen to use Statistics Denmark, which have defined all companies with 250 employees or less as small or medium sized companies, while all large companies have above 250 employees (DST, 2016). To simplify the labelling a company with 250 employees or less is described as small sized and a company with more than 250 employees is defined as big sized.

Most studies found that larger companies tend to be more likely to adopt innovation since they are more willing to experiment with innovations due the high amount of resources. In addition, larger companies found it easier to absorb risks and cost relation to the implementation than smaller companies with limited resources (Wang et al., 2010).

*P6: **Organisational** size will have a **positive** effect on chatbot technology adoption*

IT expertise

IT expertise refers to the technical knowledge available in an organisation. The more knowledge an organisation has about technological innovations, the more likely it will be to adopt IT innovation (Zhu et al., 2006). Companies with relevant IT expertise are more willing to adopt innovations as they understand the potential benefits better.

*P7: **IT expertise** will have a **positive** effect on chatbot technology adoption*

Organisation readiness

Organisation readiness refers to how essential an organisation sees new technology and in what extent the organisation depends on innovativeness for its survivability (Rai et al., 2014). An organisation's readiness for IT adoption does often appear in their company's vision and strategy for IT and digitalisation. Therefore, organisations with high organisational readiness understand the importance of implementing and using IT innovation.

*P8: **Organisation readiness** will have a **positive** effect on chatbot technology adoption*

Centralisation

The centralisation factor refers to the centrality of location of decision making authority. Studies have found a positive relation between decentralisation and information organisational structures. Organisations with those characteristics are often flexible and it is believed that it will enhance innovativeness by encouraging new ideas. On the other hand, centralised decision making is considered to be an obstacle for the adoption of innovations (Subramanian & Nilakanta, 1996).

*P9: **Centralisation** of decision-making will have a **negative** effect on chatbot technology adoption*

IT infrastructure

How much IT hardware and software the organisation has and if it is enough to support the innovation adoption. Studies indicate that organisations with a high level of IT infrastructure are more likely to adopt IT because the infrastructure is not a concern (Chan & Ngai, 2007).

*P10: **IT Infrastructure** connectivity is **positively** related to adoption of chatbot technology*

An overview of the organisational factors and their effects can be seen in table 12.

Organisational characteristics	Effect
Organisational size	Positive
IT expertise	Positive
Organisation readiness	Positive
Centralisation	Negative
Infrastructure	Positive

Table 12 - List of organisational factors and the effect on adoption

5.3.3 Environmental factors

Competitive pressure

Competitive pressure has been identified as essential in relation to organisations' decision regarding IT adoption (Zhu et al., 2003). As the competition increases, companies may see a need to invest and adopt the technology in order to gain or retain a competitive advantage.

*P11: **Competitive pressure** will have a **positive** effect on chatbot technology adoption*

External pressure

Besides competitive pressure, influences on companies' adoption of new technology have also been found from other external sources. External pressure refers to the influences from those sources. Companies can experience pressures from two aspects: suppliers and customers. If suppliers begin to support the new technology this will press the organisations to also adopt the technology. Customer pressure refers to the demand from customers of the organisation to provide the new technology as a new product or service (Ifinedo, 2011).

*P12: **External pressure** will have a **positive** effect on chatbot technology adoption*

Environmental uncertainty

This factor concerns the degree of unpredictability and volatility in the organisations environment. Literature suggest that firms operating in an uncertain environment are less likely to adopt innovations because organisations have little knowledge about how the innovation will fit in with tomorrow's market (Wu & chuang, 2010).

*P13: **Environmental uncertainty** will have a **negative** effect on chatbot technology adoption*

An overview of the environmental factors and their effects can be seen in table 13.

Environmental characteristics	Effect
Competitive pressure	Positive
External pressure	Positive
Environmental uncertainty	Negative

Table 13 - List of environmental factors and the effect on adoption

5.3.4 Top management factors

Top management attitude

According to the process for adoption innovation presented in section 5.1, formation of a favourable or unfavourable attitude towards an innovation takes place before a decision to adopt the innovation is made. The top management's attitude towards the adoption of new technology is crucial for the organisational attitude towards it.

If the top management perceives the benefits of IT adoption higher than the risks associated with adopting the new technology, then the business will be more likely to adopt the new technology (Thong & Yap, 1995).

*P14: **Top management attitude** will have a **positive** effect on chatbot technology adoption*

Top management Innovativeness

Top management innovativeness refers to a top management's ability to be innovative and to spread this innovativeness through the rest of the company. It worth noting that this factor is not the same as the previous factor, top management attitude, since the top management can have a positive attitude towards adopting new technology but still find it challenging to actually execute innovative actions. This may be caused by the business' past experiences with innovative initiatives or simply because the culture in the top management is not supporting innovativeness (Thong & Yap, 1995).

*P15: **Top management innovativeness** will have a **positive** effect on chatbot technology adoption*

An overview of the top management factors and their effects can be seen in table 14.

Top Management characteristics	Effect
Top Management Innovativeness	Positive
Top Management attitude	Positive

Table 14 - List of top management factors and the effect on adoption

5.3.5 Supplier factors

Supplier risk

A supplier can use different marketing strategies to increase the adoption of an innovation. The marketing strategy can be directed at reducing the risk associated with adopting the innovation from an early state (Easingwood and Beard, 1989). This may be achieved by giving a trial period to the customers for a certain period of time, or the supplier may decide to absorb a part of the risks by offering a lower introduction price (Frambach, 1998).

*P16: The **lower risk** for the customer will have a **positive** effect on chatbot technology adoption*

Supplier targeting

According to Frambach (1998), organisations such as innovative adopters as well as heavy users of the category of a specific innovation may be more receptive to the innovation than others. Before getting the innovation accepted by a bigger social system, the suppliers must therefore seek to obtain a critical mass of innovative adopters.

The probability of organisations adopting an innovation is therefore increased when suppliers from an early stage are more active in marketing the innovation toward the innovative organisations.

*P17: The more **focus on innovative organisations** will have a **positive** effect on chatbot technology adoption*

Supplier market winners

The third supplier factor is referring to the suppliers' approach to winning market support for an innovation, which may stimulate the diffusion it. One approach to win the market could be by gaining the favour among opinion leaders - for instance consultant firms. Another approach is to penetrate the market with lower prices than other suppliers and thus increase market share. Ideally, this would create a substantial positive word-of-mouth communication from adopters to potential adopters Frambach (1998).

*P18: **Winning the market,** through market penetration and being favoured among opinion leaders will have a **positive** effect on chatbot technology adoption*

Supplier co-operation

The last marketing strategy the suppliers can consider in order to increase the adoption of an innovation is to cooperate with other suppliers in order to educate potential users and expand total primary demand. By educating the target audience as to the workings of the new innovation, knowledge sharing will take place among the audience and the supplier can take advantage of the network externalities Frambach (1998).

*P19: The more **focus on training** of the target audience will have a **positive** effect on chatbot technology adoption*

An overview of the supplier factors and their effects can be seen in table 15.

Supplier characteristics	Effect
Supplier risk	Positive
Supplier targeting	Positive
Supplier market winners	Positive
Supplier co-operation	Positive

Table 15 - List of supplier factors and the effect on adoption

This concludes the 19 factors that collectively create our conceptual framework. The framework is conceptualised on a foundation of Rogers' DOI, TOE and Frambach's suppliers' aspect and refined through Hameed's comprehensive literature review. Our full conceptual framework is illustrated in figure 13.

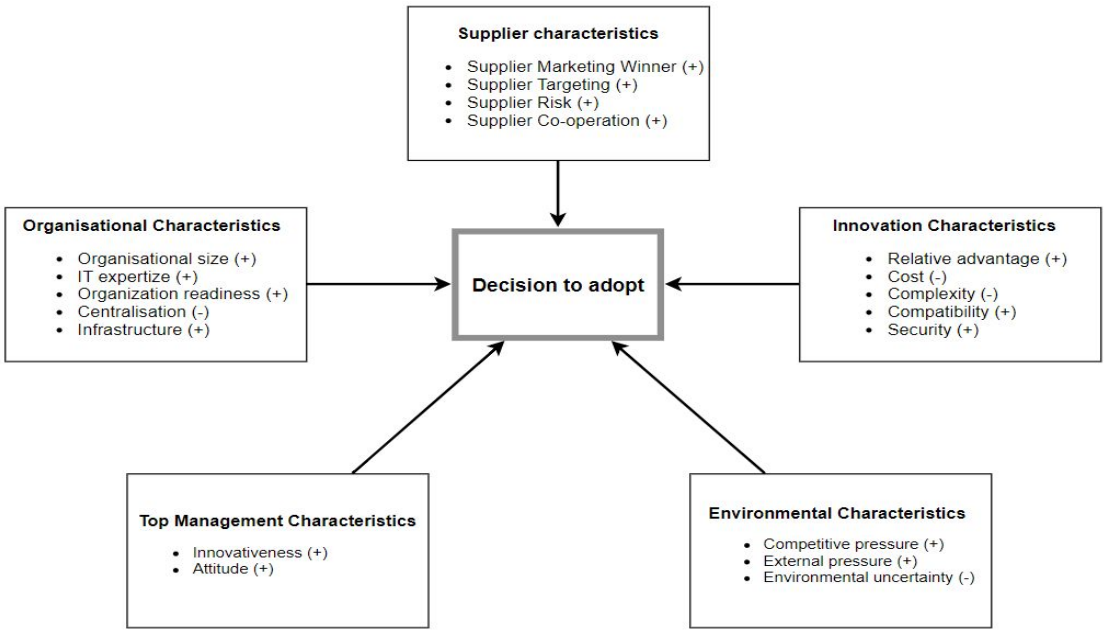

Figure 13 - Our conceptual framework

5.4 Miles and Snow's four typologies

In our thesis we ask the question: *How does a company's market strategy influence the adoption rate of the chatbot technology?* We chose to investigate this question by using Miles et al. (1978)[8] contribution to this field - a widely acknowledged research paper cited over 10.000 times[9]. It will not be a theory that guides our thesis or be a part of our conceptual framework but will instead be used to answer this specific aspect.

Miles & Snow (1978) state that organisations survive by adjusting and adapting to environmental changes and maintaining an alignment with it. This adaption can be defined as an organisation's market strategy: how it chooses to interact and relate with its market. By looking at the strategy, structure and processes of an organisation one is able predict its adaption process and thus its market strategy (Miles et al.,1978). Miles & Snow (1978) propose that there are four types of market strategies: Prospectors, Defenders, Analysers and Reactors.

Prospectors

Prospectors can be seen as the typical first-mover in a given market. Prospectors thrive in finding and exploiting new product and market opportunities, and measure success by how innovative their organisation is. This can even be valued higher than actually being profitable. Prospectors thus have to be aware of the risks that they run when they approach new technologies. New and immature technologies rarely have proved value and it might take several years before the technology generates value or might never generate value at all. Pursuing non-profitable innovations is therefore the biggest risk for a Prospector (Miles et al.,1978).

[8] For the sake of readability we will refer to this theory as Miles & Snow in the rest of the Thesis.
[9] According to scholar.google.com

Defenders

Defenders are quite the opposite as Prospectors. When prospectors generate value by exploiting new market opportunities, Defenders instead try to “seal of” a part of the market and make it nearly impossible for others to attempt to take this part of the market. They succeed in doing so by reducing costs and by selectively refining their current product offering. Defenders however tend to ignore shifts outside of their domain and can risk becoming ineffective because they are not suited to meet changes (Miles et al., 1978)

Analysers

Analysers are a type of organisations who place their market strategy between Prospectors and Defenders, borrowing the best traits from both. On the one hand, they pursue a Defenders strategy for the part of the market that they consider to be defendable and stable enough. On the other hand, an Analyser is not afraid of approaching new opportunities in the market. An Analyser will however only approach it after its viability has been proven. In practice, this means that they follow Prospectors closely and imitate them, adopting only the most successful innovations (Miles et al., 1978).

Reactors

Lastly, organisations are defined as Reactors when they have failed in pursuing one of the other three market strategies - a residual strategy. An organisation can end up as a Reactor for several reasons. One reason may be that the top management has not articulated the organisation’s strategy clearly. Another reason is that the organisation’s structure or processes does not fit the chosen strategy. Lastly, management may try to maintain a market strategy despite huge shifts in the environment, thus being unable to align the organisation with the environment (Miles et al., 1978).

6 Methodology

In this section, the decisions taken that affected the methodological approach of our thesis will be presented. The scientific world view will be defined, the general methodological decisions will be discussed and lastly the procedure of accessing, gathering and analysing the data will be presented.
This section is structured according to Saunders et al. (2009) research onion, which is a model that divides the research aspect of a thesis into six layers. The outer layer being philosophies, followed by approaches, strategies, choices, time horizons and the core of the onion being techniques & procedures. This onion metaphor is used to illustrate that each layer serves as a foundation for the layer that it surrounds (Saunders et al., 2009). This chapter will in addition be complemented with research from various other scholars.

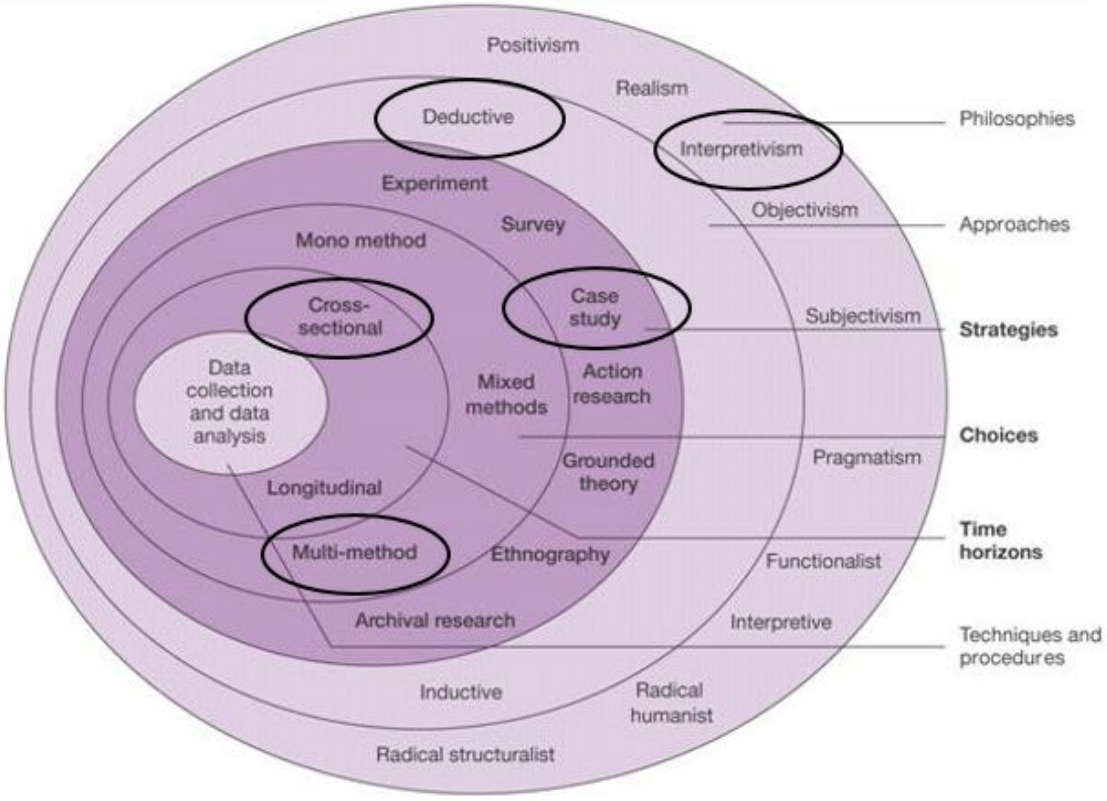

Figure 14 - Research onion, our choices are highlighted (Saunders et al., 2009)

6.1 Research philosophy

While Saunders calls this first layer “philosophy” it is typically referred to as a paradigm. A paradigm can be broken into ontology, epistemology and methodology (Burrell & Morgan, 1979). Lincoln & Guba (1985) argue that considerations of the first two, ontology and epistemology, precede discussion of the latter, method.

“Questions of method are secondary to questions of paradigm, which we define as the basic belief system or worldview that guides the investigator, not only in choices of method but in ontologically and epistemologically fundamental ways.” (Lincoln & Guba, 1985, p. 105)

Our research philosophy can in many aspects be attributed to our curiosity surrounding the methodological approach of the thesis. This curiosity will be explained below.
Our thesis had an interpretivist philosophy where we gathered and analysed the data qualitatively. We noticed that a lot of research addresses factors that influence adoption decisions, as presented in section 4.3.4 but all these studies had either a positivistic approach (see for example: Moch & Morse, 1977; Damanpour & Schneider, 2006; Karahanna et al, 1999) or they were a review of existing research (see for example: Hameed et al., 2012a; Frambach 1993; Tornatzky & Klein, 1982). In our thesis however, we, as researchers, had a curiosity that was driven by a more interpretivist question - *Why are so many companies adopting the chatbot technology.* For us it meant that understanding the decision to adopt and everything that affected it, had to be the main focus of our thesis. We argued that decision making can only be understood from the subject's point of view, thus bringing us into the interpretivist paradigm (Neuman, 2006). The epistemological consequence of this was that the truth about an adoption decision process could not fully be explained by quantitative approaches, but had to be explained by understanding the subject. Truth is therefore something that is formed by every individual, and may therefore not be the same from subject to subject (Neuman, 2006). This truth is however studied within the same socially constructed world and we therefore can compare these different truths that we expect to find in our research.
Our methodological curiosity therefore led us to an interpretivists philosophy. Our research, however, had roots in a topic that traditionally had been studied quantitatively. In practice, it meant that we took inspiration from the quantitative studies but applied it qualitatively.

6.2 Approaches

In this section, we want to elaborate on our approach - whether our thesis is deductive or inductive. An interpretative paradigm is often associated with inductive studies. Saunders et al. (2009) agrees with this statement but is more reserved in his discussion:

“...deduction owes more to positivism and induction to interpretivism, although we believe that such labelling is potentially misleading and of no real practical value.”
(Saunders et al., 2009, p. 124)

Our thesis challenges the notion that deduction owes more to positivism, mentioned in the first part of Saunders’ statement. Our thesis has a deductive approach, yet still an interpretivist philosophy. However, we are not deductive in the traditional sense: generating hypotheses, testing and then confirming or readjusting them (Saunders et al., 2009). We are still interested in understanding the meaning humans attach to events, which is quintessentially an inductive approach. Our thesis does therefore not fully lend itself to either of these approaches but borrows from both.

We begin our thesis with a developed conceptual framework, yet we do allow subjects to have an impact on how the framework is refined. The approach of our project is thus somewhere in the middle *'a deductive, qualitative analysis',* an approach presented by Gilgun (2015). This means that we let theory guide the process, which then enabled us to conduct our qualitative research based on already established concepts and frameworks (Gilgun, 2015). The pre-established theory let us make assumptions about the environment and from the data we were able to understand if these assumptions were valid or if we could highlight gaps in the theory. We argue that our approach lets us take advantage of the strengths of both the inductive and deductive approaches. Creating a conceptual model deductively lets us focus our study and be more precise in our further data collection. Using inspiration from the inductive approach lets us use the qualitative data to still go beyond the conceptual framework and find potential aspects, that our predefined conceptual framework cannot answer.

6.3 Research Strategy

Next up the third layer of Saunders et al. (2009) research onion, where we define the research strategy of our thesis. We approached the research question by investigating organisations that either had adopted a chatbot or were considering adopting one. We then collected data from these organisations and synthesised the findings. This project was thus a case study. Using Robert K. Yin's book "Case Study Research" (2014), we elaborate on this research strategy in the following.

As presented earlier, we were investigating why Danish companies are adopting *chatbot technology* and how this can be explained by using the *IT innovation adoption* theory. This problem statement provides a lot of information regarding the strategy of the thesis.
Firstly, it shows that the project asked why and how. This is traditionally often used in case study research strategies (Yin, 2014). Additionally, both *chatbot technology* and the *IT innovation adoption* theory are mentioned in the research question. These two concepts, chatbots and IT innovation adoption, guide the thesis towards the study propositions in advance (Yin, 2014; Saunders et al., 2009).

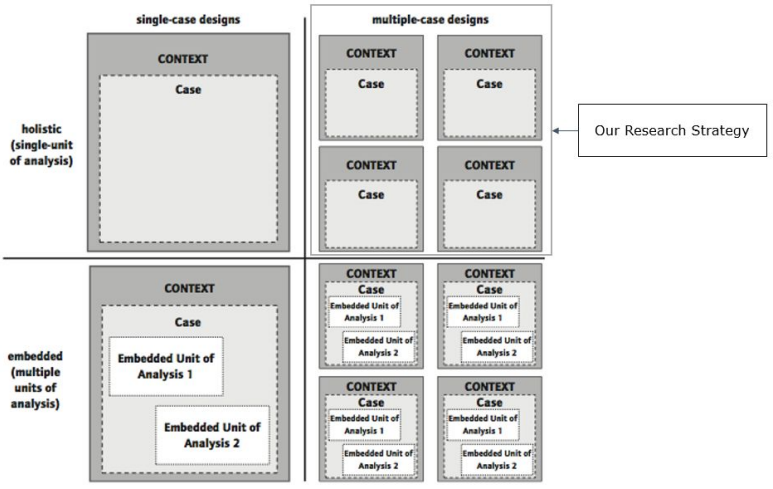

Figure 15 - Basic Types of designs for Case Studies (Yin, 2014)

Using Yin's (2014) basic types of designs for case studies we found that our project was both holistic and had a multiple-case design. To solve our research question, we found a single-case study to not be enough. We wanted to compare how organisations experienced chatbots from many different views, and therefore the project had to be a multiple-case study. This follows our epistemological philosophy, that each case will have its own truth, and we will thus need the strengths of the interpretivist paradigm.
In each case study, we had one unit of analysis - this being their use of and opinions towards the chatbot technology (Yin, 2014).

6.4 Choices and Time Horizons

The last two layers of the research onion concern the choice and time horizon of the thesis. These two layers are not extensive and are therefore briefly discussed below before moving into the core of the onion which is the data collection and data analysis section.
Regarding the choice of the thesis, we chose to centre our data around the qualitative aspect. We used two qualitative data collection techniques, interview and documentation, and analysed this data with one qualitative data method. We thus used a multi-method qualitative study because the data collection comprised of two different techniques (Saunders et al., 2009).
The time horizon of this thesis was cross-sectional, meaning that it is a snapshot of the investigated case at a specific point in time (Saunders et al., 2009). In comparison, the project could have been longitudinal, meaning that the organisations would have been investigated across time, e.g. over a year's timespan (Saunders et al., 2009). This was however, not possible due to time-constraints. A cross-sectional time horizon is also more appropriate in a dynamic case study like this, where the empirical data is time sensitive.
Miles & Huberman's (1994) graphic overview of qualitative research types lets us summarise the approach more generally: *The research interest is in → the comprehension of the meaning of action → using interpretation → in a case study (Miles & Huberman, 1994, p.7)*

6.5 Data collection and data analysis

We have now been through the outer layers of the onion. The layers have descriptively been peeled of resulting in a sound and concise description of the methodology of the thesis. In this section, the data collection will be presented and discussed. In order to ensure rigour in this thesis, we will describe in detail how we went about collecting the data and why these strategies were chosen (Silverman, 2005). Holliday (2007) supports the importance of being thorough, especially when the study is qualitative.

> *"Qualitative researchers… can easily underestimate the need for detail in their description of procedure, thus overlooking an important aspect of the demonstration of rigour. One area that requires such detail is the degree of engagement with the setting"*
> *(Holliday, 2007, p. 53).*

Ensuring that future researchers can repeat our study and that organisations will be able to understand the findings from our thesis also motivates us to be thorough in this aspect. We will discuss the circumstances of access, why those cases were chosen, the chosen techniques for obtaining the data, characteristics of the interview and then how we synthesised them and coded them. This section will use an active narrative structure in order to more naturally explain all considerations that formed the data collection (Silverman, 2005).

6.5.1 Gaining access to the case organisations

We got in contact with most of the case companies by using our professional network; asking colleagues proved very fruitful as they often could put us in contact with relevant stakeholders in relevant organisations. We gained access to the last two companies through acquaintances who could put us in contact with relevant stakeholders. Accessing the case organisations through our sources meant that they could vouch for us when putting us in contact with the company making them more inclined to talk to us. In fact, we were not turned down by a single company. If we instead had used cold-calls when contacting the companies, we expect that this would not have been the case.

Choosing the cases for this project was therefore affected by which companies we got access to. A lot depended on what people our network knew and could put us in contact with. One important aspect that was required by us, before we could accept the case organisations, was that we could conduct the interview with a person that was a stakeholder and had high standing decision rights regarding a potential chatbot adoption project. Looking back, we argue that we managed to get a diverse range of companies as cases. We gathered 10 cases, where three of them were insurance companies, two banks, three pension companies and two telecom companies. Most importantly for us was that we had some organisations who had adopted the chatbot and some that not yet had adopted it. We managed to get six cases that had not yet implemented a chatbot while the other four had a chatbot. This follows Yin's (2014) replication logic argumentation, where, instead of using sampling logic to comment on a whole population, our goal was more theoretically motivated. By replicating the applied theory across cases our findings could be validated through the other cases of our thesis that supported it (Yin, 2014).

In addition, we interviewed two suppliers of the chatbot technology who operate in the Danish market and two IT consultants from Deloitte Denmark experts in the chatbot technology in the Danish market.

The process of collecting data from each case was initiated with either a phone call or an email to the person we were put in contact with from network or acquaintances. We explained our project and if they were interested we proposed to come to their offices and conduct an interview with them.

Table 16 - Interview overview

Company	Type	Date for the interview	Name and role of informant
Alka	Case organisation	05/03/18	Christian Ahle Greve, Chief Customer Officer
CBB	Case organisation	02/03/18	Søren Meier Svendsen, Head of Market
Danske Bank	Case organisation	15/03/18	Jens Lund Andersen, Chief Consultant
Nordea	Case organisation	01/03/18	Mattias Fras, Group Head of AI Strategy & Acceleration
PensionDanmark	Case organisation	16/03/18	Peter Juncker, CIO
Sampension	Case organisation	08/03/18	Mads Ehlers Rasmussen, Head of Digitalization
SEB Pension	Case organisation	15/03/18	Martin Jacobsen, Program Manager and NewTech proponent
TDC	Case organisation	08/03/18	Ruth Nielsen, Product Owner
Topdanmark	Case organisation	16/03/18	Søren Hebsgaard, Chief Digital Officer
Tryg	Case organisation	01/03/18	Bjartmar Jensen, Chief of Process Excellence
Deloitte Denmark	Chatbot experts	07/02/18	Jørgen Steines, Partner Marc Halgreen, Senior Consultant
Boost.ai	Supplier	06/03/18	Peter Schmidt, AI Supervisor
BotXO	Supplier	02/03/18	Henrik Fabrin, CEO and Co-founder

6.5.2 Data collection techniques

We conducted one interview with each case organisation, 10 in total, and conducted the interviews within as small a timeframe as possible, in order to increase the rationale for comparing the cases. The first interview was held on the 1st of March and the last interview was held on the 16th of March. One week prior to each interview we sent an email with the overall questions that we wanted to ask them, reducing uncertainty on their side while also giving them the opportunity to prepare. Only interviewing one person from each case may seem like a lack of representativeness of the organisations, but given the fact that we managed to get in contact with important stakeholders with sufficient decision rights we argue that the informant could represent the whole organisation when regarding the adoption of a chatbot. This statement is also supported by Frambach et al. (1998).

"[the adoption] can be observed by interviewing only one person, in spite of the adoption by organizations being a group process. A single member of the group, if s/he has a position of sufficient authority in the group, will know of the outcome of the adoption process and the main considerations for it." (Frambach et al., 1998, p. 166)

The interviews were held as semi-structured interviews. Using the already established conceptual framework we created an interview guide. The questions were created according to the factors that our conceptual framework presented to ensure that we could use the interview to measure each factor. For example, the **Compatibility** factor was operationalised by asking the question *"What challenges has your company experienced in relation to the implementation of chatbot technologies?".* See interview guide in appendix 4 and factor operationalisation schema in appendix 5. It is worth noting that the interview guide for the adopters did not include the supplier factors, and that the interview guide for the suppliers was only based on the supplier factors from the conceptual framework.

The interview guide could change slightly based on if the organisation had implemented a chatbot or not. The interviews with organisations who had implemented a chatbot were naturally more retrospective, especially when discussing costs and benefits, while interviews with organisations who did not have a chatbot focused more on the anticipated costs and benefits. As mentioned, we also interviewed two chatbot experts and two suppliers of the chatbot technology. We held one interview with both chatbot experts present. This interview had no clear structure and was intended to evolve more naturally, where we let the experts talk freely. This was the very first interview we held and was therefore an important first step for us to get an insight into the field before we interviewed the case companies. The interview with the chatbot suppliers was conducted as a semi-structured interview. We created a different interview guide for these interviews because we investigated specific supplier related factors. See interview guide for the suppliers in appendix 6.

All the interviews were audio recorded, except the expert interview, which was documented with notes. The interviews were performed by the three researchers in the thesis team. In most of the interviews two of the researchers attended the interview, where one asked the questions while the second took notes and made sure that all questions were fully answered. We chose that only two of the researchers should attend the interview in order to create less intimidating settings for the informant (Saunders et al., 2009). Exactly who attended the interview and which role each had changed on a rotating basis from interview to interview. The duration of the interviews was between 45-60 minutes.

Using semi-structured interviews complemented both the ontological and epistemological views of this project. As stated, the project was an explanatory study where we sought to understand the decision process of adopting a chatbot (Saunders et al., 2009). We therefore followed the epistemological presumption that truth is found from inside the individuals thus also believing that truth is a subjective phenomenon (Neuman, 2006). With semi-structured interviews, we were able to adapt our questions according to the situation and, more importantly, ask probing questions when necessary (Saunders et al., 2009). Lastly, we also argue that there was a higher mutual trust between us and the respondent, which increased the validity of the information provided.

A survey, for example, would not enable us to create the same kind of trust as a face-to-face interview did (Saunders et al., 2009).

The case studies were not just based on a single interview, however. In order to create a more contextually relevant setting for the organisations we also gathered data from two types of documentation sources. The first documentation source was annual reports by the 10 different case companies. We mainly used these reports to corroborate what was stated in interviews (Yin, 2014). This especially helped in showing what was prioritised by top management by looking through the strategic focus. This helped indicate if an implementation of a chatbot followed strategic points highlighted in their annual report. An overview of the annual reports and our findings from it can be found in appendix 7. Secondly, we also used news outlets to find articles that mentioned the case companies. This was especially an approach we chose to create a narrative behind each case, which could show why the cases were unique and how they compared to each other from the media's point of view. These two secondary data sources were treated as important data sources, but we acknowledged their limitations. They were not intended to be used by us to comment on innovation adoption, and it is therefore likely that it contains reporting bias as the author of the document could have tried to e.g. convey a sense of success (Yin, 2014).

6.5.3 Analysing the data

The last section of this chapter concerns how we synthesised the data. In this section, we will present our considerations when reducing, displaying and validating the data. This part of the thesis was guided by Miles & Huberman (1994) who divide qualitative data analysis into three sections, reduction, display and validation, and Yin (2014) who presents a procedure model of how to conduct a multiple-case study.

Data reduction, Display and Validation

After having conducted all interviews we started coding them with regards to the factors in our conceptual framework presented in section 5.3. Because we had built the interview guide close to the factors, we did not see a need to transcribe the whole interview, instead we wrote down every quote that could be related to a specific factor. In the coding document, we wrote the quote that was relevant to a specific factor and attached a timestamp to each quote as well. It is worth noting that the interviews were conducted in Danish but later, when the quotes were transcribed, were translated to English. See coding of adopter interviews in appendix 8, coding of supplier interviews in appendix 9 and notes of expert interviews in appendix 10. By coding the interviews, we also increased the reliability of the study because it ensured that we had good access to the words spoken in each interview instead of being reliant on an interviewer's memory (Silverman, 2005). However, one limitation of this coding process was that the researchers who coded the interviews also conducted the interviews. This might create some bias if the researcher already has an end-goal of the thesis in mind that they, knowingly or unknowingly, code towards (Saunders et al., 2009). We continued reducing the data into smaller parts. One important data reduction step was to transpose comments about a certain factor into a scale of low, medium and high.

We saw this as an effective way of reducing a large dataset into a table where we easily could compare factors across cases. We therefore went through each factor for each company and defined if, for example, the informant perceived the **Complexity** of the chatbot technology as being high, medium or low. The complexity factor was then labelled accordingly. In order to increase validity of this process we used investigator triangulation (Yin, 2014), meaning that we labelled each factor separately at first and then collectively looked at our results. If we disagreed about a certain factor we would discuss it and let the best argument decide what label the factor would finally get. We would however, make sure to always keep the quotes and the labels together when conducting our analysis in order to not strip the data from its context (Miles & Huberman, 1994). When displaying the data, we used several different charts and figures. These were chosen based on what purpose the data display had as different charts have different strengths and weaknesses. Throughout the analysis we used matrices and tables to cluster, compare and focus certain aspects of the analysis. In addition, we used more specialised charts, such as the radar chart, to increase the visual narrative.

Data reduction, display and validation are not three separate phases, but interwoven and dependently affecting one another (Miles & Huberman, 1994). This was evident when we reduced the data into more primitive labels. This led us to displaying the data in a more concise manner where we could look across cases in one single display and validate the data easily. Data validation was thus seeing patterns in our data when we were in the process of displaying it or reviewing our data display results.

Analysing a multiple-case study

Our entire process of creating this thesis can be illustrated with Yin's (2014) Multiple-case study procedure figure displayed below.

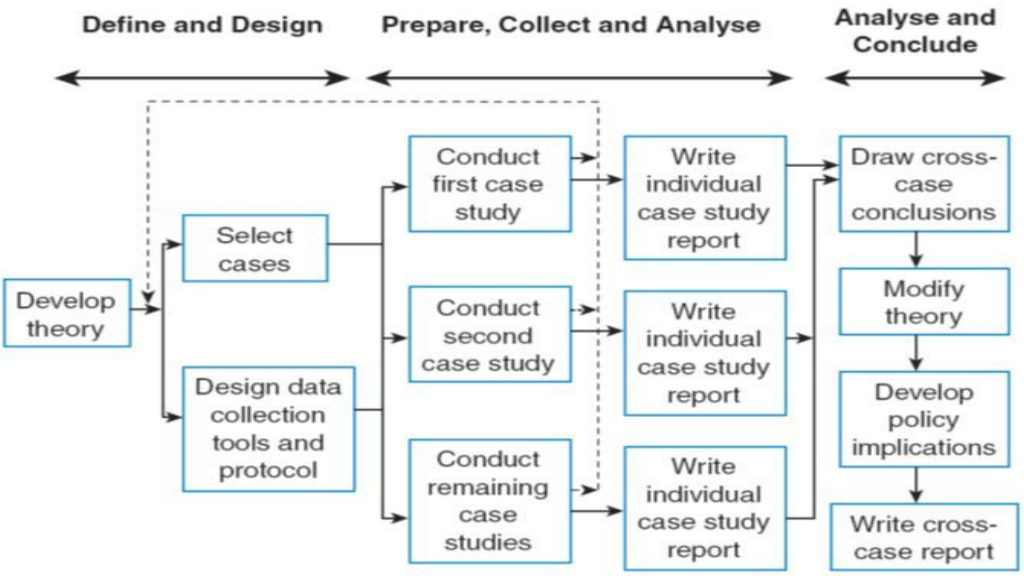

Figure 16 - Multiple-Case Study Procedure (Yin, 2014)

The first phase, Define and Design, has just been covered in the two previous sections. The second phase, Prepare, Collect and Analyse, has partially been covered in this section as well, yet the analysis part has not been covered. In this phase, the individual case analysis was conducted where we looked at each case in isolation and found emphases, patterns and themes (Miles & Huberman, 1994). In the last phase, Analyse and Conclude, we change perspective and look at all cases together conducting a cross-case analysis. This section relied on several data displays in order to highlight cross-case conclusions. The “Modify theory” and “developing policy implications” steps will be addressed in the discussion section.

6.6 Reliability, Validity and Generalisability

In academic papers validity and reliability are important factors if the results of the study should be trusted (Silverman, 2005). The philosophy of our thesis, being that it is a qualitative study, challenges the degree of reliability. Our data reflects an organisation's view on a specific artefact at a specific point in time; we would therefore be stretching the truth if we proposed that other researchers can repeat this study and get the same data (Saunders et al., 2009). In this thesis, we instead focused on gathering the necessary data in a complex and, especially, dynamic setting. We did consider reliability by making the data that we gathered as available as possible for other researchers. We systematically documented the whole process, recorded and coded the interviews, which makes it possible for other researchers to see the data and make their own analysis of it (Silverman, 2005).
Validity questions if the gathered data can be accepted as truthful. With the use of semi-structured interviews, we argue that we have a high degree of validity in our data. Semi-structured interviews lets the informant bring forth his or her own meanings about the given topic and is given time to describe this from a variety of angles (Saunders et al., 2009). One validity challenge regarding qualitative data is that it often suffers from the problem of anecdotalism. Anecdotalism refers to the challenge for researchers to prove that the conclusions are based on the whole dataset and is not just highlighting a few perfectly chosen examples, in order to arrive at an interesting conclusion (Silverman, 2005). Transparency of showing our interviews, our coding and documenting the process will be used to avoid the problem of anecdotalism.
Lastly, we will not, at this point, claim that the results of our thesis will be generalisable to other industries or companies (Saunders et al., 2009). We had a motivation to understand chatbot adoption, but we will only understand it within the boundaries of the case companies involved in this thesis.

In conclusion, this thesis’ methodological foundation was built around the research onion (Saunders et al, 2009) with input from Silverman (2005), Yin (2014) and Miles & Huberman (1994). Going through the different layers of the research onion showed that this thesis had an interpretivist philosophy in where we saw each individual having their own perceived truth. However, we sought to compare these different truths through a deductive approach where we created a conceptual framework prior to gathering the data. Our research strategy was a multiple-case study, where we wanted to apply a conceptual framework.

We chose to both gather and analyse the data with one qualitative method, which meant that we chose a multi-method qualitative study. In addition, the time horizon, was cross-sectional. In the core of the research onion we described how we got access to the 10 case companies, two suppliers as well as chatbot experts. Then we described how we used semi-structured interviews as our data gathering technique and how we had synthesised the data according to Miles & Huberman (1994) and Yin (2014). Finally, we discussed the validity, reliability and generalisability of the thesis, where transparency and documentation of procedures were key.

7 Analysis

This section will continue to follow Yin's (2014) "multi-case study procedure" model as presented in the methodology section. We have up to this point developed the theory, selected the cases and chosen the data collection techniques. We will now move into the *"Prepare, Collect and Analyse"* phase where we will present the data and progress into the last phase *"Analyse and Conclude"* where we will begin drawing conclusions.

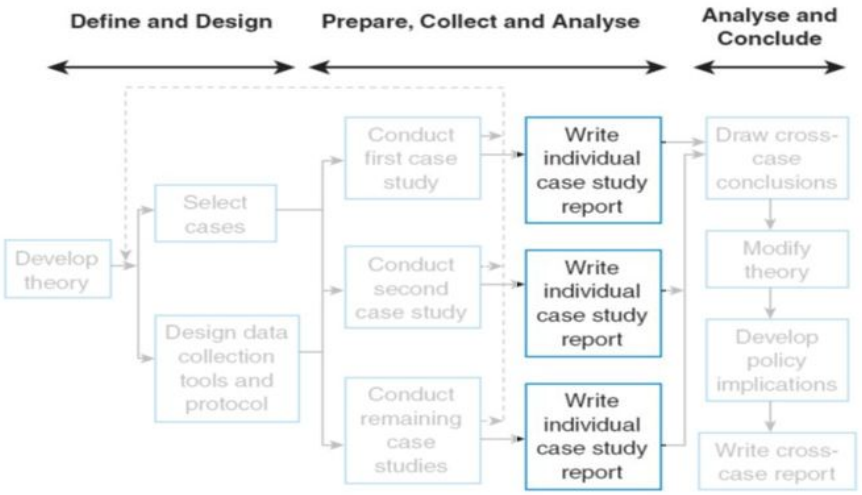

Figure 17 - Multiple-Case Study Procedure (Yin, 2014)

The first section of the analysis will focus on the individual cases, where we will conduct the individual case analysis. This will result in a presentation of each case organisations. The second part of the analysis will see us move into the "*Analyse and Conclude*" phase, where we will conduct our cross-case analyses, which will let us draw conclusions based on the analysed data. Here we will begin by looking at all the cases overall and find general patterns and tendencies that can unveil what drivers and barriers are important when deciding to adopt a chatbot. Then we will dig deeper in order to understand why some adoption factors are significant in some cases, and not in others. This will require several different approaches to analysing the data.

7.1 Individual case analysis

In this section, each case will be presented. Their situation and how they perceived the chatbot technology, at the time the interviews were conducted, will be presented. We will compare the companies to the adoption factors that were included in our conceptual framework, as mentioned in our theory chapter. It is worth noting that not all adoption factors from our conceptual framework will be mentioned in the case presentation but we will highlight only the most significant ones in order to focus this section and stay concise. Every case analysis will however be concluded by showing all adoption factors on a radar chart compared to the organisations in order to increase the comparability of the adoption factors between cases. Each case presentation will additionally be defined in relation to Miles & Snow's market strategy typologies (1978), which will increase comparability and introduce an insight into the company's overall positioning in the market. The concluding text of each individual case analysis will be compared to the media coverage of the organisation, to highlight similarities and to support our ability to identify their market strategy. The interviewed suppliers will not be included in our individual case analysis, but they will be analysed in a separate section later in this thesis.

7.1.1 Method for comparing qualitative data

Throughout the following individual case analyses we will switch between using full quotes from the organisation and use our own standardised scales that we created from the interviews. We argue that using quotes is essential to demonstrate how the organisation thinks and acts, but in order for us to compare the organisations we created a scale that was based on an iterative process of reducing these key quotes down to a standardised scale that was similar across cases (Miles & Huberman, 1994). This was done by using a three-point scale where each adoption factor was given either a "low", "medium" or "high" label based on key quotes from the interview with the case organisations. It is worth noting that in order to compare the adoption factors across the cases, we labeled the factors based on the perception that the companies had about the chatbot technology *before* they implemented. This means that in cases where the companies already had implemented a chatbot, we analysed how they perceived the chatbot technology before the implementation and not how they have perceived it after the implementation. The interviews with organisations that had already implemented a chatbot had thus a more retrospective approach. The radar chart shows if an adoption factor is, according to theory, positively or negatively influencing the adoption decision. The closer to the outer circle of the chart, the more positively it influences the adoption decision. The opposite is thus: the further towards the centre of the chart a factor is indicated, the more negatively it influences the adoption decision. This enables us to create comparable radar charts, which will conclude each individual case analysis. These charts will broadly summarise each organisation and will enable us to locate drivers and barriers moving forward.

7.1.2 Alka

Alka implemented a chatbot called *Alma* in their call-center in the early summer of 2017. The reason behind this implementation is closely related to their overall company strategy, which is to deliver the best customer experience in Denmark (Alka, Annual Report, 2018). Alka expects to execute this strategy by enabling and increasing contact with customers through digital channels (Alka, Annual Report, 2018). Therefore, implementing Alma matched with the rest of the company's goals. Alma was implemented to act as an all-around customer service employee by answering many different types of questions from customers and guide them in the right direction in order to get the best advice.
When we conducted the interview, the chatbot operated as a simple "Frequently Asked Questions (FAQ) chatbot", where the customer can ask simple, non-customer specific questions. The decision to launch this simple version was to let the chatbot enter the market as quickly as possible. The future vision for the chatbot is to integrate it with the core IT systems, which will make the chatbot able to provide a more customer specific experience as well as using it in a more commercial setting in order to increase sale

"It is in our roadmap. But there are some issues. You must uniquely identify yourself so that it can go into the core system and answer your questions. [...] It should also be able to sell more. The biggest challenge is that we have not taken a larger commercial approach to it." (Alka, Interview, 11:44).

The right fit for Alka

Alka saw the chatbot technology superior to alternative technologies like classic customer service over phones or through live chat due to a lack of 24/7 availability. The lack of 24/7 customer service was a significant constraint for the company to fulfil their overall strategy to provide the best customer experience for its customers.

> *"In relation to this, we would like to be available, as also stated in our digitalisation strategy that most of our customers will meet us digitally. [...] but this is hampered by the fact that we are not open 24/7. And we really want to give our customers an opportunity to chat with us. [...] so customers can get in touch with us anytime they want to buy insurance." (Alka, Interview, 03:28)*

Alka did see high **relative advantages** in the chatbot technology since it made it possible to answer simple questions from the customers at all times. In addition, the potential of making customer service more cost efficient was also attractive. They also saw an advantage in the fact that the technology required relatively low capital **cost** in the implementation phase.

> *"I mean, it is at least under 2.000.000, which are relatively low costs." (Alka, Interview, 19:55)*

Before implementing the chatbot technology, Alka acknowledged that their experience with technologies like Robotics and artificial intelligence was limited (Alka, Interview, 37:46). However, they still wanted to adopt the chatbot technology despite the lack of established competencies. This was mainly because Alka anticipated that acquiring the necessary chatbot **expertise** was mostly driven by a learning-by-doing approach by cooperating closely with the chatbot supplier.

"It has been a learning-by-doing process. They [Alka employees] have been sitting next to our consultants from the Boost.ai and have learned this. But I think taking into account that it's a completely new technology, then 3-6 months [of training] is not that much." (Alka, Interview, 23:40).

Despite the limited past experience with similar technologies, the technology was still aligned with Alka's existing values regarding being digitalised, which was mentioned in their digitalisation strategy (Alka, Annual Report, 2018). There are therefore both drivers and barriers when considering how **compatible** the chatbot implementation is. However, it shows an organisation that is **ready** to jump into new innovations, even enforcing a hiring freeze to emphasise the necessity for automation and digitalisation (Alka, Interview, 37:46).

Eagerness to be innovative and to be the first with new technology

During the interview with Alka, it was clear that the **top management** had an innovative attitude and a willingness to invest in new technologies. The top management's eagerness for digitalisation is evident in the overall strategy as mentioned before. This is also supported by Alka's annual report where digitalisation is presented as a high prioritisation and perceived as crucial to keep providing high customer service.

"Digital opportunities are constantly evolving, and Alka has managed to be the Danish insurance company at the forefront of development" (Alka, Annual Report, 2018)

Because of the eagerness to be innovative and their commitment to new technologies, we argue that Alka is using the Prospector market strategy according to Miles & Snow's typology of market strategies (1978). Looking through recent media coverage of Alka, it is also clear that the company want to position themselves as innovative and digital. Alka announced back in 2016 that they wanted to create an innovative culture and to be a digital and agile company (Mandrup, 2016). Moreover, the company was a runner up in the competition for 2017's most digital insurance company, and is nominated for the prize yet again this year (Manniche, 2017; Christensen, 2018). Finally, the prospector market strategy is also indicated by Alkas willingness to adopt despite the lack of pressure from the environment.

"I think you need to distinguish between having a digital competitive advantage and then <u>being</u> digital as a competitive advantage. If your digital experience is not complete, then it will be a competitive disadvantage. Therefore not necessarily a competitive advantage to have a chatbot, but a competitive disadvantages not having a chatbot." (Alka, Interview, 16:45).

They are not necessarily driven by a competitive pressure or being first, but want to complete their digital experience from a customers' perspective. This indicates a high focus on locating the technologies that can cover these needs.

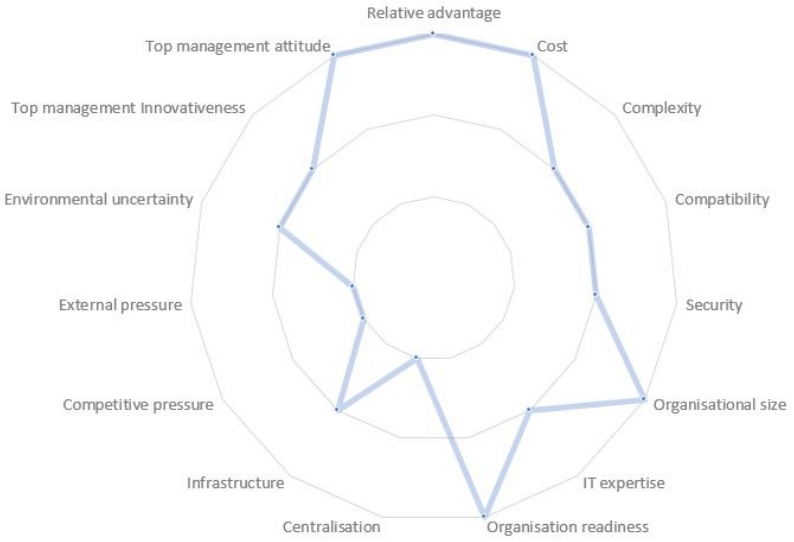

Figure 18 - Alka radar chart

7.1.3 CBB

CBB is a small company operating under the big Norwegian telecom company Telenor. CBB is an interesting case because the company recently had implemented a chatbot, and they therefore had their implementation fresh in mind. More specifically, the company launched the first version of their chatbot in the end of January 2018 and we interviewed them in the beginning of March. Their chatbot was serving as a simple FAQ chatbot and was not integrated with the rest of CBB's core IT systems.

The chatbot technology was not a plug-and-play solution

The reasons behind CBB's choice to implement the chatbot technology was partly due to a desire to deliver a better digital customer experience and partly done from a cost-efficient perspective. The company mentioned that good customer service was considered a top priority.

> *"[...] We aim to have a very good customer service and handle our customers well, it is an important part of our brand." (CBB, Interview, 05:10)*

The company therefore saw a **relative advantage** in implementing the technology due to the expectation of enhancing customer service as well as saving resources.
The **cost** related to the implementation is an interesting aspect in the case of CBB. Before implementing the technology, the company viewed the project as very inexpensive.

The capital expenditures were considered low, and in terms of labour resources they did not expect it to be significant either (CBB, Interview, 13:25). This was also confirmed by the fact that they thought of the project as a plug-and-play solution.

"We underestimated that it was an IT project and looked more at it like a commercial project like a service you could just take down from the shelf and someone didn't need to be technical in order to work with it." (CBB, Interview, 24:10)

Once CBB started implementing the technology they experienced a large increase in the need for labour resources and it surprised the company how many technical challenges they experienced. The perception of the cost related to the implementation was therefore initially low but when the implementation was realised it turned out to be costly (CBB, Interview, 13:25).
This also connects with the perceived **complexity** of the chatbot technology. Like the cost, CBB first saw the adoption technology as a straightforward task. However, in later stages of the adoption process the company experienced the technology as very complex (CBB, Interview, 16:05).

Limited IT capabilities but high ambitions

CBB is a relatively **small company** with only 120 employees. CBB has traditionally not had its own IT department, and IT has been handled by Telenor's central IT department. However, an in-house IT department has recently been built at CBB in order to use IT as a more strategic asset (CBB, Interview, 46:04). This also characterised the **IT expertise** that CBB had. They only recently established an IT department which indicates that they are still developing their IT capabilities. This is also confirmed by the lack of experience with similar technologies (CBB, Interview, 26:25).

The relatively low IT expertise also relates to a number of challenges that CBB had in terms of **infrastructure**. During the adoption, CBB faced a lot of challenges when they tried to merge the chatbot with their current manual chat. This resulted in an undesirable solution where customers had to change interface if they wanted to switch from talking to a chatbot to a human employee.

"We spent a lot of time trying to find some shortcuts and loopholes to make it a success [...] It made a unintended break in the conversation, when you have to switch from a conversation with the chatbot to our manual chat system." (CBB, Interview, 16:50)

The company acknowledged that this is a big problem, and that they had not been through enough when they chose the chatbot supplier. CBB saw this as such a big problem that they were looking for a new supplier (CBB, Interview, 17:20). This challenge can be attributed back to the fact that CBB did not understand the full scope of the project before adopting the technology.

Even though CBB has a relatively low IT expertise, we found the **organisational readiness** to be rather high. CBB sees IT and digitalisation as an important asset in their company, and they expect it to play a more strategic role in the future.

“It is clear that IT will play a strategic role in the future - everyone talks about how to automate, etc. more data, better data. We have recently insourced IT in CBB so it's also a sign that it's going this way.” (CBB, Interview, 44:30)

Regarding the **external pressure** that CBB experienced, we found it clear that they had experienced an increasing pressure from their customers. CBB mentioned that they had seen a large increase in traffic through their chat communication channel, where the number of requests had grown by 50% within the past year (CBB, Interview, 05:30). CBB wanted to meet this increase in traffic by implementing the chatbot technology, in order to ease the pressure on the customer service employees.

The case presentation of CBB up until this point indicates that CBB is using a Reactor market strategy (Miles et al., 1978). The underlying reason for implementing the chatbot technology was due to an increasing demand from their customers for chat based communication. CBB chose to react to this without having a clear strategy in advance. They had no experience with technologies similar to the chatbot technology and therefore did not consider the full scope of the project. In addition, CBB did not have a clear strategy toward being innovative which is elaborated in the following quote.

“We do not have a specific innovation agenda, we just want to make things smarter and better - here we of course want to involve both customers and employees.” (CBB, Interview, 50:35)

The quote indicates that the **top management** in CBB did not have a clear strategy towards being innovative. Among other things the company mentioned that they had a lot of ideas, they just did not have the resources to execute them (CBB, Interview, 51:50). Nevertheless, they still try to implement the chatbot technology resulting in a half-hearted attempt that ends up being a bigger investment than expected.

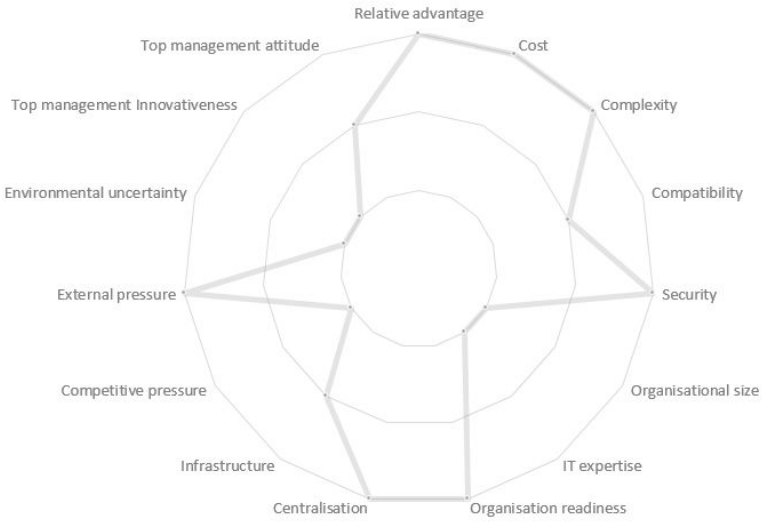

Figure 19 - CBB radar chart

7.1.4 Danske Bank

Danske Bank is the second largest case organisation and is one out of two banks included in this case study. Danske Bank operates within personal banking, business banking and private banking. When considering their chatbot project they envisioned that their chatbot would serve across these three banking areas, enabling a better customer service and would function as a supplement to their call-center (Danske Bank, Interview, 02:37). Danske Bank had, however, not yet implemented a chatbot as they still were considering how good a fit a chatbot would be for their organisation. Probably the biggest reason for Danske Bank not having implemented a chatbot yet was that they saw it as a very big endeavour. They were covering and investigating how big such an implementation would be for Danske Bank. The company acknowledges that a chatbot could be introduced but they were afraid that it will not be capable to answer all of the customers questions and thus end up being perceived as unprofessional towards the customers (Danske Bank, Interview, 08:35).

Chatbot technology as a knowledge management project

Danske Bank anticipated many **advantages** from a potential chatbot implementation. First and foremost, they expected the chatbot to be a service that could guide the customers through the self-service site.

> *"[The chatbot will be able to] start answering all the requests from customers where we actually know they started searching for the answer themselves, but in some way they have stopped because it might have been too difficult for them and choose to call instead."*
> *(Danske Bank, Interview, 01:18)*

By doing this they can reduce the number of customers contacting the call-center with questions that are already answered on the webpage. This would in turn also mean that they could reduce the number of customer service employees. Danske Bank thus saw opportunities from both a customer experience perspective and from a cost reduction perspective.
Danske Bank also expected such a project to be **costly** (Danske Bank, Interview, 21:40). This was mainly attributable to his expectation of what a chatbot in Danske Bank *can* do. The company stressed that a chatbot implementation is mostly a knowledge management project, where you have to make sure that all the knowledge available within the organisation can be structured in such a way that a chatbot can use it. According to Danske Bank, the knowledge structure needed for the chatbot project to be a success was not at that time available (Danske Bank, Interview, 12:35). Getting a sufficient knowledge structure would require expertise, time and a significant capital investment.

> *"But, we do not just see the chatbot project as comparable to mobile banking, but actually as a knowledge project. Structuring the knowledge will be the largest investment not in regard to IT but in regard to people who will run it afterwards." (Danske Bank, Interview, 21:40)*

Likewise, the **compatibility** of the project is also negated by the inclusion of the knowledge management aspect. The knowledge management structural challenges showed, from Danske Bank's point of view, that a chatbot was not yet compatible with their organisation. This means that Danske Bank found the extent of the chatbot project as being very large. However, it is important to clarify that Danske Bank still has a high **IT expertise** despite their view on the chatbot project. Their IT expertise was highly evident due to their experiences with both RPA, AI and their previous digital projects. The high level of IT expertise in Danske Bank was also contributing to their perception of the **complexity** of the chatbot technology. Even though the implementation in some ways could be seen as difficult, developing and understanding the chatbot was not the anticipatedly complex part

"The biggest hurdle is clearly to create a knowledge management strategy / structure, and process it so that it may work. This is a bigger challenge than the actual conversation layer. (Danske Bank, Interview, 12:35)."

A demand from the environment to embrace innovativeness

Turning our focus to Danske Bank's environment shows that pressures from competitors as well as other stakeholders were quite present in this case. In regard to the **competition**, the company acknowledged that they are aware of other competitors and that they had started implementing chatbots (Danske Bank, Interview, 19:49). However, Danske Bank stated that they saw it as an advantage to wait, as described in the following quote.

"I do not think we get a competitive advantage because it's quite a generic technology. That's something everyone's going to do. One can however, be better or worse than the competitors" (Danske Bank, Interview, 19:49)

Danske Bank also experienced **external pressures** from their professional network and from customers. On conferences and similar events chatbots were very popular (Danske Bank, Interview, 13:06). In addition, Danske Bank also experienced a growing expectation from customers to communicate with the organisation through chat-based communication

" [We have] to meet an expectation, which will come from our customers. They will learn that you can actually do this [use a chatbot]. Our customers also become adjusted to using it from elsewhere." (Danske Bank, Interview, 15:44).

It is clear that Danske Bank had an approach that embraced digitalisation and to be innovative. Danske Bank has proved itself to be one of the frontrunners in the digitalisation of the Danish banking industry, introducing well established mobile applications such as MobilePay (Mobilepay, 2018), which indicates that the **top management** values digitalisation as a strategic goal. This is also evident in the quote below.

Danske Bank prioritises being digital very highly. [...] I think they prioritise it [innovation], very much. For example, there is great readiness to cooperate with FinTech.
(Danske Bank, Interview, 46:14)

This prioritisation of being digital is also evident in recent news articles about the company. Danske Bank made big IT investments, back in November 2017, when the company announced that they wanted to take the digital success they have had with its private customers, and use it on their industrial customers (Stensdal, 2017). Danske Bank, however, seemed to be an organisation in duality; on one hand trying to follow the digital trends, while on the other maintaining the traditional ways of doing banking.

"We would like to create a digital bank, but still maintain our physical bank."
(Danske Bank, Interview, 40:51)

This can help explain why Danske Bank were more hesitant towards new technologies like chatbot and presented a more restrained position here. They saw an advantage in waiting with implementing the chatbot technology and learn from their competitors. Based on these insights, we define Danske Bank's strategy as that of an Analyser, according to Miles & Snow's typology of market strategies (1978). Attempting to minimise risks in regard to the implementation of the chatbot but still maximising the opportunity for profit when they see the potential to be successful with an innovation are big indicators for this.

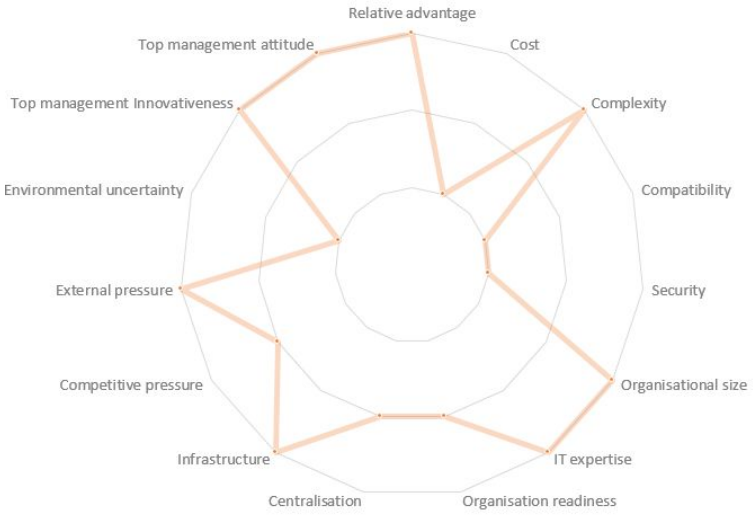

Figure 20 - Danske Bank radar chart

7.1.5 Nordea

Nordea is one of the biggest banks in the Nordics and is by far the largest company included in this thesis. They are also the most experienced company in regard to using the chatbot technology. Nordea has worked with the technology since the beginning of 2016, and implemented its chatbot NOVA in its Norwegian Life and Pension business unit in the summer of 2017. It has later launched the chatbot across other departments in Nordea, like its retail bank department in Norway and Denmark, and is launching it across the Nordic countries moving forward (Nordea, Interview, 1:50). Currently NOVA is running as a 1.0 version, functioning as a simple FAQ chatbot. At the same time Nordea is actively working towards a NOVA version 2.0, where their customers will be able to get individual assistance from NOVA, thus requiring an integration with Nordea's core IT systems (Nordea, Interview, 04:50).

The chatbot technology was an obvious choice

Diving into the reasons behind the adoption of chatbot technology and the perceived **advantages**, Nordea mentioned the better quality of customer service and cost efficiency. What Nordea saw as the main advantage however, was that the chatbot could leverage their strategy about reinventing the digital customer interface.

> *"The reason for why we are doing it is because we need to reinvent the customer interface. [...] NOVA is a way to go back again and actually provide a better service [as we had in physical banks] but in a digital format."* (Nordea, Interview 09:00)

The perceived advantages of the chatbot technology can also be related to how **complex** Nordea experienced the technology. Nordea found it easy to gain the required knowledge about the technology and easy to start to use in the initial state.

> *"With this tech it is so cheap and easy to access and implement. The required funding and resources are quite small so you can actually do it fast, showcase it and scale it up."*
> *(Nordea, Interview, 31:30)*

Nordea's perception of the complexity of the chatbot technology can also be related to their degree of **IT expertise**, which we see as being high. They had already established strong Robotics capabilities internally. Moreover, Nordea explained that they were advancing on other IT fields such as machine learning and cloud based solutions.

> *"Another reason [for adopting] was that we had come quite a long way on our Robotics/RPA journey that this was a natural next step. - from internal robots to external."*
> (Nordea, Interview, 14:03)

The already existing knowledge with similar technologies makes it easier for Nordea to understand chatbots.

Pressure from competitors to be innovative

When asking the company about what was driving their decision to adopt the chatbot technology, it was clear that their **competitors** have had an impact on this decision.

"Partly because a couple of other Swedish banks have implementing it, SWED bank was first by far, they have had a chatbot for 3 years now." (Nordea, Interview, 13:41)

This competitive pressure is also something Nordea as an organisation is beginning to understand, not only in terms of being digital but also being more innovative. More specifically Nordea's **top management** has recently started to focus more on digitalisation and innovativeness, but they still have a somewhat conservative mindset, being very risk averse and not accepting failures.

"I think a lot has happened. [Top management] talks about Nova, Robotics and even AI. [...] I think the problem is that there is a lack of knowledge, experience and understanding. [...] Being innovative means that you fail quite a bit which in banking, you know, failing is not something that we encourage. So that whole thing is working against us compared to other industries." (Nordea, Interview, 40:50)

Because of this, we define Nordea as having an Analyser market strategy (Miles et al., 1978). The reason for defining Nordea as an Analyser is mainly because they did not implement the chatbot in order to create new markets. They did it because they saw a pressure to maintain their market share from competitors already implementing the chatbot technology. In addition, it is clear from Nordea's strategy that they search to maintain their market by focusing on digitalisation and innovation. Their annual report repeatedly mentions and focuses on how a digital transformation is currently underway in Nordea, and they *"aim to have state-of-the-art IT infrastructure, operations, processes*" (Nordea, Annual Report, 2018, p. 8). Therefore, implementing the chatbot technology has been a relatively easy project for them and it was seen as a natural step in order to maintain the market. The this was also confirmed by the latest media coverage, where Nordea in late 2017 reported, that they want to lay off 6,000 employees over the next four years, as part of their ongoing digital transformation (Ingvorsen, 2017b).

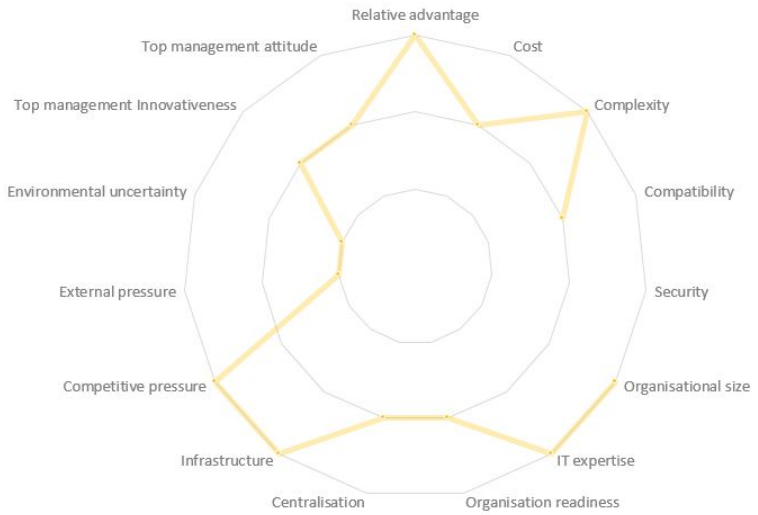

Figure 21 - Nordea radar chart[10]

7.1.6 PensionDanmark

PensionDanmark initiated a chatbot project in the fall of 2017 and went live with their first version in February 2018. The chatbot project was driven by the overall strategy for PensionDanmark consisting of three pillars: making robust investments, be cost-efficient and maintaining high customer satisfaction (PensionDanmark, Annual Report, 2018). In order to achieve the overall strategy, PensionDanmark found it necessary to invest in technologies that can automate processes (PensionDanmark, Interview, 18:30). Implementing the chatbot technology was therefore seen as a necessary step for PensionDanmark in order to become more automated.

The first version of the chatbot was a simple FAQ chatbot that was able to answer simple questions from their customers. The chatbot was implemented in a small area of the business dealing with insurances for critical illness and was planned to continuously be expanded to other limited areas. The vision with the chatbot project was to create a virtual adviser and a self-service, that customers can access around the clock.

A natural addition to PensionDanmark's services

PensionDanmark saw different types of **advantages** in regard to the chatbot technology. When compared with alternative technologies, such as phone calls or e-mails, they saw a high potential in the chatbot technology since it is available 24/7 (PensionDanmark, Interview, 09:55). In addition, automation of chat processes makes it possible to move the workload away from the human employees and let them focus on more demanding counselling, instead of answering simple questions (PensionDanmark, Interview, 15:15). This would in the end improve the customer experience. PensionDanmark therefore saw high advantages in the technology.

[10] Nordea had no comments about the security aspects of their chatbot project

To implement the chatbot technology was a natural step for PensionDanmark in order to follow their automation strategy. This is supported by PensionDanmark's annual report, where 'to be digital' is emphasised throughout the report, indicating that PensionDanmark thus is an organisation with a high degree of **organisational readiness.** The quote below states that the success in PensionDanmark among other things relies on the focus on digitalisation.

"The success is largely based on a modern IT platform focusing on automation of processes and systematic use of digital platforms in the dialogue with members, companies and organisations"
(PensionDanmark, Annual Report, 2018, p. 11)

A big part of this digitalisation focus relied on their main supplier of IT infrastructure, Microsoft, which traditionally delivered and supported PensionDanmark in their IT endeavours. Because of this relationship with Microsoft, PensionDanmark saw it as a sound decision to also use them as the supplier for the chatbot technology.

"We have made the chatbot in cooperation with Microsoft after a little due diligent investigation of platform providers. We are very much a Microsoft reliant company."
(PensionDanmark, Interview, 07:55).

This made PensionDanmark initially perceive the chatbot technology with a relatively low **complexity**, since it at face value would fit seamlessly with the rest of their IT landscape. They, however, underestimated the required **security** for using the technology. PensionDanmark did not find this factor an issue when implementing the first version of the chatbot in February 2018. However, the company later saw the security aspect as an issue because of the requirement from Microsoft to move the data to the cloud, in order for the chatbot to work with the rest of PensionDanmark's applications. This requirement was against PensionDanmark's policies regarding storage of data (PensionDanmark, Interview, 32:25).

Support from top management to experiment with new technologies

It was clear that the company's **top management** prioritised digitalisation and being quick to adopt the newest technologies. When asked, the company acknowledged the **competitors** influence on their decision to adopt a chatbot. This manifested itself in a decision from the top management demanding the development of a new chatbot in order to showcase it for their competitors.

"Our CEO and COO want something to showcase. It's new and interesting."
(PensionDanmark, Interview, 14:10).

It is clear that innovativeness is on the top of the agenda in PensionDanmark. This is clear in how they, over the past years, have sought to follow the digitalisation initiatives in the bank industry in order to stay digital themselves (PensionDanmark, Interview, 46:40). In the interview, the CEO was described as a important person crucial for their ability to be innovative.

"The CEO is very engaged in new solutions and technologies. These things cannot be completed without his interest - he is very interested in ensuring that customers are properly serviced" (PensionDanmark, Interview, 47:00)

The focus on being innovative and digital is also something we found when examining the latest news coverage there has been of PensionDanmark. In early 2017 the media reported how the company successfully had invested in RPA, which gave them a better customer service and lower administration cost (Martini, 2017). Later that year PensionDanmark won the prize for European pension company of the year at the IPE Award show, based on their innovative way of using new technologies (Duelund, 2017). These insights indicate that PensionDanmark are using a Prospector strategy to approach the market (Miles et al., 1978).

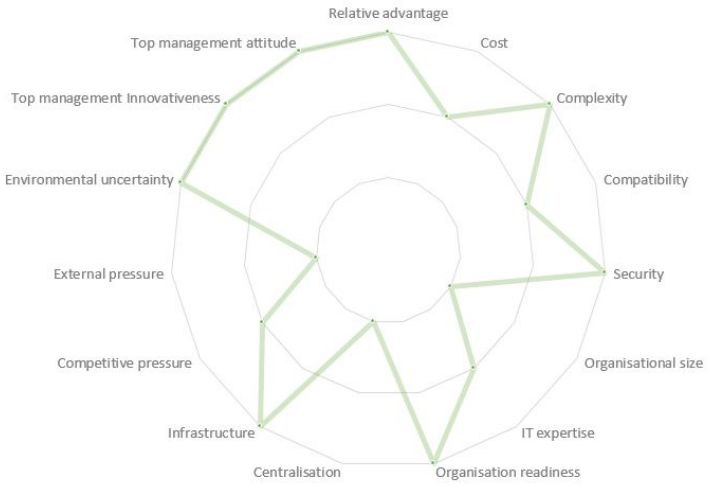

Figure 22 - PensionDanmark radar chart

7.1.7 Sampension

Sampension has the fifth largest market size in the Danish pension industry, and are considered a smaller player in the market. Sampension is a rather old pension company founded in 1945 and have been conservative in terms of digitalisation and innovation. However, they have since 2016, with the establishment of a dedicated IT development unit, tried to build a new image and become more digital. Sampension was the only one we interviewed that did not want to adopt a chatbot.

The technology is not mature enough

Sampension had no problem seeing the potential **advantages** in adopting the chatbot technology.

"Improved customer experience, most definitely, and the organisation is beginning to understand that now" (Sampension, Interview, 12:39)

This advantage was however not relevant in Sampension's situation. They did not feel that the chatbot technology was sophisticated enough to answer the type of questions their customers typically have. Further, Sampension also felt that they needed to understand their customers typical conversations better, before they could leave the conversation to a chatbot (Sampension, Interview, 03:20). They would rather like to continue working on and strengthening their existing infrastructure fundament (Sampension, Interview, 09:43). This indicates a low **compatibility**, which the following quote, where they express no ambitions for automation, supports.

"Therefore, I have chosen to set my ambition level for automation [in Sampension] to low for two reasons: 1) the complexity of the customers questions, 2) my limited available resources"
(Sampension, Interview, 03:53)

A low compatibility would, in some cases, also indicate that Sampension would perceive the chatbot technology as fairly **complex**. However, we found that the company saw the technology having a low complexity because a chatbot was, for them, merely just another communication channel (Sampension, Interview, 15:12)

A slow awakening

Sampension is an organisation with 300 employees and is very traditionally organised, with a high degree of **centralisation.** When describing the level of centralisation, the company said that every large decision needs to be processed by a central management group:

"Every time a project proposal is done, it should be sent to something called LG [the executive board] and then they will decide if you can spend 500.000 on this. The decision-making process is as in the 70's. It is ineffective and it impedes innovation."
(Sampension, Interview, 23:50)

The informant noted, however, that the **top management** is beginning to understand digitalisation and innovation, but there is still some way to go.

"The CEO and the CFO have understood the importance of IT, the others are like 'aaah' [skeptic]. [How good is the top management in general to be innovative?] Hopelessly bad"
(Sampension, Interview, 28:45)

Sampension's latest published annual report also reveals that they prioritise being digital, however it is not something that exists on the strategic agenda (Sampension, Annual Report, 2017).

In addition, the company also explained that they did not consider the pension business to be innovative. The informant, a recently hired head of IT development, was quite surprised by the technological level of the pension business, which he described as being *"2018 minus 15 years"* (Sampension, Interview, 05:45). This is also related to how Sampension perceived the **competitive pressure** to adopt the chatbot technology.

The company explained that they did not see any pressure at all and they did not feel that the technology itself could provide a competitive edge.

“It is not ‘cool’ in itself to have a chatbot. It is ‘cool’ to control customers and profiles.”
(Sampension, Interview, 15:12)

Based on the insights we got from the interview with Sampension, we define Sampension as a Defender according to Miles & Snow’s typology of market strategies (1978). They do not find it important to be innovative in the pension business. Instead it is essential for them to have the foundation of the business in place as well as having the customer in focus all the time. Recent media coverage confirms this, and the company has expressed that they focus on bringing in new customers, by providing the lowest price (Houmann, 2017).

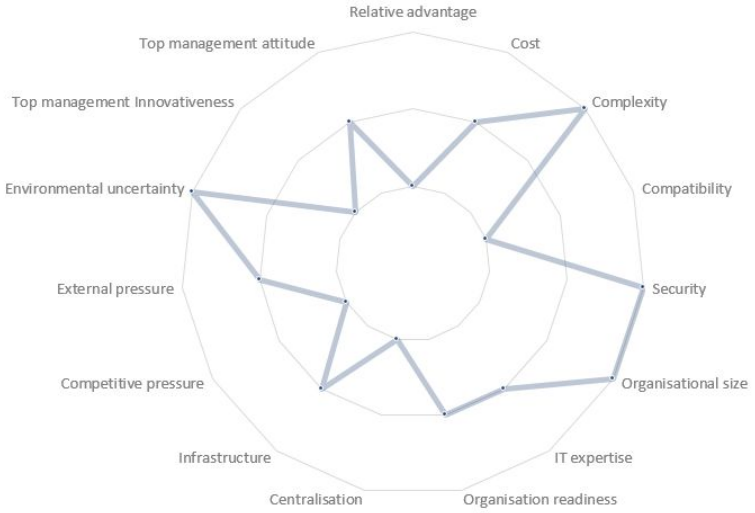

Figure 23 - Sampension radar chart

7.1.8 SEB Pension

SEB Pension is a big and complex group with many units in different branches in different countries. In our thesis, we have focused on SEB Pension in Denmark - a smaller **sized** company. SEB Pension had not yet implemented a chatbot when we interviewed them. They were however eager to get a chatbot and felt that they had not advanced enough in this field.

High potential but not without concerns

During the Interview, the company stated that they intend to use the chatbot to increase their customer service.

"Our intention was to create better customer service [through the implementation of a chatbot]. It was goal number 1. Objective number 2 was, of course, saving ... or not saving employees, but let them do something else that's more fun." (SEB, Interview, 07:30).

They wanted to implement a typical FAQ chatbot, similar to the ones mentioned earlier, in their call-center. They were motivated to do this because they were seeing a tendency that more and more inquiries were coming through online channels and that traditional websites are dying because *"the youths are using apps" (SEB Pension, Interview, 07:03)*. In addition, was the "24/7 argument" important for them as well, and was a driving **advantage** for increasing customer service (SEB, Interview, 06:38). However, the company explained that they expected the project to be **expensive** and related it to a chatbot project executed by SEB in Sweden, which was quite expensive (SEB, Interview, 09:44).

In relation to the cost, SEB Pension also anticipated challenges. More specifically SEB Pension had a clear anti-cloud policy. This reduces the **compatibility** of the chatbot project a great deal because many of the chatbot solutions are cloud based.

"The cloud policy is a huge challenge and in that relation also the GDPR. So the whole understanding that it's not pure magic, as consultant has sold it as - it's not. [The chatbots] are really good in English but not really in Danish. Lastly, Infrastructure. It does not fit in the existing infrastructure, so you can have problems." (SEB Pension, Interview, 14:07)

In the quote above, the company expresses that they did not believe that the technology was mature enough, which indicates a high degree of **complexity**. He also explained that implementing a chatbot would be a big project, where buying the product and getting it up and running is one thing, but the big part of the project is integrating it with existing systems.

It's a very big implementation. One thing is to buy the product and make it run. The big bite is, however, to integrate it with existing systems. (SEB Pension, Interview, 11:42)

Focus on digitalisation and to be innovative

One thing that stood out when reviewing SEB Pension was their focus on digitalisation and also on sharing the skills throughout the organisation. Robotics had been fully embraced in SEB Pension and there were many ongoing Robotic projects. They had additionally also established an innovation lab where employees with a lot of domain knowledge, within specific areas of the business, can come and experiment with new technologies like Robotics (SEB Pension, Interview, 16:11). This points to a high degree of **IT expertise.** To support this SEB Pension has managed to be the leading online brand in the Danish pension industry (SEB Pension, Interview, 25:14). These insights also point to a high degree of **readiness** since the company acknowledges that this could not have been possible without having the ability to adopt new technologies.

Based in the insights from the SEB Pension case, we define the company as an Analyser according to Miles & Snow's typology of market strategies (1978). On one hand, the organisation wants to be innovative and has a high degree of IT expertise in order to handle the newest IT technologies. On the other hand, the organisation hesitates when it comes to the chatbot technology because they found the technology to be immature and the project to be costly.

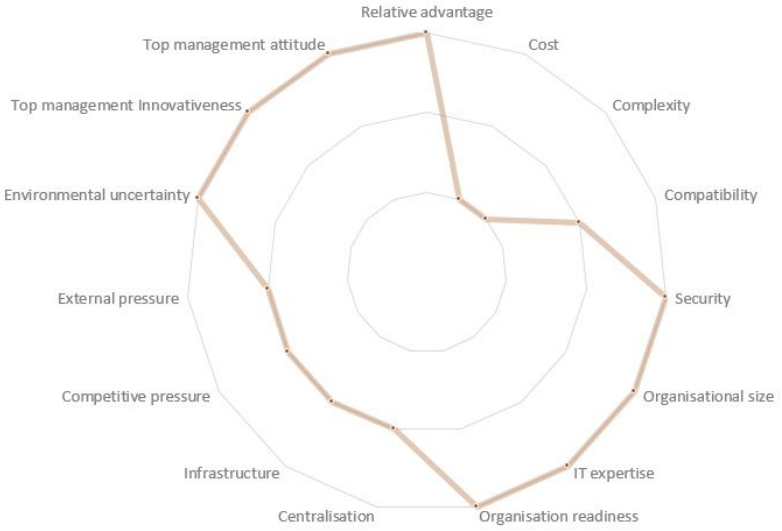

Figure 24 - SEB Pension radar chart

7.1.9 TDC

When we conducted the interview with TDC, they were developing their first version of their chatbot but had not launched it yet. Their interest in chatbot technology was initiated because the company had to replace their current website search system (Google Site search), and saw the chatbot technology as a good replacement for this. Even though the chatbot originally was meant to replace their website search system, TDC saw the chatbot project as a larger project with a bigger reach. One example is that they wanted to integrate it with existing systems such as their live chat.

A highly compatible product in a digital organisation

The main driver behind TDC's decision to adopt the chatbot technology was its ability to act as a helpful assistant for users on the TDC website. Instead of using the website search, customers could find the right information by chatting with a chatbot.

"The primary reason was to complement our search function. So one thing is that the customer can seek information, something else is that they can navigate to it. We want to take them a little more by the hand and try to frontload some of the traffic that leads into our live chat."
(TDC, Interview, 06:04)

Given the fact that TDC's decision to adopt was in part driven by a need to replace an old technology the **relative advantage** is somewhat diminished. We found that the high perceived **compatibility** was what mainly drove TDC to choose the chatbot technology.

TDC saw the chatbot project as highly compatible, because they had a digital mindset throughout the organisation, and that they already had worked with similar technologies like Robotics.

"We have a completely digital organisation now, first on the Yousee level and now on the TDC Group level. We have gone from 100 to 500 [employees in the digital organisation], which is part of the organisation and [in addition we have] Robotics that have also existed for some time."
(TDC, Interview, 16:55)

As stated in the quote, the digital organisation in TDC has increased significantly, which gives a good indication of both their **IT expertise** and **organisational readiness**. Firstly, TDC has invested in establishing strong competencies with regards to similar technologies like RPA and AI. Another good indicator of their high IT expertise was that they found it more appropriate to use internal employees to develop and train the chatbot, instead of relying on the chatbot supplier.

"We actually started out with making our suppliers do it [developing the chatbot], but quickly found out that it made more sense to do it ourselves (TDC, Interview, 13:50)."

Secondly, the recent big investment they have made in digitalising the organisation told us that their organisational readiness is high. The organisational focus on being digital was mentioned several times during the interview (TDC, Interview, 18:08; 20:27).

Another interesting organisational aspect of TDC is their degree of **centralisation**. TDC is the only big case company with a low degree of centralisation in relation to decision making. The organisation is working under agile principles and project setups are dominated by being agile as well. This means that projects like the chatbot project did not have to be approved by the top management but was initiated within the respective department (TDC, Interview, 19:11).

Lastly, the organisational focus on digitalisation is also evident in the **top management** of TDC. They acknowledged that the top management prioritises being innovative through digitalisation and said it was part of the daily mindset of an employee at TDC (TDC, Interview, 20:27). This attitude is also confirmed in the company's annual report from 2017.

"TDC Group invests heavily in digital development [...] This has resulted in TDC Group significantly decreasing the time it takes to bring new innovative solutions to the market."
(TDC, Annual Report, 2018)

Based on this presentation we define TDC as pursuing an Analyser market strategy (Miles et al., 1978). TDC did not choose to adopt the chatbot technology to expand markets, but rather to optimise existing services on their customer website. Moreover, we see TDC's reasons for focusing on digitalisation and innovation as being the competition they face in their market. As described in the introduction of our thesis, many big traditional telecom companies are being threatened, and TDC is no exception.

Looking through recent news articles tells a story of how the company is losing customers in their core product portfolio, mobile, TV and broadband, to other Danish telecom companies offering better prices and customer service (Breinstrup, 2017). TDC are, as already mentioned, responding to this by increasing their focus on digitalisation and have recently announced that they will invest 700 million in a new internal digital unit, which will focus on process optimisation and product development (TDC Group samler ressourcerne, 2018). Ultimately this tells us that TDC simultaneously tries to exploit new opportunities while maintaining their core business, which is a typical trait for an analyser.

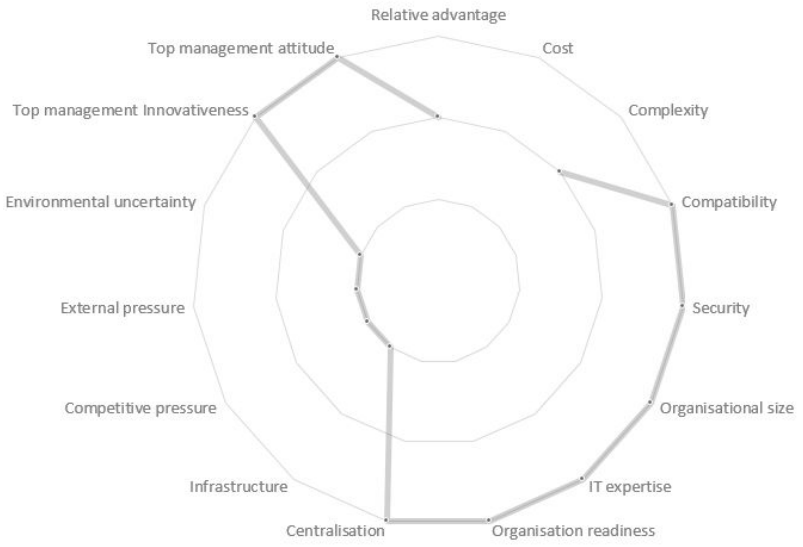

Figure 25 - TDC radar chart[11]

7.1.10 Topdanmark

Topdanmark is the second largest insurance company in Denmark and it has, like other companies within the last couple of years, started to focus more on digitalisation. Topdanmark is one of the companies that has not implemented a chatbot. When we conducted the interview, the company was in the final steps of the decision process and about to initiate a chatbot project starting in the spring of 2018.

The technology can humanise the digital interaction with customers

Topdanmark saw a high **relative advantage** in adopting the chatbot technology and, like many other companies, saw advantages from both a cost efficiency and an improvement of customer service perspective (Topdanmark, Interview, 11:19). What is interesting in the case, is that Topdanmark had a clear vision in regard to how the chatbot technology can improve customer service, and, more especially, its website.

[11] TDC did not wish to share their thoughts about the cost of the chatbot project

"We believe that a good chatbot will be able to close the gap between the classic web, mobile type offerings etc. and real personalisation. Currently only a customer employee can do this" (Topdanmark, Interview, 08:50).

Topdanmark therefore saw the technology as a way to humanise the digital interaction between the customers and the company, without human intervention. This vision Topdanmark had in regard to the technology also tells us that the company had high expectations for the technology and believed in its ability to provide benefits for the organisation. This high belief in the chatbot technology can, among other things, be attributed to the perceived high **compatibility** we found in the data from Topdanmark. This high compatibility can partly be explained by Topdanmark's organisational focus on digitalisation and partly by its current and previous experience with similar technologies. When asked about experiences with similar technologies Topdanmark said the following.

"In my opinion we are the most advanced insurance company in Denmark within the area of Machine Learning and RPA" (Topdanmark, Interview, 16:41)

In addition, they see themselves as a very data driven organisation, which also indicates an organisation that is very compatible with the chatbot technology. Because of these already established competences in related fields we found the company's **IT expertise** to be high. This was also confirmed when the informant stated that the adoption of the chatbot technology was a natural development on top of the company's existing data analytics competences (Topdanmark, Interview, 17:50)

Strong IT competencies rather than being a first mover

Diving more into the organisational factors we found a relatively high **organisational readiness** in Topdanmark. As already mentioned, digitalisation is highly prioritised on the organisational agenda, especially after the recently hired CEO has moved the strategic agenda more towards this topic.

"Topdanmark is an insanely data driven organisation. I would say data fills almost more than IT. And by data I don't only mean reports, I also mean to actually make predictive analysis. That's why IT is so important." (Topdanmark, Interview, 39:55).

One could argue that this automatically means that the **top management's** support also would be high. However, when talking about the top management's support the informant commented that although the top management now focuses on digitalisation, this focus has only recently been developed and he further said that Topdanmark in some aspects still is a very conservative organisation (Topdanmark, Interview, 43:56; 17:20). Topdanmark's relationship to innovation also reveals a company that has only recently begun to focus on digitalisation and innovation. TopDanmark has before tried to establish an innovation lab but so far it has not been a success.

"We have an innovation lab as part of my department. It has had a miserable time in the company. We are currently starting to focus on more business related innovations"
(Topdanmark, Interview, 43:19)

Collectively these characteristics tell us that Topdanmark can be categorised as an Analyser in the Miles & Snow's typology of market strategies (1978). This is based on the findings that Topdanmark traditionally has not built their business on being digital and innovative. However, they have recently found the necessity to embrace these capabilities. Looking through recent news articles also confirms this. Besides hiring a new CEO with more digital competences they have also hired a new CTO to boost these competences and bring more focus on digitalisation (Alm. Brands it-direktør, 2018). Lastly, Topdanmark was also in the media in late 2017 for the successful implementation they have had with RPA (Robotter øger kundetilfredsheden, 2017).

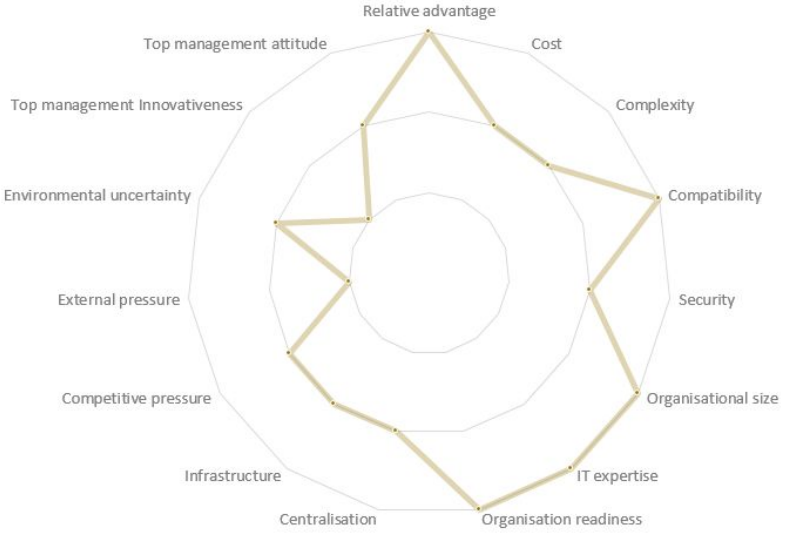

Figure 26 - Topdanmark radar chart

7.1.11 Tryg

Tryg is one of the case organisations who was in their final steps of the chatbot implementation. They were planning to launch the chatbot a month after the interview was conducted. Tryg differs from the other cases by wanting to use the chatbot internally to make the back office in their customer support-center more efficient.

Focusing on advantages despite the complexity of the technology

The **advantages** are evident from the purpose of the chatbot described above. Tryg was using a number of back office employees to assist the front line sales team when they encounter complex question from customers. Replacing the back office with a chatbot would mean that the seller could ask the chatbot while maintaining the conversation with the customer (Tryg, Interview, 10:37). Tryg saw big potential benefits from this. Another advantage was that they could reduce the amount of employees in the back office without losing quality (Tryg, Interview, 10:50).

On a more technical note, however, Tryg perceived the chatbot technology as **complex**. The informant saw Tryg as a first-mover in the insurance industry with regards to the chatbot technology. Being a first-mover had the consequence that they did not fully understand what their chatbot provider could do and what Tryg really wanted or expected from the technology.

"Our knowledge [of chatbots] is almost solely derived from an idea and a desire, so the whole decision-making process regarding [which suppliers are] in the market, what they can offer and what do we really need. This has been difficult." (Tryg, Interview, 18:25)

Their perception of the complexity of the chatbot technology is also related to the **cost** of the implementation. Tryg acknowledged that the implementation phase was very costly even before they had a functioning solution.

"Without saying the specific amount, it is costly already before we have a working solution, because there are insanely many things that are going to be structured and made." (Tryg, Interview, 20:28)

Maintaining the market by creating a new image

Tryg is an organisation with a rich history dating back to the 1700's. Tryg leads the market of insurances in Denmark and is also a prominent player in both the Norwegian and Swedish markets. Tryg is naturally interested in maintaining their market position. Releasing this goal requires them to focus on digitalisation and innovation (Tryg, Annual Report, 2018).

"We must take that position, in fact in the Nordic countries and perhaps even in the world, to be the most digitalised company in the financial industry and it requires some major investments in IT" (Tryg, Interview, 03:52)

Tryg's new digital strategy was something that was highlighted a lot during the interview. One goal of this strategy was to create a new image to position themselves more digitally and the informant acknowledged that this was also because of their competitors (Tryg, Interview, 15:44). In fact, they saw it as a necessity to be the first with new technologies, such as the chatbot technology, in order to maintain their market position.

"If you were to associate insurance companies with a car brand, then we will be a Volkswagen, but we don't want to be. We would like to be a Tesla. So even though we have a good position in the market, we are not considered to be first-movers - even if we are. So we are busy proving to our customers that we are" (Tryg, Interview, 15:44)

Tryg was therefore experiencing a **competitive pressure** in relation to adopting the chatbot technology. The desire to become the most digitalised company in the financial industry, as well as moving away from being a Volkswagen to being a Tesla also indicates a high degree of support from the **top management** as well as an **organisational readiness** to heavily rely on digitalisation. This transformation that Tryg currently is undergoing is confirmed when going through the latest media covering regarding Tryg. First of all, the company in 2016 founded a hub called “The Camp”, where new startup companies could establish themself and grow with Tryg’s help. They hoped that the startup companies could help Tryg on their journey to develop a more innovative culture (Andersen, 2016). More recently Tryg has also been in the media for announcing huge investments in digitalisation. The company’s CEO said in November 2017 that the company wants to be the best within digitalisation and had invested one billion DKK in this endeavour (Tryg-chef om milliardinvestering, 2017).

We experienced that Tryg approached the chatbot project from an optimistic perspective, highlighting the advantages with no regard for the complexity of the technology. They had spent a lot of time thinking creatively about how they could apply the chatbot in areas where it could create the most value. By adopting the chatbot technology from an early stage, Tryg knowingly put themselves in a difficult situation where new technology often is immature and complex to understand. However, they still valued this approach more than first letting the technology become more mature because they found it important to maintain their position as the leading insurance company. We see the motivation to adopt as stemming from a desire to *maintain* their market position and not to *exploit new possibilities*. Tryg is therefore defined as an Analyser according to Miles & Snow typology of market strategies (1978).

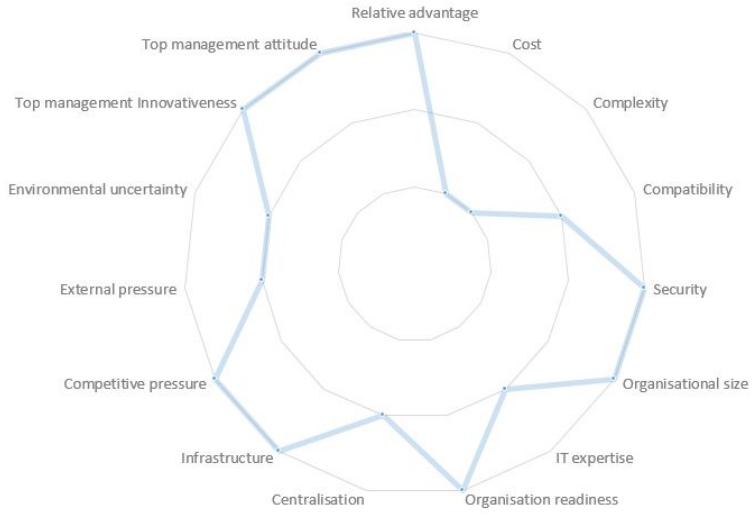

Figure 27 - Tryg radar chart

7.1.12 Conclusion on individual case analysis

We have now analysed every case company individually and presented the most significant findings. What we see across the cases is a general high belief in the technology but that it is not especially sophisticated. The chatbot's functionality is just capable of answering a fixed set of frequently asked questions. Thus confirming the immature state indicated in the introduction of our thesis. Some of the organisations try to extend their chatbot's capabilities but they often encounter infrastructural or cloud based challenges. We also find that digitalisation plays a big part in the strategy of most case companies, except Sampension who focuses on building a solid IT infrastructure. Lastly, this analysis also raised some essential questions. We were curious to know why CBB ended up underestimating the chatbot project and how much resources it required. In addition, it grabbed our attention when we saw that Danske Bank has many adoption factors in favour of the project, yet they are still hesitant to progress further. These questions will be addressed in the section where we look at market strategies in accordance with Miles & Snow.

Throughout the individual case analysis, we focused on presenting the adoption factors that have had a significant role in the cases as well as how the companies interpreted the adoption of the chatbot technology. Each case has been concluded with a radar chart that illustrates how we define the cases in relation to the adoption factors. The perception of the adoption factors across all cases are summarised in four tables (see table 17, 18, 19, and 20).

Table 17 - Perceived innovation factors

	Alka	Danske Bank	CBB	Nordea	Tryg	PensionDanmark	SamPension	SEB	TDC	Topdanmark
Relative advantage	High	High	High	High	High	High	Low	High	Medium	High
Cost	Medium	High	Low	Medium	High	Medium	Medium	High	-	Medium
Complexity	Medium	Low	Low	Low	High	Low	Low	High	Medium	Medium
Compatibility	Medium	Low	Medium	Medium	Medium	Medium	Low	High	High	High
Security	Medium	High	Low	-	Low	low	Low	Low	Low	Medium

Table 18 - Perceived organisational factors

	Alka	Danske Bank	CBB	Nordea	Tryg	PensionDanmark	SamPension	SEB	TDC	Topdanmark
Organisational size	Big	Big	Small	Big	Big	Small	Big	Big	Big	Big
IT expertize	Medium	High	Low	High	Medium	Medium	Medium	High	High	High
Organization readiness	High	Medium	High	Medium	High	High	Medium	High	High	High
Centralisation	High	Medium	Low	Medium	Medium	High	High	Medium	Low	Medium
Infrastructure	Medium	High	Medium	High	High	High	Medium	Medium	Low	Medium

Table 19 - Perceived environmental factors

	Alka	Danske Bank	CBB	Nordea	Tryg	PensionDanmark	SamPension	SEB	TDC	Topdanmark
Competitive pressure	Low	Medium	Low	High	High	Medium	Low	Medium	Low	Medium
External pressure	Low	High	High	Low	Medium	Low	Medium	Medium	Low	Low
Environmental uncertainty	Medium	High	High	High	Medium	Low	Low	Low	High	Medium

Table 20 - Perceived innovation factors

	Alka	Danske Bank	CBB	Nordea	Tryg	PensionDanmark	SamPension	SEB	TDC	Topdanmark
Top Management Innovativeness	Medium	High	Low	Medium	High	High	Low	High	High	Low
Top Management attitude	High	High	Medium	Medium	High	High	Medium	High	High	Medium

7.2 Cross-case analysis

We will now advance into the last phase of the multiple-case study model (Yin, 2014). The findings from the individual case analysis of all 10 companies involved in the thesis are now the foundation for the next section: the cross-case analysis. While the individual case studies gave valuable independent insights, the cross-case will give us a chance to generalise across cases and also allow for more sophisticated descriptions and powerful explanations (Miles & Huberman, 1994).

In this section we will begin by looking at the big picture in order to investigate which adoption factors we in general find significant, if they are predominantly drivers or barriers and what this means. After this we will dive into more specific sub-analyses where we will group the case organisations based on different parameters which will allow for new perspectives. We will look at the adoption process, if their market strategy might affect the adoption decision and if adoption factors can change from being a driver to a barrier through the adoption process. Lastly, the analysis will be concluded by highlighting the biggest takeaways from the analysis.

7.2.1 Overall drives and barriers for adopting the chatbot technology

In this first part of the cross-case analysis we address the first sub-question from our research question. We will look at what factors recurrently can be defined as drivers or barriers for the organisations adoption decision, and look at how it relates to the theory and our conceptual framework. To increase our ability to see the patterns and indications in our data we summarised the amount of times an adoption factor was either labelled as high or low. We are only interested in adoption factors labelled as high or low, because this means that the factor is either a barrier or a driver when regarding the adoption decision. More specifically, it means that if a factor, which assumes a positive effect on the adoption, is labeled as “high” it is considered a driver, if it is “low” it is considered a barrier. The same logic applies for factors that assume a negative effect on the adoption. This is illustrated in figure 28.

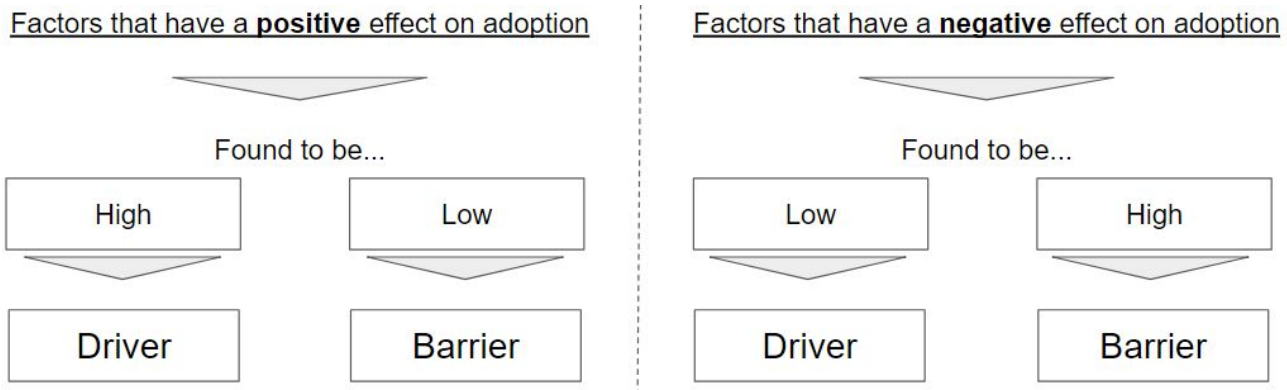

Figure 28 - Relation between effect and driver/barrier

We did not consider factors labelled as medium to have had a large significant impact on the adoption decision in either direction. The analysis of general drivers and barriers below will therefore not consider factors labelled as medium. A table was made for the drivers and barriers respectively and can be found in appendix 11.

Drivers for adopting the chatbot technology

The organisations saw in general many drivers when regarding the different aspects, we covered in the interview. This is logically sound when considering that eight out of 10 organisations either had or were close to implementing a chatbot. The most prominent drivers for adopting are displayed in table 21.

Table 21 - Most prominent drivers

Factors	# of companies with the factor
Relative advantage	8 out of 10
Organisation size	8 out of 10
Organisational readiness	7 out of 10
Security	6 out of 10
Top management innovativeness	6 out of 10
Top management attitude	5 out of 10

Relative advantage was the most prominent factor across the cases, with eight organisations seeing a high relative advantage. Only Sam Pension and TDC did not see a high relative advantage. The most recurring relative advantage that companies saw was increasing customer service.

“Our idea was to create better customer service [by implementing a chatbot]. This was the primarily goal” (SEB, Interview, 07:30)

In the quote above SEB explains their motivation for choosing a chatbot. This explanation is echoed throughout the case companies indicating that a clear driver for implementing the chatbot is that there is a match between the organisations’ wish to better their customer service, and the chatbots functionality and promises. That relative advantage is a big driver comes as no surprise as it is one of the factors found in Rogers’ DOI theory (1983) which has been tested thoroughly. We therefore agree with Rogers’ findings in this aspect.
The organisational size factor was additionally also high, with eight out of 10 being big organisations. This was, however, expected since size is an objective observation, compared to the more subjective factors of the conceptual framework.

It is mostly a product of the scope of our thesis and the industry it focuses on. We do argue that it was necessary to interview larger organisations with the capital to implement a chatbot in order to avoid fundamental difficulties when comparing larger organisations with smaller organisations. Following the conceptual framework, larger companies are more likely to decide in favour of a new innovation because they have the resources and capabilities to carry out such a project. It does therefore help explain why four organisations already have implemented a chatbot and an additional four are expecting to implement one soon.

Table 21 also shows that organisational readiness was high among many organisations. Seven out of 10 organisations state that they treat digitalisation with importance and feel dependent on digitalisation. This factor, being as prominent as it is, shows that the organisations are embracing the digital agenda. This is also supported by our analysis of case companies' annual reports shown in appendix 7. The annual reports show that there is a large focus on digitalisation and in five out of the 10 it is considered a core strategy. We find that this focus is new for some of the organisations indicating that there has been a paradigm shift these last years, were digital competencies has now become a necessity.
The two adoption factors concerning the top management's attitude towards innovations and their innovativeness is also present in five and six cases respectively. This does follow the arguments presented above regarding organisational readiness and theoretically indicates a higher willingness to adopt a chatbot. Lastly, the security factor is also regarded in most cases as something that they have control over. They don't consider security to be an issue and it has not been something that has bothered their decision. This can be explained by the limited security demands a FAQ chatbot requires.
On a general note, table 21 indicates that the organisations see a lot of benefits that matches their wants and needs. These drivers are prominent in both innovation characteristics, organisational characteristics and top management characteristics. We do therefore generally agree with Roger's (1983) propositions regarding the importance of innovation characteristics and organisational characteristics when adopting new technology. We, as well, find Hameed's (2012a) Top management characteristics to be significant drivers. The environmental characteristics was the only groups of factors where we did not find significant drivers for adoption.

Barriers for adopting the chatbot technology

As a natural follow up to finding the drivers behind the adoption decision regarding the chatbot technology, the following section will cover the adoption factors that were the biggest barriers for the decision. Using the same approach as in the section above, we have constructed a table that indicates the barriers by marking the negative factors scoring "high" and positive factors scoring "low". The most prominent barriers against adopting are displayed in table 22.

Table 22 - Most prominent barriers

Factor	# of companies with the factor
External pressure	5
Environmental uncertainty	4
Competitive pressure	4

Firstly, looking at the factor with the highest number of occurrences we see the factor external pressure. According to theory this factor should have a positive effect on the adoption of a given technology, which in this case meant that five out of 10 companies were found to perceive the external pressures as “low”. Collectively this means that this factor was the biggest barrier for the adoption of the chatbot technology, because companies simply did not experience a pressure from their customers or suppliers. This was for instance the case at TDC where they did not anticipate their customers using the technology as of now, however they hoped for this in the future.

"Chatbot, it is a bet. The demographics of our customers may not be most minded to use a chatbot. We hope, of course, that they come to use it." (TDC, Interview,09:53)

Moving on to the second group of barriers, where four organisations are included, we find competitive pressure and environmental uncertainty. This fits together with the previously discussed factor because these three collectively create the environmental characteristics. Looking a bit closer at the companies with low competitive pressure, we observed the same attitude towards the factor as we saw with external pressure. Among others, Topdanmark commented that they did not see a competitive pressure in regard to the chatbot technology.

“*We did not see anything pressure to adopt from our competitors. What I am seeing right now in the market is nothing”* (Topdanmark, Interview, 16:41)

Collectively we saw a theme in terms of competitive pressure, where many companies were not affected by it in their industry. Most companies did not see other competitors showcasing the chatbot technology, even though our analysis shows that many companies either had a chatbot or had decided to adopt one. This lack of awareness can be attributed to the fact that the technology is still very new, and that many companies are currently adopting the technology. We predict that if we conduct the same analysis a year from now, the picture will have changed because a lot more companies arguably will have implemented the technology and thus creating more awareness and ultimately more competition.
Lastly, the factor concerning the environmental uncertainty. As mentioned in the case presentation in chapter 3, we chose to judge the environmental uncertainty for each industry based on the preliminary research. Here we found the banking and the telecom industries to have a high degree of uncertainty, while pensions had a low uncertainty and insurance had a medium uncertainty.

This naturally means we had four occurrences of high uncertainty, because we interviewed two banks and two telecom companies. According to theory a high uncertainty should have a negative effect on the adoption. Tornatzky & Klein (1982) present the environmental characteristics as an aspect capable of explaining the adoption decision. What we find however, is a lack of competitive and external pressures and no clear pattern from environmental uncertainty. We therefore find no explanatory value from this characteristic to explain the adoption of chatbots.

In sum, we find it interesting that there is this lack of barriers to the adoption decision. This makes it more difficult to see patterns in our analysis when looking at the barriers to the adoption decision. One takeaway is that the most prominent barriers to adoption were factors that assume a positive effect on adoption. However, because of the lacking presence from these factors, they, instead of spurring the organisation to adopt, they lead to a situation where adopting the chatbot technology does not seem necessary.

Concluding remarks on drivers and barriers

This broad insight into the representation of each factor across cases shows that there are a large number of drivers to the decision and not a lot of barriers. This supports the fact that many of our cases are about to or have implemented a chatbot. There is a big belief in the chatbot and the benefits that it promises to deliver. Organisations have in 2017 increased their focus on digitalisation and this is presented as one of the biggest competitive forces in the financial market.

"We must adapt to the changes in the market, which also offer us many opportunities to strengthen our relations with our customers and our position in the market, in order to stay competitive."
(Danske Bank, Annual Report, 2018, p.8)

Looking closer at the relative advantage factor it was true for all cases that they wanted to use the chatbot to increase customer service. The chatbot was thus a part of the digital agenda where the chatbot was expected to cover the digitalised customer interaction.

"In 2017, the robot Alma came to Alka, and after training she was ready to chat with customers about more simple insurance issues. Customers can chat with Alma 24/7, and Alka thus achieves being available at the times when it suits the customers." (Alka, Annual Report, 2018, p.4)

The other high valued drivers, organisational readiness, top management innovativeness and attitude all fit into this narrative. The high focus on digitalisation in the annual reports shows that it is top priority among top management, but it is worth noting that only four out of the eight organisations with a high focus on digitalisation in their annual report also mention their chatbot (appendix 7). This indicates that in the organisations where chatbots are not explicitly mentioned by top management it instead is a reaction to a requirement to improve the customer service digitally, set out by the top management.

"The Executive Board has not been involved. They may have just sent an order with "save some costs", "go digital!", "Robot instead of manually!" And then we try to act on these signals." (Tryg, Interview, 41:18)

The barriers we find are interesting when considering that we find that many organisations are adopting a chatbot. There seems to be a lack of pressure to adopt a chatbot, yet they still do it. One question that arises from this is *why* and *from who* these companies then become aware of the adoption possibility? This is a question we will return to in our discussion chapter. Aside from these environmental characteristics there are not a lot of barriers. A closer look, however, shows that not a single organisation has no barriers. This indicates that there in fact are barriers for adopting present in every case. The amount of drivers or barriers, however, do not determine if an organisation will adopt or not. It all depends on how much the drivers and barriers are weighted by the organisation. The fact that there are a few, but scattered, barriers across the cases indicates that it is necessary to explore these, and the drivers as well, more in depth to understand the reason behind why a factor is significant or not.

This section has addressed the first sub-question from our research question. We conclude this section by displaying all adoption factors in our conceptual framework. The factors found to be insignificant are greyed out and we have market the environmental characteristics box with a red border to indicate that they are barriers to the decision to adopt.

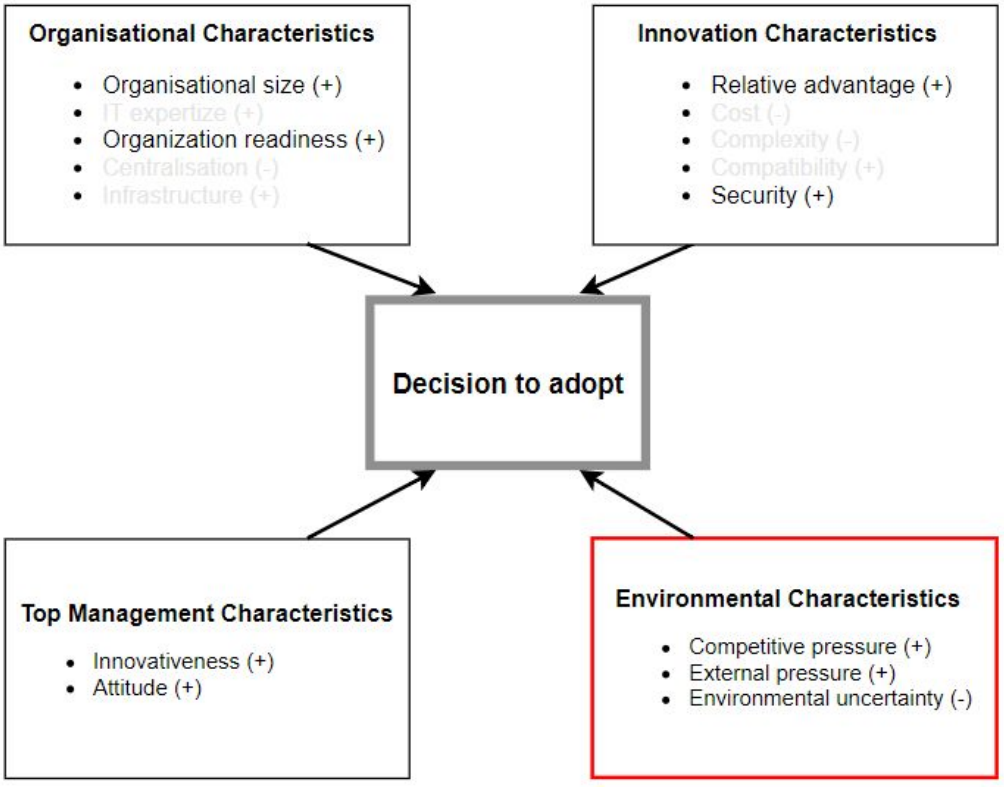

Figure 29 - Adapted conceptual framework, excluding suppliers

7.2.2 Analysis in clusters

The first step of the cross-case analysis approached the research question from a very broad point of view by grouping all the case studies together. Grouping all the cases together might, however, mean that we may miss insightful patterns. When we conduct the analysis from a general point of view we are, for example, comparing PensionDanmark and TDC. They operate in completely different industries, have widely different resources and where on a different stage in the adoption process. Moving forward we will assume a more focused view and compare organisations that share similar traits, both in terms of company characteristics and in terms of adoption factors found through the data collection. This more focused analysis will add to the overall analysis, and help us answer our research question with depth.

7.2.3 Arriving at a base graph

In this section, we will use the insights we gained from the individual case analysis to create a base chart, which will be used throughout the rest of the analysis. We chose to use the following two parameters because they created a comprehensive overview and a good point of departure.

- How far the organisation was in their adoption process
- What type of market strategy it used based on Miles & Snow's (1978) typologies.
- Type of business

In the figure below we have used the model for the adoption process, mentioned in the theory chapter, and used it as the X-axis parameter. Besides placing the companies in the different stages, we have also placed them in accordance to how far with the adoption they are. Two organisations can thus be in the same stage, but if one of them has advanced more compared to the other organisations in this stage, it is placed further to the right. We use businesses as the Y-axis parameter. In addition, the organisations are colour coded based on their market strategy typology (Miles et al., 1978) which was defined in the individual case analysis.

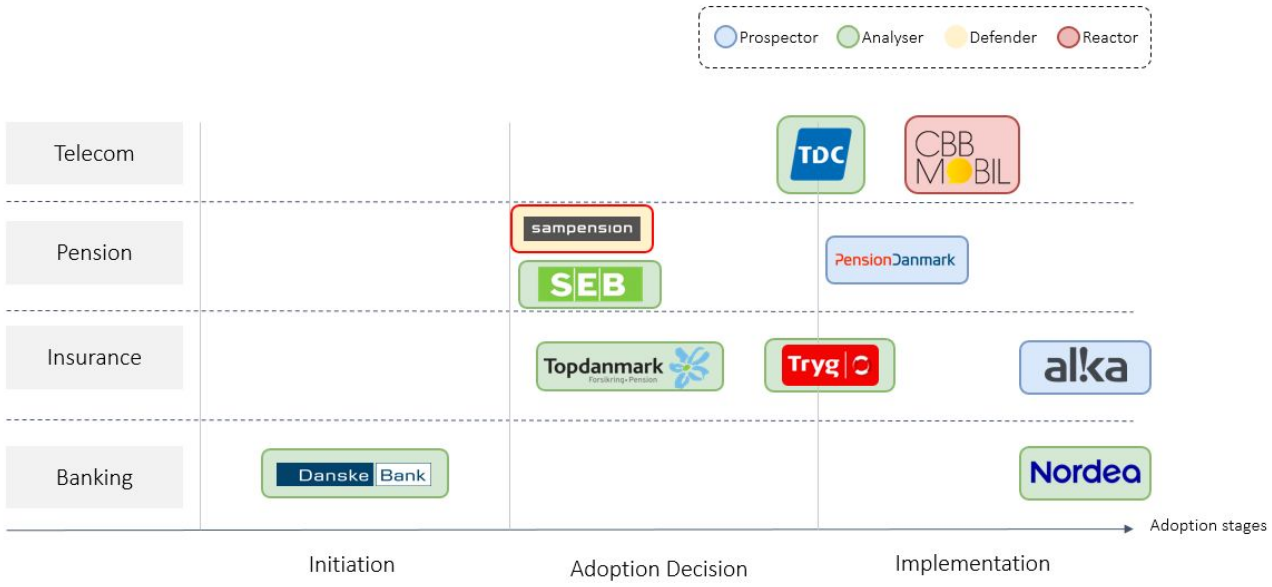

Figure 30 - Base graph

Examining from left to right, we first find Danske Bank on the far left in the *Initiation* stage due to the fact that they are still assessing the chatbot technology and are forming an attitude towards it. Moving more to the right we find Sampension, who is currently in the *Adoption Decision* stage because they have made the decision not to adopt the technology as of now. They are marked with a red border to indicate, that they do not have any intentions to adopt the technology. In the *Adoption Decision* stage we also find SEB Pension and Topdanmark. These two companies have made the decision to adopt the technology, but had not begun the implementation process when the interviews were conducted. Topdanmark is placed further to the right because they expect to start their implementation in late Spring of 2018, while SEB Pension have a longer time horizon. Moving into the *Implementation* stage we first find Tryg and TDC, who are placed to the left. These two companies had just begun implementing their chatbot when we talked to them. The four final companies have fully implemented the chatbot: Alka, Nordea, CBB and PensionDanmark. As seen on the figure, PensionDanmark is just to the right of TDC and Tryg because of their recent implementation in February 2018. Moving to the right we have CBB that implemented in January 2018 and lastly, we have Alka and Nordea who implemented in the Summer of 2017. This model will be used as the foundation in all the following sub-analyses.

7.2.4 Comparing businesses

Up to this point we have merely touched the surface of how the adoption factors influence the adoption decision. Our approach to understand each organisation better will be to cluster them based on different parameters in order to see what patterns emerge and if deviant cases can be located that can contribute to explaining the adoption decision from new perspectives.

The first parameter we chose to base the clusters on was the businesses the organisations operated in. This was a very general parameter to use and was a good way to start. We used the base chart, as illustrated earlier, to visualise the organisations compared to each other.

Overall, we see that the insurance and telecom businesses appear to be further along in the adoption process, while the pension and bank businesses do not show a consistent pattern along the adoption process parameter. The banking business is only represented by Analysers while the insurance business has a majority of Analyser and the others show no pattern using the market strategy typologies as comparison basis.
In fact, we find it difficult to point any significant pattern out when clustering the organisations based on business area. Moving beyond the graph and looking at drivers and barriers show that there are high relative advantages and organisational readiness, but this is true across all the businesses. What was interesting about this business comparison was the inconsistencies that the chart highlighted. We will investigate these inconsistencies in the coming sections of our cross-case analysis.

7.2.5 Clustering with help from Miles and Snow's typology

Based on base graph we will delve deeper into the cases in this thesis in order to understand what reasons lie behind each decision. In this section, we will cluster the cases based on Miles & Snow's typologies for market strategies (1978). This section therefore addresses the second sub-question from our research question.
We will present the four groups and which organisations belong to these groups. The groups are listed in the four tables below. We will also highlight deviant cases, which will be of interest in order to uncover the reasons for why a chatbot was adopted or not in these cases.

Prospectors	Stage of adoption	Business
Alka	Implementation	Insurance
PensionDanmark	Implementation	Pension

Defenders	Stage of adoption	Business
Sampension	Adoption Decision	Pension

Reactors	Stage of adoption	Business
CBB	Implementation	Telecom

Analysers	Stage of adoption	Business
Danske Bank	Initiation	Banking
Nordea	Implementation	Banking
SEB	Adoption Decision	Pension
TDC	Implementation	Telecom
Topdanmark	Adoption Decision	Insurance
Tryg	Implementation	Insurance

Prospectors

Alka and PensionDanmark have predominantly the traits of a Prospector. Alka is, seen from a Danish point of view, the true first-mover across the businesses in this thesis. Alka is also mentioned by other case companies as an early adopter (PensionDanmark, Interview, 38:00) and is considered the first company in the Danish market to publicly announce adopting a chatbot. Alka thus matches with a Prospector's market strategy. Especially in the context of *finding and exploiting new product and market opportunitie*s (Miles et al., 1978, p. 551).

PensionDanmark focuses on another Prospector trait. Their focus is on *maintaining a reputation as an innovator in product and market development* (Miles et al., 1978, p. 551). There is still some focus on the profitability aspect, which edges closer to an Analysers characteristic. What drives their chatbot investment, however, is to maintain their reputation as the most innovative pension organisation in Denmark. A reputation standard established when they were the first pension company to get their own webpage (PensionDanmark, Interview, 40:05). PensionDanmark is therefore a Prospector, especially when looking at the pension business alone.

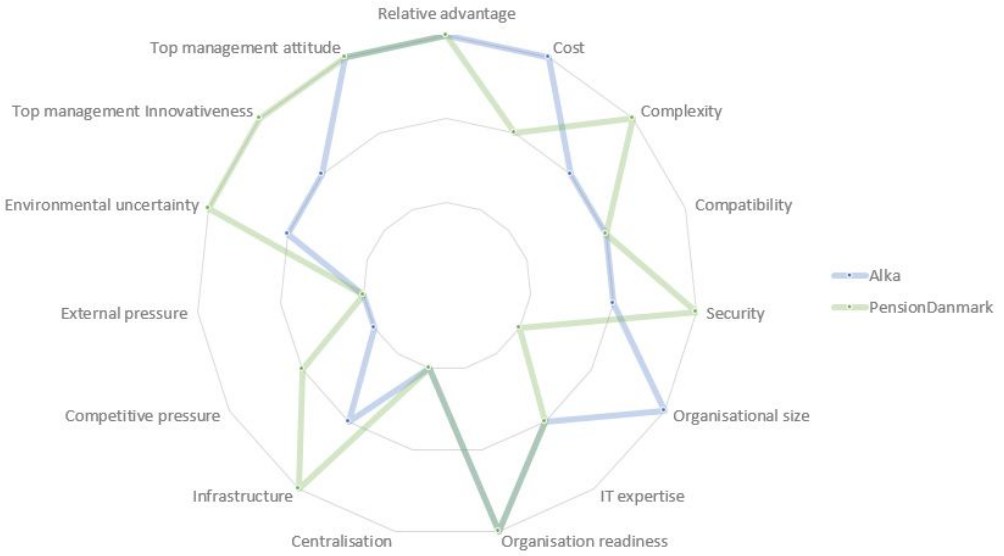

Figure 31 - Comparison of Alka and PensionDanmark

As seen in figure 31 comparing Alka and PensionDanmark to their adoption factors shows that these also support this grouping. Especially the high top management attitude and innovativeness stands out as a big driver. Both Alka and PensionDanmark are centralised, which according to theory should be a barrier. We argue that this indicates that when centralisation is coupled with the fact that the organisations has a high driver from top management innovativeness and attitude it then spurs the adoption rate. This stands as a contradiction to our established theory.
The only adoption factor where Alka and TopDanmark diverge significantly is with organisational size. A smaller organisation should in theory be a barrier to adoption, but this has not been the case for PensionDanmark. We therefore see that top management characteristics follow what is proposed in theory, but that both centralisation and organisational size do not follow what the theory proposes.

Defenders

The general agreement that the chatbot technology has a lot of benefits that matches with current strategy trends, highlighted earlier, logically leaves this thesis void of Defenders. There is however Sampension, who in the most general sense is a deviant case in our thesis. They had, for the time being, rejected the chatbot technology and chosen to focus on ensuring quality in their current digital landscape (Sampension, Interview, 09:43).

Sampension is best described by the character trait that defines Defenders as ignoring developments and instead grow through market penetration (Miles et al.,1978). Although still immature, the chatbot technology had entered the market and was starting to make an impact. Sampension however, chose to ignore these trends and chose to focus on market penetration. This is evident in their annual report.

"We also managed to cut expenses per policyholder in 2016, and we therefore decided to lower pension administration fees for all customers. This demonstrates the value of our business model, which is built on the conviction that growth creates benefits for all customers, new and existing alike" (Sampension, Annual Report, 2017, p. 5)

This statement truly shows how a Defenders strategy is ingrained in Sampension. It shows that they focus on being cost-efficient and that they focus on market penetration by lowering fees for all their customers. We have, however, pointed out that digitalisation is creating a more dynamic environment, where technological advances create new opportunities for those willing to take the risk. Sampension is therefore at risk to become ineffective if the chatbot technology follows predictions and creates a shift in the market and becomes an expected service by the customers (Miles et al., 1978).

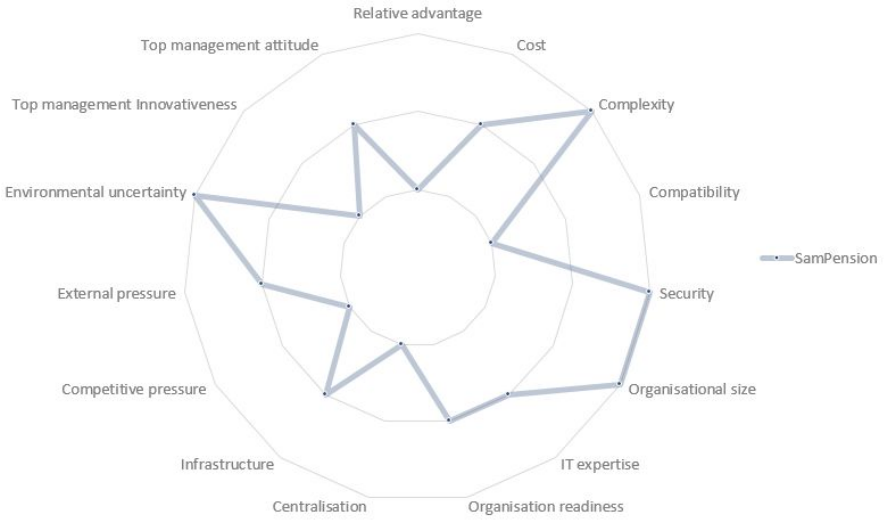

Figure 32 - Analysis of Sampension

In figure 32 it is evident that in Sampension's case there are many barriers to adoption. Roger's innovation characteristics show how Sampension sees many barriers: they do not see the relative advantages and are not at all compatible. Roger's DOI theory does therefore help explain the adoption rejection by Sampension. Sampension being centralised also follows theory as it is a barrier to adoption. Top management characteristics and environmental characteristics are also not present, again supporting the theories propositions.

There are some drivers present, such as the low perceived complexity and big organisation size, but these have not been considered to be significant enough compared to the barriers.

Reactors

Before looking at the group of Analysers we will discuss the only organisation that has ended in the dreaded Reactor category. CBB had no clear digitalisation strategy where the chatbot project naturally could fit into. They state that they have a wish to be more digital and, in the context of Telenor Group, CBB is considered as their online brand (CBB, Interview, 05:10). However, looking through the empirical data CBB stands out as an organisation trying to be a Prospector but failing because of organisational limitations and insufficient capabilities. Risks associated with a prospector market strategy is, among others, overextensions of resources. In CBB's case we find that they have misutilised their resources (Miles et al., 1978) - we base this on the lack of human resources assigned to the chatbot project, as the quote below indicates.

> *We did not have any idea how much it would finally require [...] There was a lot of [times] where [the project owner] had to go in and take over and train it etc. There has been one dedicated resource to train the robot, [then one project leader and a project owner]. This has largely been the team from the CBB side. (CBB, Interview, 13:25)*

They also explained that they ended up spending a lot more on human resources then first anticipated, and their lacking capabilities of acting swiftly and effectively were therefore evident (CBB, Interview, 13:45). This indicates that CBB is a company that has not succeeded at being a Prospector. The definition of a Reactor is a company that follows *a "residual" strategy, arising when one of the other three strategies is improperly pursued* (Miles et al., 1978, p. 557). We therefore must group them as a Reactor.

CBB is clinging to a prospectors market strategy, led by the conviction that they are a digital and an online brand; maybe because they feel forced to prospect digitally because the telecom business is as volatile as it is. Nonetheless, they fail in pursuing this strategy because they don't have the organisational skills to do it. This explains why CBB underestimated the implementation thus answering the question that was raised after the individual case analysis.

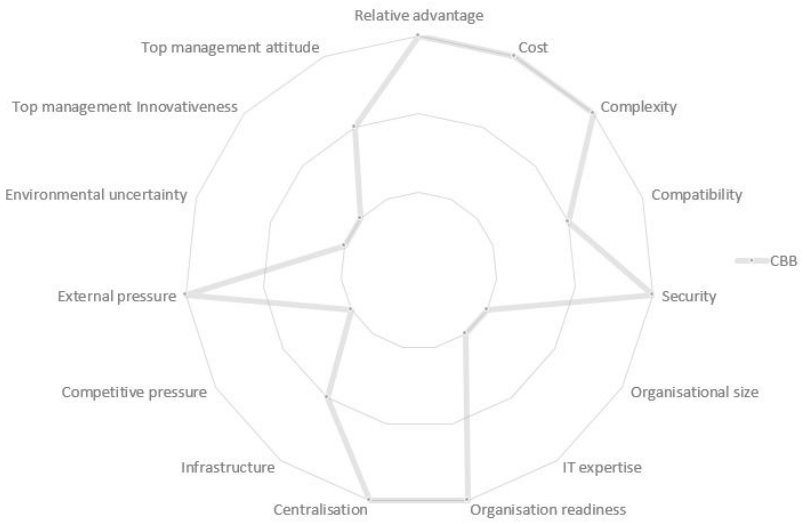

Figure 33 - Analysis of CBB

Looking at the radar chart in figure 33, plotting the adoption factors for CBB also shows an organisation with a mixed combination of adoption factors. They see relative advantages and experience a lot of external pressures, these acting as drivers and which follows the associated propositions from the theory. Yet they do not have the IT expertise and don't have support from their top management. The factors found in innovation and environmental characteristics thus follow proposed theory and have acted as drivers for the adoption decision. Yet the lack of top management support and mixed organisational characteristics indicate that they might not be the Prospector that they intend to be. This supports the claim that they are an organisation who are, in fact, capable of locating new innovations and feel the need for it, but they do not have the skills or the support to do it.

Analysers

The last group is Analysers. The middle ground between Defenders and Prospectors and also the best represented group in our thesis. Pursuing the Analysers market strategy is a difficult feat, especially in a dynamic environment (Miles et al., 1978). We however find that several organisations in our thesis can be defined as one, but we argue that the distance between Analysers, Defenders, and Prospectors is small because the digitalisation movement makes the market change at more rapid pace.

When looking at this group the most consistent pattern is that five out of the six organisations in this group have either implemented a chatbot or are about to. Only Danske Bank is still forming an attitude towards the technology. Topdanmark, SEB, Tryg, and TDC, who all are either in the *Adoption Decision* stage or early in the *Implementation* stage are very consistent with the Analysers market strategy characteristics; not being front-runners for the technology, but have still followed the technology in order to be ready when its viability has been demonstrated (Miles et al., 1978). They do, however, share some traits with a Prospector because the technology has not been given time to mature yet, which makes it quite early for an analyser to approach the technology. This is evident in how Miles & Snow (1978) define an analyser.

Especially Tryg shares some traits with a prospector. They define themselves as first-movers and strive to be the most digital insurance company in the world. However, looking through their motivation for this change, it becomes clear that they are still reacting to a change in their customer base and their reaction stems from a necessity to maintain their market position. Tryg is therefore not trying to uncover new markets or push the industry into new areas. Tryg is an Analyser that very quickly has noticed that the market is changing and has thus been willing to adopt a new and more immature technology, that they have seen become adopted by others, sooner than an analyser normally would.
In the following we will compare adoption factors among the Analysers by dividing them into smaller groups.

SEB and Tryg

Tryg and SEB are the two analysers who have the most in common. When looking at the adoption factors in figure 34, Tryg and SEB are in many aspects comparable only distinguished by some factors set to medium. We see that Roger's DOI theory is very present, both as barriers with its cost and complexity but also as drivers with a high relative advantage and compatibility. It paints a picture of two organisations with many drivers and barriers. Cost and complexity is considered high for both companies, but top management support and relative advantage are also considered high. This gives us an indication of how an Analyser both can see barriers and drivers and thus has to decide for themselves if it is worth pursuing yet. In this case Tryg has weighed the drivers relatively higher than their barriers, in contrast to SEB.

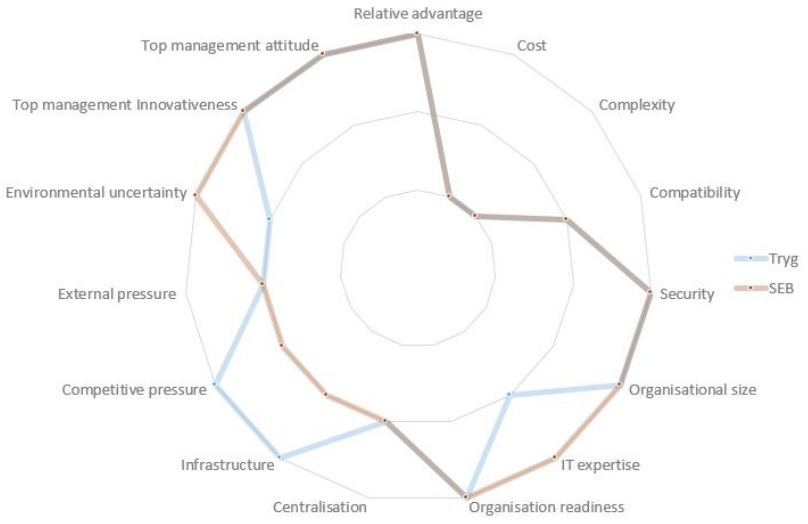

Figure 34 - Comparison of Tryg and SEB Pension

TDC and Topdanmark

TDC and Topdanmark are two more fragmented organisations. They do not show the same patterns as the other analysers[12]. Taking TDC's adoption factors at face value show that there are only a few barriers to adoption, such as the lack of external and competitive pressure. TDC is also in the process of adopting the innovation, which follows the logic of our conceptual framework. Topdanmark sees some costs and complexity issues and does not have the full support of their top management. This supports their hesitation compared to the other analysers. TDC and Topdanmark are most similar when looking at the organisational characteristics such as organisational size, IT expertise and organisational readiness. In addition, compatibility is also high for both organisations. Following the theory this means that these should be drivers for the adoption. Both organisations have also decided to adopt the chatbot and the factors thus follow the theory.

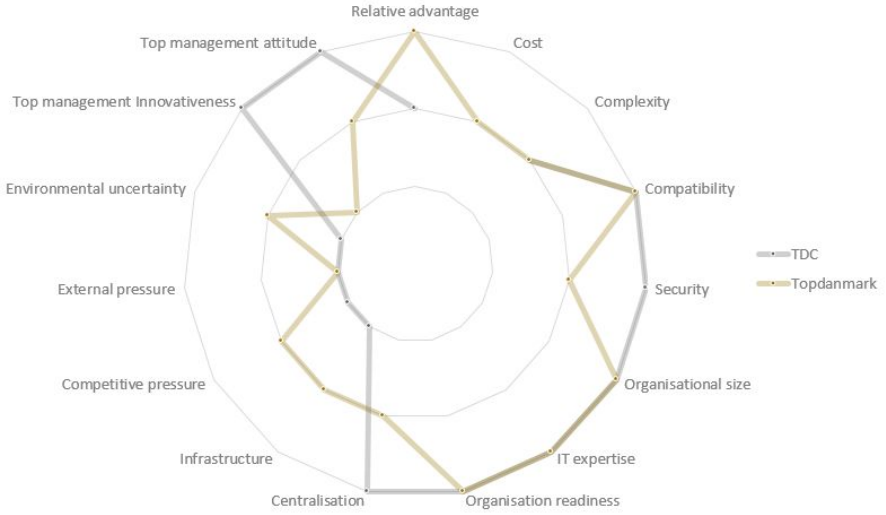

Figure 35 - Comparison of TDC and Topdanmark

Deviant Analyser cases

Two deviant cases are present in this cluster of organisations. Nordea and Danske Bank are considered Analysers even though Nordea already had implemented a chatbot and Danske Bank was still undecided towards the chatbot project.

Nordea

When looking at the base graph, Nordea is positioned in front together with the prospector, Alka. This also makes sense as Nordea has had their chatbot for a relatively long time. Yet, they did not consider themselves as being particularly innovative; it came as a natural step forward based on their increasing IT expertise (Nordea, 2018, 13:41).

[12] The companies were not able to share these specific insights

What explains why an Analyser as Nordea is on the forefront of the chatbot adoption process in the Danish financial industry is also what makes Nordea a special case. Nordea operates across all the scandinavian countries with their primary operations being in Sweden (Nordea, Annual report, 2018). Nordea was also one of two companies who saw the competitive pressure as one of the driving forces behind getting a chatbot. When asked about this, Nordeas informant mentioned Swedish banks as major competitors.

"Partly because a couple of other Swedish bank were implementing, SWED bank was first by far, had it 3 years now. Then SEB [in Sweden] launched theirs in the fall of 2016. So part of it was that others were starting doing it." (Nordea, Interview, 13:41)

This shows that there resides a much clearer cross-scandinavian point of view in Nordea where environmental impacts in Sweden also impacts Nordea in Denmark. As opposed to Nordea, SEB is a case where the organisation is more geographically independent. Their Swedish unit implemented a chatbot in 2016, but this has not had an impact on the Danish unit yet.

Danske Bank

Danske Bank is a deviant case for the opposite reason. Danske Bank was hesitant towards the chatbot technology and had not made major advances in the project yet even though they possessed many of the same traits as other Analysers and may even be the 'purest' analyser in our thesis- the quote below illustrating this point well.

"We have not been the first ones, which once in a while can be an advantage. Then the others can test and you can learn from their experiences." (Danske Bank, Interview, 19:49)

Danske Bank found it more valuable compared to the other Analysers to wait with implementing a chatbot until the technology has become more mature.

By taking a closer look at the case and findings about Danske Bank's overall approach to the adoption, we started to understand why they refrained from implementing a chatbot. Danske Bank, in its essence, had a completely different expectation and perception of what was required from a chatbot project. When we asked Danske Bank about what was needed in order for the company to implement the chatbot technology, they emphasised the need for structuring the knowledge that is available throughout their organisation and saw this as the biggest hurdle (Danske Bank, Interview, 11:22). This was a curious opinion as Danske Bank was the only organisation who mentioned knowledge management as an important aspect of a chatbot project.

"The biggest hurdle is clearly to create a knowledge management -strategy and -structure and then process it so it may work. This is a bigger challenge than the actual conversation layer." (Danske Bank, Interview, 12:35)

We realised that Danske Bank saw the extent of the project as much bigger than many of the other companies in our thesis. They did not see the adoption of the chatbot technology as a simple add-on to their existing portfolio of IT systems. Rather, the company thought that the adoption would raise new demands in terms of how Danske Bank manages their knowledge, and therefore believed they needed to have the right knowledge management structure, before they could implement the chatbot technology (Danske Bank, Interview, 21:40). On the base of this, we argue that even though Danske Bank might have had the capabilities to adopt a chatbot, they did not do so because they found the extent of the project to be big. This explains why Danske Bank hesitated regarding the adoption of a chatbot and thus answers one of the question that was raised after the individual case analysis

Comparing Nordea and Danske Bank

Figure 36 illustrates that Danske Bank and Nordea are also somewhat similar when looking at their adoption factors. High IT expertise and low complexity indicate organisations who have experience within the field of digitalisation technologies. They are also one of the few organisations who feel a pressure to adopt, from customers and external respectively. There are, however, environmental circumstances that has led Nordea to have a chatbot. One could imagine that Nordea would have been in the same stage as Danske Bank if their environment was more similar. It is interesting that Danske Bank perceives the external pressures to be high while Nordea does not. Danske Bank and Nordea are in the same industry with the same customer segment, and the pressure should thus objectively be the same. This highlights the subjectivity of how the case companies perceive these factors. In this case it indicates that Nordea and Danske Bank have a completely different interpretation of the market and it shows that the same reality can have different impacts on different organisations.

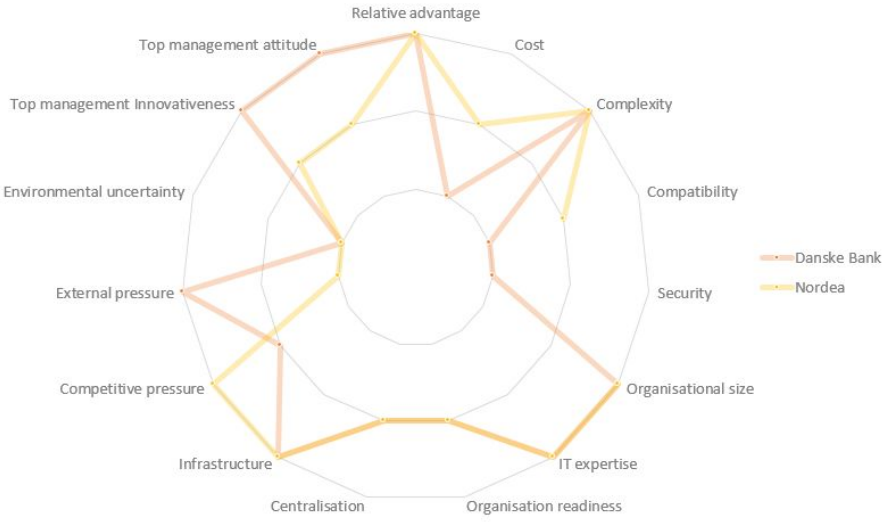

Figure 36 - Comparison of Danske Bank and Nordea

Conclusion

By understanding our cases' market strategy, we can better understand how they interpret the different factors that impact an adoption decision. We have learned that the Prospectors have implemented a chatbot and they do it because they focus on the relative advantage and the competitive pressures. Alka seeks new advantages to exploit, while PensionDanmark wants to maintain their image as an innovator.

Defenders have a different mindset when regarding innovation. Sampension focuses on building a better digital foundation before adding new innovations on top.

Reactors are a group of organisations that have failed to pursue other market strategies. Their decision to implement depends on what type of strategy they try to pursue. CBB pursued a Prospectors market strategy, and have thus implemented a chatbot. They, however, failed to utilise their resources and to realise that they were lacking the right capabilities and therefore spent more time and resources than planned.

Lastly, Analysers are somewhat in between and can both have implemented a chatbot or not. It depends on how they prioritise drivers and barriers. Tryg has implemented a chatbot because they want to maintain their market position. Topdanmark has not yet implemented one because they used longer time to take the decision due to a somewhat reluctant top management.

Clustering the case organisations according to Miles & Snow typologies (1978) thus proved to be a good approach to understand the organisations better. Not only did we get an insight into how each market strategy had affected the organisations but we also learned that companies have adopted the chatbot technology for different reasons: from Alka, a Prospector, to CBB, a Reactor and finally to Nordea, an Analyser. We also saw that there are barriers and drivers present in every pursued type of strategy but depending on the circumstances, organisations value some drivers higher than the barriers, or vice versa. This indicates that questioning why organisations in the Danish financial and telecom industries are adopting the chatbot technology has several deeper aspects to it, and they need to be understood before one can answer such a question. This section has therefore sought to answer the second sub-question from our research question.

7.2.6 The temporal dependency of adoption factors

In the previous sections of the analysis, we have analysed how the companies perceived the chatbot technology in the moment they took the decision to invest in the technology. When coding the collected data, we however found that some companies changed their perception of adoption factors over time. Our interest in this change of perception started with a number of observations we found in the case of CBB. This section therefore builds on previous findings, which enables us to start addressing the main research question. Answering the main research question requires covering many aspects. This section will start answering the main research question by covering one of those aspects.

Looking through the data we collected about CBB, it was clear that they changed their perception over the span of their adoption process. An example was how CBB perceived the cost in relation to the implementation after the adoption.

"We did not anticipate that we had to use so many resources. Starting out we did not have a clear idea of how many resources the implementation in reality demanded (CBB, Interview, 13:25)"

In the quote above, it is evident that CBB was surprised by the actual costs used by internal resources since they were higher than expected. In addition, CBB also found the chatbot technology to be much more complex than initially expected. Among other things CBB mentioned that they found it surprisingly hard to build their existing manual chat function into the chatbot, and they said that the project turned out to be much more technically challenging than expected (CBB, Interview, 16:50; 24:10).
These observations we made of CBB created a curiosity to explore whether other companies had changed their perception over time, and if it was possible to find a pattern among these changes. To display the data, we found regarding changes of perception we constructed a scatterplot diagram where we plotted the company's perception in the decision moment, and how it evolved over the span of the adoption. This scatterplot can be seen in figure 37.

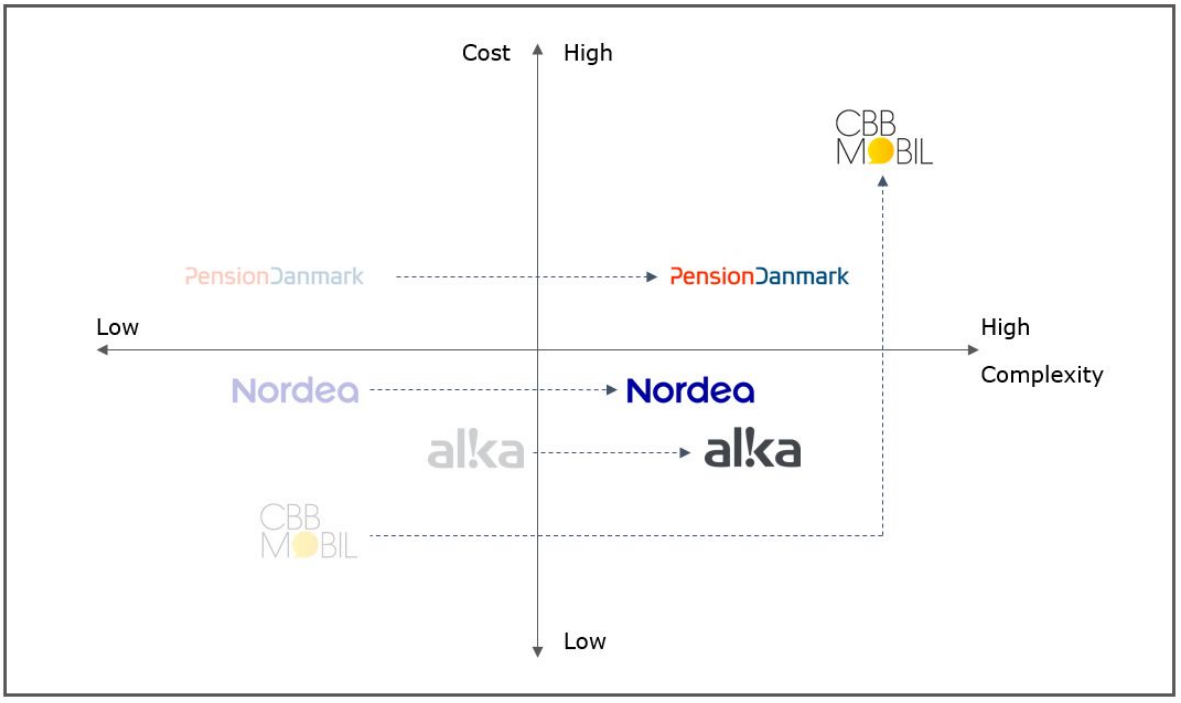

Figure 37 - Scatterplot diagram

Inspired by the CBB case, we decided to use cost and complexity as the two dimensions in the scatterplot. We only investigate the companies that had adopted the technology in this first iteration in order to see how the factors evolved. Our findings are accommodated on the chart showing the two values for each company, with an arrow indicating how their perception evolved. The initial placement is based on the individual case analysis section.

As seen in the diagram, we found that the four companies that had implemented the chatbot technology changed their perception after the adoption. We found that these four companies could be divided into two groups. One group with the two companies that recently adopted the technology, CBB and PensionDanmark, and one with the two companies that implemented the technology in the summer of 2017, Nordea and Alka. In the following, the patterns we found for each group will be explained and we comment on how this change in factors affect the adoption.

Recently adopted chatbots

As already mentioned above, CBB saw both factors increase during the adoption. This was due to a surprising need for labour resources and big challenges with the technical aspect. Because of this CBB moved both further to the right, and further to the top in the diagram.
Like CBB, PensionDanmark also saw an increase in complexity. From the project's beginning PensionDanmark saw a rather low complexity in relation to the project, because they used Microsoft as a supplier, which had delivered a big part of their existing IT systems. However, PensionDanmark found that it was difficult to get the needed support from Microsoft, and they felt left alone with many technical challenges. In addition, PensionDanmark saw it as difficult to find other resources in the market who had the right competencies and experiences with the technology to support them.

"Sometimes when we have done something new, we have partnered with, for example, Accenture [...] This time there have not been so many with the relevant experience, so we have done a lot on our own." (PensionDanmark, Interview, 32:25).

Because of this the chatbot project turned into a rather complex endeavour for PensionDanmark, which is expressed in the diagram by moving PensionDanmark further to the right.
In terms of the perceived cost, PensionDanmark acknowledge that an introduction of a new technology is expensive, but it had not been more expensive compared to other recent projects (PensionDanmark, Interview, 30:50). Because of this they stay on the same level of perceived cost, indicated on the Y-axis.

In sum, it is clear that both CBB and PensionDanmark saw an increase in complexity during the adoption of the initial version of the chatbot technology. This increase in complexity was due to the unexpected technical challenges that emerged during the implementation phase.

The complexity of furthering a chatbot's capabilities

Nordea and Alka had both implemented the chatbot technology over a year ago and were therefore in another situation compared to CBB and PensionDanmark. Nordea and Alka saw an increase in complexity after they had implemented their first chatbot when they started to focus on furthering their chatbot's capabilities. Neither of the companies experienced the implementation of their first chatbot to be complex or straining. They both implemented a simple FAQ chatbot in their first implementation and their impression of how difficult it was to implement one had not changed.

However, both Alka and Nordea have set goals to improve their chatbot: to make it more sophisticated and advanced. This feat has proved to be quite challenging for both Nordea and Alka.

"But the thing with chatbots is that it is actually quite easy to implement as a 1.0 version, but when it becomes more sophisticated, speech, recommendations, biometric login etc. once you add all that then it becomes difficult. We are not there yet." (Nordea, Interview, 28:29)

Alka also explained that they are planning to further develop the chatbot and integrate it with their core systems in order to let the chatbot answers specific customer question (Alka, Interview, 11:40). In this further development Alka found it difficult to integrate the chatbot with the existing systems, because they are too old and do not support a new chatbot technology (Alka, Interview, 12:30). Both Alka and Nordea experienced an increase in complexity, due to the fact that they found it hard to advance beyond the initial simple version of the chatbot - taking it from version 1.0 to version 2.0, as Nordea expressed it (Nordea, Interview, 28:20). This is one of the great examples of how the temporal dependency of the factors manifests itself. In this example, we see how a barrier, that initially was perceived as insignificant, changes to become significant later on - Alka emphasises this in the interview.

"The further development of our chatbot is in our roadmap. We found it to be quite difficult to progress, partly due to some technical challenges and partly due to security issues" (Alka, Interview, 12:30)

Following Alka's statement, security is also one of those factors where it was not a concern when they initially where deciding whether to implement a chatbot or not. Later, however, it became apparent that it would become a much bigger challenge because they wanted to integrate the chatbot with their current systems. The same is true for the infrastructure factor, which was not a barrier when implementing the 1.0 chatbot, but became more significant when developing the 2.0 (Nordea, Interview, 28:29).

Looking collectively at the four companies that had implemented the chatbot technology, we see that all companies saw an increase in complexity, while CBB, as the only company, saw an increase in cost. By looking at the companies in relation to how long they had worked with the technology, we found that this increase can be attributed to two things. Partly to technical challenges with the initial version and partly to the increase in complexity when they had to make their simple chatbot more sophisticated, and integrate them with their core systems - going from 1.0 to 2.0. A key takeaway from this section is thus that some factors can initially seem to be drivers to adoption, but will eventually turn into barriers because of changes in learnings or scope. On the base of this we see a trend in the diagram where companies move from the left to the right along the complexity axis.

Plotting the other companies - testing the hypothesis

Based on the four companies that had adopted the technology and the existing diagram, we made the following hypothesis: *Companies that have not implemented the chatbot technology, but want to, should perceive the technology with a low complexity (left on the complexity axis) and less costly (on the lower half of the cost axis)*. To test this hypothesis, we placed the rest of the companies in the figure 38[13].

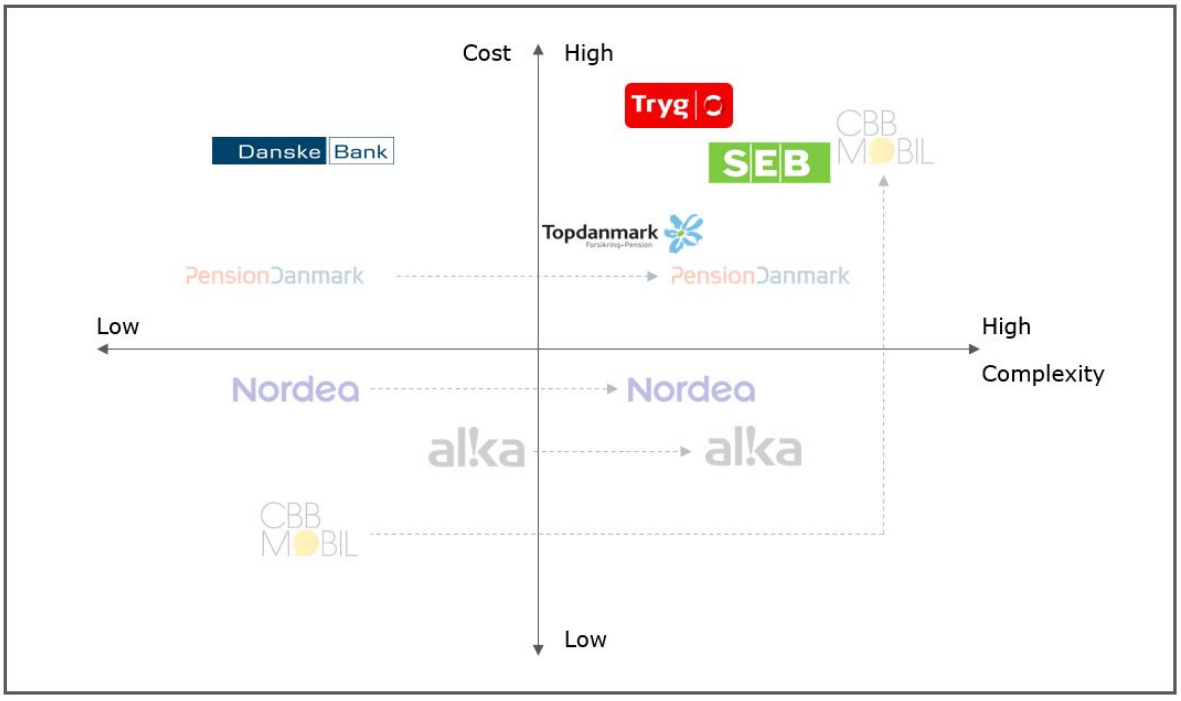

Figure 38 - scatterplot with remaining companies

The result of plotting the data in figure 38 was quite surprising since none of the companies were placed where we expected them to be. Three out of the four companies already expected the project to be both complex and costly. The last company, Danske Bank, expected the project to be relatively costly due to the extent as already described in section 7.1.4 but not as complex as the other three companies perceived it. However, when diving into the three cases already perceiving the technology as complex, we did find an interesting pattern.

Looking at Topdanmark and SEB, they both perceived the technology as complex for the same reasons as why Nordea and Alka changed their perception. Topdanmark and SEB wanted to make a more advanced chatbot that is integrated with their core systems from the beginning.

"We have set the goal [for the chatbot] to be able to go all the way and have it integrated with our core systems. [...] We are very aware that everyone tells us that nobody has developed a chatbot which is integrated behind a login and can interaction with the core systems."
(Topdanmark, Interview, 30:20)

[13] TDC and Sampension are not included in the display. TDC is not included because they did not want to share information about the cost of the chatbot project. Sampension was not included because they are not planning to adopt the chatbot technology.

Topdanmark therefore already anticipated the challenges that the integration of the chatbot with their core systems would cause. Similarly, SEB also foresaw a complex implementation. They anticipated big challenges when they were to integrate the chatbot to their core systems.

"*Setting the chatbot up will not be that expensive, however it will be much more expensive to integrate it correctly with our core IT systems.* (SEB, Interview, 12:48).

Tryg was, as opposed to Topdanmark and SEB, planning to implement a FAQ chatbot. However, they acknowledged that even implementing a FAQ chatbot would be challenging and time consuming (Tryg, Interview, 20:28).

"It's a new technology, so you do not know where to start [...] Our knowledge [of chatbots] is almost solely derived from an idea and a desire, so the whole decision-making process regarding [which suppliers are] in the market, what can they offer and what do we really need. It has been difficult." (Tryg, Interview, 18:25)

The reason for Tryg's *initial* perception of complexity and cost is therefore similar to CBB's and PensionDanmark's *changed* perceptions. The only difference is that Tryg acknowledged the complexity and cost before implementing a chatbot where CBB and PensionDanmark experienced them after they launched their first version of chatbots.
The reasons behind the changed perception by Nordea, Alka, CBB, PensionDanmark helps explain why the companies that have not launched a chatbot yet, already found the technology complex and in some cases also expensive. It seems that companies that already had implemented the technology underestimated the scope of what it takes to implement a chatbot, maybe because of a lack of existing knowledge, as was indicated in the cases of CBB and PensionDanmark. This may also indicate that companies adopting the chatbot technology in the future will learn to understand a chatbot adoption as a complex project, due to learned experiences from other companies who already have implemented the technology. This insight helps explain why some companies already have adopted the technology while others have waited. The ones that have waited, simply have a different initial understanding of cost and complexity and this influences their adoption.

7.3 Do suppliers influence the adoption decision?

Up until this section, we have yet to include the suppliers in our analysis. According to Frambach (1993) as described in the theory chapter, different actions from the supplier-side of the technology may influence the adoption rate either positively or negatively. In this section, we will provide the findings from the data collected from the two suppliers. See the coding of the supplier related data in appendix 9. The four examined supplier factors are: Supplier risk, Supplier cooperation, Supplier Targeting and Supplier Market winners. Two factors were not found to have any significant patterns, which we will elaborate on in the next section.

7.3.1 Two factors with no clear patterns

We were not able to find a clear pattern in the suppliers' approach to **reducing the risk** for potential customers. On the one hand Boost.ai provides a demo to their customers to let them try their software before deciding to invest in the technology (Boost.ai, Interview, 12:00). In addition, Boost.ai does not require customers to comply to specific infrastructure requirements (Boost.ai, Interview, 27:52). On the other hand, BotXO does not offer a trial period for their chatbot solution. A potential adopter therefore has to commit and invest in BotXO's platform before they can try the technology within their own company's domain (BotXO, Interview, 10:15). It is therefore clear, that the two suppliers have different approaches to introduce the technology to new customers, which makes it difficult to compare. According to the theory, Boost.ai's approach should improve the adoption rate since they absorb risk from the customers by letting them try the technology before they commit to it.

The same was true when we analysed the suppliers' approach to **cooperate** with partners in order to promote the technology. Again the two suppliers used different approaches. BotXO was most active in regard to spreading the technology through networks. For example, BotXO has established a network for interested people within the area of e-commerce. In this network, BotXO encourages people to talk about the technology in general as well as sharing their personal experience. They believe that the network will improve knowledge sharing between companies. In addition, BotXO cooperates with partners, such as different consultant firms, in order to facilitate events and workshops for companies interested in chatbot technology. According to the theory, the two initiatives by BotXO should improve the adoption rate. In regard to Boost.ai, they had a more laid-back approach and did not have a cooperation strategy. They cooperate with partners but only attend events if they are contracted to. As with the first supplier adoption factor, we are not able to compare the two approaches in regard to the rate of adoption. These two factors are therefore not useful to help explain why our case organisations choose to adopt a chatbot or not.

7.3.2 High focus on companies with customer engagement

Although we did not find many insights from the first two supplier adoption factors, we did find interesting takeaways in the latter two adoption factors: Supplier Targeting and the Supplier Market Winners factors. These factors support patterns and perspectives emphasised throughout our thesis, but we still find it difficult to use these insights to explain why our case organisations choose to adopt or not.

The first aspect we want to present is the interviewed suppliers' common **target group** of customers. The two suppliers had similar perspectives of how a perfect customer operates. Boost.ai focused on the same industries as our thesis is focused on.

"We [Boost.ai] have started with the banking and insurance companies, and are now in the process of moving to telecommunications companies." (Boost.ai, Interview, 06:12)

Boost.ai added that it was important that a potential adopter already has some kind of customer service or wants to establish one (Boost.ai, Interview, 20:30). BotXO agreed and added that companies with great online presence are the most potential adopters *(BotXO, Interview, 21:32).* Both Boost.ai and BotXO focused on the financial industry and were starting to work with the telecom industry. This emphasises and supports the high engagement that we have witnessed through the 10 case companies in our thesis. We cannot prove that the suppliers have increased the adoption rate, but the fact that the chatbot suppliers focus on these same industries indicates that these organisations included in our thesis are willing to adopt the chatbot technology. This is an important highlight and might indicate that the industries that are the focus of this thesis might be more interested in chatbots and willing to adopt compared to other industries.

7.3.3 Demand from buyers despite the lack of marketing from suppliers

The **supplier market winner** factor is also important to highlight in this section and relates to the previous insight. This factor refers to the marketing strategy that the suppliers use in order to win market share. When asked about how they tried to differentiate themselves from competitors, both suppliers explained that they actually did not need to put extra effort into their marketing activities to attract customers, because there currently is such a big demand and the product is selling itself.

> *"We do not need to spend money on advertisements. It all comes by itself. It's so hot that we do not have to do that much. Most of the customers contact us." (Boost.ai, Interview, 21:23)*

BotXO somewhat agrees, but explains that this is a recent change in demand, partly because of the increased media coverage (BotXO, Interview, 34:10). Based on the statements from Boost.ai and BotXO it is evident that the suppliers experienced a huge demand from customers, which is also supported by the big uptake from our 10 case companies.

These two findings indicate a booming market in the Danish financial industry and the telecom industry as well. Once again highlighting that Gartner's Hype Cycle about emerging technologies from 2017 (Panetta, 2017) is right about placing chatbots and other virtual assistants on the peak of the cycle. It confirms that the suppliers are experiencing high demand from the industries, but we cannot link the actions taken by these suppliers to the adoption decision by our case companies.

7.4 Concluding remarks

This concludes our analysis chapter. We started by presenting the individual case analysis were we looked at each case in isolation. This concluded the second stage of the multiple-case study procedure as presented by Yin (2014).

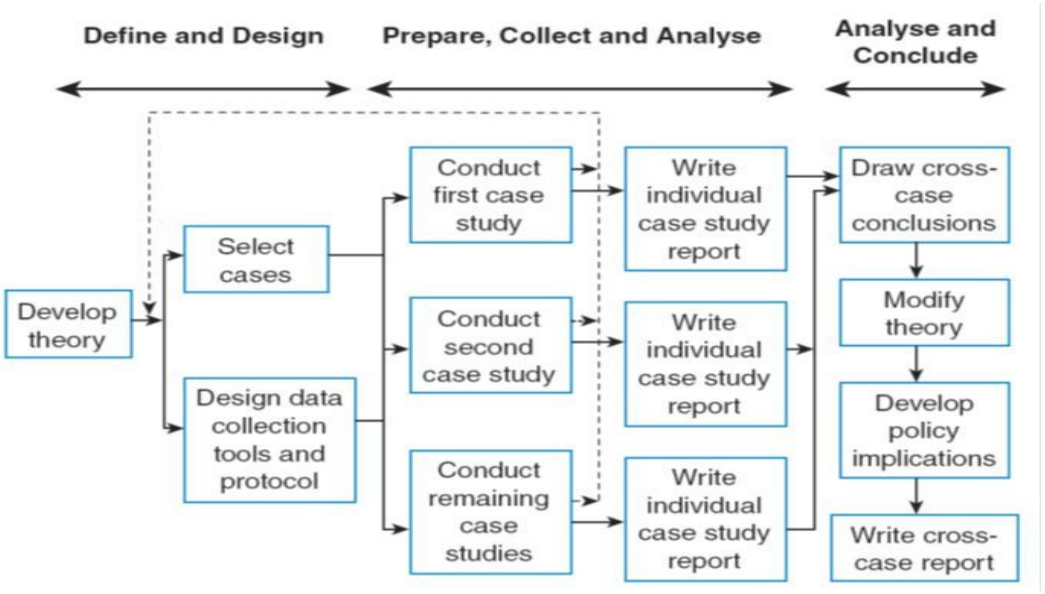

Figure 39 - Multiple-Case Study Procedure (Yin, 2014)

We then moved into the last stage of the procedure was we made our cross-case analysis. In this second stage of analysis we found a number of interesting insights and explanations to why companies were choosing to adopt a chatbot. We highlighted the most prominent drivers and barriers found in our thesis in relation to our conceptual framework. We explained how Miles & Snow's four market strategy typologies can be applied to the organisations. Then we showed how the adoption factors' temporal dependency influences the perceived complexity of the adoption. Lastly, we presented and analysed the chatbot suppliers.
In the next chapter, we will discuss what the takeaways from the analysis mean, what implications they have and if the takeaways build on a valid data foundation.

8 Discussion

In the analysis, we have presented and analysed the data and emphasized key insights. In this section, we will discuss the insights from the analysis which will see us concluding Yin's (2014) procedural model regarding multi-case studies.

Our findings from the analysis show that our methodological curiosity, *to investigate a quantitative well studied phenomenon with a qualitative approach*, gave us valuable insights to why Danish companies are adopting the chatbot technology. As previously mentioned, most theory regarding IT innovation adoption has been built upon a quantitative data collection methodology. We have, on the contrary, used a qualitative approach guided by existing theory which has revealed extensive insights and explanations to the adoption of chatbot technology. Furthermore, the qualitative approach allowed us to find patterns and understandings, that reached beyond the adoption factors from our conceptual framework. This highlights the strength of using the qualitative approach. We see this as an important implication for theory and argue that the approach we used in our thesis offers a favourable way of investigating the topic of innovation adoption.

Combining our empirical data with our established theoretical basis also gave rise to big implications for practice. We found that despite the enormous interest and willingness to adopt the chatbot technology, the companies in our thesis had only gotten lukewarm results from the chatbot project. Talking to the companies it was clear that they expected to first realise great benefit from the technology once it was integrated with the rest of their core IT systems - a version 2.0. However, none of the companies had been able to launch a version 2.0 and could therefore not realise the real value. An important implication for other potential adopters, is therefore that an integration between the chatbot technology and the existing IT infrastructure, to develop a version 2.0, is not an easy task. Companies should take this fact into account and expect to use a great amount of resources to ensure this integration.

The above mentioned discussion points regarding both theory and practice will together with other points be elaborated on in this discussion section. Firstly, we will cover the theoretical implications we found, secondly the practical implications and lastly we will discuss the validity of the thesis.

8.1 Implications for theory

This section will cover the implications for theory. We will discuss our use of theory and how our approach can contribute the field of IT innovation adoption. Further, we will look at the impact and how our conceptual framework was used and how market strategies influence the adoption decision. We will then cover the supplier aspects and lastly how adoption factors can change through the process of adoption.

8.1.1 Answering the “why” of IT innovation adoption

This thesis has sought to investigate why Danish companies are adopting the chatbot technology and how this can be explained by using the theory of IT innovation adoption. In order to investigate this, we developed a conceptual framework, which integrates different aspects from theory regarding adoption of IT innovation including Rogers’ DOI theory (Rogers, 1983), the TOE model (Tornatzky & Klein, 1982), Frambach’s conceptual framework (Frambach, 1993) as well as the adoption factor review by Hameed (2012a). Looking back on our investigation, a number of things can be discussed in relation to how well our conceptual framework served its purpose of answering our research question.

First of all we found that the conceptual framework overall worked very well for our investigation. IT innovation adoption covers a lot of aspects. From *when* an innovation is adopted, with Rogers’ S-curve; to *how* an innovation is adopted, with the adoption process model; to *why* an innovation is adopted, with the adoption factors. This leaves the researcher with endless of possibilities to investigate an innovation adoption within a case study. We chose to look at *why* innovations get adopted and thus used adoption factors to investigate this. By combining multiple views on the adoption of innovation meant we got a more holistic view of the companies’ reasons behind adopting the chatbot technology. We thus find our conceptual framework to be beneficial in investigating the topic of innovation adoption and we show that the IT innovation adoption theory can be used to answer why companies adopt a chatbot.

One could, however, argue that just using a number of specific factors from the theory somewhat limited our research and did make room for other angles or underlying reasons, that might have influenced the adoption. We met this challenge by using a qualitative research method, which allowed for a more open interpretation in our data collection phase. The fact that we used semi-structured interviews during our case study, meant we got a broader understanding that was not only limited to the specific factors. We therefore methodologically challenged previous literature, which has mostly used a quantitative approach (see for example: Moch & Morse, 1977; Damanpour & Schneider, 2006; Karahanna et al, 1999).
As opposed to these previous studies we were able to research our cases without limiting the informants to only answer questions within a fixed frame, but we allowed them to answer in their own way, thus enabling us to see if our conceptual framework was too narrow or if it had to include additional factors. This has led us to see how factors can change over time and discuss if new factors should be added to our conceptual framework. If we had used a quantitative research method, this would have resulted in a more structured approach which, arguably, would not have allowed for the same insights as the qualitative approach. This gives reason to highlight a very broad implication for theory, which is that using the theory with a qualitatively approach is an advantage for the researcher.

It enables the researcher to find underlying reasons for adoption, find reasons that fall outside the conceptual framework and to understand the nature of how the adoption factors affect the decision to adopt. Once again highlighting the success of our methodological curiosity and approach.

8.1.2 Expanding our conceptual framework

When we were investigating Danske Bank as a deviant case, we found that in order to explain why Danske Bank had not adopted a chatbot we had to look for explanations beyond our conceptual framework. According to our conceptual framework Danske Bank had many drivers for adopting a chatbot, yet they refrained from adopting a chatbot. This was a surprising finding, that we had to acknowledge. However, because of our qualitative data approach we were able to investigate this closer and find what the underlying reason for not wanting to adopt was.
We found that Danske Bank perceived the extent of the adoption project as being much bigger than other companies. We found this aspect important when explaining why Danske Bank had not decided whether to implement a chatbot or not. As described in the analysis chapter, Danske Bank found it necessary to structure their internal knowledge management infrastructure better before they were able to successfully implement the chatbot technology. This was a very different view on the chatbot technology compared to other companies like Nordea and Alka, who already had implemented a chatbot. They did not have the need to change internal processes in order to use the technology. This aspect could not be answered fully by the adoption factors included in our conceptual framework. Both the complexity and infrastructure factors only regard the innovation itself, but Danske Bank did not see the chatbot technology to be complex or challenging for their current infrastructure. The challenge for Danske Bank was the extent of the project's reach and how deep its impact would be. We therefore suggest to add a new factor for further research regarding the adoption of new technology. The new factor should cover the extent of the adoption, which we define as:

Extent of adoption
How big a part of the organisational processes is affected by the implementation and the subsequent adoption of the technology?

*P20: **Extent of adoption** will have a **negative** effect on chatbot technology adoption*

Our assumption about the effect of this new factor is that the bigger the affected part of the organisation is, the bigger a barrier the adoption factor will be - thus assuming a negative effect. We propose that this adoption factor should be included as part of the organisational characteristics and help explain why an organisation, even though the innovation characteristics are perceived as drivers, still does not decide to adopt an innovation. This lack of explanation power in our conceptual framework suggests a knowledge gap in existing theory. Our goal is, however, not to investigate these knowledge gaps but we highlight them to incite further research into these aspects of the research field.

8.1.3 The significance of the adoption factors

In the cross-case analysis, we presented the biggest barriers and drivers for the organisations in our thesis in regard to the adoption of a chatbot. We saw a lot more drivers than barriers and at the same time it became evident that some adoption factors, were not significant when looking across all cases. This has certain implications for our conceptual framework, if these insights were to be implemented into it. We will therefore use this section to comment on which elements of our conceptual framework contributed the most to explaining the decision to adopt the chatbot technology.

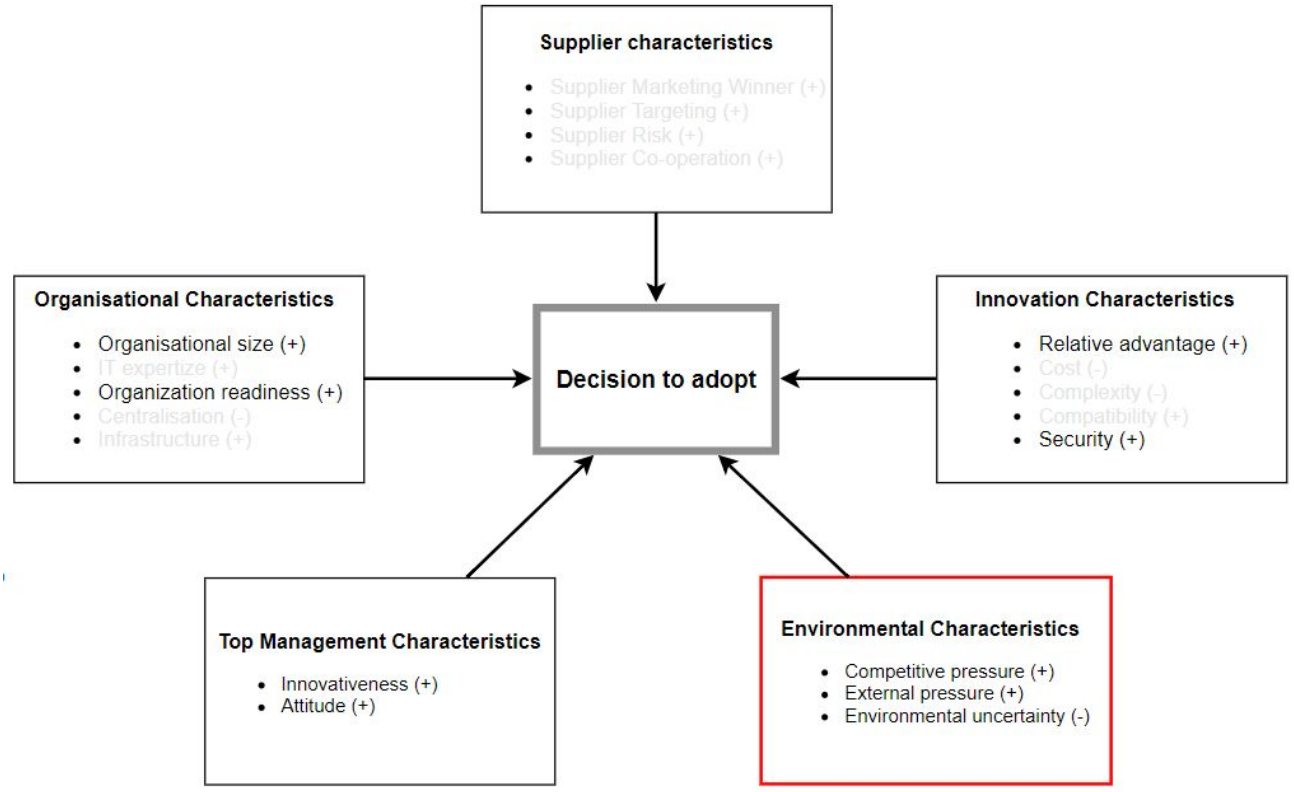

Figure 40 - Full adapted conceptual framework

We take departure in the conceptual framework presented in section 5.3 of the analysis and have added our findings regarding the supplier characteristics as they were presented in the analysis. We display all adoption factors but have greyed out the insignificant ones. The environmental characteristics box is marked with a red border to indicate that they are barriers to the decision to adopt. The figure shows that 10 out of the 19 factors included in our conceptual framework did not have a significant impact on the adoption decision. We found two drivers each in the innovation-, organisational-, and top management characteristics. The analysis showed that we were not able to link any of the supplier characteristics to the adoption decision. Lastly, we found the environmental characteristics to be barriers to the decision to adopt because of a lack of pressure and the high environmental uncertainty.

As presented in the theory section, our conceptual framework used Hameed's review of adoption factors (2012). To study the theoretical implications of our findings closer we compare our findings with Hameed's findings (2012). In table 23, all adoption factors included in our conceptual framework are shown, comparing them with the findings Hameed presented. The second column shows if the factors have been found significant in our study and the last column shows a percentage of how often the adoption factors have been found significant in other studies in relation to Hameed's research.

Table 23 - Compared adoption factors

Adoption factors	Significant in our framework	Hameed's findings
Top management attitude	Yes	91%
Organisation readiness	Yes	86%
Security	Yes	85%
Environmental uncertainty	Yes	80%
Relative advantage	Yes	79%
IT expertise	No	73%
Infrastructure	No	68%
Top management innovativeness	Yes	65%
Competitive pressure	Yes	64%
Organisational size	Yes	63%
External pressure	Yes	62%
Complexity	No	48%
Centralisation	No	46%
Cost	No	39%
Compatibility	No	34%

Our conceptual framework shares many similarities with Hameed's findings. They find **relative advantage** to be both the most used factor and is found to be the most significant when looking at innovation characteristics. This is also the case in our thesis, with almost all organisations stating relative advantages as big drivers for the decision to adopt. Hameed similarly agree with our finding regarding the **organisational readiness.** We find it to be significant, which is also the case in Hameed's study. Interestingly, Hameed finds that the **cost** factor is often used but in less than half the cases it is found to be significant. We find similar indications in our thesis where we in many cases labeled cost as a medium adoption factor. This was done because organisations did not completely disregard the costs of an adoption but it did not impact the decision significantly either.

At face value, it might seem that there is a big discrepancy between ours and Hameed's findings, because of the amount of factors that we found to be insignificant. However, every adoption factor that we found to be insignificant was also found insignificant in many studies according to Hameed. The only two factors that deviate from this statement are **Infrastructure** and **IT expertise**, which Hameed finds to be both widely used and mostly significant across studies. However, if we look closer at how we processed this factor, it shows that we find it to be high or medium in many cases. This indicates that it, at least for some organisations, is a driver for the adoption decision. As seen in table 23, many of the factors we found to be insignificant had a significant percentage under 50%, which again confirms the agreement between our findings and previous studies. This shows that even though we operationalised our conceptual framework qualitatively, we still arrived at conclusions that can be reflected in Hameed's work (2012).
The fact that we only find a limited amount of factors as relevant to examine, does not mean that only these should be used by future researchers. We found that even though some factors were not found to be significant, they still helped understand the adoption when we clustered the cases in the cross-case analysis. This was for instance the case for the **cost** and **complexity** factors which we found to be perceived very differently among the investigated companies. Despite this inconsistent pattern, the factors still helped understand the adoption and gave us interesting insights in regard to how factors change over time.

8.1.4 The influence of market strategies on the adoption decision

When building the problem statement for our thesis we wondered if, by only using the IT innovation adoption theory, we were missing out on other perspectives that could help explain a decision to adopt. We therefore introduced a theory about market strategies best known as Miles & Snow's typologies (1978). The assumption was that a market strategy could influence the adoption rate, an assumption that we found to be a new perspective to the field of IT innovation adoption. We found no studies in our literature review that used this perspective and we thus found this perspective to be quite unresearched.
We started out by asking how a company's market strategy can influence the adoption rate. What we found was that our data indicates that market strategies do, in fact, influence an adopter's decision. By comparing the case organisations to Miles & Snow's typologies presented in the theory section we placed every 10 cases in one of the four groups. We found two prospectors, one defender, six analysers and one reactor. A **Prospectors** market strategy has a positive influence on the decision to adopt. A **Defenders** market strategy has a negative influence, while an **Analysers** market strategy in general has a positive influence, but is dependent on the success of the innovation shown by Prospectors. We therefore see that Analysers can be located in different adoption process stages because different market positions and perceived environment among organisations lead to different strategic outcomes. Lastly, a **Reactors** market strategy can have either a positive or negative influence - depending on what market strategy they originally pursued. If they tried to pursue the Defenders market strategy it most likely means that they have not adopted a chatbot but have failed at reducing costs.

If they originally tried to pursue a Prospectors market strategy it most likely means that, like CBB, they have adopted a chatbot but failed at realising its potential and utilising their resources satisfyingly. A Reactor can thus have adopted a chatbot or not, depending on what type of strategy they originally tried to pursue.
These insights can therefore be incorporated into our conceptual framework as a new influencer on the adoption decision. It also, yet again, emphasises the takeaway that while Roger's DOI theory is fundamentally important to the theory of innovation adoption, it must be supported by other perspectives to fully cover all influences to an adoption decision.

This addition to the theory of innovation adoption presents an important proposition that especially suppliers of a new innovation need to take notice of. Our proposition is that in order to increase the possibility of diffusing the innovation through the intended user group, it is important to, in due time, cover if the target market has Prospectors and Analysers and not is riddled with Defenders. Prospectors are needed in order to secure that the innovation gets picked up and that it is given a chance to prove its worth. If the innovation proves that it can generate a profit for an organisation, then Analysers will be quick to follow the Prospectors lead. Although arguably difficult to spot, Reactors should be avoided. Especially Reactors trying to pursue a Prospectors market strategy could be fatal, because if the value of an innovation cannot be proven, then Analysers will refrain from adopting the innovation themselves.
This insight lets us assume a more normative role, going from explaining why the theory has impact to actually presenting how adopters and suppliers should react to this new knowledge.

8.1.5 The relevance of the supplier side

In our conceptual framework, we included the supplier side of the adoption in order to cover an aspect, which the literature indicated would affect the adoption of innovation. According to Frambach (1998) the extent to which a supplier has pursued a strategy aimed at positioning the innovation in the marketplace or has focused on reducing the risk of adoption would have a positive and significant effect on the probability of innovation adoption. However, results from our research did not reveal any significant effects of the suppliers' action in regard to the four investigated supplier factors.

One possible explanation to the missing influence of the suppliers might stem from how we chose to operationalise the supplier aspect compared to how Frambach (1998) operationalised it. We initiated the research of the supplier side with the assumption that by asking the suppliers about their action to promote the technology, we were able to determine whether or not their actions had had a positive or negative impact on the adoption rate. This means that we did not ask the adopting companies about their experiences with the chatbot suppliers' actions. This aspect deviates from Frambach's research procedure. Frambach investigates the supplier side of the adoption of electronic banking by asking how they perceived suppliers' action in regard to the promotion of the technology. Frambach was then able to compare the perception by adopters against non-adopters in order to find factors where he could identify significant effects.

Our approach to investigate the suppliers side is thus a different way to investigate suppliers' actions compared to Frambach's approach. This may explain why we did not find any significant factors affecting the adoption from the supplier side.

Another aspect that might explain why we did not find evidence to support our initial assumption regarding the suppliers' effect on the adoption of chatbot, is that the chatbot technology only recently has won impact on the Danish market. As described in the case description, only a limited number of chatbot suppliers are operating in the Scandinavian market. In addition, the technology is currently a very hyped technology as emphasised in the introduction of this thesis. The interviews with the suppliers supported this trend as well. They explained that the technology is currently so popular that the suppliers did not need to advertise it. They did therefore not experience a competitive pressure from other suppliers.
The fact that the chatbot technology only recently has been introduced in the market, and that there is a limited amount of suppliers, also deviates from how Frambach applied the theory. Frambach's research about adoption of electronic banking was conducted six years after the innovation was introduced to the market. We, on the other hand, investigated the chatbot technology within the first two years it has been on the Danish market. This means that the supplier market may not have settled yet. More chatbot suppliers will most likely be attracted to the market in the future as the chatbot technology will mature and be more proven. A higher number of suppliers, will evidently mean more competition, and suppliers' actions will therefore most likely have a greater impact than they had when we conducted the investigation.

Our learnings imply that using Frambach's theory in an environment where the innovation is recently introduced and where the industry has high beliefs in the artifact, then the suppliers' influence on the adoption rate are weakened. We therefore recommend to continue investigating the supplier side when conducting research about adoption of chatbot technology, because Frambach's previous studies indicate that this theory is especially relevant when the investigated technology has matured and more suppliers have entered the market.

8.1.6 Adoption processes as a multi-event phenomenon

In our literature review we found a discrepancy between how researchers see the process of adopting innovations. Not in how organisations move through the three stages of Initiation, Adoption Decision and Implementation, but how we, as researchers, tend to define an innovation as either adopted or not. Rogers developed his innovation adoption process with a certain degree of finality to it: you move through the stages and when each stage is completed you have fully adopted an innovation. This is a very binary way of viewing innovation adoptions (Damanpour & Schneider, 2006; Huizingh & Brand, 2009). We did not anticipate this to become significant for our ability to answer our research question, but the data continually showed that factors were perceived differently dependent on what stage of the adoption process the organisations were in. This was presented in the analysis in section 7.2.6 regarding the temporal dependency of the adoption factors.

The moving perception of difficulty can be illustrated by showing how some cases in our thesis experience the adoption. CBB and PensionDanmark went from expecting the technology to be somewhat manageable prior to the implementation to experiencing bigger difficulties during the actual implementation of a FAQ chatbot. The same is true for Alka and Nordea. They, however, already have a FAQ chatbot, and are currently in the process of adopting a more sophisticated 2.0 chatbot, which is increasing the perceived difficulty for them. To us, this defines a process where the perceived difficulty comes in waves because the innovation is adopted, not as a single event, but stepwise through many incremental smaller adoptions. In our case by first implementing a simple FAQ chatbot to then implementing a more sophisticated and advanced 2.0 chatbot, and so on, as presented in figure 41.

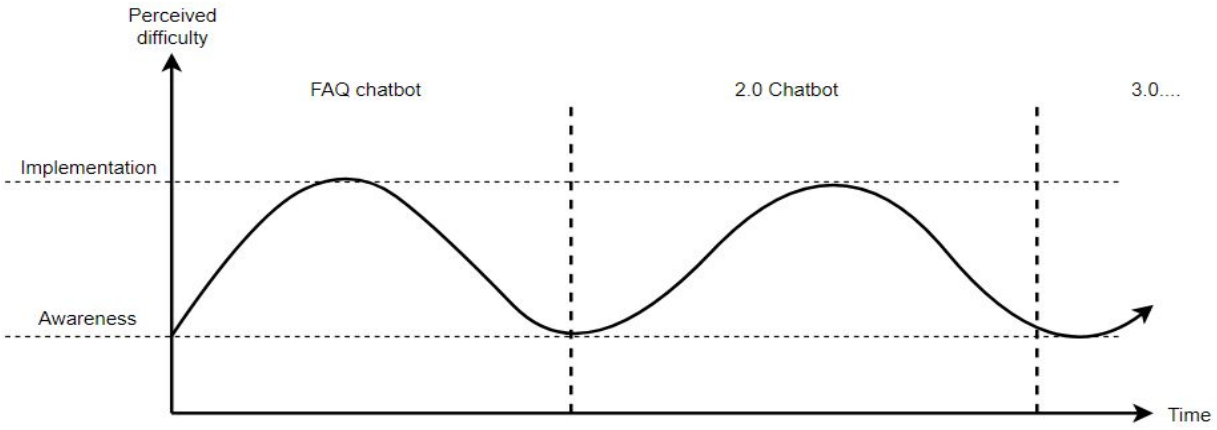

Figure 41 - The waves of perceived difficulty

Huizingh & Brand (2009) suggest that following this stepwise approach reduces the risk of an adoption because it is spread out onto several smaller adoption steps. The fact that many of our case companies have adopted a FAQ chatbot first may thus indicate why so many have adopted it.

This change from seeing an adoption process as a binary state to seeing it as many incremental adoptions, creates some fundamental changes to the innovation adoption process model presented in our theory section, which is used throughout the analysis. Instead of seeing it as a “start” and a “finish” point it will become a more iterative model. As illustrated in figure 42.

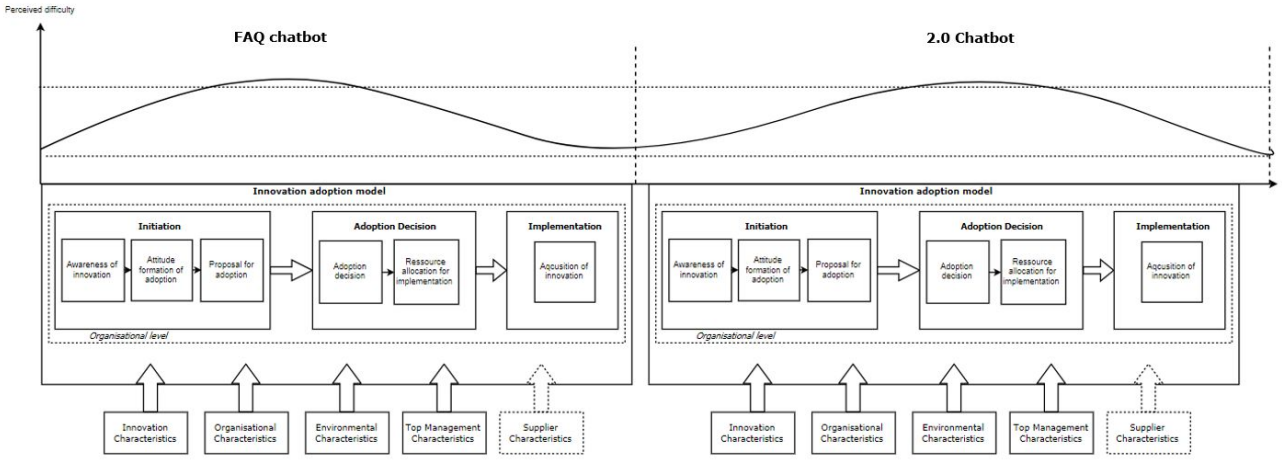

Figure 42 - Stepwise adoption perspective

When organisations, such as Alka and Nordea, finish implementing their FAQ chatbot and begin implementing their more sophisticated chatbot, they are, in fact, restarting the adoption process. This means that they are therefore once again in the Initiation stage.

What we present here is a new perspective on the traditional model of IT innovation adoption. We do not claim that the traditional innovation adoption models cannot be used iteratively, or that they never have been used iteratively in practice. We simply state that our analysis implicates new angles on the model. Some of the innovation adoption literature, supports this perspective and argues that researchers should value an innovation adoption as incremental steps instead of a dichotomy between two stages (Damanpour & Schneider, 2006). By presenting the model as above we seek to emphasise that we should acknowledge the adoption as a stepwise process and to consider this aspect when we research innovation adoption.

This change in perceived difficulty can have lethal consequences for the further diffusion of the innovation. We argue that this “disappointment” that we expect the adopting companies to experience - when they realise that the implementation is actually more difficult than expected - can make other companies more cautious when deciding to adopt or not. This can be related back to the insight building on Miles & Snow’s market strategies. If it is true that companies experience the implementation to be more difficult than expected, then this might mean that they are unable to gain value from this new innovation, thus failing at pursuing their own market strategy. This would lead them to become Reactors, and in turn other Analysers would thus refrain from approaching the innovation.

8.2 Implications for practice

So far, we have covered the theoretical implications. This, however, is only the first half of the implications. In this section, we will discuss the implications for practice and how they relate to organisations in the investigated field.

8.2.1 The consequence of immaturity and lack of research

The first implication for practice we want to present is how the chatbot technology adopters are finding it difficult to realise the benefits that they expect from the technology. Even though there is this high interest in adopting the technology, the companies that have adopted the technology do not seem to realise great value from the technology. There was some value in having an, although limited, customer service agent available 24/7, but the greater value would first come once the chatbots could answer customer specific questions, such as one's bank balance or one's forgotten phone's PIN number.

Through our investigation we found that all companies that had implemented a chatbot had only managed to implement a relatively simple FAQ chatbot, and the companies agreed that while this simple version gave some value, the real value would first occur in later stages. The companies argued that the real value first would appear once the chatbot could answer customer specific questions, and also begin to proactively fulfil the customers' needs.

Our study revealed that a big reason behind the difficulties companies were facing in regard to realising benefits from the technology, was the fact that all companies had problems integrating the technology with their core IT systems. This finding implies that companies implement the chatbot technology without having the core systems to support a technology like a chatbot. Their core IT systems were simply too old and not compatible with new technologies like this. If companies want to advance beyond a FAQ chatbot, they have to focus on strengthening their core IT systems and prepare it to integrate with new technologies like chatbots. Another point is that the technology was still very immature. As mentioned in the introduction the technology is still not advanced enough to go beyond a linear expected flow of conversation, and it often cannot fulfill the customer service without human intervention. These two points are two big hurdles for companies, before they can start realising benefits greater than just having a FAQ chatbot customer service, available 24/7.

The decision to accept the low level of sophistication that the FAQ chatbot has, is an interesting situation. Organisations seem to disregard the state of the technology and only focus on its promises. Wang (2010) highlights a problem with this stating that these organisations, however, usually do not see any benefit from adopting the innovation until several years later, when the technology finally matures.

It is difficult to say what boxes have to be checked before the chatbot technology can be considered to have matured. Relating back to the literature review, our findings indicate that the chatbot technology companies are using, can be characterised as being similar to the A.L.I.C.E. chatbot architecture that uses the traditional NLP approach.

This is interesting when considering that chatbots are envisioned to be the preferred user interface for many of the activities that end-users normally perform through a web page or a dedicated application (Reeves, 2016). To become this envisioned chatbot, however, the chatbot has to be able to replace a dedicated application or web page. But as we have highlighted, the chatbot is simply too immature and is too often reliant on human intervention. The chatbot does therefore not live up to this envisioned choice as the preferred user interface. This indicates a gap between the technological level of the commercially used chatbots and the envisioned technological level of the chatbot.

Another indicator of immaturity was the challenge for commercial companies to integrate their chatbot with existing core IT systems. We argue that this might be a consequence of the impact that the Turing test has had on chatbots. Chatbots have mostly been developed with the purpose of beating the Turing test, and developers have therefore not considered the practical values of a chatbot or how to achieve those. This is also indicated in our literature review, where we find that very little research has been done in regard to the adoption of chatbot technology in a commercial setting. In fact, we found that only two out of 20 gathered case studies articles about the chatbot technology were investigating the chatbot technology in a commercial context. None of these articles investigated the topic from a company's point of view. This indicates a knowledge gap and a need for more research related to this field. Filling this gap could increase the focus on the commercial use of chatbots and hopefully gain bigger attention from chatbot developers. Maturity is thus not only the question of reducing the gap between practice and the envisioned chatbot but also about shifting the focus from developing chatbots for research purpose to developing it with a commercial purpose in mind.

In sum, we found that companies who actually have implemented a chatbot have a hard time generating real value from it, due to its simple state. We found that the reasons for the lack of value was that companies could not integrate the technology with their core IT systems and the immature state of the technology. Lastly, we argue that the step necessary for the chatbot to become mature is for developers to start focusing more on how to apply chatbots commercially instead of trying to beat the Turing test.

8.2.2 Chatbots and the management fashion perspective

As presented in our investigation of the Danish media coverage of chatbots in chapter 2, we find that the technology has received a lot of exposure from selected media outlets in Denmark, especially gaining interest in the last two years. However, as firstly indicated in the analysis, we found the environmental characteristics to be barriers, yet somehow this did not stop any organisation from approaching the technology. This left us wondering why organisations still approached the technology, even with no significant pressure to do it and was an aspect that could not be explained in our conceptual framework. With Abrahamson's (1991) research about the management fashion theory we can argue that no pressure does not mean that there can be no desire to adopt an innovation.

Given the positive exposure surrounding the technology, as presented in the introduction, we argue that the adoption is also driven by the media's positive coverage of the technology. The companies find themselves in need of solutions to embrace the digital agenda, as is emphasised in almost all our cases' annual reports. The media coverage of the chatbot, promises that it can be the answer to this need. We thus argue that, even though we found no pressure in our analysis, there still resides this more informal pressure which contributes as a reason to why many companies are adopting the chatbot; because of a fashion trend that matches with a strategical trend. This discussion indicates that companies not only adopt because of the drivers, which are a more rational consideration. It also indicates that they adopt because of uncertainties regarding a new shift in the environment which demands a more digital agenda and companies thus find it easiest to imitate opinion leaders outside of their own group. This indication follows Shao's findings (1999). He posits that there is a three year lag from when the technology firstly starts getting attention in the media till organisations start implementing it. We find that the chatbot technology starts to get a lot of attention in 2016 in the Danish media and that now, in 2018, we see some organisations having implemented it, some are about to and some are starting to consider it.
What we see as the implication for practice is that this might be a reason for why companies are adopting the technology despite its immature state. They try to follow trends and do not worry about the actual state of the technology: they adopt now and worry about realising the benefits later. In addition, returning again to Abrahamson (1991), we currently find the fashion perspective to be the predominant perspective. Organisations' desire to adopt the technology comes from influencers outside of the industry. We expect, however, that when a certain amount of organisations have adopted the technology, which is a point that we might soon reach, then we will see that the fad perspective will take over as the predominant perspective. This means that new adopters will not imitate opinion leaders from media or consulting firms, but will imitate other organisations instead.

8.3 Validity of the results

Throughout our thesis we have embraced an interpretivists approach. In the first half of the thesis focussing on creating a context and an interest for the topic and the cases. This enabled us to delve in to the data in the second half of the thesis where we presented the data and started interpreting its meaning. One of the great aspects of our thesis was our methodological approach where we operationalised adoption factors qualitatively. Using a qualitative approach enabled us to explore the reasons for adoption from a much deeper worldview, which has led us to find complex and nuanced reasons for adoption, which is one of the key strengths of our thesis. Choosing this methodological approach did however, create some challenges for us which demanded that we continually considered the validity and reliability of our choices and interpretations.
A general challenge was operationalising adoption factors that have previously been used quantitatively. Operationalising it qualitatively through semi-structured interviews seemed to be a natural fit, because the interview guide was just a matter of relating each question to an adoption factor. We, however, learned that the data we gathered from our interview not always correlated perfectly to the definition of an adoption factor.

One answer could in some cases be related to several adoption factors. We thus had to be very precise when coding the interviews in order to not end up with a jumble of quotes and factors. Using data displays in an iterative fashion helped alleviate this challenge. With the displays, we could group certain quotes under a specific factor and then iteratively evaluate if the quotes in fact were approaching the same perceived adoption challenge.

One challenge, as acknowledged in our methodology section, is *anecdotalism - selecting only a portion of the data in order to draw a desired conclusion* (Silverman, 2015). In section 7.2.6 about the temporal dependency of factors, we highlighted an insight where the complexity and cost factors changed over time depending on where in the adoption process the organisation was. In this section we only used four out of 10 organisations to show this tendency, thus arguably edging closer to anecdotalism. We, however, manage to maintain the integrity of our analysis by using the *refutability principle - to refute initial assumptions about data in order to achieve objectivity* (Silverman, 2015). Here we test our newly adopted hypothesis on the rest of the applicable organisations, showing that our hypothesis could not be validated. Yet, the insight raises new questions, such as *do organisations experience a change in perceived difficulty when implementing an innovation?* This should be tested further, as we could only test our hypothesis on organisations that had not started implementing a chatbot. This is an example of how we accounted for every piece of data before making a claim.
Another aspect which raises the validity of our thesis is our focus on investigating *deviant cases*. An example is when we defined Nordea as an Analyser. At first, Nordea did not seem to fit any description: their early adoption of a chatbot indicated them pursuing a Prospectors approach, yet their statements from the interview matched better with that of an Analysers. We therefore looked closer at Nordea as a case and found that their other Scandinavian units had implemented a chatbot because of pressure from competition. We learned that they were an Analyser because of their strong connection to their other scandinavian units. Again, strengthening the validity of our thesis.

Looking more broadly at the quality of our research design we must highlight that using data displays helped us increase internal validity. By condensing the data and creating an overview where we could observe all of our data in one display made it easier to match patterns (Yin, 2014). This increased our ability to make interpretations and inferences that we can justify.
We also argue that we have ensured reliability in our thesis. We have extensively described our data collection methods, how we operationalised the theory and how we built our displays for pattern matching. In addition, we have documented our interview guides and coding of interviews. This enables other researchers the possibility to redo our thesis. This also fulfills the evaluation criterias as stated by Lincoln & Guba (1985) where *transferability* and *confirmability* are dependent on the possibility for other researchers to evaluate our research design. In addition, the *credibility* of our thesis - proving that our study actually has been conducted - is also fulfilled by our lengthy descriptions of cases and research design. One aspect of credibility that our thesis is lacking is that our results and interpretations have not been validated by the informants in our thesis.

By validating the results with informants, we could reduce the possibility for overinterpretation of data and inserting bias in our results. Silverman (2015) however criticises this validation approach. The subjects that we study should have no privilege to comment on their own actions. An observer's inferences cannot be refuted or validated by the subject, instead the subjects comment on the results should instead be treated as a separate source of data (Silverman, 2015).

8.3.1 Generalisability

The last aspect we want to discuss is generalisability. This aspect is tricky to fulfil when conducting a qualitative study. Our thesis has been studied in a very dynamic environment, where developments are rapid. Our qualitative study thus explores a context that may not be replicated again because the environment is constantly changing (Lincoln & Guba, 1985). We have however focussed on the adoption *decision*, which creates a stable pillar in a dynamic setting. The point of decision, when following the underlying theory, is a more constant factor throughout different innovation adoption contexts. Still we do not claim that our thesis is generalisable to other contexts than ours. We cannot claim that the implications for the theory we have provided can be applicable to all populations (Saunders et al., 2009). We can only assume generalisability in this specific context of the multi-case study. This means that results in our thesis can only be assumed to be generalisable to the 10 case organisations on our thesis. This is also emphasised in Lee & Baskervilles article (2003) on generalisability.

> *"In other words, no descriptive statement (whether quantitative or qualitative) is generalizable beyond the domain that the researcher has actually observed." (Lee & Baskervilles, 2003, p. 235)*

This statement does, however, reveal that we *can* argue for some form of generalisability in our thesis. Following Lee & Baskerville, we are able to generalise within the observed domain. Within our domain we are generalising from data to descriptions and measures. We are collecting data and stating that a collection of data from a specific case form a broader description of an aspect of the case. This description is taken further and is generalised to theory. Here we apply the descriptions to the theory that our thesis builds on. The caveat here is that we do not claim that the theory, which we have tweaked based on new descriptions, can be applied outside of our domain without any reservation (Lee & Baskerville, 2003). However, one could argue that our findings can be generalised to very similar settings. The chatbot technology is a very homogenous artifact which serves the same purpose in similar settings. A related setting could for instance be the ecommerce industry where companies also engage with end-consumers similarly to how customer engagement is conducted in the financial and telecom industry. We therefore argue that our findings can be generalised onto other industries as long as they share similar approaches to customer engagement and as long as the chatbot stays a relatively homogeneous artifact.

8.4 Limitations of research

Before concluding our Master's Thesis, we must acknowledge some limitations. No study is without its limitations but acknowledging these only increases the transparency of the study and enables the reader to understand certain circumstances that led to the limitations. These will be presented below.

When considering our methodological approach, one thing that is apparent is that we only have one primary data source - interviews. The harsh critic would say they this leaves us as rather naive researchers because we take the *verbal formulations of subjects as an appropriate substitute for the observation of actual behaviour* (Silverman, 2012, p. 239). As researchers, we argue that we use interviews as a means to understand the thoughts and actions of the investigated entity, yet it is problematic to take the information as the complete truth, because there may be a gap between what people say and what they do (Silverman, 2012).
In our thesis we ultimately do not treat the informants as the sole contributors of information, but we rather develop a context and setting around each case, where secondary data sources act as information that show that there are many perspectives and motivations behind the data gathered from the interviews.

Some limitations are also present when regarding the collected data. Some of the conclusion were drawn from a somewhat narrow basis. Even though we had 10 cases, which is a satisfying number of cases when using replication logic (Yin, 2014), it was a challenge to delve deeper into the data. In some situations we had to build our interpretations on a rather limited data basis. This was, for example, the case when we used Miles & Snow's typologies to group the organisations. Here we only found one Defender and one Reactor. This limits our ability to make sound statements about the effect of a certain aspect on the adoption decision. We however, tried to refrain from making statements that the data did not show. An argument that deemphasised this aspect as a limitation is presented by Lee & Baskerville (2003).

"Neither an increase in the sample size in a statistical study nor an increase in the number of sites in a multisite case study would be an indicator of greater generalizability of a theory to new setting."
(Lee & Baskerville, 2003, p. 241)

This does not however solve our problem of having a small data basis when drawing certain conclusion. We do encourage and acknowledge that our statements need further investigation in order to make our statements more reliable, yet we do argue that our insights and indications should be valued as gaps in knowledge in the field of innovation adoption. Our goal was always to highlight these gaps and not to test or evaluate if these insights could be applied outside of our domain.

Finally, there is a limitation to the subjective nature of how the interviewed companies were chosen. As described in the method chapter, we contacted the companies through our professional network. This meant that the selected companies were influenced by the knowledge and relationships our professional network had with them in the investigated industries. This may have led to some bias in our selected cases, as we have only had companies who in some regard already have interacted and considered adopting a chatbot. The industry might therefore still have companies who have not become aware of the chatbot possibility, and thus have not started the adoption process. Our intent was, however, to find answers to why companies *are* adopting the technology. It therefore makes sense to build a collection of data that is capable of answering this question.

9 Conclusion

If a robot has not taken your job by the time it took you to read this thesis, then you are welcome to read on and finally understand how all this research can be used to answer our research questions.

Our thesis was initiated by a discussion of the automation agenda and how it is impacting how we conduct our daily work. We approached the question by delving into one aspect of the many underlying fields that relate to automation; Cognitive Engagement (Davenport & Ronanki, 2018). Under this aspect we find the chatbot technology. By investigating this aspect we seek to comment on the automation agenda.
Our thesis shows that we maybe should not sound the alarms yet, because the robots are not as advanced as they are presented in the media - at least as far as chatbots go. The looming death of human workers with only '*ordinary skills',* as Brynjolfsson and McAfee (2014) call it, is thus only relevant if you define 'ordinary skills' to only encompass customer service agents, who do not interact with customers face-to-face. If 'ordinary skills' encompass more than that, then the looming death may not be as close as they propose.
There is however no questioning that the second machine age is inevitable. With the amount of money companies are putting into the automation of processes, they are bound to replace human workers with robots. Companies have a hurdle to pass in this regard, when it comes to figuring out how to integrate chatbots with their core IT systems. When it does find a solution to this, however, there is no saying how big an impact chatbots will have on how end-consumers interact with companies and how they are serviced in general.

To gain these insights that we present above, we have conducted a comprehensive multiple-case study. We decided to investigate the *why* of innovation adoption. Why organisations choose to adopt a chatbot, and what influenced this decision. Our research question was:

Why do Danish companies decide to adopt the chatbot technology despite its immature state and how can this be explained by using the theory of IT innovation adoption?

- *What are the barriers and drivers to the adoption of the chatbot technology?*
- *How does a company's market strategy influence the adoption rate of the chatbot technology?*

By using the information that we gathered from investigating the coverage of chatbots in Danish media and the information from the case description we were ready to conduct the research we set out to do.
We built a conceptual framework by using existing theory where we combined several aspects and perspectives which collectively explain the decision to adopt. Using an interpretivist philosophy we set out to apply our conceptual framework on 10 case organisations, in order to explain *why Danish companies decide to adopt the chatbot technology*.

Following Yin's procedural model for multiple-case studies we first individually analysed each case and found several different insights regarding the adoption of chatbot technology. What we saw during the individual analysis was a general high belief and anticipation to the technology. Additionally, we found that digitalisation plays a big part in the strategy of most case companies. After this we conducted a cross-case analysis where we looked across all case studies. This part of the analysis generated the biggest findings.

Our first finding relates to the first sub-question from our research question. We found that companies saw far more drivers than barriers, which also supports the enthusiasm about the chatbot technology as indicated throughout the introduction to this thesis. *The drivers to the adoption of the chatbot technology* are especially **relative advantage**, **organisational size** and **organisational readiness**. These were perceived to be highly present in many cases and were the main drivers of the adoption. Additionally, we also found the **top management** adoption factors to be present in many cases.
The barriers to the adoption of the chatbot technology were harder to clearly point out. We only found the **environmental characteristics** as noteworthy barriers. However, we were skeptical about the impact of this barrier because it seemed to not have made any case organisation reconsider their decision.
What we saw as an important takeaway from this sub-analysis was that, even though we found some adoption factors as being collectively more significant than others, every case organisation still had a unique combination of both drivers and barriers. This showed us that in order to understand a specific organisations adoption decision, you have to understand their unique situation.

We then turned to the second sub-question in our research. Here we applied Miles & Snow's typologies for market strategies to our case companies. We found that Alka and PensionDanmark can be defined as Prospectors because they rely on being a first mover and seek to maintain their reputation as innovators. Prospectors are therefore expected to have adopted a chatbot and this type thus *positively influences the decision to adopt an innovation*.
On the other end of the spectrum we found that companies following a Defender strategy have not adopted a chatbot because they focused on maintaining their market by enforcing market penetration. Sampension was a Defender because they focused on building a better digital foundation instead of adding innovations on top. Defenders have therefore not adopted a chatbot and this type thus *negatively influences the decision to adopt an innovation*.
In between the Prospector and Defender we found that companies following a Analyser strategy can both have implemented a chatbot or not, it depends on how they prioritise drivers and barriers. Thus, by looking closer at specific cases one can see how they prioritise. Tryg had advanced more than other Analysers, because they were reacting quickly to maintaining a market position. Danske Bank had not moved from the initiation phase because they anticipated the project to be much bigger compared to other companies. Analysers can thus both *positively or negatively influence the decision to adopt an innovation*.
Lastly Reactor companies are a group that have failed to pursue other market strategies. Their decision towards implementing a chatbot depends on what type of strategy they try to originally pursue. This explains why CBB were surprised by the resources required by the implementation: they did not have the necessary capabilities to be a prospector. Reactors can therefore either have adopted a chatbot or not. This typology thus *positively or negatively influence the decision to adopt an innovation*. Overall we found that clustering companies according to Miles and Snow typologies (1978) thus proved to be a good approach to understand the organisations better.

The two sub-questions revealed several insights and questions that led to this final important finding which relates to the main research question.
CBB being defined as a reactor sparked a curiosity. We examined the case companies that already had adopted the chatbot technology. This showed that companies changed their perception of adoption factors from planning the implementation to actually implementing the chatbot technology. This was especially evident for the complexity factor which changed in four companies from being perceived as low to being perceived as high. This was a crucial insight: we had indicated that a factor that initially was a driver later turned into a barrier. This finding led us to investigate how companies, which had yet to adopt the technology, perceived the complexity. Surprisingly they did not see a low complexity as the companies having a chatbot. This finding highlighted an important influencer to the decision to adopt. We argue that this indicates that the companies that perceive the adoption as complex have not adopted a chatbot yet, meanwhile it explains that those companies that underestimated the scope of the implementation had already implemented the technology.

The answer to the overall research question was therefore a combination of different things. First and foremost it is the abundance of drivers that organisations highlight and the almost non-existent barriers found by using the IT innovation adoption theory. We also find that some companies underestimate what an implementation requires and they therefore choose to adopt quickly. Companies are not worried about the immature state of the chatbot and they are satisfied with getting a, although limited, customer service agent that can be online 24/7. They will worry about gaining bigger benefits later.
The big enthusiasm surrounding the technology also captures company's attention and this might indicate that there is a fashion agenda that can explain some of the willingness to adopt. The fashion perspective might even be an explanation to why the environmental characteristics, which we found as barriers, had not have a impact.

Lastly, based on the findings, we recommended to expand our conceptual framework in order to include a new factor called **extent of project,** which can enable the framework to explain cases such as Danske Bank. We also recommended to see the adoption process as a stepwise process instead of a binary process, because of the indication that the perception of an adoption factor can change through an adoption processes.

9.1 Reflections

As a final remark, we would like to take a step back and reflect upon the process and results of our thesis. What have we learned along the way, and what would we have done differently if we were to conduct the thesis all over again?
One aspect that turned out to be a misstep by us, was how we worked during our data collection phase. As mentioned in the methodology, we conducted our interviews within a period of 16 days, which is a relatively short timespan. This limited our time to where we could stop and consider the actual data that we were getting from our interviews and compare it to what we had intended to gather. Looking back, we see this as a unfavourable approach, because an early analysis would have allowed for an optimisation of our data collection strategy, by evaluating the quality of our questions and considering new ways of gaining insights. We argue that this might have given us a better data foundation. Miles and Huberman (1994) agree with this view, and believe that an early analysis of data can help field-workers cycle back and forth between thinking about existing data, and generate new ways of a data collection. Increasing the time period where we conducted the interviews might thus have been a better approach because this would have given us time to evaluate the accuracy of the questions and the applicability of the answers from the informants.

We learned to acknowledge the complexity of qualitative data. The act of reducing the many hours of interviews that we had gathered down to key phrases and then further down to labels on a three-point scale proved to be a challenging task. When we, however, decided to generate and apply some categorical rules to this data we found that the spoken word does not always neatly fall into specific boxes. We had to work with the data in many iterations, before all three group members could agree on every coded and labelled quote.

Working with qualitative data thus proved to be more strenuous, than expected. Taking a more quantitative approach here would get rid of these challenges all together, however, this approach would certainly limit us on other aspects.

10 Future research

Our departing thoughts will concern what we hope to see happen in future research as a consequence of our thesis. We hope that we can leave a lasting impression which can inspire future research which will expand the knowledge about IT innovation adoption.

Our thesis has highlighted several gaps in knowledge specific to our domain. We recommend expanding our conceptual model because we found that we were in need of additional factors, as was the case with the extent of project aspect. Further we suggest including market strategies in our conceptual framework to better explain what drives the decision to adopt. These recommendations indicate a suggestion to expand our conceptual model. We also suggest reapplying our conceptual model in new settings. As mentioned in the limitation, limited to two Danish industries, the financial and the telecom industry, where we studied 10 companies in total. A suggestion for future research, is therefore to conduct the same investigation in other Danish industries. It would be interesting to find out if such an investigation would yield the same results as in our thesis, or if they would show something different. Especially exploring industries that do not share similarities as the ones in our thesis would be of interest. The financial and telecom industries have relatively high competition and environmental uncertainty with a focus on private customers. What results would the same research generate if it was conducted in a more stable industry, like the public sector, or in an industry that focuses on industrial customers, like the pharmaceutical industry?

Another recommendation for future research is the maturity state of the chatbot technology. Our analysis was conducted in the beginning of 2018, where the chatbot technology with Danish language capabilities had been available for about a year. As already mentioned in the introduction and literature review, the technology is envisioned to be much more advanced and ubiquitous in the future as the technology matures along with other AI technologies (Reeves, 2016). The technology was, however, still immature when we conducted the research, and this arguably had an effect on the adoption. The value that organisations are realising is lukewarm and the influence of suppliers is diminished because of the technology's high exposure. Because of this we suggest examining the adoption of the chatbot technology at a time where the technology has matured more. This could be an important addition to the findings from our thesis because it would create two scenarios that could be compared which would serve as new literature, that could highlight the impact of the maturity state of an innovation. We will thereby answer if the maturity will play a role in the adoption, or if we will see the same reasons for adoption?

In conclusion, we see that our thesis sets the foundation for a lot of potential future research. We find that the conceptual framework can be expanded upon and that it can be applied to other research domains in the Danish market. Lastly, we argue that an interesting perspective could be to revisit the same research question when the technology has become more mature in order to make a comparative analysis, which can contribute to research about technology maturity and its effect on adoption.

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