

A Case Study of Chatbot Implementation

An exploratory study of how organizations implement chatbot solutions within the framework of new self service technology

Abstract

New Self Service Technology (SST) is increasingly being implemented within many organizations. One of the most successful recent developments within SST can be identified as chatbot solutions within customer support functions. Despite a high academic and practical interest in general New Technology Implementation, research into Self Service Technology and its implementation process from an organizational perspective is scarce. This study contributes to research by studying three real-life cases of chatbot implementation within leading organizations in the banking and financial services industry. Through a case study approach, using an iterative and interpretative approach, this work compares three distinct cases of chatbot implementations. The depictions of our case companies Klarna, SEB, and Swedbank are extended by including the critical perspectives of external specialists within Artificial Intelligence (AI). Through the lens of models within *Innovation Management* and *New Self Service Technology Implementation*, the three cases are analyzed. Our main findings support the view that (1) organizations follow an iterative and flexible innovation process during their chatbot implementation. There are three additional major factors, which are perceived as important by organizations during the chatbot implementation process. (2) Organizations consider the existing trade-off between increasing the chatbot's ease to use and the usefulness of the chatbot. (3) Organizations consider the existing trade-off between the usefulness of the chatbot and risk that customers will not embrace the chatbot. Lastly, we find that (4) the factor of human interaction seems to be obsolete in the implementation of chatbots as a New Self Service Technology.

Keywords: Artificial Intelligence (AI), Innovation Management, New Self Service Technology, Chatbot, Interpretivist, Qualitative

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Table of Contents

1.Introduction	4
1.1 Background & Problematization	4
1.2 Purpose	4
1.2.1 Pre-study	5
1.2.2 SEB and Klarna Differences	6
1.2.3 Resulting Purpose Statement	6
2. Literature Review	8
2.1 Conceptual Review	8
2.1.1 The Research Streams	8
2.1.2. Innovation Management	9
2.1.2.1 Defining Innovation	9
2.1.2.2 Innovation Management Tools	11
2.1.3. New Self Service Technology Implementation	13
2.1.4. Chatbots	16
2.1.4.1 Overview Chatbot Typologies	18
2.1.4.2 Flow-Oriented Chatbots	20
2.1.4.3 Artificial Intelligence Chatbots	20
2.1.4.4 Hybrid Chatbots	20
2.1.5 The Conceptual Framework	22
3. Methodological Approach	25
3.1 Research Philosophy	25
3.2 Research Approach	26
3.3 Data Collection and Analysis	27
3.3.1 Pre-Study & Practicalities	28
3.3.2 Main Study & Practicalities	29
3.4 Sampling	30
3.4.1 Interviewee Selection	30
3.5 Quality of the Study	31
3.5.1 Dependability	31
3.5.2 Credibility	31
3.5.3 Transferability	31
4. Empirical Results Main Study	32
4.1 Klarna	33
4.1.1 Company Background	33
4.1.2 Chatbot Implementation Process	33
4.1.3 Chatbot Implementation - From Idea to Launch	34
4.1.4 New Self Service Technology Implementation and Customer Intention to Use	35
4.2 SEB	37
4.2.1 Company Background	37
4.2.2 Chatbot Implementation Process	37
4.2.3 Chatbot Implementation - From Idea to Launch	38
4.2.4 New Self Service Technology Implementation and Customer Intention to Use	39

4.3 Swedbank	41
4.3.1 Company Background	41
4.3.2 Chatbot Implementation Process	41
4.3.3 Chatbot Implementation - From Idea to Launch	42
4.3.4 New Self Service Technology Implementation and Customer Intention to Use	43
4.4 External Consultants	45
4.4.1 Learnings	45
5. Analysis & Discussion	48
5.1 Chatbot Choices	49
5.2 Innovation Process - From Idea to Launch	51
5.2.1 Iterative Processes to Make Intelligent Failures	51
5.2.2 Short and Small Learning Cycles	52
5.2.3 Pivoting and Early Discovery of Mistakes	52
5.2.4 Discussion	53
5.3 New Self Service Technology Implementation	54
5.3.1 Ease of use	54
5.3.2 Usefulness	55
5.3.3 Need for interaction	55
5.3.4 Risk	56
5.3.5 Discussion	56
6. Conclusion & Outlook	57
6.1 Conclusion	57
6.2 Limitations	60
6.3 Managerial Implications	61
6.4 Theoretical Contributions	61
6.5 Future Research	62
Bibliography	63
Appendix	73
Appendix 1 - Pre Study Questions (Extract)	73
Appendix 2 - Main Study Questions (Extract)	74
Appendix 3 - Interview Questions Field Experts (Extract)	75
Appendix 4 - Conducted Interviews	76

1.Introduction

1.1 Background & Problematization

With the rise of Artificial Intelligence (AI) and Machine Learning (ML), also many related new technologies are developing at a much faster pace. Nowadays, the topics of new self service technology (SST) within customer relationship management are one of the central topics within organizations (Jenkins et al., 2007).

Chatbots within the customer support functions of organizations are one of the most advanced and recent examples of new self service technologies and are diffusing rapidly (Subramaniam et al. 2018). Possible advantages of chatbots include, for instance, less simple work tasks for those who are employed within customer service departments enabling them to focus on more advanced tasks, customers receiving faster and better support as well as a simplified customer service process of scaling up for growing organizations (Subramaniam et al. 2018).

Chatbots have started to be used as a tool of interaction with potential and existing customers with some degree of “success” (Chung et al., 2018). The introduction of chatbots brings a perceived increased value for organizations as well as customers through, for instance, offering 24/7 customer service, highly adaptive and knowledgeable answers as well as cost savings within customer support functions (Jenkins et al., 2007).

Human customer support agents tend to spend a great amount of time interacting with customers through a variety of different channels: voice, email and chat to name a few. There is a massive incentive for organizations to automate support with autonomous “bots”, with the goal of reducing manual effort and resources required for problem resolution (Subramaniam et al. 2018).

1.2 Purpose

We believe that the choice of investigating the implementation process of chatbot solutions adds value through two major ways. (1) Initially, it adds to the already existing body of research when it comes to new self service technology implementation. (2) Secondly, we aim at chatbot solutions due to its increased use within customer support. Hence, the chatbot phenomenon is perceived by us as a tool, which can grant immense advantages, but also poses significant risks for both organizations and customers. As a result, we believe that chatbot solutions can add to the existing literature on new self service technology implementation due to its newness and the urgency of the topic as chatbots are becoming a central part of the daily activities of many organizations.

Focusing on the case companies introduced in the remainder of this work, the introduction of advanced chatbots has started for our case companies around 2014-2015. Being among the frontrunners with regard to chatbot solutions, we intend to combine the traditional insights of the research surrounding new self service technology implementation with the newness of the advanced chatbots we are facing nowadays. This combinations is intended to create specific new knowledge and may be the foundation for future research.

Since our main intention was to focus on the organisational perspective of how organizations implement chatbot solutions in this way, we believe that it is crucial to learn from the innovators and early adopter organisations, which have already gone through, or are currently going through, the process of implementing their respective chatbot applications in collaboration with external service providers, consultants and AI technology experts. Hence we have conducted a pre-study with two organisations in the banking and financial services industry, which both provided an excellent overview of important subtopics within this wide subject.

1.2.1 Pre-study

For the purpose of an increased personal understanding of the underlying AI technology and chatbot implementation process within organizations, it was regarded as important to conduct pre-study interviews with leading Swedish organizations already applying chatbots. The aim was to narrow down the research focus, find common themes but also potential differences between organizations to further develop our study. Taking into consideration the different views of different organizations also allowed us to take a more critical stance towards the potentially subjective views of our interviewees.

After conducting an initial analysis of potential interview partners, SEB and Klarna were chosen to be part of the pre-study for several reasons, which are as follows: (1) Initially, both organizations have recently implemented a so called “intelligent” chatbot as an addition to their offerings towards customers. (2) Secondly, the contrast between the two structures of the organizations is regarded as highly relevant as SEB is a much larger and a more established organisation, where as Klarna was founded in 2005 and is growing at a very fast rate. (3) Lastly, the case companies have chosen to apply different strategies when it comes to implementing different options of chatbots. SEB has launched a chatbot based on Natural-Language-Processing (NLP) in Swedish, where as Klarna has chosen to invest in an NLP solution, but currently focuses on a clickable user interface (UI) feature, which is available in several different languages adapting to customer preferences. According to the chatbot typology following in the remainder of this work, Klarna is using a level or maturity 1 chatbot solution, while SEB has launched a level or maturity 2 chatbot solution. It is important to state that in practice, the different levels are not as black and white and indicated in the literature, through for instance Smiers (2017) or Deloitte (2019). The levels can overlap and certain features from a next level can often be added gradually. For the sake of this work,

we intend, nonetheless, to attach a specific level or maturity to the chatbot solutions to better analyze the underlying decisions.

Due to the openness and guidance from our interview partners at SEB and Klarna, respectively, we were able to develop a specific initial implementation process of their respective chatbot solutions. Based on those results, our purpose statements as well as the research question were developed and adapted. A full summary of the organizations interviewed as well as of their chatbot solutions will be provided in the following of this work, when focusing on the main interviews and additional insights gathered through the remaining interviews. Within this chapter, the main learnings and areas of interest will be touched up on to explain the research areas chosen.

1.2.2 SEB and Klarna Differences

As previously indicated, the interviewed companies posed large differences within several interesting areas. On the other side, several similarities within the chatbot implementation process could also be identified. (1) Initially, especially large differences within the age, the size and the organizational structures of the interviewed companies can strike as foundation for further analysis. (2) In addition, it has been interesting to see which parts of the organization initiated the development of the chatbot solutions in relation to the time when it was decided to launch a chatbot. (3) Moreover, the solutions chosen in relation to their maturity level and potential future development was very insightful and underlined different business priorities of the organizations. (4) Lastly, the current level of development and especially realizable results varied. Differences in current results of the organization due to different maturity levels chosen became increasingly obvious. Simpler chatbots will generate results much quicker, but the option to scale up in the future might be different depending on which maturity level has been applied. Since Klarna initially decided to purchase an NLP chatbot solution platform but currently only engages in clickable UI and hence level 1 activities, the results were realized much faster. At SEB, a lot of effort was put into NLP and the introduction of the Swedish language within a structure, which was normally only available in English, which required a severe amount of effort upfront potentially postponing the results currently realized.

1.2.3 Resulting Purpose Statement

Our research attempts to bring light onto organisations successfully implementing chatbots, as example of a self service technology as a customer support service offered to their customers.

The purpose of this thesis is to increase the understanding of how organisations successfully implement chatbots as a self service technology for their customers

We will achieve our purpose by studying three organisations' recent implementation process of their respective chatbot solution. Our focus lays on the technology at stake. While new self service technology implementation has been studied, we argue that the recent developments in artificial intelligence and machine learning, resulting in advanced chatbot solutions, have brought new unknowns into the process. Therefore, research needs to be conducted to solve some of the unknowns that organisations face when implementing chatbots.

We will investigate the processes of our case companies in detail, and consult various stakeholders to get a deep understanding of the thoughts behind the actions. That will be answered by analysing their processes in detail; why they chose to launch a chatbot, what kind of chatbot they decided to launch, how they implemented the chatbot

1.3 Research Question

“How do organizations implement chatbots as a version of new self service technology, aimed at their customers?”

2. Literature Review

2.1 Conceptual Review

New Self Service Technology (SST) is increasingly being implemented within many organizations. One of the most successful recent developments within SST can be identified as chatbot solutions within customer support functions. Despite a high academic and practical interest in general New Technology Implementation, research into Self Service Technology and its implementation process from an organizational perspective is scarce.

The gap analyzed in current research focused on chatbot technology as recent development, which needs to be tested if similar approaches within the implementation hold. Chatbots, as experienced in our case companies have only been applied since around 2014, according to our knowledge. Chatbots are hence a new technology which has been limited in studies in previous literature due to its newness. Hence we intend to bring knowledge to show that Innovation Management is needed within organizations to successfully implement SST implementation and develop the technology within this process. Innovation is required to successfully adapt a chatbot to an organization and its goals.

Within this upcoming chapter, we intend to depict the most influential studies conducted related to our major interest - *the implementation process of chatbot solutions*.

2.1.1 The Research Streams

Through our pre-studies, the three main research streams of this work can be summarized as follows.

Initially (1) the research stream of *Innovation Management* will be investigated. This is due to the fact that chatbots as such do not exist as a final end-product, but need to be developed together with a chatbot vendor. This process requires a high degree of innovation and agility, hence we regard this research stream as a valid fit. (2) As second major research stream, we focus on *New Self Service Technology Implementation as a sub-stream of New Technology Implementation*. This topic will be at the very core of our thesis. Many studies have focused on the implementation of new technologies. We argue, that chatbots and technology surrounding artificial intelligence as well as machine learning, pose a specific kind of new technology within self service. Lastly, (3) the research stream of *Chatbots* is required to understand the available options of chatbots and understand the existing scarce research available. We believe that the combination of the three research streams covered in *Figure 1* successfully underline that this work is grounded in *New Self Service Technology Implementation* as well as *Innovation Management*, while is equally explores new research fields such as *Chatbots*.

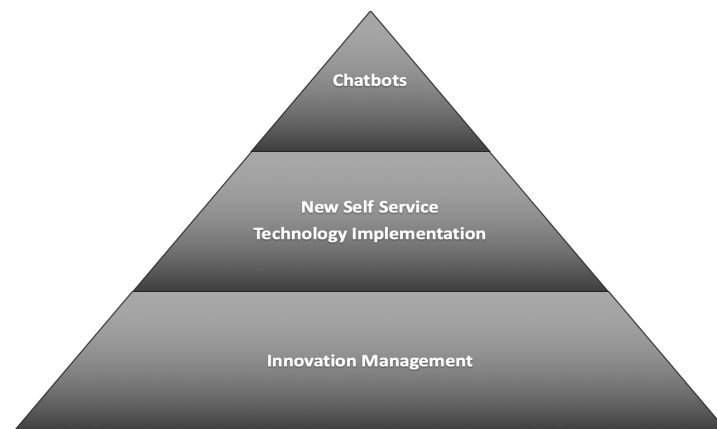


Figure 1: Research Streams

2.1.2. Innovation Management

“Innovation is a hypothesis, whose truth cannot be established with certainty” (Hurst, 1982). Innovation is a key driver of success and growth for organisations. For most organisations, which can be considered leaders in their markets, innovation stands for about 49% of their profits (Markham and Lee, 2013). However, innovation can be very complex and difficult for companies to approach correctly. 68% of innovations go over budget, 47% have some sort of technology malfunction (e.g. Samsung Galaxy Note 7), 71% of innovations become delayed or take more time than expected and 54% miss their market goals (Markham and Lee, 2013).

While innovations can fail for a number of reasons, including technical and creative reasons, many believe that the number one reason for innovation failure is related to management capability (Ray Stata, 2011).

2.1.2.1 Defining Innovation

An extremely common debate within literature is if the definition of innovation refers to it as an individual event or a process (Cooper, 1998). For the purpose of this thesis, innovation will be defined as *“an idea, practice or object perceived by its adopter to be new and an improvement”* (Jalonen, 2011). However, it is important to note that even though innovation tends to mean a change of some sort, not every kind of change implies that there is innovation (Zaltman et al., 1973).

The underlying notion and definition of innovation is that something is either added or given up to make place for the new (Jalonen, 2011). Some studies have also aimed a large part of their focus on the fact that innovation is adding or giving up is for the most part to produce improvements and upgrades. Even with this positive connotations surrounding the notion of ‘innovation’, Jalonen (2011) points out that it is very important to know that the potential value of the innovation can never be known at the same time as the innovation is born.

There exists an extensive amount of studies and articles on how to succeed with innovations and many of them also give some sort of comparison between “traditional management” and

“management for innovation”. The typical attributes of traditional management being: lean processes or reduced variation, to prevent failures as much as possible and try to “plan, plan, and plan” (Bianchi, 2018). Where as innovation management is the opposite; *variation is the most important factor, make intelligent failures and minimum effort on planning* (Bianchi, 2018).

But of course, not all innovation is ground breaking, never heard of before and will change the world. Below is an Innovation Matrix by Nahji and Tuff (2012). This model helps with the taxonomy of different innovations, with the most radical being transformational innovation, that creates new markets, targets new customer needs and is developed through a new project. The least radical innovation is core innovation which is just optimizing already existing products.

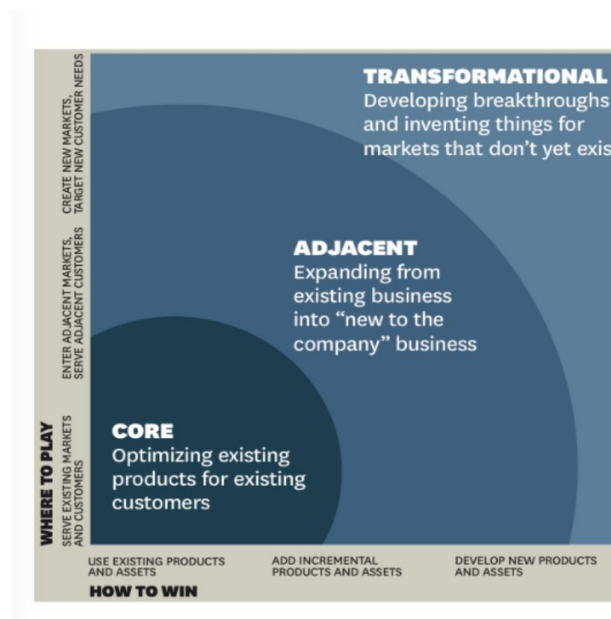


Figure 2: Innovation Matrix by Nahji & Tuff (2012)

It is important to classify innovations as it gives a good overview of the process, different types of innovation also require different types of management and different types of innovations have different impacts on the competition (Bianchi, 2018).

Despite what type of innovation one intends to develop, the fact is that it is more likely to fail than succeed. It is usually due to a management issue, but is of course subject to a wide range of reasons. As human beings it is very usual that we focus on the solution to a given problem, which in practical terms translates into some kind of brainstorming. What is likely to come out of that is the “right answers to the wrong questions” (Bianchi, 2018).

2.1.2.2 Innovation Management Tools

Another side to the literature on innovation is the actual processes and steps organisations go through to reach their final innovation. In management terms this is often called: Linear versus agile innovation process models (Saren, 1984)(Wolfe, 1994)(Wilson and Doz, 2011).

Linear or sequential models usually come in the form of stage-gate or waterfall (Godin, 2006)

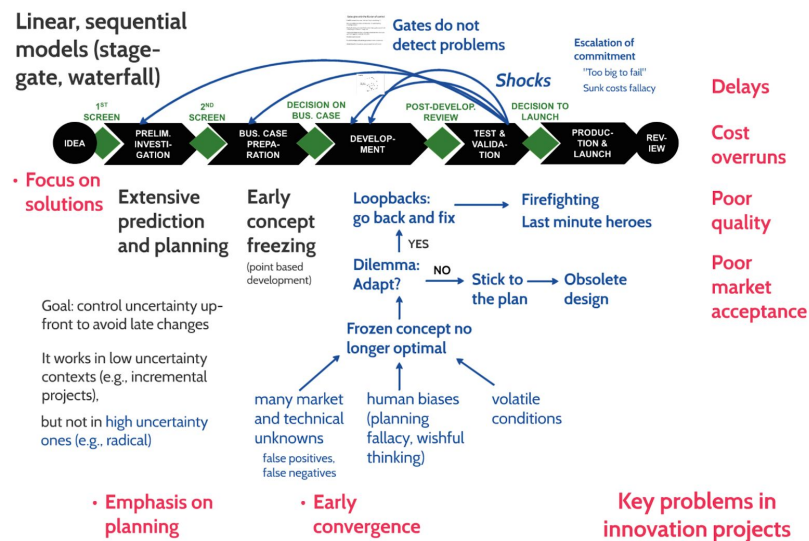


Figure 3: Source: Bianchi (2018)

A linear model, as depicted in *Figure 3*, is a step by step process. Each step is carefully thought through and planned in detail. It also requires a lot of “freezing” to move on to the next stage (Godin 2006). What this diagram also shows is that often when you are in the development phase other factors such as market unknowns, competition, human bias etc. are all things that can negatively impact the success of the innovations. Usually what happens then is that the organisation struggles to find some way to still make it work, because they have spent a lot of time and resources into the project already. Using this method usually gives the illusion of control, through checklists, customer studies etc. But in actual fact, organisations risk huge chances of failure when using the approach for many reasons (Kline, 1985).

Instead, a flexible and agile model is encouraged to use and tends to lead to more successful innovations. Focus should be on learning and doing so in short and small cycles (Wilson and Doz, 2011). This will increase the speed of receiving feedback as well as limiting the amount of investment needed. It also gives more freedom to pivot and discover errors before it is too late.

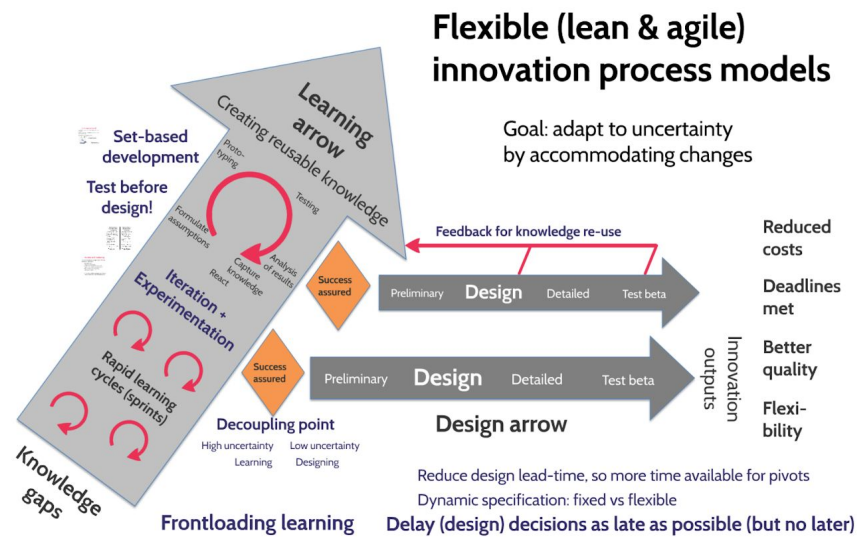


Figure 4: Source Bianchi (2018)

The difference between these two styles of working can be what “makes it or breaks it” when organisations decide, for instance, to implement a chatbot as example of new self service technology. When you operate in an agile way, you allow for exploration earlier in the process to “see what happens if...”(Wilson and Doz, 2011)(Johansson-Sköldberg et al., 2013).

This is a very fundamental mindset, for instance, to not have pre decided what the problem is and what the solution is. It can be seen as more of a playground and less of a “dress rehearsal” where everything is intended to be “practice” for the real thing (Bianchi, 2018). For more radical innovations you need to be more agile.

2.1.3. New Self Service Technology Implementation

Implementation of new technologies are seldom only about adding the actual technology itself, then it would almost be purely a question for engineers. Really important changes usually require managers, employees and leaders in the organisation to work with their current skills, abilities and behaviours so that the changes are not only implemented, but also integrated and maintained into the business.

Chatbot technology is one example of a new technology that affects the way an organisation works, as well as the way the customers interact with an organization. However, the scope of this thesis only allows for looking into the *implementation within organizations for the purpose of customer support*. The implementation of new technologies is essential for organisations to remain competitive. Across different types of industries, new technology can make a noticeable difference to a business and can, in certain instances, revolutionize the way business is conducted.

The main barrier that is widely mentioned in the literature, is the resistance to the implementation of new technology (Tushman and Anderson, 1986; Henderson and Clark, 1990). Organisations who refrain from implementing new technologies have been described as “blind to the existence or advantage of external innovations” (March and Simon, 1993), “trapped by current competencies” (Levitt and March, 1988) or “business models” (Christensen, 1997) and “paralyzed by core rigidities” (Leonard-Barton, 1992).

We believe that a sub-stream of new technology implementation is more fitting to the purpose of our study and have hence conducted research within new self service technology implementation

The reason is that new chatbot technology is being implemented as a supplement service to customers, who are using an organisation’s main products and services. The addition of these chatbots, are like the *addition of a new self service technology*, as the customer can solve customer service questions, without the use and support of an employee. We argue, based on the insights from our pre-study interviews, that there exist comparable feelings of resistance to change within the customer towards new self service technology, as with the organisational employees to the introduction to general new technology. Internal versions of a chatbot within our case companies are only a step within the process of launching the chatbot externally to customers

Hence, after conducting a general overview of insights from the research stream of “new technology implementation”, we decided to focus on a highly related niche stream through “new self service technology implementation”, which, as argued for previously, fits the purpose of our work.

The implementation of *Self Service Technologies (SSTs)* to the delivery of an existing service extracts the personnel, human interaction from the delivery and therefore more responsibilities are placed on the customer to finish the service (Curran and Meuter, 2005). Even though this is meant to increase the customer experience, it places more work on them (Langeard et al., 1981). The notion of placing responsibility on the customer, may mean that the customer decides to avoid the service instead.

This is something the organisations must keep in mind, as they may lose a proportion of their current users or customers (Langeard et al., 1981).

The customer may not have a reason to change the way they carry out the service and increasing complexity and responsibility on the customer, may lead to anxiety and stress for those who are not comfortable with the new and presumably more advanced technologies (Mick and Fournier, 1998). Some may even perceive it as a threat and may not know how to solve problems that arise themselves (Meuter and Bitner, 1998). Then there are those customers who enjoy the human contact they get when they interact with actual people (Zeithaml and Gilly, 1987) and this may be a very important factor in taking away humans in the customer support. However, there are those customers who prefer to avoid human interactions and therefore this technology allows them to interact more comfortably.

There are of course many more benefits of these technologies. For some the technology is easier and more convenient, offering around the clock service or shorter waiting lines (Meuter et al., 2000). Then of course there can be huge cost savings and effictivization within the organisations (Meuter and Bitner, 1998).

The strategies to implement these technologies, must include ways to attract customers to use the newly implemented technologies and tackle the right problems for the customers, according to the customers themselves. There has been some important work on the implementation on SSTs, but it is still a relatively new field. Some key factors that have been found to lead to satisfied or unsatisfied customers when using SSTs are: *usefulness, ease of use, availability, and convenience play a significant role in customer satisfaction with SSTs* (Meuter et al., 2000).

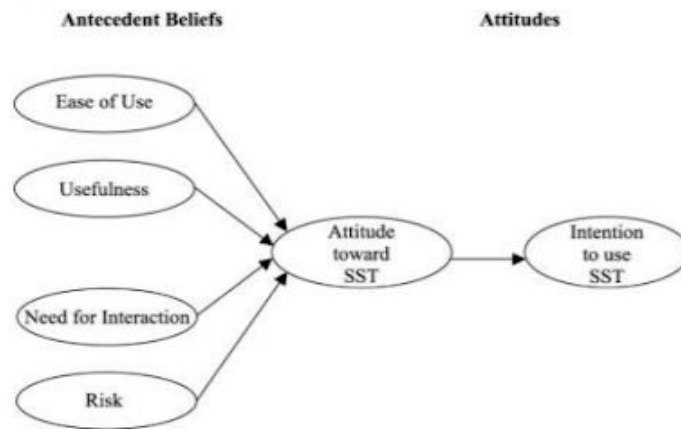


Figure 5: Source Curran and Meuter (2005)

In other important contributions, such as Parasuraman (2000) factors that contribute or prohibit “technology readiness,” have been explored by Dabholkar (1994, 1996); here it has been found that “control, performance, ease of use, need for human interaction, reliability, and speed” to be very important when it comes to the use of SSTs. Meuter and Bitner (1998) state that “support, accuracy, performance, and recovery from error” as factors which are vital in the customers willingness to use these technologies. This is a complex field, in need of more resources, no doubt, but much of what has already been researched is very important and useable.

2.1.4. Chatbots

As last research stream, we intend to shed light on the technology we are investigating. We intend to build our analytical framework by relying on the previous two research streams. Nonetheless, an important reason for our choice to opt with *Innovation Management* and *New Self Service Technology Implementation* is the fact that chatbots as such are a new and still developing technology. This fact requires organizations to be innovative within their chatbot implementation as well as it requires them to live up to theoretical expectations when it comes to new self service technology and how this is perceived by customers. The upcoming part will clarify some of the most important terms and options for organizations.

According to Brandtzaeg and Følstad (2017), the recent peak of the interest regarding chatbots stems from several factors. Initially, Brandtzaeg and Følstad (2017) outline that the increased interest depends to a large degree on recent developments within artificial intelligence (AI) and machine learning (ML). Those developments are closely related to the increased use of mobile internet as well as messaging platforms. The eventual use case of chatbots ranges from small tasks, such as setting up a bank account, to actual customer service aimed at handling complaints or providing social as well as emotional support within shopping decision (Brandtzaeg & Følstad, 2017).

Based on the large perceived positive effects on profitability, chatbots are regarded as highly impactful and can prove as promising alternative or addition to the traditional customer services provided by many organizations (Xu et al., 2017). According to Accenture (2016), the interconnection of the respective sub-parts of chatbots, consisting of (1) the interface (UI), (2) the intelligence part (AI) and (3) integration (SI) in cooperation with human customer support agents offers tremendous potential for future development.

Khan and Das (2018) define a chatbot as “*a computer program that processes natural-language input from a user and generates smart and relative responses that are then sent back to the user*”.

The history of chatbots can potentially, according to Khan and Das (2018), be traced back to 1965 and the introduction of “Elisa” developed at MIT even before the launch of the internet.

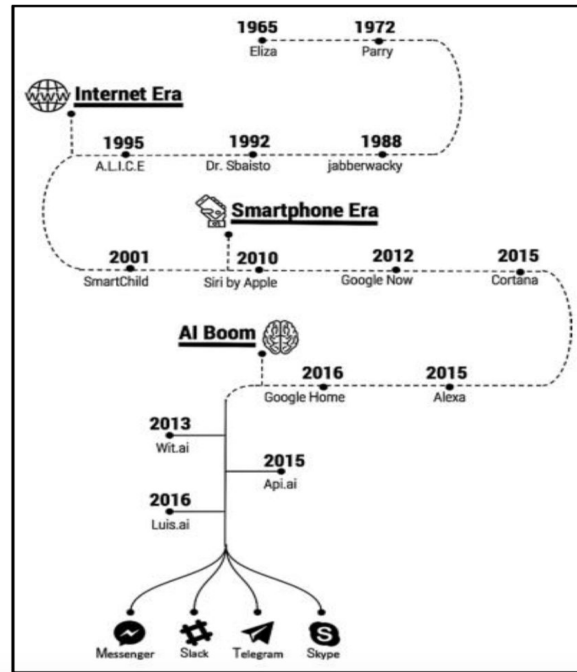


Figure 6: Chatbot History (Khan & Das, 2018)

It is important to outline that there exist a vast amount of different chatbots. For the focus on this research, *textual chatbots have been chosen*, disregarding other forms, such as chatbots focusing on voice exchanges, such as Siri by Apple or Alexa by Amazon. The main reason for this choice is the fact that only a few organizations have the capabilities and technology to benefit from voice-over chatbots, while textual chatbots can be applied and hence benefited by virtually any organization in any given industry to a limited extent. In addition, this work focuses on chatbots *within customer support*. Other usages of chatbots may include lead generation, e-commerce, and many others which we do not intend to cover.

2.1.4.1 Overview Chatbot Typologies

When referring to chatbots, it can quickly be realized that there are a variety of available options. Even within the description of chatbots, the level of complexity and the extent of AI being used and machine learning differs. This paragraph intends to develop an overview of options for organizations to choose from. Certain chatbot solutions, such as the basic task of ordering a pizza might not need the advanced AI chatbot options based on machine learning and, as a result, might provide a financial burden for organizations. Hence, from a financial as well as organizational perspective, it is imminent to be aware of the different options and to avoid investing too much money for options, which are not required.

Extending the view of Khan and Das (2018), the evolution of chatbots has been mapped extensively by Deloitte (2019) to underline the different degrees of maturity with regard to chatbot solutions on the market. While Khan and Das (2018) depict a significant overview of the development of general chatbots throughout the decades, Deloitte (2019) stress the large differences in the development of potential solutions. As such, the (1) *Scripted Chatbots* can be perceived as the most basic version currently available. By focusing on (2) *Intent Recognizers* or even (3) *Virtual Agents* the introduction of AI and machine learning enables chatbots to communicate and learn much more in depth. Lastly, (4) *Human-like Advisors* are seen as the most advanced solutions currently available enabling the chatbot to reason and understand a potential customer in the same way as a human (Deloitte, 2019).

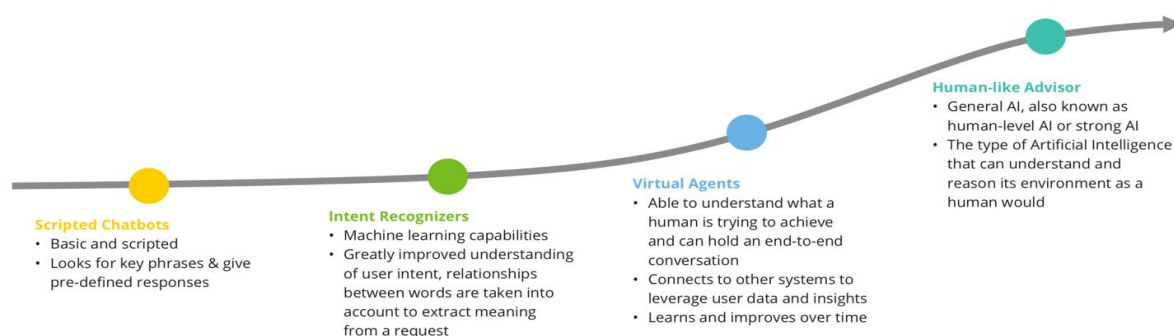


Figure 7: The Evolution of Chatbots by Deloitte (2019)

The overview by Khan & Das (2018) in relation to the more practical and predictive outlook by Deloitte (2019) provides a solid basis for the categorization in maturity of chatbots through an increased academic perspective by drawing from Smiers (2017).

Within the academic literature, chatbots are frequently divided into different generations, implying different degrees of “chatbot maturity levels”. Smiers (2017) has developed an intensive model basing the different levels on their advancement measured by “interaction”, “intelligence” and “integration”.

Within (1) *interaction* it is underlined that the user experience of a chatbot varies to a significant extent from traditional websites. This is based on the fact that chatbots are communicating through textual input. Within (2) *intelligence* it is underlined that the chatbot can reliably understand the messages of the sender. Within (3) *integration* the capabilities of a chatbot with regard to its back-end applications and its connectivity to other websites are described (Smiers, 2017).

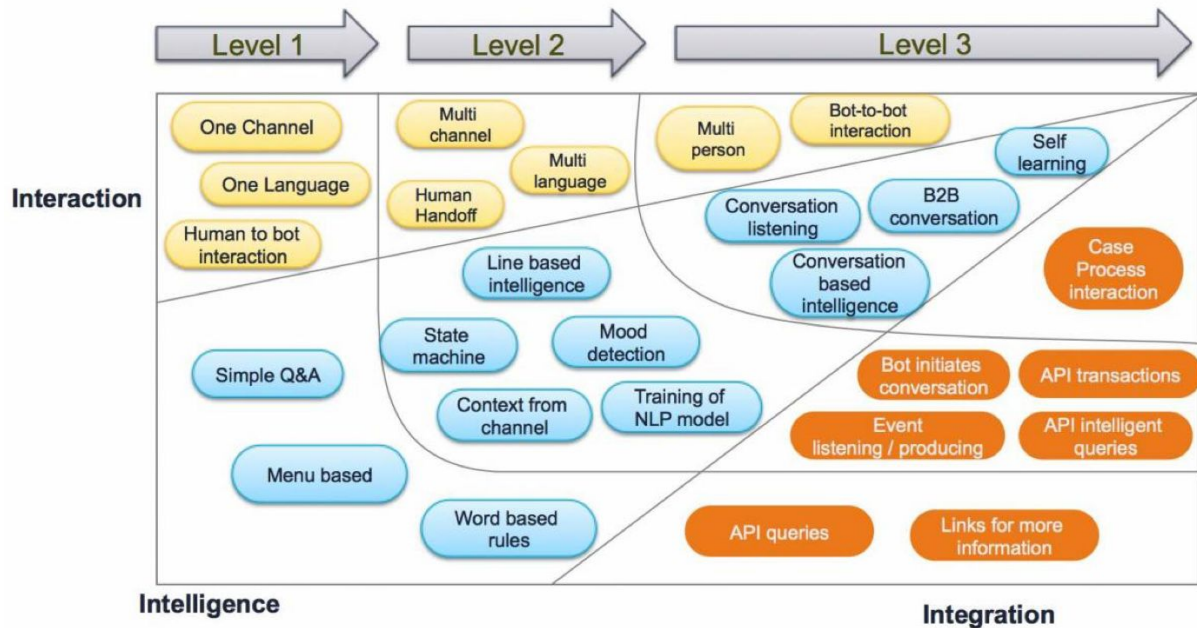


Figure 8: Levels of Chatbots by Smiers (2017)

Within *Generation or Level 1*, a chatbot is based on rule-based and clickable UI, which enables the chatbot to serve customers on a basic level through simple Q&A as well as providing links for further information (Smiers, 2017). *Generation or Level 2* enables supervised machine learning and hence focusing on AI and natural language processing, during which customers can have actual conversations with the provided chatbot on top of the already existing rule-based and clickable UI system (Smiers, 2017). One of the key differences is, in addition, the fact that the chatbot can initiate the contact (Smiers, 2017). *Generation or Level 3* enables a full combination of the previous two generations, hence relying on clickable UI linked to rule-based options and the support of AI and machine learning for the NLP applications of the chatbot (Smiers, 2017). The following overview aims at enabling the reader of this research to understand the underlying choices the organizations interviewed for this work had to undertake. In addition, it is important to realize that, although this work focused on three distinct generations of chatbot, there might be fast developments, which enable organizations to take advantage of the following generations (Deloitte, 2019).

2.1.4.2 Flow-Oriented Chatbots

As initial and most basic chatbot on the market, the first generation of chatbots revolves around flow-oriented or clickable UI chatbots. Within those chatbots, customers can narrow down their search through options provided by the developing organizations (Smiers, 2017). Very frequently, the flow-oriented chatbot results within predetermined FAQs (Smiers, 2017). It is important to note that flow-oriented chatbots are not powered by AI and machine learning and hence fully rely on the options installed by the developing organizations (Deloitte, 2019). This first generation or level of chatbots can be used frequently by organizations offering basic tasks, such as ordering pizza or as H&M, which offer Clickable UI chatbots to narrow down the clothing search online (Deloitte, 2019).

The basic nature of the flow-oriented chatbot leads to the fact that only a predetermined number of tasks can be undertaken with little freedom for additional tasks to be taken over. Customers will use this application for very specific tasks. As a result, flow-oriented chatbots do not learn over time and do not use past customer data within a conversation (Smiers, 2017).

2.1.4.3 Artificial Intelligence Chatbots

Within the second generation or level of chatbots, there is a frequent use of artificial intelligence to deliver the crucially needed user experience. Artificially intelligent chatbots rely on the use of customizable keywords in order to recognize and detect patterns (Smiers, 2017). The chatbot, then, formulates answers to the patterns detected in the user requests.

Natural Language Processing (NLP) forms the very basis for the development of artificially intelligent chatbots and powers the interaction between humans and AI, which may be initiated by the chatbot (Smiers, 2017). This second generation or level of Chatbots hence provides a much more advanced solution to organizations and users (Deloitte, 2019). Users can interact and communicate on a high level with the available chatbot. Hence, the tasks, which artificially intelligent chatbots can provide are much more complex than the chatbots within the first generation. At the same points, this leads to potential complexities, especially with regard to language translation and increase costs as well as project length predictions for organizations.

2.1.4.4 Hybrid Chatbots

Within the third generation or level, the hybrid or contextual chatbot combines advantages of Clickable UI and Natural Language Processing (NLP) to derive on solutions which (1) on the one hand steer consumers towards the correct questions but (2) on the other hand provide the AI and machine learning background necessary to make sense of the conversations and allow an increased amount of options (Smiers, 2017). The key difference to the previous generation is the fact that not only does the hybrid chatbot rely on NLP, but the use of AI and especially machine learning enables this chatbot to be the most developed chatbot available today

(Smiers, 2017). The use of AI technology and machine learning successfully creates the basis for sufficient interaction between a potential customer and a bot (Deloitte, 2019). The hybrid chatbot will learn and grow over time, taking advantage of the information provided by customers (Smiers, 2017). Hence, the contextual chatbot self-improves on a constant basis which will enable the addition of new tasks and a continuous improvement of existing services. Data from previous discussions will be stored and hence beneficial for the continuous relationship with an individual customer as well as for every possible customer (Smiers, 2017).

2.1.5 The Conceptual Framework

Combining what we have learnt from the literature review and review of the three different research streams, and keeping in mind the purpose of this thesis, we have decided to use two models from *Innovation Management and New Self Service Technology Implementation* as a lens to analyse the case companies' chatbot implementation. The *Chatbot* review serves as an improved understanding of the technology at stake and will be related to the options chosen by our case companies. We believe that it is important for the general reader to understand the different options chosen by our case companies.

The model we propose to get a topline indication of the organisations' processes is an agile innovation model. We propose to use this model as a lens in analysing the implementation of chatbots. Implementing a chatbot solution - at this stage in time - means that organizations will have to create the product almost from scratch. There is no off-the-shelf technology, readily available to the organizations. Hence, to analyze the implementation of a chatbot solution, an innovation management model is needed to analyse the process from idea to launch.

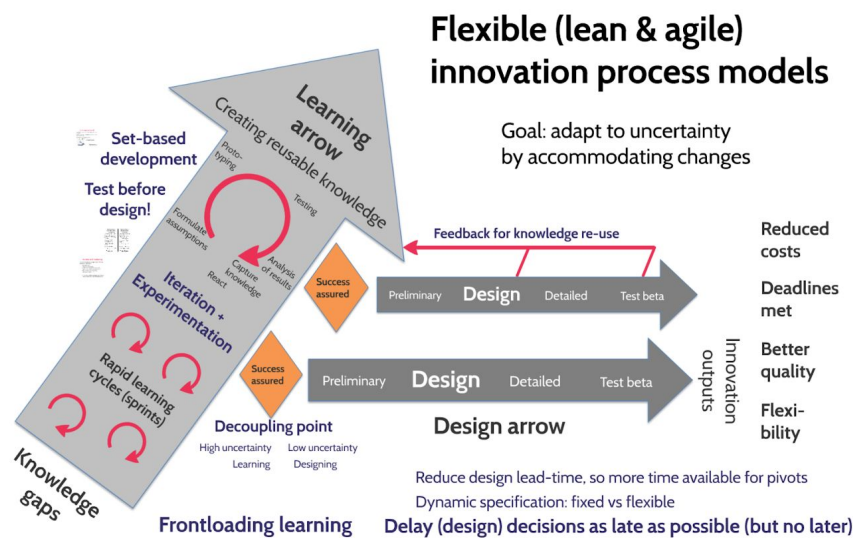


Figure 9: Source Bianchi (2018)

We believe the lean and agile innovation model by Bianchi (2018), provides a solid lens to analyse the organisations' innovation management throughout the SST implementation process. Important aspects, such as (1) a focus on iterative processes in order to make intelligent failures,, (2) short and small learning cycles, and (3) Pivoting and early discovery of mistakes, build the foundation of a flexible innovation process model

The agile model tries to abolish the otherwise rigid process of developing innovation. The framework is applied by a presentation by Bianchi (2018) and shows that learning should be

conducted as you are developing. By closing knowledge gaps you develop ideas and prototypes to test fast and fail fast. The model intends to underline that the crucial decision should be taken as late as possible. In this way, one allows more time to close the potential knowledge gap before a successful launch.

To successfully conduct an analysis of the chatbot implementation process through an innovation management perspective, we intend to supplement the innovation model by Bianchi (2018) with a “new self services technology” implementation model. This is to be able to compare important factors for SST implementation with chatbot implementation.

We propose to use a model that has been tested and used by Curran and Meuter (2005). This model shows the relationships between user attitudes and attitude towards the new self service technology and then between attitude towards technology and intention to use SST. It has been used to assess customers of banking technologies, hence the model can be perceived as even more fitting to our research, focusing on case companies within the banking and financial services industry.

Although our focus is on the organisation, the *successful* implementation of a chatbot in this scenario means that it helps the customer solve customer service problems. For this to be the case, the customer eventually needs to adopt and use the chatbot. Hence, this model will allow us to look at the organisations chatbot implementation process, through the lens of appropriate factors the organisations need for it to be successful at the end.

We will use this framework to put a theoretical lens on what organizations should keep in mind when implementing their respective SST from a theoretical perspective - we do not evaluate how customers actually perceive it, since this is out of the scope of this work.

In a perfect theoretical world, all of the factors would be taken into consideration by the implementing organization.

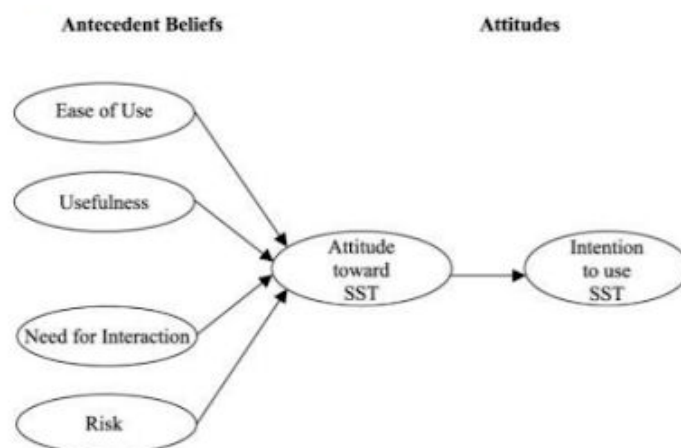


Figure 10: Source Curran and Meuter (2005)

To provide an increased understanding of the figure by Curran and Meuter (2015), we provide the following clarifications:

Attitudes

Attitudes can be defined as “a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor” (Eagly and Chaiken, 1993,). Even though there is not clear definition of technologies, but many studies have been conducted on attitudes towards different types of technology (Daamen et al., 1990).

Other research has proven that users can have different attitudes towards different SSTs (Curran et al., 2003). SST used by customers can of course have different attitudes towards it depending on the user and this will affect the intention to use an SST.

The four predictors

The four predictors are *ease of use*, *usefulness*, *need for interaction* and *risk*.

Ease of use: for the purpose of this thesis will be defined as “the degree to which a user would find the use of a particular technology to be free from effort on their part” (Davis et al., 1989).

Usefulness will be regarded as the subjective notion that using a technology will improve or better an existing process (Davis et al., 1989).

A need for interaction is defined as a desire from the customer to retain the interaction with another human within a service (Dabholkar, 1992). *Using SSTs, by definition, eliminates interaction between humans*. For many customers, the human aspect of the interactions are a are valued and necessary for a successful experience (Zeithaml and Gilly, 1987). Therefore, the use of SSTs can be less desired by some customers.

Risk is defined as the probability that an action of one person will lead to another Curran and Meuter (2005) and the danger of something negative leading to another negative action. In this case the negative action being the customers not using the new technology

3. Methodological Approach

Within the following section, it will be explained how the research philosophy chosen was derived to offer the reader an increased understanding of the methodological fit. The chosen methodological approach and the primary data collected are intended to answer the previously outlined research question.

3.1 Research Philosophy

The ultimate intention of the research at hand focuses on an increased understanding of how organizations implement chatbots aimed at customers, as one example of new self service technology implementation. Learning from insights provided by leaders through the examples of *innovators* and *early adopters* within the industry regarding the use of chatbots can be seen as crucial with regard to the further implementation and continuous learning of the stakeholders involved.

Within the chosen research method, the main source of information are organizations currently applying chatbots within their customer support functions. On the other hand, information from external technology providers selling the chatbot solution is important to include to provide a sufficient and holistic picture. We aim at including this external perspective to assure a *critical perspective* of the interview answers from our case companies. We regard this external, more questioning and opposing perspective as crucial to depict objective findings.

To successfully understand the complicated implementation processes of chatbot solutions through the lens of the innovation management and new self service technology implementation models, an interpretive approach was chosen. An interpretive approach enables the researchers to dive into the topics at stake without being limited to a large extent by regulations (Bell & Thorpe, 2013). To sufficiently understand the insights of organizations the interpretive approach enables a large degree of freedom (Bell & Thorpe, 2013). According to Bell & Thorpe (2013), an interpretive approach enables us as researchers to explore hidden reasons behind the complex social processes relating to inter-office politics and company-wide relationships. Within an interpretive approach, the inherent constructs of interests do not need to be fully known in advance of the study, which overlaps with the aim of this study. In addition, the research question can be modified throughout the use of the interpretive study. This fact enabled us to adapt throughout the study. Within an interpretive study, certain potential weaknesses need to be addressed. According to Bell & Thorpe (2013), internal validity as well as inferences may remain weak. We try to mitigate this potential issue by looking at three distinct cases as well as adding an external perspective through industry specialists. Due to the fact that we consider us novice researchers, we also might miss certain patterns in the data, which an experienced researcher might highlight better.

3.2 Research Approach

Some of the reasons for the specific use of chatbots can be summarized through (1) the recent advanced developments within artificial intelligence and machine learning, (2) the increased adoption of conversational agents as well as voice agents since the introduction of Amazon Alexa in 2014 as well as (3) the increased time horizon organizations need to adopt and maintain the chatbot solution. We argue that due to those reasons, the research area surrounding the implementation processes of chatbots is special and a current issue many organizations face. Researchers as well as practitioners argue for the specific case of chatbots as outlined within the chatbot technology overview.

Regarding the importance of an explorative approach and an open atmosphere towards interviewees, the research methods chosen are based on explorative research to break down the difficult processes underlying the issues at stake. To achieve our purpose of understanding how organizations successfully implement chatbots aimed at customers as example of new self service technology implementations, an abductive approach was chosen.

This enables us to move back and forth between the actual data gathered and the underlying theory (Flach & Kakas, 2002). We argue that this is the correct approach considering the fact that we are analyzing our data through the lens of two research streams in specific of which (1) *Innovation Management* is widely researched, (2) while *New Self Service Technology Implementation* as niche stream of new technology implementation is not as heavily researched and *chatbot technologies, in the advanced version, which we can witness since around 2014*, are considered a relatively new area. Due to the constant changes within the technologies as well as within our learning process, we argue that moving back and forth between theory and practice through an abductive approach, offers us the flexibility we need for this study. In addition, an abductive approach allows us to generate “best possible predictions”, which may be true under the assumption of “incomplete observations”.

Since a case study might present incomplete observations, semi-structured interviews with three distinct case companies as well as with external specialists were chosen. The ultimate aim of exploring a new research area will be supported by this approach and trust as well as new insights will be facilitated more effectively (Mullins, 2007). It is regarded as important to initiate the interviews with broad questions about the underlying topic to facilitate the understanding before enabling deeper questions (Mullins, 2007). Equally, it proves crucial to be able to react in a sensitive way to the behavior and answers of the interviewees (Qu & Dumay, 2011).

3.3 Data Collection and Analysis

The results of our data generation phase *are based 20* semi-structured interviews. The interviewees were chosen based on our analysis of chatbot implementations across various industries. A special focus was set on avoiding potential selection biases, which are regarded as a potential danger to the success of qualitative research (Collier & Mahoney, 1996). To generate possible conclusions applicable to various industries and sizes of organizations, an initial screening with regard to chatbot implementations was conducted.

Within the interview process, *2 interviews* are considered pre-study interviews to dig deeper into the questions we have chosen and learn more about the subject in practice. This approach largely supported us to refine the interview questions of the main study as well as the research question. A pre-study was intended to assure a reliable and highly important research question. Especially the interviews with our case companies were intended to be conducted on-site as often as possible. Interviews with consultants mainly took place over tools such as Skype Business or WebEx.

The method used can be described as “Snowballing Method” during which we intended to dig deeper and deeper into the underlying issues (Biernacki & Waldorf, 1981). Within the process of contacting potential interviewees it is important to recruit subjects for the study from among their acquaintances and contacts. Hence, the sample interviewee group is said to grow like a rolling snowball, depending highly on who was available for interviews (Biernacki & Waldorf, 1981).

Within the upcoming sections, the approach, the following analysis and the structure of the interviews will be described. The figure inserted below describes the research approach chosen in greater detail. It was highly insightful to initiate the process with pre-study interviews, followed by refining the questions and themes discussed during the interviews.



Figure 11: The research development

3.3.1 Pre-Study & Practicalities

Two pre-study interviews were conducted within organizations, which stand for an advanced diffusion of chatbot solutions. After analyzing potentially interesting industries applying chatbot technologies, especially the Banking & Insurance-, the Retail & Fashion- and the Aviation & Travel industries appeared interesting (Chatbot Guide, 2019). The main reasons for the choices of potential industries include (1) the wide use of chatbots within those industries, (2) the positive feedback organizations have received from international media (3) as well as the high possibilities to get in contact with those Stockholm-based organizations. Especially leading organizations in their fields of expertise, such as Klarna, SEB and Swedbank have been covered in international media for their capabilities to take advantage of chatbots (The Independent, 2019). For the use of our study, we intended to approach potential case companies within the same or similar industries to increase the potential to generalize our findings.

As previously discussed, the chosen interview technique can be described as semi-structural. Schensul et al. (1999) underline semi-structured interviews as an inherently important way to gather focused as well as qualitative textual data. In addition, Bernard (2000) emphasizes the perceived balanced between the extremes of either opting for structured surveys or entirely open-ended interviews. For the purpose of this research, semi-structured interviews offer the optimal solution. A certain degree of structure will underline the direction of the research, on the other hand, enough openness will be achieved for interviewees to create new insights. Based on the availability of new and rich descriptive data, the experiences within the implementation process of chatbots and the application of AI within organizations will be analyzed. Due to the sensitivity of the information at stake, consent forms were developed to assure the interviewees that company-specific information will not be available to the public.

For the success of semi-structured interviews, consent forms pose another form of trust and can create a more open atmosphere (Rabionet, 2011). The companies were briefed about our intentions and results were frequently checked with interviewees through, either (1) follow-up interviews or (2) aligning through emails summarizing our key findings.

The intention of the chosen approach is to gain more insight into an organization's implementation process of chatbots aimed at their customers. This helped us define areas to focus on in our main study. They also served as a potential tool to avoid mistakes within the main interview phase and to adapt the interview process with apparent modification and suggestions from the pre-study interviews.

The overall useability of the chosen interview approach is intended to be underlined through the pre-study phase, while clear learnings and topics of interest emerged to shape the remainder of this research.

As depicted by Bianchi (2018), the importance of initially broadly defining a problem to develop insights within the problem area cannot be underlined enough. The intention of consulting experts within the chatbot implementation field underlines our intention of discovering key issues within the chatbot implementation process of an organization and define precise areas of increased focus. Following this process, changes and developments were realized, relying on the main study interviews and drawing important conclusions for the solutions to eventually work within an organization (Bianchi, 2018).

3.3.2 Main Study & Practicalities

After successfully underlining the appropriateness of the chosen interview process, the main phase included an updated and improved version of the interview with specifications within the area of increased interest. The overall study consisted of *18 interviews*. The aim was to critically determine potential consensus and common topics and themes discussed by various interviewees.

The previously described Snowballing Method enabled us to dig deeper into the organizations, which were open to discuss their implementation processes. In addition, this method enables us to get into contact with external consultants covering the industry at stake. With regard to the practicalities surrounding our interview processes, the following can be stated. For every case company, we intended 3-4 interviews with different stakeholders with the implementation process of their respective chatbot solution. When selecting the interviewees, we further intended to focus on individuals from different organizational levels, task teams as well as departments as much as possible. For certain cases, the chatbot team was rather small, which allowed us to talk to individuals repeatedly, while for larger teams we were able to expand our view throughout the organization. The remaining interviews were scheduled with external chatbot specialists. Those external interviews gave us guidance in

terms of critically reflecting on what the case companies mentioned. The specific overview of the interviews can be found in *Appendix 4*.

Due to privacy concerns of some of our interviewees, especially with regard to our external specialist interviewees, who in certain cases were professionally connected in one way or another to our case companies, we have anonymized the names.

3.4 Sampling

3.4.1 Interviewee Selection

The immense increase of chatbot use initiated a certain difficulty within the identification process of potential interview partners. Initially, the use of chatbots on a global scale was analyzed to find and detect industries, which can be considered at the forefront of AI technologies and chatbot diffusion. Chatbot Guide (2019) provides a highly detailed analysis of organizations within various industries successfully taking advantage of chatbot solutions. In addition, Sarkar (2019) and The Independent (2019) provide an overview of the main factors why certain industries are more interested in applying chatbots than others as well as which Swedish organizations are highly engaged with chatbots.

Initiated by our analysis and the clustering within specific industries, we used an *exclusion strategy* to derive at our interview partner selection. (1) Initially, the organizations were intended to be within our best practice industries. (2) Secondly, the organizations were intended to operate in Sweden and steer their chatbot applications based from their headquarter. (3) Moreover, to derive common themes and learnings and at the same time provide various options, organizations were supposed to be using different options and specifications for their chatbot solutions.

3.5 Quality of the Study

3.5.1 Dependability

Within the field of qualitative research, dependability and hence the required academic consistency as well as repeatability is of utmost importance (Bryman & Bell, 2015). To assure dependability, we intended to conduct external audits from our supervisor. This behavior will guarantee that the research conducted is well understood and academically free from mistakes. As novice researchers, dependability issues can pose a significant threat (Bryman & Bell, 2015). We argue that since we included three distinct case studies and accompanied them with external expert interviews, a repeated study would produce highly similar results and depict similar implementation processes with regard to chatbot technologies aimed at customers.

3.5.2 Credibility

To assure credibility of the underlying study, several ways of ensuring credibility have been introduced. Initially, the notes taken and conclusions derived on were intended to either (1) be checked through follow-up interviews showing our results, (2) asking interviewees to check and agree to what has been transcribed and (3) consulting interviewees about the conclusions we drew from their statements to avoid confusion or potentially misguided judgements.

3.5.3 Transferability

Within qualitative research, transferability can pose a potential weakness since the interviewees chosen as well as the industries focused on can complicate this process. One of the additional drawbacks of qualitative research is the fact that it is often regarded as inferior when trying to generalize patterns and outcomes (Bryman & Bell, 2015). Moreover, subjectivity can always play a role in qualitative research. A rigorous and detailed approach when transcribing interviews and an objective and rationalistic approach is intended to solve most of the mentioned issues. Within our interview process, we assured to instantly transcribe the conducted interview supported by audio-files and using the previously mentioned ways to make sure our transcriptions and conclusions were correct. In addition, the rich empirical findings section is intended to increase transferability by being able to compare the main statements from our interviews in case of future research within this area

4. Empirical Results Main Study

Based on the insights gathered during the pre-study interviews with Klarna and SEB, the main study of our work included several important aspects. (1) Initially, we returned to Klarna and SEB with our updated questions and to confirm our findings from the pre-study interviews. (2) In addition, we decided to add Swedbank as a third case. (3) For all three cases it was regarded as crucial to conduct several interviews within the organization to gather insights from different stakeholders and perspectives. (4) As additional important aspects, we intended to include interviews with external experts, such as chatbot service providers, digital strategists as well as experienced consultants within the AI technology and chatbot field to not fully rely on the answers from organizations but instead develop a more critical and questioning perspective

This chapter provides the empirical findings developed from the conduction of our qualitative interviews and the insights provided from external specialists.. We will first summarize and structure the key aspects from our data generation phase, before critically assessing our empirical results within the analysis part of this work. We are aware of the fact that the organizations we interviewed might be too subjective in their answers, nonetheless, within the empirical findings section, we will portray our findings objectively and rather unfiltered before using our analytical and theoretical perspective to analyze our insights. The empirical findings are hence presented in a narrative voice of the two authors of this work without judgement.

For each of the case companies, we initially provide *(1) a depiction of their chatbot implementation process*. This is the very foundation of our study and will depict and provide a basis for further analysis through our innovation management lens. This is followed by *(2) depicting the innovation procedure at the respective case company through relying on the depiction of the chatbot implementation process - from idea to launch*.

In addition, we provide *(3) an overview of how the respective case companies reasoned around their respective choice of chatbot solution with regard to customer intention to use*. It is important to state that we present the organizational perspective, meaning that we view the SST implementation from the angle of the organizations - which customer considerations did they engage in before implementing their chatbot. This is not to be confused with customer rating the final chatbot solution.

4.1 Klarna

4.1.1 Company Background

Klarna AB Bank, or commonly referred to as Klarna, is a Swedish bank that was founded in 2005. Klarna provides financial services, such as payment solutions for online stores (Klarna, 2019). Klarna currently operates in 14 countries and serves approximately 60.000 customers across more 100.000 merchants (Klarna, 2019). Among the main services provided by Klarna is the ability to take over merchants' claims for payments and taking care of customer payments to minimize the perceived risk for sellers as well as buyers. As of 2018, Klarna has approximately 2000 employees with a large majority working at the headquarters in Stockholm, Sweden (Klarna, 2019). Klarna reported a revenue of 530 Million USD in 2017 with an e-commerce market share of 10% within the Nordics. Furthermore, Klarna purchased "Sofort" in 2014 as one of its most crucial expansion steps (Klarna 2019).

As frontrunner with regard to advanced technologies and reported flat hierarchies within the organizations, Klarna and its intertwined history with The Stockholm School of Economics poses an interesting option for the research into AI technologies and chatbots.

4.1.2 Chatbot Implementation Process

<u>Implementation Process</u>	<u>Klarna</u>
Step 1 Establishment Problem Formulation	<ul style="list-style-type: none">• problem formulation: finding solutions for growing number of transactions per day as Klarna's customer base grows• driven by the hunger to improve while also being better/more efficient
Step 2 Internal Preparations & Customer focus	<ul style="list-style-type: none">• looking at what kind of questions they get from customers (FAQs)• realized that a chatbot can solve a lot of their problems• different kinds of chatbots available on the market• NLP option purchased• Clickable UI options for current use purpose• decided to go with NLP as advanced
Step 3 MVP and Testing	<ul style="list-style-type: none">• tried NLP- bought solution• Considerable long time to market with NLP option• Decision to remain in the NLP solution while currently leveraging the clickable UI benefits
Step 4 Maintenance and Features	<ul style="list-style-type: none">• Carry on learning and developing Clickable UI plus new features• Potential to scale up to full NLP solution at any time

Figure 12: Klarna Chatbot Implementation

4.1.3 Chatbot Implementation - From Idea to Launch

As depicted in *Figure 12*, Klarna went through specific steps when implementing their respective chatbot solution. Klarna initially (1) focused on an intensive *problem formulation phase*, within which Klarna intended to find a possible solution to their underlying issue - Klarna's business was growing at such a fast rate that the organization intended to find a solution for the increasing number of customer requests and questions about their offerings. Balancing the interests of customers in terms of quality service as well as a quick and efficient handling process, Klarna derived at the possible solution of introducing a chatbot to their customers. As one of our interviewees clarifies the overall intention of Klarna's efforts:

"We evaluated how we can improve and automate this process (customer support process) at the same time, but not decreasing quality, it needs to automate and improve customer service with Klarna" - Interviewee 2

Within the second major step, Klarna (2) *initiated internal preparations* and focused on customer insights regarding specific preferences and expectations towards a chatbot. Klarna undertook an extensive market screening process of potential chatbot solution options. As described by one of our interviewees, Klarna supports the view of "failing early" within their innovation process. As one of our interviewees further described the intention of Klarna to match the speed of innovation of technology:

"Technology changes quite quickly so you have to be able to adapt quickly. Our organizational structure addresses this. Klarna switched to a new operating model, and what that means is we have changed the structure of the organisation to optimise for speed. Especially the product teams, so the teams that work on the app, to be able to be really fast" - Interviewee 2

When purchasing their chatbot solution, Klarna invested in a Level 2 chatbot solution, which is based on natural language processing. Nonetheless, Klarna decided to currently only use the Level 1 option and hence clickable user interface to provide a quick solution, while it remains an option to scale up in the future as the technology is already available within their package. One of our interviewees explains the reasoning around this decision:

"We still decided to use their product (the NLP service provider's), because their product could be used for the NLP solution when we can prioritize working on it. We do not have to guess with the model. We are in charge of the whole experience from A to Z, so we can design the experience so that we know the problem will be solved. Clickable UI is a more limited experience in a way, but it also presents us with a set of positives, or improvements from the scenario we were at that point and it was a faster time to the market at that time, and we know that we bring value to the customer from day 1 because it will solve their problems" - Interviewee 2

At the same time, Klarna relied on its already existing data from customer support functions to develop a list of FAQs and most pressing issues, which would be implemented first. After successfully purchasing a chatbot solution and initiating the collaboration with their respective vendor, Klarna quickly realized that the clickable user interface chatbot solution would serve their current needs. As “product owners” after acquiring the chatbot solution, Klarna (3) *developed a minimum viable product (MVP) and started an extensive testing procedure*. According to one of our employees, this step proved as crucial within the overall implementation process:

“You need to be able to come up with a prototype. A prototype solution. Imagine it as a very skeleton of the final product, but something which imitates the final product enough to go out and test it. Like design thinking, prototyping, iteration. We try to fail the fastest, like Jeff Bezos from Amazon would put it, from whom we take inspiration” - Interviewee 2

As chatbot solutions are not products, which are available off-the-shelf, Klarna went through an extensive innovation procedure to arrive at their respective solution. Within the last current step, (4) Klarna focuses on maintenance and adding development features. This part focuses on both - the technological perspective by relying on artificial intelligence and machine learning as well as adding specific questions and teaching the bot more insights.

4.1.4 New Self Service Technology Implementation and Customer Intention to Use

When deciding on introducing a clickable UI solution to customers, Klarna specifically kept in mind the simplicity for customers when interacting with the chatbot. As one of our interviewees explained how the chatbot should be as simple as contacting a human customer agent:

“We have a lot of volumes coming in and our philosophy is to have exceptional customer service. To a certain extent then we can do that with people, but we can only have such a big service center and therefore there became a point in this process where we thought - how can we improve and automate this process” - Interviewee 1

Hence, for simplicity reasons and to handle the large amount of inquiries, Klarna decided to use a simpler product. One of the main reasons is that customers cannot be lead in the wrong direction, but that the high volumes of inquiries can be handled and steered in the correct direction. As one of our interviewees explained this executive decision:

“Clickable UI is a more limited experience in a way, but it also presents us with a set of positives, or improvements from the scenario we were at that point and it was a faster time to the market at that time, and we know that we bring value to the customer from day one , because it will solve their problems” - Interviewee 1

To add to simplicity and stringency, the chatbot is placed on the very front page so customers can easily access it. Hence, not only the presentation, but also the tasks the chatbot can take over are clearly defined.

Klarna does not focus on the interaction with the customer, the focus was set on the simple technology at stake and continuously developing the chatbot. One of our interviewees explains that Klarna accepts the fact that there might be people more comfortable with a human agent and some might decide to use the chatbot:

“But we have not received a single feedback complaining about the chatbot. So either people don't know where to complain or it's not such an alien concept to them. Those who don't want to talk to a chatbot don't. We don't want to make it hard to talk with a human, so I guess in a way they embraced it” - Interviewee 1

4.2 SEB

4.2.1 Company Background

Skandinaviska Enskilda Banken AB, or also called SEB, is a Nordic financial services group for a variety of customer groups, including but not limited to, corporate customers, institutions and private customers (SEB Group, 2019). SEB is headquartered in Stockholm, Sweden. SEB was founded in 1856 and hence represents more traditional financial institutions within our case analysis (SEB Group, 2019). The main services provided by SEB focus on banking services and a large amount of life insurance services. The reach of SEB is largely focused on Sweden and the baltic countries. In addition, financial services are offered in countries including Germany and the remaining Nordic countries. Several branches and international offices are located globally, extending SEB's reach. As of 2018, SEB employs approximately 15.000 employees and records 4.7 Billion USD in revenue (SEB Group, 2019).

4.2.2 Chatbot Implementation Process

<u>Implementation Process</u>	<u>SEB</u>
Step 1 Idea Generation	<ul style="list-style-type: none">• Wanted to explore new technology• Curiosity/ worry - what will the future look like?• Want to stay relevant• Already had a collaboration with software provider - could have had an impact on their decision to use just a chat bot
Step 2 MVP and Testing	<ul style="list-style-type: none">• used a pilot internally to a few employees• reason: to not risk anything• created user cases to learn from
Step 3 Iteration and testing again	<ul style="list-style-type: none">• added changes from first pilot• rolled out to all 15,000 employees• Increased focus on programming Swedish
Step 4 Continuation to develop and improve	<ul style="list-style-type: none">• goal setting• balancing interests with other IT-related and prioritized projects• try on customers
Step 5 Learning and Adaptations	<ul style="list-style-type: none">• Carry on learning and balancing interests with other IT-related projects

Figure 13: SEB Chatbot Implementation

4.2.3 Chatbot Implementation - From Idea to Launch

As depicted in *Figure 13*, SEB went through 5 specific steps within their chatbot implementation. (1) SEB initiated the process with an intensive *idea generation phase*. The main goal was to explore new technologies within digital banking. As one of our interviewees explained with regard to the initial process:

“The reason why we did it (engaged in a chatbot solution) was that we had a focus on implementing or exploring new technologies” - Interviewee 1

As a special case, the chatbot solution was initiated and steered by the IT-department at SEB with the intention to explore how traditional banks can achieve long term survival and prosperity. The screening process of potential chatbot solutions was highly efficient by choosing a known and trusted IT-company, with which SEB had been working together successfully before, as one of our interviewees emphasized:

“We started our exploration journey – as we call it, and one of the reasons we chose Amelia (the product from IpSoft, the vendor) is because we have a relationship with them from earlier” - Interviewee 1

Within the second step, (2) SEB focused on a minimum viable product as well as on testing the technology. SEB decided to pilot a basic solution internally first to receive valid feedback to improve the chatbot solution before launching externally. As with many new self service technologies, SEB did not want to risk an external launch before fixing major potential issues through the feedback of employees. This initial pilot was launched in English. With regard to this initial launch, one of our interviewees explained:

“We started 2016 internally, we had a pilot with 600 employees, who were trying it out and that worked very well” - Interviewee 1

As a third step, (3) SEB aimed at increased iteration and repeated testing of the chatbot solution. Applying key learnings from the previous MVP and internal testing phase, SEB was able to rollout the chatbot solution to 15,000 employees while programming the features increasingly in Swedish as one of our interviewees underlined:

“And last year we had around 27,000 chats with Aida internally, to our IT service desk and that’s around 13,000 saved calls that would have come to the service desk, instead came to Aida – that’s around 10% of our total amount of cases that go to our service desk, which is quite a big amount”

Building on the development of their chatbot solution, (4) SEB launched the chatbot to customers within the next step. This required a lot of additional effort to launch the most advanced chatbot solution possible:

“After the internal one (piloting phase), we started to think about trying to do it for customers as well. So the decision was, yes we should, and we should do it in Swedish. And that was a big thing, we didn’t realize it at the time, but that would be the hardest thing - to develop a language” - Interviewee 1

Lastly, (5) SEB is maintaining the chatbot solution while engaging in a learning and adding process. There are still areas for improvement as customers have not fully embraced the chatbot solution yet, as one of our interviewees explained:

“We had around 43,000 conversations with customers last year, quite a low number of conversations compared to the total amount of conversations we have on the phone. It is like 2.5 million conversations, crazy! So it is a very small amount even though it is much bigger than the internal one” - Interviewee 1

4.2.4 New Self Service Technology Implementation and Customer Intention to Use

SEB decided to implement a highly advanced chatbot, focusing on natural language processing. The implementation was driven intensively from the IT-side of the organization. Hence, technologically, the chatbot is well developed, nonetheless, customers trying to use the chatbot, will not find it as easy. SEB’s chatbot “Aida” can do so many things, that a linear process is not as easy for customers. One of our interviewees explained the lacking customer focus, by the increase aim at delivering a perfect technology:

“Since this (the chatbot) was driven from a technical perspective, we maybe did not have that kind of approach on it from the beginning. Of course we did talk to some customers, did some surveys. But most of the type of questions Aida should be able to answer, that is what we have got from our customer support” - Interviewee 1

As a result, the business impact of the chosen chatbot is still highly limited, partly based on the fact that the chatbot is still partially technically developing, but partly because SEB does not clearly communicate the availability of a chatbot, as one of our interviewees mentions:

“It is also about marketing and how you find Aida quite far down on our web page so, its all about how you market this kind of service” - Interviewee 1

And:

“The biggest problem is that you cannot find the chatbot. I am trying to push to get her on the first page” - Interviewee 1

SEB developed their chatbot solution to be as human as possible and to focus on the essential tasks within the banking industry, as one of our interviewees outlined:

“She (Aida - the chatbot) can actually help the user, for example unlock user account, unlock some other account, where she actually performs things for the user. So we are not dependent on any human in that interaction” - Interviewee 1

4.3 Swedbank

4.3.1 Company Background

Swedbank AB is headquartered in Stockholm, Sweden. Swedbank currently offers retail banking, asset management and financial services within Sweden as well as the Baltic countries. Swedbank is a result of a major merging of banks in 1992 but its roots can be traced back to 1820, when “The First Swedish Saving Bank” was founded in 1820 in Gothenburg (Swedbank, 2019). Swedbank recorded a revenue of approximately 5 Billion USD in 2016 and currently employs approximately 16.000 employees (Swedbank, 2019).

4.3.2 Chatbot Implementation Process

<u>Implementation Process</u>	<u>Swedbank</u>
Step 1 Idea generation and Goal Setting	<ul style="list-style-type: none">• vision: development of a chatbot as the first point of contact• wish to simplify to contact process for customers• structural efficiency improvements and costs savings taken into account• focus on choosing the right vendor who can supply the required skills for chatbot development
Step 2 Establishment FAQs & Research	<ul style="list-style-type: none">• start with basic version and a limited amount of FAQs• scaling up questions and complexity through the collaboration with vendor
Step 3 Piloting	<ul style="list-style-type: none">• piloting internally to understand pain points and potential shortcomings• fixing bugs and adding features• launching the final solution for customers
Step 4 Iteration and testing again	<ul style="list-style-type: none">• adaptations and additional topics covered through customer feedback• feasibility studies conducted to understand customer behavior and preferences for further development• boosting monthly conversations from 50.000 to 130.000 within one year
Step 5 Continuation to develop and improve	<ul style="list-style-type: none">• move from webpage to additionally offering chatbot in the app• identifying and taking advantage of trends such as the “mobile first” trends• realization that having the chatbot as first point of contact is, as of today, unfeasible
Step 6 Learning and Adaptation	<ul style="list-style-type: none">• Learn and adapt chatbot solution while adding new important features• Goal of expanding to the baltic countries where live chats with human customer agents is already possible

Figure 14: Swedbank Chatbot Implementation

4.3.3 Chatbot Implementation - From Idea to Launch

The implementation process of Swedbank can be subdivided into 6 phases. Within an initial (1) *idea generation and goal setting phase*, Swedbank developed the vision of using a “chatbot as first point of contact” within customer support. As one of our interviewees underlined:

“The first contact for our customers should be (“Nina”) - the chatbot” - Interviewee 3

The overall intention of Swedbank was aimed at an increased simplicity and comfort for existing customers. In addition, structural advantages of using a chatbot as well as potential cost savings within customer support, steered Swedbank’s interest in a chatbot solution. Swedbank searched extensively for the right vendor supplying the correct solution meeting Swedbank’s requirements and standards. Still, the main interest is aimed at the customer as one of our interviewees explained:

“The aim (of the chatbot) is to replace contacting the bank over the phone, It started and it still about helping the customer to easier contact us” - Interviewee 3

After finding the right vendor, (2) Swedbank continued with the *establishment of appropriate FAQs*. A limited set of questions guided the development of the chatbot solution. Swedbank scaled up in the quantity as well as complexity of the questions while technically developing the chatbot. Within the third major step, Swedbank focused on (3) *piloting* an initial version of the chatbot solution. Swedbank opted for the choice to test the chatbot internally on employees. The aim was to understand potential shortcomings and pain points customers would experience and fix them before launching. After successful testing, the chatbot was launched to customers as one of our interviewees emphasized:

“We launched it and asked people to provide insights on what is good and bad. We had a focus on getting it right. When we thought it was better, after a month or two, we launched it to all customers” - Interviewee 3

After an initial testing round, (4) Swedbank continued with increased *iterations and continued testing* while adding FAQs and hence increasing the capabilities of the chatbot. Swedbank conducted feasibility studies to better understand what options customers would choose when facing the alternatives of traditional customer support versus a chatbot. Swedbank was able to launch the chatbot successfully and increased the number of monthly conversations from 50,000 to 130,000 within one year

As additional step, (5) Swedbank continued to develop and improve the chatbot, which was regarded as a separate step. Time needed to be invested in the maintenance of the chatbot

solution. Eventually, (6) Swedbank still engages in learning and adapting the chatbot constantly - both technically as well as content-wise as one of our interviewees underlined:

“Whenever we introduce a new feature we get feedback from customers. We do it regularly, all the time, that is our approach. We analyze a lot with the answers. We have a center of excellence, constantly updating, making it better” - Interviewee 3

4.3.4 New Self Service Technology Implementation and Customer Intention to Use

When implementing a new self service technology, Swedbank considered upfront how and if customers would embrace their chosen solution. Putting the customer at the center of attention, one of our interviewees described:

“We want to be where the customer is, moving around platforms should be seamless” - Interviewee 3

Hence, Swedbank tried to assure that their solutions match the preferences of their customers. This required a lot of effort since Swedbank chose a highly advanced chatbot solution. Assuring to balance the interests of customers currently with the technological difficulties proved crucial. Swedbank considered the fact that many customers would not embrace the technology, so making the chatbot appear as useful as possible was a key task. As one of our interviewees underlined:

“Because also for us - it is about learning where will this take us and what do customers really like about it. So not pushing customers into this to talk to a robot. But maybe some customers want to call us, they do not want to talk to a robot” - Interviewee 6

In addition, the risks for customers should be minimized by (1) initially teaching customers how to use a chatbot and (2) assuring that no sensitive information is entered into the chatbot. As one of our interviewees mentioned:

“And also (it is important) to be very open and guiding with customers that one should not always put sensitive information (during a conversation with a chatbot)” - Interviewee 3

Enabling customers to take advantage of the chatbot solution, while having other options in place to switch to, lays the foundation of what Swedbank believes will become a central part of their daily business. As one of our interviewees describes with regard to the combination of a chatbot with actual human customer support:

“We are also aiming at a live-chat function, which is when the customer is not getting the right answer from us, we can escalate it to a live-chat. That is a human support, switching from a chatbot to human support” - Interviewee 3

Essentially, Swedbank has the expectation to deliver a chatbot solution, which does not require the additional support of human agents. While this is considered by Swedbank as a “perfect world”, it underlines that the chatbot is not simply a tool, instead Swedbank intends to create the best possible customer experience as one of our interviewees stated:

“One should be able to do digital processes so there is no need to contact the customer support center. For example, if one loses his card, one can go through Nina now and there is no reason to call. Starting with Nina, all processes are intended to be automated. In that way, one will definitely help the customer” - Interviewee 6

4.4 External Consultants

As an addition to our three case companies, we regarded it as highly insightful to gather an external perspective with regard to the implementation of chatbots for customer support. While the focus of our work is on the three cases, external consultants and chatbot vendors can provide an additional perspective.

Throughout our interviews, we were given the opportunity to talk to a variety of external consultants and chatbot vendors. The intention was to (1) increase the generalizability of our study and receive insights into other industries as well, (2) listen to highly experienced professionals within the field who have implemented an increased amount of chatbots in various industries, companies, countries and languages (3) as well as to gain a more critical perspective towards our case companies.. We understand that our case companies aim at a positive depiction of their respective success stories when it comes to implementing their chatbot. This is one of the main reasons for the decision to include external interviews as well.

It is important to state that in no way are our external consultants rating or evaluating the respective case companies.

The external consultants provided additional insights and allow us to critically reflect on the choices made by organizations. In the following, some of the key learnings derived from our specialist interviews are summarized. We mainly used the insights of our external specialist to objectively evaluate important factors within the implementation process of chatbot solutions and to remain objective, while analyzing the insights from our case companies

4.4.1 Learnings

Chatbot Differences & Option Decision Making

With regard to the chatbot overview developed earlier in this research, external consultants underline the fact that there exist a variety of chatbot solutions on the market. Most solutions can be perceived as hybrid chatbots, which are adapted to a large degree to an organization. Organizations need to understand their current needs and take into consideration the long term impacts of their decisions. In addition, chatbots are intended to create value for the customer and hence for an organization. As one of our interviewees explained:

“Do not use a chatbot just because it is a fun and new emerging technology. You really need to find business cases where a chatbot is the best solution. Because in the end, you want people to use them. And if there is another way that is easier to use, then make sure that you use that other way” - Interviewee 18

Being aware of the fact that opting with a chatbot solution is a resource-intensive long term investment, which should be the answer to an actual need, build the foundation of a collaboration between an organization and the chatbot vendor.

With regard to the technology itself, one of our interviewees explained:

“Most chatbots are relatively easy pieces of technology. Nine out of ten (chatbots) work upon simple keyword search, hard coded, scripted instructions that pick up a word or a few words in a sentence” - Interviewee 14

Deciding to opt with a much simpler solution now to save money in the short-run, might have a significant impact in case the organization decides to scale up in the future. As one of our interviewees underlined:

“Again, you want something relatively fast, you want to try it and you want to put it out there fast. And that you can do through keyword search. The problem will be, if you decide to scale up to human like conversations the chatbot is not going to provide that” - Interviewee 14

Hence, organizations need to understand that their choices will have impacts on their possibilities to develop in the future.

In opposite to the more simple version our interviewee mentioned that organizations have the opportunity to invest in much more complicated solutions, which require a longer time frame but can equally yield higher returns and an increased amount of customer satisfaction. Those “solutions”, in the opinion of our interviewee should be distinguished from other chatbots, also in terms of wording. One of our interviewees refer to their solution as “cognitive agent”. The interviewee further explained:

“We (the organization) do not compete with chatbots, we cannot compete with them financially because what we try to do is to really offer an entire technology - and again we prefer the term conversational agent, or if you like digital labour” - Interviewee 14

As the first building block of our interviews with external consultants, we summarize the following. (1) Initially, there are large differences in chatbots. (2) Secondly, organizations need to understand their short- and long-term needs and adapt their purchased solutions accordingly. (3) Moreover, scaling up in the future needs to be enabled for organizations to remain agile in their processes. Hence, investing in a more basic version might turn out costly for organizations in the long run.

Start Internally - Expand Chatbot Externally & Launch a Complete Chatbot

Many of the chatbot specialists interviewed depicted the issues of trust in the chatbot solution. Organizations understand that customers are highly sensitive to customer support tools which lack quality. Hence, it is often realized by external consultants that organizations like to launch an internal version of a chatbot first before launching an updated and improved version externally to customers. This has many advantages. In the first place, an organization can test the technology and focus its IT capabilities on taking advantage of key learnings. Secondly, frequently asked questions can be found out much easier.

It is important to state that the internal version mentioned by our consultants are only regarded as testing phase. While organizations are welcome to keep their internal version, the external chatbots aiming at customers are the focus of this work

At the same time, it is possible for organizations to test a live version on their employees acting as potential customers. Another potential benefit is that the chatbot will, in most cases, be launched in English, since most of the most common corporate language is English. This enables organizations to simplify their testing process. As one of our interviewees explains:

“What we are mostly asked to do is customer support or employee support that is also very big for us. Because (with regard to) employees, the companies are a little bit less scared to test a chatbot. Because they might be a bit more forgiving” - Interviewee 15

After successfully launching an internal chatbot, organizations feel more comfortable in launching a chatbot externally as well.

As third building block of our interviews with external consultants, we summarize the following. (1) Organizations feel much more comfortable implementing an internal testing chatbot before launching an external version. (2) Additionally, the technology as well as the content can and will be adapted through the initial first launch. (3) External consultants emphasize the benefits of this approach as well.

5. Analysis & Discussion

To analyze the findings, we will use our analytical framework including the three mentioned topics. The intention is to interpret the empirical results and distill the most important insights.

After presenting the empirical findings with regard to our chosen case companies as well as to the external perspectives included, this upcoming chapter intends to synthesize the findings. Based on our research question and related to our developed analytical framework, this chapter intends to combine the academic and practical aspects of this work. In addition, generalizations will be drawn from our findings and the behavior of our case companies.

The insights from our external consultants will serve as additional insights, which have made us more critical towards the insights from our case companies. Nonetheless, they are not analyzed in detail, since we are focusing on our three case companies.

To analyse each of the case companies we will use the framework created in *section 2*. This will help serve as an analysis tool of each of the case companies' chatbot implementation processes.

5.1 Chatbot Choices

As described within section 2, featuring the analytical framework, which we will use to analyze and critically reflect on our empirical findings, we will use the chatbot typology developed by Smiers (2017) to build a foundation for the remainder of this analysis. We regard it as crucial to understand how advanced the solutions of the respective case companies are.

Within *Figure 15*, we have placed the respective companies in levels, which we believe reflect their current levels of chatbots. It is important to mention that the levels do not mean that a chatbot is more or less successful, it merely underlines the business decisions the organizations undertook with regard to the technology chosen. As described previously, in reality, the different levels are seldom as black and white as described by Smiers (2017). Features overlap to a great extent. Nonetheless, there are specific differences between the chatbots studied.

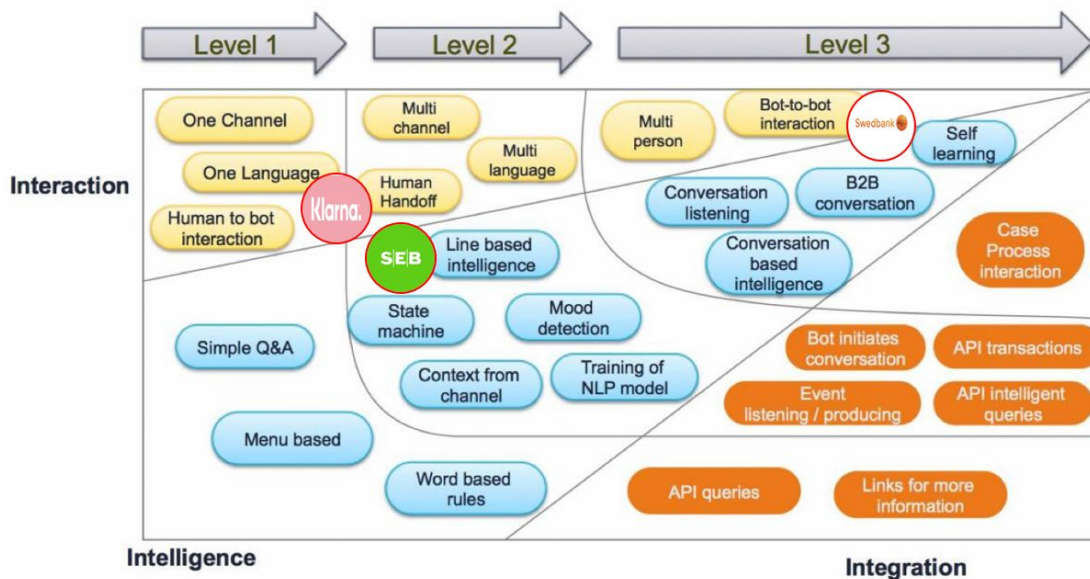


Figure 15: Levels of Chatbots by Smiers (2017) applied to case companies

Based on our interviews and our empirical results, we place (1) Klarna at the very edge of a level 1 chatbot with a slight overlap to a level 2 chatbot. While Klarna purchased an NLP solution, which would enable them to fully take advantage of their level 2 chatbot features, they decided to use a clickable-UI, which includes *word based rules* and *simple questions*, which are continuously expanded. Besides, the chatbot is menu based, which means that the chatbot limits the options to a certain extent. There exists a human to bot interaction. Features, which belong to a level 2 chatbot include the human handoff to a customer support agent as well as multi language options within different countries. Language is not considered

an issue at Klarna due to the simplicity of their constraint solution. Klarna does have the option to scale up their solution with regard to natural language processing.

We conclude:

Simpler versions of chatbot solutions enable organizations to go to the market quicker, giving up the opportunity to scale up in the future

Simpler versions of chatbot solutions can prove to be a cost advantage even though they delimit the chatbot's capabilities and only certain features will be offered to customers

With regard to (2) *SEB*, we locate their respective chatbot solution in the beginning of level 2. As described within the empirical results, SEB set high goals for their chatbot solution by investing in an NLP solution and focusing on establishing Swedish. Training the chatbot is one of the most crucial tasks for SEB and one which requires a lot of time and financial resources. The benefits of this solution might only be realized by customer at a later stage, while the chatbot can cause confusion and frustration at its current level.

We summarize:

Investing in a more advanced and time-consuming chatbot solutions requires the understanding of customers. Certain features appear to be lacking in comparison to other chatbots, nonetheless, the technology and hence the long term benefits behind the solution should not be forgotten

Lastly, (3) *Swedbank*, in our view, can be placed at the very end of a level 3 chatbot. Swedbank takes advantage of the full scale of options when it comes to their chatbot solution. Different languages within the Baltics are currently being implemented, the NLP solution is trained and highly advanced, while the chatbot engages in self- and machine learning.

We summarize:

Understanding if customers will use your solution and placing it within the right tools (such as a website and an app) is the key to successfully using a chatbot within customer support

5.2 Innovation Process - From Idea to Launch

Within this part of the analysis we intend to investigate in how far our case companies followed the theoretical requirements within the innovation process of their respective chatbot implementation. As discussed in the literature review, we will use a *flexible (lean & agile) innovation process model* to analyze the case companies behavior within the process. We will analyze some of the most important aspects of this model by looking into how the organizations behaved.

Those aspects include, as described previously (1) a focus on iterative processes to make intelligent failures, (2) short and small learning cycles, and (3) pivoting and early discovery of mistakes.

5.2.1 Iterative Processes to Make Intelligent Failures

As first case company, (1) Klarna will be analyzed: Initially, the empirical findings support the view that *Klarna* engaged in design thinking and iterative processes. Klarna understands the importance of failing early. Klarna has adopted their organizational structure to match the speed and the flexibility of an iterative process. This factor overlaps to a large extent with the theoretical model developed by Bianchi (2018). From the perspective of the flexible innovation process model, the failure of purchasing a too advanced chatbot solution could have been avoided by closing knowledge gaps earlier in the process. Klarna argues that the more advanced solution might yield benefits in the future, but this remains to be seen.

Secondly, (2) within the implementation phase, SEB engaged in several iterations and testing rounds. Especially the intention to test the chatbot internally first underlines the importance of iteration. Through internal piloting, SEB engaged in intelligent failures, which enabled improvements to the chatbot before eventually launching it externally. Still the iterative process is lacking, since SEB decided to go with a technology partner they were already working together with successfully on other projects. It can be questioned if it can be considered an intelligent failure to invest in an advanced chatbot solution without knowing if it will be embraced by customers. The chatbot solution chosen by SEB is highly advanced and hence needs more time to fully unfold its benefits. More iterative processes might have enabled SEB to take a different road.

Lastly, (3) Swedbank was rated by us as the most advanced chatbot solution within our case companies. We believe that this is also reflected in Swedbank's iterative processes. Initially, Swedbank started the chatbot project with a clear vision of making their chatbot a central and integral part of their business. To achieve this goal, Swedbank researched extensively about potential chatbot vendors, which could live up to their expectations

5.2.2 Short and Small Learning Cycles

As second aspect of a flexible innovation process model, short and small learning cycles are essential to the success of innovation. (1) Klarna developed a minimum viable product to test how customers would perceive a chatbot solution. In addition, screening of potential technology vendors to acquire knowledge about chatbots is a foundation of the short learning cycles at Klarna. This essentially resulted in gathering most important FAQs, after successfully choosing an option they perceived as appropriate. Nonetheless, Klarna decided to scale down from the NLP solution to clickable UI since this offered a better fit to their goals. There also existed a learning process after the implementation phase to add features and constantly develop the chatbot through short learning cycles in a small team. A lot of autonomy was given to the chatbot team, which enables them to make quick and efficient decisions. It appears as the learning cycles might have required too much time and wrong conclusions could have been drawn leading to the purchase of a too advanced chatbot solution.

Within the second case company, (2) SEB developed a minimum viable product early in the development phase to test it on internal employees as well as receive fast feedback. Hence, short and small learnings cycles were initially given within the process. Due to other important IT projects within the organization, SEB needed to balance the financial resources and the internal attention with additional projects. One could argue that this prolonged the learning cycles and hindered SEB from achieving more in less time.

Lastly, (3) for Swedbank, the initial goal setting established the very foundation of small learning cycle. Swedbank developed expectations towards the chatbot solution and continuously adapted throughout the process. Iteration and testing rounds, which were initially launched internally and later externally underline that the technology as well as the business integration were continuously improving.

5.2.3 Pivoting and Early Discovery of Mistakes

As a third aspect, pivoting and an early discovery of mistakes is crucial within the flexible innovation Model. (1) Klarna invested highly in early testing and pivoting of their chatbot solution with the input of appropriate FAQs from the customer service team. Through testing, Klarna experience that the NLP solution might be too advanced for their purposes, so they were able to slim down the version to the chatbot solution they currently use. Even though Klarna states that they might scale up to the full NLP solution in the future, this mistake was only discovered after already purchasing the solution. It can be argued that this mistake was not discovered early enough. Previously gathering FAQs and realizing that a much simpler solution might have been sufficient could have been beneficial. In addition, a minimum viable product or a mock-up chatbot could have been used earlier to fully overlap with the expectations of the flexible innovation process model

With regard to our second case company, (2) SEB initiated the process through an MVP and pivoted internally, which built a solid foundation for future development. Mistakes within the process were identified, especially with regard to the questions, which were the most pressing to include within the chatbot implementation. But, SEB purchased an advanced solution early on which complicated the process, while a simpler solution might have been sufficient

Lastly, (3) Swedbank focused increasingly on piloting and MVP to discover mistakes early within the process. Swedbank poses a special case since, based on the empirical results, continuous learning can be realized along the way of the chatbot implementation process

5.2.4 Discussion

Through the analysis of our empirical results, with regard to the innovation processes at our three case companies, we can summarize that the theoretical model proposed by Bianchi (2018) holds for the innovation implementation procedures of all our three case companies.

At the same time, we have critically reflected on apparent shortcomings for all of our case companies throughout their innovation process.

The main statements we can draw from using this lens are:

1. When considering the three chosen aspects of flexible innovation process models, there can be found many similarities between theory and practice; organizations engage in iterative innovation processes including short and small learning cycles and frequent testing and pivoting periods
2. From the analysis, we can see that organizations which engages in an intensive initial screening round of potential solutions, such as Klarna and Swedbank, have defined the scope of their chatbot solutions more appropriately leading to more success.
3. The three chosen aspects of flexible innovation processes work simultaneously and support each other.
4. Organizations engaging in more frequent and smaller learning cycles will set better boundaries and scopes for their chatbot solution

5.3 New Self Service Technology Implementation

We regarded it as crucial to initially analyze the innovation process of our case companies, since it shaped their respective chatbot solution. Within the last part of the analysis, we want to focus more on the new self service technology implementation aspects. As outlined in section 2, the model by Curran and Meuter (2005) underlines which factors need to be considered by organizations in order to previously understand if customers will embrace their respective SST.

It is important to state that we are not evaluating how customers actually perceive the solution - since this did not fit into the scope of this thesis. Instead, we are evaluating what the organizations stated within the empirical results section, hence how much thought and preparation they put into the different aspects outlined by Curran and Meuter (2005).

5.3.1 Ease of use

Based on the empirical results, we can draw the conclusion that the ease of use was at the very heart of the decision making process for (1) Klarna. Ease of use can be considered as one of the main reasons for an extensive pivoting phase as well as an early learning cycle. By choosing a clickable UI chatbot solution eventually, the user cannot be misled, as the user clicks on the options that are available and move forward within the process. As additional factor that the ease of use can be seen as a central aspect for Klarna, is that they placed their chatbot on their front page of their app - easy to find and easy to use.

Within the implementation process of (2) SEB's chatbot solution, the ease of use for potential users was not a central topic. The interaction between the customer and their chatbot "Aida" was structured and well thought through, however, with the complexity of the chatbot chosen and the advanced capabilities of Aida, the ease of use for the customer clearly suffered. There is an immense variety of options and questions that Aida can solve, but it is not always assured that the interaction will lead the user to the right help. As a result, the ease of use is much harder to users. Through the empirical findings, we can see that while internally Aida was a large success, the external user numbers are lacking extremely behind that. Through the lens of Curran and Meurer (2005), one can infer that the ease of use was not considered enough.

Lastly, (3) Swedbank focused increasingly throughout their implementation process on the ease of use of customers. Their chatbot "Nina" was intended to improve customer service and to be easily understandable. Focusing on the mobile first trend, the app is specifically supposed to be easy to use. This was a central topic for Swedbank to make the chatbot available on website and as app as well as easy to find. Even though Swedbank works with the most advanced chatbot of our case companies, the ease to use has not suffered, which the results and the number of users underline. An additional topic was "teaching" the customer

how to use the chatbot successfully - without adding sensitive information or asking about information, which the chatbot cannot provide

5.3.2 Usefulness

As first case company, (1) *Klarna* clearly defined usefulness from the first pivot to clickable UI. The scope of the chatbot, or in other words, what the chatbot should and should not do is clearly defined by Klarna. In this case, there is a clear connection between ease of use and usefulness. Establishing the scope of the chatbot solution enabled a simpler process of finding usefulness for potential users. At the same time, the choice to opt with a more constraint chatbot solution, may also limit the usefulness to a large degree since there are distinct limits to what the chatbot can do. Hence, Klarna considered and created usefulness, but with imminent long term constraints.

In opposite, (2) *SEB* did not, with regard to our empirical results, define what level of usefulness they intend to create. Being largely initiated by the IT-side of the organizations, consideration the usefulness was rated second next to developing the technology itself. SEB's chatbot solution "Aida" is intended to be a central part of their business operation and according to their advanced chatbot choices, "the sky is the limit" in terms of usefulness. Nonetheless, currently usefulness is lacking behind the technological development.

Lastly, (3) Swedbank specifically designed their chatbot with limits, which should not be addressed by "Nina". Swedbank specifically chose a chatbot vendor which could serve their needs and create usefulness for users. Iteration and testing periods on customers to check usefulness and added value assured increased usefulness and living up to the expectations of customers. Swedbank intended to create usefulness for users by gradually offering the chatbot solution to customers, while equally providing back up options through actual human support agents.

5.3.3 Need for interaction

With regard to the need for interaction, (1) Klarna did not invest a great amount of resources. Human contact is available only after failed communication with the chatbot. This could perhaps be a point of improvement on the organisations' side. However, they do not believe that this has been a weak point in their implementation.

Similarly, (2) *SEB* have not had a great deal of investment, into the consumers need for interaction. Could this be because the chatbot is meant to simulate the conversation with a real human, and hence, this factor is a non-factor in implementing chatbots for self service.

Lastly, (3) Swedbank are also similar in this factor. A further discussion of the parallels and key learnings will follow below. Nonetheless, Swedbank has the intention to provide the live human agent support, which is currently in the executing stage.

5.3.4 Risk

Within the case of (1) *Klarna*, the organizations has minimized risk through ease of use in this case. It is a simpler chatbot solution and hence less risk in the introduction of this service. This is one reason why they decided to go this route and it involved a high level of thought.

According to the empirical results, (2) *SEB* has a high level risk, given the complexity of the chatbot. It can do more, but also this is a trade off for a higher usefulness of the product.

Lastly, (3) *Swedbank*, even though the chatbot solution is highly advanced, has set clear boundaries to minimize risk. Avoiding sensitive information to be typed into the chatbot is one of the efforts to minimize the risk.

5.3.5 Discussion

The main statements we can draw from using this lens are:

1. When considering the four factors that should guide the implementation of SSTs; there are many similarities between chatbots and other self service technologies. According to the analysis, Ease of use, Usefulness and Risk, still affect the process and the success of the chatbot, very much.
2. Need for human interaction might be able to neglected in this process; as the chatbot is meant to simulate a real person, the user may still feel like they are getting the same interaction, as they were if the bot had been a person and not AI technology. In all 3 cases, this was the factor that they chose to put the least effort in
3. There is a big tradeoff between the remaining 3 factors when implementing a chatbot. A higher level of usefulness, may lead to higher risk and lowered easy of use, like in the case of *SEB* . Whereas, a higher ease of use leads to a lowered usefulness, like in the case of *Klarna*.
4. If companies opt for the easier to use, lower risk bot, it may be advisable to scope your chatbot and make it as good as it can be within that scope. We believe this to be a big factor in why *Klarna* succeeded in finding a perfect chatbot solution for their current needs

6. Conclusion & Outlook

6.1 Conclusion

The recent developments within Artificial Intelligence (AI) and machine learning (ML) have introduced many new technologies. One specific kind of new technology is new self service technology. One of the most striking developments can be perceived as the introduction of chatbots within customer support. Our thesis intended to increase the research surrounding the implementation processes of chatbots within the banking and financial services industry, as one of the frontrunner industries with regard to the intensified diffusion and application of chatbots within Customer-Relationship-Management (CRM).

We framed our purpose as the following:

“The purpose of this thesis is to increase the understanding of how organisations successfully implement chatbots as a self service technology for their customers”

We intended to succeed in this endeavor by answering the research question:

“How do organizations implement chatbots as a version of new self service technology, aimed at their customers?”

Within our literature review, we focused on the main aspects of a successful chatbot implementation process. (1) Initially, we outlined and argued for *Innovation Management* as an appropriate research stream to study the iterative innovation processes we witnesses during a chatbot implementation. Chatbots are developed and are not, in the advanced form studied in this work, available off-the-shelf (2) We added the research stream of *New Self Service Technology Implementation as a sub-stream of New Technology Implementation*. We argue that chatbots, based on artificial intelligence and machine learning, are a new phenomenon for organizations to implement. This is underlined by the fact that none of our case companies started their chatbot journey before 2014-2015. In addition, (3) we outlined the technological features and specifics of *Chatbot Solutions* within our literature review.

Within our analysis, we critically assess the empirical results generated by our interviews through the lens of (1) initially describing which chatbot solutions have been chosen by organizations, (2) assessing the chatbot implementation processes through an innovation management lens, (3) as well as critically assessing how the case companies prepared their solutions to be embraced by customers through the lens of a new self service technology implementation model.

We have observed that (1) the initial choices of a respective chatbot solution determine a time frame for measurable success, but also determine long term development of the chatbot solution. Organizations opting with a simpler solution forego the potential to scale up their solution in the long run, while they are able to provide measurable results within a short time frame. (2) We have observed how all organizations go through an iterative and agile innovation process to adapt their respective chatbot solution. Since chatbots are not an off-the-shelf final product, organizations find their own ways to a fitting solution. This process cannot only be seen as positive, since many mistakes can be made. (3) Lastly, we have observed that it is of crucial importance to include customer insights and put in the work upfront in order to understand what customers actually want. We see a clear correlation between organizations including the main factors of our new self service technology model and long term success.

We answer our research question aiming at increasing the knowledge about how organizations implement chatbots as a version of new self service technology, aimed at their customers :

1. Organizations follow an iterative and flexible innovation process during their chatbot implementation

Through the study of the different case companies and their respective implementation process, we saw that while the “ways to success” differ, an iterative and agile innovation process is the very foundation to implement chatbots as an example of new self service technology. All organisations underwent a period of testing, and all found this useful, giving them information on how to successfully change their SST. Here, the organisations have followed a traditional agile innovation process, and it has served to gain in all 3 cases. *Hence we can conclude that when implementing a chatbot solution, it can be recommended to carry out learning cycles and iterations.* For example, Klarna realized that a simpler chatbot is more suited to their organizational needs as well as customer expectations and pivoted. This lead them to a quicker launch, with more specific scope. Carrying out this process prior to launch can help solve strategy questions such as (1) which type of bot to launch (2) how to increase the likelihood of customers using the service (3) defining the scope of the chatbot

2. Organizations consider the existing trade-off between increasing the chatbot’s ease to use and the usefulness of the bot

In all 3 cases there a trade off between increasing the chatbot’s ease to use for customers and how useful the chatbot is, for instance how many problems it can solve. This is a crucial tradeoff that applies to most new technology implementation, specifically new self service technologies. However, as SEB state, the aim is to keep working on their chatbot so that it will work proactively with issues and hence very easy for customers to use. Although SEB, or any of the other organisations are not yet there. Hence, we can conclude that thought

should be put into the trade-offs between the ease of use of the bot for customers and the usefulness of the SST.

3. *Organizations consider the existing trade-off between the usefulness of the chatbot and risk that customers will not embrace the chatbot*

This is also a factor which is similar for other new SST implementations. The more functions the chatbot has, the more complicated it gets and therefore an increased risk that the customer will not use. However, neither SEB or Swedbank have stated that they have had any major push backs from their customers at this time. *Hence, we conclude that the trade off between risk and usefulness of the chatbot are important to consider, however, it seems at this stage in the technology, the risks are not too high.*

4. *The factor of human interaction seems to be obsolete in the implementation of chatbots as a new self service technology*

Returning to the definition of interaction within SSTs at the beginning of this thesis, we saw that by definition an SST removes the human interaction, and this can be an issue for many customers. From these 3 cases, we can see that this seems to be a non-issue within chatbots. We concluded that *this is the main difference between chatbots as an SST and other SSTs; chatbots are designed to simulate a conversation with a real human being and hence even if it encourages self service, it also maintains this human interaction in a way. This is, to our current knowledge, unique to this situation.*

6.2 Limitations

Within the framework of this thesis, several limitations need to be acknowledged and emphasized. Initially, the very nature of a qualitative study offers space for potential limitations.

(1) The development of the sample interviewees for the underlying study needs to be approached carefully. While the previously described Snowballing Method was used to gather enough interviewees and gain sufficient access into organizations, this approach has its limitations. From the initial analysis of potential interview partners for this work, some Swedish companies emerged as market leaders with regard to chatbots. Those organizations were approached directly. One apparent limitation from this choice is the fact that the *generalizability* of the study can be detected as inherent limitation. The limitations were intended to be mitigated to a minimum by also including interviews with external industry specialists and management consultants. This approach intends to enable an increased amount of generalizability and supports the findings of this work with external information from experts who have implemented chatbots in a wide array of industries.

As additional limitation, (2) it needs to be outlined that the use of chatbots for new self service technology can be questioned. The case of chatbots was meant to exemplify one of the key technological developments integrated by plenty organizations which can be grasped rather easily by a general audience. While it becomes clear that a potential generalization from the example of chatbots to other forms of self service technology can be difficult, we nonetheless believe that this work can build the foundation for this endeavour with an example case which is easy enough to be grasped by the general reader.

Moreover, (3) we do realize that more diversified data would have enhanced the quality of the study. The research question aimed to include the opinions and preferences of customers. Due to the lack of time and resources, it was decided to focus the interviews on the case companies as well as industry specialists, leaving first hand customer data out and relying on the information provided by the organizations. We reason throughout the paper that we focus on the organization itself and their decisions. Nonetheless, a study with more time and resources, might find it useful to add customer data.

Lastly, (4) after conducting our study, we believe that our findings develop the need for increased research in the area of new self service technology. One of our limitations is hence the fact that we would, in future studies, include quantitative aspects of the chatbot implementation process as well. This would enable better to measure success. Both with regard to customer data and their preferences as well as with regard to the results organizations produce.

6.3 Managerial Implications

Despite the limitations realized within the framework of this study, several managerial implications can be realized. In line with our conclusion and hence our findings, we summarize the following managerial implications.

Initially, (1) we clearly map the implementation processes of leading organizations. This can support other organizations in their process and can provide them with guidance and insights. In addition, it shows the requirement of agile innovation skills within the process. Hence, organizations can prepare for a comparable journey by updating their organizational structure.

In addition, (2) we underline the importance of understanding the customer first in order to produce a high adoption rate of the implemented chatbot. We have clearly seen that organizations, which include extensive pre-studies and aim at producing useful chatbots, will have the most success. Understanding the self service technology at stake might explain why certain factors, such as “human interaction” do not play a major role in the considerations of organizations

6.4 Theoretical Contributions

In addition to the managerial implications realized through this study, we believe that we can also provide theoretical contributions as the result of this thesis.

Initially, (1) we believe that the chatbot typologies developed within the process of this thesis, is able to explain many of the technological difficulties involved when choosing an appropriate chatbot. We consider the field of “chatbots” from an organizational perspective as a relatively new research area and hence provide theoretical contributions within this area.

As a second contribution, we believe that the combination of a more traditional research stream, such as *Innovation Management* with a more niche stream of *New Self Service Technology Implementation* shows that “old and new” knowledge can successfully be combined and can produce valid knowledge.

6.5 Future Research

Considering the limitations of this study, several aspects can be perceived as highly interesting for future research.

(1) Initially, to increase the generalizability of the underlying study it appears as inherently interesting to undertake similar studies within other industries and especially also other countries with a potentially different degree of digitization. Sweden as a country can be perceived as leading within technology. At the same time, the main focus of the study aimed at the banking and financial services industry. Organizations, such as SEB, Klarna and Swedbank have been outlined as leading with regard to digitalization and especially chatbots (The Independent, 2019). Hence, finding support for our findings by extending the view to other organizations and deep dives into several other industries, might be crucial to generalize the outcomes.

(2) In addition, as shortly indicated, we believe that a study combining qualitative and quantitative aspects of successful chatbots might be possible in the future. Due to the short time frame during which the chatbots have been used at the case companies - since 2015 - we believed that for this study the organizational perspective would create crucial learnings. We believe that once the chatbot solutions are established successfully, key learnings can be generated by relating our study to potential quantitative studies aiming at measurable success of chatbots after the implementation

(3) We believe that once this technology becomes an established and well-known application within organizations, future studies could focus on other New Self Service Technologies and could relate their learnings to the chatbot implementation process. It could be investigated in how far the processes are very similar for various technologies. Since we outlined the importance of agile innovation processes, this might be a solid foundation for future research

Bibliography

- Accenture, 2016. Chatbots in Customer Service. Available at:
https://www.accenture.com/t00010101T000000__w__/_br-pt/_acnmedia/PDF-45/Accenture-Chatbots-Customer-Service.pdf [Accessed 4 Feb. 2019].
- Acimovic-Raspopovic, V., Kostic-Ljubisavljevic, A. and Radojicic, V., 2003. "Dynamic routing design under forecast uncertainty", Proceedings of TELSIKS '03: the 6th International Conference on Telecommunications in Modern Satellite, Cable and Broadcasting Service, Vol. 1, pp. 30-3.
- Allen, T. J., 1977. Managing the Flow of Technology, MIT Press, Cambridge, MA.
- Anderson, E., 1998. Customer Satisfaction and Word of Mouth. *Journal of Service Research*, 1(1), pp.5-17.
- Anon, 2019. [online] Available at:
https://www.researchgate.net/figure/Design-Thinking-Double-diamond-scheme-applied-in-ARP-courses_fig1_319342653 [Accessed 7 May 2019].
- Appelbaum, S., Habashy, S., Malo, J. and Shafiq, H., 2012. Back to the future: revisiting Kotter's 1996 change model. *Journal of Management Development*, 31(8), pp.764-782.
- Aspers, P., 2009. Empirical Phenomenology: A Qualitative Research Approach (The Cologne Seminars). *Indo-Pacific Journal of Phenomenology*, 9(2), pp.1-12.
- Bamford, D. and Forrester, P., 2003. Managing planned and emergent change within an operations management environment. *International Journal of Operations & Production Management*, 23(5), pp.546-564.
- Beckman, S. and Barry, M., 2007. Innovation as a Learning Process: Embedding Design Thinking. *California Management Review*, 50(1), pp.25-56.
- Beckman, C.M., Haunschild, P.R. & Phillips, D.J., 2004. Friends or strangers? Firm-specific uncertainty, market uncertainty, and network partner selection', *Organization Science*, 15, 259–275.
- Bell, E. and Thorpe, R., 2013. A very short, fairly interesting and reasonably cheap book about management research.

- Bernard, R., 2000. *Social Research Methods: Qualitative and Quantitative Approaches*. Thousand Oaks, CA: Sage publications.
- Bessant, J., 2008. Dealing with discontinuous innovation: the European experience, *International Journal of Technology Management*, 42(1/2) 36–50.
- BI Intelligence., 2016. 80% of businesses want chatbots by 2020. Available at: <https://www.businessinsider.com/80-of-businesses-want-chatbots-by-2020-2016-12?r=US&IR=T&IR=T>. [Accessed 3 Feb. 2019].
- Bianchi, M., 2018. Innovation and Business renewal - introduction.
- Biernacki, P. and Waldorf, D., 1981. Snowball Sampling: Problems and Techniques of Chain Referral Sampling. *Sociological Methods & Research*, 10(2), pp.141-163.
- Bouwman, H. and Van der Duin, P., 2003. “Technological forecasting and scenario matter: research into the use of information and communication technology in the home environment in 2010”, *foresight*, Vol. 5 No. 4, pp. 8-19.
- Brandtzaeg, P. & Følstad, A., 2017. Why people use chatbots. Thessaloniki, International Conference on Internet Science.
- Bryman, A., & Bell, E., 2015. *Business Research Methods*. Oxford: Oxford University Press.
- Bull, C. and Adam, A., 2011. “Virtue ethics and customer relationship management: towards a more holistic approach for the development of ‘best practice’”, *Business Ethics: A European Review*, Vol. 20 No. 2, pp. 121-30.
- Cao, Y. and Gruca, T.S., 2005. “Reducing adverse selection through customer relationship management”, *Journal of Marketing*, Vol. 69, October, pp. 219-29
- Carter , W., 2018. How to get culture right when embedding it into AI. *Physics.org, MIT*.
- Chatbot Guide., 2019. Chatbots 101 — ChatbotGuide.org. [online] Available at: <https://www.chatbotguide.org/chatbots-101> [Accessed 5 Feb. 2019].
- Chinnakotla, M., 2018. Lessons from building a large-scale commercial IR-based chatbot for an emerging market.
- Christensen, Clayton M, 1997. *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*. Boston, MA: Harvard Business School Press

- Collier, D. and Mahoney, J., 1996. Insights and Pitfalls: Selection Bias in Qualitative Research. *World Politics*, 49(01), pp.56-91.
- Coniam, D., 2014. The Linguistic Accuracy of Chatbots: Usability From an ESL Perspective. *Text Talk* 34(5), 545–567.
- Cooper, H. M., 1984. *The integrative research review: a systematic approach*, Sage Publications, Beverley Hills, CA.
- Curran, J. and Meuter, M., 2005. Self-service technology adoption: comparing three technologies. *Journal of Services Marketing*, 19(2), pp.103-113.
- Damanpour, F., 1996. Organizational complexity and innovation: Developing and testing multiple contingency models, *Management Science*, 42(5), 693–717.
- Deloitte., 2019. [online] Available at: <https://www2.deloitte.com/content/dam/Deloitte/nl/Documents/deloitte-analytics/deloitte-nl-chatbots-moving-beyond-the-hype.pdf> [Accessed 5 Mar. 2019].
- Dorst, K., 2011. The core of ‘design thinking’ and its application. *Design Studies*, 32(6), pp.521-532.
- Euromonitor, 2018. *Trend Report*
- Fijnvandraat, M. and Bouwman, H., 2010. Predicting the unpredictable: dealing with risk and uncertainty in broadband roll-out. *Foresight*, 12(6), pp.3-19.
- Flach, P. and Kakas, A., 2000. *Abduction and Induction*. Dordrecht: Springer Netherlands.
- Fornell, C., 1992. A National Customer Satisfaction Barometer: The Swedish Experience. *Journal of Marketing*, 56(1), 6-21.
- Freeman, C. & Soete, L., 1997. *The Economics of Industrial Innovation*, Pinter, London.
- Galbraith, J., 1977. *Organization Design*, Addison Wesley, Reading, MA.
- Frow, P.E. and Payne, A.F., 2009. “Customer relationship management: a strategic perspective”, *Journal of Business Market Management*, Vol. 3 No. 1, pp. 7-27.
- Gales, L. & Mansour-Cole, D., 1995. User involvement in innovation projects: Toward an information processing model, *Journal of Engineering Technology Management*, 12, 77–109.

- Garcia, R. and Calantone, R., 2002. A critical look at technological innovation typology and innovativeness terminology: a literature review. *Journal of Product Innovation Management*, 19(2), pp.110-132.
- Godin, B., 2006. The Linear Model of Innovation. *Science, Technology, & Human Values*, 31(6), pp.639-667.
- Goodman, L., 2011. Comment: On Respondent-Driven Sampling and Snowball Sampling in Hard-to-Reach Populations and Snowball Sampling Not in Hard-to-Reach Populations. *Sociological Methodology*, 41(1), pp.347-353.
- Greenberg, P., 2009. CRM at the Speed of Light, Fourth Edition: Social CRM 2.0 Strategies, Tools, and Techniques for Engaging Your Customers, McGraw-Hill Osborne Media, Emeryville, CA.
- Grönroos, C., 1996. "Relationship marketing logic", *Asia-Australia Marketing Journal*, Vol. 4 No. 1, pp. 7-18.
- Gummesson, E., 1987. The new marketing—Developing long-term interactive relationships. *Long Range Planning*, 20(4), pp.10-20.
- Gummesson, E., 1999. *Total Relationship Marketing*, Butterworth-Heinemann, Oxford.
- Hall, J., Matos, S., Silvestre, B. & Martin, M., 2011. Managing technological and social uncertainties of innovation: The evolution of Brazilian energy and agriculture, *Technological Forecasting & Social Change*, (article in press).
- Harrington, R., 2006. The moderating effects of size, manager tactics and involvement on strategy implementation in foodservice. *International Journal of Hospitality Management*, 25(3), pp.373-397.
- Henderson, R. and Clark, K., 1990. Architectural Innovation: The Reconfiguration of Existing Product Technologies and the Failure of Established Firms. *Administrative Science Quarterly*, 35(1), p.9.
- Hill, J., Randolph Ford, W. & Farreras, I., 2015. Real conversations with artificial intelligence: A comparison between human–human online conversations and human chatbot conversations. *Computers in human behavior*, Volume 49, p. 245–250.
- Hofstede, G., 1980. *Culture's consequences: International differences in work related values*, Sage Publications, Beverly Hills, CA.

- Hofstede, G., 2001. *Culture's Consequences: Comparing Values, Behaviors, Institutions and Organizations Across Nations*, Sage Publications, Thousand Oaks, CA.
- Hurst, P., 1982. Ideas into action development and the acceptance of innovations, *International Journal of Educational Development*, 1(3), 79–100.
- Jalonen, H., 2011. The uncertainty of innovation: a systematic review of the literature. *Journal of Management Research*, 4(1).
- Johannessen, J-A., Olaisen, J. & Olsen, B., 1999. Managing and organizing innovation in the knowledge economy, *European Journal of Innovation Management*, 2(3), 116–128.
- Johansson-Sköldberg, U., Woodilla, J. and Çetinkaya, M., 2013. Design Thinking: Past, Present and Possible Futures. *Creativity and Innovation Management*, 22(2), pp.121-146.
- Kaya, E., 2016. What are the most often asked questions to virtual agents (chat bots)? [Blog] Quora.
- Khan, R. & Das, A., 2018. *Build Better Chatbots: A Complete Guide to Getting Started with Chatbots*. 1st ed. Bangalore: Apress.
- Kline, S., 1985. Innovation Is Not a Linear Process. *Research Management*, 28(4), pp.36-45.
- Koehler, J., Fux, E., Herzog, F.A., Lötscher, D., Waelti, K., Imoberdorf, R. & Budke, D., 2018. Towards intelligent process support for customer service desks: Extracting problem descriptions from noisy and multilingual texts.
- Kuligowska, K., 2015. Commercial Chatbot: Performance Evaluation, Usability Metrics and Quality Standards of Embodied Conversational Agents. *Professionals Center for Business Research*, 2(02), pp.1-16.
- Klarna., 2019. About us - Klarna UK. [online] Available at: <https://www.klarna.com/uk/about-us/> [Accessed 18 Mar. 2019].
- Langeard, E., Bateson, J., Lovelock, C. and Eigler, P., 1981. *Marketing of Services: New Insights from Consumers and Managers*, Report No. 81-104, Marketing Science Institute, Cambridge, MA.
- Leonard-Barton, D., 1993. Core capabilities and core rigidities: A paradox in managing new product development. *Long Range Planning*, 26(1), p.154

- Levitt, B. and March, J., 1988. Organizational Learning. *Annual Review of Sociology*, 14(1), pp.319-338.
- Lewis, M., 2005. "Incorporating strategic consumer behavior into customer valuation", *Journal of Marketing*, Vol. 69, October, pp. 230-8.
- March, J. & Simon, H., 1958. *Organizations*, Wiley, New York, NY.
- March, J. and Simon, H, 1993. *Organizations*. Cambridge, Mass: Blackwell.
- Markham, S. and Lee, H., 2013. Product Development and Management Association's 2012 Comparative Performance Assessment Study. *Journal of Product Innovation Management*, 30(3), pp.408-429.
- Martin., R., 2009. *The design of business: Why Design Thinking is the Next Competitive Advantage*. Unspecified.
- Menon, K. and O'Connor, A., 2007. Building customers' affective commitment towards retail banks: The role of CRM in each 'moment of truth'. *Journal of Financial Services Marketing*, 12(2), pp.157-168.
- Meijer, I.S.M., Hekkert, M.P., Faber, J. and Smits, R.E.H.M., 2006. "Perceived uncertainties regarding socio-technological transformations: towards a framework", *International Journal of Foresight and Innovation Policy*, Vol. 2 No. 2, pp. 214-40.
- Meuter, M.L. and Bitner, M.J, 1998. "Self-service technologies: extending service frameworks and identifying issues for research", in Grewal, D. and Pechman, C. (Eds), *Marketing Theory and Applications*, Vol. 9, American Marketing Association, Chicago, IL, pp. 12-19. Meuter, M.L., Ostrom, A. Meuter, M.L., Ostrom, A.L., Roundtree, R.I. and Bitner, M.J. (2000), "Self-service technologies: understanding customer satisfaction with technology-based service encounters", *Journal of Marketing*, Vol. 64 No. 3, pp. 50-64
- Mick, D.G. and Fournier, S., 1998. "Paradoxes of technology: consumer cognizance, emotions, and coping strategies", *Journal of Consumer Research*, Vol. 25, September, pp. 123-43.
- Mullins, J., 2007. Discovering "Unk-Unks". Available at: <https://sloanreview.mit.edu/article/discovering-unkunks/> [Accessed 1 Feb. 2019].
- Nagji, M. and Tuff, G., 2012. *A Simple Tool You Need to Manage Innovation*. Harvard Business Review.

- Nguyen, B. and Mutum, D., 2012. A review of customer relationship management: successes, advances, pitfalls and futures. *Business Process Management Journal*, 18(3), pp.400-419.
- Parasuraman, A., 2000. "Technology readiness index (TRI): a multiple-item scale to measure readiness to embrace new technologies", *Journal of Service Research*, Vol. 2, May, pp. 307-20.
- Payne, A. and Frow, P., 2006. "Customer relationship management: from strategy to implementation", *Journal of Marketing Management*, Vol. 22 Nos 1/2, pp. 135-68
- Piyatrapoomi, N., Kumar, A. and Setunge, S., 2004. "Framework for investment decision-making under risk and uncertainty for infrastructure asset management", *Research in Transportation Economics*, Vol. 8, pp. 199-214.
- Plattner, H., Meinel, C. and Leifer, L., 2010. *Design Thinking: Understand – Improve – Apply Understanding Innovation*. Springer Science & Business Media.
- Rabionet, S., 2011. How I Learned to Design and Conduct Semi-structured Interviews: An Ongoing and Continuous Journey. *The Qualitative Report*, 16(2), 563-566.
- Rogers, E., 2003. *Diffusion of innovations*. New York: Free Press.
- Rose-Anderssen, C., Allena, P. M., Tsinopoulos, C. & McCarthy, I., 2005. Innovation in manufacturing as an evolutionary complex system, *Technovation*, 25, 1093–1105.
- Rubin, A., 2009. Uses and Gratifications. In: Nabi, R.L., Oliver, M.B. (eds.) *The SAGE Handbook of Media Processes and Effects*, pp. 147–159. Sage, Washington, D.C.
- Saren, M., 1984. A classification and review of models of the intra-firm innovation process. *R&D Management*, 14(1), pp.11-24.
- Sarkar, C., 2019. "What's Your Chatbot Strategy?" – Christian Sarkar. [online] [Marketingjournal.org](http://www.marketingjournal.org). Available at: <http://www.marketingjournal.org/whats-your-chatbot-strategy-christian-sarkar/> [Accessed 6 Feb. 2019].
- SEB Group., 2019. Who we are | SEB. [online] Available at: <https://sebgroupp.com/about-seb/who-we-are> [Accessed 23 Apr. 2019].

- Schensul, S., Schensul, J. and LeCompte, M., 1999. *Essential ethnographic methods*. Walnut Creek: Altamira Press.
- Scholl, W., 2013. The socio-emotional basis of human interaction and communication: How we construct our social world. *Social Science Information*, 52(1), pp.3-33.
- Smiers, L., 2017. How can chatbots meet expectations? introducing the bot maturity model. Available at: <https://www.capgemini.com/2017/04/how-can-chatbots-meet-expectations-introducing-the-bot-maturity/> [Accessed 5 Mar. 2019].
- Smith, A.K., Bolton, R.N. and Wagner, J., 1999. "A model of customer satisfaction with service encounters involving failure and recovery", *Journal of Marketing Research*, Vol. XXXVI, August, pp. 356-72
- Siddique, I., & Shadbolt, N., 2016. *Strategy Implementation Literature Review*. by Agrione. Center of Excellence in Farm Business Management, Report, March.
- Simonite, T., 2017. Facebook's Perfect, Impossible Chatbot. *MIT Technology Review*.
- Souder, W. E. & Moenaert, K. D., 1992. Integrating marketing and R&D project personnel within innovation projects: an information uncertainty model, *Journal of Management Studies*, 29(4), 485–512.
- Subramaniam, S., Dasgupta, G.B., Aggarwal, P. & Paradkar, A., 2018. "COBOTS - A cognitive multi-bot conversational framework for technical support: Industrial applications track", *Proceedings of the International Joint Conference on Autonomous Agents and Multiagent Systems, AAMAS*, pp. 597.
- Stafford, T., Stafford, M., Schkade, L., 2004. Determining Uses and Gratifications for the Internet. *Decision Sci.* 35(2), 259–288.
- Swedbank.com., 2019. About us | Swedbank. [online] Available at: <https://www.swedbank.com/about-swedbank.html> [Accessed 23 Apr. 2019].
- Tatikonda, M. V. & Rosenthal, S. R., 2000. Technology novelty, project complexity, and product development project execution success: A deeper look at task uncertainty in product innovation, *IEEE Transactions on Engineering Management*, 47(1), 74–87.
- Torre, A., 2018, "A more human side of a chatbot. Analysing anthropomorphism in conversations with a virtual agent depending on the level of elicited agent knowledge", *CEUR Workshop Proceedings*.

- The Independent., 2019. Swedish banks embrace artificial intelligence as a cure to closures. [online] Available at: <https://www.independent.co.uk/news/business/news/sweden-banks-robots-ai-artificial-intelligence-closures-financial-industry-online-digital-banking-a7868471.html> [Accessed 5 Feb. 2019].
- Tushman, M. and Anderson, P., 1986. Technological Discontinuities and Organizational Environments. *Administrative Science Quarterly*, 31(3), p.439
- Qu, S. and Dumay, J., 2011. The qualitative research interview. *Qualitative Research in Accounting & Management*, 8(3), pp.238-264.
- Quinton, S. and Harridge-March, S., 2010. "Relationships in online communities: the potential for marketers", *The Journal of Research in Interactive Marketing*, Vol. 4 No. 1, pp. 56-73.
- Verweire K., 2014. *Strategy Implementation*. First edition, by Routledge, London and New York.
- Walker, W.E., Harremoes, P., Rotmans, J., van der Sluijs, J.P., van Asselt, M.B.A., Janssen, P. and Kraymer von Krauss, M.P., 2003. "Defining uncertainty: a conceptual basis for uncertainty management in model-based decision support", *Integrated Assessment*, Vol. 4 No. 1, pp. 5-17.
- Wernerfelt, B. and Karnani, A., 1987. "Competitive strategy under uncertainty", *Strategic Management Journal*, Vol. 8 No. 2, pp. 161-77.
- Wheelen, T., Hunger, J., Hoffman, A. and Bamford, C., 2012. *Concepts in strategic management and business policy*.
- Wilson, K. and Doz, Y., 2011. Agile Innovation: A Footprint Balancing Distance and Immersion. *California Management Review*, 53(2), pp.6-26.
- Wolfe, R., 1994. Organizational Innovation: Review, Critique and Suggested Research Directions.. *Journal of Management Studies*, 31(3), pp. 405-431.
- Wunderlich, N. & Paluch, S., 2018. "A Nice and Friendly Chat with a Bot: User Perceptions of AI-Based Service Agents", *ICIS 2017: Transforming Society with Digital Innovation*.

- Yan, R., 2018. "Chitty-chitty-chat bot": Deep learning for conversational AI", IJCAI International Joint Conference on Artificial Intelligence, pp. 5520.
- York, J. G. & Venkatraman, S., 2010. The entrepreneur–environment nexus: Uncertainty, innovation, and allocation, *Journal of Business Venturing*, 25(5), 449–463.
- Xu, A., Liu, Z., Guo, Y., Sinha, V., & Akkiraju, R., 2017. A New Chatbot for Customer Service on Social Media. *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*.
- Zadeh, L., 1983. The role of fuzzy logic in the management of uncertainty in expert systems. *Fuzzy Sets and Systems*, 11(1-3), pp.199-227.
- Zaltman, G., Duncan, R. & Holbek, J., 1973. *Innovations and Organizations*, Wiley, New York, NY.
- Zeithaml, V.A. and Gilly, M.C., 1987. "Characteristics affecting the acceptance of retailing technologies: a comparison of elderly and nonelderly consumers", *Journal of Retailing*, Vol. 63, Spring, pp. 49-68.

Appendix

Appendix 1 - Pre Study Questions (Extract)

Introduction:

- Name:
- What is your current function at your organization?
- What responsibilities fall within your job description?

Topic 1: What thoughts and processes were undertaken before implementing Chatbots?

- What was the main reason for the consideration of Chatbots?
- How did you evaluate the market for potential solutions?
- How did you involve customers in the development of your Chatbot solutions?
- How did perceived financial benefits of Chatbots guide you in your decision?
- What key activities does the Chatbot take over? (potentially showing us an example)

Topic 2: How do organizations decide to implement Chatbots?

- Who was part of the team making the decision to implement?
- Based on which insights did they make the decision?
- How long did it take to implement?
- Did you receive any severe setbacks?
- Are you combining Chatbots with human customer support? (If yes, to what degree)

Topic 3: What are the useful factors for organisations to consider when implementing a Chatbot from both the supply and demand side?

- Have there been any struggles implementing your Chatbot?
- Have there been any unexpected wins?
- How did you overcome struggles ?(if there were any)

Topic 4: How do customers interact with Chatbots and perceive the services that it brings?

- How do customers interact with Chatbots and perceive the services that it brings?
- What kind of data have you collected from your customer interactions with your Chatbot?
- How do customers experience the Chatbot?
- How do they interact with the Chatbot?
- Is there any data you have not collected but would like to?

Topic 5: Summarizing questions

- Is there anything else you would like to share with us, which we have not touched upon the process?
- What are potential key learning for you within the Chatbot implementation process

Appendix 2 - Main Study Questions (Extract)

Topic 1: Process over time (Planning, Deciding, Implementing)

“How do organizations go about the implementation process of new technologies, such as chatbots : should result in a depiction of the process”

- After our last interviews, we outlined the key implementation phases of your chatbot solution, would you agree to them?
- Can you clarify the entire process of the chatbot to find the most critical phases?
- Can you describe in more detail about the data you collected after the critical moments?
 - how and why did you use that data?
- Since implementation process are never as straightforward as depicted; which are main issues to overcome?

Topic 2: Purpose and expectation management

“How do purpose and expectations towards chatbots develop and change within the implementation process?”

- What was your initial purpose of introducing a chatbot, in other words, what was the chatbot supposed to accomplish in due time?
- How did your initial expectations change through the process of the chatbot implementation?
- How did the leadership of the organization support you throughout the “sensemaking process” of adapting the chatbot solutions chosen?

Topic 3: Customer experience and interactions

“How do organizations leverage customer insights and preferences with regard to their chatbot solutions (existing customer relationships - Human Computer Interaction from marketing perspective)”

- How did your existing customers embrace the chatbot solution?
- How does your customer interaction focus change due to the introduction of your chatbot?
- Did you gather potential customer preferences in the beginning of your chatbot implementation process
 - If yes, what was the outcome of that analysis
 - If no, what were thoughts about not including the customer within the process (enough data from internal analysis, reliance on supplier, general organizational approach)
- How did the chatbot technology provider guide your decision making process?

Appendix 3 - Interview Questions Field Experts (Extract)

- Please describe your role, some challenges you encounter etc

Topic 1: Process over time (Planning, Deciding, Implementing)

- what do you consider to be very important when thinking about implementing a chatbot?
- How does the first interaction with the companies that want to implement chatbots usually go?
- How critical is it to do research from the supplier side?
- We have gotten the feeling that organisations who have implemented their chatbots have collected limited data before and during from their customers, what is your opinion on this?

Topic 2: Purpose and expectation management

- How do you think they manage expectations?
- What is the most common reason to implement a chatbot?

Topic 3: Customer experience and interactions

- How do you feel the customers react to these?
- What is the biggest challenge organizations face with customer ai interaction?

Appendix 4 - Conducted Interviews

#	Interviewee	Role	Industry	Interview Length
<u>Pre-Study</u>				
1	Specialist Interview	Head Center of Excellence	Banking	31:26 min
2	Specialist Interview	Head of Chatbots	Banking and Financial Services	26:43 min
<u>Main Study</u>				
3	Specialist Interview	Team Manager Digital Banking	Banking	49:04 min
4	Specialist Interview	Head of Chatbots	Banking and Financial Services	45:01 min
5	Specialist Interview	Head Center of Excellence	Banking	35:22 min
6	Specialist Interview	Head Center of Excellence	Banking	42:10 min
7	Specialist Interview	Senior AI Architect	Information Technology and Service	51:07 min
8	Specialist Interview	Senior Digital Strategist	Digital Communication	41:15 min
9	Specialist Interview	UX Designer Specialist Chatbots	Banking	30:10 min
10	Specialist Interview	Senior AI Architect	Information Technology and Service	30:45 min
11	Specialist Interview	Team Manager Digital Banking	Banking	20:07 min
12	Specialist Interview	Team Lead Digital	Retail	30:03 min
13	Specialist Interview	Design Specialist Chatbots	Technology Consulting	30:10 min
14	Specialist Interview	Director Global Strategic Accounts	Information Technology and Service	48:26 min
15	Specialist Interview	Management Consultant	Management Consulting	20:01 min
16	Specialist Interview	Head of Smart Automation	Technology Machinery	30:12 min
17	Specialist Interview	Co-Founder	Computer Software	30:00 min
18	Specialist Interview	Management Consultant	Information Technology and Service	30:40 min
19	Specialist Interview	Head of Chatbots	Banking and Financial Services	18:05 min
20	Specialist Interview	UX and Web Project Lead	Information Technology and Service	40:21 min