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**THE USE OF ARTIFICIAL INTELLIGENCE IN
CUSTOMER RELATIONSHIP MANAGEMENT**



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ABSTRACT

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This bachelor's thesis examines the ways that artificial intelligence (AI) is used in customer relationship management (CRM). Artificial intelligence has increased its reputation in recent years causing it to evolve into an even more useful technology. The use of AI grows constantly, and customer relationship management is one of the more relevant areas that takes an advantage of this powerful technology. This thesis aims to answer questions why and how AI is used in CRM. furthermore, this thesis examines a crucially relevant company, Salesforce and an artificial intelligence developed by them called Einstein. This thesis is conducted as a literature review. The results of this thesis point out that artificial intelligence is used in all the areas offered by CRM. This thesis focuses on four areas of CRM being sales, marketing, analytics and commerce. In every area artificial intelligence can offer a significant benefit to the user increasing efficiency, profit margin and user-friendliness.

Keywords: Artificial intelligence, AI, Customer relationship management, CRM, Salesforce, Einstein

TIIVISTELMÄ

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Tekoälyn käyttö asiakkuudenhallinnassa

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Tietojärjestelmätiede, Kandidaatintutkielma

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Tässä kandidaatintutkielmassa tutkitaan tapoja, joilla tekoälyä hyödynnetään asiakkuudenhallinnassa. Tekoäly on viime vuosina kasvattanut suosiotaan merkittävästi, jonka vaikutuksena se on kehittynyt entisestään hyödyllisemmäksi teknologiaksi. Tekoälyn käyttö kasvaa jatkuvasti, ja asiakkuudenhallinta on yksi ajankohtaisista alueista, johon tätä merkittävää teknologiaa hyödynnetään. Tämän tutkielman tarkoitus on vastata kysymyksiin miksi, ja miten tekoälyä käytetään asiakkuudenhallinnassa. Sen lisäksi tutkielma tarkastelee aiheeseen kriittisesti liittyvää yritystä nimeltään Salesforce ja sen tarjoamaa tekoälyä, Einsteinia. Tutkielma on toteutettu kirjallisuuskatsauksena. Tutkielman tuloksena löydettiin, että tekoälyä hyödynnetään kaikissa asiakkuudenhallinnan tarjoamissa alueissa. Tutkielmassa keskityttiin neljään eri alueeseen, jotka olivat myynti, markkinointi, analytiikka ja kaupankäynti. Jokaisella alueella tekoäly pystyy tarjoamaan merkittävän hyödyn käyttäjälle lisäten tehokkuutta, voittomarginaalia, sekä helppokäyttöisyyttä.

Asiasanat: Tekoäly, Asiakkuudenhallinta, Salesforce, Einstein

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1 INTRODUCTION

Artificial intelligence (AI) is a level of intelligence that includes machines that “think like a human” or otherwise think as though they are intelligent (Ertel, 2017). Artificial intelligence has attracted an increased attention of varied disciplines making it one of the most hyped technologies now. AI has many sub-fields such as machine learning and natural language processing and many of these fields are considered a crucial part of today’s research related to computer science. (Xue & Zhu, 2009).

AI has made its way into increased volume of companies’ infrastructures and solutions due to its revolutionizing data analytics power, ability to increase efficiency and its proved power of providing an overall mostly positive impact on solutions it has been implemented to (Nayak & Dutta, 2017). **Customer relationship management** (CRM) is a system created to aid a user with relationship management and an overall control of sales and leads. This thesis explores the possibilities that AI offers to boost CRM’s efficiency and usability. Customer relationship management is an area that attempts to increase sales, customer loyalty and an overall customer knowledge through data collection and analyzation as well as simplified information output. AI’s data collection and analyzation capabilities make it a relevant technology to CRM thus creating an interesting opportunity which is examined in this thesis.

Research related to this topic has increased in the recent years making this thesis more relevant to conduct though still some specific areas are researched subtly. The use of AI in CRM has been research more in individual areas of CRM or in AI thus a more general look into the topic is required. This thesis attempts to bring some of these areas together creating a broader look into this revolutionizing phenomenon. Personal interest and recent talk of Salesforce and its technologies lead into examination of Salesforces and its own integrated AI, Einstein. The main goal of this thesis is to examine current AI implementations in CRM and to give an overall look into benefits of AI technologies in CRM. The thesis is firstly targeted for companies discussing the possibility of AI implementation.

1.1 Research problem and questions

This thesis answers two main questions regarding the use of artificial intelligence in customer relationship management:

- How is artificial intelligence used in customer relationship management?
- Why is artificial intelligence used in customer relationship management?

1.2 Research method

Research is conducted in a form of literature review. The literature is acquired using IEEE (Institute of Electronics and Electronics Engineers) Xplore digital library, Google scholar, Scopus and JYKDOK using the following search conditions.

- Research question 1: (“Artificial Intelligence” OR AI) AND (“Customer Relationship Management” OR CRM) AND Salesforce
- Research question 2: (“Artificial Intelligence” OR AI) AND (“Customer Relationship Management” OR CRM) AND Salesforce

One of the main examples this thesis brings up is Salesforces artificial intelligence, Einstein, which is an artificial intelligence implemented into their platform allowing for varied use of AI technologies in different areas of Salesforce. There are very few studies on the topic but the main sources from this subject will be from Salesforces websites and sites they refer to, though source criticism will be applied.

1.3 Research structure

This thesis consists of five chapters. The first chapter is this, the introduction, which goes through introduction to the topic followed by the research method and the structure used to conduct this thesis.

The second chapter explores artificial intelligence. Definition for AI varies heavily thus making it optimal starting point for the chapter. After which two relevant applications of AI are provided, education and business. Various problems of AI usage, and implementation is discussed followed by summary of the topic. Main goal of this chapter is to explain to the reader basic uses and concepts of AI thus making references to AI easier for the reader to comprehend.

The third chapter delves into customer relationship management. In this chapter the thesis aims to define CRM followed by benefits that CRM provides to the user. In this chapter Salesforce is examined for the first time while looking deeper into their market leading CRM followed by summary of the topic. The main goal of this chapter is to look at definitions and advantages of CRM giving the reader an understanding of the basics of CRM. After which Salesforces CRM

is examined granting understanding about Salesforces strengths as a service and product provider.

Fourth chapter discusses the main goal of this thesis, AI and CRM together. The chapter tries to find out many different advantages and applications for the use of AI in CRM. The chapter is discusses the analytic side of AI since it provides a more general look into this field. The other area explored is Salesforce's Einstein. This area is reviewed, not only from the general perspective, but also from the viewpoint of Salesforce. The chapter also divides into three subchapters looking into three areas of CRM where AI is used. Reasoning for the general viewpoint and the selection of the three viewpoints is because many of the areas on this topic are greatly lacking in research.

The fifth and the final chapter is a conclusion which sums up the topics reviewed in this thesis. The main findings and suggestions for future studies are also given in the conclusion.

2 ARTIFICIAL INTELLIGENCE

In this chapter we deal with a different definitions and applications of artificial intelligence (AI). The chapter also discusses common problems in the area of artificial intelligence and ends in a summary on the topic discussed.

2.1 Definition of artificial intelligence

The term “artificial intelligence” dates back as far as 1956 when a young assistant professor of mathematics, John McCarthy, and his colleagues conducted a study on artificial intelligence. A basis of the study was that any aspect of learning or intelligence can be so accurately detailed that a machine can be made to mimic it. (Buchanan, 2005).

Even though AI is a rather old technology, defining it has proven difficult, resulting in varied definitions for the term. For one, the difficulty of defining artificial intelligence comes from the struggle of defining the word “intelligence”. Intelligence is not a measurable unit, and many believe that we cannot even understand our own brain thus lacking the ability to understand the concept of intelligence. The lack of comprehension makes it bizarre thought that a human is trying to replicate such an inadequately understood ability. The term “artificial” is also under debate due to its heavy link to science fiction and apocalypse scenarios. These struggles together create a difficult environment to define the term simply, however many have given their own view for the definition of the term.

Despite the debate on the definition of artificial intelligence one of the most popular definitions for artificial intelligence comes from John McCarthy himself: “The goal of AI is to develop machines that behave as though they were intelligent.” (Ertel, 2017). More broadly by (Kiruthika & Khaddaj, 2017), AI is intelligent computer programs and machines that have an ability to learn. This culminates into thought that artificial intelligence exceeds human intelligence.

This thesis explores massive multibillion-dollar software company Salesforce and their integrated artificial intelligence, Einstein. Salesforces customer relationship management offers world’s leading platform giving software as a service (Manchar & Chouhan, 2017). Salesforce is brought up at this part of

the thesis because one should look at their definition of AI. Salesforce defines AI as a concept of having machines “think like humans” (Salesforce 2019a).

AI’s definitions are varied making it more important to comprehend the main concept of AI which involves machines or computers working with some level of intelligence or learning ability. Due to AI having many different definitions and levels, this thesis does not dwell deeper into different areas and sub areas of AI but rather focuses on applications of AI. In the context of this thesis and its goals one can refer to Salesforces definition of AI being the concept of having machines that think like humans.

2.2 Applications of artificial intelligence

The use of AI grows rapidly making the area of AI applications increasingly vast thus dividing subject into two subchapters dealing with relevant areas of utilization of artificial intelligence. These areas contain a role of AI that is considered important in the later discussion of AI’s use in customer relationship management.

2.2.1 The use of AI in education

Computers have been an influential part of education for tens of years though their role has changed immensely in the last few years. Systems such as a computer-based training (CBT) and a computer aided instructions (CAI) were some of the first systems used to aid the learner through computers. Even though these systems were considered valuable at first, soon became clear that these systems were not suitable for everyone since they did not account for learner’s abilities.

Soon systems for a more individual take on education through computers was considered and the first system that provided eminently positive results was an intelligent tutoring system (ITS). Such system was held in a significant importance since the studies emitted the system having been a remarkable aid to people such as students. One study showed that pupils using an ITS performed as well as those who did not use such systems and required only half of the time studying. (Beck, Stern & Haugsjaa, 1996).

One might doubt the relevancy for AI’s use in education to this thesis but the use of AI in education provides a noteworthy finding on the use of artificial intelligence as an assistant. Be it a sales assistant, a chatbot, a tutoring system or Scarlet – an intelligent teaching assistant, the role of AI as an assistant is one of its more influential utilizations. (Ilhan et al., 2017).

AI enables the next level of personalized learning thus providing an increased efficiency of the learning practice. One can use an AI in aid to determine their weaknesses and strengths while simultaneously providing teachers and other tutors with a crucial information about the learner and their learning habits (Florea & Radu, 2019). A meta-analysis from du Boulay (2016) shows that

artificial intelligence in education (AIED) systems performed slightly worse than individual tutoring done by a human. Considering that a computer is easier to “hire” than a human, AI yields more convenient and efficient solution to individual tutoring.

In addition to already discussed benefits, AI produces many more, for instance automating monotonous activities of a teacher such as grading, essay analyzing or other answer checking. This frees the educator to do the work that an AI currently cannot accomplish such as being more emotional support for students. AI is already capable of identifying students at risk and it can interact with student’s natural language which rises them up from only interacting on a superficial level. (Florea & Radu, 2019).

The use of AI in education of course has flaws one being the possible lack of emotions on computers, but this chapter focuses on the upside of AI usage in education, trying to provide the reader with more positive benefits of artificial intelligence. In conclusion, artificial intelligence is used in many areas of education from a kindergarten to a high school as well as in other academic establishments. The aid that AI provides as an assistant is significant and shall not be underrated or overlooked. Studies show that AI has had and will have an influential part in education. The growth of AI is immense, and it effects many areas on our lives, one being education. (Kandlhofer et al., 2016).

2.2.2 The use of AI in business

Business models (BM) are rapidly changing due to fast growth of different technologies. Integrating different technologies may cause an infrastructural problem in addition to time and money consumption. Integrating an AI is no different from other technologies except for its novelty. Research on the topic of AI integration is limited due to its “freshness” in the scene. Increased interest for AI is causing enlargement of investing on AI in many different sectors causing companies to accommodate to the state-of-the-art business models which often include technologies such as artificial intelligence in some way. (Soni et al., 2019).

According to Quan & Sanderson (2018), systems perspective is necessary for better utilization of AI in businesses. Business models have changed swiftly from interaction between humans to communication between a human and a machine. Likewise, business model innovation (BMI) is shifting heavily into a machine territory. Business model innovation is the constant change of current business models or the construction of a whole new one. A mindset regarding BMI is at question since new technologies arrive hastily and when the change is often the natural course of action in almost every part of business. Modern advanced BMI perspective is moving towards more advanced technologies such as AI thus making it relevant to businesses to consider familiarizing themselves with such technologies. (Valter, Lindgren & Parasad, 2017).

Decision making is a crucial part of every business and is commonly based on data derived from information systems. Examples of these systems are for instance customer relationship management (CRM), supply chain management

(SCM) and enterprise resource planning (ERP). The data from the different systems can be extracted, analyzed and stored more effectively with the help of an artificial intelligence. This provides the possibility of allowing for the decision-making of being simpler and more efficient. An AI can be used in assistance of many more tools used by businesses, for example business intelligence (BI) tools which are a recent trend, developed to assist in decision making. The BI tools contain many limitations still one being data analyzation. Artificial intelligence can be implemented into these BI tools to exceed the limitations. Business intelligence components include, but are not limited to data mining, visualization, knowledge management and online analytical process. AI technologies can be heavily implemented into different components of BI thus, not only providing increase in efficiency, but also in usability. Computational intelligence (CI) is term describing rising paradigm of an information processing which focal point is intelligent system designing. Intelligent BI systems can be created with CI methods which family consists partly of AI technologies, creating crucial link between business's decision making and AI. (Jui-Yu, 2010).

One major benefit of AI is its ability to perform autonomous jobs with the utmost consistency thus releasing people to do more meaningful jobs and task. The use of artificial intelligence has increased quality and performance of the many areas it has been applied to. AI in considered more beneficial over natural intelligence in some areas since it offers consistency, stability and efficiency. Use of the both intelligences together have been proved to maximize working capability. Artificial intelligence provides dependable platform where people can make use of their natural intelligence. (du Boulay, 2016).

Stock investing is an important income not only for individuals but also for businesses. Investing always involves risk and it's for an investor to decide the level of risk that they prefer. The stock market is highly unpredictable and earning big with a low level of risk is a phenomenon that occurs very rarely but a one that is sought for. Many analysis methods have been conducted, providing general help to the investors. Influence factors for a stock price is constructed from many different aspects though the price is considered the most important one. The Kaburobo is an example of a stock robot which is designed to provide the user with a high income with increased possibility. The Kaburobo uses many different AI technologies to determine a stock with low risk but which provides the most positive outcome. Paper examining the Kaburobo only deducted one test and the main purpose of the paper was to develop interest in the topic of stock robots though the paper provided evidence that the use AI is a viable and influential option for stock markets. (Jianliang, Linshan & Xiang, 2009).

Looking at AI from different angle, the Gartner hype cycle shows a good example of AI's vigorous growth. Gartner's hype cycle is a graph showing all the emerging technologies of that specific year. While examining Gartner's hype cycle one can notice that AI related topics repeatedly occur in the top of the hype cycle. In 2015 at the peak of inflated expectations were topics such as autonomous vehicles and machine learning, and in 2018 topics such as deep neural networks and a virtual assistant. Hype for AI is long lasting firmly ongoing phenomenon

that ceases to stop any time soon. (Steinert & Leifer, 2010). Gartner's cycle is one of the most prominent models for informing businesses of upcoming and ongoing technologies and according to Gartner Inc. AI technologies will be introduced to most software products by 2020 (Kaplan, 2018).

In conclusion from the business perspective, adopting an AI can present variety of positive effects in many different areas of businesses. AI as a technology is still very unpredictable thus making it difficult to fully understand its influence on businesses. Relying heavily on AI may prove advantageous in the areas of autonomous labor work, data analyzation, stock investing and decision-making. On the other hand, AI's uncertainty may cause a variety of dilemmas such as unwanted costs and the increase of infrastructure. Overall AI and machine learning are gaining significant role in businesses, making it relevant to business to consider whether they want to implement AI in some form into their infrastructure. (Muthusamy, Slominski & Ishakian, 2018). For a company, major benefits lay in AI's great capability to analyze data, handle the more autonomous operations, provide impressive calculation power and help varied information systems to perform better (Quan & Sanderson, 2018).

2.3 Problems of artificial intelligence

Rarely can we find a technology which provides only a positive outcome to our society and lives. Artificial intelligence sure has its flaws and they scale from technical problems to deep ethical questions. This thesis focuses on AI's logical and infrastructural problems though it also explores more deeper concerns regarding topics such as warfare and ethicality.

AI's infrastructural problems are vast, and they should be taken into a consideration when for instance a company is deciding on implementing an AI into their business or platform solutions. These problems include areas related to software, personnel, storage and security. Starting with software and algorithms, a company is required to finetune the AI solution for their use and this can prove problematic. Hand in hand with this problem follows personnel complication. Understanding AI is not quite as straightforward as one might think and it calls for expertise on the topic. Lack of ability to adapt wanted AI into company's structure might have detrimental consequences rather than inherently positive results. (Kiruthika & Khaddaj, 2017).

Continuing with infrastructural problems, machines and computer in general propose a major concern which is storage. Any use of an AI requires data and due to its recently growing importance, data is considered new major natural resource for companies. Some parts of data storing, analysis and informing is made mandatory by laws and regulations, but company should not underestimate the power of their data. Referring to the problem though, storing all this data might prove problematic to some and many resorts to cloud storages. Cloud storages and AI go hand in hand and will be discussed later in this thesis but focusing on the complications that storage limitation brings, companies should

take into considerations areas such as meta-data management, extracting relevant information from the data flow and growing infrastructure cost due to escalation of intricacy of IT systems and storages. AI can have role in this both complicating but also helping to figure out needed solutions for these problems. Implementing an AI might bring an unwanted complexity of infrastructure thus creating undesired costs and obstacles. (Kedia & Lunawat, 2018).

AI proposes another problem, logic. Understanding human intelligence has proven difficult which means artificial intelligence in no different. AI can be unpredictable to the point where it can do decisions on its own that seem correct to it but are considered flawed by us. Example, that du Boulay (2016) brings up in his research on AI's impact on us, contains a robot receiving task of cleaning a vase. The robot's solution is to knock down the vase rather than dusting it since it accelerates the process vastly. The action seems bizarre to us, but the robot is just following its logic.

Since we are creating machines that are supposed to think on their own, it might prove problematic to understand their logic. Apple's Siri is an AI that is integrated into many Apple products. Siri's main goal is to provide answers to questions asked by a user. Siri's team leader Tom Gruber believes in understanding AI's logic before trusting it. Though if the user might require an explanation for how Siri comes up with an answer, the problem arrives of Siri not being able to resolve its own logic. The research director of artificial intelligence department at Apple, Ruslan Salakhutdinov believes that use of artificial intelligences such as Apple's Siri, calls for mutual trust between a human and an AI. (Dasoriya et al., 2018).

According to a research conducted by Lazanyi (2018), trust is considered a most important feature of AI. Also, over half of the respondents in the research answered that they are not at all ready to utilize AI. Mistrust is connected to resistance of change which is a major matter of controversy in general. Artificial intelligence in grand spectrum is considered unreliable and immensely unemotional which are values considered very important, not just in AI, but in general.

Malignant failure models like human extinction are worrying though extreme topics of discussion. Artificial intelligence is related to this topic heavily by the cause of theories such as "instrumental convergence thesis" which theorizes that for any goal given to any intelligent enough entity, would lead to converging into medium-term goals because they ease all potential final goals. These medium-term goals might be undesirable, and they might have a harmful effect. (Murphy, 2018).

Moving into another ominous topic, warfare. The sinister view we shall examine since the war is a constant on this planet. Opportunity that AI proposes to warfare might not be necessarily one of efficiency, which is intriguing to industrials, but one of survival. It is common sense that any authority given to an autonomous weapon might lead into an unsought outcome (White, 1991). Lethal autonomous weapons systems (LAWS) are one example of extreme use of an AI in a weapon industry. As we provide more power to the robots and machines, we are losing our foundation of human dignity. LAWS may provide us with less

innocent casualties but on the other hand it may flourish terrorism tremendously (Kumar et al., 2016).

Weapons are not the only dilemma concerning the increase of authority. The number of ethical problems increase as AI integrated machines in general gain more power. Social media algorithms, autonomous cars or effects of autonomous maritime transportation ecosystem, planned to be implemented in 2025, are some of many AI applications that cause major ethical questions. These notable utilizations of AI lead into even deeper level of our society. Standardizations and actions from the government must be initiated to the use of AI and this creates whole a new dimension to think about. (Vakkuri & Abrahamsson, 2018).

One extreme example of AI's misdoing comes from Harvard where an African American student received a racially discriminating message while using Google search engine when his white colleagues received no such message. This raises a question of equality and decency of an AI system. (Lan & Sijing, 2018). We cannot fully control AI's actions thus providing unwanted results such as ones of a racist kind. Topics like racism and unfairness are one of the more drastic kind and they bring us some extremely serious topics to examine.

As a conclusion about the topic, AI provides many benefits to many areas in our life and society, but the negative effects must not be overlooked. Opinions about the superintelligence and other extreme possibilities AI offers, roam the discussion widely and intensively. Superintelligence is a concept where an AI exceeds human intelligence thus providing even less control of an AI. (Hurlburt, 2017). Present machines lack many characteristics of a human thus making them still more of an intelligent computer than of an intelligent human. This provides us, at least in a conceptual level, with enough control over doings of an AI. Problems are the one to be resolved and research is one to be conducted before integrating AI into everything in our lives.

"Logic will get you from A to B. Imagination will take you everywhere." This is a famous quote from none other than Albert Einstein. Relevancy to AI comes from the thought that there's still so much AI can comprehend. According to many studies the present status of an AI is still far away from the threatening scenarios highlighted by many. (Braga & Logan, 2017).

2.4 Summary

In this chapter the goal has been to familiarize the reader with different definitions of AI. As discussed earlier, the clear definition for AI is still under serious debate but understanding the concept of AI is possible through combining definitions from many different sources. Few relevant areas that take advantage of AI were examined, providing insight into more practical use of AI. AI's disadvantages, varying from structural problems to logical problems and from ethical questions to inequality discussion, were also reviewed in this thesis, providing more critical look into this vastly hyped technology.

3 CUSTOMER RELATIONSHIP MANAGEMENT

This chapter explores customer relationship management (CRM), firstly by defining the term, followed by the benefits gained from using a customer relationship management system. The chapter also takes deeper look into a Salesforce's customer relationship management system since it is the main customer relationship management system discussed in this thesis. This chapter ends in a summary from the topic being discussed.

3.1 Definition of customer relationship management

The definition for customer relationship management has evolved in the recent years due to new technologies influencing companies' infrastructure heavily. Most common definition for CRM comes from the *journal of marketing* where Boulding, Staelin, Ehret and Johnson (2005) along with Payne and Frow (2005) propose the following definition though shortened slightly to compress the lengthy definition into a more condensed version: *"CRM is a cross functional strategic approach concerned with creating improved shareholder value through the development of appropriate relationships with key customers and customer segments."*

Integration between different functions is important to highlight when defining CRM because it separates the term customer relationship management from the term relationship marketing. Relationship marketing (RM) is a larger concept concerning relationship managing, making CRM a sub term to RM. Following graph shows different concepts of relationship management according to

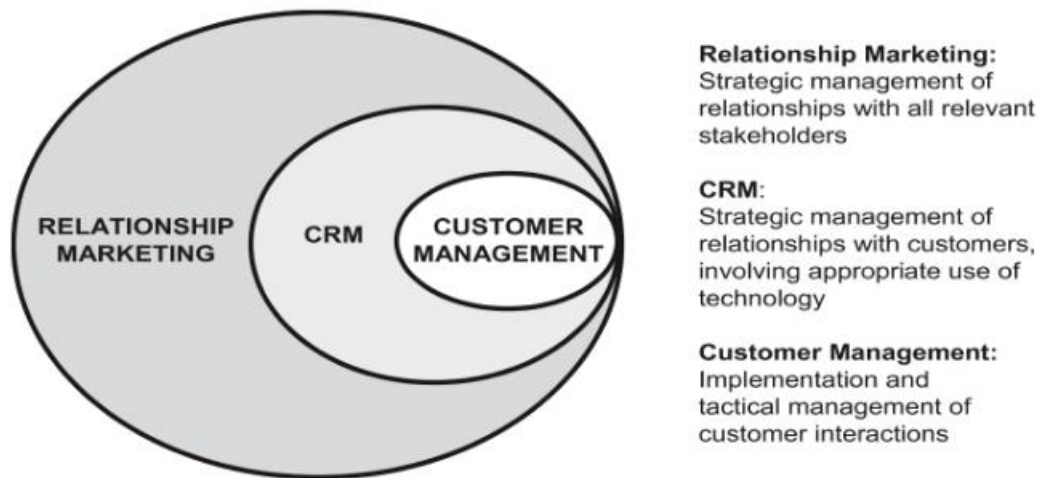


Figure 1 Relationship Marketing, CRM and Customer Management

Relationship management is an overall management of customer relationships to attain a long-term shareholders value. CRM is a relationship management involving a computer and an integration of different functions using technologies. Customer Management is an area of CRM that focuses on a customer experience. Customer interaction includes automation, personalization and campaign management. (Frow & Payne, 2009).

CRM has gone through a three-phase change from 1998 to 2008 advancing from: 1) marketing to customers the best product to 2) marketing to customers the best service to finally 3) marketing customer with dynamic services and products that suit them the best. The growth of social communities has led to an increase in information-sharing which has created a whole new area in CRM integration. This evolution has shaped CRM into even more dynamic direction making social networks an important part of enterprise resource planning (ERP) and CRM solutions. Increase in social networks also has created a more open platform to give feedback concerning services and products thus making customer happiness of extreme importance. (Buttle, 2009).

3.2 Benefits of customer relationship management

Even though CRM is a rising trend, debate about its effectivity is an on-going discussion. One survey from Verhoef & Langerak (2002) shows that only about 12 percent of large companies in EU and US are using CRM applications now and about 28 percent are developing them. A reason for such low ratings might be because the success rate of CRM projects is not convincing. Companies are not generally satisfied with CRM performance though this is due to misconceptions

regarding the use of or implication of CRM. Often CRM is considered of being a direct improvement on many areas of business though in reality implementing such systems is much more than just installing and using them. (Richards & Jones, 2008).

CRM benefits are varied by industry since such solutions are to be tailored to suit a specific industry though recent studies show that this variability is not as major as before considered. This leads into the core benefit that a CRM system provides in varied industries that are recognized regularly. Relationship, value and brand are three types of equity that get benefitted most from using CRM. These three can be compressed into a one term, customer equity, which is involved with identifying value of a customer to a business. According to (Richards & Jones, 2008) there are 7 core benefits of using CRM which are:

1. An improved ability to target profitable customers
2. Integrated offering across channels
3. An improved sales force efficiency and effectiveness
4. Individual marketing messages
5. Customized products and services
6. An improved customer service efficiency and effectiveness
7. An improved pricing

Not only do current customers matter, but also the hidden customer base. CRM can help in customer targeting, not only increasing in quantity, but also in quality of the customer base. Customer value management is the most important part of CRM thus making control, as well as targeting of a customer base, hugely important. Customer targeting is important due to relevancy of recognizing different customers types which are a model customer, a product customer and an underlying customer. Customer loyalty and satisfaction are qualities held in great priority and CRM helps business to find more valuable customers by a measurable evaluation of the customer value. (Liu & Zhu, 2009).

Consumers nowadays are more digital than ever. Huge increase in personal mobiles, a continuous connection to internet and overall number of digital footprints, causes different channels to increase in size as well as in relevancy. Distribution channels are going through a revelation caused by new technologies emerging society and businesses. Integrating an CRM to media channels is much easier in today's world due to modernization of technologies. CRM allows for better understanding and integration of social channels leading into better customer knowledge. (De Sutter et al., 2011).

For a company to be successful, it needs to profit long term thus making sales force efficiency and effectiveness of a great importance. Sales forces capabilities are also a dependent power in improving customer equity which is an important notion to financial accountability. Customer-centered marketing is vastly increasing making CRM a good aid considering businesses' sales force. CRM grants an ability for a better understanding of the customer base thus allowing for more customer-centered marketing. (Rust, Lemon & Zeithaml, 2004).

Communication between a company and a customer is a necessary action, giving a customer a possibility of providing a desired feedback to the company

and on the other hand, it gives a company an excellent opportunity to gain customer advantage and knowledge through open and efficient communication. CRM can enable a company to inform a customer real time with more individualized messages and information. Customer feedback analyzation and storing is a crucial information for a business, in which CRM is an effective tool of gathering this data. The data enables a company to continuously improve their customer services and customer knowledge resulting in a better customer satisfaction and loyalty. (Guo & Niu, 2007).

This increased customer knowledge can allow for more personalized pricing and a reduction of the average cost among larger customer groups. By understanding the customer better, the company has an ability to fulfill their needs and wishes better thus allowing for more accurately adjusted prices. Pricing is continuously moving towards a customer-based pricing from a cost-based pricing making CRM's capabilities to enhance the customer knowledge of a great advantage. (Richards & Jones, 2008).

Culmination of the benefits provided by CRM, lie on a deeper customer knowledge thus giving company an opening to gain advantage over competitors through more personalized marketing, messaging, pricing, advertising and targeting. Customers' needs and habits are a crucial type of information that needs to be collected and exploited to benefit the company. Integrating CRM in many different departments of a company has proven effective though one has to remember to maintain crucial balance between different capabilities inside business such as implement capability, marketing capability and organization capability. Maintaining a correct balance and investing in a profound planning are two essentials factor leading into success of a CRM implementation. (Yang, 2010).

3.3 Salesforce customer relationship management system

Founded in 1999, Salesforce has two decades later achieved a supremacy in CRM market. Salesforce is an American software company lead by Marc Benioff, chairman and co-CEO of Salesforce. Salesforce provides the most used CRM software in the world while also receiving titles such as the Most Innovative Company by Forbes and the 15th Most Admired Company in the World by Fortune. Benioff has also received impressive titles such as "Innovator of the Decade" by Forbes, and he is recognized as one of the World's 25 Greatest Leaders by Fortune. (Salesforce, 2019e).

An idea behind cloud computing is that programming or a software is offered as a service. This eliminates the need for a downloaded application in order to use a such service because everything happens in the cloud through the internet. Salesforce offers cloud-based CRM solutions making it extremely accessible anywhere, anytime. the use of cloud provides many benefits e.g. better automation, a simple infrastructure, a low cost, and an increased accessibility. When buying a Salesforce product, one needs to only pay for the services they need thus lowering the cost and allowing the user to make use of only what they desire.

Since companies do not have to store all the data themselves, lots of unnecessary infrastructure is saved. (Manchar & Chouhan, 2017).

Ultimately, the use of a cloud has made the Salesforce CRM a no.1 used customer relationship management system in the world. Salesforce's platforms are easy to use and versatile, suiting companies varying from a small to a large. The use of cloud reduces overall cost from lack of need to install or maintain anything. It also enables a large-scale accessibility through the internet, giving all employees access to the CRM system effortlessly. Security, speed and a simple GUI are features highly desired from CRM systems. Salesforce's Drag n Drop qualities make tasks such as coding, not required from the user. Coding overall has been made simpler by Salesforce due to the use of cloud and automation technologies such as artificial intelligence. (Patel & Chouhan, 2016). The following table from Patel & Chouhan (2016) points out the simplicity of using Salesforces coding language compared to two popular coding languages being Java and .Net Framework:

Table 1 Coding language comparison

Language →	Java	.Net Framework	Salesforce Apex
Criteria ↓			
Workspace	On premise	On premise	On cloud
License	Required	Required	Not required
Cost	High	High	Average
Time required to develop an application	High	High	Low
Creation of report & dashboard	Complex	Complex	Simple
Database management	Manual	Manual	Automated

According to Patel & Chouhan (2016), the inbuilt features, such as the Drag n Drop and Apex enable for not only an easier understanding of logic behind objects, but also for a faster working pace which creates a more engaging and efficient platform for all the user types. Salesforce provides security through the permission granting and denying thus resulting in less security preaches from unwanted access points. (Patel & Chouhan, 2016).

Yu (2019) shows in his book *Salesforce's Trailheads* which aid the user to understand the system and its functions better. These Trailheads provide a solution to majority of problems and they can be referred when the user is faced with a problem. This in grand spectrum reduces a customer support's workload and provides self-learning experience for the user. As well as being a massive aid to the customer and the company, the Trailheads are also fully free to a consumer lowering the threshold of using the Trailheads. Trailheads also reward the participant with points and badges allowing for a simplified proof of one's capabilities and knowledge. (Patel & Chouhan, 2016). The following is a picture from Salesforce's website shows an example of possible Trails and the point rewarded from completing these Trails for the user.

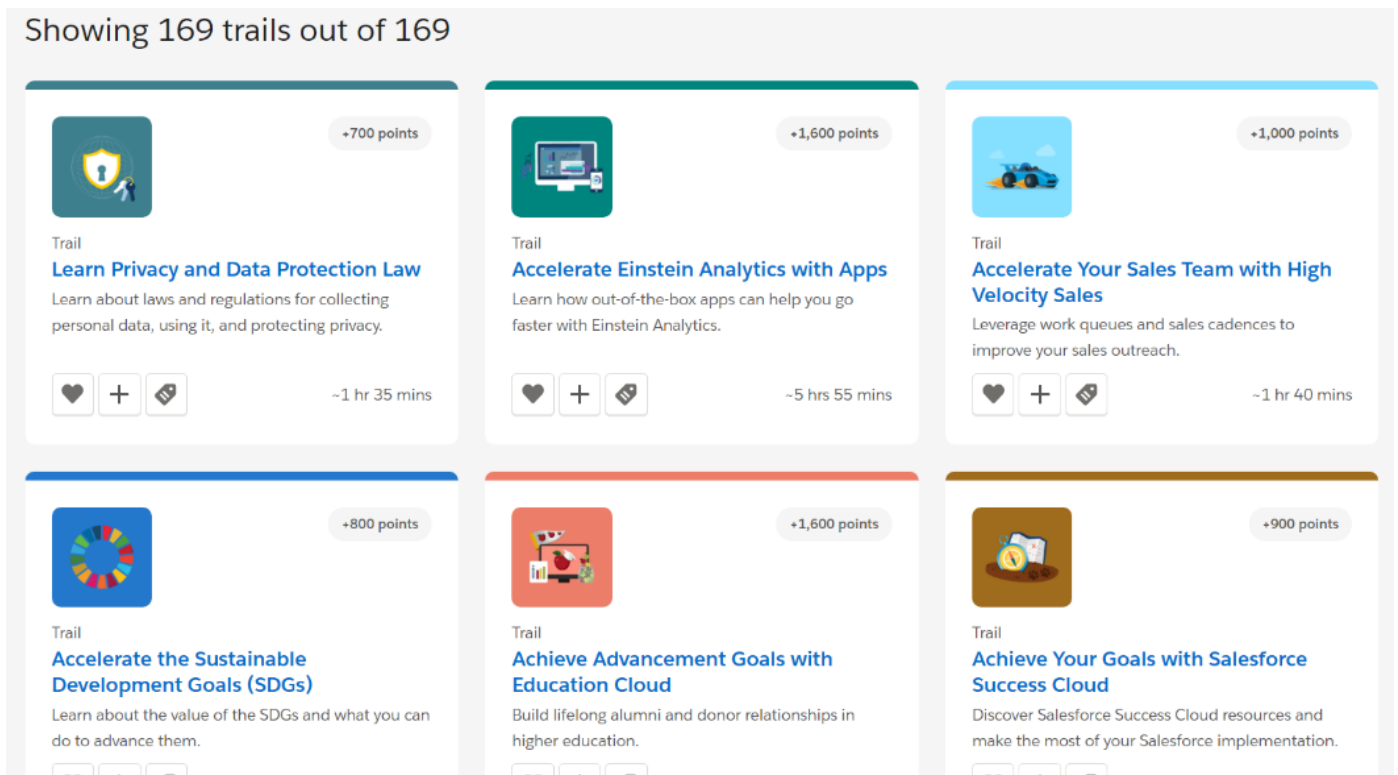


Figure 2 Salesforce Trailheads

3.4 Summary

The second important topic of this thesis was discussed in this chapter, customer relationship management. CRM provides a business with tools to control their customer relationships better. Benefits of a CRM system are extensive but also heavily discussed. CRM systems are not used by most businesses due to the

negative stigma regarding the difficulty and the failure rate of a CRM implementation. This chapter pointed out the vast amount of benefits of using CRM being increase in customer equity and the understanding of customer base allowing for more personalization in pricing, messaging and advertising. No.1 used CRM in the world, Salesforce's CRM, was examined due to high relevancy of the Salesforce in this thesis. It's cloud properties as well as it's easy-to-use and versatile platform grant Salesforce an edge over the competition. The motivation for implementing AI into CRM comes from the thought of maximizing the data derived from the CRM.

4 USE OF AI IN CRM

In this chapter, the thesis focuses on the use of artificial intelligence in customer relationship management. Firstly, by looking into area of analytics which is one of the main uses for AI in CRM. Second part of the chapter is a deep dive into Salesforce's Einstein. Salesforce's Einstein is one of the only fully integrated AI's in CRM. This section firstly explores Einstein in general after which it divides into three sections covering three different areas of CRM. These areas are sales, marketing and commerce and the areas were chosen due to lack of research on other areas.

4.1 Analytics

Analytics is a growing part of organization in which areas such as data, acquired sources, analysis, predictive models and fact-based management are used in aid of making decisions and actions. Business analytics has evolved from a plain data analysis into one of the main providers of a competition advantage. Business analytics consists of three stages differencing each other with difficulty, value and intelligence levels. These three stages are descriptive, predictive and prescriptive analytics. The most used stages still, the descriptive and the predictive analytics, aim to answer to questions regarding the current and recent events. Business analytics use techniques such as machine learning, data mining, simulation and artificial intelligence in a goal to answer questions such as "What has happened?" and "What will happen?". Prescriptive analytics is a more recent trend in analytics using more recent technologies such as sensors, real-time streaming and Internet of Things (IoT) as tools to provide an aid in company's decision making. (Lepenioti et al., 2020).

Fuzzy logic is a concept in which AI techniques are used to manage the uncertain attributes and values which are normally comprehended poorly. Fuzzy logic can be used, not only to extract hidden information crucial for the company, but also cut down the complexity of the customer data. Whereas CRM systems are proven way to assist companies attract new customers and provide

personalized services, AI can help the CRM systems with the data analysis giving the CRM a whole new branch of benefits to utilize. (Stephen, Cheng & Lam, 2016).

Hummer et al. (2019) shows in their research that AI's power in analytics comes from its data management ability. CRM can collect heaps of information from many different sources though often lacking storage and analysis of this data. This data is can be referred as Big Data which means for one the vast amount of data produces by various compartments in a business. Salesforce (2019b) implicates that AI's capability to analyze the mass amounts of data at an increased rate can prove advantageous for company's data analyzing problem. As far as data storage problem goes, a cloud storage can help company to store a mass amounts of data without any self-provided storage space. A cloud storage infrastructure enables for machine learning model training and ability to take advantage of additional compute services. If one wishes to still use a large-scale data warehouse can AI prove advantageous in that area as well. Not only can AI's capabilities of analyzing and categorizing data with increased efficiency help with managing large-scale data warehouses better, but they also help to face less struggle when prototyping potential future problems. (Ostrowski, 2018).

4.2 Salesforce Einstein

According to (Yu, 2019) Salesforce's Einstein is a unique application, being one of the only fully integrated artificial intelligences in a customer relationship management system. This integration allows for a more unrestricted and efficient use of all the applications provided by Einstein in a powerful Salesforce platform. Salesforce (2019d) themselves say that the cloud functionality of Salesforce lifts its advantages into a whole new level while also making Salesforce's Einstein rather exclusive solution. No other platform can provide all the functions and perks Salesforce and Einstein together can. (Shrivastava, 2017).

Cloud services are a current trend adopted by many companies including IT giants like Microsoft, IBM and Oracle. The use of cloud allows for more freedom to the user due to all the services and applications being in offer through the internet. This creates a beneficial lack of need to install or upkeep anything. Cloud is seen as a revolutionizing technology in software, application and product development. Switching into the cloud is continuous and growing direction giving an explanation why the Salesforce is growing so rapidly. Salesforce is one of the leading cloud providers nowadays, providing important solutions such as customer relationship system. Salesforce used to only provide the CRM system but nowadays it as expanded into many more areas such as mobile solutions and artificial intelligence, called Einstein which is the main point of view in this chapter. (Stephen, Cheng & Lam, 2016).

Huang et al. (2019) implicate that 5 important characteristics of an intelligent user-interface technologies which are voice input, natural-language, voice output, intelligent interpretation and agency. Einstein promises of being a top of

the line smart assistant, providing excellent quality in all the previously mentioned characteristics (Salesforce, 2019d). according to Patel & Chouhan (2016), Salesforce's Einstein differs from other providers with its data collection, tailored predictions and the advantage of being a part of a trusted platform. Einstein's data collection is fully automated, not requiring any actions from the user. As for tailored predictions, every business is different and their data is managed, distributed, and produced differently, making it convenient that Salesforce provides customized objects for companies. The mass quantity of data, which Einstein can analyze, store and provide simply to the user, would normally require a unit of data scientists to handle. Lastly, Einstein is integrated into Salesforce giving an ability to use all its capabilities in any part of the platform which adds a major convenience. (Laubheimer, 2018).

An increased need for fluid and open social interaction through the internet makes Einstein's Cloud Community highly desired functionality. AI's role in this component is constructing more personalized feeds, answers and recommendations for the user. AI can highlight unanswered questions leaving no stone turned and no customer unsatisfied. (Shrivastava, 2017). In Johan Yu's (2019) book he goes through Einstein's freedom and he points out that the user is free to analyze the data as they please using the tools they want and, in the platform, they desire to do it. Einstein allows for an ability to create custom datasets, recipes, dataflows and dashboards as desired allowing for even more freedom in usability.

At this point the chapter focuses on more specific areas of CRM. The areas are attempted to view from the point of Salesforce, but some general information can also be found due to huge relevancy for the topic.

4.2.1 Sales

According to Quan & Sanderson (2018) profitability is the most important quality of a company. Almost every business exists to make profit thus influencing the society and the markets positively. Most businesses offer products or services to customers making the area of sales one of the most important fields of work. Leads and opportunities are sales terms meaning potential sales opportunities. A sales opportunity is a qualified lead, while a lead is the possibility of a future sale through information of a person or a company. A business should focus immensely on findings the best possible sales opportunities and leads. AI can be used in aid of finding these desired leads and opportunities. (Yang, 2010).

Einstein provides service called Lead Scoring which filters out unproductive leads effectively. Einstein uses AI to analyze company's previous sales data and current top factors of a lead to determine whether the lead is evolving into an opportunity or not. Factors and the data are displayed clearly to the user thus making it easier to recognize the best leads and opportunities. The Einstein Lead Scoring is an extraordinary application because it improves over time, all the time. As the AI gets and gives more data it becomes more intelligent, providing increasingly better results. Einstein Lead Scoring requires no setup and it provides

user with understandable lead score factors, accelerated engagement on the most promising leads and an easy-to-use platform for lead tracking (Salesforce, 2017b).

According to Salesforce (2017a) Artificial intelligence in the area of sales allows user to gain a simplified information about the company's leads, opportunities and customers. Authorizing an AI to do the customer data analyzing saves not only time, but also money by providing possible increase in profit. Less time spent in lead qualification, data analyzation and customer activity tracking allow the user to spend his time in more advantageous actions, such as engaging on desired opportunities and leads. (Chagas et al., 2018).

4.2.2 Marketing

Global markets have transformed in the last decade into a more competitive and social platform. The communication between an organization and its clients has become increasingly important due to rise of social channels, which produce more flexible and easy interaction between previously mentioned parties. This increase in internet usage leads into more web customers and thus more data that needs be collected in a daily basis. Customer's needs need to be satisfied with an increased efficiency and accuracy, making marketing one of the key factors on today's competitive edge over rivals. (Yang, 2010).

CRM systems in general are a proved way of improving customer relationships and allowing the user an ability to engage into an improved customer base. CRM allows the user to, not only identify, but also maintain more optimal customer relationships. Large amount of potential lost revenue is lost due to lacking customer profiling and potential customer databases. Nearly 75% of companies admit that this phenomenon happens in their business, and the potential revenue loss could reach as high as 50% for the organizations working in the field of finance or retail. (Florez-Lopez & Ramon-Jeronimo, 2009).

Salesforce (2019d) point out that the use of AI allows for a better management of data collected from the customers. AI can analyze customer behavior in a deeper level allowing insights into the customer base thus enabling for more personalized messages, product placement, and an overall marketing. This personalization can increase a customer loyalty and an overall customer happiness due to decrease on undesired messages, advertisement and product placement. Consumer journey is concept of customer roaming the website moving from a page to page, in path, controlled by their clicks. AI can analyze this path, to not only create more optimal journey for customer, but also providing an insight into best performing channels, messages and events. (Yu, 2019).

Parmar et al. (2018) argue that AI's photo and text recognition and processing present an opportunity to a company to have a clearer vision of their brand. The text classifying allows an automatic classification of recognized texts granting an access to organized information about wanted words, pictures or texts. Social channels are filled with such information only requiring a fitting tool to enable company to gain deep insights into their brand. (Salesforce 2019b).

4.2.3 Commerce

Electronic commerce or better known as E-commerce has revolutionized the rules in the business world. Like many areas of business, commerce has also gone through cycle of getting smarter, faster, more convenient and more efficient through developing technologies. Commerce nowadays is more personal than ever due to the transformation of regular trading platforms into more personalized portals. Transactions have been made safer and more transparent increasing efficiency and trustworthiness of commerce. (Huang et al., 2019).

Salesforce's Einstein provides even more intelligent 1-on-1 shopping experience. AI produces more relevant recommendations and sorting to the customer leading into an increased sales potential. Through the data processing, Einstein also provides the user with insights into most effective products and categories allowing for better bundling and pricing for future products. Founded in 1994, Icebreaker is a New-Zealander base-layer apparel selling company which proposes that after switching into Einstein Cloud Commerce, the company's recommendation click rate went up 40% which lead into 28% growth in revenue, gaining 11% overall raise in average order value. Like with any Salesforce product, being a cloud service, the set-up time and cost is minimal. (Salesforce, 2019c).

According to Huang et al. (2019) E-commerce often lacks an ability to learn from customer's behavior creating a huge missed opportunity to gain all-important customer knowledge. Limitations in information supply and interactivity cause a less personalized platform for the customer and a less influential system for the company. AI's ability to provide meaningful information at an increased pace allows for these limitations to be resolved. (Salesforce, 2019c).

5 CONCLUSION

In this thesis the use of artificial intelligence in customer relationship management was examined through scientific material. The two first chapters aimed to give an insight into main technologies in this thesis, artificial intelligence and customer relationship management. After which the two main questions were given answers. The questions being :

- How is artificial intelligence used in customer relationship management?
- Why is artificial intelligence used in customer relationship management?

The definition for artificial intelligence were given through examination of scientific researches and the main definition for this thesis was concluded of being that AI is a concept of machines thinking like humans. Relevant applications of AI were discussed gaining insight into different capabilities and uses of AI. It was discovered that AI is used widely in many areas of society providing vast amount of positive, as well as some negative, effects. These negative effects were discussed later in the chapter providing an overall look at AI's problem areas which were unpredictability, unfairness, increased complexity of infrastructure.

The second main chapter investigated customer relationship management through scientific research providing a definition for the term being more subtly: "a cross functional strategic approach concerned with creating improved shareholder value." CRM provides many benefits which were discussed, allowing for easier understanding of AI's worth to CRM. One the main benefits CRM provides is its ability to increase customer knowledge creating an opportunity for a better customer loyalty and happiness and in the end allowing for more profit to be made. Salesforce's CRM was explored giving a context to later discussed Salesforce Einstein. It was concluded that Salesforce's platform and services are easy-to-use, affordable and customizable making them a one of a kind set for a company to consider.

The third main chapter explored artificial intelligence's aid in customer relationship management. Firstly, analytics was explored giving an insight into one of the more general and useful uses of AI in CRM. After this Salesforce's Einstein was explored through not only general overview but also through three different areas of CRM being sales, marketing, and commerce.

In analytics, AI shines with its power of data analyzation. Big data is a concept that has gained a lot of attention lately and for a good reason. Data is a current leading source of natural resource to a company thus giving AI a massive potential of being revolutionizing technology in that area. Analyzing data that CRM collects makes for a dream team in the department of company's desire to gain insight into not only to their customers, but also into their infrastructure.

Salesforce is a great example of combining many of AI's core benefits into an already excellently performing and revolutionizing platform. Salesforce is an easy-to-use system that allows for a large amount of customizability. Its AI implementation and the cloud services make it a unique service that offers next level technology utilization with varied levels of prices and functionalities. The overall benefit for the use of AI in CRM is still under a lot of debate due to its uniqueness, freshness and the overall skepticism to technologies such as AI and CRM. Still, AI's main benefits lay on the data analyzation and reliability – allowing for autonomous tasks to be performed by a computer or a machine in a more consistent and increased rate.

In sales the main benefit that AI provides is its lead and opportunity identification power. Without the use of an AI, most profitable and promising leads and opportunities might be more difficult to recognize and to engage on. Customer profiling and segmentation are the key factors when a company is looking to maximize its profits through customer knowledge. AI's capability to provide better customer profiling allows for a less lost revenue and an overall boost in marketing through better understanding of the customer base and the company's brand.

The gains in marketing are based on AI's capability to recognize different patterns leading into better understanding of customer base and company's brand. The growth in social interaction has caused a change in marketing thus making AI's ability to personalize marketing a huge advantage. Furthermore, AI's text, speech and picture recognition abilities open up a whole new opportunity for a company to exploit knowledge in aid of better marketing

Commerce has transformed into more 1-on-1 interaction through electronic channels such as the internet. This creates a requirement for more individualized experiences for the customers and more personalized services from the companies. One main goal of CRM is to provide deeper insights into customer's needs and behavior thus creating a need for more personalized commerce. AI boosts this personalized commerce into a next level with its data analyzation ability.

Future research from this topic is required due to increasing interest in a technology such as artificial intelligence. Especially research from the more practical viewpoint is massively lacking, making majority of the current research only hypothetical.

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