The impact of technological innovation on the customer care industry

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Undergraduate Thesis

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1. Introduction

With the emergence and advancements in technology and its implementation across industries, it is crucial to study the movement towards digitalization and understand its various aspects. This study aims to provide a comprehensive outlook on how digitalization has impacted the customer care industry. In the following sections of this chapter, we will outline the reasons behind this study and explain how it will achieve its objectives.

1.1. Key terms and definitions

For the better comprehension of the topic discussed on this paper it is needed to provide the readers with the tools which they need to better comprehend the content of the paper. Therefore, on the list below definitions of key terms which is discussed on this paper can be found.

Definitions:

Artificial intelligence (AI)- The term artificial intelligence (AI) describes a machine's capacity to carry out operations that ordinarily require human intellect, such as speech recognition, understanding of natural language, and decision-making (Soori et al. 2023).[1]

Deep learning - Deep learning is a subfield of artificial intelligence that focuses on creating large neural network models that are capable of making accurate data driven decisions (John D.Kelleher 2019).[2]

Generative AI - The term "generative AI" refers to computational techniques that are capable of generating seemingly new, meaningful content such as text, images, or audio from training data (Stefan Feuerriegel n.d.).[3]

Machine learning (ML) – Machine Learning is a branch of AI it uses algorithms to give robots the ability to learn from data and get better over time (Soori et al. 2023).[4]

Customer Relationship Management (CRM) system - system capture and integrate customer data from all over the organization, consolidate and analyse it, distribute customer information

[1] https://www.sciencedirect.com/science/article/pii/S2667241323000113?via%3Dihub Assessed at 22.06.2024
[2] https://books.google.hr/books?hl=en&lr=&id=b06qDwAAQBAJ&oi=fnd&pg=PP9&dq=what+is+deep+learning&ots=_pA-PLiTYQ&sig=lE7FyS0d4F5toCd7LhHoTBWsZyY&redir_esc=y#v=onepage&q=what%20is%20deep%20learning&f=false Assessed at 22.06.2024
[3] https://ar5iv.labs.arxiv.org/html/2309.07930 Assessed at 22.06.2024
[4] Same as no.1

to various systems and customer touch points across enterprise, and provide single enterprise view of customers (Spremić, 2020)[5].

Chatbot - Chatbot also known as Chatterbots or chatter robots, is the computer system that can communicate with human in the form of messaging app (Ahmad et al. 2018).[6]

Natural-language processing - Natural language processing (NLP) refers to computer systems that analyse, attempt to understand, or produce one or more human languages, such as English, Japanese, Italian, or Russian. The input might be text, spoken language, or keyboard input. The task might be to translate to another language, to comprehend and represent the content of text, to build a database or generate summaries, or to maintain a dialogue with a user as part of an interface for database/information retrieval (Publishers and Papers 2018).[7]

1.2. Description Of the Impact of Technological Innovation on Customer Care

Technological innovation is transforming industries worldwide, and the customer care industry is no exception. Emerging technologies such as artificial intelligence (AI), machine learning (ML), and chatbots, are reshaping how businesses interact with their customers. These advancements offer opportunities for improved efficiency, personalized service, and enhanced customer satisfaction. However, they also present challenges including the need for significant investment, potential job displacement, and concerns over data privacy and security.

The shift towards technology-driven customer care solutions is driven by the increasing demand for 24/7 support, faster response times, and the ability to handle large volumes of customer interactions. For instance, chatbots and virtual assistants can manage routine inquiries, freeing human agents to focus on more complex issues. AI-powered analytics provide insights into customer behaviour, allowing for tailored marketing strategies and proactive problem resolution. Despite these benefits, the integration of new technologies necessitates comprehensive training programs, changes in organizational culture, and a rethinking of traditional customer service models.

The customer care industry must navigate these changes while maintaining a focus on customer satisfaction and loyalty. Balancing technological adoption with the human touch remains crucial, as personalized, empathetic interactions are often key to resolving customer

[5] https://ar5iv.labs.arxiv.org/html/2309.07930 Assessed at 22.06.2024
[6] https://www.researchgate.net/publication/327097910 Assessed at 22.06.2024
[7] https://dl.acm.org/doi/10.5555/1074100.1074630 Assessed at 22.06.2024

issues effectively. Additionally, businesses must ensure that the adoption of new technologies aligns with legal and ethical standards, particularly in terms of data handling and customer privacy.

1.3. Aim and purpose of the research

The main goal of this thesis is to explore the impact of technological innovation on the customer care industry, focusing on both the opportunities and challenges it presents. The objectives are the following:

1. To analyse the current state of technological adoption in the customer care industry.

2. To evaluate the benefits and drawbacks of key technological innovations such as AI, ML, chatbots and CRMs.

3. To assess the impact of these technologies on customer satisfaction, service efficiency, and operational costs.

4. To identify best practices for integrating new technologies into customer care strategies.

5. To propose recommendations for businesses looking to leverage technology while maintaining high levels of customer service.

1.4. Research Methods used in the study

This study will utilize a mixed-methods approach, which entail the following research methods:

1. Literature Review: Analysis of existing literature on technological innovations in the customer care industry, including academic papers, industry reports.

2. Case Studies: In-depth examination of specific companies that have integrated technological innovations into their customer care processes.

3. Trends and statistics: which will include the latest trends and statistics in the integration of technology in the customer service industry.

1.5. Contribution of the thesis to understanding technological impact on customer care

This thesis will contribute to the understanding of how technological innovations are reshaping the customer care industry. It will provide valuable insights into the benefits and challenges of adopting new technologies and offer practical recommendations for businesses. By examining case studies and industry trends, the thesis will highlight best practices and innovative approaches that can help companies enhance their customer care strategies. Furthermore, it will address the need for balancing technological efficiency with personalized human interactions, ensuring that businesses can meet the evolving expectations of their customers.

1.6. Thesis Structure

This paper is divided into four chapters. The introductory part describes the importance of the research topic, the subject, the aim and purpose of the paper, the methodology used, and the structure of the paper itself. The second part of the paper - technological innovation in customer care – aims to give an overview of the key technological innovations, furthermore, give an overview of the benefits and limitations of implementation of said technologies. Moreover, the impact of technological innovation on customer experience will be evaluated.

In the third part of this paper, we will analyse case studies of technological implementation in the customer care industry in different sectors. This approach allows us to observe how implementation of technology in customer care can impact different sectors, and how some effects are shared, and some may differ, varying from industry to industry. Furthermore, this section will provide the readers with the latest trend and statistics in the field. In the final fourth part, we will give a conclusion and recommendations where will summarize the key aspects and findings of the paper and provide recommendations to businesses, as well as future research and directions related to our topic.

2. Technological Innovations in Customer Care

Across all industries or sectors, one of the most critical aspects that demands significant thought and care is how we communicate with and take care of our customers, as they are the primary reason for the existence of any service or product provider. The survival and success of both new and established entities depend on the demand generated by customers for their services or products. Therefore, to remain competitive and relevant, companies must prioritize customer care throughout every phase of product or service consumption.

Attracting customers is no longer enough: maintaining their loyalty and encouraging the use of the service or product repeatedly as well as recommendation to others is equally important. A robust customer care service is essential for achieving this goal, as it helps to build a solid customer base and fosters positive word-of-mouth recommendations. This involves understanding customer needs, addressing their concerns promptly, not only during the purchase phase but also throughout the entire lifecycle of product or service consumption (Lemon and Verhoef 2016).[8]

Before the introduction of advanced technology, customers who wished to contact companies had to write letters or visit the company in person to ask questions or provide feedback. This limited communication often led to numerous problems. Companies struggled to fully understand which aspects of their products or services needed improvement or which, on the contrary were well-received. Timely identification of market reactions was challenging, and responding to negative feedback was crucial for maintaining the company's reputation and long-term existence. The absence of efficient communication channels delayed businesses from adapting quickly to customer needs and market changes, often resulting in customer dissatisfaction and lost opportunities for improvement.

Technological advancements, such as the telephone which lead to the establishment of call centres, the internet, and the most recent innovations in artificial intelligence, have revolutionized customer care industry and practices. These advancements have significantly improved communication between customers and providers, enabling companies to address customer needs more effectively and promptly disregarding the fact that the volume of customers and products have increased significantly. The telephone introduced real-time voice communication, allowing customers to resolve issues or seek information without delay. The

[8] https://pure.rug.nl/ws/files/81733365/Understanding_Customer_Experience_Throughout_the_Customer_Journey.pdf
Assessed at 22.06.2024

internet brought about email and live chat support, providing more convenient and flexible options for customer interaction.

Artificial intelligence (AI) and *machine learning* (ML) have further transformed customer care by enabling personalized and predictive support. *AI-powered chatbots* can handle a large volume of inquiries simultaneously, providing instant responses and solutions (Lucija Ivančić, 2024).[9] Machine learning algorithms analyse customer data to predict issues before they arise and offer tailored recommendations, enhancing the overall customer experience. These technologies not only improve efficiency but also enable companies to gather valuable insights into customer preferences and behaviour (Oku Cobham 2021).[10] Furthermore, the development of CRM systems has reshaped the methods which businesses handle customer relations, "CRM systems examine customers from a multifaceted perspective. These systems use a set of integrated applications to address all aspects of the customer relationship, including customer service, sales, and marketing" (Spremić 2018).[11] The four above-mentioned technologies will be discussed in greater detail further in the course of this paper.

Moreover, social media platforms have emerged as powerful tools for customer engagement and feedback. Companies can now monitor and respond to customer comments and reviews in real-time, demonstrating their commitment to customer satisfaction and transparency. Social media also allows businesses to proactively share updates, promotions, and useful content, fostering a stronger connection with their audience (Oku Cobham 2021).[12]

It is crucial to emphasize that customer care does not end at the point of purchase. Post-purchase support is equally important in ensuring customer satisfaction and loyalty. Companies must continue to engage with customers as they use and consume their products or services. This includes offering comprehensive support, addressing any issues or questions that arise, and providing helpful resources and information. Post-purchase follow-up, such as surveys and feedback requests, helps businesses understand the customer experience and identify areas for improvement (Lemon and Verhoef 2016).[13]

[9] https://pure.rug.nl/ws/files/81733365/Understanding_Customer_Experience_Throughout_the_Customer_Journey.pdf Assessed at 21.06.2024
[10] https://pure.rug.nl/ws/files/81733365/Understanding_Customer_Experience_Throughout_the_Customer_Journey.pdf Assessed at 21.06.2024
[11] https://ar5iv.labs.arxiv.org/html/2309.07930 Assessed at 22.06.2024
[12] https://ar5iv.labs.arxiv.org/html/2309.07930 Assessed at 22.06.2024
[13] https://pure.rug.nl/ws/files/81733365/Understanding_Customer_Experience_Throughout_the_Customer_Journey.pdf Assessed at 22.06.2024

Salesforce which is a cloud-based software company which provides customer relationship management software and applications focused on sales, customer service, marketing automation, e-commerce, analytics, and application development, conducted a survey in 2020 names State of the Connected Customer, the results of the survey displayed an 85% response in how consumers across different sectors believe that the customer experience is just as important as the product or service (Mulcahy n.d.).[14] The result of this survey just emphasizes how important customers care is for the consumers, as people like to feel heard and taken care of, and having a well-established customer care is big part of that.

A good, post-purchase established customer care builds trust and strengthens the value of the company's offerings. Customers who feel supported and valued are more likely to return for future purchases and recommend the company to others. This continuous relationship is essential for building a loyal customer base and sustaining long-term business success.

2.1. Overview Of Key Technologies (AI, ML, ChatBots, CRM)

Before considering the ways in which the technological innovations have impacted the daily interaction of companies providing services and their respective customers, it is important to have an understanding of some of the selected technological methods used across a variety of industries. Moreover, it is crucial to consider the implementation of the new technologies by companies, as service providers, to consequently examine the immense impact the implementation decision has on the customers. For the purposes of this research, Artificial Intelligence (AI), Machine Learning (ML), chatbots, and CRM systems will be briefly discussed in turn, as the main focus of the paper is not to analyse the extensive field of computer science, but to examine the impact of such systems on the field of customer service instead.

One of the most widely implemented methods nowadays is Artificial Intelligence – "In modern parlance, artificial general intelligence refers to the ability of a machine to communicate, reason and operate independently in both familiar and novel scenarios in a similar manner to a human." (Du-Harpur Id et al. 2020).[15] This technology allows computers to imitate human intelligence, equipped with problem-solving features and without requiring actual human intervention (Soori et al. 2023).[16] The subsets of the extensive concept of AI

[14] https://www.salesforce.com/content/dam/web/en_us/www/documents/research/salesforce-state-of-the-connected-customer-4th-ed.pdf Assessed at 16.06.2024
[15] https://academic.oup.com/bjd/article/183/3/423/6748151 Assessed at 21.06.2024
[16] https://academic.oup.com/bjd/article/183/3/423/6748151 Assessed at 21.06.2024

involve ML, which will be discussed further, as well as deep learning, Natural Language Processing, and robotics (Soori et al. 2023).[17] Examples where AI is utilized include, but are not limited to are: GPS guidance, digital assistants, Siri speech recognition, autonomous vehicles, generative AI tools (such as Chat GPT) (Manakitsa et al. 2024).[18] AI algorithms, encompassing tools like machine learning and deep learning, are being 'learned' from various amounts of data and modelled by the decision-making processes of the human brain (Rodgers 2022).[19] The utilization of AI, particularly through the implementation of machine learning (ML) algorithms, is highly evident in Customer Relationship Management (CRM) systems, these systems integrate various aspects of customer interactions to provide comprehensive insights into customer history and preferences (Libai et al. 2020).[20] By employing AI, CRM systems can analyse vast amounts of customer data, predict customer behaviour, and enhance customer engagement and satisfaction through personalized interactions and automated processes (Roba and Maric 2023).[21] A field of computer science, AI is capable of creating new content and envisioning complex issues for a company to address, such as customer retention (Lucija Ivančić, 2024).[22]

When considering a subset of AI, it is of paramount importance to acknowledge ML, which are "algorithms and statistical models that are programmed to learn from data, therefore recognizing and inferring patterns within them. This enables computers to perform specific tasks without explicit instructions from a human operator ." (Du-Harpur Id et al. 2020) [23] In order to clarify, ML is only a method that forms part of the more general notion of AI, albeit sometimes the concepts of "AI" and "ML" are used interchangeably (Kühl 2019).[24] The multi-faceted uses of machine learning (ML) include daily applications such as facial recognition, product recommendations, and email automation, particularly in the realm of spam filtering, for example in email spam filtering, the system learns to identify spam emails based on patterns and characteristics in the data (Manakitsa et al. 2024).[25] Machine learning, a crucial fragment of AI that uses algorithms, is also extensively implemented in finance, nowadays increasingly

[17] Same as no.16
[18] https://www.mdpi.com/2227-7080/12/2/15 Assessed at 22.06.2024
[19] https://www.google.hr/books/edition/Dominant_Algorithms_to_Evaluate_Artifici/4eqCEAAAQBAJ?hl=en&gbpv=1&dq=AI+algorithms&printsec=frontcover Assessed at 22.06.2024
[20] https://doi.org/10.1016/j.intmar.2020.04.002 Assessed at 21.06.2024
[21] https://link.springer.com/chapter/10.1007/978-3-031-25695-0_21 Assessed at 22.06.2024
[22] https://mail-attachment.googleusercontent.com/attachment/u/1/?ui=2&ik=d1418a1cbf&attid=0.3&permmsgid=msg-a:r2715021576574912146&th=1903ae528d1c4b1f&view=att&disp=inline&realattid=f_lxoj7lw72&sadnir=2&saddbat=ANGjdJ8f1sgDa0QRYge5DL3Ox6RdxtqcHdlS6rpdtBnejbx Assessed at 21.06.2024
[23] https://academic.oup.com/bjd/article/183/3/423/6748151 Assessed at 21.06.2024
[24] https://www.researchgate.net/publication/327802544_Machine_Learning_in_Artificial_Intelligence_Towards_a_Common_Understanding Assessed at 22.06.2024
[25] https://www.mdpi.com/2227-7080/12/2/15 Assessed at 22.06.2024

accentuating the institution's 'customer-orientability', but also when it comes to "managing assets, evaluating levels of risk, calculating credit scores, and even approving loans" (Kelly 2023).[26] In fact, JP Morgan has implemented "machine learning to provide competitive pricing and optimize execution in what is already one of the most liquid and automated asset classes alongside equities" (Anon 2019).[27] The incorporation of ML is also widely applied in FinTech services, especially in the field of customer service, which would be discussed at a later stage in chapter 3**.**

The increasing popularity of customer self-service through *chatbots***,** "driven by AI, automated rules, natural-language processing (NLP), and machine learning (ML)" (Mohan 2022)[28]**,** can understand multiple question requested by human, moreover, possess the ability to differentiate between uniqueness of word including emoticons (Aishwarya Gupta 2020).[29] AI is a tool possessing conversational techniques, such as natural language processing (NLP), which enables chatbots to understand the questions posed by the user (customer) and automate the responses to those questions (Aishwarya Gupta 2020).[30] For instance, the latest progression of AI chatbots, typically defined as "intelligent virtual assistants" or "virtual agents," have removed the need for manual research and human intervention. The well-known Apple's Siri, Amazon Alexa, for example, simplify the methods through which customers find the desired information, by instantaneously responding to questions and requests of the customer — through text and audio input (Berdasco et al. 2019).[31]

Another cutting-edge technology which has been developed in hope to aid businesses to achieve and better relationship with their customers is customer relationship management (CRM). Salesforce which is a well know company CRM systems has defined the term as follows: "Customer relationship management (CRM) is a system for managing all of your company's interactions with current and potential customers. The goal is simple: improve relationships to grow your business. CRM technology helps companies stay connected to customers, streamline processes, and improve profitability" (Anon n.d.).[32] The CRM systems have the ability to combine the data from various sources and can use AI to aid manage relationships with your clients throughout the entire life cycle of the product or service. The

[26] https://www.researchgate.net/publication/327802544_Machine_Learning_in_Artificial_Intelligence_Towards_a_Common_Understanding Assessed at 22.06.2024
[27] https://www.jpmorgan.com/insights/markets/forex/machine-learning-fx Assessed at 16.06.2024
[28] https://www.oracle.com/chatbots/what-is-a-chatbot/ Assessed at 16.06.2024
[29] https://pdfs.semanticscholar.org/f5f4/746acffef08df37f184cb6acc0505362ea9b.pdf Assessed at 22.06.2024
[30] https://pdfs.semanticscholar.org/f5f4/746acffef08df37f184cb6acc0505362ea9b.pdf Assessed at 22.06.2024
[31] https://www.mdpi.com/2504-3900/31/1/51/htm Assessed at 22.06.2024
[32] https://www.salesforce.com/eu/learning-centre/crm/what-is-crm/ Assessed at 22.06.2024

CRM system can have many functions this includes sales calls, customer service interactions and marketing emails and the list does not stop here (Anon n.d.).[33]The CRM is a system which can provide aid to any business of any size, and it can provide business the efficiency they may be lacking.

Having provided a brief, simplified explanation of the complex terms within the emerging technological innovation, as complicated as the field of computer science might appear, the purpose of this research is to address the effect the above-mentioned technology has on the interaction with humans, specifically on the sphere of customer service.

2.2. The Implementation of Technological Innovation by Companies

With the development of technology, some new applications and systems have been developed to automate certain processes and simplify performance across most industries. In any industry exist integral processes such as accounting, sales, customer care, marketing, which are necessary to take place for the institution to be functional. It is important to note that all implementation of technological innovation takes place in a climate of enthusiasm for its potential in assisting both the service providers, and the end-users. Whether in entertainment, or in finance, technological advancements, particularly in AI and ML, have significantly enhanced the ability of humans to complete tasks with extreme efficiency.

Technology like AI was created by humans, and when successfully implemented is now serving humankind, by mimicking the problem-solving capabilities of a real human-being, and not only in the corporate world. Non-profit and government institutions may also implement AI, assisting in serving their stakeholders better. Notably, the use of AI in the field of healthcare is no exception. During the battle against the pandemic, "AI had dramatically improved our diagnosis, prediction, and treatment level AI could analyse the epidemiological characteristics, clinical characteristics, and treatment effects of COVID-19 through extensive data of clinical cases" (Chang et al. 2021). Therefore, the advantages of AI implementation are abundantly clear for the stakeholders of the public sector as well.

When it comes to addressing the needs of private sector, companies utilize technological innovations like AI primarily to improve the efficiencies of their processes, by automating certain tasks and minimize costs, (Manyika James and Sneader Kevin 2018) albeit sometimes

[33] Same no.32

at a detriment, as will be discussed at a later stage. Technological innovations like AI enable businesses to focus on strategic goals, innovate more effectively, and maintain a competitive edge in their industries (Kost 2020). In the dynamic landscape of modern business, companies which hesitate to adopt new technologies face a range of formidable challenges and by resisting technological innovation, businesses risk falling behind competitors and compromising their efficiency and productivity (Kreiterling 2023) . Outdated processes and systems can lead to inefficiencies in operational effectiveness and delaying growth opportunities (Carvalho et al. 2021). Furthermore, failing to embrace technologies results in missed chances for innovation and market differentiation, limiting a business's ability to meet evolving customer expectations and capitalize on emerging trends, which, in turn, can be detrimental to the success in their line of business (Dr. Priya Trivedi, Fatema Akhter, Dr. Abid Khan , Ahmad A. I. Shajrawi , Prof. Nada Ratkovic 2023).

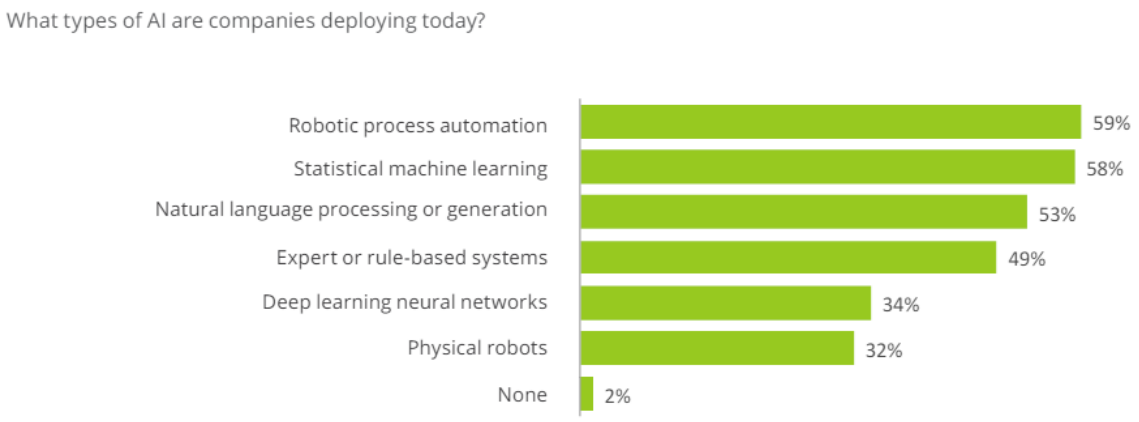
The optimism of business leaders for AI and cognitive technologies implementation is becoming increasingly evident. For instance, in a survey conducted by Deloitte in 2017 (Anon 2017)[34], whereby the considerations of implementing AI were examined, it was found that the majority of the 'cognitive-aware' business leaders surveyed were expecting that (cognitive) AI technologies "will transform both companies and entire industries" (Anon 2017). [35] A successful implementation of AI technologies into the operational side of the businesses can "directly influence how organizations accomplish tasks, make decisions, create engaging interactions, and generate stronger business outcomes" (Anon 2017).[36] Crucial to note, in their report, the terms "cognitive technologies" and "AI" are used by Deloitte interchangeably. In their survey, Deloitte found that nearly 40% of the cognitive investment focus is on the area of customer service; this is in comparison to the business functions of supply chain and procurement (30%) and manufacturing (30%). Moreover, the methods of AI implementation vary, with some techniques already discussed in chapter 3 occupying the top list of technologies implemented, as demonstrated (**Figure 1**).

The top of the list as depicted below at 59% is RPA – Robotic Process Automation – which, when combined with other AI methods previously discussed, such as NLP and ML, strive to automate intuitive and judgment-based responsibilities without the explicit human involvement. Previously, completing tasks manually would take time, often leading to human-

[34] https://www2.deloitte.com/us/en/pages/deloitte-analytics/articles/cognitive-technology-adoption-survey.html (p. 6 and 9 of the first downloaded survey) – Assessed on: 16.06.2024
[35] Same as no.34
[36] Same as no.34

error, as it can be overwhelming to stay on top of what needs to be done. Using AI-driven automation to perform repetitive tasks improves efficiency, which consequently leads to achieving higher profitability (Juan Perez, 2023).

Figure 1



Furthermore, when asking business leaders to list the benefits of AI implementation into their processes, it was found that companies seemed to not pursue cost-cutting as a major objective of AI implementation. In fact, the aim least frequently chosen by companies was "to reduce headcount through automation." (Anon 2017). [37] With all the findings considered, in today's digital economy, embracing innovation and leveraging technology are essential for companies aiming to remain agile, competitive, and resilient in the face of evolving market demands.

Implementation of automation through AI also enhances productivity, once the company's processes and workflows are established, further opportunities for automation can be identified (Coombs et al. 2020). Automating tasks like follow-up sequences help a business to maintain a good connection with customers, and paying bills saves time and assists in undertaking work that could have taken days to complete (Coombs et al. 2020). This allows team members to focus on important tasks that require their direct attention (Coombs et al. 2020). The integration of AI and machine learning in the development process allows for rapid prototyping, predictive modelling, and automation of routine tasks, significantly reducing the time-to-market and enhancing product quality (Coombs et al. 2020). As a result, companies can respond quickly to market changes, stay ahead of the competition, and deliver superior value to

[37] https://www2.deloitte.com/us/en/pages/deloitte-analytics/articles/cognitive-technology-adoption-survey.html (p. 6 and 9 of the first downloaded survey) – Assessed on: 16.06.2024

their customers. Implementing automated tasks reduces the risk of human error, saving both time and money (Melissa Johnson 2022).

Automating bookkeeping with software that imports charges with a click, eliminating manual entries. Automated drip campaigns enhance communication by regularly contacting prospects and current customers in your pipelines (Melissa Johnson 2022). This way, the use of automation apps for social media posts benefits not only the company, but also ensures timely content delivery for the customers (Melissa Johnson 2022). By increasing productivity in this way, it is ensured that the business continually progresses without anything being overlooked, and in the meantime achieving customer satisfaction.

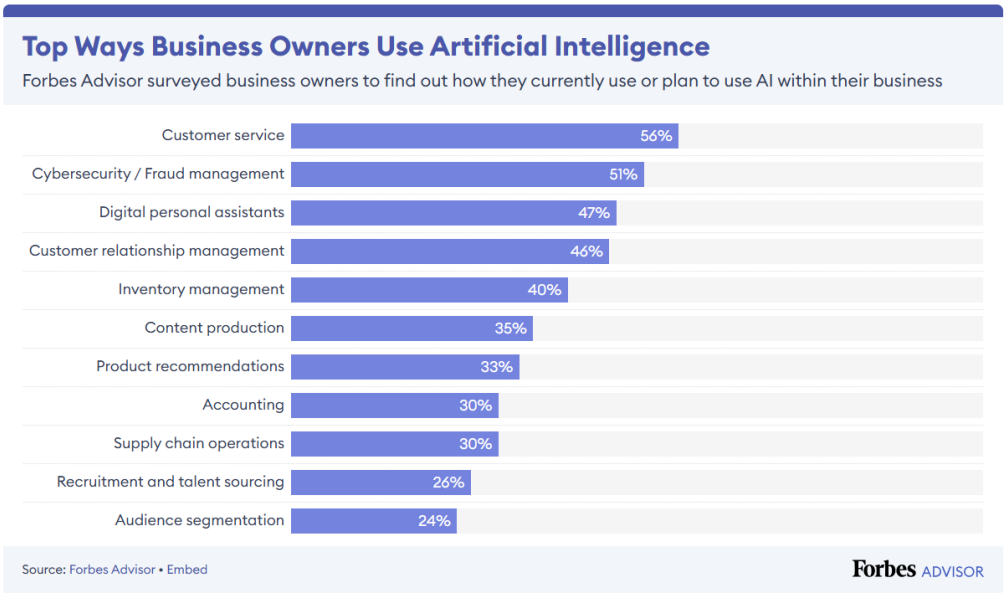
This could be seen in the very recent case of Adobe, whose shares skyrocketed 16% after results showing that Adobe's AI-implementation efforts were successful, "with senior executive David Wadhwani saying existing users were moving to higher-priced plans" (Anon 2024a) to gain access to their AI-powered option. Initially, some forecasts pointed that the kingpin in the market for editing tools for photos and videos, "could lose customers to AI startups such as Dall-E maker OpenAI that allow users to generate images with simple text prompts" (Anon 2024a).[38] This is a prime example of how the potential unwillingness to follow the trend of technology implementation can create issues with meeting the demand of customers, eventually leading to a hiccup in profitability results. After the company raised its annual revenue forecast given that more customers turned to its AI-powered editing tools, currently[39] at $528.81, the Adobe's shares have reached their highest level since March 14, and if this positive trend continues, it was estimated that "the company could potentially add more than $30 billion to its market value" (Anon 2024a). It would be of significance to potentially examine the difference in profitability, driven by customers, of companies which actively implement AI-tools, and those companies who take a more conservative approach when it comes to new technological implementations. As Morningstar commented on the case of Adobe, "rapid generative artificial intelligence adoption should help drive growth over the next several quarters"(Dan Romanoff 2024)[40], and future studies could address the aftermath of companies either implementing AI-powered tools, or risk falling behind peers. Moreover, the reluctance to implement new technologies and stay in line with technological advancements exposes businesses to increased cyber security risks and threatens their ability to keep data

[38] https://www.reuters.com/technology/artificial-intelligence/adobe-surges-ai-optimism-fuels-annual-revenue-forecast-2024-06-14/ Assessed at 16.06.2024
[39] At the time of writing.
[40] https://www.morningstar.com/stocks/adobes-strong-quarterly-results-drive-share-gains Assessed at 16.06.2024

stored safe. Legacy systems are more vulnerable to cyberattacks, putting sensitive data at risk and undermining customer trust (Kevin Buehler, Venky Anant, Tucker Bailey, James Kaplan, Mahir Nayfeh 2020)(ColorTokens Inc 2021).

In addition to the above-mentioned survey, a more recent questionnaire performed by Forbes in 2024, further emphasized the practical importance of AI-driven technologies in the view of surveyed companies (Haan 2024).[41] The respondents group consisted of 600 American business owners who currently use AI or plan to implement AI-related new technologies in the next six months. It was concluded that "nearly two-thirds (64%) of business owners believe AI will improve customer relationships" (Haan 2024)[42]. With such optimism for AI-tools integration, it can be suggested that the reluctance of other 'AI-pessimistic' companies to implement new technologies and stay in line with technological advancements exposes such companies to increased cyber security risks and threatens their ability to stay in competition in the highly competitive global market. Outdated systems are more vulnerable to cyberattacks (ColorTokens Inc 2021), putting sensitive data at risk and undermining customer trust, which is of significance, especially given that for the 'AI-optimistic' companies, the key target of AI incorporation for companies is deemed to be customer service, at 56%, as demonstrated below (**Figure 2**).

Figure 2

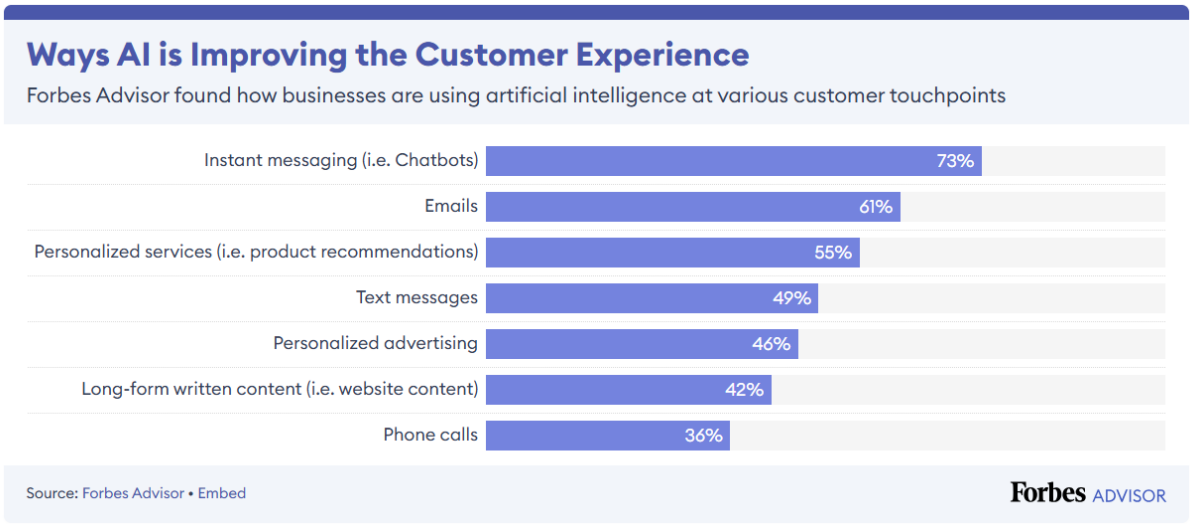


[41] https://www.forbes.com/advisor/business/software/ai-in-business/ Assessed at 16.06.2024
[42] Same as no.41

The Forbes Advisor survey showed that according to some companies, AI is actively enhancing customer service across various touchpoints, which is of significance for the retention of old customers, and the acquisition of new customers. For example, 73% of businesses use or plan to use AI-powered chatbots for instant messaging. This is in addition to "61% of companies utilizing AI to optimize emails, and 55% implementing AI for personalized services, such as product recommendations" (Haan 2024).

Referring to the above-mentioned survey again, it can be concluded that the majority of the respondents [companies] believe the deployment of AI will drastically benefit their line of business, with 64% of respondents expecting that AI will improve customer relationships and increase productivity, and 60% anticipating that AI will assist in driving sales growth (Haan 2024). The implementation of AI into the diverse customer interaction channels, customer service is becoming more efficient and personalized. Moreover, AI is viewed as an asset for improving decision-making (44%), decreasing response times (53%) and avoiding mistakes (48%) (Haan 2024). As shown below (**Figure 3**), AI-driven tools like chatbots, are the most widely used technique by companies at 73% when it comes to customer interaction (Haan 2024).

Figure 3



Having discussed the trend for AI-driven tools deployment, it can be concluded that companies are able to rapidly respond to market changes, stay ahead of the competition, and deliver superior value to their customers. The danger of not keeping up with technological

innovations on one hand, and the risks associated with the integration of technological innovation on the other hand, accentuates that both risks should be equally taken into consideration by companies when it comes to their goal of enhancing customer service. As will be discussed in the next section, to derive real benefits from technologies as comprehensive and powerful as AI, the company is required to have a clear-headed, balanced view on their capabilities, their strong and weak points, and adapt their operations accordingly.

2.3 The Benefits of Technological Implementation

One of the impacts of technological innovation has been the magnified enhancement of communication channels through the implementation of Artificial Intelligence, Machine Learning, and chatbots (Libai et al. 2020). The innovations in communication technologies have increased the number of ways in which customers can reach businesses and get an answer: from traditional phone calls or the necessity to show up to the company dedicated office in person, customers now can receive the desired feedback by email, tracking systems, and live chat. In other words, customers now have multiple channels through which to address a business (Kreiterling 2023). Aside from the advantages, it is crucial to note that the incorporation of new technologies must nevertheless be carefully considered, given the potential risks and threats technological intervention might pose (Kreiterling 2023).

The adoption of technologies has profoundly transformed the customer experience in the customer care industry. These technologies have helped the industry to grow evolve in many different and exciting ways. The following are some examples of how technology has evolved customer's journey and satisfaction:

1. Provide 24/7 Customer Support: Offering round-the-clock human call centre support is often too costly for many businesses. Chatbots provide a cost-effective solution, allowing companies to offer 24/7 assistance to customers without incurring unsustainable expenses (Aishwarya Gupta 2020).

2. Help Customers Find Answers Faster: While FAQs are useful, they can be overwhelming due to their comprehensive nature. Chatbots streamline this process by enabling customers to quickly find answers to their questions without sifting through extensive pages of information (Ahmad et al. 2018).

3. Ease Purchase Decisions: Chatbots assist customers in understanding their options before they interact with a customer service agent, which is especially helpful when seeking price quotes. This is increasingly important as customer demographics shift. While nearly 90% of people currently prefer speaking to a live agent, 75% of millennials avoid phone calls, favouring faster, more efficient communication methods (Anon n.d.).[43]

4. Reduce Customer Frustration: Optimized self-service programs, including chatbots, help address simpler customer queries independently, reducing the overall traffic on phone lines. This results in shorter wait times for more complex issues and improves employee engagement by allowing customer service agents to focus on more challenging and deep problems. Research from Gartner indicates a significant reduction in call, chat, or email inquiries (up to 70%) following the implementation of virtual customer assistants (Anon n.d.).[44]

The benefits derived from AI implementation usually include increased efficiency and productivity, cost savings, as well as improved accuracy, and competitive advantage, some other advantages include further innovation and the environmental impact – both of which are also of significance when it comes to serving the customers (Kreiterling 2023). Although some of the advantages and risks associated with the incorporation of new technologies were discussed in the previous sections, it is also noteworthy to note the below points, favouring the tech-incorporation in terms of customer service.

One of the key advantages is that access to advanced technologies fosters innovation by enabling the development of new products, services, and business models by companies, enabling them to serve their customers better (Kreiterling 2023). One of the exciting examples is AI- powered 3D printing technology, which includes the optimization of design and production (Talaat and Hassan 2021). By implementing sophisticated AI algorithms to create optimized product designs given specific restrictions, such as materials, size, and function, this innovation allows for rapid prototyping and innovation in product design (Füller et al. 2022). It all comes down to the flexibility and agility granted to companies, striving to become more adjustable, adapting quickly to market changes and customer demands, by deploying modern features based on user [customer] feedback.

[43] https://www.ubiquity.com/resources/cx-tech/digital-technology-impact Assessed at 17.06.2024
[44] Same as previous

With the on-going talks about massive concept of environmental impact becoming increasingly substantial for some customers, green AI-driven technologies and energy-efficient solutions help advance the field of sustainability of business operations. Renewable energy solutions like solar panels reduce reliance on fossil fuels and decrease carbon footprints, while AI tools optimize "the storage and distribution of energy from renewable sources" (Consultancy Services Team 2023)[45], in the meantime considering multi-faceted aspects like demand, supply, price, and grid conditions. Consequently, "AI algorithms determine the best times to store energy, when to release it, and how much to distribute" (Consultancy Services Team 2023)[46]. With more customers (who are sometimes also business owners) being more lenient to pay more or simply choose a more sustainable service-provider, AI improvement of the efficiency of renewable energy sources and reduction of greenhouse gases will continue to play a significant role in the sector.

Moreover, AI-driven cybersecurity solutions detect and mitigate threats in real time, enhancing organizational security (Him 2024). The new technology is increasingly being leveraged in the finance sector to bolster defences against cyberthreats, since the complexity and sophistication of cyberattacks necessitate advanced and adaptive security measures, and AI provides exactly that (Samuel Onimisi Dawodu et al. 2023). AI can analyse vast amounts of data in real-time to detect anomalies and patterns of cyber threats, by way of ML, which monitors network traffic to identify unusual patterns that may signify an intrusion (Samuel Onimisi Dawodu et al. 2023). Hence, AI systems predict potential vulnerabilities and pre-emptively address them before they are exploited (Samuel Onimisi Dawodu et al. 2023). When it comes to finance, AI systems detect fraudulent activities by analysing transaction patterns and flagging suspicious behaviour, which, as will be seen in the case of Revolut, can sometimes affect customer relations. By monitoring real-time transactions, AI determines patterns that deviate from the usual norm. AI algorithms evaluate the risk level of transactions, users, and systems, enabling proactive risk management, and provides recommendation as to how to mitigate the associated risks. Therefore, AI provides a dynamic approach to improving cybersecurity, especially in the finance sector (Samuel Onimisi Dawodu et al. 2023). The ability to analyse colossal amounts of data, point out the anomalies, and automate responses makes AI an invaluable tool in the fight against cyber threats. However, it is quintessential to continuously

[45] https://www.fdmgroup.com/blog/ai-in-energy-sector/ Assessed at 16.06.2024
[46] Same as previous.

update and refine AI models to stay up-to-date and adapt to evolving threats and ensure the protection of financial systems and data.

Technology has revolutionized customer interactions, profoundly enhancing the customer experience (Libai et al. 2020). Personalization is now possible through tools like ML, allowing businesses to tailor products and services to the individual preferences of each customer. Enhanced communication channels through tools like chatbots enable real-time engagement, while streamlined service delivery and omnichannel strategies ensure a more efficient and cohesive experience (Ahmad et al. 2018). Self-service options empower customers to independently resolve issues, and data-driven insights inform better decision-making (Ahmad et al. 2018). Not only beneficial for the company itself, but the integration of technological innovations has also led to increased convenience and flexibility for customers, faster response times and resolution of issues, as well as greater accessibility for customers preferring different communication methods. The aim and the usual result of AI integration are the reduced load on customer service agents for the company, as well as faster issue resolution for the customer.

2.4 The Challenges and Limitations of Technological Implementation

Given that companies have been utilising the technological innovations to give themselves an edge in the competitive markets, by creating new technologies and enhancing old business models, companies became more efficient and effective in achieving the set goals of the organization. Although the rapid advancement of technology mostly aims to assist, it also poses some negative side effects, of which a company must be particularly aware of and take into serious consideration before deciding in favour of technological implementation. In this section we will delve into the disadvantages of technological implementation, determine the possible reasons why technological innovation poses challenges and how come it also aids entrepreneurs in achieving their goals.

The impact of the implementation of technological innovation on customer service through AI-driven chatbots is especially demonstrated in finance and logistics, as will be discussed in chapter 3. This way, technology accelerates product innovation, adapting to customer needs. However, these advancements also pose challenges, such as data privacy

concerns and the necessity for continuous technological adaptation (Deepa and Abirami 2024).[47]

When it comes to data privacy, one must remember that the collection and use of large amounts of personal data of customers by technologies like AI and social media platforms raise significant privacy issues (Anon 2018).[48] This is especially true for the financial sector, where the stakes are significantly high. AI algorithms alter finance by predicting trends and personalizing financial experiences for the customers. Yet the dilemma lies in the fact that transparency in the financial service industry is key, hence the financial service providers should be careful to balance the effectiveness of AI with transparency. Therefore, this "focus on clarity underscores the importance of data governance in AI, which involves various licensing frameworks" (Dupuy 2024)[49] This, in turn, poses challenges for companies implementing new technologies, as they would be required to navigate the complex and constantly evolving landscape of regulations (Anon 2018)[50].

In addition to the risks associated with data privacy and cyberattacks risks, the danger also lies with increased reliability and dependency on new technologies, as this can lead to significant disruptions if systems fail or experience downtime, leading to customer dissatisfaction (K. R. 2018). Crucially, the excessive reliance on AI can lead to a reduction in human oversight and intervention, potentially causing issues to go unresolved or improperly handled, an example of such will be discussed in chapter 3. Major customer issues might get lost, mishandled, which also prolongs the time it takes for solving customer complaints, if there's no human agent to review and address escalations effectively. This is especially true given that there is still some room for improvement for AI-driven tools in the field of customer service: the limited understanding of customer's context, nuance, and complex queries often leads to inadequate responses (Larivière et al. 2017). Oftentimes, customers really require a 'human touch' in some of the problems they are facing with the service provider, since, for instance, a customer service chatbot might not fully comprehend a customer's detailed problem or provide a solution that doesn't address the specific issue, as in the *case of Revolut* discussed at a later stage.

[47] https://midatlantic-cx.com/blog/the-impact-of-technology-on-customer-experience
[48] https://gdpr-info.eu/ Assessed at 23.06.2024
[49] https://www.reuters.com/legal/transactional/legal-transparency-ai-finance-facing-accountability-dilemma-digital-decision-2024-03-01/ Assessed at 23.06.2024
[50] Same as no.47

Crucially, exploring the ethical implications of technological advancements, particularly of AI in terms of data privacy will be imperative, as businesses are nothing if their customers are not able to trust them. Ethical and bias concerns also take place, as AI and ML algorithms can perpetuate and amplify existing biases if not properly managed and monitored, calling for diligent monitoring and some additional work on improvement in the field. Bias in facial recognition technology, for instance, has led to higher error rates for certain demographic groups, leading to problems "such as racial or gender discrimination, socioeconomic disparities, or unfair treatment based on personal characteristics" (Ghosh 2023), henceforth raising ethical concerns. Addressing these challenges requires a multi-faceted approach, including robust cybersecurity measures, steady patterns of training, regulatory compliance, and promoting a culture of adaptability and swift implementation of innovation.

Crucially, inaccurate assessment of company's operations and clientele, and extreme reliance on AI-driven tools can come off as a detriment to the field of customer service for the companies. The case of Revolut discussed in the next section serves as a prime example of when the implementation of AI and ML processes has compromised the relationship between a company and its' clients.

Therefore, balancing competitiveness with cost-effectiveness is vital, especially in the early stages, to create quality products or services efficiently and offer the best to customers. It is already a cost-intensive activity to open a business, so business leaders must think thoroughly before making commitments that would cost them even further investment.

This way, technological innovations like AI, ML, and chatbots have made customer care more efficient, responsive, and practically tailored to individual needs of the customers, leading to higher customer satisfaction and loyalty. However, it also requires businesses to continuously adapt and integrate new technologies to stay competitive and meet evolving customer expectations.

3. Case Studies and Industry Analysis

In this section of the paper, we will analyse case studies of technological integration as well as give some industry analysis and trend. We will firstly delve into the case study in fields of finance and logistics, we have chosen these industries for 2 reasons, firstly to have diversity and furthermore these industries are very customer interactive. Moreover, we will give an overview of trends and statistics related to our paper.

3.1. Case studies of technological integration

The case study of Revolut and DHL which are well known entities within their respective sphere and industry, will provide the real-life examples of how technological innovations and integration has influenced their customer care activities and practices. As well as get the opportunity to observe in real life how technological innovations aid and challenge the customers and businesses.

3.1.1. Financial Technology: Revolut

When considering finance, the role of automation and Artificial Intelligence should not be disregarded. The integration of AI and automation in customer service has resulted in 24/7 customer support availability, which has consequently reduced wait times with instant responses to common queries. In addition, the ability to handle a high volume of inquiries simultaneously and allowing the employees of the business to handle more complex issues. One of the most leading and ground-braking FinTech companies Revolut has implemented "AI-based fraud detection system… [which]… employs sophisticated machine learning algorithms to analyse vast amounts of transaction data, identifying patterns and anomalies that indicate potentially fraudulent activities"(Anon 2024b).[51] Crucially, in this case, AI "has prevented scams worth over €550 million, contributing to a 30% reduction in fraud losses related to card scams" (Anon 2024b).[52] Additionally, the neobank offering a wide range of online banking services, also offers a live in-app chat support, whereby customer's queries are addressed by a chatbot.

The FinTech has introduced a new AI-scam feature to its over 35 million customers in February 2024. The system uses sophisticated machine learning to protect its clients, by determining the high likelihood of if the customer making a card payment is seemingly part of

[51] https://aiexpert.network/case-study-revoluts-ai-revolution/ Assessed at 17.06.2024
[52] Same as previous.

a scam, and if so, decline their payment. Ever since the launch of the new option, "Revolut has observed a 30% reduction in the fraud losses resulting from card scams where money has been sent for investment opportunities" (Anon n.d.).[53] This is a significant beneficial AI-input to the customers, provided that the payment was, in fact, a scam, and not a 'necessary payment' that is only deemed as a scam by the incorporated technology. Nevertheless, despite the availability of the 24/7 in-app customer support being of convenience, the "luck" of talking to a real human being during the use of digital banking is necessary to address more complex issues, which the chatbot naturally often fails to do.

A staggering example of technological innovation used by this neobank turning not in the customer's favour is the scandal of 2020, whereby the Revolut accounts of some customers have been frozen for months, as the semi-automated compliance procedure came into play. Revolut has been using the automated AI -driven compliance algorithms to adhere to the UK 'Money Laundering, Terrorist Financing and Transfer of Funds Regulations 2017' (Marks 2019).[54] In short, The Compliance team of Revolut deal with all the exceptions that aren't handled by FinTech's automated compliance algorithms, and it is only the exceptional cases that are handled so that "a human is making the final decision (presumably an uncontactable 'compliance agent' partner)" (Marks 2019).[55] With some customers stranded abroad, unable to retrieve their funds due to algorithms and chatbot automated processes, the situation has escalated resulting in legal actions building up against Revolut (Kimathi 2023),[56] with dissatisfied customers accentuating that "Revolut did not have a telephone number. Instead, it had an in-app chat facility that failed to work. A conversation would be started but not finished."[57]. In response to customer complaints, the market-leading FinTech bank encouraged its' users to request support via the in-App chatbot support feature, later stating that they were "having a heavy demand of chats and requests" (Hinchliffe 2020)[58] which was creating delays in getting hold of an agent. Such ambiguity of promoting the 'ground-braking' technological innovation, yet that, at the same time, being the reason of the deteriorating of the relationship with the customer, has forced many customers to walk away, closing their accounts

[53] https://www.revolut.com/en-NL/news/revolut_launches_ai_feature_to_protect_customers_from_card_scams_and_break_the_scammers_spell/ Assessed at 17.06.2024
[54] https://www.zdnet.com/finance/revoluts-clumsy-automated-fintech-bank-compliance-results-in-frozen-accounts-and-lack-of-customer-service/ Assessed at 17.06.2024
[55] Same as no.54
[56] https://www.fintechfutures.com/2020/09/revolut-faces-lawsuit-in-romania-over-blocked-account/
[57] Same as no.55
[58] https://www.fintechfutures.com/2020/09/revolut-customers-got-paid-late-last-week-after-technical-glitch/ Assessed at 17.06.2024

with Revolut, and turning their funds to more traditional banking institutions, viewing them as more secure and 'customer-friendly'. A single breach has the power to destroy customer trust, ruin the brand reputation, and inflict irreparable damage. While the technology industry continually innovates to counter-evolving threats, there are cases where the integration of new technologies can become a threat to customer relationship on itself.

The non-existent address or phone number of Revolut's office, combined with the impossibility of having a simple face-to-face or phone conversation with an employee of this FinTech, is a vivid example of failure of a company to find a balance between a "helpful" implementation of AI-driven mechanisms and number of employees. The "clumsy" implementation of the newly available technological tools by a neobank has overestimated the power of technology, which in turn led to a detriment in customer relations. Since, at the end of the day, who would trust an 'unreachable human' and robot to handle their funds, especially if it is a large amount of money?

3.1.2. Logistics: DHL

A profound effect of Artificial Intelligence is also evident in the field of logistics, as companies are optimising their supply chains, and the interface of some logistics websites and application is increasingly becoming more user-friendly to the customer. From warehouse operations, to managing unforeseen disruptions, more often do logistics companies tend to implement AI in their day-to-day operations.

The industry of logistics is known to be prone to several risks in their operation: from natural disasters to labour shortages, by providing visibility given its predictive capabilities, AI helps to mitigate the risks involved, essentially serving the personnel, which is serving the customer. Known to be a fast-paced industry, logistics is assisted by the AI real-time monitoring of warehouse operations, and data provided is of significance when it comes to improved controls of warehouse management. This in turn has significantly improved traditional warehouse operations, and has "transformed traditional warehouses into efficient, high-tech distribution centres that can keep up with the speed of fulfilment needed in today's consumer environment and help improve the customer experience" (Bart De Muynck 2023)[59].

[59] https://www.fintechfutures.com/2020/09/revolut-customers-got-paid-late-last-week-after-technical-glitch/ Assessed at 17.06.2024

By improving data quality and providing valuable insights by using predictions (such as an ETA of the shipment) or forecasts, AI also provides the real-time visibility for the companies, which can consequently be shared with partners and, most importantly, customers. In freight-forwarding, the task of informing the customer about the state/location of their shipment is also greatly simplified by the AI-powered tracking system on the companies' websites (Anon 2023a).[60] This way not only can the customer view the location and steps of their order, but this also diminishes the workload for the operators in charge of each respective shipment. With less workload, the 'human operators' can also be adding a more personal touch, monitoring some 'problematic' shipment of goods more diligently, providing customers with a more frequent, detailed update about the state of routing, for example. This significantly increases the trust of a customer, improves collaboration and the overall resilience of the supply chain.

It can therefore be determined that the effective communication between the numerous stakeholders involved in the process to get the product from point A to point B and supply chain risk management remain a crucial focus of many freight-forwarding companies' investments.

With digitalisation becoming a key aspect for some of the leading logistics companies, Deutsche Post DHL Group has allocated "2 billion euros until 2025 to the goal. Across its global network of warehouses and factories, 5,000 robotic order pickers now pluck parcels from shelves, increasing the number of items picked per hour by 180%"[61] (LaBrecque 2024). With the necessary agility of the freight-forwarding industry, the company believes that "this allows workers to "focus on value-adding work that calls for human intelligence" and relieves them of physical stressors" (LaBrecque 2024). As stated by Tim Tetzlaff, the Global Head of Accelerated Digitalization of DHL Supply Chain: "The more we can use robots to complete repetitive or distant tasks in highly predictable, structured environments, the more we free up our employees to leverage their unique human capabilities" (Anon n.d.).[62] In the field of logistics, with hundreds of people involved for the transportation of a single shipment, AI assists the concerned employees of the companies, this way also assisting the interested party – the customer – to get the goods moved from one country or city, to the destination.

[60] ChatGPT and the Like: AI in Logistics | DHL Freight (dhl-freight-connections.com) Assessed at 16.06.2024
[61] https://www.reuters.com/sustainability/climate-energy/logistics-firms-plot-sea-change-sustainability-through-ai-automation-2024-01-04/ Assessed at 17.06.2024
62 Tim Tetzlaff, Global Head of Accelerated Digitalization, DHL Supply Chain at https://www.dhl.com/global-en/delivered/digitalization/ai-in-logistics.html Assessed at 17.06.2024

A sophisticated process on the inside, some customers fail to understand the complexity of the freight-forwarding operations, and this is where AI-driven tools simplify the procedure, not only for the customer, directly or indirectly affected. For instance, by ensuring that the goods are placed accurately on the conveyor belt and dealing with exceptions as they arise, "AI-powered sorting robots are becoming a game-changer, increasing sorting capacity by some 40% or more." (Anon n.d.)[63] Although what might seem as irrelevant to the customer, the precision is of crucial importance in a logistics operations processes, where during any step of the way things could go wrong. Operating with the trusted shipment in an accurate, clear, transparent, way is key for customer retention, and generally a good reputation of any logistics company.

Of course, there is still a long way to go for the logistics companies to become fully digitalised, and some are still yet to reach the digital maturity, which can only be done via the change in culture and mindset (Anon n.d.).[64]

3.1.3. Comparison of Case Studies

The case studies of Revolut in financial technology and DHL in logistics illustrate the significant impacts of technological innovations on customer care practices. Both companies have utilized automation and AI to improve efficiency and service quality, albeit with different outcomes and challenges. Revolut's integration of AI in customer service has enabled 24/7 support and rapid fraud detection, preventing scams worth over €550 million and reducing fraud losses by 30%. Chatbots handle high volumes of inquiries, freeing human agents for complex issues. However, despite these advancements, Revolut faced backlash for over-reliance on automation. In 2020, prolonged account freezes due to AI-driven compliance checks led to significant customer dissatisfaction and legal actions. The lack of direct human contact exacerbated these issues, highlighting the need for a balanced approach.

On the other hand, DHL uses AI to optimize supply chain and warehouse operations, improving efficiency and reducing risks. AI-powered tracking systems provide real-time shipment visibility, enhancing customer satisfaction and reducing operational workload. DHL's significant investment in robotics has increased efficiency, with robotic systems boosting item pick rates by 180%. This approach allows human workers to focus on complex tasks, improving

[63] Same as no.61
[64] https://adnavem.com/blog/digital-transformation-slow-in-logistics-compared-to-other-industries_Assessed at 16.06.204

employee engagement and customer service. However, achieving full digital maturity requires a cultural shift. DHL aims to balance AI's efficiency with the human touch necessary for complex customer interactions.

Revolut's experience shows the risks of over-reliance on technology, whereas DHL's approach of augmenting human roles with AI has maintained customer trust and satisfaction. AI's role in fraud prevention (Revolut) and risk management (DHL) is crucial, but human oversight is necessary to handle exceptions and maintain trust. Technological integration must align with customer needs. While AI can enhance efficiency, human interaction is essential for addressing complex issues and building lasting relationships. Balancing technological innovation with human oversight is key. Companies must remain responsive to customer feedback and refine their use of technology to meet evolving demands.

Revolut and DHL demonstrate the transformative impact of technology on customer care. Success lies in utilization of technology to enhance, not replace, human elements, ensuring a balance that fosters efficiency and customer trust.

3.2. Analysis of industry trends and statistics

The customer service industry is rapidly evolving due to significant advancements in technology. These changes are enhancing the efficiency and effectiveness of customer service operations, leading to improved customer experiences. This section analyses current industry trends and key statistics, showcasing the transformative impact of these technological innovations.

Understanding what is and what is ahead of us is a strategic move which we must implement in all aspects of business; therefore, it is important for us to present the data of studies where customer experience was measured in respect to the technological implementation within the industry. We can see that tool such as ChatBots and other self-service technologies are meeting the demands the of the users as study shows that “81% of customers try to resolve their concerns themselves before contacting a customer service rep, and more shoppers are expecting the ability to handle their own cases via a self-service portal.” (Jonathan Sidor 2023).[65] As result of this demand for self-service customer technologies more

[65] https://getzowie.com/blog/customer-service-technology Assessed at 18.06.2024

and more businesses are implementing them and trying to find the perfect balance of where to intervene with a human agent.

We can see all the signs are telling us that the world of customer care and in general the manner in which customers are being handled, is moving towards the integration AI and similar technologies. According to Gartner Digital Markets' 2024 Tech Trends Survey, "With more ways to shop than ever before, retailers seek tools that help them meet the evolving customer expectations. The rise of phygital commerce, frictionless delivery, mobile and social shopping, customer service chatbots, AI and hyper-personalization, or metaverse experiences, is intensifying technology adoption in the retail sector." (Bazaman 2023).[66] We can see that all the latest research are pointing to one thing and that is the integration of technology, but it is also emphasised that we must know where to draw the line with the tasks which is delegated to the hands of technology.

It is worth mentioning that after the Covid-19 people have become very reliant on technology to solve their problems, in PwC's Global Consumer Insights Pulse Survey published in 2021, 50 % of respondents said they had become more "digital" as a result of the pandemic (Riveiro 2022),[67] Furthermore, the contact centre and CRM markets is expected to grow 4.64% through 2024, and it is predicted that the growth will surpass the growth in in-house services (Riveiro 2022).[68] Research shows that the increase in demand in technological integration after Covid-19 has increased and companies have to listen to what is demanded of them

[66] https://www.gartner.com/en/digital-markets/insights/2024-tech-trends-in-retail Assessed at 18.06.2024
[67] https://www.pwc.de/en/customer-transformation/customer-engagement/customer-service-and-engagement-study.html Assessed at 18.06.2024
[68] Same as no. 66

4. Conclusion

The research delved into the transformative impact of technological innovation on the customer care industry, examining various technologies such as artificial intelligence (AI), machine learning (ML), and chatbots. The findings highlight that these technologies significantly enhance the efficiency, personalization, and predictive capabilities of customer service operations. AI-powered chatbots, for instance, can handle a high volume of inquiries simultaneously, providing instant responses and improving customer satisfaction. Additionally, ML algorithms analyse customer data to predict issues before they arise and offer tailored recommendations, thereby enhancing the overall customer experience. Despite these advancements, the integration of new technologies poses challenges such as the need for significant investment, potential job displacement, and concerns over data privacy and security.

To fully capitalize on technological innovations in customer care, businesses should strategically invest in AI and ML technologies to automate routine tasks and gain customer insights, freeing human agents for complex issues. Prioritizing data privacy and security is essential to build trust and ensure compliance with regulations. Comprehensive training programs for employees can mitigate job displacement and enhance their adaptability to new technologies. Maintaining a human touch in interactions remains crucial, balancing automation with personalized, empathetic service. Additionally, businesses should leverage customer feedback from social media and other platforms to continuously improve service strategies.

The success of the modern technological tools, such as artificial intelligence (AI), machine learning (ML), big data analytics, chatbots, and customer relationship management (CRM) systems have proved that they are here to stay, especially during and after the COVID-19 pandemic.

The implementation of new technology is the combination of data, technology and ways of working, which assists both individuals and companies to automate, connect, innovate and make better-informed decisions. From the perspective of modern businesses, the best way to better meet the needs and enhance the experience of customers, consumers and employees is to proceed hand in hand with the new technology.

The multi-faceted utilization and innovation of technology has paved the way for companies to advance their areas of service, especially in the crucial field of customer care. Customer service is fundamental to building a successful business, and the implemented technological innovation now increasingly supports direct connection between the business and

its customers, by driving customer satisfaction, loyalty, consequential to revenue growth, while also enhancing brand reputation and providing valuable market insights.

The modern means through which the technological innovations in customer care are utilized, has tremendously contributed to the concept of 'putting the customer first', so that the AI-powered tools ensure that company slogans like "Do what you can't" (Anon 2023b)[69] and "Live In Your World, Play In Ours" (Anon 2021)[70] have further assisted to centre the importance of customer service accordingly.

[69] https://news.samsung.com/za/samsung-celebrates-women-who-do-what-they-cant Assessed at 18.06.2024
[70] https://en.wikipedia.org/wiki/PlayStation#:~:text=The%20brand%20is%20produced%20by,Entertainment%2C%20a%20division%20of%20Sony.&text=%22Play%20has%20no%20limits.%22 Assessed at 18.06.2024

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II. List of Graphs: