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Chatbots and virtual assistants vs. human agents in IT customer support

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ABSTRACT

While the integration of technology in customer support continues to thrive, its application in IT settings displays exciting advancements but severe limitations. For years, companies have had to balance operational efficiency with quality human interactions in providing customer support services across the globe. In the interconnected world today, end-user transparency and a seamless user experience are more critical than ever. IT customer support resides within a complicated system of technologies and human-set measures that vary across users and technological capabilities.

This master's thesis goes beyond the dynamics of chatbots and virtual assistants against human agents to research the combined impact of these service providers on customer experiences and operational efficiency. The research focuses on the proportionality of automated and human services in a Ukrainian-Swedish IT outsourcing company to offer an indicator for IT support strategies.

This study explores various phenomena through quantitative surveys and qualitative interviews. It examines user satisfaction, the real success quotient of service technologies, and strategically customized inclusion in serious business arrangements. The focus areas cover enhancing communication efficiencies, making customer interaction deeper, and providing more advanced technology.

Ultimately, this thesis predicts a future where technology and human service agents merge to produce more user-friendly, empathetic, and intuitive IT customer support. AI and machine learning skills, coupled with other managerial policy designs will help stakeholders meet users' needs comfortably and optimally exceed user expectation levels, developing a responsive engaged customer support system.

Keywords: Chatbots, Virtual Assistants, Human Agents, IT Customer Support, Customer Experience, Service Design, Human-centricity, Artificial Intelligence (AI).

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1. INTRODUCTION

1.1. Background of the research problem

The evolution of customer support services has far-reaching relevance for digital-age businesses and organizations. Communication channels, customer expectations, and the role of technology in service provision are universal trends that do not affect only one industry or a particular region. Big and small businesses are interested in the convergence of these trends, and virtually every customer domain is affected. Understanding and handling these trends require careful application of Service Design principles that allow organizations to increase the quality of the user experience through the optimal design of people, processes, and technology.

More industries embrace digitalization to enable more efficient customer support, and this research can be used to make critical decisions and strategies. The interaction between chatbots, virtual assistants, and human communication in the context of Information Technology (IT) reaction to customer support establishes a model that may be applied in other industries facing the same phenomena. Service Design allows organizations to build service trend charts that balance automated and human involvement, ultimately achieving a better customer experience.

This research is conducted within the context of a Ukrainian-Swedish IT outsourcing company. The organization provides an extensive portfolio of customer support services to its clients, operating at varying scales and complexities. Given the organization's unique position, it served as an excellent venue for researching the subject topic, where different client support scenarios occur. The insights discussed in this research are not specific to the organization but may affect many IT outsourced companies, particularly in Ukraine and other outsourcing regions.

This research will illuminate how business organization can design IT customer support processes using Service Design to accommodate chatbots, virtual assistants, and human intelligence.

This research contributes to several areas of study, with a particular emphasis on Service Design:

Customer support services: it adds to the evolving literature on customer support services by examining the impact of chatbots, virtual assistants, and human interactions on customer satisfaction and loyalty.

Service Design: this study contributes to Service Design by addressing the design of customer support processes that optimize the use of chatbots, virtual assistants, and human agents to deliver an enhanced customer experience. It investigates the design of Artificial Intelligence (AI)-driven systems, and service workflows.

By shedding light on these areas of research, this thesis seeks to provide practical guidance and theoretical contributions that can inform the strategies and decision-making processes of businesses in the field of customer support services, particularly IT outsourcing and the integration of AI technologies. Service Design principles play a critical role in creating effective and user-centered support systems.

1.2. Definition of key terms

This thesis provides definitions for several terms pertinent to the subject matter. They are presented below.

Information Technology (IT), as delineated by the seminal work of Brod (1984), encompasses the use, development, and management of computer systems and technology to handle information for businesses and organizations. This domain includes software, hardware, and network-related aspects, playing a crucial role in modern digital infrastructure and innovation.

IT customer support refers to the service provided by IT companies to assist their customers with technical problems and inquiries, utilizing various channels such as phone, email, live chat, and self-service portals (Smith, 2020). This essential aspect of IT management ensures prompt resolution of issues and enhances overall customer satisfaction in the rapidly evolving digital landscape.

Customer Experience (CX) refers to the overall impression that a customer has of a company, product, or service (Smith & Johnson, 2020). It is influenced by various factors, including the quality of customer service, the ease of use of products or services, and the overall brand perception (Smith & Johnson, 2020).

Customer Satisfaction is the level of contentment and happiness that customers experience after interacting with a product, service, or support (Johnson & Smith, 2021). It is a critical metric for evaluating the success of customer support efforts (Johnson & Smith, 2021).

Retention of the Customer focuses on strategies to keep customers loyal and engaged with a company's products or services, as defined by Anderson et al. (2019). It's an essential aspect of maintaining a strong customer base (Anderson et al., 2019).

Service Design is a multidisciplinary approach aimed at enhancing customer experiences by optimizing services through strategic design of people, infrastructure, and communication (Stickdorn & Schneider, 2011). It involves understanding customer needs, iterating service prototypes, and aligning the service system with the customer journey to create user-centric experiences (Moritz, 2005).

Natural Language Processing (NLP) is a subset of artificial intelligence (AI) that enables computers to understand, interpret, and generate human language, according to Brown & Miller (2019). It plays a critical role in applications like language translation, chatbots, and speech recognition (Brown & Miller, 2019).

Machine Learning (ML) is a branch of AI that focuses on algorithms enabling computers to learn from data, make predictions, and enhance performance without explicit programming (Johnson et al., 2020).

Artificial Intelligence (AI) encompasses technologies designed to create intelligent systems capable of tasks requiring human-like cognitive functions, thus improving automation and decision-making (Smith & Patel, 2018).

The Artificial Intelligence Markup Language (AIML) is a specialized markup language designed for creating software agents or chatbots that simulate human-like conversations (Wallace, 2003). AIML structures the patterns of dialogue and responses, enabling developers to script conversations in a way that allows chatbots to engage users with realistic interactions. This language plays a critical role in the development of conversational AI, facilitating more natural and intuitive user experiences (Wallace, 2003).

Human-computer interaction (HCI) is an interdisciplinary field focused on the design and use of computer technology, particularly as it interacts with human behavior (Dix et al., 2004). This domain explores how humans engage with computers, aiming to improve the usability

and accessibility of computer systems. Effective HCI helps to create interfaces that are intuitive and responsive to user needs, enhancing the overall effectiveness of technology in daily activities (Dix et al., 2004).

The Net Promoter Score (NPS) is an established metric utilized by businesses to measure customer loyalty and predict business growth (Reichheld, 2003). By asking customers to rate the likelihood that they would recommend a company's product or service to others, NPS categorizes respondents as Promoters, Passives, or Detractors. This simple yet effective system helps companies understand the customer experience and align their strategies accordingly (Reichheld, 2003).

Knowledge Base (knowledge management) is an organized repository of information used by computers for efficient storage and retrieval of knowledge (Lee & Kim, 2021). IT support tasks like problem-solving and decision-making in AI systems (Lee & Kim, 2021).

Chatbot is a computer program that simulates conversation with human users (Garcia & Wang, 2022). Chatbots are typically powered by NLP and ML algorithms, allowing them to understand and respond to a wide range of human language inputs. They are increasingly used in various industries, including IT customer support, for automating routine tasks and providing 24/7 customer service (Garcia & Wang, 2022).

AI-Powered Chatbots use artificial intelligence to enhance their functionality (Chen & Li, 2020). These chatbots can learn and adapt over time, enabling them to provide more personalized and accurate responses to customer queries (Chen & Li, 2020).

Virtual Assistant is a software application that offers personalized assistance to users (Jones & Smith, 2019). VAs can perform a variety of tasks, such as setting alarms, managing calendars, making appointments, handling customer service requests, providing technical support, and offering personalized recommendations (Jones & Smith, 2019).

1.3. Selection of the topic, motivation in terms of the topic

The pace of life has significantly accelerated with the emergence of online services. Communication channels and the provision of customer service have also undergone substantial changes. In the past, customer service primarily took place face-to-face or over the phone. However, with the advent of the internet, a multitude of alternative channels for accessing customer service have developed, such as email, chat interfaces, and feedback

forms. Simultaneously, the number of channels through which users can progress through the sales funnel has increased. Customer service expectations have also undergone profound transformations.

Previously, it was sufficient for a customer support representative to resolve your query through interaction, and the number of interactions was not critically important. However, customer expectations have evolved significantly. Nowadays, it is expected that services will be provided in a channel that is convenient for the customer and at the speed of a click. Whereas, in the past, customer service standards allowed for responding to the first chat question within 30 seconds, users are now likely to consider the response slow if it takes more than 10 seconds. All of these changes have led to the emergence of a need for chatbots when dealing with a high volume of inquiries to reduce the cost of customer support staff.

Chatbots can promptly provide answers, sort inquiries, and prioritize them for customer support specialists. With the development of modern AI technologies, chatbots could potentially engage in full dialogues with customers and resolve their issues. However, based on my experience, after interacting with a chatbot, customers often request assistance from a human representative. This raises questions about whether this preference is linked to insufficient AI and communication algorithm development or stems from negative experiences customers have had before this point. This work also aims to address questions about the ideal combination of humans and chatbots to deliver the best customer experience.

1.4. Research goals and research questions

The preliminary research questions for this thesis are as follows:

> What are end-users perceptions of chatbots and virtual assistants, and how effective are these technologies in resolving IT customer support issues?

This question aims to explore user perceptions of chatbot and virtual assistant technologies and assess their effectiveness in addressing and resolving customer support issues, thereby contributing to the understanding of these technologies' impact on the user experience in IT support settings.

> How might organizations balance the strategic integration of chatbots, virtual assistants, and human agents in IT customer support to maximize their ability to impact user experience and boost efficiency?

As organizations strive to balance technological advancements with human interaction, it is imperative to explore strategies for harnessing the synergies between chatbots, virtual assistants, and human agents effectively. This question seeks to uncover best practices, frameworks, and approaches to enhance the coexistence and collaboration of AI-driven systems and human support agents in IT customer service.

The primary objectives of the research for the thesis are seeking answers to the above examination through the following angles:

Determining the end user's perception of chatbots and virtual assistants regarding IT customer support: It ranges from gathering information on user satisfaction as well as how much they would want to use such devices in finding their solutions.

Establishing the effectiveness of chatbots and virtual assistants to the IT customer support issue resolution: it seeks to establish how practically effective the two technologies are in responding and finding the solutions towards the resolution of queries also since they are accompanied by the users; their effectiveness in streamlining the issue resolution.

Through the systemic and detailed examination of the research questions and its objectives, this thesis provides an in-depth understanding of how design services magnify the dynamic relationship between automation with an assurance to better end-user changes in the pursuit of satisfaction in the field of IT customer support services.

1.5. Limitations of the research.

While this research aims to offer valuable insights into the experiences and perspectives related to the interactions between chatbots and virtual assistants and their users, several limitations need to be acknowledged to understand the generalizability and applicability of the findings.

First of all, the geographical scope of the research is limited. The research will be based on the experiences of IT support agents from Ukraine and the European Union (EU). The selected countries as the scope of data collection is driven by the accessibility to data, and the

context of the case organization. As a result, the findings may be more applicable to countries that have similar socio-cultural differences and businesses.

The research will be conducted in English, and the participants, mainly IT support agents, and clients, also mostly speak English. This is another language constraint, which limits the voices of others who speak different languages. This means that the findings may not be inclusive of experiences and interactions from linguistic backgrounds

Due to cultural differences, people have different communication styles, approaches, and preferences; thus, considering the diversity of countries within the European Union culture, the findings from this research may not reflect all the cultural underpinnings that affect user interactions. Thus, the findings may have a higher alignment with certain norms of specific countries based on the focused areas of research.

The research will focus specifically on IT support services. Although the data generated may be useful to the industry, the findings may not be transferable to other sectors. This is because the nature of the IT-support services may influence the findings differently than other sectors.

The study takes place in the contemporary technological landscape of chatbots and virtual assistance as of the research period. Since technology is rapidly evolving, and further advancements or modifications in the field may occur after the research is concluded, the findings do not reflect the most recent status of technology in upcoming periods

The research primarily examines interactions between IT support agents and clients mediated by chatbots and virtual assistants. Other forms of customer interactions, such as phone support or face-to-face interactions, are beyond the scope of this study. Limiting the focus to certain interaction channels may constrain the breadth of understanding regarding the overall customer experience.

One other limitation is the research setting – a Ukrainian-Swedish company that provides IT outsourcing services. While it delivers valuable insights, the results of the research could not be fully generalized to the whole sector. Different organizational structures, policies, and practices might shape the dynamics of chatbot-human interaction differently in various companies.

The research is conducted within a specific timeframe, and certain aspects of the customer support landscape may evolve after the study's conclusion. The temporal constraints may limit the ability to capture long-term trends or changes in customer behavior and technology adoption.

Temporal limits the ability to capture longer trends or changes in customer attitudes and technology acceptance. However, these limitations are inherent to the focus and nature of the research. Knowing them may help interpret the results with sophistication and design subsequent research that would further explore and counteract them.

1.6. Summary of the methodology

This research seeks to broadly explore the functions of chatbots and virtual assistants in IT customer support services. To attain this goal, it is important to incorporate a mixed method based on a flexible framework that use cases study as a key primary strategy for gathering information. The appropriate methodology for this research is intended to provide adequate insights regarding the unique relationship adopted between automated systems and human agents in providing customer support.

The thesis is thoughtfully sectioned into six integrated chapters each revolving around the relevant supporting evidence correlated to the subject regarding the influence of chatbots and virtual assistants in customer support services.

Chapter One - Introduction. This chapter encompasses the essential basis of the thesis by briefly discussing the background of the research, which describes the transition of customer support in the digital realm.

Chapter Two - Theoretical Implications. Building upon the introduction, this chapter delves into the theoretical foundations that underpin the research. It offers an in-depth examination of relevant literature, including theoretical frameworks, models, and concepts that inform the study. This theoretical underpinning is essential for understanding the broader context in which chatbots and virtual assistants operate in IT customer support services.

Chapter Three - Research Design (Methodology). In this chapter, the research methodology is meticulously detailed. It elaborates on the approach taken to conduct the research, encompassing the specific methods employed and the rationale behind their selection.

Chapter Four - Results of the Research. This pivotal chapter presents the empirical findings obtained through the research process. It provides an in-depth analysis of the data, illuminating the key insights and outcomes of the study. The empirical results are essential for concluding the impact of chatbots and virtual assistants on customer support services.

Chapter Five - Discussion. This section contains the discussion centrally enclosed following the primary research question by conducting an in-depth explanation and interpretation of the information provided from research to study and discussing overall research results and their relevance to the existing context of the IT Customer Support services environment

Chapter Six - Conclusions with Achievements and Recommendations for Further Research. The final chapter serves as the culmination of the research journey. It summarizes the key achievements and conclusions derived from the study, shedding light on the role of chatbots and virtual assistants in IT customer support services. Additionally, it offers practical recommendations for further research and areas where future investigations may expand upon the findings, ensuring that the study contributes to ongoing discussions in the field.

This structured approach enables a rational, comprehensive, and logical examination of the research topic accomplished by introducing the research context and objectives, conducting a wide literature review, presenting empirical findings, discussing outcomes, and formulating conclusions and recommendations. The methodology and the corresponding structure of the paper help to build a strong framework for analyzing and exploring the current trends in the field of customer support, especially considering its transformation through chatbot and virtual assistant implementation.

1.7. Ethical approaches

This chapter outlines the ethical principles and safeguards that will be observed throughout this research (Finnish National Board on Research Integrity TENK, 2023; VR, 2023; European Code of Conduct for Research, 2023). It encompasses key elements, including voluntary participation, informed consent, anonymity, and confidentiality.

All research participants, including individuals and the participating organization, will engage in this study voluntarily. No participant will be subjected to any form of compulsion or coercion, and they will have the unimpeded right to withdraw from the research at any stage without facing adverse consequences.

Before the commencement of the research, informed consent will be obtained from all participants. The informed consent process will transparently convey the research objectives, procedures, and potential implications of participation. Participants will be encouraged to ask questions and seek clarifications, and their informed consent will be documented. All data collected will be used exclusively for research purposes.

Anonymity will be ensured by shielding participants' identities through the use of pseudonyms or other protective measures to prevent the identification of specific individuals. No personally identifiable information will be incorporated into the research findings.

Confidentiality will be maintained for all research data collected, which will be handled with the utmost confidentiality. Data will not be disclosed, shared, or made accessible to individuals outside of the research team. It will be securely stored, both physically and digitally, with access limited to authorized personnel only.

The research to be conducted poses minimal potential for harm, as it is non-intrusive and based on the analysis of publicly available, non-confidential data. It does not involve the collection of personal or sensitive information. Therefore, there is minimal risk associated with participation.

This research is intended to provide constructive insights and recommendations that can benefit the participating organization and the broader industry. The findings are aimed at enhancing operational efficiency and the quality of customer support services.

In summary, this research is committed to upholding ethical standards, safeguarding the rights and interests of all participants, and ensuring the study is conducted with the highest level of integrity and professionalism.

2. LITERATURE REVIEW

This thesis chapter explores the theoretical background of chatbots and virtual assistants. It discusses their historical evolution and their influence on end-user satisfaction in the IT industry. Additionally, it highlights the importance of modifying chatbots to prioritize human-centricity, a key aspect of Service Design.

2.1. Historical evolution of chatbots

The historical development of chatbots is thoroughly chronicled in "A Bibliometric Review of Chatbots in the Context of Customer Support" by Dragoș Florentin Mariciuc from Alexandru Ioan Cuza University of Iași (Mariciuc, 2022). This comprehensive review traces the lineage of chatbot technology back to its roots with Alan Turing, often regarded as the progenitor of artificial intelligence (AI). Turing's groundbreaking 1950 paper, "Computer Machinery and Intelligence," not only introduced the seminal question, "Can machines think?" but also proposed what is now known as the Turing Test - a method to assess whether a machine's behavior is indistinguishable from that of a human (Mariciuc, 2022).

The aspiration to pass the Turing Test spurred the creation of the first conversational agents designed to simulate human-like interactions. This was vividly demonstrated in 1966 when Joseph Weizenbaum (1966), a German computer scientist working at the Massachusetts Institute of Technology (MIT), developed ELIZA. ELIZA is considered the first chatbot and was designed to mimic a psychotherapist, engaging in dialogue with users by recognizing keywords and responding with pre-programmed replies (Weizenbaum, 1966).

ELIZA's foundational technology, despite its simplicity and technical limitations, paved the way for significant advances in the field of conversational AI (Weizenbaum, 1966). Over the ensuing decades, researchers and developers expanded upon Weizenbaum’s initial work, gradually overcoming many of the technical challenges and enhancing the chatbots’ ability to manage more complex and fluid conversations.

The mid-1990s marked another milestone in chatbot development with the introduction of "Artificial Linguistic Internet Computer Entity" (A.L.I.C.E.) by Richard Wallace (1995). Utilizing more sophisticated techniques in natural language processing (NLP) and the Artificial Intelligence Markup Language (AIML), A.L.I.C.E. represented a more advanced form of chatbot, which garnered considerable acclaim, including multiple Loebner Prize awards during the early 2000s (Abushawar et al., 2015).

As the turn of the century approached, there was a notable expansion in chatbot development, fueled by broader advancements in AI and a deeper understanding of natural language processing. This era saw the emergence of Microsoft's Clippy and SmarterChild on platforms like MSN and AOL. These chatbots, more advanced than their predecessors, offered a variety of services including office support and real-time information delivery, helping to mainstream the use of chatbots in everyday applications (Watters, 2016; Shawar et al., 2007).

The year 2016 was particularly transformative for chatbot integration as major social media platforms like Facebook Messenger adopted these technologies, significantly enhancing their role in marketing and customer engagement. This period, however, was not without its challenges, highlighted by the ethical and technical controversies surrounding Microsoft's Tay chatbot on Twitter. Tay's problematic behavior brought to light some of the potential risks and complexities of deploying AI-driven conversational agents in public-facing roles (Vicent, 2016).

More recently, the prominence of chatbots has surged, particularly during the COVID-19 pandemic. Chatbots have been instrumental in disseminating accurate information about the virus, providing essential humanitarian aid, and playing a pivotal role in combating misinformation and reducing public confusion during this critical time (Adamopoulou et al., 2020).

Throughout these developments, chatbots have evolved from simple scripted programs to complex AI-driven systems that can engage in meaningful interactions with users, offering insights into both the technological progression and the growing integration of chatbots in various sectors of society.

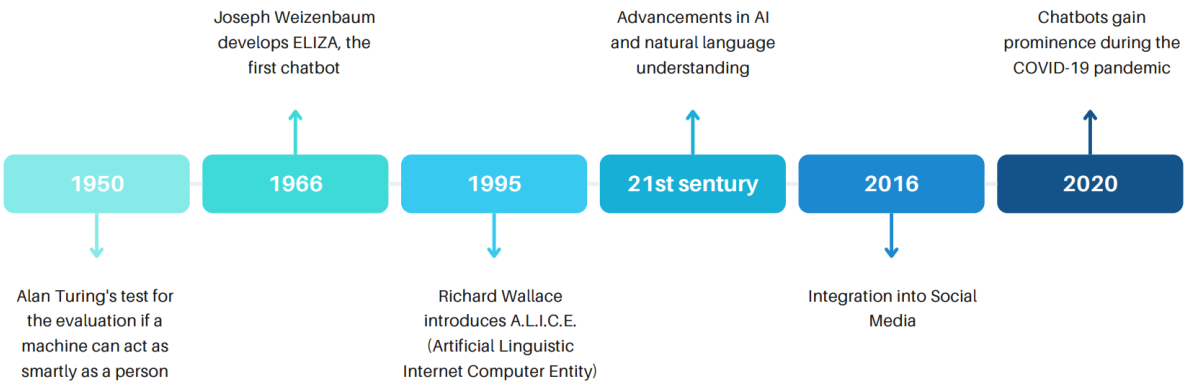

Figure 1. Historical evolution of chatbots. Created by Kyrylenko, 2024

Over the decades, chatbots have transformed from simple conversational agents into sophisticated virtual assistants, revolutionizing human-computer interaction and shaping the future of customer support services. These advancements underscore the remarkable evolution of chatbot technology and its profound impact on society.

2.2. Organizational factors affecting chatbots implementation

As chatbots have evolved, their role in organizations has undergone a significant transformation. The integration of chatbots into organizational processes has become vital, promising enhanced efficiency and customer service. However, the successful implementation of chatbots hinges on various organizational factors. Drawing from insights provided in "Organizational Factors Affecting Successful Implementation of Chatbots for Customer Service" by Juliana J. Y. Zhang, Asbjørn Følstad, and Cato A. Bjørkli (2023), this chapter explores the intricate relationship between organizational factors and their influence on the effective deployment of chatbots in customer service operations (Zhang et al., 2023).

As highlighted in "Organizational Factors Affecting Successful Implementation of Chatbots for Customer Service" by Juliana J. Y. Zhang, Asbjørn Følstad, and Cato A. Bjørkli (2023), research specifically targeting the implementation effectiveness of chatbots is still emerging. However, the broader literature on technology innovation and implementation offers valuable insights into the organizational factors that significantly impact successful deployment (Zhang et al., 2023). Additionally, Singh, Akbani, and Dhir (2020) conducted a comprehensive review of the literature on service innovation implementation, identifying key factors that are crucial for successful innovation implementation. These factors include organizational structure, leadership, management support, organizational climate, and

practices related to knowledge management, communication, and success measurement. This section examines these factors and their implications for the successful implementation of chatbots.

Figure 2. Factors of successful implementation of innovations. Created by Kyrylenko, 2024

Organizational structure plays a critical role in shaping the dynamics of innovation implementation. Decentralized structures, as highlighted by Singh, Akbani, and Dhir (2020), empower employees and foster proactiveness, while centralized authority and regulation can introduce ambiguity. Frameworks such as sociotechnical systems and human factors emphasize the importance of balancing technological, organizational, task, environmental, and individual elements (Zhang et al., 2023). Organizational structures that encourage employee engagement, decision-making participation, and knowledge sharing tend to promote technology adoption and acceptance of change. This aligns with the findings from Zhang et al. (2023), who highlighted the significance of competent and dedicated AI trainers and effective team organization for chatbot implementation.

Effective leadership and management support are vital in navigating the complexities of innovation implementation, with different leadership styles needed at various stages (Zhang et al., 2023). Transformational leadership, which emphasizes inspiration and individualized consideration, is conducive during the exploratory phase, while transactional leadership provides clarity for implementation (Zhang et al., 2023). Trust and commitment to change are fostered when management actively supports innovation initiatives. Passive leadership approaches have been found counterproductive, emphasizing the importance of proactive leadership in driving successful implementation outcomes.

Organizational culture significantly impacts attitudes toward innovation and digital transformation (Zhang et al., 2023). Leaders play a pivotal role in fostering a culture that encourages learning, participative decision-making, power-sharing, support, collaboration, and tolerance for risk and conflicts. A digital culture aligned with digital transformation goals is essential for organizational success in the age of digitalization. Such a culture ideally fosters collaborative work environments, creativity, innovation, challenges, initiatives, and continuous improvement through a shared digital strategy.

Effective knowledge management and collaboration are crucial for successful innovation implementation (Zhang et al., 2023). Organizations utilize internal expertise and external partnerships to leverage diverse knowledge and resources. The importance of knowledge diversity and sharing has been well-documented in facilitating innovation success. Organizational partnerships play a crucial role in supporting technological innovation, with organizations actively seeking and maintaining partnerships with vendors and consultants for this purpose.

Setting clear performance goals and providing appropriate rewards are essential drivers of innovation implementation. Sawang and Unsworth (2011) make a clear distinction between implementation effectiveness and innovation effectiveness, emphasizing the importance of both process efficiency and outcome achievement. They suggest that relevant performance metrics should encompass not only the smoothness of the implementation process but also the broader impact of the innovation on organizational outcomes such as finances, customer satisfaction, and employee well-being (Sawang & Unsworth, 2011).

In summary, successful chatbot implementation requires a comprehensive understanding of organizational dynamics and proactive management of factors such as structure, leadership, culture, knowledge management, collaboration, and performance incentives.

2.3 Chatbots in IT customer support services

The integration of chatbots within IT customer support services has become an essential strategy, primarily focusing on enhancing operational efficiency and user satisfaction. This trend, significantly influenced by the foundational research of Zhang, Følstad, and Bjørkli (2021), underscores the transformative role of chatbots in redefining customer support to meet the expectations of a digitally proficient consumer base. The ongoing evolution of these sophisticated digital assistants highlights a focused effort to address the increasing technological reliance among consumers for daily interactions (Zhang et al., 2021).

According to Brandtzaeg & Følstad (2017), the deployment of chatbots offers significant benefits, particularly in augmenting operational efficiency and enhancing the quality of customer interactions. These advantages are realized through the provision of personalized self-service options, which enable users to quickly resolve their inquiries independently. This reduction in routine query management not only boosts productivity but also promotes user autonomy and empowerment. This aspect is well-supported by the research from Brandtzaeg & Følstad (2017), which emphasizes users' appreciation for immediate and accessible support (Brandtzaeg & Følstad, 2017).

Additionally, the incorporation of advanced Natural Language Processing (NLP) technologies equips chatbots with the cognitive abilities required to understand and respond effectively to user queries (Gartner, 2019). This technological advancement enables support for diverse forms of communication, including text, voice, and multimedia, ensuring that user preferences are comprehensively catered to (Gartner, 2019). The versatility of chatbots not only extends the reach of customer service but also enriches user experiences by accommodating various engagement modes, as noted by Gartner (2019). This adaptability enhances the effectiveness of chatbots in meeting modern customer service demands (Gartner, 2019).

Successful chatbot integration into customer service frameworks involves more than advanced technology; it requires a holistic approach that addresses both technical and organizational aspects (Følstad & Skjuve, 2019). While "no-code" platforms simplify the

design of conversational flows, organizations still face challenges adapting to evolving customer service paradigms, as argued by Følstad & Skjuve (2019). This adaptation includes integrating AI training mechanisms to enhance chatbot performance and establishing protocols for smooth transitions between automated support and human assistance. These critical factors are discussed more closely by Følstad & Skjuve (2019), who emphasize the importance of strategic implementation to fully leverage chatbot capabilities (Følstad & Skjuve, 2019).

Echoing the insights of Zhang, Følstad, and Bjørkli (2021), the effective deployment of chatbots depends not only on their technological capabilities but also on organizational readiness to adapt to shifting customer expectations. Addressing both intricate technical aspects and broader organizational dynamics, businesses are well-positioned to harness the potential of chatbots to deepen user connections, streamline operations, and drive growth in the digital age (Zhang et al., 2021).

Zhang et al.'s (2021) study underscores the critical role of chatbots in modernizing customer support services, highlighting their ability to enhance operational efficiency and user service experience through personalized self-service options. This innovation has been well-received by users, who value the immediacy and accessibility it provides, leading to increased productivity and convenience for both users and organizations. Furthermore, strategic chatbot design not only automates routine tasks but also tailors support solutions to streamline interactions and boost overall satisfaction, a dynamic further explored by Brandtzaeg & Følstad (2017).

2.4 Perception of chatbots by end users

Following the integration discussed in the previous chapter, exploring the perceptions of end users regarding chatbots is a critical aspect of successfully implementing these IT customer support projects. The significant penetration of chatbots across firms in many different industries, particularly customer service, makes it essential to measure how virtual assistants are received in relevant fields to improve their impact and prominence.

Insights from the study "Faster Is Not Always Better: Understanding the Effect of Dynamic Response Delays in Human-Chatbot Interaction" by Gnewuch et al. (2018) provide valuable perspectives on user perceptions. This research investigates how variations in response times impact views on chatbots, challenging the typical assumption that faster responses are always

better. Gnewuch et al. (2018) explore how response timing affects chatbots' perceived human likeness and their social presence, highlighting the nuanced implications of response speed on user satisfaction and engagement (Gnewuch et al., 2018).

A key finding from the study of Gnewuch et al. (2018) is the application of social norms to chatbots by users, treating them similarly to human interactions. Unlike traditional interfaces where delays are often met with frustration, chatbot interactions are viewed more leniently, reflecting their human-like attributes and the conversational nature of their interactions. This tolerance highlights the importance of designing chatbots with natural and engaging social cues (Gnewuch et al., 2018).

Moreover, the research of Gnewuch et al. (2018) underscores how contextual factors significantly shape user perceptions of chatbots. Depending on the type of task, user expectations, and the conversational context, users may prefer varying response speeds. For complex or emotionally significant tasks, slower, more thoughtful responses that mirror human interaction might be favored. In contrast, for more straightforward tasks, users might value speed and efficiency (Gnewuch et al., 2018).

Additionally, the study of Gnewuch et al. (2018) emphasizes the benefits of infusing chatbots with human-like traits to enhance user engagement and satisfaction. Elements such as conversational tone, empathy, and personality can make interactions with chatbots more immersive and enjoyable. This approach aligns with previous research by Nass et al. (1994) and MacDorman & Ishiguro (2006), which discuss the advantages of anthropomorphism in human-computer interactions. These studies suggest that when chatbots exhibit more human-like characteristics, users are likely to find the interactions more relatable and satisfying, thereby improving the overall user experience (Nass et al., 1994; MacDorman & Ishiguro, 2006).

In conclusion, the findings from Gnewuch et al.’s (2018) research illuminate the nuanced dynamics of human-chatbot interactions, emphasizing the need for thoughtful chatbot design to improve the customer experience (CX). By deepening the understanding of user perceptions and preferences, chatbot designers and developers can create solutions that not only fulfill functional requirements but also foster meaningful and satisfying interactions, thereby enhancing the effectiveness and acceptance of chatbots in diverse applications.

2.5. Chatbot's effect on user compliance

After unpacking end-user perceptions, the addition of chatbots into customer service platforms distinctive changes how organizations interact with their users. While this change offers a plethora of benefits, it also brings in several complexities in how the digital assistants are perceived and interacted with by end-users. Importantly, the chatbots' design aspects, such as compliance- or recommendation-geared features, are critical to coherent outcomes.

Research by Gnewuch et al. (2018) delves into the subtleties of user compliance in chatbot interactions, highlighting the role of anthropomorphic design cues. These elements, such as the use of natural language processing (NLP) and emotional responsiveness, make chatbots seem more human-like and are shown to significantly boost user engagement and compliance. This increase in compliance is supported by social response theory, which suggests that users respond more positively to systems that resemble human behavior and communication styles (Nass et al., 1994; MacDorman & Ishiguro, 2006).

An intriguing aspect of chatbot interaction, as discussed by Gnewuch et al. (2018), is the impact of response timing. Contrary to popular belief, their study indicates that immediate responses may not always be viewed favorably. Introducing strategic delays can make chatbots appear more thoughtful, echoing the natural pacing of human thought processes. This approach enhances their perceived intelligence and social presence, fostering greater user compliance and improving overall interaction quality (Gnewuch et al., 2018).

This empirical evidence provided by Gnewuch et al. (2018) highlights the significant impact of anthropomorphic cues and adjusted response timings can influence user compliance. This research aligns with Nass et al. (1994), who propose that users tend to apply similar social expectations to chatbots as they do in human interactions, showing a preference for chatbots that display human-like traits, such as varied language use or empathetic responses. These preferences are further supported by MacDorman & Ishiguro (2006), who suggest that the perceived human-likeness of a system can enhance its effectiveness in engaging users. These insights highlight the critical importance of designing chatbots to closely emulate human conversational norms, thereby significantly improving user compliance.

In conclusion, as detailed in Gnewuch et al.'s (2018) study "Faster Is Not Always Better: Understanding the Effect of Dynamic Response Delays in Human-Chatbot Interaction," these findings offer a nuanced guide for refining chatbot design to enhance user compliance. By

incorporating human-like features and fine-tuning interaction dynamics, chatbots can be more effectively utilized across various sectors. This approach not only meets functional needs but also enriches the user experience, thus maximizing both operational efficiency and user engagement (Gnewuch et al., 2018).

Overall, this strategic integration of human-like features into chatbots represents a notable advancement in our approach to artificial intelligence within customer service, positioning these digital agents not merely as tools of convenience but as capable, engaging assistants that users can trust and relate to, building on the previous discussions of chatbot perceptions and effectiveness.

2.6. Chatbot Responses in Service Failure Scenarios

Even though the chatbot design discussed was aimed at improving user compliance, it is evident that chatbots' role falls most significantly within the recovery phase. With the increasing significance of digital communications in the customer support sector, the chatbot recovery design has a significant influence on user experience and, in turn, on customer satisfaction and retention. Well-designed recovery messages are crucial because they shape user attitudes and decisions regarding further interactions with the service.

In organizational contexts, service failures, where chatbots fail to adequately address or respond to user requests, often lead to user dissatisfaction and negatively impact the overall experience with a company, resulting in a reduced Net Promoter Score (NPS). These incidents pose a significant challenge for firms relying on chatbots to streamline operations and enhance customer service efficiency. The research "Seeking empathy or suggesting a solution? Effects of chatbot messages on service failure recovery" by Haupt et al. (2023) provides valuable insights into different communication strategies that chatbots can employ in such scenarios. The study categorizes recovery messages into two types: solution-oriented and empathy-seeking messages. This distinction helps in understanding how different approaches can affect customer satisfaction and recovery outcomes during service failures (Haupt et al., 2023).

Solution-oriented messages encourage users to modify their queries to better suit the chatbot's processing capabilities, aiming to resolve the issue through a direct call to action. This approach boosts perceptions of the chatbot's competence, suggesting that it is capable of handling user requests with some user adjustment. According to research by Moore, Sundar,

and Nass (2000), when chatbots prompt users to adjust their input, it not only facilitates problem resolution but also enhances user perceptions of the chatbot's technical capabilities, reinforcing trust in the technology.

Conversely, empathy-seeking messages appeal to the user's understanding and patience by acknowledging the chatbot's limitations and seeking the user's empathy (Haupt et al., 2023). Haupt et al. (2023) found that such messages are particularly effective when the fault is perceived to be on the part of the chatbot. These messages align with users' expectations for sincerity and accountability in service interactions, fostering a sense of personal connection and trust, even in the face of service failures (Haupt et al., 2023).

The effectiveness of these strategies also significantly depends on how users attribute the cause of the service failure. If users blame the chatbot (external attribution), empathy-seeking messages that admit limitations tend to resonate more, fostering a forgiving attitude. Conversely, if the failure is perceived as the user's error (internal attribution), solution-oriented messages are more effective, empowering users to correct the error and proceed effectively. Haupt et al. (2023) emphasize that aligning chatbot responses to the user's attribution of fault significantly enhances the effectiveness of the interaction, increasing user satisfaction and the likelihood of a positive outcome in the face of service failures.

The findings from Haupt et al. (2023) underscore the importance of tailoring chatbot responses based on the nature of the service failure and user attributions to significantly improve user satisfaction. This adaptive communication strategy not only mitigates the immediate negative impacts of service failures but also enhances the overall user experience, encouraging continued use and positive engagement with the chatbot (Haupt et al., 2018).

Furthermore, Haupt et al. (2023) suggest that chatbot developers program the ability to dynamically recognize types of service failures and user responses. This capability would enable chatbots to automatically select the most appropriate recovery message, optimizing interactions in real-time and bolstering user trust and loyalty (Haupt et al., 2018).

In conclusion, leveraging effective chatbot messaging in service failure scenarios is crucial for maintaining customer satisfaction and trust. By integrating insights from Haupt et al. (2023), firms can better equip their chatbots to handle service failures effectively, transforming potentially negative experiences into opportunities for reinforcing user trust and loyalty. Future research should continue to explore the long-term impacts of different

recovery strategies on brand perception and customer retention, further building on the understanding of chatbot interactions and user compliance discussed previously.

3. RESEARCH DESIGN

In this section of the master's thesis, attention is directed toward the research methodology utilized throughout the study. Here, the focus lies in explaining the process of selecting an appropriate methodology, examining the chosen research philosophy, and furnishing a detailed description of the data collection process. Each of these aspects will be explored to offer a comprehensive understanding of the methodological framework supporting this research document.

3.1. Research strategy

As Creswell J. W., and Creswell, J. D. (2017) articulate, the research design serves as the blueprint for a study, framing the approach to addressing the central research question. The chosen methodology plays a pivotal role, impacting the study's credibility, trustworthiness, and overall efficacy. This design guides the collection, analysis, and interpretation of data, ensuring that the research methods align with the study's objectives and are capable of addressing the posed questions effectively (Creswell & Creswell, 2017).

Research methodology acts as a guiding framework for research strategies, directing the choice of data collection and analysis approaches. It involves the selection of appropriate methods such as surveys, interviews, workshops, and literature reviews, contingent on the philosophical orientation of the research, which may be quantitative, qualitative, or a mix of both. Selecting the most suitable methods is critical for maintaining the integrity of the research (Creswell, 2014; Denzin & Lincoln, 2011). This careful selection ensures that the methodology aligns with the underlying theoretical assumptions and research objectives, ultimately enhancing the validity and reliability of the study findings (Mertens, 2014).

Table 1. outlines the core stages and their respective purposes, as employed in crafting this master's thesis.

Table 1. Research stages with their purposes and outcomes. Created by Kyrylenko, 2024

Stage	Purpose	Outcome
Literature review	Investigate and understand fundamental theoretical aspects relevant to the research subjects.	Examine available literature, including expert articles and reviews, to establish a solid grasp of essential concepts, theories, and the results of already applied technologies.
Survey	Assess the subject matter topic with the involved stakeholders to ascertain their viewpoints and gather insights.	Gain a comprehensive understanding of stakeholders' perspectives, and quantify their feedback to gain insights into their perception of the subject matter topic.
Interview	Discuss current industry trends, delve into best practices, and actively contribute to the advancement of technology in the field.	Conduct in-depth semi-structured interviews to delve into nuanced aspects, extract valuable insights, and provide a more holistic perspective on the research topics.

These stages are instrumental in shaping the research strategy and guiding the data-gathering and analytical processes in the thesis. The chosen methods reflect the study's philosophical stance, ensuring a coherent and effective research approach.

According to Saunders et al. (2019), research philosophy embodies the fundamental beliefs that guide the investigative process, significantly influencing how knowledge is developed. This philosophy includes ontological and epistemological views, which reflect on the nature of reality, the essence of human knowledge, and the values held by the researcher. Saunders et al. (2019) further emphasize the profound impact of research philosophy on methodological choices, affecting everything from the design of the study to the interpretation of data. This influence ensures that the methods chosen align closely with the underlying assumptions about how knowledge should be acquired and interpreted (Saunders et al., 2019).

According to Bryman (2016), in the realm of business and management research, five predominant philosophies are recognized:

1. Positivism: Advocates for the use of empirical evidence and scientific methodologies.
2. Critical Realism: Investigates the layered nature of reality and underlying causal mechanisms.
3. Interpretivism: Views reality as a social construct, shaped by human experiences and interactions.
4. Postmodernism: Challenges the notion of universal truths, celebrating diversity and subjective interpretations.
5. Pragmatism: Focuses on practical outcomes and solutions to problems.

According to Creswell (2014), selecting an appropriate research philosophy is crucial for guiding the investigative journey, ensuring alignment with the study's aims and contextual backdrop. This selection process involves careful consideration of the researcher's philosophical stance to align seamlessly with the research questions and objectives. Creswell further emphasizes the importance of this alignment, noting that the chosen philosophical approach should support the methods, strategies, and instruments used in the study, thereby enhancing the coherence and depth of the research findings.

Based on the aforementioned considerations, the selection of interpretivism at the initial stages of the research appeared to be suitable for this study. The subjectivist outlook on human-chatbot interaction reflected in the views revolving around each situation as a product of a set of personal perceptions and reactions that cannot be duplicated enjoys many proponents. The opinion that going through the same situations for the sake of a scientific experiment resembles ‘repeating nothing’ by Schwandt (1994) seemed insightful and allowed growth from a given assumption. Nevertheless, as the progression of the work revealed the necessity of combining an in-depth qualitative exploration with a suitable amount of quantitative data, it implied a modification in the research philosophy

Pragmatism, as described by Creswell and Plano Clark (2011), was adopted to accommodate this methodological diversity. This philosophy advocates for the practical application of multiple methodological perspectives to address complex research questions effectively. By integrating both qualitative and quantitative methods, pragmatism enables a holistic exploration of human-chatbot interactions, providing both depth and breadth in understanding these dynamics.

This pragmatic approach not only allows for a comprehensive analysis of qualitative data gathered from interviews and observations but also supports the integration of quantitative data, which is crucial for testing hypotheses and validating patterns observed in the qualitative phase. Morgan (2007) highlights how pragmatism encourages flexibility in research design, making it particularly suitable for studies involving emerging technologies like chatbots. This flexibility ensures that the research design is robust, adaptable, and capable of addressing the multifaceted nature of human-chatbot interactions, thus providing a richer and more accurate depiction of the social and technological dynamics at play.

3.2. Literature review

In conducting this research, the literature review acts as a crucial component, guiding the development of the study's theoretical framework and methodology. It is essential for establishing a solid foundation of existing knowledge and identifying gaps that the current research aims to fill. Hart (1998) emphasizes that a well-constructed literature review not only synthesizes relevant information but also critically examines the relationships between existing studies and the current research question. This approach ensures a comprehensive understanding of the field and aligns the study's objectives with the broader academic discourse.

To ensure a robust analysis, academic articles were chosen as the primary source of information. Given that chatbots are a rapidly developing field, it is crucial to utilize the most recent sources to accurately understand and interpret the current landscape of chatbot technology and its applications. Ridley (2012) highlights the importance of selecting current literature in technology fields, where advancements occur swiftly, to capture the most relevant and cutting-edge research insights. This strategy ensures that the study remains relevant and contributes effectively to ongoing technological discussions.

The literature review of this thesis exclusively used articles from credible academic journals and conferences. It consists of peer-reviewed research articles, and the highest quality is paramount to ensuring the evidence base of the study. The table below includes the list of articles used in this thesis and serves as an organized summary of the selected sources, including information about the author, years of publication, and the main relevant findings.

Table 2. The list of literature used as the basis for the literature review.

Created by Kyrylenko, 2024

Category	Requisites
Articles that were analyzed and included in the thesis	● Juliana J. Y. Zhang, Asbjørn Følstad & Cato A. Bjørkli (2023) Organizational Factors Affecting Successful Implementation of Chatbots for Customer Service, Journal of Internet Commerce, 22:1, 122-156. ● Mariciuc, D. F. (2022). A bibliometric review of chatbots in the context of customer support. Journal of Public Administration, Finance and Law, (26), 206-216. ● Adam, M., Wessel, M., & Benlian, A. (2021). AI-based chatbots in customer service and their effects on user compliance. Electronic Markets, 31(3), 427-445. ● Haupt, M., Rozumowski, A., Freidank, J., & Haas, A. (2023). Seeking empathy or suggesting a solution? Effects of chatbot messages on service failure recovery. Electronic Markets, 33(56). ● Lin, C.-C., Huang, A. Y. Q., & Yang, S. J. H. (2023). A review of AI-driven conversational chatbots implementation methodologies and challenges (1999–2022). Sustainability, 15(4012). ● Gnewuch, U., Morana, S., Maedche, A., & Adam, M. T. P. (2018). Faster is not always better: Understanding the effect of dynamic response delays in human-chatbot interaction. In Proceedings of the 26th European Conference on Information Systems (ECIS), Portsmouth, UK, June 23-28.
Articles that were analyzed and not included in the thesis	● Jiménez-Barreto, J., Rubio, N., & Molinillo, S. (2021). “Find a flight for me, Oscar!” Motivational customer experiences with chatbots. International Journal of Contemporary Hospitality Management, 33(11), 3860-3882. ● Naqvi, M. H. A., Hongyu, Z., Naqvi, M. H., & Kun, L. (2024). Impact of service agents on customer satisfaction and loyalty: Mediating role of chatbots. Journal of Modelling in Management, 19(2), 470-491.

The importance of conducting a literature review cannot be overstated. It not only enriches the researcher's understanding but also ensures that the study is built upon the foundation of what is already known, avoiding redundancy and leveraging existing research to push the boundaries of knowledge further. Furthermore, by focusing on academic articles, the research remains closely aligned with the latest developments and discussions within the field. Ridley (2012) highlights these points, emphasizing the critical role of a literature review in synthesizing and integrating previous research to inform current studies effectively.

This is particularly important in areas like chatbot technology, where new advancements and insights are continuously emerging, influencing both practical applications and theoretical discussions.

This approach ensures that the thesis remains current and relevant, providing a comprehensive snapshot of the state-of-the-art in chatbot research. It also supports the credibility and academic rigor of the study, as the findings and discussions are directly linked to verified and recent data, reflecting the latest trends and innovations in this dynamic field.

3.3. Survey: mixed methods research

Applying Saunders and Tosey's (2012) layers of research design, this study adopts the pragmatic research philosophy, which emphasizes practical outcomes and the use of multiple methods to address research questions effectively. The mixed methods research methodology combines both qualitative and quantitative approaches to comprehensively explore the research questions.

In this study's data collection methodology, the strategic use of surveys is highlighted, emphasizing their significant role as research tools. Surveys, as a data collection method, involve administering structured questionnaires designed to gather quantifiable data that can be statistically analyzed (Babbie, 2016). They offer a structured approach to data gathering, effectively capturing respondents' comprehension, insights, and viewpoints on the subject matter. This method provides a valuable perspective on the collective understanding and attitudes toward the topic under investigation. Babbie (2016) underscores the effectiveness of surveys in collecting quantifiable data from large samples, which can be generalized to a broader population, providing critical insights into patterns and trends.

This methodological choice facilitates the collection of data in a uniform manner, enabling the acquisition of standardized responses that are particularly suited for quantitative analysis

(Creswell, 2014). The consistency afforded by the structured nature of surveys aids in the reliable identification of patterns and trends within the data. This reliability is essential for drawing meaningful conclusions from the research. Creswell (2014) emphasizes that the uniformity and systematic approach of surveys allow researchers to apply statistical techniques effectively, ensuring the validity and reliability of the findings, and enabling broader generalizations from the sample to the larger population.

Furthermore, the surveys' strength in recruiting a large and varied sample of respondents greatly strengthens the study's evidence, making the results applicable to a wider population as part of this research. The surveys' structured and methodical process further aligns with the goals of this study, as it leads to a systematic and detailed exploration and understanding of the research questions in context. Thus, this approach not only deepens the research but also guarantees a credible and valid result, enhancing this study's credibility and usefulness.

Analyzing the responses obtained with the help of the survey, further research focuses on the details of chatbots and virtual assistants implementation and usage-based attitudes of the IT Ukrainian-Swedish company customers in comparison with the interaction with a live customer support agent. The answers cover a variety of questions, such as the frequency of contacting customer support providers, the channels preferred for getting help, levels of satisfaction with chatbots/virtual assistants and live agents, and open-ended questions aiming at getting well-thought comments or new suggestions.

The demographic profile of the respondents, primarily aged between 25 and 44 and possessing Master's degrees, reflects a diverse user base with varied experiences and expectations. The survey collected responses from 81 participants in total.

A semi-structured research design is used in the study, combining closed-ended questions used to measure particular usage frequencies and satisfaction rates with open-ended questions designed to gather a comprehensive narrative of end-users' experiences, difficulties, and wishes for future improvement. Thus, it is supposed that the multi-functional collection of data would allow obtaining a complete and systematic picture of the current chatbot and virtual assistant utilization – what works, what does not work, and where there is potential for further development.

Receiving feedback from survey participants regarding their personal experiences, accompanied by constructive recommendations for future improvements, is an important

avenue to further refine the design and implementation of chatbots and virtual assistants. Participant-generated insights are essential to further develop these innovations in a way to be much more responsive to user needs, preferences, and the evolving opportunity of customer support interactions.

Conducted within survey results, the exhaustive study reveals the essential and developing nature of the roles of chatbots and virtual assistants in the area of IT customer support. It emphasizes the necessity for continual technological improvement and the centrality of user-oriented developments in the optimization of these digital assistants, providing for stronger efficiency, overall user experience, and improved performances in customer support provision.

3.4. Interview: qualitative research

The interview, a quintessential method of qualitative research, became a pivotal tool in this study's repertoire for thorough examination of the multi-faceted chatbot and virtual assistant technology in IT support. The specific type of interview, a structured conversation spiced with elements of flexibility was well-positioned to explore the subtle nuances crucial for an informed opinion on chatbots and virtual assistants status quo and the exciting prospects ahead. The semi-structured format enabled an engaging and comprehensive chat where my open-ended yet focal questions steered the conversation while respondents had the room to provide extensive remarks that diversified and detailed the research further.

Participants in this study were two experts - professionals from companies engaged in the development and implementation of chatbot and virtual assistant technologies. These experts, hailing from a spectrum of organizational scales - from nimble startups to sprawling enterprises - brought forth a wealth of knowledge grounded in their firsthand experiences with chatbot applications in various business contexts.

The research inquiry was organized around several pivotal themes that are integral to understanding the operational, strategic, and experiential dimensions of chatbots and virtual assistants:

- Challenges and client needs: identifying the primary issues and requirements presented by clients, offering a glimpse into the driving forces behind the adoption of chatbot solutions.

- Clienteles profile: gaining insights into the demographics of the clients served by these technologies, understanding the sectors and business sizes most inclined towards leveraging chatbots for IT support.
- Human-bot interaction paradigms: investigating the ideal frameworks for interaction between users and bots, examining the balance between automation and human intervention for optimal service delivery.
- Pros and Cons of chatbot adoption: evaluating the perceived benefits, such as efficiency and cost savings, against the challenges, including personalization and user engagement hurdles faced by chatbots.

In synthesizing these discussions, the study draws on foundational principles from key literature on qualitative research methods. Rubin and Rubin (2012) emphasize the significance of creating a conversational space in qualitative interviewing where meaningful, in-depth data can be harvested through a semi-structured format. This approach facilitates an interactive dialogue where respondents can share their experiences and perceptions in a more nuanced and detailed manner, allowing for rich data collection.

Additionally, the flexible and adaptive nature of qualitative interviews, as advocated by Braun and Clarke (2013), aligns with the exploratory goals of this research. This flexibility permits adjustments to the interview process in response to the data being collected, thereby enabling a more comprehensive understanding of the evolving domain of chatbot technologies. Such an approach is particularly effective in capturing the complexities and dynamics inherent in new technological applications, ensuring that the research remains relevant and deeply informed by the participants' insights and experiences.

Looking at these qualitative interviews, it is within the prospect of this thesis to create a nuanced context for the implementation of these chatbot and virtual assistant applications in IT support. The goal is to provide insights into the application of AI-driven applications in service-oriented sectors. The study is a work in progress, and in light of ongoing trends and ongoing feedback from the participants, the study is inclined to investigate further the optimal applications of these technologies to improve both satisfaction by the users and operational integration into different contexts of service. It is a detailed foray into both the technical capabilities of chatbots and the human factors that will be descriptive enough for further implementation of technology in customer support, and therefore playing that role.

4. RESULTS OF THE RESEARCH

This chapter delves into the results and analysis obtained from both the survey and expert interviews. The primary objective was to collect data on respondents' attitudes toward Chatbots and Virtual Assistants. This data was then used to draw comparisons with human communication in IT support services.

The survey received responses from 81 participants and was exclusively conducted among employees of a Ukrainian-Swedish IT outsourcing company. The survey aimed to gain insights into respondents' preferences, satisfaction levels, and areas for improvement in the context of IT customer support.

The primary objective of the expert interviews was to obtain perspectives from professionals in the Chatbot industry who are knowledgeable about the technologies and can forecast future developments. A total of two individual expert interviews were conducted with subject matter experts in the field.

4.1 Survey results

4.1.1. Survey methodology

The survey methodology adopted a systematic approach to examine perceptions of human support versus support provided by chatbots and virtual assistants among employees of an IT outsourcing company. The survey aimed to explore their preferences and levels of satisfaction with these support systems.

Responses were collected from 81 participants via an online platform, providing a broad range of perspectives from within the IT industry.

Designed with a mix of 10 research-specific questions and 3 demographic inquiries, the survey utilized a semi-structured format. This approach facilitated flexible data collection while maintaining consistency across responses.

A pivotal element of the survey was the satisfaction rating scale, where participants rated their satisfaction from 1 to 5. 1 being the least satisfied, 5 being the most satisfied. This quantitative metric was instrumental in gauging overall sentiments.

The survey also included multiple-choice questions strategically positioned to capture specific preferences from predefined options, streamlining the data collection process.

Furthermore, open-ended questions were incorporated, giving participants the chance to elaborate on their views. This qualitative component of the survey enriched the data, allowing for a deeper understanding of the varied perspectives.

Overall, the semi-structured design of the survey effectively merged quantitative assessments with qualitative insights, enabling a comprehensive analysis of respondents' attitudes and enhancing the robustness of the findings.

4.1.2. Survey outcomes

Demographic profile of survey respondents

The demographic breakdown of the survey respondents provides data on their age, educational background, and nationality. The age distribution shows a predominant group, with 56.8% of the participants aged between 25 and 34 years. This group was followed by those aged 35 to 44 years, who accounted for 35.8% of the respondents. These figures suggest that the majority of participants are relatively young, likely reflecting a tech-savvy demographic that is comfortable with using digital platforms and services.

In terms of educational attainment, the respondents were highly educated, with a significant 81.5% holding a master's degree. This was followed by 13.6% who had obtained a bachelor's degree and a smaller segment of 1.2% who possessed a doctorate. This indicates that the survey captured a well-educated cohort, which might influence their expectations and experiences with customer support services due to a potentially higher level of critical thinking and demand for quality service.

Nationally, the vast majority of the respondents, 95%, were Ukrainians. This strong representation of Ukrainians was complemented by 5% of participants coming from various other countries, providing a predominantly local but slightly international perspective to the data.

Frequency of contact with customer support services

The survey also delved into the frequency at which respondents needed to contact customer support services. A significant majority, 71.6%, reported that their interactions with support services were infrequent, occurring about once a month. This suggests that for most

customers, encounters with customer support are not a regular occurrence, potentially indicating a satisfactory experience with the products or services used or a preference to resolve issues independently.

An additional 21% of respondents reached out to customer support occasionally, about once a week. This group likely encounters minor issues more frequently or may require ongoing support due to the nature of the products or services they use. A smaller portion of the participants, 4.9%, engaged with support services several times a week, suggesting a subset of users with either less satisfactory product experiences or higher dependence on customer support.

Finally, a minimal fraction of the respondents, 2.5%, reported a constant need for support, contacting customer support more than three times a week. This group represents a critical segment for customer service departments, as their frequent interactions could provide valuable insights into potential areas for improvement in products, services, or support procedures.

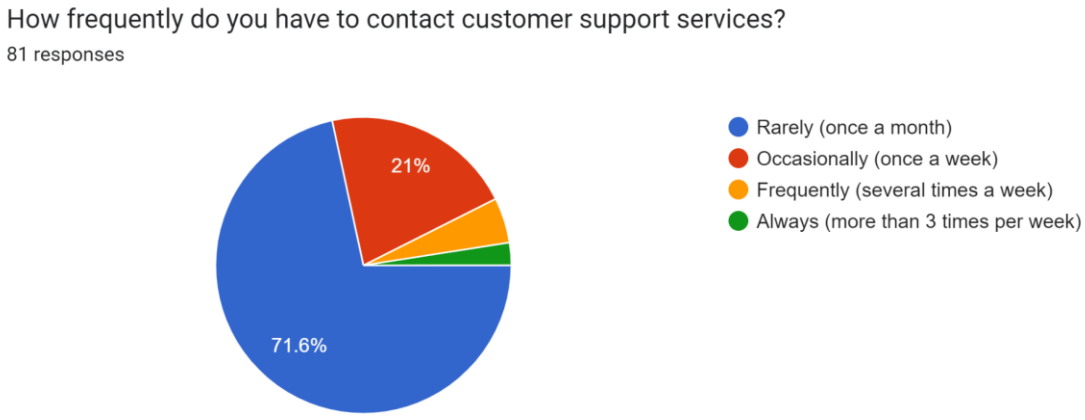

Figure 3. Frequency of contacting customer support services

The contrast in responses between participants from the IT industry and those from other sectors starkly illustrates how professional backgrounds significantly influence perceptions and interactions with customer support services. IT professionals, with their specialized knowledge and intimate familiarity with industry products and processes, often approach customer support with a more critical and informed perspective. This heightened awareness

and understanding naturally lead to elevated expectations and nuanced demands when utilizing support services. As such, recognizing and understanding these differences is crucial for tailoring support services to effectively meet the diverse and specific needs of various user groups.

Preferred channels for obtaining support services

In delving deeper into the preferences for methods of obtaining support, the survey revealed distinct choices among the participants. Live support chats emerged as the overwhelmingly preferred method, with 85.2% of respondents opting for this real-time interaction. This preference underscores the value placed on immediate responses and direct communication, which live chats can offer, enhancing the user's control over the interaction and potentially leading to faster resolutions.

Following live support chats, phone support was the second most popular choice, preferred by 39.5% of respondents. This method remains significant for those who seek a more personal touch or need to explain complex issues that might be difficult to convey through text alone. Phone support also allows for nuanced communication and immediate feedback, which can be critical for resolving more complex service issues effectively.

Chatbots and virtual assistants, while less popular, were still chosen by 25.9% and 8.6% of participants, respectively. The use of these tools highlights a segment of the user base that values the convenience and 24/7 availability that automated solutions provide. Although they are less favored compared to more human-centric options, their role in handling basic inquiries and providing quick answers can not be understated, as they free up human resources to tackle more complex issues. This distribution of preferences illustrates a broad spectrum of needs and expectations, which support services must adeptly manage to provide a satisfying customer support experience across different platforms and technologies.

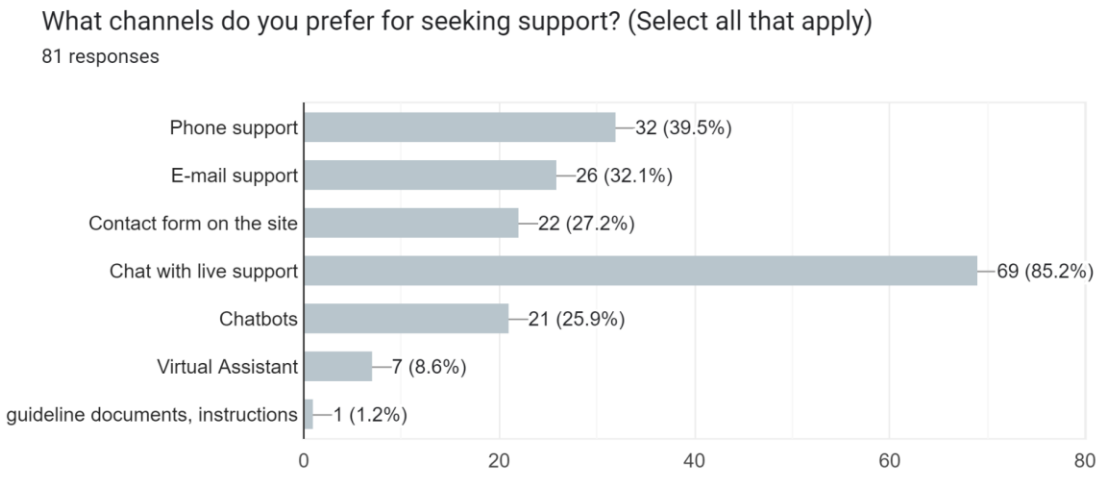

Figure 4. Preferred channels for seeking support

The data underscores a pronounced preference for live support chats as the primary method for seeking assistance, emphasizing their integral role in fostering robust user engagement and satisfaction. The immediacy and interactivity provided by live chats help resolve queries swiftly, leading to a higher rate of user satisfaction and retention. These dynamics illustrate the growing expectation for real-time solutions in customer support, which live chats fulfill more effectively than other methods.

Conversely, the relatively lower utilization of chatbots and virtual assistants highlights a crucial area for development within the spectrum of customer support tools. This situation underscores the ongoing need to enhance the capabilities of these automated solutions to better align with user preferences and deliver a more seamless and effective support experience. While chatbots and virtual assistants offer the advantage of round-the-clock availability and handling high volumes of simple queries without human intervention, their current limitations in handling more complex interactions and providing personalized responses have curtailed their effectiveness and acceptance.

Satisfaction rating with chatbots and virtual assistants

Participants' satisfaction ratings with chatbots and virtual assistants shed further light on these issues. A notable 48.1% of respondents rated their experience as average, scoring it a 3 out of 5. This middling score suggests that while some users find chatbots and virtual assistants moderately useful, there is significant room for improvement in their functionality and user

interface. Additionally, 24.7% expressed dissatisfaction with a score of 2, and 7.4% rated their experience as very poor, with the lowest score of 1. These figures indicate a clear challenge in meeting customer expectations and underscore the imperative to refine these technologies.

Significantly, the absence of any top-tier satisfaction ratings (5 out of 5) among participants highlights a critical gap in the perceived value offered by chatbots and virtual assistants. This gap represents an opportunity for technology developers to invest in sophisticated AI that can understand context, recognize nuance, and learn from interactions to improve performance over time. By addressing these challenges, businesses can enhance the effectiveness of their automated support tools to not only meet but exceed user expectations, thus transforming these tools into more valuable assets in the customer support arsenal. Enhancements might include integrating more advanced natural language processing, improving response accuracy, and offering a more personalized interaction experience, bridging the gap between automated efficiency and human-like engagement.

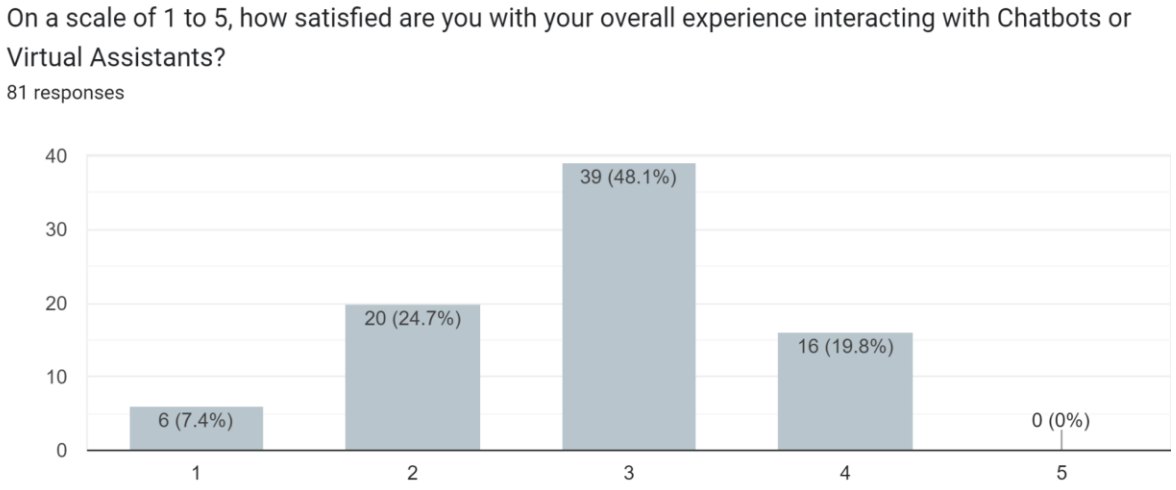

Figure 5. Satisfaction level of interacting with Chatbots

The analysis uncovered a range of satisfaction levels among participants interacting with chatbots and virtual assistants, with many viewing their experiences as merely average. A significant portion of the survey respondents marked their experiences as middling, which suggests that while the tools were functional, they failed to impress or fully meet user needs. Moreover, a smaller yet noteworthy segment of users expressed dissatisfaction, adding to

concerns about the effectiveness of these technologies in delivering a satisfactory customer experience. Most telling was the complete absence of top-tier satisfaction ratings for interactions with chatbots and virtual assistants. No participants rated their experiences at the highest level, starkly underscoring the gap between the current capabilities of these tools and user expectations. This observation points to a compelling need for specific enhancements, such as improving the cognitive and empathetic abilities of chatbots to better understand and respond to user inquiries in a more human-like manner.

Satisfaction rating with human agents in IT customer service

In stark contrast, participant satisfaction with human agents in IT support services painted a far more positive picture. The majority of users expressed high levels of satisfaction, with 49.4% giving a high satisfaction score of 4 and an impressive 38.3% rating their experiences as excellent with a score of 5. Remarkably, none of the respondents rated their satisfaction with human agents at the lowest level. This significant disparity in satisfaction levels between human agents and automated systems underscores the enduring value of the human touch in customer support contexts. Human agents are perceived as more effective in handling complex queries, providing personalized responses, and empathizing with customers' frustrations, which are aspects that automated tools currently struggle to replicate.

These findings highlight the robust advantages that human interactions hold over automated systems in terms of emotional intelligence, problem-solving capabilities, and customer satisfaction. However, they also identify critical areas for development in chatbot and virtual assistant technology, such as enhancing linguistic models, incorporating advanced machine learning techniques to predict and understand user preferences, and integrating affective computing to recognize and respond to emotional cues. By bridging these gaps, there is potential not only to enhance the efficiency of these digital tools but also to elevate the overall user experience to levels comparable to that of human interactions. Thus, focusing on these enhancements could significantly shift user perceptions and satisfaction ratings, ultimately making virtual assistants and chatbots more valuable as frontline customer support tools.

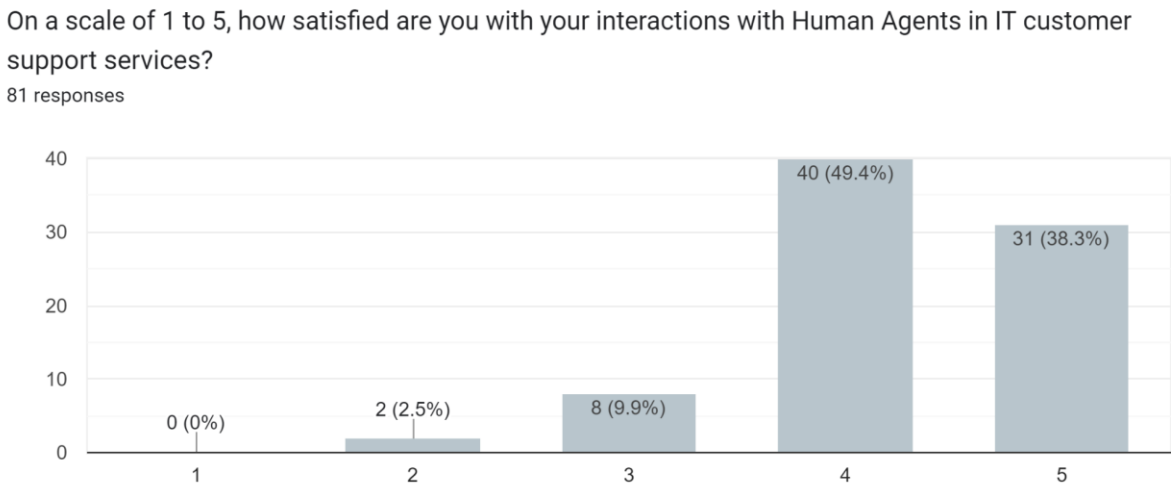

Figure 6. Satisfaction level of interacting with Human Agents

The analysis further illuminated that participants generally held a more favorable view of human agents compared to automated systems in IT support services, reflecting higher satisfaction levels with human interactions. This difference underscores the necessity for significant improvements in automated systems to elevate their user satisfaction levels to those comparable with human agents. While human agents excel in providing personalized, empathetic, and nuanced support, automated systems often lack in these areas, leading to a disparity in user satisfaction.

The survey delved into various factors affecting user satisfaction with chatbots and virtual assistants, revealing a complex array of influences that dictate the effectiveness of these technologies. Key factors included reaction speed, cited by 58% of respondents as important, and resolution speed, valued by 50.6%. The quality of service was highlighted by 51.9% of participants, while lower percentages reflected the importance of empathy (12.3%), human-centricity (17.3%), personalization (21%), and accuracy of information (56.8%). These findings highlight the multifaceted nature of user satisfaction, where efficiency and accuracy are crucial, but softer skills like empathy and personalization are also vital for enhancing the user experience with automated systems. Enhancing these aspects could lead to significant improvements in how chatbots and virtual assistants are perceived by users.

In contrast, the factors influencing satisfaction with human support agents were also analyzed, revealing a slightly different set of priorities among respondents. Speed of reaction

was noted by 42%, while speed of resolution was again significant at 50.6%. The quality of service was paramount, with 60.5% emphasizing it. Additionally, higher importance was placed on empathy (42%), human-centricity (40.7%), personalization (49.4%), and accuracy of information (59.3%). These results underscore the critical roles of efficiency, reliability, empathetic communication, and tailored interactions in fostering positive user experiences with human agents. They suggest that while technological efficiency is essential, the human elements of support - such as understanding and adapting to user needs - are equally crucial.

Levels of trust in chatbots and virtual assistants

The survey also probed participants' levels of trust in chatbots and virtual assistants for handling sensitive or confidential information, compared to their trust in human agents. The results showed mixed trust levels, with a plurality (42%) reporting moderate trust in automated systems - a reflection of the cautious optimism that users have about the security capabilities of these technologies. However, 24.7% of respondents expressed only slight trust, indicating significant reservations about the ability of chatbots and virtual assistants to securely manage sensitive data. Interestingly, a smaller segment, 8.6%, conveyed complete trust, suggesting a subset of users are very confident in the technological advancements of automated systems. Conversely, 14.8% of participants indicated they do not trust these systems at all with sensitive or confidential matters, highlighting a substantial skepticism that could impede the adoption of chatbot and virtual assistant technologies for more critical tasks.

These insights into trust dynamics emphasize the need for continued advancements in the security and data-handling capabilities of chatbots and virtual assistants. Ensuring robust security measures and transparent data policies can be pivotal in gaining user trust and broadening the acceptance and utilization of these technologies in handling sensitive interactions. As automated systems evolve, incorporating advanced encryption and privacy-preserving features may help mitigate concerns and boost confidence among users, potentially leading to greater reliance on these tools for a broader array of services.

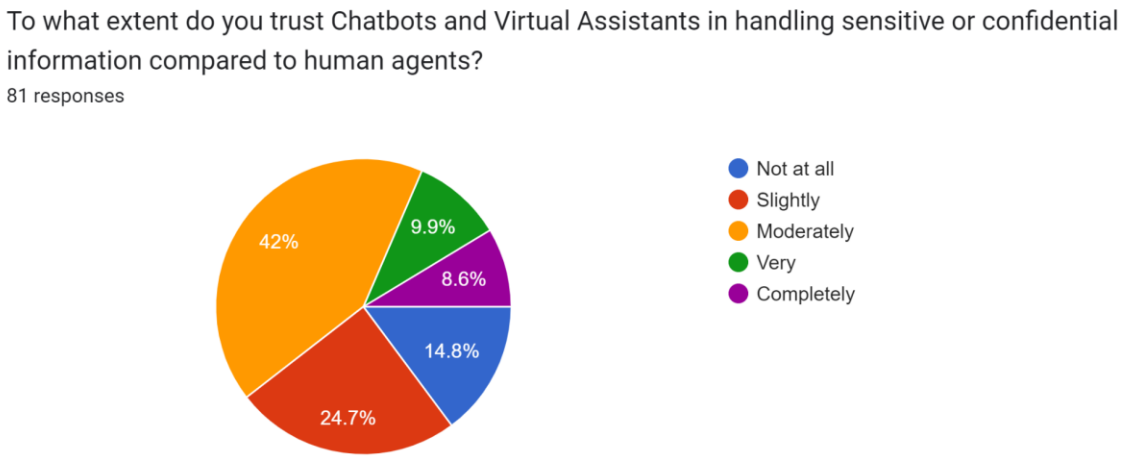

Figure 7. Level of trust in Virtual Assistance in handling sensitive information

These findings shed light on the complex attitudes toward the reliability and security of chatbots and virtual assistants, highlighting the imperative need to bolster data privacy and security measures to enhance trust in these automated systems. As technology advances, ensuring the confidentiality and integrity of user data becomes increasingly critical, particularly in scenarios where sensitive information is handled by automated systems.

Survey responses revealed a range of preferences for using chatbots or virtual assistants over human agents in IT customer support, dependent on the nature of the issues being addressed. Participants shared various situations where they found automated systems preferable. One common thread was the preference for chatbots for straightforward tasks or inquiries that do not require human intervention. For example, one respondent noted the utility of automated systems for simple actions: "Only when I need to clarify some information or resolve an issue that can be resolved automatically, like order cancellation" (n13). This highlights the efficiency of chatbots in handling routine requests swiftly and without human error.

Another respondent pointed to the situational usefulness of chatbots, saying, "It is useful to use chatbots to know how something works. But if something is broken or my settings are very custom, I prefer talking to real humans" (n58). This response illustrates that while chatbots are valued for providing basic information and guidance, complex or highly personalized issues are better handled by human agents, who can offer nuanced support and creative problem-solving.

Additionally, preferences for automated systems were noted for specific conditions, such as outside normal operating hours or when immediate assistance is needed, and human agents are not available. For instance, participants mentioned, "With an easy/standard request or outside of normal support working hours" (n10) and "If it's nighttime and a human agent is not available" (n23). These comments reflect the appreciation for the 24/7 availability of chatbots, which can provide an immediate response to urgent inquiries at any time, enhancing customer satisfaction by ensuring support is always at hand.

Privacy concerns also played a significant role in the preference for chatbots, with one participant expressing, "When I need to share sensitive information or don't want to hear a dismissive tone from people, I would prefer to interact with a chatbot" (n06). This suggests that some users perceive automated systems as more neutral and less judgmental compared to human agents, potentially offering a safer space for discussing sensitive matters.

The summary and analysis of these responses are presented in the table below, which categorizes the types of issues participants typically encounter when interacting with chatbots and virtual assistants. The table is structured to provide a clear overview of when users prefer automated support over human interaction, highlighting the efficiency of chatbots for routine and time-sensitive tasks and underscoring areas where human support is deemed superior, particularly for complex, sensitive, or highly personalized service needs. This detailed categorization aids in identifying specific enhancements needed in chatbot programming and training to better align their capabilities with user expectations and preferences, ultimately driving greater satisfaction and trust in these technologies.

Table 3. Analysis of qualitative results of the survey on issues respondents experienced with chatbots. Created by Kyrylenko, 2024

Types of issues respondents experienced with chatbots	Examples of responses	Quantity of responses
Inaccuracy and Lack of Relevance	"Info provided is inaccurate or irrelevant" (n49), "Generic responses not helpful" (n39).	17

The barrier to Human Support	“Chatbots act as barriers to accessing human support”, and “Prolonged resolution process due to chatbots” (n04).	10
Functional Limitations	“Inability to handle non-standard or complex queries” (n69), “Limited functionality in addressing diverse issues” (n26).	12
Low Speed of Resolution	“Delays and inefficiencies in issue resolution” (n64) and “Lengthy process of obtaining adequate response” (n33).	6
Lack of Personalization	“Responses lack personalization and tailored support” (n19), and “Disconnect in addressing individual needs” (n78).	5
Corner Cases Handling	“Inability to effectively address rare or corner cases” (n08).	4
Language Barrier	“Difficulty in communicating due to language barriers” (n16).	2

Survey participants provided insightful feedback on potential improvements and features they would like to see in chatbots and virtual assistants, aimed at enhancing their effectiveness and user satisfaction. Common themes emerged around the integration of more sophisticated functions and deeper human-like interaction.

One critical feature highlighted by respondents was the ability to seamlessly switch to human agents when necessary. Participants stressed the importance of having an option for smooth transitions in situations where the complexity of the issue exceeds the capabilities of the chatbot. One respondent aptly noted, "A smooth transition to human assistance is crucial, especially in complex situations where the expertise of a human agent is irreplaceable" (n12). This feature would not only enhance user satisfaction by providing a safety net when automated systems falter but also ensure continuity and efficiency in the resolution process.

Another frequent suggestion was the need for more detailed and personalized responses from chatbots. Participants expressed that personalization significantly enhances the user experience by making interactions feel more relevant and engaging. A participant mentioned,

"Personalization adds a human touch, making interactions more engaging and tailored to individual needs. It contributes significantly to a positive user experience" (n08). This indicates a strong desire for chatbots to move beyond generic responses and develop capabilities that mimic the nuanced understanding of a human agent.

Improving the artificial intelligence behind chatbots was another key area highlighted by respondents. Enhanced AI would allow for more accurate, context-aware responses, making interactions smoother and more intuitive. One user stated, "Enhanced artificial intelligence would result in more accurate and context-aware responses, making the overall interaction smoother and more efficient" (n47). This suggests an expectation for chatbots to understand basic queries anticipate needs and adapt responses based on the conversation's context.

Moreover, better context awareness was emphasized, with participants expressing a need for chatbots to maintain and understand the continuity of conversations. A respondent highlighted, "Chatbots should be able to understand and remember the context of ongoing conversations to provide coherent and relevant assistance over time" (n21). This capability would vastly improve the user's experience by ensuring that the user does not need to repeat information and that the chatbot can make logical connections based on previous interactions.

The summary and analysis of these responses are carefully documented in the table below, which categorizes request types and feature suggestions aimed at improving the future user experience with chatbots and virtual assistants. This table is a valuable resource for developers and designers, providing direct insights into user preferences and needs. By addressing these highlighted areas, the next generation of chatbots can be significantly more user-friendly, efficient, and capable of handling complex interactions that currently frustrate users. This progression is essential not only for enhancing the effectiveness of chatbots but also for integrating them more seamlessly into the broader landscape of customer support tools, where they complement rather than compete with human agents.

Table 4. Analysis of the improvement features requested by respondents. Created by Kyrylenko, 2024

Request type	Examples of responses	Quantity of responses

Accuracy and Context Understanding	"The possibility of solving non-typical issues with their help", and "Improve AI for the better understanding context of the issue" (n13).	8
Flexibility and personalization	“I would like to see more personalized recommendations” (n06), and “More flexibility with personal cases" (n72).	4
Connectivity and proactive support	“The ability to quickly connect a Human Agent if necessary" (n34), “Personalization, dealing with complex issues, proactive support" (n57).	3

The survey results revealed a range of opinions on the efficacy and constraints of chatbots and virtual assistants versus human agents in the realm of IT customer support. While some respondents appreciated the speed and 24/7 availability of automated systems, others noted limitations in handling complex or nuanced inquiries that typically require human intervention. This diverse feedback underscores the potential for both collaboration and tension between automated systems and human workers.

4.2. Expert interview results

The expert interviews were meticulously planned and executed using a semi-structured format, ensuring a focused yet flexible dialogue with professionals deeply involved in the development and implementation of chatbots and virtual assistants. These professionals hail from companies that serve a broad spectrum of clients, ranging from agile startups to multinational enterprises, each with distinct needs and expectations from technological solutions. These interviews were instrumental in gaining a profound understanding of the current landscape and emerging trends in chatbot and virtual assistant technologies specifically tailored for IT support services.

The main questions/topics we discussed with the respondents during the interviews:

- What are the prevalent issues or requests typically presented by your clients?
- Can you provide insights into the profile of your clientele?
- What constitutes an ideal framework for human-bot interaction?
- Regarding bots, what are the advantages and disadvantages frequently highlighted by clients?

- How do bots tackle the challenges related to empathy and personalization?
- What are the current shortcomings of bots in your observation?
- Could you outline your perspective on the future evolution of bots within the support industry?

Data Analysis Approach

To analyze the interview data, thematic analysis was used. Thematic analysis is a qualitative method that involves identifying, analyzing, and interpreting patterns (themes) within data (Braun & Clarke, 2006). It allows for a structured yet flexible approach to understanding qualitative data, providing insights into the key themes that emerge from expert interviews. The analysis process began with transcribing the interviews and becoming familiar with the content by reading through the transcripts multiple times.

The next step involved coding the data to identify significant patterns and features. These codes were then grouped into potential themes based on their similarities and relationships. Themes were reviewed and refined to ensure they accurately represented the data, and each theme was defined and named to reflect its core insights. This systematic approach helped uncover the central themes presented in the interviews.

Interview Results

Expert 1 provided detailed insights into the needs of their primary clientele, which mainly consists of Small and Medium-sized Businesses (SMBs), and occasionally larger enterprises for specific transactional processes. This expert advocated for a 70/30 model of human-bot interaction for SMBs, which they considered cost-effective and practical. They emphasized that while automation and cost-efficiency are significant advantages, challenges such as the lack of deep personalization, setup complexities, and a shortage of skilled experts often hinder wider adoption.

Discussing the technological capabilities, Expert 1 explained that for simpler products, setting up a comprehensive response system is feasible. However, the expert stressed the continuous need for technological advancement, particularly in enhancing AI's ability to remember and learn from past interactions and improving language versatility beyond English to include other major languages.

Looking forward, Expert 1 estimated a short to medium term of six months to a year to reach a new level of quality in bot functionalities. They highlighted a growing demand for skilled professionals who can navigate the complexities of bot setup and customization. The expert also noted the burgeoning field of voice bots, particularly their integration into popular messaging platforms like Telegram and WhatsApp, which could revolutionize user interactions by adding convenience and enhancing accessibility.

Expert 2 shifted the focus towards enterprises, particularly in sectors like aviation, retail, and e-commerce, where automation can play a transformative role in scaling operations and reducing costs. This expert suggested that about 15-20% of routine tasks could be effectively automated in such environments. The conversation also covered the challenges of high regulatory demands, the need for enhanced security for large data sets, and the high expectations set by state-of-the-art systems like ChatGPT.

Expert 2 emphasized the critical role of metadata in achieving personalization at scale and discussed the importance of conversational designers who craft dialogues to convey empathy and maintain a human touch in interactions. The future, according to this expert, lies in multi-channel communication support, advancements in voice-to-text technology, and more robust security measures, all of which are essential for maintaining trust and efficiency in enterprise-level operations.

These in-depth expert interviews offer a rich tapestry of insights, painting a detailed picture of the current and future state of chatbots and virtual assistants in IT support. This enhanced understanding is invaluable for stakeholders aiming to navigate the complex landscape of digital customer support solutions, aligning technology with human-centric service models to redefine the effectiveness of IT support systems across various industries.

5. DISCUSSIONS

This chapter synthesized the most important discoveries from the investigation and compared them with existing literature to generate more extensive explanations and suggestions. These findings elucidate numerous critical features of user experience, technological efficiency, and organizational philosophy in incorporating chatbots and virtual assistants into IT support services. The analysis reveals the complex interplay between technological advancements, user reception, and the critical importance of human elements in optimizing customer support experiences. Service Design principles are vital to optimizing these elements, emphasizing the need to strategically align people, processes, and technology to enhance the customer experience.

Technological advancements and user reception

The research findings highlight the significant role that technological advancements in chatbots and virtual assistants play in shaping customer interactions. These technologies are designed to enhance operational efficiency and boost user engagement. However, their reception among users remains mixed, largely due to their current technological limitations. Chatbots often struggle with handling complex or sensitive inquiries, lacking the finesse of human agents. This shortcoming underscores the urgent need for improvements in natural language processing and machine learning capabilities, which would enhance AI responsiveness and problem-solving acuity, as noted by Gnewuch et al. (2018).

Moreover, the experiences of the first users who interacted with the initial forms of technologies contribute to low expectations that may prevent further efforts to develop and spread innovations. Another factor concerns the dissatisfaction of professional IT employees, the main participants in the discussed studies. Their high standards and dissatisfaction with autonomous systems are based on the idea that it is unnatural and impossible to imitate human nature. Identified results can open additional opportunities for chatbots designers who can offer solutions that precisely address professional users' hidden needs and address the challenge of artificial nature. In such a way, the gap between what chatbots or robots can do and what users are ready to accept is reduced.

The human element in customer support

The rise of automated customer support tools has not resolved the need for human interaction, which emphasizes the key role of empathy on a very high level. Indeed, users claim much more satisfaction from interactions with a human rather than an AI agent, especially in the case of more profound understanding and emotional intelligence – a skill where AI demonstrations lower performance. Therefore, the current study is supported by Gnewuch et al. (2018) who identify the significant role of ordinary reassurance and emotional engagement of human agents, not limited to pure problem-solving.

In addition, this research demonstrates that the personalization of conversation with chatbots in human features has a high potential to be intensively improved. Introducing strategic pauses in a chatbot's responses, rather than having them respond instantaneously, creates a sense of reflection and active conversation rather than mere question-and-answer, enabling consumers more attentive to their interaction and less likely to perceive it as a strictly functional encounter. Organizations seeking to increase the power of chatbots to create knowledge and experience should prioritize the development of AI abilities such as emotional intelligence, which enables them to identify users' feelings and adapt reaction responses. This could significantly fill the gap in digital and human interaction and empower users to gain confidence in the performance of automated systems.

Balancing AI and human interaction

According to the results of this study, achieving an effective balance between AI automation and human interaction is crucial for contemporary customer support frameworks. This balance is essential not only for maintaining operational efficiency but also for ensuring that customer interactions are handled with genuine care and understanding. By leveraging AI to manage routine inquiries, organizations can free human resources to address more complex and emotionally charged issues, thereby optimizing the overall support structure's efficiency. Training for human agents should therefore extend beyond technical skills to also include developing emotional intelligence, preparing them to intervene effectively when AI falls short. This dual approach not only maintains a high level of customer service but also improves employee morale by reducing monotonous task loads. These results align with scholarly work that underscores the importance of emotional intelligence in customer interactions (Haupt et al., 2023).

Service Design Implications

This research highlights the crucial role of Service Design in optimizing IT customer support services. Service Design principles help integrate automated and human elements to enhance the user experience. By understanding the customer journey and key touchpoints, chatbots can be effectively positioned to handle routine tasks, freeing human agents to focus on more complex issues. As Gnewuch et al. (2018) suggest, adaptable, empathetic, and responsive chatbots are vital in Service Design, enabling these systems to integrate seamlessly into workflows while delivering accurate responses and enhancing user satisfaction.

Service Design ensures technology aligns with user expectations by structuring support systems that respond to evolving needs and iterating on design based on user feedback. Leveraging data analytics, service designers can identify chatbot performance gaps and make improvements to align automated solutions with user expectations. By managing the transition between automated systems and human agents, Service Design principles help create cohesive customer support experiences and avoid customer frustration, as emphasized by Zhang et al. (2021).

Organizational strategy and future outlook

The strategic implementation of chatbots within organizational frameworks is a significant determinant of their success or failure, according to the results of this study. Properly aligning chatbot integration with business objectives necessitates a robust investment in technology and an adaptable workflow that accommodates new digital tools. This includes the essential aspects of training staff and establishing clear protocols for interactions between humans and bots. Moreover, fostering an organizational culture that supports digital transformation is crucial for successfully adopting these technologies (Zhang et al., 2021). Hence, the results of this study are in line with Zhang et al. (2021). In addition, this study shows that as the demand for advanced chatbot capabilities grows, the industry must also tackle the shortage of skilled natural language programming engineers. Addressing this challenge is vital for advancing chatbot sophistication to levels comparable to high-performing systems like ChatGPT. According to the insights of this study, continued investment in this area is crucial for evolving towards more sophisticated, empathetic, and effective automated customer support solutions, ensuring that digital advancements effectively complement and enhance human capabilities in customer service.

The comprehensive assessment conducted in this master's thesis not only discusses the present state of chatbot and virtual assistant technology in IT customer support but elaborates on the future prospects and strategic necessities for integrating and optimizing this element in business promotion fields. It includes the relevance of the technology in scalability, international application, and possible revolution in customer support across industries. The current study demonstrated that due to continued fine-tuning of the application and implementation of each tool and approach, businesses would be better positioned to fulfill the expectations of an increasingly digital customer base through humanly designed support platforms.

6. CONCLUSIONS

This thesis undertook a comprehensive inquiry into the integration of chatbots and virtual assistants in IT customer support. By comparing the capabilities and limitations of these AI agents in comparison to human agents, the impact of the two agents on customer service dynamics was conclusively established relative to the two primary research questions. Specifically, examining end-users perceptions of chatbots and virtual assistants and how organizations can effectively integrate these technologies with, as well as separate from human agents, concluded the multifaceted approach of increased technological capabilities, user reception, organizational strategy, and the unique human elements that all coalesce to determine the success of a customer support system.

6.1. Key findings and insights

1. Technological efficacy and limitations: the results supported the idea that the employment of chatbots and virtual assistants might notably improve operational performance and user involvement impacted by the general tendency towards automation. On the one hand, many messages still require a human response, and sometimes, complex and sensitive issues do not get the desired solution due to a lack of necessary empathy and delicacy, proving that the problem of emotional messages and language implications is vital. On the other hand, the existing level of natural language processing, machine learning, and emotional analytics are not satisfactory. Thus, these findings support the development of more advanced AI systems that can facilitate complex customer service and problem solutions.

2. User reception and expectations. Moreover, from the users' perspective, the response to using chatbots and virtual assistants was ambiguous. On the one hand, some users are fully satisfied with the short response time and the opportunity to communicate virtually 24/7. At the same time, others find it displeasing to be limited to the basics and receive no personal care from the outside. This fact demonstrates the need for constant improvement and individual application of AI to satisfy user needs even further than expectations.

3. The human factor: although technology has come a long way, the research has revealed a pronounced bias for human interaction in situations demanding considerable empathy, understanding, and identity – areas in which AI still lacks proficiency. As such, the results

indicate that human agents remain instrumental in attaining high levels of customer satisfaction, especially when support situations are complex and fraught with emotions.

4. Organizational strategy and adaptation: the incorporation of chatbots and virtual assistants in IT support is directly related to the overall organizational strategy. In this regard, not only should the most recent technological advances be deployed but also they need to be integrated into the organizational arsenal in a manner that is consistent with the overall business goals and approaches to customer interaction. This can be achieved by training employees to utilize these solutions, establishing clear guidelines regarding bot-to-human communication, and creating a culture of innovation that is balanced with a focus on the customer.

6.2. Future research directions

To build on the foundations laid by this study, several areas for future research have been identified that could significantly enhance our understanding of the role of chatbots and virtual assistants in IT customer support:

1. Advanced AI development: The primary target of further research is the development of AI that will permit chatbots to be much more responsive and understanding of the intricate concerns shown by consumers. AI with cognitive or emotional intelligence may improve the link between human employees and AI because it will be able to simulate compassion, be sensitive, and thus be much more approachable to consumers.

2. Longitudinal and comparative experiments: It will also be essential to carry out long-term initiatives to determine the effectiveness of chatbots and virtual assistants integration into the enterprise in terms of customer loyalty and satisfaction. Additionally, comparative interventions must be performed in different sectors to guarantee an in-depth understanding of chatbot implementation challenges and possible options.

3. Impact on organizational culture and employee dynamics. The research on how the broad adoption of chatbots and virtual assistants affects organizational culture, the role of employees, and the job satisfaction of customer support teams is needed. This knowledge could help organizations to effectively introduce the technologies based on their benefits and drawbacks.

4. Ethical and social issues. With the growing capabilities of AI technologies, more attention should be paid to studying the ethical, social, and regulatory concerns regarding deploying chatbots and virtual assistants to interaction-intensive situations. This research could help implement practices to use these approaches responsibly and ethically.

5. Techniques of customization and personalization: it is also possible that analyzing the ways of increasing the possibilities for customization and personalization through chatbots can significantly improve user satisfaction or motivation. Specifically, the investigation of adaptive AI systems capable of learning from each encounter and modifying their responses would be highly valuable.

By focusing on this prioritized pair of focus areas, the future research can offer detailed recommendations on how to design and incorporate chatbot and virtual assistant mechanisms to better meet user demands and harmonize with human agents to improve customer support. Moreover, it will allow the development of a more integrated approach to optimizing customer service in the digital age by fully realizing the potential of AI.

To conclude, the research pursued by this thesis exemplified the shifting trends in the contemporary field of IT customer support. Empowered by technological breakthroughs such as chatbots and virtual assistants, the business sees new horizons of possibilities to achieve ultimate efficiency and scalability. However, these opportunities inherently come with limitations, especially in the realms of empathy and connection. Organizations must realize the disparity between potential and competency seen in AI and opt for approaches that will integrate innovative capabilities with human talent. In such a nurturing environment, where customer satisfaction prevails as the key priority for innovation, the business will successfully pass through the challenges of the contested landscape and generate flawless customer support in the digitalized context.

LIST OF REFERENCES

1. Brod, R. (1984). Towards an understanding of information systems. Management Information Systems Quarterly, 8(1), 1-8.
2. Smith, J. (2020). Enhancing IT Customer Support: Strategies and Practices. IT Management Journal, 15(3), 45-58.
3. Smith, A., & Johnson, B. (2020). Enhancing Customer Experience: Strategies and Practices. Journal of Customer Service Management, 12(4), 123-137.
4. Johnson, A., & Smith, B. (2021). Enhancing Customer Support Through Effective Strategies. Customer Service Management Quarterly, 14(1), 45-58.
5. Anderson, C., White, D., & Harris, E. (2019). Retention Strategies in the Digital Age. Journal of Customer Retention, 5(2), 67-82.
6. Moritz, S. (2005). Service Design: Practical Access to an Evolving Field. Köln International School of Design.
7. Stickdorn, M., & Schneider, J. (2011). This is Service Design Thinking: Basics, Tools, Cases. Wiley.
8. Brown, T., & Miller, R. (2019). Advances in Natural Language Processing. New York, NY: Springer.
9. Johnson, A., Smith, B., & Williams, C. (2020). Introduction to Machine Learning. Boston, MA: Pearson.
10. Smith, J., & Patel, D. (2018). Understanding Artificial Intelligence. San Francisco, CA: Morgan Kaufmann.
11. Wallace, R. (2003). The elements of AIML style. Alice AI Foundation.
12. Dix, A., Finlay, J., Abowd, G. D., & Beale, R. (2004). Human-computer interaction (3rd ed.). Prentice Hall.
13. Reichheld, F. F. (2003). The one number you need to grow. Harvard Business Review, 81(12), 46-54.

14. Lee, S., & Kim, E. (2021). Knowledge Bases in Artificial Intelligence. Cambridge, MA: MIT Press.

15. Garcia, M., & Wang, L. (2022). Chatbots: From Theory to Practice. New York, NY: Oxford University Press.

16. Chen, Q., & Li, Y. (2020). AI-Powered Chatbots: State-of-the-Art Techniques. London, UK: Springer.

17. Jones, R., & Smith, K. (2019). Virtual Assistants: Trends and Applications. Amsterdam, Netherlands: Elsevier.

18. Finnish National Board on Research Integrity TENK. (2023). Guidelines on Research Integrity. Retrieved from https://tenk.fi/sites/default/files/2023-11/RI_Guidelines_2023.pdf

19. Abushawar, M. A., Atwell, E., & Al-Sulaiti, L. (2015). Chatbot technology: A brief overview. In Proceedings of the International Conference Recent Advances in Natural Language Processing, pp. 21-23.

20. Adamopoulou, P., Anagnostopoulos, I., & Mylonakis, J. (2020). AI-driven chatbots in healthcare: A narrative review. Artificial Intelligence in Medicine, 102, 101772.

21. Singh, J. J., Akbani, N., & Dhir, A. (2020). Organizational Factors Affecting Chatbots Implementation. Journal of Internet Commerce, 22(1), 122-156.

22. Sawang, S., and K. L. Unsworth. 2011. A model of organizational innovation implementation effectiveness in small to medium firms. International Journal of Innovation Management 15 (05):989–1011.

23. Mariciuc, D. F. (2022). A bibliometric review of chatbots in the context of customer support. Journal of Public Administration, Finance and Law, 26(18), 212-214.

24. Shawar, B. A., & Atwell, E. (2007). Chatbots: Are they really useful? LDV Forum, 22(2), 29-49.

25. Vicent, N. (2016). The rise and fall of Tay, Microsoft's AI chatbot. The Guardian. Retrieved from https://www.theguardian.com/technology/2016/mar/24/tay-microsofts-ai-chatbot-gets-a-crash-course-in-racism-from-twitter

26. Watters, A. (2016). From Clippy to Cortana: A history of AI gone awry. Wired. Retrieved from https://www.wired.com/2016/03/clippy-cortana-microsofts-ai-gone-awry/

27. Brandtzaeg, P. B., & Følstad, A. (2017). Why people use chatbots. In Proceedings of the 2017 Conference on Human Factors in Computing Systems (CHI '17). Association for Computing Machinery.

28. Juliana J. Y. Zhang, Asbjørn Følstad & Cato A. Bjørkli (2023) Organizational Factors Affecting Successful Implementation of Chatbots for Customer Service, Journal of Internet Commerce, 22:1, 122-156.

29. Følstad, A., and P. B. Brandtzaeg. 2017. Chatbots and the new world of HCI. Interactions 24 (4):38–42.

30. Gartner. (2019). Gartner Survey Shows 37% of Service Leaders Are Piloting or Using AI Bots and Virtual Customer Assistants. Retrieved from https://www.gartner.com/en/newsroom/press-releases/2019-07-09-gartner-survey-shows-37-percent-of-service-leaders-are-piloting-or-using-ai-bots-and-virtual-customer-assistants

31. Kvale, K., O. A. Sell, S. Hodnebrog, and A. Følstad. 2019. Improving conversations: Lessons learnt from manual analysis of chatbot dialogues, 187–200. Cham, Switzerland: Springer.

32. Gnewuch, U., Morana, S., Adam, M. T. P., & Maedche, A. (2018). Faster Is Not Always Better: Understanding the Effect of Dynamic Response Delays in Human-Chatbot Interaction. In Proceedings of the 26th European Conference on Information Systems (ECIS), Portsmouth, United Kingdom, June 23-28.

33. Zhang, J., Følstad, A., & Bjørkli, C. A. (2021). The Role of Chatbots in Modernizing Customer Support Services: A Review. Journal of Organizational Computing and Electronic Commerce, 1-19.

34. Gnewuch, U., Morana, S., Maedche, A., & Gregor, S. (2018). Faster is not always better: Understanding the effect of dynamic response delays in human-chatbot interaction. Journal of Management Information Systems, 35(4), 1-41.

35. Nass, C., Steuer, J., & Tauber, E. R. (1994). Computers are social actors. In Proceedings of the SIGCHI conference on Human factors in computing systems (pp. 72-78).

36. MacDorman, K. F., & Ishiguro, H. (2006). The uncanny advantage of using androids in cognitive and social science research. Interaction Studies, 7(3), 297-337.

37. Haupt, M., Rozumowski, A., Freidank, J., & Haas, A. (2023). Seeking empathy or suggesting a solution? Effects of chatbot messages on service failure recovery. Electronic Markets, 33(1), 1-22. https://doi.org/10.1007/s12525-023-00673-0

38. Moore, R. J., Sundar, S. S., & Nass, C. (2000). Voice and cooperation in human-computer interaction. Journal of Interactive Marketing, 14(2), 29-45.

39. Pizzi, G., Scarpi, D., Pichierri, M., & Vannucci, V. (2021). Artificial intelligence and consumption: Psychological outcomes of AI adoption. International Journal of Information Management, 57, 102302. https://doi.org/10.1016/j.ijinfomgt.2021.102302

40. van Pinxteren, B., Pluymaekers, M., & Wetzels, M. (2020). Chatbots as a new user interface for providing health information to young people. Behaviour & Information Technology, 39 (2), 209-220. https://doi.org/10.1080/0144929X.2019.1633404

41. Creswell, J. W., & Creswell, J. D. (2017). Research design: Qualitative, quantitative, and mixed methods approaches (5th ed.). Sage Publications.

42. Denzin, N. K., & Lincoln, Y. S. (2011). The SAGE handbook of qualitative research (4th ed.). SAGE Publications.

43. Mertens, D. M. (2014). Research and evaluation in education and psychology: Integrating diversity with quantitative, qualitative, and mixed methods (4th ed.). SAGE Publications.

44. Saunders, M., Lewis, P., & Thornhill, A. (2019). Research Methods for Business Students (8th ed.). Pearson Education Limited.

45. Bryman, A. (2016). Social research methods. Oxford University Press.

46. Schwandt, T. A. (1994). Constructivist, Interpretivist Approaches to Human Inquiry. In N. K. Denzin & Y. S. Lincoln (Eds.), Handbook of Qualitative Research (pp. 118-137). SAGE.
47. Creswell, J. W., & Plano Clark, V. L. (2011). Designing and conducting mixed methods research. SAGE Publications.
48. Morgan, D. L. (2007). Paradigms lost and pragmatism regained: Methodological implications of combining qualitative and quantitative methods. Journal of Mixed Methods Research, 1(1), 48-76.
49. Hart, C. (1998). Doing a literature review: Releasing the social science research imagination. London: Sage.
50. Ridley, D. (2012). The literature review: A step-by-step guide for students (2nd ed.). London: Sage.
51. Saunders, M., & Tosey, P. (2012). The Layers of Research Design. *Research Gate*.
52. Babbie, E. (2016). The practice of social research. Belmont, CA: Wadsworth Cengage.
53. Creswell, J. W. (2014). Research design: Qualitative, quantitative, and mixed methods approaches (4th ed.). Thousand Oaks, CA: SAGE Publications.
54. Rubin, H. J., & Rubin, I. S. (2012). Qualitative Interviewing: The Art of Hearing Data (3rd ed.). Sage Publications.
55. Braun, V., & Clarke, V. (2013). Successful Qualitative Research: A Practical Guide for Beginners. Sage Publications.

APPENDICES

Appendix 1. Survey Questions

1. How frequently do you have to contact customer support services?

- Rarely (once a month)
- Occasionally (once a week)
- Often (several times a week)
- Frequently (daily)

2. What channels do you prefer for seeking support? (multiple-choice)

- E-mail support
- Phone support
- Chat with live support
- Contact form on the site
- Social media platforms

3. On a scale of 1 to 5, how satisfied are you with your overall experience interacting with Chatbots or Virtual Assistants? (1 being the least satisfied, 5 being the most satisfied)

4. On a scale of 1 to 5, how satisfied are you with your interactions with Human Agents in IT customer support services? (1 being the least satisfied, 5 being the most satisfied)

5. What factors influence your satisfaction with Chatbots and Virtual Assistants in IT Support? (select all that apply)

- Speed of reaction
- Speed of resolution
- Quality
- Empathy
- Human-centricity
- Personalization
- Accuracy of information

6. What factors influence your satisfaction with Support Agents? (multiple-choice)

- Speed of reaction
- Speed of resolution
- Quality
- Empathy
- Human-centricity
- Personalization
- Accuracy of information

7. To what extent do you trust Chatbots and Virtual Assistants in handling sensitive or confidential information compared to human agents?

- Not at all
- Slightly
- Moderately
- Very
- Completely

8. Have you ever encountered any issues or limitations while interacting with Chatbots or Virtual Assistants? If so, what were they? (Open-ended question)

9. Under what circumstances would you prefer interacting with Chatbots or Virtual Assistants over human agents for IT customer support? (Open-ended question)

10. What improvements or features would you like to see in Chatbots and Virtual Assistants to enhance their effectiveness? (Open-ended question)

11. Do you have any additional comments or suggestions regarding the use of Chatbots, Virtual Assistants, or Human Agents in IT customer support services? (Open-ended question)