Effectiveness of artificial intelligence chatbots for customer service

by

Howard Azaga

B.S. Mechanical Engineering, Tuskegee University, 2009

M.S Electrical Engineering, Tuskegee University, 2011

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Howard Azaga, *Middle Georgia State University*, *Howard.Azaga@MGA.edu*

Introduction

Customer service is assistance provided by a company to individuals who use or purchase its service or products. Companies utilize artificial intelligence (AI) powered customer support services to provide faster and more effective support. AI-powered chatbot applications are used by many organizations to answer frequently asked questions or to give common instructions to customers. “Managers need to know how their consumer groups define satisfaction and then interpret satisfaction scales to target, report, and respond to satisfaction levels. Guided by our framework, managers should conduct postpurchase segmentation, realizing that consumers vary concerning the components and related properties of satisfaction. Results suggest that different industries may need to use different satisfaction scales, or a single industry may need to tailor scales to different types of consumers" (Giese & Cote, J. A, 2000).

The use of AI is considered to provide better feedback than previous human interactions and present cost savings to companies, eliminating the need for the overhead required of human resources. More recent years have shown an increase of AI as an alternative to human customer service representatives, especially since the Covid-19 pandemic. Social distancing was required, and many companies shifted to utilizing AI chatbots for customer service (Mulyano et al, 2022). As time progresses, the services address high-fidelity issues versus human subject matter expert interaction. With the use of artificial intelligence in customer service platforms becoming more common, this paper will explore if this advancement in technology equates to efficient and effective customer service experiences.

With technological advancements, companies take advantage of efficiencies that cause paradigm shifts in their field. Customer service historically is a field that is based on human-to-human communication with the assistance of technology. With AI-powered chatbots, companies may lower overhead costs by decreasing human customer service operations. Ngai et al. (2021) investigated the design of a knowledge base that can effectively support customer service chatbot applications. The intended purpose of using chatbot applications is to improve customer experience and customer relationship management. Therefore, it is imperative to study the topic of AI chatbot customer service effectiveness.

The purpose of the study was to identify relevant literature in the field of AI Chatbot Customer service. The study will provide data that companies can perceive insights for customer service strategies. The significance of the study is that findings will reveal factors influencing customer acceptance and areas for improvement in AI chatbot implementation. This study answered the following research question:

RQ1: What are the themes in relevant literature associated with the use of artificial intelligence in customer service platforms as it relates to effective customer service experiences for consumers?

Review of Literature

With technological advancements, companies take advantage of efficiencies that cause paradigm shifts in their field. Customer service historically is a field based on human-to-human communication with the assistance of technology. With AI-powered chatbots, companies will lower overhead costs by decreasing human customer service operations. Therefore, it is imperative to study the topic of AI chatbot customer service effectiveness.

Customer Service and Satisfaction

Customer service is assistance provided by a company to people who use or purchase its service or products. “Managers need to know how their consumer groups define satisfaction and then interpret satisfaction scales to accurately target, report, and respond to satisfaction levels. Guided by our framework, managers should conduct postpurchase segmentation, realizing that consumers vary for the components and related properties of satisfaction. Results suggest that different industries may need to use different satisfaction scales, or a single industry may need to tailor scales to different types of consumers” (Giese & Cote, J. A, 2000). Customer satisfaction is a subjective term that can only be substantiated by an individual customer. A company cannot simply state they provided a correct answer, and in essence, superior customer service satisfaction was experienced. Customer service satisfaction is a human emotion-based experience.

Human Emotion Toward AI

Giroux et al (2022) study explores how individuals act morally toward AI technology. They document how consumer behaviors differ from human-to-human interaction vs human to AI. In addition, they captured that the intention to report an error has decreased as people use AI-powered self-checkout machines at businesses. Overall, they discovered that decreased morality in human interaction with AI-powered machines is caused by individuals experiencing a decrease in guilt when not interacting with a human. In their study, Ciechanowski et al (2019) examined the nature of human and non-human interaction processes. Their experiment consisted of two parts. The first is a measurement psychophysiological reaction of users interacting with chatbots and the use of a questionnaire focused on assessment and interactions in a person's willingness to work with a chat box. "We gathered the following psychophysiological data from participants: electromyography (EMG), respirometer (RSP), electrocardiography (ECG), and electrodermal activity (EDA). In the last, declarative stage, participants filled out a series of questionnaires related to the experience of interacting with (chat)bots and to the overall human–(chat)bot collaboration assessment" (Ciechanowski et al, 2019). Results of the study showed that participants preferred a simple form of a chatbot versus a more personalized one with an avatar to mimic human effects.

Rieger et al (2022) study describes a phenomenon called the perfect automation schema. This describes the behavior of a human getting serviced by technology understanding of failure or error from the technology. In the case of perfect automation schema, a human will value automation technology less than human interaction if the technology makes a mistake, the authors evaluated humans in terms of trust, reliability, and responsibility. They captured these variables by performing 3 experiments on human subjects. The three experiments simulated a loan acceptance task, a chemical plant instruction task, and an X-ray assessment task. Each experiment interacted with a human subject from the points of artificial intelligence, decision support systems, and human subjects. The findings from the study show a contrast from the author's hypothesis that a perfect automation schema would be observed. In the end, it was found that human trust and perceived utility were not reduced to a level lower than human support if a system failure happened in the experiment.

AI Use in Customer Service

As technology advances, a topic that usually involves human-to-human interaction to be successful can now be performed by the power of AI. Chaudhary and Srivastava (2022) state that digital transformation in the realm of engineering is used to replace conventional processes with automation to process large data problems efficiently. Artificial intelligence and other technological advances are replacing human interaction every day. Brill et al. (2019) surveyed to confirm satisfaction with digital assistance powered by AI. The overall study provided evidence that people are satisfied with using digital assistance. By adding AI technology to business processes, complex tasks, and customer service tasks, businesses achieved

productivity gains. The author's study aimed to close a gap in data with the contextual experience of respondents and the evidence of a customer service section with digital assistance.

The world now profits from the impact of AI and its many applications. Many companies are utilizing AI chatbots to perform service communications to their customers. Data sources are available to come to a scientific conclusion if AI-supported customer service is efficient. Ivan et al. (2022) provided background for this with their study. It related the subject to other published content in the world of AI and technology innovation. The authors took historical data on AI customer service applications and interviews for their study. Using these data sources, they conducted a data content analysis and concluded that AI-powered customer service is overall more efficient than human-based service.

Risk of AI with High-Fidelity Issues

AI applications have the potential to be implemented in many areas, and it is accepted as one of the most disruptive technologies in business. “Artificial intelligence can be used to realize new types of protective devices and assistance systems, so their importance for occupational safety and health is continuously increasing" (Steimers & Schneider, 2021, add page number). Therefore, its limitations should also be discussed to evaluate the implementation risks (Caner & Bhatti, 2020). With any technology, there are limitations. AI can be used with a positive success rate for customer service applications, but to what level? Commonly, bots are used to communicate the answer to frequently asked customer service questions. In most cases, if the scope of the problem cannot be calculated because of difficulty (high fidelity issue) by the AI, the application will elevate to human interactions for customer service. There is a gap in the literature on AI addressing complex human-based problems. Issues that can result in loss of life or catastrophic human injury should never be addressed by AI.

Methodology

The study consisted of a qualitative study design. Qualitative methods were employed to gather meaningful data from multiple sources, which allowed an in-depth exploration of the intricate phenomena within a specific context. (Rashid et al., 2019). A thematic literature review was conducted by evaluating existing literature on AI-powered chatbot applications for customer service focusing on common themes identified. Data collected related to the research question: What are the themes in relevant literature associated with the use of artificial intelligence in customer service platforms as it relates to effective customer service experiences for consumers?

Data was extracted from various literary host websites using terms applicable to the research question. Terms were identified based on their relevance to the research question. Literature was collected from Google Scholar, EBSCOhost, ProQuest, using the identified criteria for the study. Each database yielded an extensive list of articles (Table 1). Proquest and EBSCOhost offered the most robust filtering processes. Specific terms such as “chatbot”, “artificial intelligence”, and “customer service” were included. Boolean operators (AND/OR) included the terms “business” and “computer science” to further filter literature. To ensure the most robust research addressing the research question, specific criteria were followed including identifying articles that were published in peer-reviewed journals. All articles must have been published in the past 10 years. Articles were excluded (Table 2) from the analysis if they did not include a data collection process that reflected the consumer’s perspective on using chatbots in addition to the benefits from the company’s perspective.

Table 1. Article selection process

Step 1:	Total Articles Identified search criteria (N = 2,096) Database 1: Google Scholar (N = 12) Database 2: EBSCOhost (N = 521) Database 3: ProQuest (N = 1,563)
Step 2:	Filtered articles based on specific terms (N = 82)
Step 3:	Articles included in analysis that met all inclusion/exclusion criteria (N = 18)

Table 2. Inclusion and exclusion criteria

Inclusion Criteria	Exclusion Criteria
Published research in a peer reviewed journal	Research not in a peer reviewed journal
Research published in the past 10 years	Research that only focuses on the company's perspective
Research reflects the consumer's perspective on customer service using chatbots	Research that only has quantitative data
Research includes quantitative and qualitative data to show chatbot's effectiveness with consumers	Research published before 2014
Research offers company's perspective or data on cost efficiency	

Data Analysis

Thematic analysis was used to identify recurring themes and patterns in the literature (Braun & Clarke, 2006). The literature search process involved intense scouring of academic literature. Using the inclusion criteria, articles were quickly reviewed to assess if they were aligned with the purpose of this research. Results were further refined to include full-text articles to view, Boolean operators, and specific keywords to further narrow down the articles. A more thorough review required reading through articles to identify if they should be included further.

Data was analyzed from relevant articles using Dedoose, which identifies themes to be coded to gain insight into the research question. This program allows for various forms of media to be uploaded, and then analyzed. All articles were converted from PDFs to .docx files before being uploaded into Dedoose. This ensured a smooth coding process. As each article's results section was analyzed, and commonalities were identified in the articles to create themes, which were grouped.

Results

The purpose of this study was to identify the themes that would provide insight into the customer's perspective on using chatbots for customer service. The use of this technology is aimed at enhancing efficiency and customer satisfaction. Through an in-depth thematic analysis of existing literature, this study sought to uncover the strengths, limitations, and potential areas for improvement in AI chatbot use for customer service. Four themes were identified from the thematic analysis: customer satisfaction,

resoluteness, process design, and customer reaction. Themes are patterns, or main ideas, that emerge throughout several pieces of text. These themes weave together pieces of data that answer the research question. Once themes were identified, the codes were created to further categorize the data. The analysis ultimately answered the research question "What are the themes in relevant literature associated with the use of artificial intelligence in customer service platforms as it relates to effective customer service experiences for consumers? "

Theme 1: Customer Satisfaction

The theme of satisfaction was the most significant in the research, emerging 33 times. Several articles highlighted the importance of customers feeling satisfied with using chatbots to address their concerns. Park et al (2023) indicated, "When customers have positive voice interactions with a robot, it can lead to them developing a positive attitude towards the overall service" (2023). While chatbots offer quick resolution to problems, a customer's overall satisfaction with the software can contribute to a customer's continued interest in that company (Chang & Jiang, 2020).

For many respondents in the literature, trust was seemingly extremely important when interacting with chatbots. This theme emerged a total of 32 times. Several articles connected trust with loyalty and continued business. Brill et al. assert that consumers with more than 2 years of experience with chatbot technology are 17% more trusting of the service (Brill et al, 2019). Relevant literature assessed customers who used chatbots for various customer service needs including banking and ecommerce. Customers who perceive the chatbot to be friendly are more likely to trust the technology with their sensitive information (Cheng et al., 2022).

Theme 2: Resoluteness

Quickly resolving customer concerns is one of the benefits that companies receive by using chatbots. This theme was noted in several pieces of literature. Customers expect that by contacting a customer service representative, their issues will be resolved. This code was presented a total of 22 times in the literature. Consumers can view a chatbot as less effective than a human, so it is essential that chatbots appropriately resolve issues. Sands et al. conducted a study examining the effects of chatbots resolving issues after customer service failures. Their research indicated that when a "process failure" occurred due to the fault of a chatbot, customers were less satisfied and not inclined to continue business with the company (Sande et al, 2022). As a result, companies must design chatbots to solve the customer's problem or connect the customer with a live agent once the identified problem is beyond the chatbot's scope. As noted in several pieces of literature, resolving the customer's concern reduces frustration for the customer.

Theme 3: Process Design

Chatbots offer the ability to be customized to the needs of the company, based on what their consumer desires. For many companies, the impact of service is essential when employing these technologies. Park et al asserted that chatbots should be designed to use the appropriate "language and tone" when interacting with consumers (2023). Simple things such as designing the robot to utilize the customer's name or other personalizing factors should be considered as well. These custom processes can also be used to predict a consumer's behavior and answer key questions that will enable a smoother experience for the customer (DeAndrade & Tumerelo, 2021).

Since chatbots are not actual humans, they offer unique benefits to companies that humans do not. For example, chatbots are not limited to working certain hours each day or required to take breaks as humans are. Their flexibility "operates with agility, availability, and accessibility, continuously, 24 hours a day, seven days a week" (DeAndrade & Tumerelo, 2021). Flexibility emerged a total of 18 times throughout the pieces of literature. Although not real, chatbots can be designed to have human-like features, which is

known as anthropomorphism. Research indicates that these lifelike bots will be more well-received by consumers when they are frustrated with the interaction (Crolic et al, 2022).

Companies, large and small, are in business to maximize profits and minimize losses. Cost-saving strategies are a large part of introducing artificial intelligence into the customer service realm. The upfront cost of designing artificial intelligence for customer service is very expensive, but if it is used effectively and received well by the consumer, then profits can potentially increase (Trivedei, 2019). In a study conducted by Castello et al, they assert that the obvious benefit of using chatbots does have a cost-cutting effect, but to ensure that the customer is comfortable using this technology, it is the company's responsibility to communicate the benefits of the technology to the consumer (Castello et al., 2023).

Theme 4: Customer Reactions

The use of chatbots introduces an additional aspect of trust but relates to the company trusting the consumer. Because there is no physical person conducting the interaction with the chatbot, the consumer may be less likely to report an error, which can provide a financial benefit in some instances (Giroux et al, 2022). Extending on the theme of anthropomorphism, it may be beneficial for companies to create life-like chatbots because this can "increase the level of perceived guilt and thus motivate people to adopt moral actions" (Giroux et al, 2022). Furthermore, consumers expect customer service representatives to employ empathy when interacting with them; this is inclusive of human and artificial intelligence interactions (Cheng, 2021).

Although not mentioned in many articles, the theme of autonomy is nonetheless important when examining customer's perceptions of interacting with chatbots. While traditional communication is limited when interacting with chatbots, consumers feel a desire to have a "master-servant" relationship with the chatbot to meet whatever their customer service needs are. In a nutshell, consumers This level of autonomy is essential in having a positive experience for the consumer.

The results listed below in Table 3 highlight relevant codes present in the literature, including 18 peer-reviewed articles.

Table 3: Frequency of Codes

Code	Frequency
Satisfaction	33
Trust	32
Resoluteness	20
Custom Processes	19
Flexibility	18
Moral Judgements	17
Efficiency	13
Cost Savings	5
Autonomy	4

Implications of Findings

As technological advances continue to change the landscape of customer service, chatbots will continue to be used as effective methods of resolving customer conflict. A thematic analysis of relevant literature revealed that chatbots are used for multiple reasons including customer satisfaction, resoluteness, their customizable process design, and their ability to manage or not manage customer reactions. Findings revealed that all of the themes above are relevant and should be considered when a company decides to employ this form of technology.

Furthermore, this study's findings shed light on our future society. Companies are utilizing methods to cut costs. These strategies can negatively affect the workforce. As indicated in several pieces of literature, companies are creating chatbots to perform tasks that humans have been doing for years. Anything beyond the scope of the chatbot's design is handed off to a human customer service representative. Nonetheless, the presence of the automated chatbot is felt as actual human jobs are eliminated and the profession becomes more scarce.

Limitations of the Study

This study included limitations that could have influenced the results. First, there is a gap in the literature on artificial intelligence addressing complex human-based problems. Although there were a great number of articles found regarding customer service chatbots, the research became more limited as filters were utilized to address the specific needs of this study. This technology is still relatively new, and although there were a plethora of articles relating to the artificial intelligence topic, finding articles that also focused on the consumer's perspective was challenging. Filtering the articles using specific search terms such as "artificial intelligence" and "customer service" in addition to Boolean operators truly narrowed down the literature that was relevant to this study. Perhaps having more articles to siphon through would have garnered more data, resulting in additional themes.

Second, this study only included articles with quantitative and qualitative data because the purpose was to highlight rich anecdotal customer experiences. Limiting the scope of the study to only articles that included both forms of data further purged a long list of possible literature that only included quantitative data. Although numbers are valuable resources when conducting research, they were not the sole focus of this study. This study aimed to understand the consumer's perspective, and it was essential to include studies that would truly highlight how consumers felt after using a chatbot product. Some examples of gathered research included consumer interviews, situational observations, and online surveys that allowed participants to type their responses to questions.

Recommendations for Future Research

Expanding the research process to include additional databases may provide additional research to support another analysis. This may cast a wider net and offer additional resources to support the results of this thematic analysis. Furthermore, since chatbots are used more frequently by businesses, it may be valuable to explore the effect chatbots have on eliminating human jobs. Current literature that was included in this study offered that chatbots are currently limited in their scope; they must employ a human customer service representative for more complex situations they cannot solve. As technology continues to evolve, that practice may become antique. Researchers are constantly fine-tuning and customizing artificial intelligence capabilities, and eventually, there may be technology that is so life-like that it can mimic more human capabilities. Exploring how these advanced processes affect the job market, which can in turn affect customer service is worth exploring; especially since this study indicated that moral judgements are valuable considerations when utilizing chatbots. Lastly, the theme of satisfaction, specifically relating to trust, emerged several times. Further seeking an understanding of how chatbots can ease the fears of consumers relating to financial transactions or sharing sensitive information with chatbots may be beneficial in customers accepting the product. This study provides a peak into the capabilities of the future. It provides

insight into the experiences of the consumer and how artificial intelligence technology assists in solving problems for customers.

Conclusion

The data collected in this study provides insight into the emergent themes in relevant literature relating to chatbots being used as effective customer service mechanisms for consumers. The deep dive into many pieces of literature unveiled that chatbots can be useful tools to solve simple problems if used correctly. More complex issues still require the use of human customer service representatives. This gap in technology is an opportunity for further advances in technology that can eliminate human-consumer interaction in solving issues. The twofold benefit of artificial intelligence has lasting implications for consumers and companies. Fully analyzing the effect of utilizing artificial intelligence as a customer service mechanism should be critical in the design of this product for each company as each company offers unique services to their customer. The analysis of the literature included in this study revealed that chatbots are used in a variety of industries including banking, retail, and automotive, just to name a few.

Emergent themes in this research highlighted the customer's perspective on interacting with artificial intelligence. The analysis unveiled that customer satisfaction is paramount when considering the effectiveness of chatbots. A positive experience can create opportunities for long-lasting consumer-company relationships. By considering these themes, companies can tailor chatbots to their customer's needs. Expanding on this research will continue to sharpen the customer service industry, creating a better experience for consumers and improving efficiency for organizations.

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