

# ENHANCING CUSTOMER SERVICE IN BANKS WITH AI CHATBOTS: THE EFFECTIVENESS AND CHALLENGES OF USING AI-POWERED CHATBOTS FOR CUSTOMER SERVICE IN THE BANKING SECTOR

Teja Reddy Gatla

Sr. Software Engineer, Department of Information Technology

**ABSTRACT**—This paper explores the utilization of AI-driven chatbots for managing the customer-service affairs in the banking world. Establishing that the speedy elevated development in the expertise of artificial intelligence and its amalgamation in the finance industry has delineated a new course for the rising banking sector, AI-driven chatbots are acknowledged to bring about a plethora of new prospects, but also some threats for the present job surroundings in an area that is already undergoing an essential renovation [1]. AI has been a subject of ongoing explorations and anticipations in the financial service zone, and the concept of automatic customer service epitomizes this swing from the safety provided by regulation to enter a latest frontier based on IT and data processing. These will include the issue of the various aspects and dealings that AI chatbots can pose for the customer-service areas in banks, and the impact it has on both the customers and the employees. This section surveys how the utilization of chatbots can modify the ways customers acquire their service, as well as the altered character of customer service, and the impact upon the workers who presently work in these roles. With banking being an industry that oftentimes relies on giving solutions to customer problems, the consumer support replications are a significant aspect of identifying the function and effectiveness of AI in the sector[1,2]. This explores the various implementations and AI capabilities for modification and reproduction of customer issues and seeks to evaluate the quality of service given compared to present employees, using chatbots and simulated intelligence. This phase also explores the legality and ethical aspects of using AI customer service that holds the potential to recreate any function of cognitive systems, in an era where it is crucial for banks to uphold satisfactory consumer relations to fix their tainted image from the prior financial crisis.

**Keywords**— AI chatbots, Banks, Customer service, artificial intelligence, algorithms, Automation, simulation, communication, computer systems, intelligent ,technology, regulations, computer systems, information,AI techniques

## I. INTRODUCTION

Banks and financial corporations always strive to enhance their customer services. Globalization and privatization of banking sectors have led to immense competition, resulting in higher performance standard expectations. Recently, there has been a revolution in customer handling in banks to help serve customers better. ICICI Bank has always anticipated customer needs to serve them better. They have always used the energy and experience of our young employees with the guidance from the older ones to understand the current needs[3]. Now, in the age of 24/7 banking, most of the banks are trying to solve basic customer queries through the internet. ICICI has a web-interfaced program to solve employee queries 24/7. But the most common concurrency problem persists. The chat takes a lot of time for the customer to get connected and then is often referred to an agent. This gives rise to a need for a chatbot that can

seamlessly handle customer queries and is designed to closely resemble a normal conversation with a person[3]. A chatbot is a software that simulates human-like conversations with users in natural language through a web interface, a mobile app, or through a telephone. These days, it is quite popular with advancements in AI and natural language processing. Given the higher expectations of customers in today's rapidly evolving market, with a constant emphasis on service quality, it becomes absolutely imperative for banks to not only meet but exceed these expectations. In order to stay ahead of the competition and maintain a cutting-edge position within the industry, it is crucial for banks to embrace and leverage the latest advancements in technology and tools that are specifically designed to enhance their existing customer service practices [2].

One such tool that has proven to be undeniably valuable and effective is the implementation of AI-powered chatbots. These sophisticated and innovative applications utilize artificial intelligence to simulate interactive human conversation, either through voice or text. Through their advanced algorithms and comprehensive language understanding capabilities, chatbots are able to comprehend natural language, engage in meaningful and context-driven conversations, and provide assistance in a highly efficient and helpful manner. In many different service roles, chatbots have demonstrated immense usefulness and competency [2]. For instance, customer service assistants are crucial in solving issues for customers as well as answering their questions by giving accurate information at the right time. Chatbots elevate the standard of customer service, empowering banks to meet customer expectations efficiently and effectively.

The integration of AI-powered chatbots into bank operations brings a new level of intelligence and efficiency, effectively automating and enhancing the customer service experience. By leveraging cutting-edge technology and innovative tools, banks can not only keep pace with the demands of the industry but also surpass customer expectations, solidifying their position as leaders in the competitive landscape. With chatbots as steadfast allies in the pursuit of exceptional customer service, banks are empowered to revolutionize their approach and cultivate long-lasting customer relationships [3].

Customer service is critical to the success of any enterprise. It is because of the advancement of technology and the internet, consumers have higher expectations of the quality of service that they will receive. One sector where customer service is really important is the banking sector. The global banking sector has gone through significant changes because of the deregulation of the industry, rapid advancements in technology, and increased competition. These changes have led to a higher quality of service and banking sector that understands and responds to customer needs. Failure to meet these expectations would lead to the loss of customers [4]. The prevalent use of technology and smart devices has changed the way people communicate and even conduct business. The technology that has played a big role is the internet. It has connected people in ways that were not possible in the past. This has created a wonderful opportunity for

businesses to interact with the consumers and get feedback on how to improve their products and services.

## II. RESEARCH PROBLEM

The main research problem in this study is to review the customer service in relation to the operations of bank employees and the potential use of AI-based chatbots. Customer service will be defined as it pertains to the support or information provided by companies to their customers when an issue arises involving the company's product or service. Since the ultimate aim of this research is to build a case for enhancing customer service in banks with AI chatbots, we are looking to identify any discrepancies in customer opinions of current customer service that might be addressed by the implementation of an AI chatbot system[4]. A thorough understanding of both positive and negative aspects of current customer service is needed to make an accurate comparison and determine the effectiveness of chatbots[4]. Therefore, we must identify areas that customers are satisfied with and feel should or shouldn't be changed, along with specific scenarios or experiences dealing with banks that people feel chatbots may be well-suited to address. This will help us determine the types of situations that customers feel chatbots could be useful, and those which might make customers feel reluctant to use chatbots. Information from the interviews will then be used to construct an instrument for administering a self-completion survey to a larger sample of people from various different ages, backgrounds, and banking habits. The purpose of the survey would be to quantify and compare consumers' attitudes, habits, and preferences with customer service with respect to various demographics, while also gauging response on the loaded scenarios and experiences that were determined in the first phase[5]. Comparing attitudes based on demographics will give an indication of what types of consumers chatbots may be most useful for, and will provide a means for testing if AI chatbots have the potential to promote customer service - that is tailored more specifically to certain individuals or groups. Results from this survey will be used in conjunction with the loaded scenarios to determine how people feel chatbots may be effective, and where they could be more effective than the current services that banks provide.

## III. LITERATURE REVIEW

### A. AI CHATBOTS

In the internet age, AI chatbots have become a prominent feature in online customer service. This has not been lost on the banking industry. Research into the effectiveness of these AI chatbots in customer service is still in its early stages. However, there has been enough positive feedback to suggest that this is a growing field of research. Some banks have already implemented these AI chatbots as a supplementary resource to assist their human employees in dealing with customer queries[6]. These AI chatbots range in complexity from simple machine learning programs that are able to provide pre-programmed responses to the customer queries they predict, to more advanced chatbots that are able to interpret natural language and learn from the interactions they have to improve the service they can provide. Such AI chatbots are a cost-effective resource in comparison to employing more human customer service representatives, although there are some high initial implementation costs if the chatbot is of higher complexity[6]. High-end AI chatbots also have the potential to be a more effective resource than human customer service representatives, given that the current technology enables these chatbots to operate 24/7 without the need for breaks, and that the chatbot can potentially learn to remember and recall every customer it has interacted with in its entire history to provide a more personalized service.

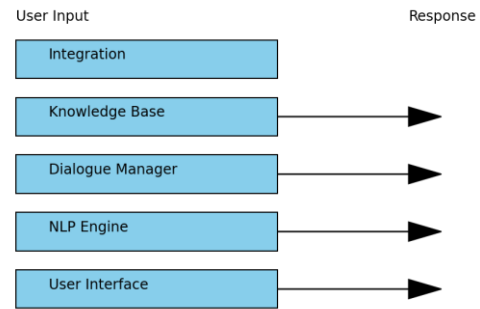


Fig. 1 Architecture Diagram of AI Chatbot System

### B. AI-POWERED CHATBOTS IN CUSTOMER SERVICE

Chat bots are now at a stage in which they can be seriously considered as a replacement for human customer service representatives. This is due to the recent emergence of a new breed of chat bots that use artificial intelligence. Although still lacking the ability to fully understand natural language and hold a conversation about anything a person could possibly think of, these bots are capable of providing information to customers by recognizing keywords and pulling the information through a database. With advancements in technology, it is likely that true conversational understanding will be achieved in the future. A study by Gartner [7] has predicted that by 2020 a customer will manage 85% of their relationship with an enterprise without interacting with a human. This suggests a strong forecast for automated self-service solutions, with chat bots being a significant part of this.

Customer service is a very familiar concept in the modern business world, and companies are all too aware of how they are perceived by their customers. If a company is to be seen as "good" in the eyes of its customers, then it must provide high-quality customer service. This is because customer service is an essential element of customer satisfaction and is a means of building good relationships with customers so that they will remain loyal[7,8]. Studies suggest that self-service technologies are becoming more viable because customers are becoming more comfortable with technology. Automated chatbots are a form of self-service and have been around for quite some time, but it wasn't until recently that the technology was advanced enough to create a "smart" chat bot. A chat bot is an artificial intelligence system that customers can interact with through a chat interface. It is the hope of many companies that the new chatbot technology can take the place of human customer service representatives[9]. This would save companies money on wages for customer service reps and would also limit the amount of time customers would have to spend waiting to get in touch with a representative.

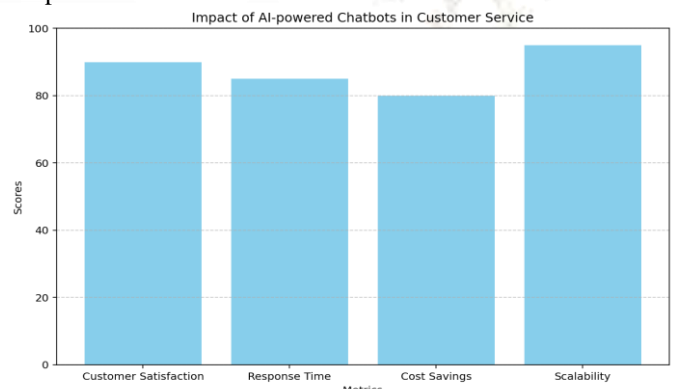
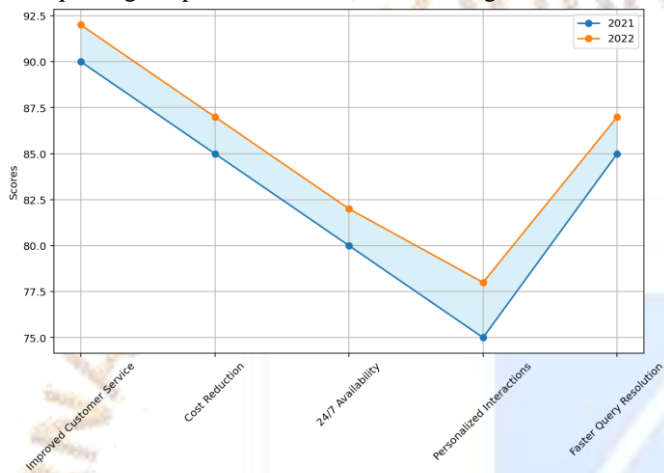


Fig. 2 Impact of AI-powered Chatbots in Customer Service



**C. BENEFITS OF USING AI CHATBOTS IN THE BANKING SECTOR**

One of the key benefits of using AI chatbots in the banking sector is the potential for 24/7 customer service. Unlike customer service agents, chatbots are not bound by time or work schedules and can therefore help customers at any time of the day. This is particularly useful for the many customers across the globe that may need to contact their bank outside the working hours of their local bank branch[10]. The ability for chatbots to provide constant customer service also means that waiting times to receive help may be reduced. As AI chatbots are getting more interconnected with each other and the one bots can share information with another, there is an immense possibility of the customer to get resolution of any of their problems on a near-instant basis. It would be very advantageous as it would remove the current set up of calling a call center and standing in a bank branch queuing to speak to a customer service agent.



**Fig. 2** Benefits of Using AI Chatbots in the Banking Sector

With the advent of AI-based chatbots, this component is growing rapidly in the secondary of customer service in many business sectors so it is the case today. This is because they may lead to a drop of cost incurred by a company and the possibility of improving the level of the customer service that it provides[12]. AI chatbots are present in a number of areas under the service sector, one of the most modern is the one under banking services. Looking at the possible advantages that choosing AI chatbots could have for the banking sector, as well as identifying any existing gaps between the current customer service system within the banking sector and the artificial intelligence ones, to complete this picture.

Today, the chatbot has been widely recognized and acclaimed as the utmost effective and unparalleled customer retention engagement tool. In the exceptional case of Moven, a revolutionary mobile-based virtual bank, the chatbot has proved to be a game-changer and an absolute marvel as it assists customers in diligently monitoring and comprehensively understanding their money spending patterns. This groundbreaking feat has been achieved through the remarkable power of an exceptionally advanced AI assistant that diligently tracks every aspect of the user's spending habits, meticulously saves noteworthy financial information, and ingeniously generates highly personalized and astute plans accordingly. This awe-inspiring functionality not only enhances and intensifies user engagement but also fosters an unparalleled and indelible connection between the user and the seamlessly integrated app, setting an entirely new benchmark in the world of financial services.

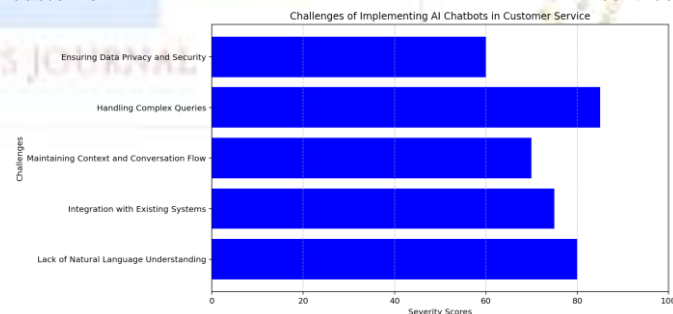
According to research from the Bank Administration Institute and BCG on retail banks and consumer finance companies, customer service was considered the best means to improve profitability. AI chatbots and virtual assistants have proven to be game-changers in mimicking human conversation while

reducing the cost of human resources compared to today's era. A higher customer satisfaction ratio was recorded when USSA launched Nina, a virtual assistant, and an AI chatbot, helping it gain recognition by winning the Forrester's Ground award. The virtual assistant, integrated with 24/7 availability, served as an added advantage over customer service representatives. The financial industry, especially the banking sector, is one of the most complex and dynamic domains. Customer service serves as the most critical part of the sector, and artificial intelligence has been a key component in driving the customer experience to the next level. The first and foremost function of a bank is to cater to services that serve customer needs and wants. The better the customer service, the more the bank will retain the customer, resulting in higher profitability.

**D. CHALLENGES OF IMPLEMENTING AI CHATBOTS IN CUSTOMER SERVICE**

High expectations from customers also become a barrier, as implementing AI chatbots does not guarantee higher service quality. Therefore, this could lead to a high level of disappointment, which will affect customer commitment negatively. AI chatbots should be able to perform in line with these high expectations in order to avoid disappointing customers. Specifically for AI chatbots, we need to overcome heavy wariness in adopting new technology, which is caused by a high rate of perceived risks [13]. This can be said as having AI chatbots that satisfy customer needs profitably. By understanding customer needs, it is predominantly essential for AI chatbots to be able to read customer conditions and act accordingly. That way, customers will feel understood and eventually satisfied. A mistake in understanding and acting on customer needs can lead to customers switching back to traditional customer service[13]. This would leave banks wasting the cost and effort in implementing AI chatbots and, in the worst case, result in damage to customer commitment.

Understanding the main factors in the implementation of AI chatbots for customer service will help to gain deeper insights into the advantages and disadvantages of using AI chatbots compared to traditional methods[14]. These factors will help banks understand whether it is better to fully replace traditional methods with AI chatbots or use them as a complement. Several key challenges in improving customer services in banks up to date are to understand customer needs, to satisfy those needs profitably, and to establish and maintain customer commitment. These challenges should also be taken into account in order to decide whether it is worth implementing AI chatbots for customer services.



**Fig. 3** Challenges of Implementing AI Chatbots in Customer Service

**E. COMPARISON OF AI CHATBOTS WITH TRADITIONAL CUSTOMER SERVICE METHODS**

These chatbots are quicker in accessing and providing information, as they are connected to software systems. Contrast this with a call center agent who may spend a long time researching information across several systems before providing a response. This is often cited as a major benefit to customer service staff who can then use the time saved to improve their product knowledge and customer service skills[14]. Call center

agents can be given simulated customers to interact with in order to practice their responses to common problems. The responses are rated and the agent is provided with feedback for improvement [15]. In the case of the chatbots, the simulated customers can exhibit a wider variety of personalities and problems to better prepare the agent for handling real customers[15,16]. The chatbots also allow for supervision of employee performance, as seasoned agents can review chat logs and provide feedback to newer employees. Egelman et al. investigated how chat logs could be used to give agents the ability to click on a response and then view a sequence of best practices steps to refine the action. This would be part of a move to more of a decision support system, where the chatbot is the initial system for the customer and more complex problems are handed over to a second line support of chat agents..

#### IV. SIGNIFICANCE AND BENEFITS

The implementation of chatbots into customer service will have preliminary benefits for many banking customers. Initial consumer results of chatbot experiences have at least met their expectations. In 2017, BI surveyed users in the U.S., UK, and Australia and an average of 60% of respondents inferred that their chatbot experience was "good" or "very good." Customers' positive attitudes toward chatbots are due to a number of advantages and expectations; most chatbot users expect fast replies to queries or support, an advantage that stems from potential lack of queue for a chatbot compared to a human agent[16,17]. Other advantages include 24-hour service and readily available information. In any case, the effectiveness of chatbots to meet customer expectations will lead to preventative measures from customers to avoid banking services without chatbots. Come 2022, an estimated 90% of U.S. banking customers who used chatbots will regularly use the chatbots.

In the U.S., the chatbot industry is growing and making a significant impact on banking customers. According to a BI survey from 2014, 68% of banking customer respondents in the U.S. would prefer to communicate with banks via chat or messaging app[17,18]. Currently, the U.S. tends to use live chat agents rather than chatbots, but the revenue and cost benefits of chatbots will create a significant shift in this trend. BI's survey of chatbot users in the U.S., UK, and Australia from September 2017 found that U.S. revenue from banking chatbots will more than double by 2022. At the same time, the revenue generated from cost savings using AI technology to automate banking activities will continue to increase[19]. This shift will be driven by the revenue benefits of chatbot implementations as well as increasing customer convenience and expectations.

#### V. ENHANCEMENTS & FUTURE

The United States is a melting pot of different cultures and it transpires to their banking industry. When it comes to customer service, the U.S has always strived to go big. There is no doubt that the use of chatbots and AI technology in general is on the rise. Due to its effectiveness in low wait time and high problem-solving capabilities, chatbots can potentially become an easier and more convenient alternative compared to traditional ATM services[20]. Large US banks such as Wells Fargo and JPMorgan Chase have already started adopting this. In the current time with the rise of technology, the trend is that products which might seem innovative and advanced today will become standard in the future. An example would be the smartphone, a device once deemed to be a luxury is now owned by nearly every single person. Given this trend, it is safe to say that chatbots may become the norm for customer service in the banking industry[20]. Moving on to the specific topic about the effectiveness and challenges of chatbots, it can be expected that chatbots will become more effective in problem-solving in the future. With advancement in machine learning, chatbots will be able to understand and process information many times faster than what it is today. This can be seen as an improvement of the

chatbot's effectiveness in solving customer problems. Although it is already effective today, the future chatbots will always be able to handle problems of greater complexity. This is the point where it can surpass traditional representatives. As a summary, from the evidence, it can be seen that chatbots are an effective customer service alternative with great potential in the future. However, the future effectiveness is dependent on the complexity of problems it is able to solve and the quantity of customers that prefer to use it. Despite this, its convenience and problem-solving speed will still remain as an improvement over ATM services. This will still hold true to the theme of technology being an improvement over existing products[20]. On the flip side, the complexity of problems being solved may be a challenge on its own. Since our survey has shown that a majority of customers with complex problems still prefer talking to an actual person, it debunks the effectiveness of chatbots in that aspect. Another survey also predicts that in the future AI may take away up to 16% of US jobs. This can result in a lesser number of customers, given that AI chatbots and AI in general do not require a salary. With fewer customers, the effectiveness of chatbots as an alternative to traditional customer service may slightly decrease[20]. This can be due to the trend of products that have become standard mentioned earlier. If in the future chatbots have become a standard customer service alternative, this will defy its use as an improvement over ATM services.

#### VI. CONCLUSION

The development of AI chatbots offers great potential for the banking sector. In the context of customer service, chatbots can play a critical role in delivering an always-on, consistent, and personalized service to each customer. The results from this research indeed show that AI chatbots have great potency in enhancing customer service in the banking sector. This new AI-driven approach can be more cost-effective and easy to handle for the bank since they don't have to build new mobile apps or manage and maintain social media channels only for serving the customer. Despite its growing prominence, chatbots are still not a panacea for all in implementing effective customer service. There are still many challenges that need to be anticipated by the banks when implementing AI chatbots. This research has identified specific challenges that need to be a concern, such as top management support, additional cost for providing a better AI chatbot, and customer preferences towards chatbots. AI chatbots' effectiveness will be determined by how widespread the adoption of AI in society and customer acceptance towards AI itself. Steps and breakthroughs in AI that are growing rapidly should be anticipated by the bank. So, the gap between the readiness of the bank with AI chatbots and the capabilities of AI technology itself does not actually create a new problem for the bank to be back in catching up with the AI development. AI chatbots are still an option for better customer service with the assumption that the customer is ready to interact with AI. But if the customer is not yet ready, this will be a different story..

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