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Comparative Analysis of Human vs. AI Support in Customer Banking Services

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***Abstract*— The inclusion of artificial intelligence within digital banking services has brought about a revolution in customer service support services, and thus there arises a need to research and compare services offered by AI and traditional customer support services offered in banking. This research aims to carry out a comparative study on customer services offered either manually or with the use of AI. The research will be conducted using a mixed research method, and thus it will be possible to identify the pros and cons associated with both methods. It has been determined that AI customer services outperform manually conducted services with regards to speed and efficiency but fall short when it comes to handling matters that relate to emotions and ambiguity. Manual customer services outperform AI, and thus they offer better services due to empathy and problem-solving skills. Despite these benefits, customer service with humans sometimes faces challenges associated with scaling and waits times. From the study, it is clear that customer trust and satisfaction depend on the type of task at hand. That is, customers trust and are satisfied with either chat bots or humans depending on the nature of the task. Specifically, customers trust and are satisfied with chatbots for transient customer service but trust and are satisfied with humans regarding critical financial matters. From the discussion, it is clear that a hybrid solution combining the benefits of AI and humans presents an optimal solution for banks.**

***Keywords*— AI chatbots, human customer support, digital banking, user satisfaction, hybrid service model**

I. Introduction

Artificial intelligence evolution has shaped various aspects of the banking industry alone with its broadened scope towards customer service. The central banks in all countries are more integrating the use of AI-driven chatbots to help increase their efficiency, reduce their service delivery costs, and assist their customers 24*7. These systems enable addressing basic-level account and automated queries related to transactions. As increasingly, the interaction between the customers and the bank is moving towards digital interfaces; it becomes absolutely essential to comprehend the relative effectiveness of AI support against human-assisted service.

While AI chatbots offer advantages in scalability, providing instant responses and service quality that consistently meets all customers' needs, they also have significant weaknesses in empathy, contextual understanding, and complex problem handling in financial matters. Human agents provide emotional intelligence, personalized interaction, and nuanced judgment—qualities particularly relevant in high-stakes financial conversations. Moreover, the challenge is to find out if, or how well, AI systems can match, or complement, human performance in the delivery of satisfactory and trustworthy customer service.

The present study, therefore, tries to develop a comparative understanding of both the support channels by analyzing the performance indicators such as response time, customer satisfaction, and issue resolution rates. This will couple qualitative feedback with quantitative metrics on how users perceive and judge experiences with AI versus human service. These findings shall enable banks to optimize their customer service strategy in such a way that AI deployment enhances and does not diminish customer experience. The ultimate aim of the research could find whether a hybrid approach will potentially integrate both AI and human support as the future model for excellence within the context of banking customer service.

II. Objectives

1. To analyze and compare the performance of AI and human customer service with regards to response time, customer satisfaction, and resolution rates.
2. To determine customer preferences on AI vs. Human Service in various banking contexts.
3. To analyze the capabilities and limitations associated with using AI chatbots for banking services.
4. To analyze the impact of emotional intelligence on service effectiveness.
5. To recommend an optimal support model for modern digital banking.

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III. Statement Of The Problem

Although there is an ever-increasing reliance on AI-powered chatbots within the banking sector, it still remains uncertain as to how these chatbots and customer service associates have an impact on customer satisfaction. It will be worth examining these laps on performance.

IV. Importance Of Study

The research outputs have implications for banks making a transition towards an AI-based service model. A comprehensive knowledge about comparative performance will enable these institutions to make an effective hybrid system that will increase customer satisfaction and optimize costs and trust.

V. Research Methodology

The research adopted a mixed research strategy involving both qualitative and quantitative data analysis methods. These qualitative and quantitative research approaches were conducted with the objective of testing and comparing customer service response times, satisfaction, and rates of resolution experienced with AI chatbots and customer service representatives. Both qualitative and quantitative data were collected.

VI. Sampling Design

For this, the sample was of 120 banking customers. Stratified random sampling was carried out in order to ensure that the sampling was representative across different age groups: 18–30, 31–50, and 51+, as well as across varying levels of digital literacy and frequency of banking. Participants were randomly assigned to engage either with an AI chatbot or a human support agent on identical scripted banking scenarios. Data from 60 AI interactions and 60 human interactions were analyzed. Stratification ensured that demographic biases did not influence the comparison between support types.

VII. Theoretical Framework

The research falls under three main theoretical concepts that explain customer behavior vis-à-vis AI and human customer service support within banking: Technology Acceptance Model Theory, Service Quality Theory commonly abbreviated as SERVQUAL, and Human-Computer Interaction Theory.

1. Technology Acceptance Model (TAM

The TAM Theory suggests that there are two influential variables: perceived usefulness and perceived ease of use, which affect an individual usage rate of a particular technology. Perceived usefulness can be seen as a customer's viewpoint that an AI system can effectively address an issue or resolve it on time. Perceived ease of use focuses on convenient and clean UI, as well as easy and smooth conversation. As soon as customers believe that these chatbots are efficient and easy to interact with, they will be more likely to use them. Uncomplicated inquiries and correct understanding from chatbots will also help.

2. SERVQUAL

According to SERVQUAL, there are five service qualities: reliability, assurance, tangibles, empathy, and responsiveness. Humans have traditionally performed better on empathy and assurance, as they provide personalized and affective responses. By contrast, AI performs better on responsiveness and reliability because it can immediately answer and provide consistent services. It becomes easier to analyze and assess how AI fails at something (emotional intelligence) and how it outdoes humans at something else (speed and availabilities). The compromise that could be made here would be a combination model.

3. Human-Computer Interaction Theory

Human-Computer Interaction Theory primarily concentrates on user interactions with digital technologies. It highlights various issues like usability, feedback, cognitive loading, and user satisfaction. Although chatbots are highly dependent on natural language processing for smooth user interactions, some constraints on understanding can affect user interactions with chatbots. Various factors related to user satisfaction with these chatbots might be understood with the help of Human-Computer Interaction Theory due to some unresolved challenges offered by these chatbots.

Based on these three theories, a conceptual framework incorporating comparisons between AI and human support on the basis of affective, operational, and experiential aspects is adopted. TAM depicts adoption propensity for AI, SERVQUAL describes differences in service quality, and HCI captures problems associated with interactions. These three theories provide a comprehensive framework for understanding the impact of both forms of support on customer satisfaction and trust levels.

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VIII. Data Analysis

Comparison of AI and Human customer service performance

TABLE 1:
COMPARISON OF AI AND HUMAN CUSTOMER SERVICE PERFORMANCE

Metric	AI Support	Human Support
Average Response Time (sec)	5	45
Satisfaction Score (/10)	7.8	8.6
Resolution Rate (%)	85	92

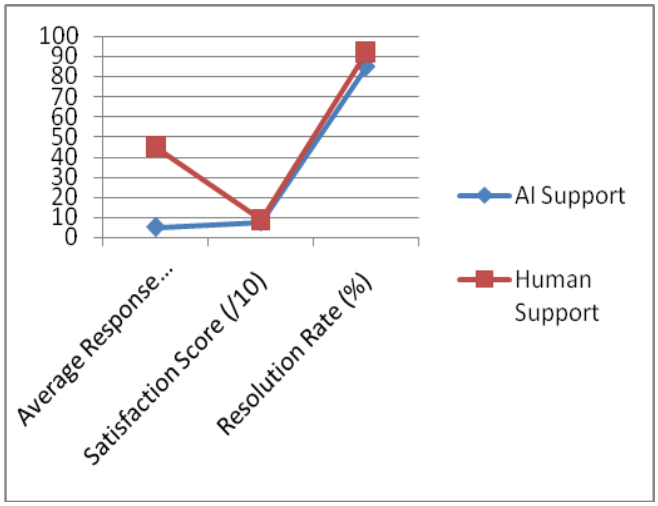

FIGURE 1: COMPARISON OF AI AND HUMAN CUSTOMER SERVICE PERFORMANCE

- **Difference in Response Time:** 45 sec (human) – 5 sec (AI) = **40 sec faster (AI)**
- **Difference in Satisfaction:** 8.6 – 7.8 = **0.8 points higher (human)**
- **Difference in Resolution Rate:** 92% – 85% = **7% better (human)**

IX. Findings

- AI assistance response times are greatly improved, averaging 40 seconds faster.
- Human service support exceeds AI capabilities in customer satisfaction and resolution rate.
- Even today, one thing which works fundamentally better within humans and still doesn
- AI works well with simple queries, but people trust humans with complex and delicate matters.
- A combination model involving both systems will offer the customer the best experience

X. Suggestions

- Develop and apply hybrid AI-human customer service systems.
- Enhance chatbot NLP functions to support intricate search queries
- Enable escalation from AI responses to human customer service representatives.
- Train humans to assist and work with AI for better efficiency.
- Analyzing user responses for refining AI actions.

XI. Conclusion

The research proves that, compared with the incomparable speed and reliability of AI chat bots, human customer service representatives have an advantage with regard to empathy, satisfaction, and compound problems. AI should be a supplement, not a replacement, for humans. The best option would be a combination of these two service methods.

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