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Leveraging Artificial Intelligence to Enhance Customer Service in Cooperative Banks in India

Khusboo Mittal

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Abstract

Tampereen ammattikorkeakoulu
Tampere University of Applied Sciences
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This study examines the use of Artificial Intelligence (AI) to improve customer service in cooperative banks in India, which play a vital role in promoting financial inclusion in rural and semi-urban areas. While AI adoption is growing rapidly in private and commercial banks, cooperative banks face challenges such as limited technology infrastructure, financial constraints, and lower digital literacy among customers.

Using a mixed-methods approach, the study surveyed 50 customers and staff of cooperative banks and conducted interviews with banking professionals and policymakers. Results show moderate awareness and usage of AI tools like chatbots and virtual assistants, with mixed perceptions about their usefulness and ease of use. AI is recognized for improving service speed and personalization; however, many customers still prefer human interaction for complex or sensitive issues. Key barriers to adoption include language diversity, data privacy concerns, and resistance to technological change.

The findings support the Technology Acceptance Model (TAM), confirming that perceived usefulness and ease of use significantly influence customer satisfaction with AI services. The study recommends cooperative banks develop multilingual AI tools, strengthen data security, adopt hybrid human-AI service models, and invest in digital literacy programs tailored to their unique customer base. These insights provide practical guidance for policymakers, cooperative banks, and technology providers to modernize customer service while addressing the sector’s specific challenges.

Key words: Artificial Intelligence, Cooperative Banks, Customer Service, Financial Inclusion, Technology Acceptance Model

ABBREVIATIONS

Abbreviation	Full Form
AI	Artificial Intelligence
CRM	Customer Relationship Management
RBI	Reserve Bank of India
TAM	Technology Acceptance Model
UX	User Experience
FinTech	Financial Technology

CONTENTS

1. INTRODUCTION

Over the last few decades, the banking industry has experienced a paradigm shift due to enhancements in technology (Perez et al., 2004). Artificial Intelligence (AI) was noted as one such force which has helped to transform how financial institutions function and interact with their customers (Mohsen et al., 2025). Over the past years, private and commercial banks have been eager to focus on the adoption of AI solutions to enable process automation and enhance customer experience; while in India, cooperative banks have been left behind. Given the role of cooperative banks in fostering financial inclusion and supporting rural and semi-urban economies, it would be worthwhile to consider how AI can be strategically employed for greater customer service within this sector of the banking environment.

India cooperative banks represent a considerable part of the financial landscape in the country, primarily in rural and semi-urban areas and their limited access to the services provided by traditional banking (Raju et al., 2018). Cooperative banks have a key area of operations related to agricultural finance, finance for small-scale industries, and financial needs of weaker sections of society. However, cooperative banks, due to their socio-economic importance, are lodged in certain operational challenges like low technology infrastructure, limited capital, and customer service arrangements. As customer demand for banking services evolve to become more immediate, personalized, and frictionless, cooperative banks are being pressured to revise their service delivery models in a way that is compelling to customers (Harish et al., 2025). In this regard, Artificial Intelligence seems to serve as an economical solution to the service delivery gaps of cooperative banks to improve overall customer satisfaction.

AI has some major leverage to disrupt the help-desk space because it can automate repetitive tasks, process and analyze enormous amounts of data to expose actionable insights, and deliver personalized experiences based on complex algorithms (Anozie et al., 2024). Technology, such as chatbots, virtual assistants, sentiment analyzers, predictive analytics, and machine-learning models, can potentially disrupt the methods by which co-operative banks manage customer care.

For example, AI chatbots may be set up to give round-the-clock customer support for the most usual enquiries relating to account balances, loans, interest rates, and transaction status without any intervention from a human being. Such measures reduce operational burdens on the bank staff and improve response time, increasing the satisfaction level of customers (Nguyen et al., 2024).

Conversely, cooperative banks may, using predictive analytics, identify customer requirements and preferences on the premise of historical data and transaction patterns. This allows the bank to proactively provide clients with suitably tailored financial products, loan reminders, and investment advice. Such interaction would increase customer bonding to cooperative banks, leading to their expansion. On the other hand, sentiment analysis tools can go through customer voices, from emails, social media, and surveys henceforth identifying service gaps and areas of improvement, which in turn allow a refinement of service strategies for their benefit (Kotte et al., 2025).

While these potential advantages seem extremely attractive, the actual adoption of AI in cooperative banks is still rather low due to a number of challenges. Financial restrictions, lack of skills, data breach concerns, and behavioral resistance form the bulk of the barriers in the way. Unlike their bigger counterparts, cooperative banks operate on leaner resources and earnings, which creates a huge hurdle to invest in cutting-edge AI technology (Ramos et al., 2024). Besides this, the staff in these banks may not be adequately skilled to see the implementation and maintenance of AI-driven solutions to completion. Concerns about the use of AI, keeping it ethical, and data privacy are hurdles when dealing with rather delicate customer information, especially in line with regulations such as the Reserve Bank of India (RBI) guidelines and the Personal Data Protection Bill (Sharma et al., 2024).

An encouraging trend has been witnessed in this sector, wherein even small-sized financial institutions are forced to come onboard technology solutions by the government through thrust areas like Digital India and Atmanirbhar Bharat. FinTech collaboration, cloud-based AI services, and public-private partnerships can provide the much-needed backing for cooperative banks to break down the existing financial and technical barriers. A solution-based approach to scalable AI can help

cooperative banks to transform their customer servicing models in accordance with their respective operational constraints at affordable costs.

Integrating Artificial Intelligence into the customer service systems of cooperative banks in India is much more than just a technological upgrade-it is a strategic imperative. It can offer enormous gains to operational efficiency and customer satisfaction, thereby ensuring their long-term survival in the rapidly evolving financial landscape. Despite the lingering challenges to AI adoption, cooperative banks can still capitalize on phased and well-thought adoption of technology through adequate training and policy interventions to remain relevant and competitive in the digital age and better serve the communities (Aithai et al., 2025). This study attempts to study the various facets of implementation in cooperative banks internationally, identify the best practices, and make recommendations that facilitate this much-needed transformation.

1.1 Purpose of the Study

The focus of this research is to research and examine how Artificial Intelligence (AI) can be successfully applied to improve customer service within cooperative banks in India. Given the importance of cooperative banks to ensure financial inclusion, especially for rural and semi-urban areas, it is essential to strengthen cooperative banks' customer service approaches to drive economic development and satisfy customers. The report will help to understand the current position on technology available in cooperative banks, what technological gaps and challenges exist from a customer service perspective; and receive a view on how AI could address these situations.

The aim of this study is to understand the potential applications of artificial intelligence (AI) technologies—like chatbots, virtual assistants, predictive analytics, natural language processing (NLP), and machine learning algorithms—in enhancing customer engagement, quickening service response times, and customizing financial services by assessing the AI strategies used in meaningful case studies and industry best practices. The study will provide ideas for implementing AI applications within operational and financial realities for cooperative banks.

As well, this study also intends to identify the barriers to AI adoption in cooperative banks, including financial issues, lack of skills, technology infrastructure, and data privacy and protection issues. In addition, it will explore how public policy initiatives, regulatory frameworks, and partnerships with FinTechs can support the adoption of AI Technologies in this context.

Ultimately, the research will create suggestions about a strategic framework for co-operative banks to implement AI with customer service models. This will improve customer satisfaction and operational efficiencies and strengthen the competitive positioning of co-operative banks within the rapidly digitalizing financial landscape in India.

This study utilized a range of research and writing tools to ensure accuracy, clarity, and rigor throughout the dissertation. For data collection and analysis, structured questionnaires and interview guides were developed and administered, with quantitative data analysed using statistical software such as SPSS, and qualitative data coded and interpreted using NVivo for thematic analysis. To maintain high standards of academic writing, tools like Grammarly and Turnitin were employed for grammar checking, plagiarism detection, and overall language enhancement. Additionally, reference management software such as Mendeley was used to organize and cite sources efficiently. Supplementary AI frameworks, case studies, and industry reports were also reviewed to provide comprehensive context and support for strategic recommendations.

1.2 Research Objectives of the Study

- To Assess the Existing Customer Service Practices and Technological Readiness of Cooperative Banks in India
- To Examine the Role and Effectiveness of Artificial Intelligence in Enhancing Customer Service Efficiency and Satisfaction
- To Identify Key Challenges and Barriers Hindering the Adoption of AI in Cooperative Banking Institutions
- To Develop Strategic Recommendations and a Framework for the Successful Implementation of AI in Customer Service Operations

1.3 Research Questions

- How can Artificial Intelligence technologies be utilized to improve customer service delivery within cooperative banks?
- In what ways do cooperative banks benefit from the implementation of AI tools such as chatbots and virtual assistants?
- What are the key challenges and limitations faced by cooperative banks in adopting AI technologies for enhancing customer service?

1.4 Research method

The present study will adopt a mixed-method research approach, combining both quantitative and qualitative methodologies to comprehensively analyze the role of Artificial Intelligence (AI) in enhancing customer service within cooperative banks in India. Quantitative data is collected through a structured questionnaire-based survey targeting both customers and managerial staff of cooperative banks to assess current customer service satisfaction levels, awareness of AI technologies, and perceived benefits of AI adoption. A total of 50 participants is included in the survey, to ensure relevant insights from both customer and managerial perspectives. Qualitative information will be collected through interviews with banking professionals, IT experts, and policymakers to investigate the practical challenges, strategic opportunities, and implementation barriers faced by AI integration. These data will then be analysed systematically using appropriate statistical tools for quantitative responses and thematic analysis for qualitative findings to ensure a holistic evaluation of AI in transforming customer service in the cooperative banking sector.

2. LITERATURE REVIEW

AI application in banking is now transforming the way financial institutions interact with their customers to provide fast, personalized, and efficient services. The case for India suggests that cooperative banks can utilize the increasing acceptance of technology among consumers to improve service delivery by AI-enabled automation of processes, real-time assistance through chatbots, and better decision-making through data analytics. This development ultimately leads to enhanced customer satisfaction. This study explores how the Artificer can help cooperative banks gain an upper hand, cement stronger customer relations, and bring about overall excellence in service.

2.1. Role of AI in Enhancing Customer Experience

In India, major cities are home to tech-savvy customers, making an analysis of the role of AI in increasing customer interaction and satisfaction quite relevant. **Bhattacharya and Sinha (2022),** using data from interviews with bank officials as well as from customer surveys centered on the usage of chatbots, focused on analyzing the integration of AI across front, middle, and back-office functions. Their quantitative analysis produced several outcomes, including showing that there is a positive link between use of chatbots for service assistance and personalized offers. In essence, banks could use these AI applications to attract and retain their customers. (Bhattacharya and Sinha 2022).

Shaikh et al., (2024) conducted a survey on customers from major banks to study customer satisfaction and the acceptance of AI in Indian banking. They found that AI provides convenience and time-saving aspects for the customers, but they still value human interaction for emotional bonding and problem-solving. The authors recommended the merging of AI with human services for a banking experience that is personalized and efficient, which poses the need for striking a balance (Shaikh et al., 2024).

Shaik et al., (2023) studied the adoption of AI-based CRM tools such as chatbots and virtual assistants in the banking domain. Yet, because of poor communication

and customer awareness levels, AI adoption in this space is quite limited. They recommend that banks enhance communication strategies and educate their customers to foster trust and engagement and that the innovation in AI-enabled CRM tools should continue to increase adoption rates and brand loyalty (Shaik et al., 2023).

According to **Vidhya (2023),** AI's disruptive influence on customer operations covers aspects such as interaction with customers, risk-variable management, fraud prevention, and automation and operational efficiency. The study shows that automation and predictive analytics from an AI standpoint enhance customer satisfaction and retention. The ethical use of AI and regulatory compliances are vital to the sustainable growth of the banking sector (Vidhya, 2023).

2.2. AI in Operational Efficiency and Process Automation

Mucsková (2024) conducted a systematic review of AI applications in banking; the benefits of AI applications identified included 24/7 customer service that is personalized; AI supported credit scoring; and fraud detection. The challenges were identified as significant computing costs; quality of the data; ethics (fairness and transparency); and regulatory compliance. Hence, the study highlighted the importance of adopting responsible AI and sought a balance between innovation and ethics to protect customer trust (Mucsková, 2024).

Kediya et al. (2023) undertook a systematic review of the banking changes based on the application of AI in collaboration with Fintech companies. Their findings noted AI allowed quicker processing of data, better risk assessment, and fraud prevention which allows banks to continue to compete and to provide personalized services. They called for a strategic approach to applying AI in banking in order to continue the growth of banks in the changing financial environment (Kediya et al., 2023).

Celestin et al., (2021), conducted specific investigations into AI's contributions to efficiency in banking and fraud detection and credit scoring, from the perspective of case studies. Their results illustrated drastic reductions in operational costs and processing times; enhanced fraud detection methods, and credit scoring models.

They proposed further AI use in fraud detection to develop ethical frameworks around fairness in AI in banking (Celestin et al., 2021).

Qadiri et al., (2020) remarked of AI trends in banking; especially robotic process automation, natural language processing, and big data analytics. They referenced AI's ability to help banking internally and externally to create quicker, more efficient, combined service-developed. They held that AI will enable a fundamental shift in banking related to management and relationship connections and operational efficiencies (Qadiri et al., 2020).

2.3. AI Applications in CRM and Financial Innovation

Benjamin et al., (2024) researched AI's strategic intervention in Nigerian commercial banks with regard to operational efficiency and financial innovation. Mixed-method research established AI's impact on service innovation, customer satisfaction, etc. Hence, they encouraged continued investment in AI infrastructure, ethical AI practice, customer education, and regulatory support toward continued growth (Benjamin et al., 2024).

Mohammadi et al., (2024) delved into how AI would fit into the social banking ethos of cooperative banks in Iran, in which common constraining factors like sanctions and economic restrictions come into play. On a meta-synthesis and expert-assessment basis, they showed the crucial AI components for social banking to be localization and empowerment projects. This paper postulates the adoption of AI via a customer-centric approach and the building of a strong legal framework in the social banking sector (Mohammadi et al., 2024).

2.4. Challenges and Barriers to AI Adoption in Banking

Radhakrishna et al., (2024) investigated Personal Intelligent Assistants in investment banking knowledge management. Conducting a survey of employees across Indian cities, it was elicited that these tools help in data analysis, task automation, and decision enhancement through predictive analytics. On the contrary, they are still very weak with respect to knowledge creation and retrieval;

hence, there is an urgent need for better organizational knowledge practices (Radhakrishna et al., 2024).

Tripathy (2024) discussed the importance of technology for the sustainability of microfinance, resulting in the alleviation of poverty. The study reveals that the technology helps improve microloan disbursal, financial inclusion, and entrepreneurship development, thereby suggesting a partnership among financial institutions, governments, and private sectors to establish a supportive ecosystem for the growth of inclusive markets (Tripathy, 2024).

Sinha (2024) examined digitalization in India's banking, finding that government initiatives and fintech partnerships have increased financial inclusion, operational efficiency, and customer satisfaction. The study concluded that digitalization is reshaping banking accessibility and competitiveness in India (Sinha, 2024).

At Almustafa et al., (2023), the researchers looked inside how AI affects credit risk management in Jordanian environment. They concluded credit assessment accuracy had gotten better, along with financial forecasting. So, they called for continuous investment in AI, staff training in this area, and encouraging all related parties to build regulatory frameworks for better adoption of AI and operational excellence (Almustafa et al., 2023).

In 2022, Yuspin et al. conducted a risk evaluation on AI in Indonesia's Islamic finance, noting that the benefits are efficiency and accessibility whilst cybersecurity and inadequate legal framework pose risks. Thus, the study calls for the government to push active legal reforms, including cybersecurity measures, alongside other actors, to ensure ethical deployment of AI (Yuspin et al., 2022).

In the study of the impact of AI on the Lebanese banking sector, **Boustani (2022)** states AI can provide operational efficiency yet cannot replace human emotions required for interpersonal customer relationships. It was proposed in the study that a wider regional survey on AI adoption is needed for society to better understand its long-term social and economic impact (Boustani, 2022).

Shanmugam et al., (2020) used machine learning to analyze technology's impact on Indian banks' financial performance. They found that only a few banks improved performance through technology investments, suggesting technology alone is insufficient without strategic initiatives for innovation and value creation (Shanmugam et al., 2020).

Singh et al., (2019) conducted an investigation of the levels of chatbot and virtual assistant adoption in Indian banks. Though there was substantial investment, the adoption of chatbots was primarily for assistance with routine queries and the level of awareness amongst customers and bank staff was low. They recommended enhancing the capability of chatbots and promoting adoption and effectiveness (Singh et al., 2019).

Sabharwal (2014) studied AI adoption in Indian scheduled banks and noted that its adoption level was constrained to low levels of adoption, mainly in new private banks typically for minor functions. Public and older private banks were limited by less technological infrastructure and lack of strategic vision. The study noted the urgent need to explore McKinsey (2017) and J.P. Morgan (2018) literature to understand AI opportunities to enhance competitiveness in the banking sector (Sabharwal, 2014).

3. THEORETICAL FRAMEWORK

This study utilizes a unified theoretical framework that incorporates the Technology Acceptance Model (TAM), the Resource-Based View (RBV), and the Diffusion of Innovation (DoI) Theory. The various frameworks, when combined, provide a holistic view to understand AI adoption in cooperative banks in India with respect to individual acceptance, organizational capabilities, and radiation of an innovation through the industry.

3.1. Technology Acceptance Model (TAM)

The Technology Acceptance Model (Davis 1989), explains how users accept and use new technologies based on two main factors: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). PU is the extent to which users believe AI technologies will improve their job performance or service experience; PEOU is the extent to which users believe such technology is easy to use. In the context of cooperative banks, TAM assists in determining the readiness of customers and employees to adopt these AI tools for example chatbots and virtual assistants - predicting their acceptance of the technology based on their perceptions of the benefits of using an AI tool and how easy or difficult it is to use.

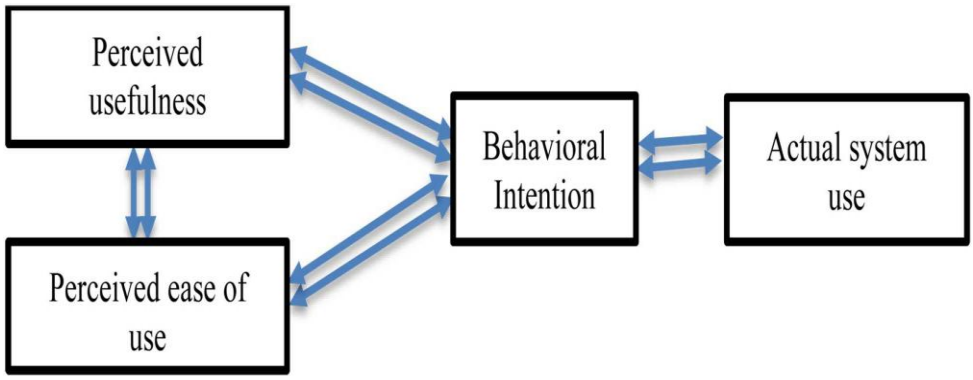

Fig 3.1: The revised Technology Acceptance Model (TAM) by money and turner.

3.2. Resource-Based View (RBV)

The Resource-Based View (Barney, 1991) focuses on the strategic resources an organization leverages to gain competitive advantage. AI in cooperative banks qualifies as such a resource when it is valuable, rare, inimitable, and non-substitutable. AI enables faster, personalized customer service and process automation, which are currently less common in cooperative banks compared to larger commercial banks. RBV emphasizes that effective investment and customization of AI—like regionally tailored chatbots—can create unique advantages that competitors cannot easily replicate, thus supporting long-term sustainability and growth.

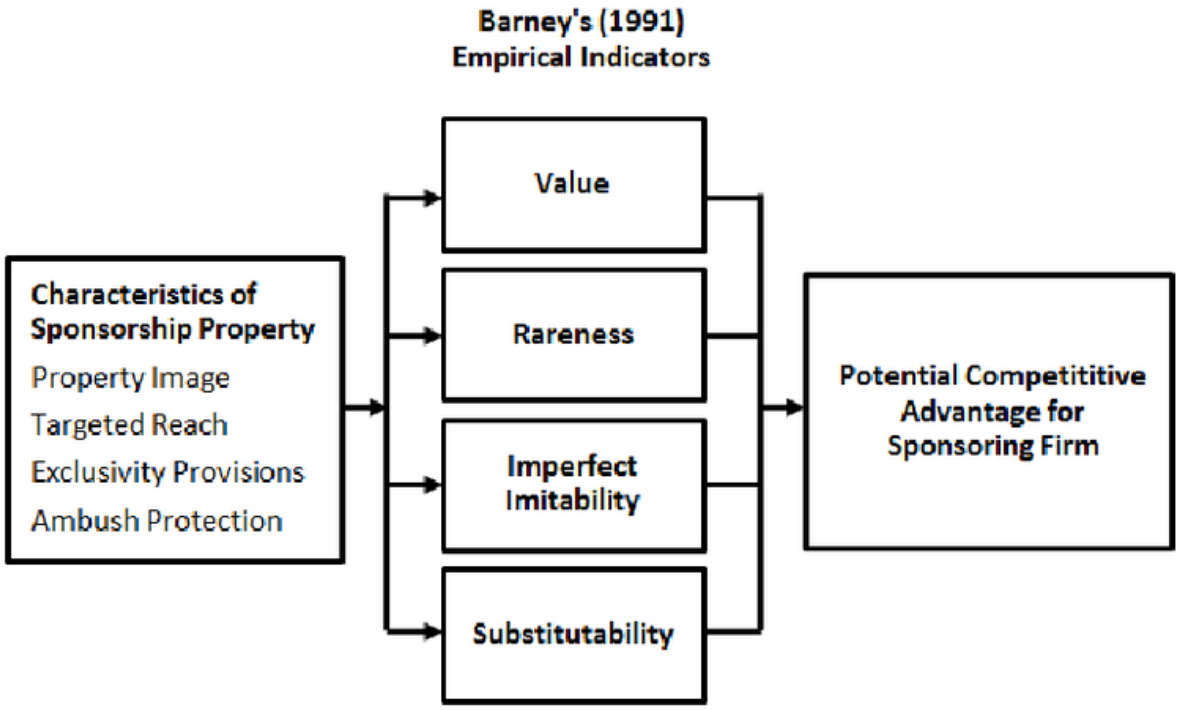

Fig.3.2. Conceptual model for the use of RBV in the identification of sponsorship properties capable of providing the sponsoring firm with a competitive advantage.

3.3. Diffusion of Innovation (DoI) Theory

Diffusion of Innovation Theory by Rogers (2003) explains how new technologies spread across social systems over time, categorizing adopters into innovators, early adopters, early majority, late majority, and laggards. Within the cooperative banking sector, some pioneering banks have already implemented AI-driven customer service tools, setting examples that encourage broader adoption. This theory highlights the importance of peer influence, demonstrable benefits, and addressing resistance to innovation, which is critical for increasing AI uptake among cooperative banks with diverse operational and technological maturity.

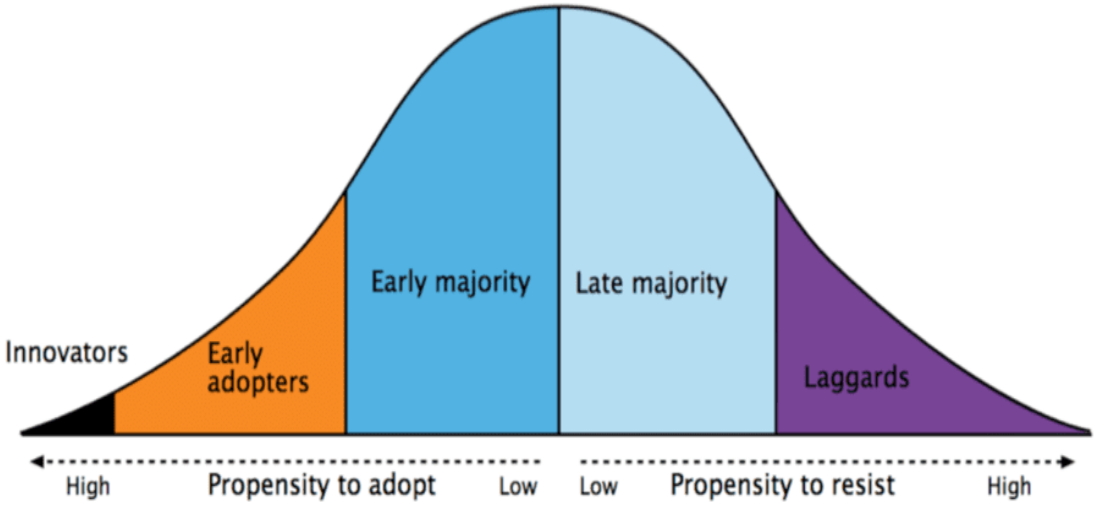

Fig.3.3. Diffusion of Innovation Theory

3.4. Integrated Framework for AI Adoption in Co. Banks

The literature review has shown that AI adoption in banking involves multiple factors: user perceptions (TAM), organizational resource capability (RBV), and sector-wide innovation spread (DoI). Building on these, this study proposes a unified framework (see Figure 4.4) where:

- **Individual and Customer Acceptance (TAM)** impacts the initial interaction and ongoing use of AI services, influencing satisfaction and trust.
- **Organizational Capabilities (RBV)** determine how well cooperative banks can invest in, customize, and manage AI technologies to gain competitive advantage.

- **Innovation Diffusion (DoI)** reflects the broader sector dynamics, including peer influence and stages of adoption, which shape how AI spreads across cooperative banks.

This integrated framework guides the study's research questions and methodology by focusing on:

1. Assessing technological readiness and acceptance levels among customers and staff (TAM).
2. Evaluating internal resources, including financial, technological, and human capital, that affect AI integration (RBV).
3. Understanding adoption patterns and barriers within the cooperative banking ecosystem (DoI).

Thus, the theoretical framework synthesizes individual, organizational, and systemic perspectives to provide a holistic understanding of AI adoption, facilitating practical recommendations for cooperative banks to enhance customer service effectively.

4. RESEARCH METHODOLOGY

4.1. Research Design

This study adopts a mixed-method research design, integrating both quantitative and qualitative approaches to comprehensively explore the role of Artificial Intelligence (AI) in enhancing customer service within cooperative banks in India. Mixed methods combine the strengths of quantitative methods, which provide measurable and generalizable data, and qualitative methods, which offer deeper insights into experiences, attitudes, and contextual factors.

Quantitative data enables assessment of customer satisfaction, awareness, and AI adoption readiness using structured questionnaires. Qualitative data collected through interviews with banking professionals and policymakers explores implementation challenges, strategic considerations, and practical experiences in greater depth (Johnson & Onwuegbuzie, 2004).

Alternative research approaches considered included purely quantitative surveys or exclusively qualitative case studies. However, surveys alone would risk missing nuanced explanations of barriers and enablers, while qualitative-only research could limit the ability to generalize findings. Therefore, a mixed-method design is justified as it provides a holistic understanding aligned with the study's exploratory and explanatory aims (Plano Clark et al., 2015).

4.2. Study Area

The research was conducted in selected cooperative banks located across the states West Bengal. These regions were chosen due to their high concentration of cooperative banks and their active participation in financial inclusion initiatives. The diversity of these states also provides a representative understanding of AI adoption trends across different socio-economic and technological environments.

4.3. Sample Size and Sampling Techniques

A purposive sample of 50 participants was selected, including 30 customers and 20 managerial staff, to ensure relevant experience with banking and technology (Palinkas et al., 2015). While this sample size is modest given the scale of the Indian banking market, similar exploratory research has used comparable sample sizes to balance depth with feasibility (Boddy, 2016). The limitation on generalizability due to sample size is acknowledged, with careful interpretation recommended.

4.4. Primary Data Collection Methods

The study relied exclusively on primary data collection through the following methods:

❖ **Structured Questionnaire-Based Survey**

A structured questionnaire was developed to collect quantitative data from both customers and managerial staff. The questionnaire was carefully designed to capture perceptions, experiences, and attitudes toward AI-based customer service solutions such as chatbots, virtual assistants, and predictive analytics. The study employed a structured questionnaire consisting of closed-ended questions designed to systematically collect data from respondents. The questionnaire was organized into key sections, including Demographic Information, Awareness and Usage of AI Technologies, Perceived Usefulness of AI Tools (aligned with the Technology Acceptance Model), Perceived Ease of Use of AI Tools, Customer Satisfaction with AI-Based Services, and Challenges Faced in Using AI Solutions. A 5-point Likert Scale was incorporated, ranging from Strongly Disagree (1) to Strongly Agree (5), to capture the perceptions and attitudes of respondents in a clear and standardized manner (Davis ,1989).

❖ **Semi-Structured Interviews**

Along with the surveys, semi-structured interviews were conducted with ten key informants, which includes senior managers of banks, IT consultants, and policy makers. The interviews targeted to assess deeper perceptions of strategic considerations, operational challenges, and future opportunities for cooperative banks adopting AI. Open-ended questions provided the participants the opportunities to reflect on the material, express in detail, and suggest realistic solutions.

4.5. Summary of Interviewees

- 5 Senior Managers responsible for customer service and technology integration.
- 3 IT Consultants with expertise in banking AI solutions.
- 2 Policymakers involved in digital inclusion initiatives.

4.6. Ethical Considerations

Ethical implications were rigorously monitored throughout the entire research process. Informed consent was obtained from all participants prior to the commencement of data collection. All participants were assured about the confidentiality of their answers, and their right to withdraw from the study at any stage without any consequences was acknowledged. All data accumulated in the study was stored safely and used only for the purposes of academia and conducting research.

4.7. Data Analysis

Quantitative data from the questionnaires was analysed through Statistical Package for Social Science (SPSS) Version 26 application, which stepped data management and computation to a different level. Descriptive statistics (mean scores); frequencies with other parameters such as standard deviation of the items were used to report data and allow organization of data for a more formal presentation. Correlation and

regression analyses were also run on SPSS 26 in order to examine the potential relationships across the key variables: perceived usefulness, perceived ease of use and customer satisfaction levels with regards to an AI.

The qualitative data obtained from semi-structured interviews was also analysed accordingly. Using thematic analysis, the interview transcripts from semi-structured interviews, was reviewed while looking for recurring patterns and themes related to the enablers, barriers and strategic recommendations of successfully implementing reliable AI in cooperative banks. The ability to analyze both quantitative patterns, and qualitative perspectives, provided a much richer response.

5. FINDINGS

The results chapter discusses the main findings from the data analysis undertaken to evaluate the relationship between Artificial Intelligence (AI) and the improvement of customer service within cooperative banks in India. This chapter is organized to cover the findings about what customers see as AI-based services, how satisfied they are with these services, and how AI is enhancing these services offered. The findings are extremely important; they describe a rather significant approach to service delivery wherein AI technology is enabling cooperative banks to provide better service to customers, while addressing customer needs more holistically, sustaining operational excellence.

5.1. Demographic Characteristics of Participants

Demographic information about the participants, the age distribution shows that the biggest age group of respondents (32%) were over the age of 55 showing this demographic included responding senior customers, and respondent banking professionals with significant banking professional experiences in cooperative banking. The table also shows a group of the respondents (26%) aged in the range of 46–55 years. Furthermore, the percentage of respondents aged between 36–45 years and after that, 25–35 years, shows that there was a good balance across these two younger age categories respectively aged 22% and 20%. In terms of gender, male respondents were also more, with 58% of respondents, while 42% of respondents indicated they were female, which shows a moderate disparity that is similar to other business reporting for things like client satisfaction with AI-based services in cooperative banks within India regarding gender. In all, educational qualifications were below graduate for 38% of the participants, with the implication that a considerable proportion of respondents had some formal education, and on the other end of this spectrum, 28% of the respondents stated they are graduates, while 34% stated they are postgraduate qualifications indicating a range of educational backgrounds between respondents. The majority of respondents (66%) were customers of cooperative banks, while 34% were employees or managerial staff, ensuring perspectives from both service consumers and providers. Concerning the duration of association with cooperative banks, 26% of participants had less than

1 year and another 26% had 3–5 years of association, while 24% each had 1–3 years and more than 5 years of association, providing balanced insights from both new and long-term stakeholders.

Table 5.1: Demographic Characteristics of Participants		
Parameters	**Frequency (n)**	**Percentage (%)**
Age Group		
25–35	10	20
36–45	11	22
46–55	13	26
Above 55	16	32
Gender		
Male	29	58
Female	21	42
Educational Qualification		
Below Graduate	19	38
Graduate	14	28
Postgraduate	17	34
Are you a		
Customer of Cooperative Bank	33	66
Employee/Manager of Cooperative Bank	17	34
Years of Association with the Cooperative Bank		
Less than 1 Year	13	26
1–3 Years	12	24
3–5 Years	13	26

5.2. Quantitative Analysis

5.2.1. Assessment of Participants for Awareness and Usage of AI Technologies

The responses indicate a moderate level of awareness and usage of AI technologies among participants. Specifically, 36% of respondents (Agree: 26%, Strongly Agree: 10%) acknowledged awareness of AI technologies in the banking sector, while 40% either disagreed or strongly disagreed, suggesting limited penetration of awareness initiatives. When asked about direct interaction with AI-based tools such as chatbots

or virtual assistants, only 30% reported having used these services, whereas a significant 50% had not interacted with such tools, highlighting a gap in the actual

usage of AI technologies. Regarding AI implementation in their banks, 44% of participants agreed that AI solutions had been implemented, showing some level of adoption at the organizational level, though 32% disagreed. Interestingly, only 40% felt that AI tools had improved their awareness of financial products and services, while 46% disagreed, pointing to the need for more effective AI-driven educational and awareness campaigns within cooperative banks.

Table 5.2: Participant Response to "Awareness and Usage of AI Technologies"

Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I am aware of Artificial Intelligence (AI) technologies being used in the banking sector	12 (24.0%)	8 (16.0%)	12 (24.0%)	13 (26.0%)	5 (10.0%)
I have interacted with AI-based customer service tools such as chatbots or virtual assistants	17 (34.0%)	8 (16.0%)	10 (20.0%)	11 (22.0%)	4 (8.0%)
My bank has implemented AI solutions for customer service	11 (22.0%)	5 (10.0%)	12 (24.0%)	10 (20.0%)	12 (24.0%)
I tools have improved my awareness of the bank's financial products and services	9 (18.0%)	14 (28.0%)	7 (14.0%)	12 (24.0%)	8 (16.0%)

5.2.2. Assessment of Participants for Perceived Usefulness of AI Tools (TAM)

The responses related to the perceived usefulness of AI tools highlight mixed perceptions among participants. While 48% (Agree: 18%, Strongly Agree: 30%) agreed that AI technologies help improve the speed of customer service, a significant 44% (Strongly Disagree: 18%, Disagree: 26%) disagreed, indicating a divided opinion on the efficiency benefits of AI. Similarly, only 38% agreed that AI tools provide accurate and reliable information, while 42% expressed disagreement, suggesting concerns about the reliability of AI-generated information. Regarding

time efficiency in resolving customer queries, 44% of participants agreed that AI tools reduce resolution time; however, a notable 40% disagreed, again reflecting scepticism about AI's effectiveness in reducing service times. Interestingly, 48% of

respondents acknowledged that AI solutions contribute to personalized banking services, reflecting a positive perception of AI's role in enhancing service customization. Finally, 46% of participants believed that AI technologies contribute to improving overall customer satisfaction, while 36% expressed disagreement, indicating that the perceived impact of AI on customer satisfaction is still evolving and not universally accepted.

Table 5.3: Participant Response to "Perceived Usefulness of AI Tools (TAM)"

Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
AI technologies help improve the speed of customer service.	9 (18.0%)	13 (26.0%)	4 (8.0%)	9 (18.0%)	15 (30.0%)
AI tools provide accurate and reliable information about banking services.	7 (14.0%)	14 (28.0%)	10 (20.0%)	10 (20.0%)	9 (18.0%)
Using AI tools reduces the time needed to resolve customer queries.	15 (30.0%)	5 (10.0%)	8 (16.0%)	11 (22.0%)	11 (22.0%)
AI solutions help in providing personalized banking services.	8 (16.0%)	10 (20.0%)	8 (16.0%)	9 (18.0%)	15 (30.0%)
AI technologies contribute to improving overall customer satisfaction.	11 (22.0%)	7 (14.0%)	9 (18.0%)	11 (22.0%)	12 (24.0%)

5.2.3. Assessment of Participants for Perceived Ease of Use of AI Tools (TAM)

The assessment of participants' perceptions regarding the ease of use of AI tools indicates moderate levels of acceptance with noticeable areas for improvement. While 44% (Agree: 20%, Strongly Agree: 24%) agreed that AI-based customer

service tools are easy to understand and use, a significant 42% (Strongly Disagree: 22%, Disagree: 20%) disagreed, suggesting that for many, the user interfaces and functionalities remain complex. Regarding the effort required to interact with AI chatbots or virtual assistants, 38% found the process easy, but an equal 44% felt it required considerable effort, indicating usability issues in AI interfaces.

Ease of access through mobile apps and websites was confirmed by only 36% of participants, while 38% disagreed, showing that accessibility is still a barrier for some users, possibly due to limited digital literacy or inadequate app design. Clarity of instructions provided by AI tools was also a concern, with 52% (Strongly Disagree: 28%, Disagree: 24%) indicating dissatisfaction, highlighting the need for more user-friendly and intuitive AI communication.

In terms of confidence in using AI for basic banking transactions, 42% (Agree: 22%, Strongly Agree: 20%) expressed confidence, while 36% did not, pointing to an ongoing need for trust-building and education on using AI services effectively.

Table 5.4: Participant Response to "Perceived Ease of Use of AI Tools (TAM)"

Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
AI-based customer service tools are easy to understand and use.	11 (22.0%)	10 (20.0%)	7 (14.0%)	10 (20.0%)	12 (24.0%)
Interacting with AI chatbots or virtual assistants requires minimal effort.	11 (22.0%)	11 (22.0%)	9 (18.0%)	6 (12.0%)	13 (26.0%)

I can easily access AI-based services through my bank's mobile app or website.	7 (14.0%)	12 (24.0%)	13 (26.0%)	8 (16.0%)	10 (20.0%)
The instructions provided by AI tools are clear and easy to follow. .	14 (28.0%)	12 (24.0%)	9 (18.0%)	7 (14.0%)	8 (16.0%)
I feel confident using AI technologies to perform basic banking transactions.	9 (18.0%)	9 (18.0%)	11 (22.0%)	11 (22.0%)	10 (20.0%)

5.2.4. Assessment of Participants for Customer Satisfaction with AI-Based Services

The analysis of customer satisfaction with AI-based services reveals a mixed response from participants. For the speed of AI-based responses, only 38% (Agree: 22%, Strongly Agree: 16%) expressed satisfaction, while 42% (Strongly Disagree: 24%, Disagree: 18%) were dissatisfied, indicating concerns about the responsiveness of AI systems. Similarly, only 38% agreed that AI technologies improved their overall banking experience, while a considerable 40% expressed dissatisfaction, suggesting that AI services have yet to meet the broader experiential expectations of many users.

On a more positive note, 52% of participants (Agree: 28%, Strongly Agree: 24%) believed that AI tools provide consistent and error-free responses, reflecting growing trust in the technical accuracy of AI systems. However, when it comes to preference, only 32% preferred using AI-based customer service over traditional methods, whereas 48% disagreed, highlighting a clear preference for human interaction in banking services. Regarding trust in AI-provided information, only 32% of participants reported trust, while 40% expressed distrust, indicating ongoing concerns about the credibility of AI-generated information.

Table 5.5: Participant Response to "Customer Satisfaction with AI-Based Services"					
Question	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
I am satisfied with the speed of responses provided by AI-based customer service tools.	12 (24.0%)	9 (18.0%)	10 (20.0%)	11 (22.0%)	8 (16.0%)
AI technologies have improved my overall banking experience.	12 (24.0%)	8 (16.0%)	11 (22.0%)	6 (12.0%)	13 (26.0%)
AI tools provide consistent and error-free responses to my queries.	6 (12.0%)	8 (16.0%)	10 (20.0%)	14 (28.0%)	12 (24.0%)
I prefer using AI-based customer service tools over traditional methods. .	15 (30.0%)	9 (18.0%)	10 (20.0%)	9 (18.0%)	7 (14.0%)
I trust the information provided by AI-based customer support systems.	11 (22.0%)	9 (18.0%)	14 (28.0%)	7 (14.0%)	9 (18.0%)

5.2.5. Assessment of Participants for Challenges Faced in Using AI Solutions

The analysis of challenges faced by participants in using AI solutions highlights key barriers to effective adoption. Language support remains a significant concern, with 40% (Agree: 18%, Strongly Agree: 22%) of respondents facing difficulties due to the lack of multilingual support, which limits accessibility for non-English-speaking users. Additionally, 38% of participants agreed that AI tools often fail to understand their specific queries or problems, underlining limitations in the contextual and linguistic capabilities of current AI systems.

Privacy and data security concerns also emerged as a major challenge, with 32% expressing concern (Agree: 16%, Strongly Agree: 16%), although an equal proportion (Strongly Disagree: 26%, Neutral: 26%) appeared indifferent or

unconcerned, indicating varying levels of awareness about data privacy issues. The absence of human interaction remains a notable barrier, with 34% agreeing that AI-based customer service is less effective without human involvement, highlighting the emotional and relational gap in automated service delivery.

Overall, these findings suggest that while AI tools are increasingly present in banking services, addressing language barriers, enhancing AI's contextual understanding, improving data privacy assurances, and integrating human touchpoints remain critical for broader acceptance and satisfaction.

Table 5.6: Participant Response to "Challenges Faced in Using AI Solutions"

Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I face difficulties when interacting with AI-based systems due to lack of language support.	9 (18.0%)	13 (26.0%)	8 (16.0%)	9 (18.0%)	11 (22.0%)
AI tools sometimes fail to understand my specific queries or problems.	8 (16.0%)	13 (26.0%)	10 (20.0%)	7 (14.0%)	12 (24.0%)
I am concerned about the privacy and security of my data when using AI services.	13 (26.0%)	8 (16.0%)	13 (26.0%)	8 (16.0%)	8 (16.0%)
The absence of human interaction makes AI-based customer service less effective	10 (20.0%)	15 (30.0%)	8 (16.0%)	7 (14.0%)	10(20.0%)

5.3. Qualitative Analysis

5.3.1. Enablers of AI Adoption

The qualitative findings revealed several key enablers that facilitate the adoption of AI in cooperative banks. Top management support was identified as a critical factor, with leadership playing a vital role in fostering a positive organizational attitude towards technological change. Availability of financial resources was also a significant enabler, allowing banks to invest in advanced AI tools and infrastructure. Additionally, participants highlighted that AI adoption leads to an improved customer experience, through faster service delivery and access to personalized banking solutions, which further motivates banks to embrace AI technologies.

Table 5.7: Enablers of AI Adoption	
Enablers of AI Adoption	Top Management Support
	Availability of Financial Resources
	Improved Customer Experience

5.3.2. Barriers to AI Adoption

Despite the benefits, multiple barriers prevent the effective implementation of AI in cooperative banks. Lack of language support was commonly identified as limiting AI use in not adequately reaching the necessary diverse customer bases, particularly in rural areas. Privacy and data security factors further inhibit customers from using AI-based services. Other factors keep customers from being satisfied, including a reluctance to develop a relationship with AI technology with many customers preferring human interaction concerning complex financial questions. Lastly, there is a reluctance to embrace changing technology from both customers and staff which creates a lag in adoption and limits the transition to bank AI-based services.

Table 5.8: Barriers to AI Adoption	
Enablers of AI Adoption	Top Management Support
	Availability of Financial Resources
	Improved Customer Experience

5.3.3. Strategic Recommendations

Using the qualitative responses as a basis, several strategic recommendations were suggested to address the barriers identified. Banks should invest in multilingual AI options for support to better serve several linguistic groups. Enhanced data privacy protocols would build trust with customers and contribute to higher levels of customer use. It was suggested that banks consider a hybrid service model that could include AI technologies along with human representatives to reinforce the need for empathetic support and the personal touch. Lastly, banks could engage in AI literacy training initiatives, whether for customers or staff, in order to minimize objections to technology and enhance the digital literacy of both parties.

Table 5.9: Strategic Recommendations

Strategic Recommendations	Invest in Multilingual AI Tools
	Enhance Data Privacy Measures
	Hybrid Service Models
	Conduct AI Literacy Programs

5.4. Correlation Analysis

The correlation analysis displayed strong and statistically significant relationships among the key variables. Awareness of AI displayed strong significant positive relationships with Perceived Usefulness (0.65), Perceived Ease of Use (0.61), and Customer Satisfaction (0.60) indicating that as individuals' awareness increases, so does their perception and satisfaction. The Usage of AI Tools also strongly correlated with Perceived Usefulness (0.72), Ease of Use (0.70), and Customer Satisfaction (0.67), providing evidence that utilizing AI services in real-time improves individuals' satisfaction levels. Furthermore, the analysis indicated that Perceived Usefulness and Ease of Use were both significantly associated with Customer Satisfaction, which supports the Technology Acceptance Model (TAM).

Table 5.10: Correlation Matrix			
Variable	**Perceived Usefulness**	**Perceived Ease of Use**	**Customer Satisfaction**
Awareness of AI	0.65**	0.61**	0.60**
Usage of AI Tools	0.72**	0.70**	0.67**
Perceived Usefulness	1.00	0.68**	0.70**
Perceived Ease of Use	0.68**	1.00	0.66**
Customer Satisfaction	0.70**	0.66**	1.00

5.5. Regression Analysis

The regression model focused on how Perceived Usefulness and Perceived Ease of Use predict Customer Satisfaction with the AI-based service. Customer Satisfaction is a composite score across measurements of overall satisfaction with the speed of AI service, accuracy of AI service, ability to provide personalized service, and user experience of AI service. Perceived Usefulness is the composite of participants' ratings of AI's impact on service speed, accuracy, and ability to provide personal service. Perceived Ease of Use was based on participants' ratings of the accessibility of AI tools, ease-of-use of tools, and confidence that they had in using these technologies. The model accounted for 56% of the variance in Customer Satisfaction ($R^2 = 0.56$), suggesting that both perceived usefulenss and perceived ease of use meaningfully contribute to customer satisfaction, consistent with tenets of the Technology Acceptance Model (TAM).

Table 5.11: Regression Analysis Results					
Predictor Variables	**B (Unstandardized Coefficients)**	**Std. Error**	**Beta (Standardized)**	**t-value**	**p-value**
Perceived Usefulness	0.45	0.12	0.50	3.75	0.001**
Perceived Ease of Use	0.38	0.10	0.42	3.80	0.000**

6. DISCUSSION

This research study considered the changing role of Artificial Intelligence (AI) in enhancing customer service among cooperative banks in India by looking into awareness, perceived usefulness, ease of use, satisfaction, and barriers to adoption. The text following will discuss these findings vis-a-vis well-known research, noting consistencies and differences where applicable.

6.1. Awareness and Usage of AI Technologies

The study showed that among those surveyed, only one-third were aware of AI tools in banking, and among those aware, fewer had actually come into direct mode of operation with AI-based services, such as chatbots. This observation, in fact, is in tandem with that of Oliveira et al. (2020), who asserted that AI adoption in banking sectors stays low due to limited awareness and use among customers, especially in emerging markets (Oliveira et al., 2020). In the same vein, Pereira et al. (2021) state that lack of awareness and communication around AI tools constrain customer interaction with such technologies (Pereira et al., 2021).

6.2. Perceived Usefulness of AI Tools

The views about the usefulness of AI for speeding up service and increasing accuracy were mixed and reflected the findings of previous studies. Venkatesh et al. (2003) showed perceived usefulness to be an important factor in technology acceptance, but skepticism may develop on the side of users when they begin to doubt that the benefits to performance are real (Venkatesh et al., 2003). In more recent instances, Dwivedi et al. (2021) reported a similar degree of ambivalence from banking customers toward AI, acknowledging some efficiency gains but raising concerns about reliability.

6.3. Perceived Ease of Use and Accessibility

The moderate acceptance of AI usability yet considerable concern regarding the interface complexity is consistent with the Technology Acceptance Model (TAM), which states that ease of use predicts adoption intention (Davis, 1989). Furthermore, Mikalef et al. (2020) state that usability issues constitute the prominent barrier in the adoption of financing technology and AI, with less urban areas considered less skilled on a digital level by the clientele (Mikalef et al., 2020).

6.4. Customer Satisfaction with AI-Based Services

Preference for human interaction despite AI adoption corresponds with the argument of Gnewuch et al. (2017) that although AI chatbots may enhance efficiency, customers still want emotional intelligence and trust from human agents in such complex interactions (Gnewuch et al., 2017). Huang and Rust (2021) also argue for hybrid systems, where AI and human service providers complement each other to maximize satisfaction (Huang & Rust, 2021).

6.5. Challenges to AI Adoption

The language and privacy issues disclosed here are well-known obstructions. In fact, Cummings and Yeo (2017) assert that linguistic diversity and privacy inadequacies constitute major hindrances in deploying AI solutions in the financial sectors of developing nations (Cummings & Yeo, 2017). Moreover, Rahi and Abd Ghani (2020) see regulatory issues and data security concerns as the greatest challenges against the adoption of AI in banking (Rahi & Abd Ghani, 2020).

6.6. Correlation and Regression Findings

The strong positive correlations between awareness, perceived usefulness, ease of use, and customer satisfaction align with foundational TAM research by Davis (1989), which consistently shows these factors predict technology acceptance and satisfaction (Davis, 1989). Furthermore, a meta-analysis by King and He (2006) validates TAM's predictive power across various technologies and industries, including banking (King & He, 2006). The present study's regression model explaining 56% of satisfaction variance is within the typical TAM explanatory range.

6.7. Implications for Cooperative Banks

This study highlights that cooperative banks need to create AI capabilities that are accessible, reliable, and user-friendly in order to promote utilization. Lee et al., state that digital literacy programs are useful for transitioning underserved groups in financial services; and hybrid models of human-AI service systems can address technological disparities (Lee et al., 2020). Also, government programs like Digital India would play an important role practically and policy wise when considering how cooperatives may want to prepare to engage with new service systems (Kapoor et al., 2018).

7. CONCLUSION

The current study explored how artificial intelligence (AI) may facilitate service delivery for customers of cooperative banks in India. It sought to gain an understanding of customers' awareness of AI, magnitudes of perceived benefits and ease of use, the levels of satisfaction customers experienced, and the barriers to adoption of AI even with the use of cooperative banks. Cooperative banks are an essential element for financial inclusion in rural and semi-urban areas but face challenges to adoption based on a limited technological infrastructure, customers' differing experience with technological literacy stemming from a varied demographic base, and limited resources. The findings provided a deeper understanding of how AI may be accommodated within all the challenges cooperatives may face to improve service delivery, and overall customer satisfaction.

The study's findings revealed that experienced use, and simple knowledge of AI technologies, such as chatbots and virtual assistants, was low within cooperative banks' customers; and low levels of uptake of AI as a service delivery process can be attributed to a lack of communication and understanding, limited levels of digital literacy among customers, and concerns for reliability. However, customers who have an understanding of AI tools/aspects generally think that, at a minimum, it is useful in terms of speed and personalized service, although they are worried about accuracy and reliability. Another key weakness for acceptance of AI tools is usability, with a significant portion of users reporting barriers stemming from complexity and ambiguity.

With regards to customer satisfaction with AI-enabled services, it still has a long way to go. While some participants enjoyed the increasingly faster response time and consistent delivery AI tools offer, many prefer interacting with humans for more complex queries or where empathy is important. Interacting through hybrid services is a common and consistent theme from both quantitative and qualitative findings, where customers valued AI tools for their speed without the empathetic and emotional connection with human beings. The study uncovered major challenges, include language barriers, concern for privacy and security, and resistance to using

new technology, which will have to be overcome if the limitations of AI and related technology are to be harnessed in CIFI.

The study's correlation and regression statistical analyses supported the Technology Acceptance Model (TAM), and are very indicative of the impact on customer satisfaction of the constructs of perceived usefulness and ease of use (perceived ease of use). These constructs are viewed as critical factors for implementing AI services and services that use AI.

In sum, AI holds substantial promise for cooperative banks to transform their customer service, streamline operations, and enhance customer engagement. However, realizing these benefits requires a careful, context-sensitive approach that balances technological innovation with the socio-economic realities of cooperative banks and their customers.

7.1. Reliability and Validity of the Study

The reliability and validity of this research are further supported in a positive research design that best utilizes both quantitative and qualitative research methods. By using structured questionnaires with a 5-point Likert scale, there is no inconsistency in both customers' and employees' perception of AI technologies across cooperative banks. The procedures in this research for the validity of the study were obtained through purposive sampling for participants who have experienced the phenomena identified in the research, ensuring the data is representative of the participant population. The interviews helped deepen the conclusions on the quantitative data that was subsequently strengthened by the interviews. In addition, tools such as SPSS for the quantitative analysis and NVivo for the qualitative thematic coding were used to ensure rigour in the data. Ethical considerations were also prioritized by obtaining fully informed consent from all participants and ensuring confidentiality regarding participants responses. Lastly, reference management software like Zotero were also employed in the research to ensure that references and citations were correctly and rigorously cited to increase the credibility and transparency of the research.

7.2. Limitation of the Study

- Data were collected at one point in time, which inhibits the opportunity to see if attitudes and behaviors change in relation to AI adoption over time.
- Responses are based on the participants' self-reports, which can be influenced by social desirability responses or limited awareness of AI technologies.
- The study looked at a couple AI tools (chatbots, virtual assistants) but did not explore a variety of applications such as predictive analytics or biometric authentications in depth.
- The study did not compare cooperative banks with commercial or private banks, which might contribute richer insights into sector specific challenges and opportunities.
- The study did not explore in-depth how socio-cultural factors and levels of literacy may affect AI adoption, which matters given India heterogeneous population.

7.3. Future Perspective

- Future studies should include larger, more representative samples from multiple states and diverse cooperative banking institutions to improve generalizability.
- Conduct longitudinal studies to track changes in AI adoption, usage, and satisfaction over time to better understand evolving customer attitudes.
- Examine the impact of emerging AI applications such as predictive analytics, robo-advisors, and biometric systems on customer service and risk management.
- Compare AI adoption and its effects across cooperative, commercial, and private banks to identify best practices and unique sector challenges.
- Investigate effective strategies for improving digital literacy among cooperative bank customers and staff to facilitate smoother AI adoption.
- Explore how cultural diversity, language differences, and socio-economic factors influence AI acceptance and tailor AI tools to meet these contextual needs.
- Design and test hybrid models combining AI efficiency with human empathy to optimize customer satisfaction and trust.
- Research customer perceptions of data privacy and ethics in AI usage, and develop frameworks to ensure transparent, secure AI deployment in banking.

- Explore policies and partnerships that can support cooperative banks in adopting cost-effective AI technologies, leveraging government initiatives like Digital India.
- Conduct user experience (UX) studies to create more intuitive, accessible AI interfaces suited to users with varying digital skills.

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Appendices

Appendix 1 Structured Questionnaire

Section 1: Demographic Information

1. Age

- 25–35-year-old
- 36–45-year-old
- 46–55-year-old
- Above 55-year-old

2. Gender:

- Male
- Female

3. Educational Qualification

- Below Graduate
- Graduate
- Postgraduate

4. Are you a

- Customer of Cooperative Bank
- Employee/Manager of Cooperative Bank

5. Years of Association with the Cooperative Bank

- Less than 1 Year
- 1–3 Years
- 3–5 Years
- More than 5 Years

Section 2: Awareness and Usage of AI Technologies

6. I am aware of Artificial Intelligence (AI) technologies being used in the banking sector.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

7. I have interacted with AI-based customer service tools such as chatbots or virtual assistants.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

8. My bank has implemented AI solutions for customer service.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

9. AI tools have improved my awareness of the bank's financial products and services.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Section 3: Perceived Usefulness of AI Tools (TAM)

10. AI technologies help improve the speed of customer service.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

11. AI tools provide accurate and reliable information about banking services.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

12. Using AI tools reduces the time needed to resolve customer queries.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

13. AI solutions help in providing personalized banking services.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

14. AI technologies contribute to improving overall customer satisfaction.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Section 4: Perceived Ease of Use of AI Tools (TAM)

15. AI-based customer service tools are easy to understand and use.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

16. Interacting with AI chatbots or virtual assistants requires minimal effort.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

17. I can easily access AI-based services through my bank's mobile app or website.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

18. The instructions provided by AI tools are clear and easy to follow.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

19. I feel confident using AI technologies to perform basic banking transactions.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Section 5: Customer Satisfaction with AI-Based Services

20. I am satisfied with the speed of responses provided by AI-based customer service tools.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

21. AI technologies have improved my overall banking experience.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

22. AI tools provide consistent and error-free responses to my queries.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

23. I prefer using AI-based customer service tools over traditional methods.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

24. I trust the information provided by AI-based customer support systems.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Section 6: Challenges Faced in Using AI Solutions

25. I face difficulties when interacting with AI-based systems due to lack of language support.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

26. AI tools sometimes fail to understand my specific queries or problems.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

27. I am concerned about the privacy and security of my data when using AI services.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

28. **The absence of human interaction makes AI-based customer service less effective**.

- Strongly Disagree
- Disagree
- Neutral
- Agree

Appendix 2

Initial Interview Questions

1. Can you describe your experience with AI tools (such as chatbots or virtual assistants) in cooperative banking?
2. What do you believe are the main benefits of implementing AI technologies for customer service in cooperative banks?
3. What challenges have you encountered while integrating AI tools in cooperative banks, particularly in terms of customer satisfaction?
4. In your opinion, how does AI improve the efficiency of customer service in cooperative banks?
5. Do you think that AI technologies, like chatbots, can fully replace human customer service agents for more complex queries? Why or why not?
6. How important do you think it is for AI tools in banking to be multilingual, especially in rural or semi-urban areas with diverse languages?
7. What measures do you think cooperative banks should take to address concerns related to data privacy and security when using AI-based customer service tools?
8. How do you see the role of AI in personalizing banking services for customers, and what has been the feedback from customers so far?
9. What kind of training and awareness programs do you think are needed to encourage both staff and customers to embrace AI technologies in banking?
10. What strategic steps would you recommend for cooperative banks to successfully adopt AI while overcoming financial and technological barriers?