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Evaluating The Impact Of Ai-Driven Banking Services On Customer Satisfaction In Indian Banks

[1] **Dr. Srinivas Barla**, [2] **Dr. Gaddam Naresh Reddy**,

[1]Assistant Professor, Part Time Faculty, Professor of Commerce,
[1] Department of Commerce,
[2] Department of Commerce,
[1] Dr. B. R. Ambedkar Open University, Hyderabad, Telangana State, India.
[2] University College of Commerce & Business Management, Osmania University, Hyderabad-500 007, Telangana State, India

Abstract: **1. Introduction** Artificial Intelligence (AI) has revolutionized the banking sector by enhancing customer experience and improving operational efficiency. Banks worldwide are leveraging AI-driven technologies such as chatbots, fraud detection systems, and automated loan processing to optimize services. Indian banks, both public and private, have integrated AI-based solutions to enhance efficiency and customer engagement.

2. Objectives The primary objective of this study is to assess the impact of AI-driven banking services on customer satisfaction in Indian banks. The study aims to evaluate customer perceptions, identify key benefits and challenges, and analyse the effectiveness of AI in banking operations.

3. Purpose of the Study This research is conducted using a primary data approach, collecting responses from 100 banking customers through a structured questionnaire. The purpose of the study is to provide insights into AI adoption in banking and to recommend improvements that enhance service quality and customer experience.

4. Conclusion AI-driven banking services have made significant strides in delivering efficient and tailored solutions. However, to fully realize their potential, financial institutions must address existing concerns by focusing on system reliability, user education, and customer-centric design. This approach will be essential for building trust, enhancing satisfaction, and ensuring long-term success in the digital banking era.

Index Terms **- Artificial Intelligence, Banking sector, Awareness, Perceptions.**

I. INTRODUCTION

Artificial Intelligence (AI) is transforming the global banking sector by automating operations, enhancing customer experiences, and improving security. The integration of AI-driven technologies in banking has enabled financial institutions to streamline operations, reduce costs, and provide personalized services to customers. AI applications such as chatbots, fraud detection, credit risk assessment, and automated customer service have significantly reshaped the way banking services are delivered. With the rapid advancements in AI, financial institutions are leveraging these technologies to enhance efficiency, mitigate risks, and provide seamless banking experiences.

In India, the banking sector has embraced AI-driven solutions at an increasing pace, with public and private sector banks adopting AI to enhance service delivery and operational efficiency. Prominent banks such as the State Bank of India (SBI), HDFC Bank, and ICICI Bank have integrated AI-powered solutions to optimize customer engagement and streamline banking operations. AI-driven chatbots like SBI's SIA, HDFC Bank's

EVA, and ICICI Bank's iPal provide instant responses to customer queries, improving service accessibility and efficiency. Additionally, AI is utilized in fraud detection, predictive analytics, and automated loan processing, reducing turnaround times and minimizing human errors.

The growing adoption of AI in banking brings both opportunities and challenges. While AI enhances banking operations by improving efficiency, security, and personalization, concerns regarding data privacy, lack of human interaction, and AI's decision-making transparency persist. Customers often hesitate to fully trust AI-driven solutions due to fears of security breaches and errors in automated decision-making processes. Addressing these challenges is crucial for banks to foster customer trust and ensure the successful implementation of AI-driven banking services.

This study aims to evaluate the impact of AI-driven banking services on customer satisfaction and operational efficiency in Indian banks. By analyzing customer perceptions, challenges, and the overall effectiveness of AI in banking, this research provides insights into the role of AI in transforming financial services. Additionally, the study explores potential improvements in AI adoption to enhance customer experiences and optimize banking operations.

Despite the increasing reliance on AI in banking, research on its impact in the Indian banking sector remains limited. While existing studies focus on AI adoption trends, there is a lack of empirical analysis on customer satisfaction and operational efficiency. This research seeks to bridge this gap by evaluating customer experiences and analyzing how AI-driven services influence banking operations. The study's findings will contribute to the broader understanding of AI's role in banking and offer recommendations for improving AI-based banking services.

The integration of AI in banking is an evolving phenomenon, with continuous advancements shaping the future of financial services. By examining the benefits, challenges, and future prospects of AI-driven banking services, this study aims to provide a comprehensive assessment of AI's influence on customer satisfaction and banking efficiency. As banks continue to invest in AI-driven technologies, understanding customer expectations and addressing their concerns will be essential for ensuring the successful adoption and optimization of AI in banking.

The evolution of artificial intelligence in the banking sector aligns closely with the increasing digitalization of financial services. In recent years, customer expectations have shifted toward faster, more accessible, and customized services. In response, banks are under pressure to innovate while maintaining trust, compliance, and service quality. AI-driven technologies serve as a strategic tool to meet these demands, enabling banks to offer scalable solutions with minimal human intervention.

AI adoption is no longer limited to back-end operations; it is now reshaping front-end customer interactions. For instance, chatbots and virtual assistants have become mainstream, enabling banks to provide 24/7 customer service. AI algorithms can analyze vast amounts of transactional data in real-time to detect fraud or recommend financial products tailored to individual needs. These developments signify a paradigm shift in how banking services are conceptualized and delivered.

Despite the promise, the path to widespread AI adoption is not without hurdles. Concerns regarding algorithmic bias, ethical use of customer data, regulatory compliance, and the digital divide must be addressed to ensure inclusive and responsible AI deployment. In a country like India, where banking penetration is still expanding into rural and semi-urban regions, the success of AI will depend on how well these technologies can adapt to diverse customer needs and technological literacy levels.

Therefore, this study is both timely and significant. It not only evaluates the tangible benefits of AI in enhancing operational performance and customer satisfaction but also highlights the areas where improvements are necessary. Through this, the research aims to inform future strategies for responsible, efficient, and customer-friendly AI integration in the banking sector.

II. THEORETICAL FRAMEWORK

AI Origins Worldwide The concept of Artificial Intelligence (AI) dates back to the mid-20th century, when scientists and researchers began exploring ways to develop machines capable of simulating human intelligence. The formal foundation of AI was laid in 1956 at the Dartmouth Conference, where leading scientists such as John McCarthy, Marvin Minsky, and Alan Newell discussed the potential of machines that could perform tasks requiring human-like intelligence. Early developments in AI focused on rule-based systems and symbolic reasoning, leading to the creation of expert systems in the 1970s and 1980s. These systems were primarily used in specialized fields such as healthcare and finance.

The 1990s and early 2000s witnessed the emergence of machine learning, a subfield of AI that enabled computers to learn from data and improve performance over time. Breakthroughs in neural networks and deep learning further accelerated AI advancements, making it possible to develop sophisticated applications such

as natural language processing, computer vision, and predictive analytics. Today, AI is widely used in industries such as finance, healthcare, retail, and manufacturing, driving efficiency and innovation across sectors.

AI Development in India India has rapidly embraced AI technology, recognizing its potential to transform various sectors, including banking. The Indian government's initiatives, such as the National Strategy for Artificial Intelligence (NITI Aayog), emphasize AI adoption to enhance economic growth and public service delivery. In the financial sector, AI has played a significant role in improving digital banking, fraud detection, credit risk assessment, and customer service automation.

Leading Indian banks have integrated AI-driven technologies to improve operational efficiency and customer engagement. For instance, the State Bank of India (SBI) launched SIA, an AI-powered chatbot, to handle customer queries efficiently. Similarly, HDFC Bank's EVA and ICICI Bank's iPal are AI-driven chatbots designed to enhance customer interactions. AI-based credit scoring models are also being used to assess loan eligibility and automate underwriting processes, reducing approval times and minimizing risks.

III. **Review of Literature**

Author	Year	Conclusion
Jain	2024	AI-driven banking requires collaboration between stakeholders, regulators, and society to maximize benefits while addressing challenges.
Narang et al.	2024	AI enhances productivity, decision-making, and cost efficiency in banking. However, it raises concerns about bias, data privacy, and ethics.
Polireddi	2024	Banks and regulatory bodies must strengthen security measures to boost AI reliability and increase customer trust.
Demirel & Topcu	2024	AI-driven chatbots and video calls improve digital banking experiences.
Du & Zhai	2024	AI-based financial recognition models using random forest algorithms significantly enhance fraud detection accuracy and reduce financial fraud cases.
Manser Payne & O'Brien	2024	AI is reshaping banking by introducing new business models and replacing traditional financial services.
Dr. Amtul Wahab	2024	AI in Indian banking enhances employee performance and service quality.
Farishy	2023	AI frameworks exist for business adoption, but a standardized AI integration model is still required for various industries.
G et al.	2023	AI has shifted banking from physical branches to digital platforms, improving core banking, customer support, and analytics.
Hinge	2022	Industry 4.0 is revolutionizing banking through AI, robotics, and blockchain, enhancing financial services beyond digital transactions.
Theuri & Olukuru	2022	AI-driven automation in banking enhances efficiency, reduces cyber risks, and helps banks compete with FinTech firms.
Syed et al.	2022	A 1% increase in digital financial services reduces banking efficiency by 0.09% and stability by 0.05%, negatively impacting the short-term financial landscape in India.

Author	Year	Conclusion
Patel et al.	2022	Future research should explore AI integration challenges in banking to help scholars and practitioners.
Sharan Kumar Shetty	2022	AI implementation in banks is expensive but reduces workload and operational errors, leading to improved efficiency.
Kommana V Ganesh Kumar	2021	AI and analytics together strengthen banking operations and contribute to organizational success.
Dr. V. Padmanabhan	2021	AI training for employees enhances banking efficiency and service quality.
A. Geetha	2021	AI applications in banking and financial services increase customer satisfaction and awareness of AI-driven banking.
Dr. Monica Sharma	2020	AI has transformed the Indian banking sector by automating processes and reducing dependence on human labor.
C. Vijay	2019	AI is extensively used in the Indian banking sector, providing benefits such as improved efficiency and cost reduction, but faces adoption barriers and regulatory concerns.

IV. Research Gap

Despite the increasing adoption of AI in banking, there is a lack of comprehensive research evaluating its impact on customer satisfaction and operational efficiency, particularly in the Indian context. Most existing studies focus on AI implementation trends and technological advancements rather than assessing customer perceptions and experiences with AI-driven banking services. Additionally, while global research has examined AI's role in fraud detection and risk management, fewer studies have explored its effectiveness in enhancing personalized customer experiences and trust in Indian banks.

Another significant gap is the lack of empirical data on customer challenges and concerns regarding AI adoption. Issues such as trust, data security, and the trade-off between automation and human interaction require further exploration. This study aims to bridge these gaps by assessing the real-world impact of AI-driven banking services in India, providing insights that can guide banks in optimizing their AI strategies for improved customer satisfaction and operational performance.

V. Objectives

1. To analyse customer Awareness levels with AI-driven banking services in India.
2. To analyse customer satisfaction levels with AI-driven banking services in India.
3. To identify the challenges and future expectations of AI-based banking services.

V Research Hypotheses

The study proposes the following hypotheses to evaluate the impact of AI-driven banking services on customer satisfaction and operational efficiency in Indian banks:

H1: AI-driven banking services have a significant positive impact on customer satisfaction.

H2: AI integration significantly enhances operational efficiency in Indian banks.

H3: Customer trust and security concerns have a significant influence on the adoption of AI-driven banking services.

VI Research Methodology

This study employs a quantitative research approach to assess the impact of AI-driven banking services on customer satisfaction and operational efficiency in Indian banks. A **convenience sampling** method was used to collect data from **65 respondents**, consisting of banking customers who use AI-based banking services.

Primary data was gathered through a structured questionnaire designed to evaluate customer experiences, perceptions, and concerns regarding AI-driven banking services. The questionnaire included Likert scale-based questions, multiple-choice questions, and open-ended responses to capture diverse insights.

For data analysis, **simple statistical techniques** such as frequency distribution, percentage analysis, and mean score analysis were employed to interpret customer responses effectively. These methods help in identifying key trends, customer satisfaction levels, and operational efficiency improvements attributed to AI adoption in banking.

This methodology ensures a comprehensive understanding of AI's role in Indian banking and provides empirical insights into its benefits and challenges from a customer perspective.

VII RESULTS AND DISCUSSION

Reliability Statistics	
Cronbach's Alpha	N of Items
0.926	45

The Cronbach's Alpha value of 0.926 indicates excellent internal consistency for the scale used in the study, suggesting that the 45 items measured are highly reliable. This value indicates that the items are strongly correlated and collectively measure the intended construct effectively.

Table 1: Demographic profile of respondents

Demographic profile of respondents		Frequency	Percent
Age	18-25 Years	21	32.3
	26-35 Years	26	40.0
	36-45 Years	13	20.0
	46 and above Years	5	7.7
Gender	Male	41	63.1
	Female	24	36.9
Education Level	Diploma/Associate Degree	5	7.7
	Bachelor's Degree	20	30.8
	Master's Degree	25	38.5
	Ph.D. or Higher	15	23.1
Income Level	Rs. 20,000 Rs.50,000	15	23.1
	Rs.50,001 – Rs.1,00,000	20	30.8
	Rs.1,00,001 – Rs. 2,00,000	13	20.0
	Above Rs. 2,00,000	7	10.8
Bank Type	Public Sector Bank	45	69.2
	Private Sector Bank	20	30.8
Frequency of Bank Usage	Daily	34	52.3
	Weekly	20	30.8
	Monthly	11	16.9
Total		65	100.0

Source : Primary Data

The table stated The demographic analysis provides insights into the characteristics of respondents, which are crucial for understanding their perspectives on AI-driven banking services.

1. Age Distribution: The majority of respondents (40%) fall within the **26-35 years** age group, followed by **18-25 years** (32.3%). A smaller percentage belongs to **36-45 years** (20%) and **46 & above** (7.7%).

2. Gender Distribution: The study includes **63.1% male** and **36.9% female** respondents.

3. Education Level: The largest group of respondents holds a **Master's degree (38.5%)**, followed by those with a **Bachelor's degree (30.8%)**. A significant portion holds **Ph.D. or higher (23.1%)**, while **Diploma/Associate degree holders are the least (7.7%)**.

4. Income Level: The majority earn between **Rs.50,001 – Rs.1,00,000 (30.8%)**, followed by **Rs.20,000 – Rs.50,000 (23.1%)** and **Rs.1,00,001 – Rs.2,00,000 (20%)**. Only **10.8%** earn above **Rs.2,00,000**, indicating that most respondents fall within the middle-income bracket.

5. Bank Type Preference: A significant majority (69.2%) prefer **Public Sector Banks**, while **30.8%** use **Private Sector Banks**.

6. Frequency of Bank Usage: More than half of the respondents **(52.3%)** use banking services **daily**, while **30.8% use them weekly**. Only **16.9%** engage in banking on a **monthly basis**.

Table 2: Are you aware of AI-driven banking services

Are you aware of AI-driven banking services		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Chatbots	N	3	4	38	12	8
	%	4.6	6.2	58.5	18.5	12.3
Automated loan processing	N	3	3	9	29	21
	%	4.6	4.6	13.8	44.6	32.3
AI fraud detection	N	3	1	21	20	20
	%	4.6	1.5	32.3	30.8	30.8
Credit Scoring	N	4	3	4	38	16
	%	6.2	4.6	6.2	58.5	24.6
Voice & Biometric Banking	N	3	1	18	28	15
	%	4.6	1.5	27.7	43.1	23.1
Automated Investment & Wealth Management	N	2	3	9	24	27
	%	3.1	4.6	13.8	36.9	41.5

Source : Primary Data

The above table indicates that The awareness of AI-driven banking services varies among respondents. **Credit scoring (83.1%)**, **automated investment & wealth management (78.4%)**, and **automated loan processing (76.9%)** have the highest awareness, with most respondents agreeing or strongly agreeing that they recognize these services. This suggests that AI-driven financial decision-making tools are well known among users. **Voice & biometric banking (66.2%)** and **AI fraud detection (61.6%)** have moderate awareness, but a significant proportion of respondents remain neutral (**27.7% and 32.3%, respectively**). This indicates that while these technologies are recognized, many may not fully understand their functionalities or benefits. **AI chatbots have the lowest awareness, with 58.5% of respondents being neutral.**

Table 3: Descriptive statistics of Are you aware of AI-driven banking services

Are you aware of AI-driven banking services	N	Mean	Std. Error of Mean	Std. Deviation
Chatbots	65	3.28	.115	.927
Automated loan processing	65	3.95	.129	1.037
AI fraud detection	65	3.82	.130	1.044
Credit Scoring	65	3.91	.127	1.027
Voice & Biometric Banking	65	3.78	.121	.976
Automated Investment & Wealth Management	65	4.09	.125	1.011

Interpretation of Awareness of AI-Driven Banking Services (Mean & Standard Deviation Analysis)

Automated Investment & Wealth Management (Mean = 4.09, SD = 1.011) has the highest awareness among respondents, suggesting that AI-driven financial advisory tools and robo-advisors are well recognized. **Automated Loan Processing (Mean = 3.95, SD = 1.037)** and **Credit Scoring (Mean = 3.91, SD = 1.027)** also have high awareness, reflecting familiarity with AI's role in financial decision-making and credit evaluations.

AI Fraud Detection (Mean = 3.82, SD = 1.044) and **Voice & Biometric Banking (Mean = 3.78, SD = 0.976)**show moderate awareness, indicating that while respondents recognize these security-related AI applications, further education and trust-building efforts may be needed.

Chatbots (Mean = 3.28, SD = 0.927) have the lowest awareness among AI-driven banking services, implying that many respondents may either not recognize chatbots as AI-powered tools or have limited engagement with them.

Table 3: Usage of AI-Driven Banking Services

Usage of AI-Driven Banking Services		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Chatbots	N	1	6	28	20	10
	%	1.5	9.2	43.1	30.8	15.4
Automated loan processing	N	3	8	12	30	12
	%	4.6	12.3	18.5	46.2	18.5
AI fraud detection	N	2	5	19	22	17
	%	3.1	7.7	29.2	33.8	26.2
Credit Scoring	N	2	7	15	24	17
	%	3.1	10.8	23.1	36.9	26.2
Voice & Biometric Banking	N	3	6	14	26	16
	%	4.6	9.2	21.5	40.0	24.6
Automated Investment & Wealth Management	N	2	9	16	24	14
	%	3.1	13.8	24.6	36.9	21.5
automated transactions	N	2	3	15	33	12
	%	3.1	4.6	23.1	50.8	18.5
Robo-advisors	N	1	8	13	22	21
	%	1.5	12.3	20.0	33.8	32.3

Source : Primary Data

Interpretation of Usage of AI-Driven Banking Services. The usage of AI-driven banking services varies across different applications, with some services being more frequently utilized than others.

1. High Usage Services: Automated Transactions (69.3% Agree & Strongly Agree) – The most frequently used AI service, highlighting customer reliance on AI-driven payment processing and banking automation.

Automated Loan Processing (64.7% Agree & Strongly Agree) – A widely used service, indicating strong adoption of AI in streamlining loan approvals.

AI Fraud Detection (60.0% Agree & Strongly Agree) – Many respondents use AI-driven fraud prevention, showing confidence in security features.

2. Moderate Usage Services: Credit Scoring (63.1% Agree & Strongly Agree) – Indicates frequent use of AI-based credit evaluations for financial decision-making.

Voice & Biometric Banking (64.6% Agree & Strongly Agree) – A well-adopted security feature, though some users may still be hesitant.

Robo-Advisors (66.1% Agree & Strongly Agree) – Shows a significant adoption of AI-powered financial advisory services.

3. Low Usage & Neutral Stance: Chatbots (43.1% Neutral, 46.2% Agree & Strongly Agree) – Many users remain neutral, suggesting limited engagement or recognition of chatbot capabilities.

Automated Investment & Wealth Management (58.4% Agree & Strongly Agree, 24.6% Neutral) – While used by many, a quarter of respondents remain uncertain, indicating a need for greater awareness.

Table 4: Descriptive statistics of Usage of AI-Driven Banking Services

Descriptive statistics of Usage of AI-Driven Banking Services	N	Mean	Std. Error of Mean	Std. Deviation
Chatbots	65	3.49	.114	.921
Automated loan processing	65	3.62	.133	1.071
AI fraud detection	65	3.72	.129	1.038
Credit Scoring	65	3.72	.132	1.068
Voice & Biometric Banking	65	3.71	.135	1.086
Automated Investment & Wealth Management	65	3.60	.133	1.072
automated transactions	65	3.77	.113	.915
Robo-advisors	65	3.83	.133	1.069

The table shows that Interpretation of Descriptive Statistics for Usage of AI-Driven Banking Services. Robo-Advisors (Mean = 3.83, SD = 1.069) *and* ***Automated Transactions (Mean = 3.77, SD = 0.915)*** *have the highest usage, showing strong adoption of AI for financial advisory and automated banking operations..* ***AI Fraud Detection (Mean = 3.72, SD = 1.038), Credit Scoring (Mean = 3.72, SD = 1.068), and Voice & Biometric Banking (Mean = 3.71, SD = 1.086)*** *indicate moderate to high usage, suggesting that security and financial decision-making tools are well-integrated into user experiences.* ***Automated Loan Processing (Mean = 3.62, SD = 1.071) and Automated Investment & Wealth Management (Mean = 3.60, SD = 1.072)*** *are also frequently used, though slightly lower than other services, indicating that some users may still rely on traditional methods.*

Chatbots (Mean = 3.49, SD = 0.921) have the lowest usage, implying that while AI-powered chatbots are available, user engagement remains moderate. This could be due to a preference for human interaction in customer service.

Table 5: Satisfaction with AI-Based Banking Services

Satisfaction with AI-Based Banking Services		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Ease of Use & Accessibility	N	3	4	26	19	13
	%	4.6	6.2	40.0	29.2	20.0
Accuracy & Reliability	N	2	5	11	23	24
	%	3.1	7.7	16.9	35.4	36.9
Security & Trust	N	3	5	17	20	20
	%	4.6	7.7	26.2	30.8	30.8
Speed & Efficiency	N	1	6	15	21	22
	%	1.5	9.2	23.1	32.3	33.8
Personalization & Customer Engagement	N	2	2	15	28	18
	%	3.1	3.1	23.1	43.1	27.7
Problem-Solving Capabilities	N	2	4	17	21	21
	%	3.1	6.2	26.2	32.3	32.3

Source: Primary Data

The above table shows that Interpretation of Satisfaction with AI-Based Banking Services.. ***Ease of Use & Accessibility****: 49.2% of users find AI banking easy to use, while 40% are neutral. A small percentage (10.8%) find it challenging.*

Accuracy & Reliability: 72.3% agree AI banking is reliable, with minimal concerns about accuracy (10.8% disagree). **Security & Trust**: 61.6% feel AI banking is secure, but 12.3% still have security concerns, and 26.2% are uncertain. **Speed & Efficiency**: 66.1% are satisfied with the speed, and 10.7% disagree, indicating strong positive feedback on efficiency. **Personalization & Customer Engagement**: 70.8% agree AI enhances personalization, but 23.1% are neutral, suggesting room for improvement. **Problem-Solving Capabilities**: 64.6% feel AI resolves issues well, while 9.3% disagree, indicating general satisfaction with problem-solving.

Table 6: Descriptive statistics of Satisfaction with AI-Based Banking Services

Satisfaction with AI-Based Banking Services	N	Mean	Std. Error of Mean	Std. Deviation
Ease of Use & Accessibility	65	3.54	.128	1.032
Accuracy & Reliability	65	3.95	.132	1.067
Security & Trust	65	3.75	.139	1.118
Speed & Efficiency	65	3.88	.129	1.038
Personalization & Customer Engagement	65	3.89	.118	.954
Problem-Solving Capabilities	65	3.85	.130	1.049

The table shows that Descriptive statistics of Satisfaction with AI-Based Banking Services.

Ease of Use & Accessibility (Mean = 3.54): Moderately satisfied, but improvements in ease of use could enhance experience. High variability in responses. **Accuracy & Reliability (Mean = 3.95):** Strong satisfaction, with some users still expressing concerns. **Security & Trust (Mean = 3.75):** Generally positive but mixed satisfaction, suggesting room for trust-building in security. **Speed & Efficiency (Mean = 3.88):**

High satisfaction, though some users may experience occasional inefficiencies. **Personalization & Customer Engagement (Mean = 3.89):** Strongly positive, with most users appreciating the personalized experience. **Problem-Solving Capabilities (Mean = 3.85):** Satisfactory problem-solving, but some variation in user experiences.

Table 7: Customer Perceived Benefits

Customer Perceived Benefits		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Faster Service	N	1	1	23	18	22
	%	1.5	1.5	35.4	27.7	33.8
24/7 Availability	N	1	4	9	23	28
	%	1.5	6.2	13.8	35.4	43.1
	N	2	2	14	25	22
Reduced Human Errors	%	3.1	3.1	21.5	38.5	33.8
Cost Ecciency	N	2	2	13	25	23
	%	3.1	3.1	20.0	38.5	35.4
Personalized Banking Experience	N	1	3	10	21	30
	%	1.5	4.6	15.4	32.3	46.2

Source : Primary Data

The table shows that Customer Perceived Benefits.

Faster Service: 61.5% of users believe AI offers faster service, with minimal disagreement (3%), suggesting general satisfaction with speed. **24/7 Availability**: 78.5% agree that AI banking is available round-the-clock, with very few (7.7%) disagreeing, indicating widespread recognition of this benefit. **Reduced Human Errors**: 72.3% of respondents feel AI reduces human errors, while only 6.2% disagree, showing that AI helps reduce mistakes. **Cost Efficiency**: 73.9% agree AI banking is cost-efficient, with minimal disagreement (6.2%), indicating broad recognition of cost savings. **Personalized Banking Experience**: 78.5% agree AI enhances personalization, with only 6.1% disagreeing, suggesting strong appreciation for tailored experiences.

Table 8: Descriptive statistics of Customer Perceived Benefits

Customer Perceived Benefits	N	Mean	Std. Error of Mean	Std. Deviation
Faster Service	65	3.91	.118	.947
24/7 Availability	65	4.12	.121	.976
Reduced Human Errors	65	3.97	.122	.984
Cost Efficiency	65	4.00	.122	.984
Personalized Banking Experience	65	4.17	.119	.961

Highest Satisfaction: *Personalized Banking Experience (4.17)* had the highest mean score, indicating strong user appreciation for AI's ability to tailor services to individual needs. **Most Recognized Benefit:** *24/7 Availability (4.12)* is highly valued, confirming that customers appreciate AI's continuous banking access.

Error Reduction & Cost Efficiency (3.97 & 4.00): Customers largely trust AI to minimize human errors and provide cost-effective services, but slight variation suggests some users may still experience occasional issues.

Lowest Satisfaction (Still Positive): *Faster Service (3.91)* had the lowest mean but remains positively perceived. The relatively higher standard deviation (0.947) suggests that while many users find AI banking fast, some do not notice a significant speed improvement.

Table 9: Challenges do you face while using AI-based banking services

Challenges do you face while using AI-based banking services		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Lack of Human Interaction	N	1	7	26	21	10
	%	1.5	10.8	40.0	32.3	15.4
Accuracy Issues	N		9	12	28	16
	%		13.8	18.5	43.1	24.6
Security and Privacy Concerns	N		10	18	26	11
	%		15.4	27.7	40	16.9
	N		7	16	28	14
Lack of Trust in AI Decisions	%		10.8	24.6	43.1	21.5
Technical Issues	N	1	5	13	33	13
	%	1.5	7.7	20.0	50.8	20.0

Source : Primary Data

The table presents respondents' opinions on various challenges they face when using AI-based banking services. The responses are categorized into five levels: **Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree.** Below is an analysis of each challenge based on the distribution of responses.

1. **Lack of Human Interaction:**

47.7% (32.3% Agree + 15.4% Strongly Agree) feel that AI-based banking services lack human interaction. 40% remain neutral, while only 12.3% disagree.

2. **Accuracy Issues:**

67.7% (43.1% Agree + 24.6% Strongly Agree) believe AI banking services may have accuracy issues. 18.5% remain neutral, while only 13.8% disagree.

3. **Security and Privacy Concerns:**

56.9% (40% Agree + 16.9% Strongly Agree) express concerns about security and privacy in AI banking.27.7% remain neutral, and 15.4% disagree.

4. **Lack of Trust in AI Decisions:**

64.6% (43.1% Agree + 21.5% Strongly Agree) do not fully trust AI-based decisions. 24.6% are neutral, and only 10.8% disagree.

5. **Technical Issues:**

70.8% (50.8% Agree + 20.0% Strongly Agree) report experiencing technical issues. 20% remain neutral, and only 9.2% disagree.

Table 10: Descriptive statistics of Challenges do you face while using AI-based banking services

Challenges do you face while using AI-based banking services	N	Mean	Std. Error of Mean	Std. Deviation
Lack of Human Interaction	65	3.49	.116	.937
Accuracy Issues	65	3.78	.121	.976
Security and Privacy Concerns	65	3.57	.118	.951
Lack of Trust in AI Decisions	65	3.75	.114	.919
Technical Issues	65	3.80	.112	.905

The table show that Interpretation of Challenges Faced While Using AI-Based Banking Services.

The **lack of human interaction** has a mean of **3.49** with a standard deviation of **0.937**, indicating a moderate concern with some variation in responses. **Accuracy issues** have a mean of **3.78** and a standard deviation of **0.976**, showing significant doubts about AI's precision. **Security and privacy concerns** score **3.57** with a **0.951** standard deviation, highlighting considerable apprehension. **Lack of trust in AI decisions** has a mean of **3.75** and a **0.919** standard deviation, reflecting strong skepticism with relatively consistent

responses. **Technical issues** have the highest mean of **3.80** and a **0.905** standard deviation, indicating that system-related problems, such as errors and malfunctions, are a primary concern.

Table 11: Future Expectations and Improvements

Future Expectations and Improvements		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
More Human-Like AI Interaction	N	1	6	27	14	17
	%	1.5	9.2	41.5	21.5	26.2
Enhanced Fraud Detection and Security Features	N	1	5	10	26	23
	%	1.5	7.7	15.4	40.0	35.4
AI-Driven Personalized Investment Advice	N	1	6	23	17	18
	%	1.5	9.2	35.4	26.2	27.7
AI-Based Voice Banking	N	1	4	18	25	17
	%	1.5	6.2	27.7	38.5	26.2

Source : Primary Data

The data reflects users' expectations for enhancements in AI-based banking services, focusing on **human-like interactions, security, investment advice, and voice banking**.

1. More Human-Like AI Interaction: 47.7% of respondents agreed or strongly agreed, while **41.5% remained neutral** regarding the need for AI to mimic human interactions. **Only 10.7% disagreed**, indicating that most users prefer AI systems to be more conversational and intuitive.

2. Enhanced Fraud Detection and Security Features: 75.4% of respondents agreed or strongly agreed, highlighting **security as a top priority** for AI banking. **Only 9.2% disagreed or strongly disagreed**, indicating a strong consensus that fraud detection measures need improvement.

3. AI-Driven Personalized Investment Advice: 54% of respondents agreed or strongly agreed, while **35.4% remained neutral**, showing moderate demand for AI-based financial guidance. **Only 10.7% disagreed**, meaning most users see potential benefits in AI-powered investment advisory services.

4. AI-Based Voice Banking: 64.7% of respondents agreed or strongly agreed, indicating strong demand for voice-enabled banking services. **Only 7.7% disagreed**, while **27.7% remained neutral**, suggesting some users are undecided on its benefits.

Table 12: Descriptive statistics of Future Expectations and Improvements

Future Expectations and Improvements	N	Mean	Std. Error of Mean	Std. Deviation
More Human-Like AI Interaction	65	3.62	.127	1.026
Enhanced Fraud Detection and Security Features	65	4.00	.122	.984
AI-Driven Personalized Investment Advice	65	3.69	.128	1.030
AI-Based Voice Banking	65	3.82	.118	.950

The highest priority for improvement is **enhanced fraud detection and security features (4.00)**, as **75.4% of users agreed or strongly agreed** that AI banking should strengthen security measures. **AI-based voice banking (3.82)** is also in demand, indicating that users want more convenient, speech-driven banking solutions. **AI-driven personalized investment advice (3.69)** is another key expectation, showing that customers are interested in more tailored financial guidance from AI. **More human-like AI interaction (3.62)** is also desired, reinforcing the need for a balance between automation and personal engagement in banking services.

Table13: Regressing analysis – Model Summary

Variable	R	R Square	Adjusted R Square	Std. Error of the Estimate
Usage of AI-Driven Banking Services	.737[a]	.543	.536	.55102
Customer Satisfaction with AI-Based Banking Services	.649[a]	.421	.412	.63426
Customer Perceived Benefits	.545[a]	.298	.286	.69377
Challenges do you face while using AI-based banking services?	.225[a]	.050	.035	.70636
Future Expectations and Improvements	.222[a]	.049	.034	.97630

a. Predictors: (Constant), aware of AI-driven banking services

The table shows model summary of regression analysis predictors is *aware of AI-driven banking services* ***and dependent various are following.***

1. Usage of AI-Driven Banking Services

Awareness of AI banking explains **54.3%** of the variation in usage. A strong correlation (**0.737**) indicates that higher awareness leads to greater adoption of AI services. The model fits well with a **standard error of 0.551**.

2. Customer Satisfaction with AI-Based Banking Services

Awareness explains **42.1%** of customer satisfaction with AI banking, showing a moderate correlation (**0.649**). This suggests that better awareness enhances satisfaction, with a **standard error of 0.634**.

3. Customer Perceived Benefits

Awareness explains **29.8%** of the variation in perceived benefits. The moderate correlation (**0.545**) indicates that as awareness increases, customers recognize more benefits, though it's a weaker predictor than usage or satisfaction.

4. Challenges Faced While Using AI-Based Banking Services

Awareness has a weak impact on challenges, explaining only **5%** of the variation. The low correlation (**0.225**) suggests that challenges faced by users are not significantly influenced by awareness.

5. Future Expectations and Improvements

Awareness explains only **4.9%** of the variation in future expectations. The weak correlation (**0.222**) indicates that awareness has a minimal influence on what improvements customers expect from AI banking services.

Table14: Analysis of ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Usage of AI-Driven Banking Services	Regression	22.761	1	22.761	74.964	.000[b]
	Residual	19.129	63	.304		
	Total	41.890	64			
Customer Satisfaction with AI-Based Banking Services	Regression	18.430	1	18.430	45.814	.000[b]
	Residual	25.344	63	.402		
	Total	43.774	64			
Customer Perceived Benefits	Regression	12.843	1	12.843	26.683	.000[b]
	Residual	30.323	63	.481		
	Total	43.166	64			
Challenges do you face while using AI-based banking services?	Regression	1.671	1	1.671	3.348	.072[b]
	Residual	31.433	63	.499		
	Total	33.104	64			
Future Expectations and Improvements	Regression	3.100	1	3.100	3.253	.076[b]
	Residual	60.050	63	.953		
	Total	63.150	64			

This ANOVA table evaluates the significance of the regression models in explaining the variation in various dependent variables based on **awareness of AI-driven banking services**.

1. Usage of AI-Driven Banking Services

F = 74.964, **p = 0.000**. The regression model is **highly significant** ($p < 0.05$). This suggests that awareness of AI-driven banking services explains a substantial portion of the variation in AI usage.

2. Customer Satisfaction with AI-Based Banking Services

F = 45.814, **p = 0.000**. The regression model is **significant** ($p < 0.05$), indicating that awareness significantly influences customer satisfaction with AI banking services.

3. Customer Perceived Benefits

F = 26.683, **p = 0.000**. The regression model is **significant** ($p < 0.05$), meaning that awareness has a substantial impact on how customers perceive the benefits of AI banking.

4. Challenges Faced While Using AI-Based Banking Services

F = 3.348, **p = 0.072.** The regression model is **not statistically significant** ($p > 0.05$), indicating that awareness of AI-driven banking services does not have a significant effect on the challenges customers face.

5. Future Expectations and Improvements

F = 3.253, **p = 0.076**. The regression model is **marginally significant** ($p = 0.076$). This suggests that while awareness has a small influence on future expectations, the effect is weak and not fully statistically significant.

VIII Conclusion

This study offers an in-depth analysis of the awareness, usage, satisfaction, perceived benefits, challenges, and future expectations associated with AI-driven banking services. The findings clearly indicate that artificial intelligence is playing an increasingly important role in modern banking, especially among younger, well-educated, and middle-income individuals who frequently engage with public sector banks. These users tend to interact with AI tools such as credit scoring, automated transactions, and loan processing, reflecting a growing dependence on AI for routine financial services.

While the overall awareness of AI in banking is relatively high, the actual usage of these services tends to align closely with the level of awareness. Automated services like transactions and loan processing are widely adopted, whereas technologies such as AI chatbots and biometric banking show limited engagement. This suggests that customers may be more comfortable with conventional digital services or may lack familiarity with more advanced AI features.

In terms of satisfaction, users appreciate the speed, reliability, and personalization that AI-based systems offer. However, several barriers to satisfaction remain. Notably, ease of use, data privacy, and trust in AI decision-making are areas of concern for a significant portion of users. Many users find the systems challenging to navigate and express skepticism about the security and transparency of AI-driven processes.

The study also highlights common challenges such as technical glitches, lack of human interaction, and insufficient communication regarding how AI decisions are made. These challenges underscore the need for banks to enhance system usability, foster greater transparency, and strike a balance between automation and human touch to build user confidence.

Looking to the future, users have expressed strong expectations for improved AI services, including enhanced fraud detection, stronger security measures, more human-like interactions, personalized investment advice, and voice-enabled banking. These preferences indicate a demand for smarter, safer, and more intuitive banking experiences.

In conclusion, AI-driven banking services have made significant strides in delivering efficient and tailored solutions. However, to fully realize their potential, financial institutions must address existing concerns by focusing on system reliability, user education, and customer-centric design. This approach will be essential for building trust, enhancing satisfaction, and ensuring long-term success in the digital banking era.

IX Limitation of this study

1. Sector-Wise Bank Segregation Not Done
2. Geographical Limitation (Data Collected Only in Telangana)

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