

The Role of Artificial Intelligence (Ai) in Banking Sector

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ABSTRACT

The rapid advancement of Artificial Intelligence (AI) has significantly reshaped the banking sector by enhancing service delivery, improving security and increasing operational efficiency. This study explores the role of AI in banking particularly in areas such as customer experience, fraud detection and the growth of FinTech services. A descriptive & analytical research design was adopted, using both primary and secondary data sources. Primary data was collected through a structured questionnaire from 50 respondents selected through convenience sampling from urban and semi-urban areas. The data was analyzed using percentage analysis and graphical tools.

The results indicate that AI adoption in banking is widely recognized and accepted among customers. A large majority of respondents are aware of banking services, while 94% are familiar with AI and actively use digital banking platforms. About 88% of respondents consider AI important in banking operations and 78% feel secure while using AI-enabled services. Interaction with AI tools such as chat bots and virtual assistants is also notable though awareness and usage of FinTech services remain comparatively lower. Furthermore, 64% of respondents believe that AI helps in reducing human errors and most respondents agree that it plays a crucial role in fraud detection and prevention.

The study concludes that AI has brought substantial improvements in banking by making services faster, more accurate and customer-friendly. It has also strengthened fraud prevention systems and increased customer trust. However, there is still a need to enhance awareness and adoption of advanced FinTech services. Overall, AI continues to play a transformative role in modern banking and its effective implementation will be key to future growth and innovation in the banking sector.

Keywords: Artificial Intelligence, Banking Sector, Customer Experience, Fraud Detection, FinTech

1. INTRODUCTION

Artificial Intelligence (AI) has emerged as a transformative force across industries and banking sector is no exception. With the rapid growth of digitalization and data-driven technologies, banks are increasingly adopting AI to enhance operational efficiency, improve decision-making & deliver superior services. AI refers to the simulation of human intelligence in machine that is capable of learning, reasoning and performing tasks autonomously.

In Modern Banking environment, AI plays a crucial role in improving customer experience by offering personalized services, 24/7 assistance through chat bots and faster transaction processing. Customer today expects convenience, speed & accuracy, which AI-enabled systems help deliver effectively. From Mobile banking applications to virtual assistants, AI has significantly changed how customers interact with banks.

One of the most critical applications of AI in banking is Fraud detection. With the rise in digital transactions, the risk of cyber fraud & financial crimes has increased. AI systems use advanced algorithms and machine learning techniques to monitor transaction patterns, detect anomalies and prevent fraudulent activities in real time. This not only enhances security but also builds trust among customers.

Furthermore, AI is a key component of the growing FinTech ecosystem, where technology-driven innovations are reshaping traditional financial services. FinTech companies and banks collaborate to introduce AI- powered solutions such as automated credit scoring, robo-advisors and predictive analytics. These innovations are making financial services more accessible, efficient and cost-effective. Overall, the integration of AI in the banking sector is revolutionizing the industry by improving efficiency, strengthening fraud prevention mechanisms and enhancing customer satisfaction. This study aims to explore the role of AI in banking sector, focusing on its impact on customer experience, fraud detection and the development of FinTech solutions.

2. OBJECTIVES OF THE STUDY

1. To understand the concept of Artificial Intelligence (AI) and its relevance in the modern banking sector.
2. To analyze the role AI in enhancing customer experience through personalized services, chat bots and digital banking platforms.
3. To examine the effectiveness of AI in fraud detection and prevention of financial crimes in banking sector.
4. To evaluate the impact of AI on operational efficiency and decision-making in banking.
5. To explore the role of AI in the growth of FinTech and digital banking innovations.

3. REVIEW OF LITERATURE

According to Salunkhe R. T. (2019), the paper explained how technology had transformed the way businesses operated, leading to a growing demand for AI in the Indian banking sector. It highlighted that banks were gradually adopting AI and using it in different ways to improve their services. The study noted that AI adoption had grown rapidly in banking compared to other sectors, mainly because banking operations still involved significant human intervention. Researcher focusing specially on SBI and HDFC bank, how these banks explored and implemented AI to enhance customer service. It concluded that AI had played an important role in improving customer experiences and it was expected to further strengthen banking services in the future.

According to Srivastava and Sindhu (2020), the study explored how online banking users in India had accepted mobile banking services. It developed a model based on factors such as ease of use, confidence, social influence and customer support to understand their behavior. Researcher using data from 420 bank customers, the study found that these factors had significantly influenced their intention to adopt mobile banking. The results provided useful insights into digital banking adoption and helped banks to promote mobile banking services.

According to Hentzen & Dolan (2022), the study aimed to systematically review existing research on AI in customer-facing financial services and identify gaps for future work. The authors analyzed 90 research articles from ABDC journals using databases like Scopus, applying the TCCM framework. The findings showed that research was divided between data-driven studies and theory-driven studies. The

study highlighted a lack of strong theoretical development & called for more research to build or extend theories, along with more empirical work on consumer behavior. It also emphasized the need to explore issues related to regulations, ethics and policy in areas like insurance and pensions. The review was limited to customer-facing services and suggested future research should include back-office and operational contexts.

According to Alhajeri & Alhashem (2023), the study examined how AI was used in the banking sector to detect and prevent financial crimes such as money laundering, identity theft and terrorism financing. It highlighted those financial institutions, due to sensitive nature of money and records had been major targets for criminal activities. The research explained that AI techniques had been applied to monitor customer behavior, transactions and market pattern to identify any suspicious activities. By analyzing transactions AI had helped in understanding banking habits and detecting irregularities linked to illegal financial movement. Overall, the study provided insights into the role of AI in strengthening fraud detection and prevention in financial systems.

According to Tanveer Ahmed Siddquee (2025), the study examined how AI had been used in commercial banking to improve credit decisions, risk assessment and fraud detection. It used both data analysis from financial institutions in Bangladesh and interviews with experts to understand practical challenges. The findings showed that AI-based systems had improved loan approvals, reduced defaults and made processes faster and more efficient compared to traditional methods. However, challenges such as system compatibility, lack of real-time data and limited explain ability had been highlighted. Overall, the study emphasized the need for advanced AI models and human oversights to make banking systems more effective and reliable.

According to Amarna A.H., Aldaaif H. A.& Hameed A.T.(2025), the study examined how AI affected customer satisfaction in banks listed on the Palestine stock exchange. It focused on 3 main factors such as privacy & security systems, mobile banking services and AI chat bots. Using a quantitative approach, the researchers collected data from 300 customers across 8 banks through a 16 items questionnaire & analyzed it using structural equation modeling (Smart PLS). The findings showed that all 3 factors had a positive impact on customer satisfaction. Among them, privacy & security systems had the strongest influence, followed by mobile banking services and then AI chat bots. Overall, the study concluded that AI contributed to improving customer experience in Palestinian banks, with security playing a key role in building customer trust.

4. RESEARCH METHODOLOGY

- **Research Design and Approach:** The study employs a quantitative as well as qualitative research approach to assess the role of AI in banking sector. The present study is descriptive and analytical in nature. Descriptive research is used to describe the concept of AI and its applications in banking sector. Analytical research is used to evaluate the role of AI on various banking functions such as customer experience; fraud detection and operational efficiency.
- **Data Collection:** Primary data was gathered through a structured questionnaire designed to capture information related to demographic profile, awareness of AI applications in banking, usage of digital banking services, fraud detection & security perception, operational efficiency & FinTech innovations and overall customer experience & satisfaction. Secondary data is collected from various sources such as: Research papers, academic journals, official websites, Articles, books, etc.

- **Sampling Design:** A convenience sampling method was used to collect data from 50 respondents, consisting of banking customers who used digital banking services. The area of sampling was urban as well as semi-urban.
- **Tools and Techniques of data analysis:** The collected data was analyzed by using following tools: Percentage analysis (to understand response distribution), Bar charts & Pie charts (for graphical representation), Percentage analysis (to evaluate overall perception)
- **Variables:** Independent Variable- Artificial Intelligence and Dependent Variable- Customer experience, Fraud detection efficiency, Operational efficiency, Decision-making, FinTech adoption.

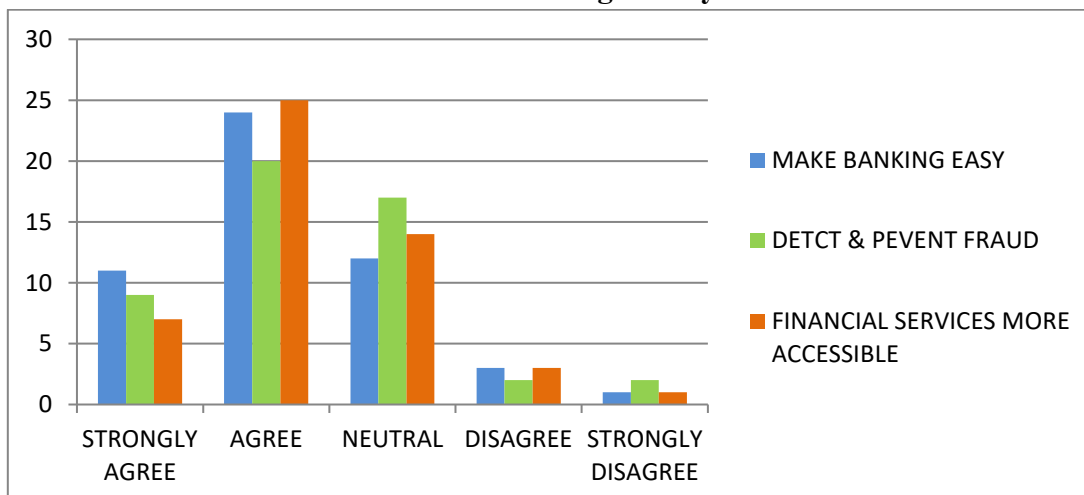
5. INTERPRETATION AND RESULTS

The collected survey data was analyzed by using Percentage analysis & graphical tools such as Bar charts & pie charts. The analysis covered demographic variables (age and occupation), awareness of digital banking services, FinTech services and AI-based services, perception of security, frequency of digital banking usage, awareness about detection and prevention of fraud by AI and overall satisfaction levels.

Interpretation and Charts:

- **Age Distribution:** Majority of respondents belong to the younger and middle age group, indicating the higher level of acceptance of digital and AI-based banking services.
- **Digital Banking Awareness:** Most of the respondents are aware of digital banking services.
- **FinTech Services Awareness:** Most of the respondents know about FinTech services such as digital wallets, robo-advisors and they even used it.
- **AI Awareness:** Most of the respondents are aware about basic features of AI such as chat bots, virtual assistants, etc.
- **Use of Digital Banking:** Mobile banking, internet banking, etc. are the most frequently used services.
- **Security Perception:** Most of the respondents feel secure while using AI- enabled banking services.
- **Awareness of Fraud Detection & Prevention by AI in Banking:** Most of the respondents are aware about the use of AI in fraud detection in banking and majority of respondents are agree that AI helps in preventing fraud and cyber crime.
- **Overall Satisfaction:** High levels of satisfaction are observed among digital banking users.

Table-1: Percentage Analysis



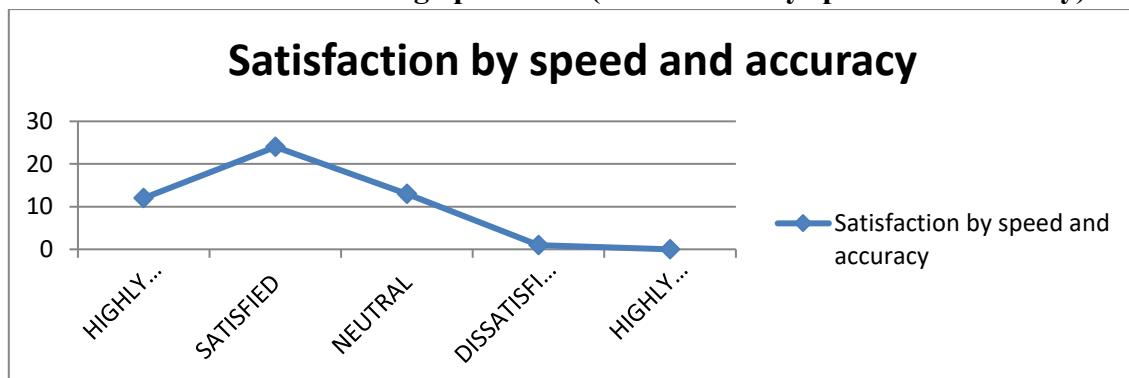
Interpretation: Table-1 shows customer perception about how AI make banking functions easy, AI make financial services more accessible and the role of AI in detection of fraud & prevent from cyber crime by giving alert notification which is determined most of the respondents agree with important role of AI in banking sector.

Table-2: Multiple Responses Analysis

RESPONSES	YES (Frequency & %)		NO (Frequency & %)		NOT SURE (Frequency & %)		TOTAL (Frequency & %)	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Awareness of banking services	49	98	1	1	-	-	50	100
Heard about AI	47	94	3	6	-	-	50	100
Importance of AI in banking	44	88	3	6	3	6	50	100
Use of Digital banking services	47	94	3	6	-	-	50	100
Interaction with Chat bots & Virtual assistants	38	76	12	24	-	-	50	100
Security of online banking	39	78	3	6	8	16	50	100
Awareness of FinTech services	34	68	12	24	4	8	50	100
Use of FinTech services	15	30	35	70	-	-	50	100
AI reduce human error	32	64	7	14	11	22	50	100

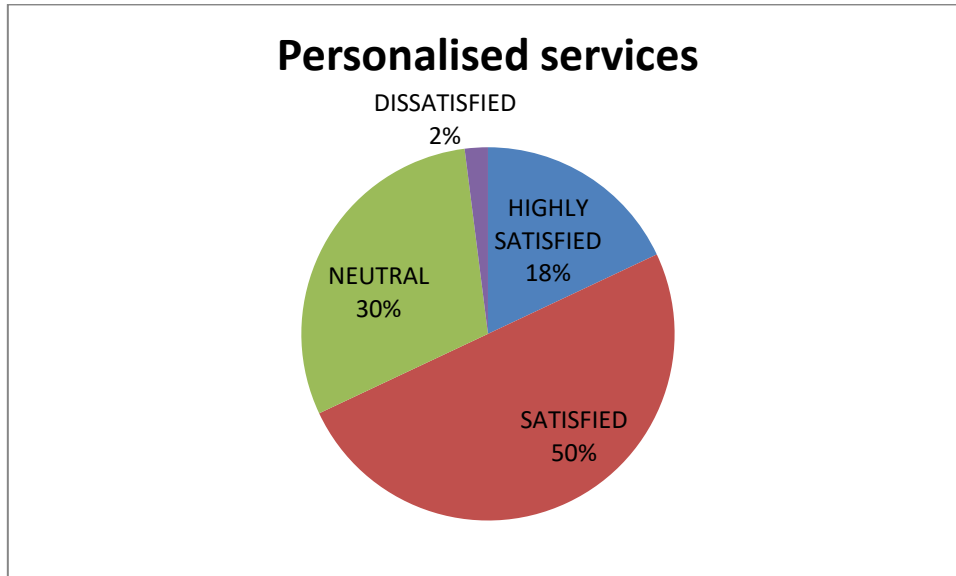
Interpretation: The above table-2 shows that the frequency analysis for evaluating the uses of AI in banking sector revealed that 98% respondents know about banking services, 94% heard about AI, 88% respondents feel importance of AI in banking, 94% used digital banking services, only 76% respondents interact with AI applications like chatbots & virtual assistance, 78% were secured with online banking, only 68% aware about FinTech services & 30% used it, 64% respondents said AI reduced human error in banking.

Table-3: Role of AI in banking operations (Satisfaction by speed and accuracy)



Interpretation: Table-3 shows customer perception about speed and accuracy provided by AI applications in banking sector.

Table-4: AI helps in personalized services



Interpretation: Table-4 shows personalized services of AI in banking majority of respondents were in favour (50% respondents were satisfied, 18% were highly satisfied and 30% were neutral) in this regards with these services.

6. CONCLUSIONS

The study clearly demonstrates that artificial intelligence (AI) has become a vital component in transforming the modern banking sector. It is no longer just a technological advancement, but a strategic tool that enhances overall banking performance and customer satisfaction. The findings indicate that a majority of customers aware of AI-driven services and actively use digital banking platforms, reflecting a strong acceptance of technology in financial services.

AI has significantly improved customer experience by offering faster, more accurate and personalized services through tools such as chat bots, virtual assistants and mobile banking application. Customers value convenience and efficiency and AI-enabled systems are effectively meeting these expectations. The high level of satisfaction observed among respondents further confirms the positive impact of AI on banking service delivery. Another important contribution of AI is in the area of fraud detection and security.

The study reveals that customers feel relatively secure while using AI-based banking services and recognize the role of AI in identifying and preventing fraudulent activities. This strengthens trust in digital banking systems and encourages wider adoption. In addition, AI contributes to operational efficiency by reducing human errors, speeding up processes and supporting better decision-making. Although awareness of FinTech services is moderate, their usage is still limited, suggesting that banks need to focus more on promoting and educating customers about these innovations. Overall, the research concludes that AI plays a transformative role in banking by improving efficiency, enhancing security and delivering better customer experiences. However, to fully realize its potential, banks should address challenges such as increasing awareness of advanced AI applications, improving customer trust

and ensuring proper implementation of technology. Further research can explore ethical concerns, regulatory frameworks and integration of AI in broader banking operations.

7. REFERENCE

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