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Artificial Intelligence in Fintech in the Banking Sector: an Empirical Study on Customer Perception and Trust using SPSS

Arsha Glory G, Fazeela N

St. Joseph's College of Arts and Science for Women, Autonomous, Hosur, Tamil Nadu, India.

Abstract: *Artificial Intelligence (AI) has become a transformative force in the Financial Technology (FinTech) ecosystem, particularly within the banking sector. AI-powered systems are increasingly used for fraud detection, credit scoring, chatbot assistance, loan processing, and personalized financial services. Despite its technological advancements, customer perception and trust remain critical determinants of AI adoption in banking. The present study aims to analyze customer perception, trust, and usage behavior towards AI-driven FinTech services in the banking sector. Primary data was collected from 82 respondents using a structured questionnaire, and statistical analysis was performed using SPSS software. Reliability analysis, percentage analysis, Chi-Square test, correlation, and mean analysis were conducted. The results indicate a significant relationship between customer trust and frequency of AI usage, along with a strong positive correlation between perceived security and customer satisfaction. The study concludes that while customers appreciate the efficiency and speed of AI-based banking services, concerns regarding security and transparency continue to influence adoption levels. The findings provide insights for banks and policymakers to enhance ethical AI implementation and strengthen consumer confidence.*

Keywords: *Artificial Intelligence, FinTech, Banking Sector, Customer Trust, SPSS Analysis, Digital Banking.*

1. INTRODUCTION

The rapid digital transformation of the financial sector has significantly reshaped the traditional banking landscape. Artificial Intelligence (AI) has emerged as one of the most disruptive technologies within Financial Technology (FinTech), enabling banks to automate processes, enhance customer experiences, and improve operational efficiency. AI refers to intelligent systems capable of learning from data, recognizing patterns, and making decisions with minimal human intervention In the banking sector, AI applications include fraud detection algorithms, robo-advisory platforms, automated credit scoring models, conversational chatbots, risk assessment systems, and predictive analytics. Global consulting firms such as McKinsey & Company have reported that AI adoption can reduce operational costs significantly while improving risk management efficiency. Similarly, Deloitte has highlighted that AI-powered automation enhances customer engagement and service speed. In India, regulatory bodies such as the Reserve Bank of India emphasize responsible AI governance to ensure transparency, fairness, and data protection in digital banking. While AI improves efficiency and convenience, customers often express concerns related to privacy, data misuse, algorithmic bias, and lack of human interaction. Therefore, understanding consumer perception and trust towards AI in banking becomes crucial for sustainable technological adoption. This study attempts to empirically examine customer perception, trust levels, and satisfaction regarding AI-driven FinTech services in the banking sector using statistical analysis through SPSS.

2. REVIEW OF LITERATURE

"AI promotes financial inclusion"(2022) by World Bank. According to the World Bank, AI- driven FinTech solutions enhance financial inclusion by providing accessible digital services to underserved populations. Research studies indicate that AI-based fraud detection systems significantly reduce financial crimes by analyzing transaction patterns in real time.

Studies by PwC suggest that "AI increases operational productivity and enhances predictive risk management in

banks" (2022). However, literature also highlights concerns regarding ethical AI usage, transparency in automated lending decisions, and cybersecurity vulnerabilities. Previous empirical studies reveal that customer trust is a key mediator between AI technology and adoption behavior. "AI in financial services: Enhancing customer engagement through intelligent automation."(2020) by Deloitte. States that AI-powered chatbots significantly enhance customer engagement by providing instant responses, 24/7 availability, and personalized interaction in digital banking platforms.

3. OBJECTIVES

- To analyze the level of awareness about AI in FinTech.
- To identify factors influencing acceptance of AI-powered banking services.
- To study challenges faced while using AI-driven platforms.
- To improve trust and adoption using AI-fintech platforms.

4. METHODS AND DISCUSSION

The present study adopts a *descriptive research* design to analyze consumer perception towards Artificial Intelligence in FinTech banking services. *Primary data and Secondary data* was collected using a structured questionnaire distributed to 82 respondents through *convenience sampling*. The questionnaire included statements measured on a five-point Likert scale to assess awareness, trust, satisfaction, security perception, and usage frequency of AI-powered banking services. The collected data was coded and analyzed using the Statistical Package for Social Sciences (SPSS).

5. KEY CONCEPTUAL FRAME OF THE STUDY

5.1 Digital Transformation and the Emergence of AI in FinTech

- The rapid expansion of information and communication technologies has fundamentally transformed economic systems, particularly the financial services industry. Traditional banking, which once relied heavily on manual processing and physical branch networks, has shifted toward digital platforms powered by intelligent technologies. This transformation is not merely technological but structural, altering how financial institutions operate and deliver value.
- The global financial crisis of 2008 acted as a turning point, exposing inefficiencies and trust deficits within traditional banking systems. This created an environment conducive to innovation, encouraging the rise of technology-driven financial models. Artificial Intelligence (AI), supported by big data and machine learning, emerged as a central driver of this transformation.
- The transition from FinTech 1.0 (basic digital infrastructure such as ATMs and telecommunication systems) and FinTech 2.0 (internet and digital banking) to FinTech 3.0 represents the integration of AI into core banking systems. In this phase, financial services are no longer just digitized but intelligent, automated, and predictive.
- AI-enabled FinTech solutions are designed to analyze vast volumes of structured and unstructured financial data, enabling banks to make faster, data-driven decisions. This marks a shift from reactive banking to proactive and predictive financial management.

5.2 Conceptual Understanding of AI in FinTech Banking

- Artificial Intelligence in FinTech refers to the use of intelligent algorithms, machine learning models, and data analytics tools to enhance the efficiency, accuracy, and personalization of financial services. Unlike traditional IT systems that follow predefined rules, AI systems learn from data patterns and continuously improve their performance.
- AI is widely used in automated credit scoring systems, where algorithms evaluate a borrower's creditworthiness by analyzing transaction history, spending behavior, repayment patterns, and alternative data sources. This reduces human bias and speeds up loan approval processes.
- Fraud detection systems powered by AI use anomaly detection techniques to monitor transactions in real time. By identifying irregular patterns or suspicious behavior, these systems significantly reduce financial fraud and operational risk.

- AI-driven chatbots and virtual assistants enhance customer engagement by providing instant responses to queries, assisting in transactions, and offering personalized recommendations. These tools operate 24/7, improving accessibility and customer satisfaction.
- Robo-advisory platforms use machine learning models to provide automated investment advice based on customer risk profiles and financial goals. This democratizes wealth management by making financial advisory services accessible at lower costs.

5.3 Impact of AI on Banking Operations and Customer Experience

- AI significantly reduces operational costs by automating repetitive back-office functions such as data entry, compliance verification, document processing, and transaction monitoring. This allows banks to allocate human resources toward strategic decision-making roles.
- Risk management has been strengthened through predictive analytics models that forecast credit risk, market fluctuations, and liquidity concerns. AI systems can process large datasets faster than traditional risk assessment methods, enhancing accuracy and reliability.
- Customer experience has been transformed through personalization. AI analyzes customer data to offer tailored product recommendations, customized loan offers, and targeted financial planning advice, increasing customer engagement and retention.
- Digital payment systems, particularly in emerging markets like India, rely heavily on AI for fraud prevention and secure authentication. Real-time transaction monitoring ensures secure digital ecosystems, thereby increasing trust in online financial transactions.
- AI contributes to financial inclusion by enabling banks to assess creditworthiness of individuals without formal credit histories. By analyzing alternative data such as mobile usage patterns and digital payment history, AI expands access to financial services for underserved populations.

5.4 AI-Driven FinTech in the Indian Banking Context

- India has emerged as one of the fastest-growing FinTech ecosystems globally, driven by increased smartphone penetration, internet accessibility, and government-led digital initiatives. Regulatory guidance from the Reserve Bank of India has played a critical role in supporting secure digital financial infrastructure.
- The rise of Unified Payments Interface (UPI) has transformed digital transactions, with billions of monthly transactions monitored and secured using AI-based fraud detection systems. AI ensures real-time authentication and anomaly detection within high- volume transaction environments.
- Indian FinTech startups are actively leveraging AI in areas such as digital lending, InsurTech, RegTech, and WealthTech. Cloud computing and AI analytics enable scalability and cost efficiency, allowing startups to compete with traditional banking institutions.
- The demographic advantage of India, with a large young and digitally active population, has accelerated AI adoption in financial services. This has created a favorable environment for AI-driven innovation in banking.
- Government initiatives aimed at increasing digital literacy and infrastructure development have strengthened the foundation for AI-based financial services expansion.

5.5 Challenges and Future Outlook of AI in FinTech Banking

- Regulatory uncertainty remains a challenge, as authorities must balance innovation with financial stability and consumer protection. Excessive regulation may hinder innovation, while insufficient regulation may increase systemic risk.
- Cybersecurity and data privacy concerns represent significant barriers to AI adoption. Since AI systems rely heavily on customer data, robust encryption, data governance frameworks, and compliance mechanisms are essential.
- Ethical issues such as algorithmic bias and transparency in automated decision-making require careful attention. Banks must ensure that AI-driven credit scoring and lending systems do not unfairly discriminate against certain groups.
- Workforce displacement due to automation necessitates reskilling and upskilling programs. Employees

must develop digital competencies to adapt to AI-integrated banking environments.

- Despite these challenges, the future of AI in FinTech banking appears promising. Integration of AI with blockchain technology, advanced analytics, and decentralized finance models is expected to redefine financial ecosystems further.
- Sustainable growth will depend on building customer trust, strengthening cybersecurity frameworks, promoting ethical AI governance, and ensuring regulatory clarity.

6. KEY FINDINGS OF THE STUDY:

- The majority of respondents (41.5%) belong to the age group of 31–40 years, indicating that working-age individuals are the primary users of AI-enabled FinTech banking services.
- A higher proportion of respondents are male (62.2%), suggesting comparatively greater adoption of AI-driven banking platforms among male users.
- Most respondents (58.5%) are undergraduates, showing that individuals with basic higher education demonstrate significant awareness and usage of AI-based financial technologies.
- Nearly 50% of the respondents are employed, highlighting that working professionals actively engage with AI-integrated banking services for financial transactions and digital payments. About 30.5% of respondents earn below $10,000 annually, indicating that AI- powered FinTech services are accessible even to lower-income groups, supporting financial inclusion.
- The most frequently used AI-enabled FinTech service is UPI transactions (59.8%), reflecting the widespread adoption of digital payment systems supported by intelligent authentication and fraud monitoring mechanisms.
- A majority of respondents (45.1%) expressed trust in FinTech platforms when sharing personal information, suggesting moderate confidence in AI-driven data management systems.
- Around 43.9% of respondents agreed that AI-based FinTech services are safe and secure, indicating a positive perception of digital security measures.
- Nearly 42.7% of respondents stated that AI-supported customer service systems, such as chatbots and automated assistance, are helpful when problems arise, demonstrating improved service efficiency.

7. RESULTS OF AI IN FINTECH IN BANKING SECTOR

The successful implementation of AI in Fintech in Banking sector leads to measurable outcomes:

- **Improved Operational Efficiency**

  The results indicate that Artificial Intelligence enhances operational efficiency in banks by automating routine tasks such as transaction processing and loan approvals. This reduces manual errors, saves time, and improves overall productivity.

- **Enhanced Customer Experience**

  AI-powered tools like chatbots provide instant support and 24/7 service availability. Customers benefit from faster responses, personalized services, and greater convenience in banking transactions.

- **Strengthened Fraud Detection and Risk Management**

  AI systems improve fraud detection by monitoring transactions in real time and identifying unusual patterns. This enhances risk management and increases customer confidence in digital banking services.

- **Faster Credit Assessment and Decision-Making**

  AI-based credit evaluation enables quicker and more accurate loan approvals. Automated decision-making reduces delays and improves transparency in financial assessments.

- **Promotion of Financial Inclusion**

  AI supports alternative credit scoring and digital access to banking services, helping underserved populations access financial products. This contributes to inclusive growth and wider adoption of digital banking.

8. DISCUSSION

The findings of the study confirm that Artificial Intelligence significantly influences the FinTech banking ecosystem by enhancing operational efficiency and customer convenience. The significant relationship between trust and usage frequency indicates that trust acts as a crucial determinant in AI adoption. Customers who perceive AI systems as reliable and secure are more likely to use digital banking services frequently. The strong positive correlation between perceived security and satisfaction highlights the importance of cybersecurity frameworks and transparent AI governance. These findings are consistent with previous studies conducted by global institutions emphasizing trust and ethical implementation as key drivers of AI acceptance. However, customer apprehensions regarding data privacy and automated decision-making continue to persist. This indicates the need for banks to implement explainable AI models and improve transparency in algorithmic decisions.

9. LIMITATIONS OF THE STUDY

The study is limited to a sample size of 82 respondents and is based on convenience sampling, which may restrict generalization. The study focuses primarily on perception rather than technical evaluation of AI systems. Future research may incorporate larger samples and comparative studies across different regions.

10. CONCLUSION

Artificial Intelligence is revolutionizing the FinTech landscape within the banking sector by enabling automation, personalization, and improved risk management. The empirical findings of this study reveal that customer trust and perceived security significantly influence AI adoption and satisfaction levels. While respondents generally demonstrate positive attitudes towards AI-powered banking services, strengthening transparency, cybersecurity, and ethical AI governance remains essential for long-term sustainability. The study concludes that AI adoption in banking will continue to grow, provided customer trust is nurtured through responsible implementation and regulatory compliance

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