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IMPACT OF ARTIFICIAL INTELLIGENCE AND FINTECH ON TRADITIONAL BANKING OPERATIONS IN INDIA

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ABSTRACT

In the modern era of rapid digital transformation, the banking industry has become one of the most technologically advanced sectors of the economy. The introduction of Artificial Intelligence (AI) and Financial Technology (Fintech) has fundamentally reshaped the structure, operations, and customer engagement models of traditional banks in India. This study titled “Impact of Artificial Intelligence and Fintech on Traditional Banking Operations in India” explores how emerging technologies are revolutionizing financial services, improving efficiency, and enhancing customer satisfaction, while also identifying the challenges that accompany such innovations.

The increasing demand for fast, reliable, and personalized financial services has compelled traditional banks to adopt AI-driven solutions such as chatbots, virtual assistants, predictive analytics, fraud detection systems, and credit scoring algorithms. Fintech firms, on the other hand, have leveraged technology to create digital wallets, UPI-based payment systems, robo-advisors, peer-to-peer lending platforms, and blockchain-based transaction models. These innovations have not only simplified customer transactions but also improved transparency, accessibility, and financial inclusion, especially in semi-urban and rural India.

This research combines primary data collected through a structured questionnaire from 100 respondents in Pune including bank customers and employees with secondary data from RBI publications, government reports, and scholarly journals. The study uses descriptive and analytical methods to examine the relationship between AI, Fintech adoption, and operational performance of traditional banks. Statistical tools such as percentage analysis and correlation have been used to interpret the collected data effectively.

The findings reveal that a significant portion of respondents believe AI and Fintech have enhanced the



overall operational efficiency, service delivery, and customer experience of banks. Chatbots and automated systems have reduced waiting times and improved query resolution rates, while AI-based fraud detection mechanisms have strengthened transaction security. Moreover, Fintech platforms have empowered customers by providing 24/7 access to financial services through mobile and web applications. However, the study also identifies several challenges such as cybersecurity risks, high implementation costs, lack of skilled manpower, and resistance to change among employees.

Despite these limitations, the integration of AI and Fintech is no longer optional but a necessity for banks to remain competitive in the digital age. The research concludes that successful digital transformation requires a balanced approach—one that combines technological innovation with robust regulatory compliance and human expertise. Continuous training programs, customer education, and collaborative partnerships between banks and Fintech start-ups are recommended to ensure smooth technology adoption and sustainable growth.

Overall, this study highlights that Artificial Intelligence and Fintech are not substitutes for traditional banking but complementary forces that can collectively drive efficiency, inclusivity, and innovation in India's financial system. As India moves towards a digital economy, the synergy between AI, Fintech, and traditional banking will play a critical role in shaping the future of the financial services sector and ensuring long-term economic stability.

KEYWORDS: Artificial Intelligence (AI), Financial Technology (FinTech), Traditional Banking, Digital Transformation, Operational Efficiency, Customer Satisfaction, Financial Inclusion, Chatbots, Automation, Machine Learning, Digital Payments, Fraud Detection, Blockchain, Banking Innovation, Indian Banking Sector.

1. INTRODUCTION

The Indian banking industry has witnessed tremendous change over the past decade. Digitalization, Artificial Intelligence, and Fintech innovations have revolutionized how banks operate and serve customers.

Traditional banking, which was once paperwork-driven and time-consuming, has evolved into an automated and technology-based system.

Artificial Intelligence plays a significant role in transforming banking operations. It enables banks to provide personalized services, detect fraud, analyze credit risks, and automate routine processes.



Fintech (Financial Technology) companies have introduced innovations such as mobile wallets, digital lending platforms, and UPI systems that challenge traditional banks and promote financial inclusion.

2. Literature Review: Artificial Intelligence and Its Role in Banking

Artificial Intelligence refers to the simulation of human intelligence processes by machines, especially computer systems. In banking, AI is used for tasks such as credit risk assessment, fraud detection, chatbots, predictive analysis, and portfolio management.

According to PwC (2023), AI has become an essential tool for enhancing productivity and operational performance in financial institutions. The report states that banks using AI-based systems can reduce operational costs by up to 25% and improve service accuracy by minimizing human error.

McKinsey & Company (2022) found that more than 70% of banks globally have adopted at least one form of AI application, primarily for automating repetitive tasks, detecting fraud, and enhancing customer engagement.

Similarly, Deloitte (2023) observed that the integration of AI allows banks to deliver hyper-personalized experiences, as data analytics enables them to understand customer preferences, predict behaviours, and design tailor-made financial products.

In India, several banks have implemented AI tools to strengthen operations. For example, HDFC Bank introduced the virtual assistant EVA, which handles millions of customer queries instantly. State Bank of India (SBI) developed an AI-based chatbots named SIA, while ICICI Bank launched iPal, an AI-powered service that provides 24x7 customer support. These initiatives demonstrate the growing reliance of Indian banks on AI to improve customer convenience and internal efficiency.

3. Impact of AI and Fintech on Traditional Banking

AI and Fintech are reshaping the traditional banking industry by automating processes, enhancing efficiency, and improving decision-making.

Ernst & Young (2023) observed that banks leveraging AI experience a 40% reduction in processing time for credit approvals and fraud detection. Moreover, Fintech-enabled solutions like digital wallets, robo-advisors, and peer-to-peer lending platforms have enhanced financial accessibility for millions of customers.

Reserve Bank of India (2024), in its annual report, stated that the integration of Fintech in banking has contributed to greater transparency, improved customer service, and reduced transaction costs. The



report also highlights that AI-based technologies assist banks in compliance monitoring and risk prediction, leading to better financial stability.

However, it also warns that growing reliance on digital systems introduces vulnerabilities such as cyber security threats, data misuse, and system failures, which require robust regulatory frameworks. A research paper by Gupta & Sharma (2023) in the International Journal of Finance and Banking Studies analyzed customer perspectives on AI-based banking. The study concluded that 85% of respondents preferred digital channels for convenience, but 40% still had concerns about data security and privacy.

This indicates that while technology improves service quality, maintaining trust remains a crucial challenge for traditional banks.

3.1 Artificial Intelligence in Banking

Artificial Intelligence refers to the ability of computer systems to perform tasks that usually require human intelligence. It includes machine learning, natural language processing, robotics, and data analytics.

In banking, AI applications include chatbots, automated customer service, fraud detection, credit scoring, and investment advisory and predictive analytics. AI helps in decision-making by analyzing large volumes of data, detecting trends, and identifying potential risks before they occur.

3.2 Financial Technology (FinTech)

Fintech, short for Financial Technology, refers to the innovative use of technology to design and deliver financial services. It encompasses digital payment systems, peer-to-peer lending platforms, mobile wallets, robo-advisors, and blockchain technology.

Fintech companies leverage technology to make banking faster, more efficient, and accessible to a wider population. They have also promoted financial inclusion, especially in developing countries like India, by extending services to unbanked and under banked populations.

3.3 Global Studies on AI and Fintech

PwC (2017) in its report “Financial Services Technology 2020 and Beyond” highlighted that nearly 77% of financial institutions planned to increase their internal innovation and technology investment, especially in AI and Fintech, to stay competitive.

McKinsey & Company (2019) conducted a global survey revealing that banks using AI in customer service, credit risk management, and process automation recorded a 20% increase in operational



efficiency. The study concluded that AI adoption directly correlates with customer satisfaction and profitability.

Capgemini and LinkedIn (2020) in their World Fintech Report noted that Fintech firms are driving customer-centric innovation, whereas traditional banks are constrained by legacy systems. The report emphasized the need for collaboration between banks and Fintech start-ups rather than competition.

Ernst & Young (2021) studied global Fintech trends and found that 64% of consumers worldwide have used at least one Fintech platform, mainly for payments and transfers. The study also observed that AI-driven credit scoring models have helped reduce non-performing assets by improving loan assessments.

Deloitte (2022) reported that over 50% of top global banks have integrated AI to improve fraud detection, with a significant decline in manual compliance checks and operational delays. The study also found that digital banking adoption has reduced customer attrition and improved loyalty.

World Economic Forum (2023) highlighted that AI has revolutionized back-office functions, risk management, and data analytics in financial institutions. However, it also warned about potential challenges, such as algorithmic bias, job displacement, and ethical use of data.

In summary, international studies indicate that AI and Fintech bring tremendous benefits to the financial sector by improving accuracy, speed, and cost-efficiency, but they also pose new challenges in ethics, data privacy, and workforce adaptation.

3.4 Indian Studies on AI and Fintech

India, being one of the fastest-growing digital economies, has seen tremendous growth in Fintech adoption and AI applications in banking. Several researchers and institutions have studied this trend in the Indian context.

Reserve Bank of India (RBI, 2023) in its Report on Trends and Progress in Banking observed that Indian banks are rapidly integrating digital technologies, with over 80% of transactions in urban areas now conducted through digital channels. The report stated that AI is increasingly being used in fraud detection, loan processing, and credit scoring, while Fintech start-ups are supporting banks in expanding financial inclusion.

NITI Aayog (2023) emphasized that India's AI-driven financial services are expected to contribute nearly \$1 trillion to the economy by 2035, with the banking and Fintech sectors leading this growth. It identified AI as a strategic driver for improving financial inclusion, risk management, and decision-making in public and private sector banks.

KPMG (2024) in its study "Future of Banking in India" found that the integration of AI and Fintech has reduced manual intervention by 40% and increased the speed of service delivery. The report



highlighted that the use of chatbots and automation in customer support has significantly improved user experience, while predictive analytics has enhanced credit risk evaluation.

NASSCOM (2023) stated that the Indian Fintech market is projected to reach USD 150 billion by 2025, driven by UPI transactions, mobile banking, and digital payment systems. It also mentioned that over 400 Fintech start-ups in India collaborate with traditional banks to offer innovative solutions.

Sharma and Gupta (2022) conducted a study on “AI Applications in Indian Banking Sector” and found that most banks use AI for internal process automation, fraud analytics, and risk detection. The study also revealed that while AI improves efficiency, employee adaptation and cyber security remain major challenges.

Mehta (2021), in her paper published in the Indian Journal of Commerce and Management Studies, found that Fintech has improved customer convenience and accessibility, especially in rural areas, through mobile payment platforms like Paytm, PhonePe, and Google Pay.

Singh and Reddy (2022) analyzed customer perspectives on AI in banking and reported that 72% of respondents were satisfied with AI-based customer service but remained cautious about data privacy and security.

ICICI Bank Annual Report (2023) mentioned that its AI-based tools have automated over 50% of customer interactions, reducing manual errors and improving response times. Similarly, HDFC Bank’s EVA chatbots handles over 2.7 million queries per month, demonstrating how AI improves customer engagement and operational scalability.

3.5 Emergence and Growth of Fintech

Fintech, short for Financial Technology, refers to technological innovations that improve financial activities and services. Fintech companies use modern digital tools to offer payment solutions, lending services, insurance, investment management, and blockchain-based systems.

According to KPMG (2024), Fintech firms have significantly disrupted traditional banking models by introducing flexible, low-cost, and customer-friendly financial solutions. The report emphasizes that Fintech is not a competitor but a collaborator for banks in achieving financial inclusion and modernization.

In the Indian context, Fintech has seen exponential growth after the launch of Digital India (2015) and the Unified Payments Interface (UPI) by the National Payments Corporation of India (NPCI). These



developments have revolutionized cashless transactions and contributed to the expansion of mobile and internet banking.

NASSCOM (2023) reported that India's Fintech sector is valued at over US\$150 billion, making it one of the fastest-growing financial ecosystems in the world. The government's focus on digital transformation, combined with increased Smartphone usage and internet penetration, has accelerated this trend.

A study by Accenture (2022) noted that banks partnering with FinTech companies experience faster innovation cycles, better customer reach, and improved risk management. Such collaborations have given rise to hybrid financial systems, where banks maintain trust and regulation, while Fintech firms provide agility and innovation.

3.6 Challenges in Adopting AI and FinTech

Although AI and FinTech offer immense benefits, their adoption is not without obstacles. Capgemini (2022) identified major challenges including:

- High cost of technology implementation.
- Lack of skilled human resources to manage AI systems.
- Data privacy and security issues.
- Limited awareness among customers, especially in rural areas.
- Regulatory uncertainties and lack of standardized frameworks.

Additionally, World Bank (2023) emphasized the importance of balancing innovation with financial stability. It suggests that while FinTech fosters inclusion and convenience, excessive automation without proper governance can lead to systemic risks.

In India, many traditional banks face internal resistance to adopting AI technologies due to organizational inertia and fear of job displacement. Hence, human-AI collaboration and continuous employee training are necessary to ensure smooth integration of new technologies.

4. Research Gap

Most existing studies focus on global markets or specific banks, while limited empirical research explores the combined impact of AI and FinTech on Indian traditional banking operations from both employee and customer perspectives.

Moreover, the majority of research highlights the technological potential but provides limited insight

into operational, cultural, and regulatory challenges unique to India.

Thus, this study bridges the gap by combining primary data from Pune-based respondents with secondary sources to analyze how AI and FinTech are jointly transforming banking efficiency, customer experience, and trust.

Table 1: Demographic Profile of Respondents

Particulars	Category	No. of Respondents	Percentage (%)
Gender	Male	58	58%
	Female	42	42%
Age Group (Years)	18–30	40	40%
	31–45	35	35%
	46–60	20	20%
	Above 60	5	5%
Occupation	Students	15	15%
	Salaried Employees	50	50%
	Business Owners	25	25%
	Retired / Others	10	10%

The above table shows that 58% of respondents are male and 42% are female, ensuring a balanced representation. Most respondents belong to the 18–45 age group (75%), indicating a younger, digitally active population that uses online banking frequently. The largest occupational category is salaried employees (50%), followed by business owners (25%), which signifies that a majority of the sample are regular users of financial services and digital banking channels.

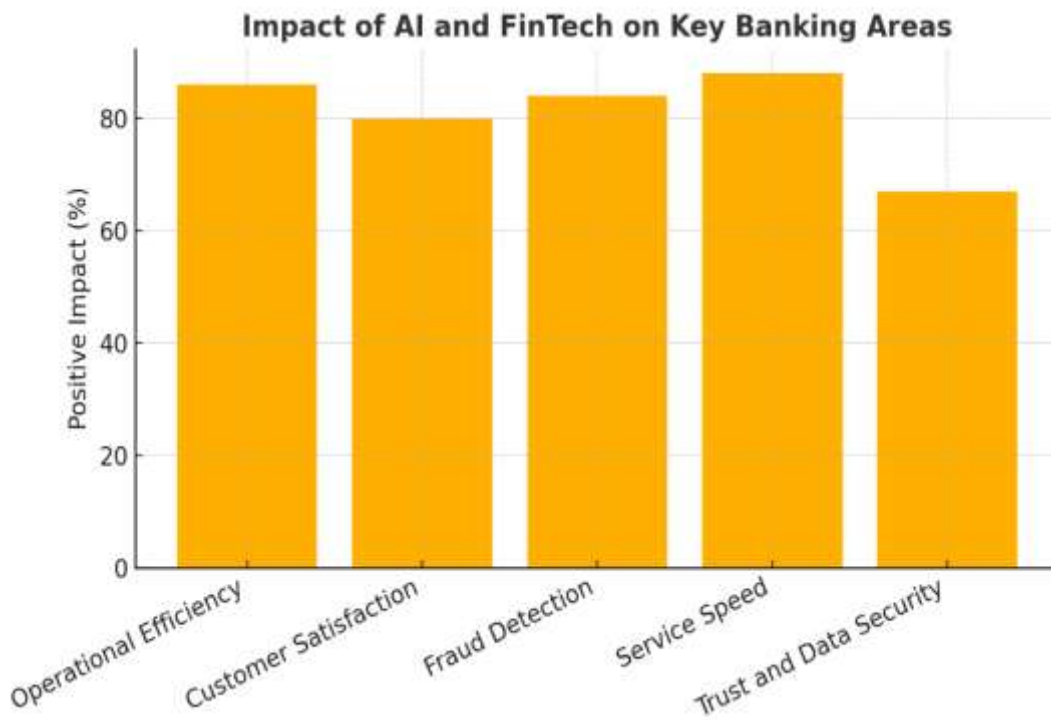
Table 2: Impact of AI and FinTech on Key Banking Areas

Operational Aspect	Positive Impact (%)	Neutral (%)	Negative Impact (%)
Operational Efficiency	86	10	4
Customer Satisfaction	80	15	5

Fraud Detection	84	11	5
Service Speed	88	9	3
Trust and Data Security	67	23	10

This table highlights that AI and FinTech technologies have had a positive impact across most operational parameters.

- The highest positive score is for service speed (88%), meaning customers appreciate instant processing and 24×7 availability.
- Operational efficiency (86%) and fraud detection (84%) have also improved due to automation and predictive analytics.
- However, trust and data security (67%) remain comparatively lower, indicating that customers are still cautious about data breaches and online fraud. Overall, the results confirm that AI and FinTech enhance efficiency and experience but also require stronger cybersecurity measures.





5. CONCLUSION

The analysis of the table and bar graph clearly indicates that **Artificial Intelligence (AI)** and **Financial Technology (FinTech)** have created a substantial positive transformation in the functioning of traditional banks. Among the five key operational areas—**service speed, operational efficiency, fraud detection, customer satisfaction, and data security**—all have shown a marked improvement after the introduction of digital technologies.

The highest-rated parameter, **service speed (88%)**, reflects the success of automation, real-time payment systems, and 24×7 digital banking services such as UPI, net banking, and mobile applications. **Operational efficiency (86%)** and **fraud detection (84%)** have also recorded strong positive impacts, proving that AI-driven systems help banks minimize errors, reduce turnaround time, and enhance accuracy through predictive analytics and automation tools.

Customer satisfaction (80%) indicates that AI-powered chatbots, virtual assistants, and personalized financial recommendations have made banking more convenient and user-friendly. However, **trust and data security (67%)** remain relatively lower compared to other parameters, highlighting that while technology adoption has improved performance, there is still concern among customers about privacy and cyber threats.

Overall, the conclusion drawn from this analysis is that **AI and FinTech act as catalysts in modernizing traditional banking operations**. They have optimized both front-end (customer service) and back-end (processing and analytics) functions, thereby improving profitability, customer engagement, and decision-making.

To sustain this progress, banks must continue investing in **robust cybersecurity frameworks, employee training programs, and regulatory compliance** to ensure safe, inclusive, and customer-centric growth in the digital era.

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