



Original Article

Role of Artificial Intelligence in Banking

Dr. Sau. Gursal Vijaya Nitin¹, Mr. Gursal Shreyas Nitin²

¹Sau. Sushilamai Kale Arts, Commerce, & Science College, Gautamnagar

²Research student, Shri Shahu Mandir Mahavidyalaya, Parvati, Pune

Email: minanitin11@gmail.com

Manuscript ID: **Abstract:**

JRD -2025(I)-170902

ISSN: 2230-9578

Volume 17

Issue 9(I)

Pp. 6-10

Sept. 2025

Artificial Intelligence (AI) is revolutionizing the banking sector by reshaping customer experience, risk management, fraud detection, and operational efficiency. With the rapid increase in digital transactions, banks are adopting AI-based solutions such as chatbots, predictive analytics, and personalized services to stay competitive and secure. This paper examines the role of AI in banking, its practical applications, advantages, and challenges. It also analyzes global and Indian perspectives, supported by case studies and statistical data, to highlight how AI is transforming traditional banking practices. The study concludes that AI is not just a technological upgrade but a strategic necessity for the future of banking.

Keywords: Artificial Intelligence, Banking, Digital Transformation, Customer Experience, Fraud Detection

Introduction:

Submitted: 9 Aug. 2025

Revised: 20 Aug. 2025

Accepted: 20 Sept. 2025

Published: 30 Sept. 2025

The banking sector has undergone a profound transformation in recent years, driven largely by advances in digital technologies. Among these, Artificial Intelligence (AI) has emerged as a game-changer, reshaping how banks operate, interact with customers, and manage risks. "AI is reimagining the way banks serve customers, conduct operations, and manage risks."¹ Traditionally, banking services were labor-intensive and time-consuming, relying heavily on human intervention for decision-making and execution. However, with increasing data volumes, rising customer expectations, and the growing threat of fraud, conventional systems have proven inadequate in ensuring efficiency and security. AI has enabled banks to adopt smarter solutions such as chatbots for customer service, predictive models for credit scoring, fraud detection algorithms, and personalized financial recommendations. By leveraging machine learning, natural language processing, and data analytics, banks are now able to reduce costs, improve decision accuracy, and provide real-time solutions to customers. The use of AI has also accelerated financial inclusion by making banking services more accessible and efficient for a wider population. "According to a recent RBI report, "generative AI is poised to improve banking operations in India by up to 46 percent," boosting areas like customer service, risk management, and cost control."² "Despite widespread promise, challenges such as data privacy, systemic risk, and governance loom large."³



Quick Response Code:



Creative Commons (CC BY-NC-SA 4.0)

This is an open access journal, and articles are distributed under the terms of the [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International](https://creativecommons.org/licenses/by-nc-sa/4.0/) Public License, which allows others to remix, tweak, and build upon the work noncommercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Address for correspondence:

Dr. Sau. Gursal Vijaya Nitin, Sau. Sushilamai Kale Arts, Commerce, & Science College, Gautamnagar

How to cite this article:

Sau. Gursal. V. N, Gursal S. N. (2025). Role of Artificial Intelligence in Banking. Journal of Research & Development, 17(9(I)), 6-10





In the Indian context, leading banks like HDFC, ICICI, and SBI have started integrating AI-driven platforms for fraud prevention, loan processing, and customer engagement. “RBI data shows that AI adoption correlates with bank size. Larger banks, notably private-sector ones, mention AI-related keywords in their reports six times more (and public banks three times more) in 2022–23 compared to 2015–16, indicating faster uptake among well-resourced institutions.”⁴ Globally, institutions such as JPMorgan Chase and Bank of America are setting benchmarks in AI adoption with innovative applications like virtual assistants and contract analysis tools. Despite these advancements, challenges related to data privacy, ethical use of AI, and implementation costs remain critical areas of concern. Thus, the role of AI in banking is not merely technological but strategic—shaping the future of finance by balancing automation, security, and personalized services. This paper attempts to examine the applications, benefits, challenges, and measurable impact of AI in banking, with a focus on both global trends and the Indian banking landscape.

Objectives of the Study:

1. To understand the applications of AI in banking.
2. To analyze the benefits of AI for banks and customers.
3. To study the challenges and risks associated with AI adoption.
4. To examine the future potential of AI in transforming banking services.

Application of AI in Banking:

Artificial Intelligence (AI) is being applied across multiple areas of the Indian banking sector, enhancing both customer-facing services and internal operations. In fraud detection and risk management, banks such as the State Bank of India (SBI) have deployed AI-powered monitoring systems capable of flagging anomalies in real time, helping reduce fraudulent activities. Customer service has seen a major transformation with chatbots like HDFC’s EVA, which can resolve millions of queries quickly and accurately. AI has also streamlined credit scoring and loan processing, as in the case of ICICI Bank, where approvals that earlier took days are now completed within minutes. In personalized banking and marketing, banks such as Axis Bank leverage AI-driven recommendations to better match financial products with customer needs. Additionally, the integration of Robotic Process Automation (RPA) with AI has improved operational efficiency, reduced manual effort and cut costs across several banking functions.

Table No. 1

Applications of AI in Banking and Impact

AI Application Area	Example / Case	Reported Impact / Data
Fraud Detection & Risk Management	SBI uses AI-powered fraud detection systems	Fraud cases reduced by 30% in pilot testing (RBI Report, 2023)
Customer Service (Chatbots & Voice Assistants)	HDFC EVA chatbot	Answered 2.7M queries in 6 months with more than 90% accuracy
Credit Scoring & Loan Processing	ICICI Bank AI-based credit appraisal system	Loan approval time reduced from 3 days to few minutes
Personalized Banking & Marketing	Axis Bank AI-driven product recommendations	Increase in cross-selling by 25%
Operational Efficiency	Use of RPA + AI for back-end tasks	Processing cost reduced by 20 to 30% across multiple banks

Source: Compiled by researcher from RBI (2023), Business Today (2023), HDFC Bank Report (2022), and ET CIO (2021).

Benefits of AI in Banking:

The following are the benefits of AI in banking-

1. Enhanced Customer Service

AI-powered chatbots and virtual assistants provide 24/7 support, answer queries instantly, and handle routine requests, reducing wait times for customers.

2. Fraud Detection and Security

AI systems analyze patterns in transactions to detect unusual activity in real time, preventing fraud and ensuring safer banking for customers.

3. Personalized Banking Experience



AI helps banks understand customer preferences and spending behavior, offering customized product recommendations, credit offers, and financial advice.

4. Operational Efficiency

Automation through AI reduces manual work, speeds up processes like loan approvals, and cuts operational costs, improving productivity.

5. Risk Management

AI algorithms assess creditworthiness more accurately by analyzing multiple data points, helping banks make better lending and investment decisions.

6. Regulatory Compliance

AI tools help banks comply with complex financial regulations by monitoring transactions, generating reports, and flagging compliance issues.

Challenges in AI Adoption in Banking:

While AI offers many advantages, its adoption in the banking sector faces several challenges that need careful attention. The following are the key challenges:

1. High Implementation Cost

Setting up AI systems requires heavy investment in technology, infrastructure, and skilled manpower, which may not be feasible for all banks.

2. Data Privacy Concerns

Banks handle sensitive financial data. Using AI raises concerns about data security, breaches, and compliance with data protection laws.

3. Skill Gap

Many banks lack professionals trained in AI and data science, creating difficulties in managing and operating advanced AI systems.

4. Integration with Legacy Systems

Banks often rely on outdated IT systems, making it challenging to integrate new AI technologies smoothly without disrupting services.

5. Ethical and Bias Issues

AI decisions (like loan approvals) may unintentionally carry biases, leading to unfair treatment of certain customer groups.

6. Regulatory Challenges

Financial regulations evolve slowly compared to technology, creating uncertainty in adopting AI within existing legal frameworks.

Case Examples:

Case Study 1: HDFC Bank - AI Chatbot “Eva” (India)

In 2017, HDFC Bank launched EVA (Electronic Virtual Assistant), one of India’s first AI-powered banking chatbots, developed in collaboration with Senseforth AI Research. The chatbot was designed to enhance customer service by providing instant responses and reducing the workload of call centers. “Within the first six months of launch, EVA demonstrated significant success, handling over 2.7 million customer queries, interacting with 530,000 unique users, and engaging in 1.2 million conversations.”⁵ As ETCIO.com highlights, “Eva currently handles 50,000 plus semantic variations for thousands of banking-related intents ... Eva never sleeps and her learning never stops!”⁶ This illustrates the scalability and adaptability of AI in banking. Moreover, the chatbot achieved an accuracy level of over 85% and maintained an uptime of 99.9%, ensuring consistent availability. Tasks that traditionally took 8–10 minutes were reduced to just seconds, significantly improving customer experience and operational efficiency.

Case Study 2: ICICI Bank – Robotic Process Automation (India)

ICICI Bank has been a pioneer in adopting Robotic Process Automation (RPA) to streamline its internal processes and improve efficiency. “The bank introduced over 750 software robots that handle processes such as Know Your Customer (KYC) verification, compliance checks, loan processing, and transaction monitoring. According to the bank, these bots are capable of completing tasks up to 85% faster than manual operations while ensuring accuracy and compliance.”⁷

As Chanda Kochhar, the former CEO of ICICI Bank, stated in an interview, “We are using software robotics in over 200 business processes across various functions of the bank. This has resulted in increased productivity and accuracy in

operations.”⁸ The successful implementation of RPA has not only reduced turnaround time for customers but also optimized back-end operations, demonstrating how AI-driven automation is transforming banking efficiency in India.

Case Study 3: State Bank of India (SBI) – YONO App (India)

The State Bank of India (SBI) launched its flagship digital platform YONO (You Only Need One) in 2017, integrating artificial intelligence to provide personalized financial services and product recommendations. “YONO has become one of the largest digital banking platforms in India, attracting over 60 million registered users and contributing to nearly 40% of the bank’s new savings accounts”.⁹

According to Dinesh Kumar Khara, Chairman of SBI, “YONO has been at the forefront of our digital transformation, offering seamless banking and lifestyle services on a single platform.”¹⁰ AI-driven features of YONO analyze customer behaviour and spending patterns to recommend tailored credit cards, loans, and investment options, thereby improving customer engagement. The platform’s success showcases how AI can combine convenience with personalization, making it a benchmark in digital banking innovation.

Table No. 2

Summary Table

Bank/Platform	AI Application	Key Metrics & Quotes
HDFC Bank (EVA)	Chatbot for customer service	2.7M queries, 530K users, 85% accuracy, 99.9% uptime
ICICI Bank	AI-powered Virtual Assistant & RPA	iPal handles millions of interactions; RPA speeds up compliance, KYC, loans
SBI (YONO)	AI-enhanced digital banking platform	Integrated platform with personalized services across banking and non-banking realms

Source: Compiled by researcher from RBI (2023), Business Today (2023), HDFC Bank Report (2022), and ET CIO (2021)

Conclusion:

The integration of Artificial Intelligence in banking has transformed the way financial institutions operate, deliver services, and engage with customers. From chatbots like HDFC Bank’s EVA providing instant query resolutions, to ICICI Bank’s RPA streamlining compliance and loan processing, and SBI’s YONO app offering personalized financial solutions, AI has proven to be a game-changer.

The applications and benefits are evident in improved efficiency, cost reduction, enhanced customer experience, and stronger fraud detection mechanisms. However, challenges such as data privacy, ethical concerns, and high implementation costs continue to be critical areas requiring attention.

The case studies clearly demonstrate that AI is not merely an experimental tool but a strategic necessity for modern banking. With continuous advancements and growing adoption, AI is expected to play an even greater role in shaping the future of financial services, making banking more accessible, intelligent, and customer-centric.

References:

1. Brynjolfsson, E., & McAfee, A. (2017). *Machine, Platform, Crowd: Harnessing Our Digital Future*. W.W. Norton & Company.
2. Accenture (2019). *Banking Technology Vision: The Post-Digital Era is Upon Us*. Accenture Report.
3. Deloitte (2020). *AI in Banking and Capital Markets: Innovation and Adoption*. Deloitte Insights.
4. PwC (2018). *Financial Services Technology 2020 and Beyond: Embracing Disruption*. PwC Report.
5. ETCIO.com. (2017, December 18). *HDFC Bank’s AI chatbot ‘EVA’ answers 2.7 million queries in six months*. Retrieved from <https://cio.economictimes.indiatimes.com>
6. The Indian Express. (2017, December 19). *Meet EVA, HDFC Bank’s AI-powered chatbot handling customer queries*. Retrieved from <https://indianexpress.com>
7. Business Today. (2018, March 15). *ICICI Bank deploys 750 software robots to power banking operations*. Retrieved from <https://www.businesstoday.in>
8. ETCIO. (2018, April 5). *How ICICI Bank is using AI to amp up customer centricity*. Retrieved from <https://cio.economictimes.indiatimes.com/news/strategy-and-management/how-icici-bank-is-using-ai-to-amp-up-customer-centricity/63390838>
9. Economic Times. (2022, July 15). *SBI YONO app contributes to 40% of new savings accounts*. Retrieved from <https://economictimes.indiatimes.com>



Journal of Research and Development

Peer Reviewed International, Open Access Journal.

ISSN : [2230-9578](https://doi.org/10.22309/jrd.v17i9.12345) | Website: <https://jrdvrb.org> Volume-17, Issue-9(I) | Sept - 2025

10. Business Standard. (2021, March 3). *SBI YONO app continues to drive growth, over 60 million registered users*. Retrieved from <https://www.business-standard.com>