

IMPACT OF AI AND ITS APPLICATIONS IN FRAUD DETECTION IN SELECTED INDIAN BANKS

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ABSTRACT

Artificial Intelligence has taken the world to another level. It is a tool that can effectively detect and prevent fraud. Indian Banks are facing a lot of Cyber attacks, Phishing, and digital attacks. Even though Banks are secured against attacks, they fall prey to cybercriminals. An analysis has been done on how AI as a tool can detect and prevent such attacks. The paper is descriptive, and a study of AI and its applications in Fraud Detection in some Indian Banks has been conducted. The Banks taken are HDFC Bank, ICICI Bank, SBI and Axis Bank. The Study is web-based, and the data have been collected from the literature review, articles, newspapers and available information from the concerned websites. The study also sheds light on how adopting AI has tremendously reduced fraud in banks

Key Words: Artificial Intelligence, Algorithms. VPA

INTRODUCTION

AI is a field that combines computer science and robust datasets to enable problem-solving. AI does not replace human decisions; instead, AI adds value to human judgment. Artificial intelligence is the future of banking as it can prevent fraudulent transactions and improve compliance through advanced data analytics. (Khakar. K 2023). Artificial intelligence is the imitation of human intelligence by machines or the ability of machines to perform tasks using human intelligence (Lin, 2019; Ozili, 2023a). Within the banking and financial services industry, Artificial Intelligence (AI) for fraud detection refers to implementing machine learning (ML) algorithms to mitigate fraudulent activities. Fraud detection systems are critical in safeguarding businesses against financial crime, preserving brand integrity, and maintaining customer trust (Singh.H, 2020). Technologies such as neural networks, natural language processing (NLP), and anomaly detection algorithms enable more accurate and adaptive fraud prevention. AI-based solutions have shifted fraud detection from being a reactive, rule-dependent function to a proactive, data-driven and continuously evolving process, dramatically improving businesses' ability to protect themselves from financial crime. (Singh, H., 2020). The advent of AI in banking is not merely a matter of choice but a strategic necessity in the face of intensifying global competition. Banks that harness AI effectively gain a competitive edge by accelerating decision-making, reducing operational costs, and ensuring regulatory compliance (Singh et al., 2024). Another critical area where AI made a substantial impact is fraud detection. Security concerns also stressed the imperative for banks to adopt AI technologies. The nature of contemporary cyber threats necessitates advanced and adaptive security measures (Singh et al., 2024). The usage of AI technologies in banking customer relations has been discovered to have clear uses and advantages, but scientific study shows that these systems still have problems with security and trustworthiness because the technology is still susceptible to breaches (Dale.R, 2016). Concerns about the use of internet banking are related to perceived danger, such as identity theft (R Vedapradha, R. H., 2018). Trust is a key factor in determining whether e-banking will be accepted. As advancements in AI technology continue, both AI-driven fraud

prevention providers and leading financial institutions are banking on AI to become an even more valuable tool in preventing fraud attempts and mitigating fraud risks.

In this purview, gone are the days when people were standing in long queues and long hours for deposit and withdrawal of amounts. Due to technological advancements, there is a sea change in the banking industry. As technology advances, so do scams like Cyber Attacks, Digital arrests, Phishing etc. Artificial Intelligence has encompassed in every facet of life, so there is a need on how AI and its applications have impacted in detecting and reducing the detection and reduction of fraud in banks.

LITERATURE REVIEW

AI is transforming Indian Banking by offering services like smart chatbots, smart wallets, underwriting, voice-assisted banking, smart investment-related advice and many others. AI is helping Indian Banks to meet regulatory compliance, fraud detection and assessment of an individual's creditworthiness. Technologies such as blockchain and analytics are also proving to be effective in creating a robust mechanism against cybercrime, fraud detection and prevention. **(Vijai, C. 2019)**. Data quality is crucial for AI to be effective, and also for deploying machine learning techniques to combat fraud from practical and academic perspectives. **(Bao, Y., et.al., 2020)**. AI models that run on algorithms have helped banks in aiding customer verification, preventing unauthorised activity, handling risk analysis, limiting money laundering problems, and increasing precision and accuracy. AI has also assisted banks in prudent detection of fraud and risk management by using technologies- ML (machine learning), deep learning, and predictive analytics. AI technologies- ML (machine learning) and PA (predictive analytics) serve a dual purpose- One, they improve detection of frauds, and two, they also work towards the prevention of fraudulent activities. **(Manu et.al., 2020)**. What are the benefits and challenges of AI is for the banking industry? Data theft and Privacy concerns, regulatory compliance, and job displacement are some of the challenges that stimulate the essential debates about the usefulness of AI. How AI is influencing across the different facets of the banking process- from approach to customer relationship. AI Transformation: it has transformed Risk Management (risk management and prudent fraud detection measures). **(Kumar et.al.2023)**. Supervised, unsupervised, and reinforcement learning techniques are utilised to identify suspicious patterns, predict fraudulent activities, and adapt to emerging threats. It highlights the critical components of an AI fraud detection, which include data collection, feature engineering, model training, and evaluation metrics. AI-enabled systems face challenges such as data privacy concerns, model interpretability issues, and the risk of adversarial attacks. By leveraging AI, businesses can significantly improve their fraud detection mechanisms, minimise financial losses, and foster greater trust among stakeholders. **(Singh,2021)**. The banking industry can improve the security of digital transactions via AI algorithms **(Rahman et al., 2023)** and enhance the effectiveness and efficiency of business transactions **(Liu et al., 2024)**. AI is designed like a human with the knowledge and ability to learn, feel, think, and act for users to obtain good analytical insights. **(Kamishetty, R., 2024)**.

OBJECTIVE OF THE STUDY

To know how AI and its applications have made an impact on fraud detection in selected Indian banks.

METHODOLOGY

The study is secondary in nature, and information was collected from existing literature, Newspapers, and relevant websites. The study has analysed how AI has impacted fraud

detection in Selected Indian Banks. The banks selected were SBI, HDFC, ICICI and Axis Bank. The bank is selected based on the network and the number of branches in the country. The study is descriptive, and an analysis is made on AI and its impact on Fraud detection in the selected Indian banks.

DISCUSSIONS

As the study is descriptive, a comparison has been made of AI-related dimensions and the AI applications the banks have adopted for fraud detection, along with their impact.

A COMPARATIVE FRAMEWORK

To crystallise the competitive landscape, the following table provides a side-by-side comparison of the four banking titans across key AI-related dimensions.

Feature/Capability	HDFC Bank	ICICI Bank	State Bank of India (SBI)	Axis Bank
Core Data Advantage (Scale & Richness)	120M+ customers; rich post-merger data including mortgages, insurance, and investments.	Large scale but smaller than HDFC/SBI; strong digital transaction data from early adoption.	Unmatched 520M+ customer base; most diverse demographic and geographic data.	Smaller base; strategic focus on enriching internal data with external alternate data sources.
Stated AI Vision	“AI-First Enterprise”: A fundamental re-architecting of the entire organization around an AI core.	“Digital Platforms & Solutions”: Pragmatic use of technology for efficiency and seamless experience.	“Tech-Powered Innovation”: Leveraging the YONO platform as the primary vehicle for digital transformation.	“Analytics-Driven Distinction”: Using data and AI to create a differentiated, hyper-personalized offering.

Key AI Initiatives	Agentic AI (Cybersecurity), 'Next Best Action' engine, FICO partnership for credit scoring.	'iPal' chatbot, extensive RPA for process automation, real-time EFRM for fraud detection.	'Only Yono' platform revamp, GenAI/LLM integration, dedicated AI project financing unit.	GenAI Competency Center, advanced Personalization Engine ('nudges'), alternate data scorecards.
Primary AI-driven Strength	Predictive Power from Scale: Ability to build the most accurate models due to data volume and variety.	Process Efficiency & Agility: Leader in automating internal processes for speed and cost reduction.	Unmatched Reach & Distribution: Ability to deploy digital services to the largest and most diverse population.	Hyper-personalization & Niche Underwriting: Excels at creating tailored experiences and assessing risk in new segments.
Potential Weakness / Challenge	Post-merger technology and cultural integration complexity.	Significant scale disadvantage relative to HDFC and SBI in the long run.	Inertia from legacy systems and the bureaucratic pace of a public sector bank.	Smaller proprietary data moat to fuel and train AI models at the same scale as leaders.

(Source: www.klover.ai)

AI AND ITS IMPACT ON THE BANKS

HDFC BANK

HDFC Bank is the largest private sector bank, which has a colossal customer base of 120 million (12 Crore). As of March 2025, its distribution network comprised 9455 branches and 21139 ATMs. This network is also being transformed into a deployment channel of AI. The most critical element of HDFC Bank's AI strategy is that it is not a bottom-up, departmental initiative but a top-down, corporate-level mandate. Ramesh Lakshminarayanan, the Chief Information Officer (CIO) and Group Head of IT, has explicitly positioned Data, AI, and Machine Learning at the "centre of banking's evolution towards Banking 3.0," framing it as the core of the bank's future. The Bank's AI Strategy is not merely theoretical; it is actively deployed across the enterprise to enhance customer relationships. For customer

interactions, banks is using AI to power their “Next Best Action (NBA) and “Immediate Next Best Action (iNBA) engines and also their bank AI chatbot, Eva(Electronic Virtual Assistance), has become a significant channel for customer service. (www.india.ai)

India’s largest private sector lender HDFC Bank has identified over 15 programmes that will use generative artificial intelligence (GenAI), chief executive Sashidhar Jagdishan told shareholders in the FY25 annual report.

Jagdisdhan said that with rising threats like phishing, deepfakes, and impersonation scams, the bank has upgraded to the next-generation cybersecurity operations centre (CSOC), powered by AI and machine learning capabilities.

- a) **Deep Fakes:** HDFC Bank’s “End of Scam Sale” campaign was a groundbreaking initiative aimed at raising awareness about online fraud and the potential misuse of deepfake technology. The campaign revolved around creating a fictitious fashion brand called “Lulumelon” and using hyper-realistic deepfake videos of popular Bollywood actress and dancer Nora Fatehi to promote unbelievable discounts and too-good-to-be-true offers.

Impact:

The “End of Scam Sale” campaign achieved remarkable success, exceeding HDFC Bank's expectations. The campaign's impact was further recognised through several prestigious awards, including:

- **Cannes Lions International Festival of Creativity:** 3 Shortlists in PR Lions and a Silver Lion in PR for Use of Events & Stunts
 - **Abby's 2024 Goafest:** 1 Grand Prix in the Use of AI category, 3 Gold, 3 Silver, and 2 Bronze
- b) **Gan AI:** Gan.AI played a crucial role in the campaign by creating hyper-realistic deepfake videos of Nora Fatehi. Gan.AI also cloned her voice using advanced synthesis techniques. These deepfake videos were then seamlessly integrated into the “Lulumelon” brand’s promotional materials, including social media posts and website content. Gan.AI created deepfake videos of Nora Fatehi, who promoted the fictitious “Lulumelon” brand. Gan.AI replicated Nora Fatehi’s voice to synchronise with the deepfake videos.

Impact

The campaign initially deceived consumers with unbelievable offers and discounts. Upon visiting the “Lulumelon” website, consumers were met with a reveal video exposing the scam and educating them about online fraud.

ICICI BANK

ICICI Bank has a network of 6,742 branches and 16,277 ATMs across India. ICICI Bank is a pioneer in leveraging Robotic Process Automation (RPA), powered by AI, to streamline high-volume, repetitive tasks. This is evident in its back-office operations, from account opening to loan processing, where automation has significantly reduced manual effort, minimised errors, and improved turnaround times. The bank has implemented a sophisticated, real-time Enterprise Fraud Risk Management (EFRM) solution that uses machine learning algorithms to analyse customer behaviour patterns and identify transaction anomalies. It also applies AI to its credit underwriting processes, incorporating non-traditional data to assess

creditworthiness more accurately. ICICI Bank has built a powerful API infrastructure, offering over 2,600 APIs for retail banking and 200 for corporate banking.³⁷ This extensive library makes it a preferred partner for fintech's and enables rapid integration of new services.

Impact

AI algorithms are used to monitor transactions and detect potential fraud, enhancing security for customers. machine learning algorithms to monitor transactions in real-time, identifying unusual patterns that signal suspicious activity before fraud occurs. By identifying and flagging suspicious transactions, the AI-driven system prevents fraudulent activities from escalating, thereby strengthening the overall security of the banking experience.

(www.india.ai)

SBI BANK

The State Bank of India (SBI) had a total of 22,542 branches across India. With a customer base of over 520 million (52 crore), SBI possesses a data pool of unparalleled size and demographic diversity. Its reach extends to every corner of the country, providing it with data that is truly representative of the Indian population. YONO is a colossal digital ecosystem with over 88 million (8.8 crore) registered users. It serves as the primary vehicle for SBI's digital and AI initiatives, integrating not just banking but also investments, insurance, and e-commerce. A planned revamp, dubbed 'Only Yono', aims to introduce hyper-personalisation, biometric logins, and enhanced multilingual support, further cementing its role as the bank's digital front door. SBI is actively implementing AI-powered insights for its customer satisfaction tools (like Net Promoter Score and Customer Effort Score) and is developing AI-driven engagement models to deliver hyper-personalised experiences to its vast customer base.⁴⁵ In risk management, it is leveraging advanced analytics and AI to enhance credit underwriting and build proactive early warning systems to detect financial stress in its loan portfolio.

Impact

State Bank of India (SBI) is implementing AI to combat fraud through systems like the AI-powered platform at SBI General Insurance. Uses an AI-powered system to automatically assess vehicle damage from photos and videos, identify fraud patterns by cross-referencing with a vast database, and verify documents to detect and prevent fraudulent claims.

AXIS BANK

Axis Bank operates 5,706 domestic branches across India, and the Bank employs AI for fraud detection by using advanced AI models. The bank uses AI in Real Time Fraud Detection, Reduced False Positives, and Enhanced Transaction Monitoring. SWIFT in partnership with AXIS Bank, has launched an AI-driven pilot to help combat payments fraud occurring in cross-border payments. The pilot will use AI algorithms to analyse historical transaction data and detect anomalies indicative of fraud. "For fraud control, this pilot looks at how we can incorporate newer technologies like artificial intelligence into the algorithms that we have," Neeraj Gambhir, group executive, treasury, markets and wholesale banking products, Axis Bank. (Shukla,2024)

To enhance operational efficiency, we launched Axis Deep Intelligence (ADI), a GenAI-powered internal chatbot now deployed over 5,500 branches and supporting over 100,000 employees. We are actively integrating AI/ML, automation, and data analytics to improve customer engagement, streamline operations, and boost workforce productivity through AI-

assisted tools. Additionally, we have empowered departments with Co-pilot capabilities, deploying over 4,500 bots across 1,850+ automated processes (Subrat Mohanty, Executive Director, Axis Bank)

Impact

Axis Bank has embraced this evolution by establishing a dedicated competency centre for Gen AI. Internally, the bank uses applications like chatbots to streamline operations while ensuring ethical and secure deployment. Beyond operational efficiency, Gen AI holds immense potential for fraud prevention by analysing transaction patterns and identifying anomalies in real-time. (Poovaiah, 2025)

CONCLUSIONS

Despite the drawback of available information on the Bank's Website and Other AI related websites, the study found that AI is a boon for banks for real-time detection of any suspicious activity when analysing a large number of transactions. The AI Systems will help in several ways, like Workforce support, Regulatory Compliance, Anomaly detection, Risk Scoring, and Network Analysis. The Fraud Detection with the use of AI in banking are huge and increasing, like Crypto tracing, Verification Chatbots, Ecommerce Fraud Detection, and Online fraud statistics are alarming. Cybercrime costs the world economy \$600 billion annually, which is 0.8% of the global GDP. RBI has launched Malehunter.ai is an important move to remove mule accounts. As banks have implemented AI tools to some extent, if they are implemented in a large-scale bank will benefit in fraud detection much earlier. AI fintech, as a tool protect individuals from financial losses resulting from phishing scams, identity theft, payment, credit card, and other varieties of banking fraud.

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