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**THE INFLUENCE OF ARTIFICIAL INTELLIGENCE ON THE BANKING INDUSTRY:  
CHALLENGES AND OPPORTUNITIES**

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**ABSTRACT**

Machine Intelligence, called as Artificial Intelligence (AI), is intelligence demonstrated by machines, as contrast to the natural intelligence exhibited by humans and other animals. Artificial Intelligence is evolving and getting smarter every day. Purpose-designed activities include speech recognition, learning, planning, and problem-solving. From SIRI to Self-Driving Cars, Artificial Intelligence is advancing rapidly. In general, Artificial Intelligence consists of two basic ideas. First one is to study how the human brain and its thought process work, and second one is to help express those processes through machine learning. Artificial intelligence in finance is more than just chat-bots. This whitepaper describes how Artificial Intelligence is being used in the Indian Banking Sector, the benefits, and challenges of Artificial Intelligence in India. The study also provides insight into the positive and negative effects of using artificial intelligence in the Indian banking industry. As this study is descriptive in nature, all necessary and relevant data have been obtained from various journals, journals of published articles and the websites.

**Keywords:** Tech-Savvy Customer, Customer-Centricity, Mobile Banking, E-Banking, Real-Time Money Transfer.

**Introduction**

Artificial intelligence (AI) is the simulation of human intelligence that contributes to the development of smarter machines that can intelligently perform human tasks. The technology itself is getting better and smarter every day, making it possible for more and more industries to use AI for different purposes. The banking industry is one of the first to adopt AI. The banking sector is using AI in a novel way that saves a lot of time and money. The banks use algorithms to get accurate results, which help them provide better service to customers and boost sales performance, both of which help them make money. The Worldwide Artificial Intelligence Spending Guide from the International Data Corporation (IDC) projects that global spending on artificial intelligence (AI), which includes software, hardware, and services for AI-centric systems, will exceed \$300 billion in 2026 and reach nearly \$118 billion in 2022. Over the forecast period of 2022 to 2026, a compound annual growth rate (CAGR) of 26.5% will be driven by the ongoing incorporation of AI into a wide range of products. This is more than four times higher than the worldwide IT spending CAGR of 6.3% over the same five-year period. In addition to these fundamental applications, banks can implement the technology to improve back-office efficiency and even lessen the risk of security and fraud.

**Evolution and the History of Artificial Intelligence**

In recent years, artificial intelligence has developed into a formidable instrument that enables robots to think and act like humans. Some have even referred to it as the "4th industrial revolution." "Software based on Darwinian concepts like "survival of the fittest" has been developed by researchers to build AI algorithms that improve over time without the need for human intervention. In just a few days, the computer recreated decades of AI research, and its creators anticipate that it will eventually discover novel AI methods. We will learn about how AI is constantly changing in this article. The study of neural

networks dominated the AI field's history from the 1950s to the 1970s; From the 1980s to the 2010s, the first applications of machine learning emerged. It was just the beginning of the term "artificial intelligence," but neither the case nor the method was used until the late 1990s. After major tech giants like Facebook, IBM, Microsoft, and Google began utilizing AI and Machine Learning for business purposes, the pace of artificial intelligence only increased after 2011. Even though artificial intelligence has been around for millennia, its true potential was not discovered until the 1950s..

### **AI in the Present**

From workflow management solutions to trend forecasts and even the way businesses buy advertisements, artificial intelligence technologies are increasing productivity like never before. Inferences and estimates that are beyond the comprehension of humans can be drawn from vast amounts of data that are collected and organized by AI. Additionally, it instantly identifies unusual patterns, such as spam and fraud, to alert organizations about suspicious behavior and improves organizational efficiency while lowering the risk of a mistake. After China and the United States, India produces the third most AI research output of any nation.

### **AI in the Future**

As part of their digitization efforts, banks are increasingly collaborating with financial technology (FinTech) companies to provide enhanced banking solutions to their customers by 2023, AI is anticipated to save banks \$447 billion, according to research.

#### **Why is the banking industry using artificial intelligence?**

The use of artificial intelligence has the potential to save a lot of money. Accenture's study found that banks can double their transaction volume with the same staff by utilizing AI banking tools.

In today's world, the amount of data produced by humans and machines far outpaces their capacity to comprehend, comprehend, and apply that data to complex decisions. For instance, even though tic-tac-toe (noughts and crosses) has 255,168 unique moves, most humans can avoid losing, with 46,080 of those ending in a draw. With more than 500 x 10<sup>18</sup>, or 500 quintillion, possible moves, far fewer people would be considered checkers' grand champions.

### **Review of the Literature**

In her research paper from 2020, Dr. Monica Sharma explained that the current applications of AI in the banking industry have altered the nature of Indian banking. Her entire research was devoted to the idea of AI in banking, including how it has revolutionized banking and how it has affected human labor. In his paper, Mr.C.Vijay (2019) discusses the benefits and challenges of India's artificial intelligence and how it is utilized in the banking sector. Advancements in FinTech that are made possible by artificial intelligence and the various ways in which they can enhance the operations of an Indian banking sector Mr. Amer Awad Alzaidi (2018) provided an explanation of how artificial intelligence is being used in the banking industry and the effects it has. SPSS21.0 was used to conduct a quantitative analysis of the collected data as well. In their study titled "Machine Intelligence vs. Human Judgment in New Venture Finance," Christian Catalini, Chris Foster, and Ramana Nanda (2018) found that machine learning models trained to mimic human evaluators performed better than models trained solely to maximize financial success. In her research paper titled "How Artificial Intelligence is changing the banking sector - A case study of top four Commercial Indian Banks," Jewandah S (2018, July) examines the areas in which banks are introducing machine intelligence and the applications of AI in principle in Indian commercial banks. Traditional banking is moving forward, and banks are gradually adopting cutting-edge technologies like artificial intelligence (AI), blockchain, and cloud computing. However, banks are

still far from the AI revolution, and human interaction is still important. The banking industry in India is figuring out how to incorporate AI in a way that will soon improve bank operations and customer service.

### **Objectives of the study**

1. To study the areas in which banks are utilizing artificial intelligence
2. To investigate the impact that artificial intelligence on the banking industry
3. To study the positive and negative effects of AI on the banking industry.

### **Research Methodology**

This descriptive study discusses the meaning and motivations of artificial intelligence, as well as the challenges and benefits of AI for the Indian banking industry. Observation and documentary analysis comprise the entire study. In addition, the necessary and pertinent secondary data are gathered from numerous websites, research papers, journals, and publications, among other sources. As needed, theoretical information on the subject has also been obtained from books.

### **Artificial Intelligence in Banking Sector**

Artificial Intelligence in Banking in India According to the 2017 PwC FinTech Trends Report (India), worldwide investment in AI applications reached USD 5.1 billion (Euro 4.3 billion) in 2016. PNB as well as banks prefer SBI, HDFC, ICICI, HSBC and Pivot banks in India have turned towards simulated intelligence. The banks must compete in a future filled with cutting-edge technology, so they cannot afford to delay starting their journey into artificial intelligence.

**Drive-Through Banking:** With drive-through banking, you can conduct banking transactions without leaving your vehicle. A window allows customers to conduct business through a lane.

In drive-thru banking, a voice AI system is being developed to replace humans. In July 2018, Cline, a startup based in Ann Arbor that made voice-powered AI platforms for banking in 2015, tried drive-through ordering.

**Bank Stations:** Artificial intelligence can be used in banks' front, middle, and back offices. Self-service terminals make up the bank stations, which provide customers with a wide range of value-based e-services like bill payments and government e-services. Today, big data applications in banks are transforming the industry.

**Passbook update kiosks:** Over the past few years, the Indian banking industry has moved from being run by people to being run by machines. An automatic kiosk that lets customers print their passbooks is the passbook printing kiosk. For instance, Indian Bank SBI has installed Swayam, a kiosk for printing passports that uses barcode technology and makes it easy for customers to update their passports.

**Chatbot -The Intelligent Banking Assistant:** Chatbots or virtual assistants aim to make human-computer interaction easier. The front-desk scenes at banks are being replaced by chatbots, an example of AI in banking. Customers get cutting-edge digitized and individualized interactive experiences from these AI-driven machines. Indian Bank SBI has introduced the chatbot SIA (SBI Intelligent Assistant), which, like bank representatives, assists customers with everyday banking tasks. Additionally, it promptly responds to NRI customers' inquiries via the SBI gateway's chat box.

**Cash Deposit Machines:** Self-service terminals that permit cash deposits at any time are known as Cash Deposit Machines. The issue of having to wait in long lines at banks to deposit cash is solved by this facility. The quickest and most dependable way to deposit cash at any time is through a bank. This service, in which the account balance is credited immediately, is offered by private and state-owned banks alike. For each successful transaction, the customer will receive a receipt.

This machine can also be used to make payments to multiple accounts.

**Mobile Banking:** Globally, mobile phones are getting smarter. Since millions of people rely heavily on mobile banking, AI-powered banking apps are highly sought after. Customers have easily switched to mobile banking. Having a personal virtual assistant, whether it's Siri from Apple or Alexa from Amazon, is very appealing. Users all over the world have embraced it with open arms.

**Blockchain Technology and Banking:** Blockchain is a digital, distributed, and decentralized ledger. It is digital data (a block) that is kept in a public database (a chain). Blockchain is used to store encrypted data, and Artificial Intelligence is the brain or engine that makes decisions and helps with data analysis.

**Algorithms and Fraud Detection Using AI:** Algorithms are the foundation of AI. A set of algorithms make up machine learning. An algorithm is a set of rules, instructions, or other ways for computers to solve problems. In real time, AI is very good at finding patterns. It offers risk-reduction recommendations and identifies suspicious behavior by utilizing additional behavioral indicators. Fraud has been a major problem in the financial sector, and one of the most important areas in which artificial intelligence systems have excelled is fraud detection in the banking industry.

**Smart Wallets:** Major players like Google, Apple, Paypal, and others have jumped on the digital wallet bandwagon and developed their own payment gateways. Digital wallets are said to be the future of real-world payment technologies. This makes people less reliant on actual cash and makes money more accessible to more people.

**Voice Assisted Banking:** As technology enables customers to use banking services with voice commands and touch screens, physical presence is gradually vanishing. Natural language technology can answer questions, locate information, and connect users to various banking services by processing queries. Human error is reduced as a result, increasing efficiency.

**Data-driven AI applications for lending decisions:** Applications based on data for lending decisions AI applications that are embedded in end-user devices, personal robots, and bank servers can analyze a lot of data and provide individualized financial advice, calculations, and forecasts. These applications can also research various customized investment opportunities, loans, rates, fees, etc. to develop and track financial plans and strategies.

**Customer support:** Support for customers with the development of speech and natural language processing technologies, we are getting closer to the day when computers will be able to answer most questions about customer service. Customers would be happier as a result of the end of line waiting.

**Digitalization instead of branch lines:** Digitalization rather than branch lines Banking is a time-consuming process with a history of long lines and slow responses that hinder productivity. Even opening a bank account was viewed negatively because frantic customers would rush from post to post to complete the necessary paperwork.

**Blockchain hastening payments:** Blockchain speeds up payments The customers that banks serve are undergoing a significant shift in their purchasing habits and preferences because of the digital revolution, particularly mobile and social media. There is rising demand for more options and control over how they interact with a bank. As a result, payment delays will be a thing of the past.

**State Bank of India (SBI):** Started a national hackathon called "Code for Bank" for developers, startups, and students to come up with creative ideas and solutions for the banking sector using technologies like predictive analytics, fintech/blockchain, digital payments, Internet of Things, artificial intelligence, machine learning, BOTS, and robotic process automation. The bank currently uses an AI-based solution that was developed by Chapdex, the winning team from its first hackathon. This solution helps the bank understand how its customers act by capturing their facial expressions.

**HDFC Bank:** HDFC bank has fostered a man-made intelligence based chatbot called Eva (Electronic Virtual Help), worked by Bengaluru based Sense forth that has tended to over 2.7 million client inquiries, associated with more than 530,000 special clients, and held 1.2 million discussions. In the first

few days of its availability, the device has responded to more than 100,000 inquiries from thousands of customers in 17 nations in less than 0.4 seconds. In-store robotic applications known as IRA (Intelligent Robotic Assistant) are also being tested by the bank.

**ICICI Bank:** Software robotics have been used in over 200 business processes across ICICI Bank's various divisions. The bank refers to this technology as "robotic software," and it claims to be the first in the country and one of only a few in the world to use it to automate repetitive, time-consuming, high volume business tasks.

**Axis Bank:** Axis Bank recently launched a conversational banking app with AI and NLP (Natural Language Processing) to assist customers with financial and non-financial transactions, answer frequently asked questions, and contact the bank for loans.

### **The Challenges Facing India's AI Development:**

1. The Obstacles in the Way of India's AI Development until now, applications based on AI have primarily focused on consumer goods and been driven largely by the private sector. Government policymakers must pay attention to the emerging scale and implications of the technology.
2. India ought to take into consideration the public and private funding models for AI research that have been demonstrated to be successful in the United States, China, South Korea, and other countries.
3. In today's economic environment, the sequential system of education and work is out of date because jobs change quickly, and skills become valuable and then obsolete in a few years.

### **Benefits of artificial intelligence for banking sector fraud detection:**

The accuracy of credit card fraud detection and anti-money laundering can both benefit from anomaly detection.

**Support Services and the Help Desk:** Humanoid Chatbot interfaces can be used to make customer interactions more efficient and less expensive.

**Management of risk:** Using historical data, risk analysis, and removing human error from hand-crafted models, customized products can be offered to customers.

**Security:** It is possible to identify suspicious behavior, analyze logs, and fake emails in order to prevent and possibly anticipate security breaches.

**Back-office processing automation and digitization:** Back-office processing times can be greatly reduced by using OCR to capture document data and machine learning or AI to generate insights from the text data.

**Wealth Management for Masses:** Bot Advisors can manage personalized portfolios for clients by considering factors like lifestyle, risk tolerance, expected returns on investments.

**ATMs:** At ATMs, advanced AI techniques like deep learning and image/face recognition using images from real-time cameras can be used to detect and prevent frauds and crimes.

### **Conclusions:**

Artificial Intelligence has numerous advantages for the banking industry. In India's banking industry, artificial intelligence is transforming customer-facing services and business procedures. It is also being used to check for compliance with regulations, find fraud, and evaluate an individual's creditworthiness. The use of AI has the potential to make business processes run more smoothly, provide services that are tailored to each customer, and support larger objectives like financial inclusion. The recent push toward digitalization is, without a doubt, rapidly influencing conventional banking models. However, it has also exposed the institutions to growing vulnerabilities and threats to their cyber security. When it comes to



developing an active defense mechanism against cybercrime, the banks are increasingly looking into emerging technologies like block chain and analytics.

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