# ARTIFICIAL INTELLIGENCE IN INDIAN BANKING SECTOR: AN OVERVIEW

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## Abstract

*In today's digital era, technology plays a major role in helping businesses or organizations achieve their goal of providing good services to their customers. AI (Artificial intelligence) is transforming the global markets rapidly. AI technology has been explored across numerous industries and the banking sector. Recent years in India, AI has used in banking has increased. Artificial Intelligence is described as the ability of a device to perform cognitive functions we companion with human minds, such as perceiving, reasoning, getting to know, interacting with the surroundings, hassle solving, or even exercise creativity. Artificial intelligence is carried out in banking systems via algorithms with wonderful success in custom management services, Credit Information Services, Frequently Asked Questions (FAQ) services, Financial Assistance Services. Presently, the enhancement in overall performance of a banking machine is achieved via applying the A.I. The banking industry is undergoing various reforms, with a focus on the client as the primary driver. Customers that are tech aware and often interact with cutting-edge technologies want banks to provide smooth experiences. In order to meet these expectations, banks have expanded their industrial landscape to encompass retail, IT, and telecom through the use of services like mobile banking, e-banking, and real-time money transfers. Thus, the paper aims to analyze the concept of Artificial Intelligence and to discuss the opportunities of Artificial Intelligence in Indian Banking sector and also to understand the growth of Artificial Intelligence in Indian Banking sector.*

**Keywords:** Artificial Intelligence, Banking, Technology, Digital

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## 1.INTRODUCTION

In today's digital era, technology plays a major role in helping businesses or organizations achieve their goal of providing good services to their customers. AI (Artificial intelligence) is

transforming the global markets rapidly. Artificial intelligence (AI) is the computer-controlled robots to perform tasks that typically require human intelligence and understanding. Artificial intelligence is also used in banking to detect fraud, resolve customer inquiries, monitor customer behavior, and recommend personalized services. Artificial intelligence helps in automate processes, make better decisions, and manage customer requests with less effort. It also helps in manage risk by detecting and preventing fraud and money laundering in real time. Artificial intelligence can be used in a variety of ways to improve the banking sector.

In India, one of the biggest challenges facing banks today is poor data and customer segmentation. The emergence of payment technology companies such as Airtel Payments Bank and Paytm Payments Bank, emergence of neo banks and neo banking platforms, and emergence of NBFCs have made it difficult for banks to survive in the existing paradigm. In the new era, banks are using new technologies to further develop and improve their services to customers. Artificial intelligence is helping banks transform their entire business, from insurance to sales, contracts to cybersecurity. Banks are using analytics, blockchain, and machine learning to future-proof their products and services. Artificial intelligence in banking and finance improves the efficiency and competitiveness of banks and financial institutions. Banks are using AI for a variety of purposes, including fraud detection, improving customer experience, monitoring customer behavior to provide better service, and checking the credit history of users' products to predict loan risk. Areas where banks utilize artificial intelligence include: One of the main application areas of artificial intelligence in the banking industry is artificial intelligence-based chatbot services. AI chatbots in banks can support customers and provide accurate answers to their questions. These chatbots provide users with a personalized experience. Therefore, AI chatbots for banking sectors helps banks attract customers, improve service quality, and expand their brand's impact on the business. Smart mobile apps can track user behavior and extract sensitive information based on user browsing trends. This information helps service providers provide personalized recommendations to customers. Thus, the study aims to analyze the concepts AI in Indian Banking sector and also discusses the various opportunities of ai in Indian banking sectors and also the growth of AI in Indian banking sector.

## 1. OBJECTIVES

The study mainly undertakes to analyze the Artificial Intelligence in the Indian Banking sector. The specific objectives are

1.1 To analyze the concepts of Artificial Intelligence.

1.2 To discuss the opportunities of Artificial Intelligence in Indian Banking sector.

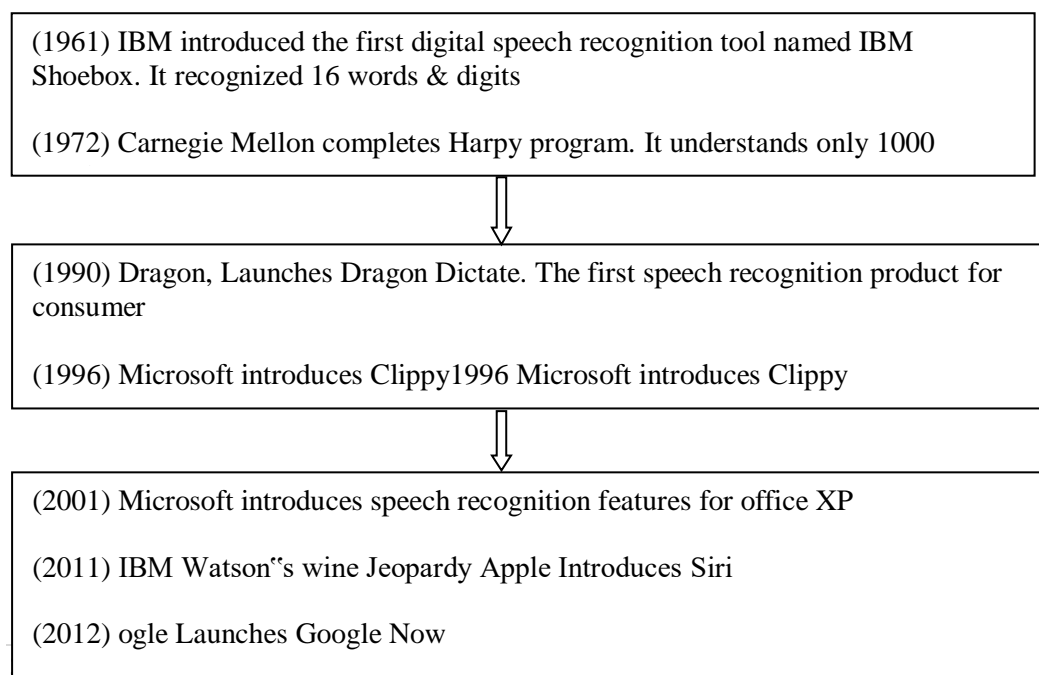1.3 To understand the growth of Artificial Intelligence in Indian Banking sector.

## 2. RESEARCH METHODOLOGY

The paper is descriptive, in the sense that the study attempts review literature to understand the various concepts, and analytical by the way that it attempts to analyze the Artificial Intelligence in the Indian Banking sector.

### 3.1 HISTORY OF ARTIFICIAL INTELLIGENCE IN INDIA

AI technologies and the development of intelligent bots' retailers began to implement messaging chat bots that allowed customers to engage conversationally. The natural progression was for these messaging bots to become voice enabled, driving the rise in voice bots we are seeing today. This progressive voice technology was born at Seattle worlds in 1962 where IBM added a tool referred to as "Shoebox" that may carry out mathematical functions. The technology has come an extended way via the creation of voice assistants by means of leading generation organizations Apple's Siri in 2011, In 2012, Google Now; In 2014 Microsoft Cortana; In 2014, Amazon Alexa, and Google Assistant in 2016.

**Figure 1: History of Artificial Intelligence**

(1961) IBM introduced the first digital speech recognition tool named IBM Shoebox. It recognized 16 words & digits

(1972) Carnegie Mellon completes Harpy program. It understands only 1000

(1990) Dragon, Launches Dragon Dictate. The first speech recognition product for consumer

(1996) Microsoft introduces Clippy1996 Microsoft introduces Clippy

(2001) Microsoft introduces speech recognition features for office XP

(2011) IBM Watson"s wine Jeopardy Apple Introduces Siri

(2012) ogle Launches Google Now

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| (2013) Microsoft introduces Cortana |
| (2014) Amazon introduces Alexa & the Amazon Echo2014 Amazon introduces Alexa & the Amazon Echo |
| (2016) Google Launches Google Home |
| Present (2019) majority of technologies under AI are in a rapid innovation |

**Source:** World Economic Forum, New Physics of Financial Services, August 2018

It is predicted that there can be great increase inside the range of voice-enabled assistants, it is estimated to 1.83 billion by 2025. The ability to make voice commands on our smart phones was introduced through the Google voice search app for mobile in 2008 and followed by the launch of Apple's Siri in 2011. Further, the quickly evolved in using voice commands for sending texts and emails, as well as performing basic searches. Thus, voice recognition software that turned our verbal commands in to text in order to carry out the necessary actions.

## 3.2 ARTIFICIAL INTELLIGENCE IN INDIA

The Indian economy is rapidly changing due to artificial intelligence (AI), which is revolutionising traditional management techniques. The rapidly growing AI industry is expected to be a job-creating engine. Currently, there are 400 start-ups working on AI and machine learning domains. In India, during 2016, about $150 million dollars is invested in AI sector by private players alone and the number has been growing. This enormous potential for job creation demonstrates the important role artificial intelligence (AI) can play in meeting employment needs and promoting economic growth in the nation. The National Strategy on Artificial Intelligence and the AI for India are only two of the major initiatives the Indian government has launched in support of reflecting the nation's dedication to advancing the field.

In India, the impact of AI can already be seen in a wide range of organisations and industries. Businesses are using AI to improve operations across all industries, including the financial industry, retail, and manufacturing. Further, Indian retailers are using AI to improve supply chains, personalise recommendations and ensure maximum efficiency. AI is being used by

Indian manufacturers to raise quality control standards and promote cost effectiveness, demonstrating the many benefits that AI can provide. Indian banks are using AI to strengthen fraud detection systems and improve customer service, delivering a more secure and seamless experience.

### 3.3 AI – CHANGING FACE OF BANKING IN INDIA

The growth of Artificial Intelligence (AI) in the Indian banking industry has been a gradual but consistent process. Indian banks have recently embraced AI-powered solutions to increase operational effectiveness, improve customer experience, and reduce fraud. The growth of big data and digital technology has been one of the main factors influencing AI growth in the Indian banking sector. In India, banks have access to massive amounts of data, which they can use to inform their business decisions and develop AI-powered solutions. The Indian central bank, Reserve Bank of India, is a major factor in any new technology adoption in Indian banking sector. RBI has taken a pragmatic view of embracing new technology adoption on banks through regulation. RBI's proactive push of new technology adoption has not just been restricted to creating policy frameworks.

India has become one of the global fintech hubs. In India, most progressive banks like ICICI Bank, Axis Bank and HDFC Bank have proactively gone to fintech. During 2017, Bank Chain was announced by SBI where, more than 30 members consortium led by SBI includes banks, NBFCs and the National Payments Corporation of India (NPCI), an organization set up by Indian banks to support retail payments. Bank Chain is a community of banks for exploring, building and implementing blockchain solutions. Bank Chain is supported by Pune-based start-up Prime chain Technologies to create these solutions.

### 3.4 AI APPLICATIONS IN INDIAN BANKING SECTOR

The technologies like biometric fraud detection systems, AI bots, and digital payments contributes to providing outstanding services for a wider range of clients. A wide range of technologies fall under the field of artificial intelligence, including but not limited to machine learning, natural language processing, expert systems, vision, speech, planning and robotics. AI applications in Indian banking sectors are as follows:

- **Chatbots**

Chatbots are one of the most widely used AI applications across sectors. They provide high return on investment in cost reductions. Most frequently requested tasks, like fund transfers, mini statement access, balance inquiries may be efficiently handled by chatbots. Thus, the workload from other channels like call centers and online banking is lessened.

- **Smart Wallets**

  Mobile wallets with Artificial intelligence incorporated to make payments for bus ticket, taxi, event, movie, utility bill payments

- **Robo advice**

  One of the issues in the financial services industry is automated guidance. The information provided by the user, a robo-advisor makes an effort to determine the financial well-being of its clients. The robo-advisor will be able to provide suitable investment recommendations in a certain product class, right down to the individual product or stock, based on this research and the client's goals.

- **Cyber security**

  Assessing the data from prior threats and identifying trends and signs that appear unrelated to detect and prevent assaults, artificial intelligence (AI) can dramatically increase the efficacy of cyber security systems. AI is not only capable of stopping external threats, but it keeps an eye out for internal dangers or breaches and recommend remedial activities to stop data theft or misuse.

- **Credit scoring**

  AI analyses data from a variety of standard and non-traditional data sources, which is crucial in assisting alternative lenders in determining the creditworthiness of clients. This facilitates the development of creative lending systems by lenders, for people or organizations with little credit history, and is supported by a strong credit rating model.

## 3.5 ADOPTION OF AI IN THE BANKING SECTOR

Artificial intelligence plays a very important role in the Indian economy. During 2016, global investment in AI applications touched USD 5.1 billion (Euro 4.3 billion) PwC FinTech Report India (2017). Not only PNB but banks like SBI, HDFC, ICICI, HSBC, Axis banks and many other banks in India have turned towards AI. The some of the banks adopted AI are:

### 3.5.1 State Bank of India

SBI bank introduced SIA. SIA provides a chatbot solution that enables customers to interact with the bank through natural language conversation, reducing wait times and the need for human customer service representatives. It assists customers with routine financial procedures and answers their questions ineptly, exactly like a bank staff. SIA is continuously evolving to provide more AI-powered solutions to enhance the customer experience.

### 3.5.2 Bank of Baroda (BoB)

It has created a digital branch with gadgets like an artificial intelligence-based robot called Baroda Brainy and a Digital Lab with free Wi-Fi services.

### 3.5.3 Allahabad Bank

Allahabad Bank uses artificial intelligence (AI) in various aspects of its operations like Fraud detection, automated customer service, loan processing, including risk management are some frequent applications for AI in the banking industry. Banks can process a lot of data accurately and rapidly, improve operational efficiency, and provide better and more personalized services to their customers by using AI.

### 3.5.4 Andhra Bank

Andhra Bank has implemented an AI initiative called Float Bot to improve its customer service and reduce manual labour. AI Chatbot is linked with the Core Banking waiters of this bank to digitally interact and manage onboarding and training and for the visitors. It is an AI-powered chatbot solution that enables customers to interact with the bank through natural language conversation, reducing wait times and the need for human customer service representatives.

### 3.5.5 YES Bank

YES Bank has implemented two major AI initiatives that is YESm Power where this is an AI-powered platform that provides a range of services to the bank's customers, such as

chatbots for customer service, fraud detection, and risk management and YES ROBOT is to improve its operations and customer experience.

### 3.5.6 HDFC Bank

It has created the chatbot EVA, which stands for Electronic Virtual Assistant and is an AI-powered chatbot solution which enables customers to interact with the bank through natural language conversation. EVA responds to consumer questions quickly and accurately, cutting down on waiting periods and the demand for human customer service employees.

### 3.5.7 Axis Bank

It stands for Axis AI and Automation and is an AI-powered platform that provides a range of services to the bank's customers, such as chatbots for customer service, fraud detection, and risk management. The AI initiative is aimed at improving the bank's operational efficiency, reducing costs, enhancing the customer experience, and staying ahead in the rapidly evolving banking industry. By implementing AXAA, the bank can provide more targeted products and services, prevent fraudulent activities, and improve its reputation and competitiveness in the market.

### 3.5.8 ICICI Bank

ICICI bank was the first in the nation to integrate AI technology on a broad scale into visually appealing operations. This has implemented multiple AI initiatives, but it does not have a specific named AI initiative. However, the bank has implemented AI-powered chatbots, AI-powered fraud detection solutions, and AI-powered personalized services. These programs have helped ICICI Bank increase operational effectiveness, lower expenses, and improve customer satisfaction.

### 3.5.9 Canara Bank

Canara Bank introduced Mitra, it is an AI-powered virtual assistant that provides instant and accurate responses to customer inquiries through natural language conversation a creative robot that assists visitors in navigating the bank. The second AI is, Candi, it is an AI-powered chatbot solution that enables customers to access banking services through a conversational interface.

### 3.6 OPPORTUNITIES OF AI IN INDIAN BANKING SECTOR

AI helps the bank to understand the expenditure pattern of the customer. The banks can come up with customized investment plan & assist the customers for budgeting, banks can send the notification about the advice for keeping a check on the expenses and investments based on the data. The transactional & other data sources can be tracked to help understand the customer's behavior and preferences to improve their experience. The few opportunities of ai in Indian banking sectors are

- **Enable Convenient Banking Services**
  With the help of voice technology, consumers can easily ask for account balances, request an analysis of their financial health, and inquire about their investment portfolio.

- **Leverage Customer Insights**
  The fintech industry leveraging Artificial Intelligence, machine learning and natural language processing, voice applications can gather key customer insights to personalize and improve offerings.

- **Boost Loyalty Through Digital Channels**
  Financial service providers can increase customer loyalty through voice applications that help to improve customer short-term and long-term financial wellness.

- **Retail Banking Use Cases**
  Banks can use voice technology to provide individuals with customized, personalized banking experiences to improve their financial health and better manage their personal finances.

- **Personalized Financial Services**
  Personalized connect will reach new heights as automated financial advisors and planners provide expertise in making financial decisions. They analyze market against the user's financial goals and personal portfolio, and offer recommendation regarding stocks and bonds.

- **Customer support**
  As speech processing and natural language processing technologies improved, when computers could handle most customer service queries. This would mark an end to waiting in line and hence result in happier customers.

- **Blockchain hastening payments**

  The banks serve is going through a major shift in terms of buying behaviors and preferences, driven by the digital revolution, particularly social media and mobile. An increased demand for more choice and control in how they interact with a bank is on a rise. Sluggish payment processes will be a thing of the past as Blockchain is set to inculcate the advantage of real-time payment process, hastening up the procedure of payment, thereby increasing support and satisfaction.

## 3.7 PRESENT STATUS OF AI IN INDIAN BANKING SECTOR

In India, the four leading commercial banks in partnership with Fintech startups have pioneered in using AI to improve their customer's experience, reduce costs and improve overall efficiency. Many Research institutions and Universities have been working with various AI technologies for decades, and chiefly in the field of societal transformation. The application of AI and ML (machine learning) to various functions in the banking industry has enabled them to offer a far more personalized and well-organized customer service. By achieving that, banks have also been able to gain enhanced insights into their customers' preference and expectations from the bank. Accordingly, automation of back-end workflows has shown better outcomes. SBI is at present using an AI-based technologically advanced solution given by Chapdex. This AI based solution examines cameras installed in bank branches and captures the facial expressions of the customers. SBI has launched chatbot SIA developed by PAYJO, a startup based in Silicon Valley and Bengaluru. HDFC is also experimenting with in-store robotic applications IRA - Intelligent Robotic Assistant further improve customer experiences and reinvent its business scenario. Unsurprisingly, research firms are optimistic on the potential of AI in financial sector especially the banks. According to Fintech India report by PwC in 2017, the global spending in AI applications touched $5.1 billion, up from $4 billion in 2015. Further, technology curve financial organizations are adopting a holistic approach to reap benefits of Artificial Intelligence. Indian banks have started implementing variety of AI applications including chatbots, risk monitoring, training, etc.

## 3. CONCLUSION

In recent years, India is focusing on technology, it is a key component of economic development. AI enhances business results exponentially as it is evolving as the go-to technology across the world. Banking sector is becoming one of the first adopters of AI and

implementing the technology in different ways. The applications of AI include smarter chat-bots for customer service, personalizing services for individuals and even placing an AI robot for self- service at banks. Beyond these basic applications, banks can implement the technology enhance the efficacy of back-office and also reduce the fraud and security risks. Thus, Artificial intelligence is set to become the sole determinant of the competitive position of Indian banks.

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