



THE INFLUENCE OF ARTIFICIAL INTELLIGENCE ON THE INDIAN BANKING INDUSTRY

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Abstract

Artificial Intelligence (AI) is a rapidly evolving technology that affects people all over the world. The banking industry is quickly becoming one of the early users of AI. Banks are working with and using technology in a variety of ways. Artificial Intelligence is improving and becoming smarter every day. We will explore how Artificial Intelligence is employed in the Indian banking sector, the benefits, and the challenges that Artificial Intelligence faces in this paper. Artificial Intelligence's development and the various ways in which it might improve the operations of the Indian banking industry are discussed. The study's goal is to look into the advantages of artificial intelligence in the Indian banking sector. The influence of AI has been far-reaching, with every bank customer benefiting. Because of the government's efforts to increase financial inclusion and push India into a digital economy, AI is essential for the banking sector. This is only possible if AI is widely used in the Indian banking sector. AI will be a game-changer in the banking industry.

Keywords: Artificial Intelligence (AI), Machine Intelligence, learning, problem solving.

ARTIFICIAL INTELLIGENCE (AI)

Artificial intelligence (AI), also known as "machine intelligence," is intelligence displayed by machines as compared to human intelligence. The term "artificial intelligence" is frequently used to describe machines that perform tasks that humans associate with the human mind, such as "learning" and "problem-solving." In terms of the application of knowledge and skills, artificial intelligence is the ability of a machine or a computer to copy from something natural. Artificial Intelligence occurs when a machine mimics a human mind by thinking for itself. The ability of smaller and financial service providers to compete with larger

institutions has been transformed by artificial intelligence and advanced analytics-driven decision making. Today, big data combined with advanced statistical needs and machine

learning algorithms, now can find patterns in an organization's data that would otherwise be impossible to detect with standard analytical methods. Accenture defines AI as "a computer system that can sense, comprehend, act, and learn." A system that can see the environment around it, analyze and interpret the information it gets, take actions based on that understanding, and learn from its mistakes. And, by allowing robots to connect more naturally with their surroundings, people, and data, technology can expand both humans and machines' capacities well beyond what they can do on their own."

EVOLUTION

While we have only recently witnessed AI in action, the history of AI extends back to the 1950s, when Alan Turing presented a paper on the prospects of basic intelligence in machines. It was only in the late 1990s that Artificial Intelligence as a concept was established, but no application of the case or Artificial Intelligence method was carried out.

After big tech firms like Facebook, IBM, Microsoft, and Google began to engage in Artificial Intelligence and Machine Learning, the pace of Artificial Intelligence only increased after 2011 for use in commercial applications.

ADOPTION

Today, AI implementations include everything from data mining to algorithm monitoring, facial identification, and optical character recognition. Advertising and marketing, accountancy, insurance, the internet, transportation, aerospace, agriculture, and genetics are just a few of the industries where AI is now being used. In 1990, new technologies centered on AI research, enhancing the potential for natural language processing, image identification, deep learning, voice recognition, and emotion recognition. It was used taken up by several start-ups to generate market interest.

THE ROLE OF BANKING INDUSTRY

Banks play a crucial role in today's market and are widely regarded as their lifeblood. Because they manage currency, credits, and other financial activities, Banks assist and motivate their customers to save money and earn interest in order to ensure their financial future. Banks also help businesses to grow by providing financial support. Every bank transaction must be accurately documented. Banks are mostly using computers to do this. ATMs, mail, telephone banking, online banking, and mobile banking are some of the ways via which banks conduct operations. Computer networks are necessary for the seamless operation of the banking industry, and banks use AI to make this possible.

BENEFITS OF ARTIFICIAL INTELLIGENCE

For the economy, business and industries: AI has the potential to aid the economy by assisting in the evolution of work. Robots and artificial intelligence will assist people in doing their jobs better, not

replace people.

For humanity and society: Artificial intelligence (AI) improves information flow and efficiency, allowing humans to take advantage of new opportunities. More time will be available for people to learn, experiment, and explore.

Expenditure pattern: AI can assist in determining a customer's spending pattern, allowing for the creation of personalized strategies for them.

Online banking and mobile banking: Online banking and mobile banking are becoming increasingly popular as a means of conducting transactions at all hours of the day and night. Machine learning can fully integrate and monitor client data, such as precise demographics, website analytics, and records of online and offline transactions.

Offer High security: The banking system advantages from AI's excellent security; AI mobile apps can make transactions faster and safer.

Understand the user's behavior and offer personalized experience through an app; banks handle customer-oriented operations easily while reducing the cost of hiring additional employees.

WHY AI IN BANKING INDUSTRY?

- Enormous challenges in the banking sector.
- Thrust for a process-driven operation.
- Initiate self-service in the branches.
- Customer desire to deliver different personalized solutions.
- Enhance operational effectiveness..
- Employee productivity should be increased.
- To support focus on productivity and efficiency.
- The use of robotics tools and visualisation to extend human function
- To minimize the chances of fraud and scam.
- Manage a massive amount of data at rapid speed while gaining important insights.
- To make effective decisions.

BANKING SECTOR: AI IMPLICATION TOOL

- Google Cloud Machine Learning Engine.
- Engati.
- Azure Machine Learning Studio.
- Tensor Flow.
- Cortana.
- IBM Watson.
- Infosys Nia.

➤ Play-ment.

It is a data labeling platform that can generate training data at a large scale for robotic models.

ARTIFICIAL INTELLIGENCE - THE CHANGING FACE OF BANKING IN INDIA

In banking, artificial intelligence can interact with people by making choices and persuading clients. Artificial intelligence (AI) enables the banking industry to identify client preferences, ensure customer happiness, and assist customers in understanding their banking expectations. For greater growth possibilities and to serve new-age consumers, banks are actively integrating new-age technologies. AI is assisting banks in transforming their operations across the board, from accounting to sales to contracts and cyber security. Banks are future-proofing their offerings and services with data analytics, blockchain, and machine learning. Many traditional banks have partnered with fintech companies to provide customers with modernized banking products. Traditional banks are battling with tech-savvy fintech companies, which are embracing newer technology such as artificial intelligence.

ARTIFICIAL INTELLIGENCE IN BANKING

The banks cannot afford to wait, to get on their artificial intelligence journey as they have to compete in a future which is packed with innovative and advanced technology.

Drive thru Banking: Drive-thru banking allows you to do financial transactions without ever leaving your vehicle. Customers can perform transactions through a glass in a lane. In drive-thru banking, a voice AI system is being developed to take the position of humans. In July 2018, Clinic, an Ann Arbor-based business that built voice-powered AI platforms for banking in 2015, expanded into drive-through ordering. Its conversational AI breakthrough can understand orders and make corrections in the discussion even if participants have language problems or thick accents. Drive-thru banking allows you to do financial transactions without ever leaving your vehicle. The customer can complete the purchase through a window in a lane. In drive-thru banking, a voice AI system is being developed to take the position of humans.

Bank Stations: Artificial intelligence can be used in the front office, middle office, and back office of a bank. The bank stations are a network of self-service terminals that provide consumers with a variety of value-based e-services such as bill payments, government e-services, and so on. Today, big data is the industry standard, and banks are redefining the industry with big data applications. The banking sector is using the data to better client connections, and AI is assisting in the structuring and sorting of the data. To service new-age customers, artificial intelligence is the way of the future for banks.

Passbook updating kiosks: In recent years, the Indian banking industry has shifted from being driven by people to being managed by technology. Customers can print their passbooks at a passbook printing kiosk, which is an automatic kiosk. Indian institutions such as SBI and Bank of Baroda have invested heavily in this technology. They've set up self-service passbook kiosks where users can print their passbooks. Although banks also have been hiring, the nature of skill sets required is changing, with a focus on front-

end personnel. For example, Indian Bank SBI has deployed Swayam (passbook printing kiosk) that employs barcode technology and allows customers to update their passbooks without trouble.

Chatbot-The Intelligent Banking Assistant: Chatbots or virtual assistants are new tools designed to simplify interaction between humans and computer. Chatbots are examples of AI in banking that are replacing the front-desk scenes at the banks. These AI-led machines provide next level digitized and customized interactive experiences to the customers.

Cash Deposit Machine: Cash Deposit Machines are self-service terminals that allow you to make a cash deposit at any time. This service eliminates the need to wait in huge lines at banks to deposit cash. Banks provide the quickest and most dependable means of depositing cash 24 hours a day, seven days a week. Both state-owned and private banks provide this service, which credits the account balance immediately. For each successful transaction, customers will obtain a transaction receipt. This machine can also be used to make payments to different accounts.

ATM Machine Helpline: These allow clients contact their respective banks in the event of an emergency and are available at ATMs. AI has also been implemented in ATMs. In ATMs, the following segments have been added: Machine learning for ATM security, machine vision ATM cameras, facial recognition for security and improved customer experience, ATM predictive maintenance, and ATM cash demand forecasting are all examples of machine learning in action.

Mobile Banking: Mobile phones are becoming smarter all around the world. Millions of people rely heavily on mobile banking; therefore AI-powered banking mobile apps are quite appealing to them. Consumers have easily transitioned to mobile banking. Having a personal virtual assistant, whether it's Siri from Apple or Alexa from Amazon, is highly appealing. It has received widespread acceptance and approval from users all across the world. Client needs can be easily met using mobile applications. There are clever apps that can follow a user's actions and provide them with personalized savings and spending advice. Nowadays, every bank provides mobile and text banking services. Daily transactions such as money transfers, payments, and soon have become more convenient with the advent of mobile banking. With the introduction of artificial intelligence in mobile banking, consumers may better organize their finances, receive smart financial advice, and conduct more efficient and faster transactions.

Blockchain Technology and Banking: Blockchain is a digital ledger that is distributed and decentralized. It's a type of digital data (block) that's stored in a public database (chain). Artificial Intelligence is the brain or engine that enables decision making and assists in the analysis of data acquired. Blockchain is used to store encrypted data, and Artificial Intelligence is the brain or engine that enables decision making and assists in the analysis of data collected. It is commonly assumed that blockchain technology benefits solely the bitcoin business; however this is not the case. Blockchain technology aims to address a variety of

difficulties surrounding digital transactions, including data security, fraud prevention, and so on. Interbank transactions, cross-border remittances, crypto banking, record storage, KYC, loan syndication,

and improved transparency are just a few of the applications for blockchain..

INDIAN BANKS USING AI

About 32% of banking sector is already using AI technologies like predictive analytics, voice recognition, etc., There are 12 Indian banks which have taken AI initiatives over the last few years. The list includes:

State Bank of India (SBI): SBI is currently using an AI-based solution developed by Chapdex, the winning team from its first national hackathon, “Code for bank”. On the front desk, it uses SIA chatbot, an AI-powered chat assistant developed by Payjo, a startup based in Silicon Valley and Bengaluru. It addresses customer enquiries instantly and helps them with everyday banking tasks just like a bank representative.

Bank of Baroda: BoB has set up of hi-tech digital branch equipped with advanced gadgets like artificial intelligence robot named Baroda Brainy and Digital Lab with free Wi-Fi services.

Allahabad Bank: In a media statement earlier, the Allahabad bank said that its app ‘EmPower’ is scheduled to get major enhancements like Chatbot and artificial intelligence- based ecommerce payments.

Andhra Bank: Bengaluru-based AI startup, Floatbot has launched AI Chatbot integrated with Core Banking Servers of Andhra Bank, to digitally engage and automate customer support for its 5Cr customers. Floatbot will also develop a chatbot for 20K+ internal employees of Andhra Bank to automate on boarding and training.

YES Bank: It has partnered with Gupshup, a bot platform, to launch „YES mPower” – a banking chatbot for its loan product. Another AI product **YES ROBOT** is equipped to answer consumer’s banking related queries anytime, anywhere. Also, YES BANK was the 1st Bank in India to introduce chatbot based banking with the launch of YES TAG in April 2016 which allows customers to perform banking transactions on various social messengers.

HDFC Bank: It has developed an AI-based chatbot, “Eva”, built by Bengaluru-based Sense forth AI Research. Eva can assimilate knowledge from thousands of sources and provide simple answers in less than 0.4 seconds. Going forward, Eva would be able to handle real banking transactions as well. HDFC is also experimenting with in-store robotic applications and launched a prototype robot IRA (“Intelligent Robotic Assistant”).

ICICI Bank: It has deployed software robotics in 200+ business processes across various functions of the company, created mostly in-house using AI features such as facial and voice recognition, natural language processing, machine learning and bots among others. The software robots at ICICI Bank are configured to capture and interpret information from systems, recognize patterns and run business processes across multiple applications to execute activities. One such product is its AI-based chatbot, named iPal, which helps in answering queries, helping in financial transactions and discovering new features.

Axis Bank: It launched an AI-enabled app that uses natural language processing to enable Conversational banking that helps consumers with financial and non-financial transactions, queries and product information.

Canara Bank: It launched Mitra, a humanoid robot developed by Bengaluru-based Invento Robotics which helps customers navigates the bank. Another one Candi, which is slightly smaller than Mitra is supplementing the human resource.

City Union Bank: It launched the banking robot, Lakshmi. The robot can interact with customers on more than 125 subjects. Apart from answering generic questions, the robot is also programmed to connect with the core banking solution.

Punjab National Bank: In 2018, the bank announced its plan to implement AI in account reconciliation as well as using analytics to improve its audit systems. The move came in after the infamous debilitating fraud of approximately INR 20K Cr, carried out by the pair of Nirav Modi and Mehul Choksi in February 2018, which almost paralysed the bank's operation for a short time.

IndusInd Bank: It has launched Alexa Skill, „IndusAssist“, using which bank account holders can conduct financial and non-financial banking transactions with Alexa, Amazon's virtual assistant.

ARTIFICIAL INTELLIGENCE AND ROBOTICS

Robotics and Artificial Intelligence are being actively invested in by India's banking sector (AI). Intelligent machines are being used to meet the needs of today's tech-savvy consumer. Examples:

- i) Kumbakonam based City Union Bank launched Lakshmi, India's first AI-powered banking robot, was launched in November 2016. While critical information about the customer is presented on the robot's screen, all generic questions are answered verbally.
- ii) In 2016, ICICI Bank implemented Software Robots in over 200 of its business operations. These software robots have slashed customer response times by up to 60% while increasing accuracy to 100%.
- iii) In one of its Mumbai branches, HDFC introduced the Intelligent Robotic Assistant (IRA). Customers are directed to various banking operations within the branch by this IRA.
- iv) DIGI Bank is India's first digital-only bank. DIGI Bank, launched by DBS Bank, Singapore's biggest bank and a major bank in Asia, has proven to be a watershed moment in India's AI-enabled banking services. In 2016, DBS established DIGI Bank, India's first mobile-only bank. It is a paperless, signature-free, and branchless bank, unlike traditional banks. It's the only AI-powered virtual bank that uses Aadhaar cards to authenticate consumers.

- v) Examples of Chatbot (Chat robot – a computer programmed that simulates human conversation through AI) launched by few banks in India.

Name of the Bank	CHATBOT
SBI	SIA
ICICI	iPal
HDFC	EVA
Yes Bank	YES TAG
DIGI Bank	Digor

IMPACT OF ARTIFICIAL INTELLIGENCE IN BANKING

Banks are employing artificial intelligence (AI) applications to recommend, forecast, and execute personalized financial advice to consumers, as well as to obtain quick information on financial strategies, lending rates, and future market trends.

Customer Satisfaction: AI assists banks in providing tailored and more efficient services to their consumers, as well as boosting revenue, making faster decisions, and maintaining positive customer relationships.

Chatbots: Chatbot is an automated conversation programme that is either run automatically or follows a pre-determined path. Bot is the short form of Robot, and Chatbot is an automated chat programme that is either run automatically or follows a pre-determined path. In banking, a chatbot is a means to use AI in the form of robotics. Chatbots are available 24 hours a day, 7 days a week and provide prompt customer service.

Personalized Financial Guidance: AI assists clients in making simple and quick financial decisions by providing up-to-date information on the current market structure as well as stock and bond recommendations.

Digital Wallets: Customers can use digital wallets to purchase any goods online using either their mobile phone or their computer.

Interactive voice response systems (IVRS): Customers are greeted by an automated speech system that engages with them, answers their queries, routes calls to the proper financial departments, and provides a pleasant experience.

Detecting Fraud: AI detects banking fraud by sifting through massive amounts of transactional data and looking for unusual actions or patterns of activity. AI reduces banking fraud, aids in quick response, protects against security breaches, and aids in powerful machine learning.

Improving customer support: Customer satisfaction has an impact on the banking industry's success, since it forms people's impressions of the financial institution's brand and drives banks' attempts to target and retain customers.

Helps in knowing Creditworthiness: Banks continue to assess a person's creditworthiness based on their revenue and financial activities. Machine learning is used by AI loan decision systems to analyze patterns and behaviours in order to evaluate whether or not a user is a good customer.

Better Customer Services: AI-based relay information utilizes machine learning by referring users to the source using data obtained from users' devices. AI-enabled features also allow services, offers, and insights to be tailored to the user's preferences and needs.

Better regulatory compliance: Cognitive fraud analytics are used by AI tools to monitor customer behaviour, track transactions, identify suspicious activity, and evaluate data from various compliance systems. Personalization, risk and cost reduction, increased employee productivity, and regulatory compliance are all ways AI is adding value to customers.

Risk management: Mitigating fraud by analysing transactions in real time for suspicious patterns, assessing clients' creditworthiness, and providing risk analysts with the appropriate recommendations for risk reduction.

Trading and Securities: Robotic Process Automation (RPA) aids in security settlement by reconciling and validating data in the back office with trades enabled in the front. The complete process of trade enrichment, confirmation, and settlement is made easier by artificial intelligence.

Portfolio Management: Customers' portfolio profiles are created using AI and machine learning-based technology platforms based on their investment limitations, trends, and preferences. Banking and artificial intelligence are poised to usher in the next wave of digital revolution. Thus, AI has transformed every aspect of the banking processes faster, money transfers safer and back-end operations more efficient.

THE FUTURE OF ARTIFICIAL INTELLIGENCE IN BANKING

Due to advancements in AI technology, AI will become stronger and smarter in the future, allowing every consumer to have a secure banking experience. Artificial intelligence (AI) will lay the groundwork for more product and service innovation. Furthermore, AI can the ability to completely change consumer experiences and create entirely new financial business models. Collaboration between humans and machines is required to obtain better results, which will necessitate training and a rethinking of the future of banking jobs. Furthermore, mass customization is the key to unlocking enormous future potential, which can only be realized with AI and blockchain. The banks are using AI to create innovative customer experiences through a variety of solutions, thereby setting new benchmarks for the Indian financial sector and forging a new path by embracing tech intensity. Data is converted to a digital format using AI technology. It contributes to a better client experience. Both the customer and the bank benefit from it because it saves time. It aids in the reduction of human mistakes. It aids in the development of strong and loyal customers. It facilitates the passage

of huge cash inflows and outflows. It facilitates cashless transactions from any location and at any time.

CONCLUSION

To summaries, Artificial Intelligence is growing in popularity, and banks are studying and integrating this technology, which is changing the way consumers are served. As a result, Artificial Intelligence has a bright future in the banking sector, and the adoption of AI makes it even easier for customers to conduct transactions from any location and at any time without having to wait in long lines at the bank. As a result, Artificial Intelligence aspires to provide individualized, high-quality customer care as well as efficient and time-saving services

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