Impact and Challenges of Artificial Intelligence in Banking

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“AI is probably the most important thing humanity has ever worked on.” – Google CEO Sundar Pichai.

Abstract –
Artificial Intelligence is a fast developing technology across the world. The banking sector is becoming one of the first adopters of artificial intelligence. Artificial Intelligence is stated to be intelligence by machines. Financial transactions of the banks are analysed for learning, problem solving and decision making with artificial intelligence and also by using big data, advanced analytics coupled with machine learning algorithms. The paper is about studying the impact of Artificial Intelligence (AI) in banking sector in India and the challenges faced by the banking sector in implementing Artificial Intelligence. The aim of the study is to examine the benefits of Artificial Intelligence in banking sector in India. AI’s impact was far-reaching and every customer of bank is getting benefitted with the adoption of AI. AI is necessary for banking sector due to the government’s efforts in financial inclusion and to push India into a digital economy. This could happen only with widespread use of AI by the banking sector in India. It is the AI which is going to be the major game changer in the banking sector.

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

1. ARTIFICIAL INTELLIGENCE (AI)

1.1 Introduction
Artificial intelligence (AI) which is also called as “machine intelligence” is intelligence exhibited by machines contrary to the usual intelligence displayed by people. Artificial intelligence is often used to describe machines that humans associate with the human mind, such as “learning” and “problem solving”. Artificial Intelligence is the ability of a machine or a computer to copy from something that is natural, in terms of acquiring and applying knowledge and skills. When a machine mimics a human mind by thinking for itself, it is known as Artificial Intelligence. Artificial intelligence and advanced analytics driven decision making has transformed the ability of smaller and financial service providers to compete with larger institutions. Today, big data coupled with advanced statistical needs and machine learning algorithms can uncover pattern in organization’s data which are otherwise impossible using traditional analytical tools.

In the context of banking, Accenture defines AI as, “A computer system that can sense, comprehend, act and learn. A system that can perceive the world around it, analyse and understand the information it receives, take actions based on that understanding, and improve its performance by learning from what happened. And by enabling machines to interact more
naturally - with their environment, with people and with data - the technology can extend the capabilities of both humans and machines far beyond what each can do on their own.”

1.2 Components of Artificial Intelligence

The components of artificial intelligence are as follows:
- Computer science
- Psychology
- Neuron science
- Biology
- Maths
- Sociology
- Philosophy

1.3 The Role of Banking Industry

Banks play an important role and considered as life blood of today’s economy because it handles cash, credits and other financial transactions. Banks help customers and motivates them to save money and earn interest for a secure future. Banks also extend financial assistance to the expansion of industries. Every financial transaction done through the banks must be properly documented. To implement this, the banks primarily use computers. Number of the channels that banks use for operations are through ATM’s, mails, telephone banking, online banking and mobile banking. The smooth operation of the banking world is done through computers and networks are feasible only because banks use AI.

1.4 Benefits of Artificial Intelligence

- **For the economy, business and industries:** AI can benefit the economy by helping the evolution of work. Robots and AI will help people perform their work better, not take their jobs.
- **For humanity and society:** AI enhances information throughput and efficiency, helping people create new opportunities. People will have more time to learn, experiment and explore.
- **Expenditure pattern:** AI can help in understanding the customer’s expenditure pattern and customized plans can be offered to customers.
- **Online banking and mobile banking:** The online banking and mobile banking become popular as a tool for 24/7 transaction. AI access customer data, such as detailed demographics, website analytics and records of online and offline transactions, machine learning can integrate and analyse information.
- **Offer High security:** AI offers high security to the banking sector;
- **AI mobile applications:** AI mobile applications can make the transaction quicker and safer.
- **Understand** the user’s behaviour and offer personalized experience through an app, banks handle customer-oriented operations easily while reducing the cost of hiring additional employees.
1.5 Limitations of Artificial Intelligence

- The production and maintenance of AI requires high costs.
- AI consists of advanced software programs that require regular updates to meet the needs of the changing environment.
- AI might be able to do, replacing adaptive human behaviour.
- AI makes the people lose their creative power, and can increase the unemployment rate.
- AI in wrong hands can be serious threat to human kind, if individuals start thinking destructively, they can generate these advanced machines.

2. Objectives of the Study

- To study the areas in which Artificial Intelligence (AI) can be implemented in banking sector in India.
- To analyse the impact of AI in the growth of banking sector in India.
- To examine various challenges faced in implementing AI in banking sector.
- To identify various initiatives to overcome the challenges in implementing AI in banking sector.
- To predict the future of AI in banking sector.

3. Methodology

Research Design: The study employs analytical method of research, and it is based on secondary sources of information such as journals, news articles and business magazines. Various prominent websites have been a major source of data. The study attempts to look at the expansion of AI in banking sector in India.

4. Artificial Intelligence - The Changing Face of Banking in India

Artificial Intelligence in banking can interact with humans by making decisions and in a convincing way encourage customers. AI enables banking industry to know the customers preferences, ensure customer satisfaction, and help the customers understand their expectations from the banks. Banks are actively adopting new-age technologies for better growth prospects and to serve new-age customers. From accounting to sales to contracts and Cybersecurity, AI is helping banks transform operations across the board. With data analytics, blockchain and machine learning, banks are future-proofing their offerings and services. Many traditional banks have collaborated with fintech startups to offer modernized banking solution to their customers.

Traditional banks competing with tech-savvy fintech players, moving to adopt newer technologies like artificial intelligence. AI empowers banks completely redefine how they operate, establish innovative products and services, and impact customer experience interventions. To get competitive edge, banks will need to embrace AI and adopt into their business strategy.
5. AI TECHNOLOGY SYSTEMS IN BANKING SECTOR

Some of the key artificial intelligence technology systems used in banking sector are robotics, computer vision, language, virtual agents, and machine learning (including deep learning).

6. REASONS FOR ADOPTION OF AI IN THE BANKING SECTOR

- Immense competition in the banking sector
- Introducing self-service at banks
- To improve operational efficiencies
- Move towards process-driven services
- To focus on profitability and compliance
- Demand from customers for more customized solutions
- Effective decision making
- To reduce fraud and security risks
- To increase employee productivity
- To augment human work through software robotics
- To manage huge volumes of data at record speed

7. AREAS OF ADOPTING AI IN BANKS

Many areas where banks are utilizing AI to streamline the processes include:

- Accounting
- Merchant Services
- Fraud and Cybersecurity
- Risk Management
- Compliance
- Customer Service
- Wealth management
- Business process management
- Physical Security
- Asset Management
- Internal Audit
- Sales
- Marketing
- Financing and loans (credit assessment)

8. INDIAN BANKS USING AI

About 32% of banking sector is already using AI technologies like predictive analytics, voice recognition, etc., according to joint research conducted by the National Business Research Institute and Narrative Science. There are 12 Indian banks which have taken AI initiatives over the last few years. The list includes:

a) SBI
b) Bank of Baroda (BoB)
c) Allahabad Bank
d) Andhra Bank
e) YES Bank  

f) HDFC  

g) ICICI  

h) Axis  

i) Canara Bank  

j) City Union Bank  

k) Punjab National Bank  

l) IndusInd Bank  

- **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 5 Cr customers. Floatbot will also develop a chatbot for 20K+ internal employees of Andhra Bank to automate onboarding 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 Senseforth 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 navigate 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.

9. **IMPACT OF ARTIFICIAL INTELLIGENCE IN BANKING**

Banks are using AI applications to recommend, forecast and execute tailored financial advice to customers and also gain quick information on financial strategies, loan rates and the future market progress.

- **Customer Satisfaction:** AI helps banks in providing personalized and more efficient services to customers and in increasing revenue, faster decision making and having a good customer relationship.

- **Chatbots:** Bot is the short form of Robot and Chatbot is an automated chat program that is either run automatically or follows a pre-determined path. Chatbot is a way of using AI in the form of robotics in banking. Chatbots are available 24/7 and provide efficient customer service.

- **Personalized Financial Guidance:** AI helps customers to make easy and quick financial decisions by way of up to date information on the current market structure as well as provide suggestions on stocks and bonds in which customers can invest.

- **Digital Wallets:** Digital wallets provide digital money to the customers in purchasing any item online either with a mobile phone or a computer.

- **Interactive voice response systems (IVRS):** An automated voice system which interacts with customers, answer certain questions and routing calls to appropriate banking departments and gives a pleasant experience to customers.

- **Detecting Fraud:** AI captures banking fraud by scanning through the vast transactional data and tracking down any unorthodox activities or irregular behavior patterns. AI minimizes banking fraud, helps in immediate action, protect security breaches and helps in powerful machine learning.

- **Improving customer support:** Customer satisfaction impacts the performance of banking industry and shapes people’s perceptions of the financial institution’s brand and also influences banks client targeting and retention efforts.

- **Helps in knowing Creditworthiness:** Banks still rely on one’s revenue and banking transactions to determine whether they are creditworthy. AI loan decision systems are using machine learning to observe the patterns and behaviours to determine whether a user can really be a good customer or not.

- **Better Customer Services:** Using data gathered from users' devices, AI-based relay information using machine learning by redirecting users to the source. AI-related features
also enable services, offers, and insights in line with the user’s behaviour and requirements.

- **Better regulatory compliance**: AI tools usually rely on cognitive fraud analytics that observe customer behaviours, track transactions, identify suspicious activities, and assess the information of different compliance systems. AI is providing greater value to customers through personalization, minimizing risks and costs, improving employee productivity and ensuring higher regulatory compliance.

- **Risk management**: Mitigating fraud by scanning transactions for suspicious patterns in real-time, measuring clients for creditworthiness, and enabling risk analysts with right recommendations for curbing risk.

- **Trading and Securities**: Robotic Process Automation (RPA) helps in security settlement through reconciliation and validation of information in the back office with trades enabled in the front office. AI facilitates the overall process of trade enrichment, confirmation and settlement.

- **Credit Assessment**: AI can analyse all data sources together to generate a coherent decision. In fact, banks today look at creditworthiness as one of their everyday applications of AI.

- **Portfolio Management**: AI and machine learning-based technology platforms make customised portfolio profiles of customers based on their investment limits, patterns and preferences. Banking and artificial intelligence are at a vantage position to unleash the next wave of digital disruption.

Thus, AI has transformed every aspect of the banking processes faster, money transfers safer and back-end operations more efficient.

### 10. CHALLENGES OF ARTIFICIAL INTELLIGENCE IN BANKING

Few key challenges faced by the banks are:

- Developing a thinking artificial systems are currently too difficult to achieve in practice.
- Wide spread use of AI raises a number of ethical, moral and legal issues that are yet to be addressed.
- Benefit of AI technologies accrue to a few rich and wealthy owners of investment capital.
- Possess high negative impact on traditional skills and increasing inequality.
- Difficulty in Customer segmentation.
- Lack of credible and quality data.
- Diverse language set.
- Lack of skilled engineers.
- Unavailability of people with right data science skills.
- Lack of clarity of business goals.
- No clear internal ownership of testing emerging technologies.

### 11. MEASURES TO OVERCOME THE CHALLENGES OF AI

The challenges of AI can be overcome by:

- AI has the ability to streamline processes and boost productivity, but this can only be achieved if banks utilise machines to their full potential.
• AI can find patterns, trends and associations, discover inefficiencies, learn and become better, execute plans,
• AI can predict future outcomes based on historical trends,
• AI can inform fact based decisions.
• Articulate interactions between managers and technologists for common interpretation of technology.
• Open up the discussion across bank, create boundaries, stimulate attractors, encourage dissent and diversity, manage starting conditions and monitor for emergence.
• Duplicate data, log data and present it when needed.
• Leading banks should hire Chief AI Officers while investing in AI labs and incubators.
• AI-powered banking bots are being used on the customer experience front.
• Intelligent personal investment products should be made available.
• Moving towards custom in-house solutions that leverage sophisticated ontologies, natural language processing, machine learning, pattern recognition, and probabilistic reasoning algorithms to aid skilled employees and robots with complex decisions.
• Decision support and advanced algorithms allow the automation of processes that are more cognitive in nature.
• Incorporate advanced self-learning capabilities.
• Sophisticated cognitive hypothesis generation/advanced predictive analytics.
• Provide automated AI-powered customer service.
• Chatbots can be “employed” to act as customer service agents and serve customers continuously throughout a day. Routine and basic operations i.e. opening or closing the account, transfer of funds, can be enabled with the help of chatbots.

12. The Future of Artificial Intelligence in Banking

Due to the development in the field of AI technology, AI is going to be stronger and smarter in the future, which will help any customer to have a secure banking experience. AI will provide the foundation for increased product and service innovation. Further, AI has the potential to transform customer experiences and establish entirely new business models in banking. To achieve better results, there needs to be a collaboration between humans and machines that will require training and a reassessment of the future of work in banking. Also, mass customization is the key to unlocking significant opportunities in the future and can be tapped only through technologies like AI and blockchain.

The banks are harnessing the power of AI to deliver new customer experiences with various solutions and are setting new standards for the Indian banking ecosystem, thereby charting a new wave by embracing tech intensity.

AI technology transforms data into a digital format. It helps in enhancing customer experience. It helps in saving time both for the customer as well as for the bank. It helps in reducing human error. It helps in building a strong and loyal customers. It helps in the movement of large cash inflow and outflow. It helps in dealing with cashless transactions from any place and at any time.
13. CONCLUSION

To conclude, Artificial Intelligence is gaining popularity day by day and banks are exploring and implementing this technology in transforming the way customers are assisted. So, the future of Artificial Intelligence in banking sector is very bright and with the introduction of AI, it makes it even easier for a customer to do transactions from any place and at any time without waiting in long queues at the bank. Hence, the aim of Artificial Intelligence is to provide personalized and high quality customer satisfaction along with efficient and time saving services.

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