ARTIFICIAL INTELLIGENCE IN INDIAN BANKING SECTOR: CHALLENGES AND OPPORTUNITIES

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Abstract

Artificial Intelligence (AI) is fast developing technology for across the world. The banking sector is becoming one of the first adopters of Artificial Intelligence. Banks are exploring and implementing technology in various ways. Artificial Intelligence is getting better and smarter day by day. AI has several opportunities for the banking sector. There are many fin-tech start-ups that offer banking AI solutions, and banking regulators are fostering AI adoption through legislation and collaboration. Other opportunities include the following: personalized services, smart wallets, decision-making and problem-solving, customer satisfaction and loyalty, process automation (especially targeting repetitive tasks), transactional security and cyber security improvements, and promotion of digital financial inclusion. Nevertheless, the key banking industry stakeholders have to formulate appropriate strategies aimed at overcoming existing and prospect AI challenges. Among the AI challenges that should be prioritized we include the following: job loss and user acceptance concerns, privacy breaches, creativity and adaptability loss, restrictive implementation and operational requirements, digital divide, availability of vast quality data, AI-business strategy alignment, and loss of emotional "human touch". This necessitates empirical studies to expand the existing body of knowledge regarding AI opportunities and challenges in the banking industry.
Key words: Artificial Intelligence, Banking, Fintech, Technology, Intelligence.

Introduction:

The banking industry has become the major adopter of artificial intelligence (AI) technology. The penetration of AI technology in this industry has especially increased with the advent of Internet or online banking and self-service branch networks. Natural language processing (NLP) and machine learning systems are being used to automatically and reliably respond to customer queries, monitor saving and spending trends, and make disbursements on behalf of customers among other use cases. Automation of repetitive processes and tasks could save costs, minimize human error, and allow staff to focus their energy on more value-adding operations. Banks are also increasingly leveraging big data analytics systems powered by AI and machine learning to offer quicker and personalized customer services and experiences. With customers being the major driver of any service industry, AI may be used to gain a greater understanding of the needs and behaviours of customers. Consequently, banks leverage the increased understanding of consumers in order to personalize their products and services. Other than customer-facing banking applications, big data analytics systems may be used to enable banking executives and managers to make more informed decisions concerning various internal

business processes, operations, investments, risks, resource utilization, and so on. Other compelling use cases of big data analytics and machine learning include facilitating the detection of fraudulent transactions, improving internal policy and legal or regulatory compliance, offering secure transactions, and predicting future outcomes. Therefore, AI technology is adequately mature to be deployed in the banking sector. Banks are harnessing it to streamline business processes, optimize service efficiency, enhance customer experiences, build strong customer relationships, foster business growth and competitiveness, and quickly respond to internal and external changes

Objectives:
1. To study the areas where the artificial intelligence is being used by the banks.
2. To study about the application of Artificial intelligence in Banking Sector.
3. To study the impact of AI on India's banking sector and the AI implementation challenges faced by Indian banks.
4. To examine the impact of AI and associated applications on digital financial inclusivity.

Methodology:
The study is descriptive in nature and is based on secondary data. The data are collected from various reports, journals, news articles, various bank portals, RBI portal and internet sources.

What is artificial intelligence?
According to the father of Artificial Intelligence, John McCarthy, it is ―The science and engineering of making intelligent machines, especially intelligent computer programs.

Artificial Intelligence is a way of making a computer, a computer-controlled robot, or a software think intelligently, in the similar manner the intelligent humans think.

AI is accomplished by studying how human brain thinks and how humans learn, decide, and work while trying to solve a problem, and then using the outcomes of this study as a basis of developing intelligent software and systems.

Artificial Intelligence History:
The term artificial intelligence was coined in 1956, but AI has become more popular today thanks to increased data volumes, advanced algorithms, and improvements in computing power and storage. Early AI research in the 1950s explored topics like problem solving and symbolic methods. In the 1960s, the US Department of Defence took interest in this type of work and began training computers to mimic basic human reasoning. For example, the Defence Advanced Research Projects Agency (DARPA) completed street mapping projects in the 1970s. And DARPA produced intelligent personal assistants in 2003, long before Siri, Alexa or Cortana were household names. This early work paved the way for the automation and formal reasoning that we see in computers today, including decision support systems and smart search systems that can be designed to complement and augment human abilities. While Hollywood movies and science fiction novels depict AI as human-like robots that take over the world, the current evolution of AI technologies isn't that scary – or

quite that smart. Instead, AI has evolved to provide many specific benefits in every industry. Keep reading for modern examples of artificial intelligence in healthcare, retail and more.

Artificial Intelligence Industry in India – The Current Status:

A news report published in October in The Economic Times said, ― Start-ups witness 108% growth in funding in India in 2018. The news report further mentioned that Artificial Intelligence was among those domains which witnessed fastest adoption among industry sectors. Currently there are about 400 start-ups working on AI and machine learning domains. About $150 million dollars is invested in India's AI sector by private players alone and the number has been growing since 2016. Though there has been growth, India lags far behind countries like US and China in terms of investment. With a copious pool of STEM talent and with growing population of youngsters, India will be banking on AI for its economic growth and improvement in quality of life of its citizens. There are several start-ups that are based in cities such as Bengaluru, New Delhi, Mumbai and Hyderabad which work on artificial intelligence principles to serve consumers better. Their product range vary from multi-lingual chat bots to online shopping assistance and automated consumer data analysis. The companies have been working in areas such as e-commerce, healthcare, edtech, fintech etc. Though in their nascent stage, the performance of these companies have been promising.

Indian Banks and the Technology:

The balanced approach followed by Indian central bank, Reserve Bank of India, is another major factor in any new technology adoption in Indian banking sector. In the last few years—especially during the governorship of Raghuram Rajan and his successor Urjit Patel—RBI has taken a cautious but pragmatic view of embracing new technologies, often forcing technology adoption on banks through regulation, wherever it has seen scope to enhance customer experience and efficiency using a particular technology. RBI's proactive push of new technology adoption has not just been restricted to creating policy frameworks. It has used a mix of regulation, evangelism and even worked with the industry to make things easier and effective. The creation of National Payment Corporation of India (NPCI) which has significantly brought down the cost of electronic transactions is a case in point. The regulator also has an academic/research unit, Institute of Development and Research in Banking Technology (IDRBT) which keeps studying the opportunities and challenges in new technology areas. It is not a coincidence that both these units have been actively involved in testing out block chain as a proof of concept. India's position is quite unique here. It is a fact that India is a tech-hub. Apart from being a large technology outsourcing destination, India is also the home to vendors with a large core banking market share globally. Two of the top three core banking solution vendors—Infosys and TCS—are headquartered in India. Of late, India has also seen a lot of activity in the fintech arena. The country has become one of the global fintech hubs. While in many developed markets, fintechs and banks have enjoyed an uneasy relationship, in India, most progressive banks like ICICI Bank, Axis Bank and HDFC Bank have proactively gone to fintechs, creating contests and hackathons to get the best of innovations, sometimes even sharing their APIs with these fintechs. Bank Chain was announced on 8 February 2017 by SBI, India's largest bank. It's a 30+ member consortium

led by SBI, the country's largest lender, and includes banks, NBFCs and the National Payments Corporation of India (NPCI), an organization set up by Indian banks to support retail payments. Simply put, Bank Chain is a community of banks for exploring, building and implementing block chain solutions. Bank Chain is supported by Pune-based start-up Prime chain Technologies to create these solutions. Currently, it has 37 members and 8 live projects.

AI Opportunities in Banking Sector:
1. **Presence of many start-ups focusing on banking AI solutions:** The fact that there are many start-ups that focus on banking AI solutions imply banks have a pool of technology firms to contract and source AI-based systems from.
2. **Banking regulators forcing banks to adopt AI through regulation and effective collaboration:** Banking regulators (such as Reserve Bank of India (RBI)) are proactively pushing AI technology adoption among banks. Furthermore, central banks and FCA are collaborating with the banking sector to make AI adoption more efficient and effective.
3. **Personalized Financial Services:** Personalized connect will reach new heights as automated financial advisors and planners provide expertise in making financial decisions. They analyze market temperament against the user's financial goals and personal portfolio, and offer recommendation regarding stocks and bonds.
4. **Smart Wallets:** Digital wallets are touted as the future of real-world payment technologies, with major players like Google, Apple, Paypal and others, jumping on the bandwagon and developing their own payment gateways. This decreases the dependence on physical cash, thereby expanding the reach of money to greater levels.
5. **Data-driven AI applications for lending decisions:** Applications embedded in end-user devices, personal robots, and financial institution servers are capable of analyzing a huge volume of data, providing customized financial advice, calculations and forecasts. These applications can also develop financial plans and strategies through research, regarding various customized investment opportunities, loans, rates, fees, etc. and track the progress.
6. **Underwriting:** The insurance sector is also coming up with a storm as they are moving towards congruent automation. By utilizing AI systems that automate the underwriting process, the organizations come armed with more granular information to empower their decisions.
7. **Voice Assisted Banking:** Physical presence is slowly fading away as technology empowers customers to use banking services with voice commands and touch screens. The natural language technology can process queries to answer questions, find information, and connect users with various banking services. This reduces human error, systemizing the efficiency.
8. **Customer support:** As speech processing and natural language processing technologies mature, we are drawing closer to the day, when computers could handle most customer service queries. This would mark an end to waiting in line and hence result in happier customers.

9. **Digitalization instead of branch lines:** Banking is a lengthy process, with past records of long queues and sluggish response marring the productivity. Even opening a bank account was viewed in negative terms as harried consumers would run pillar to post, while getting the necessary documentation complete. Digitization of documentation eases that pain and creates a comprehensive platform, where the consumers and providers connect.

10. **Block chain hastening payments:** The customer base that banks serve is going through a major shift in terms of buying behaviours 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 block chain is set to inculcate the advantage of real-time payment process, hastening up the procedure of payment, thereby increasing support and satisfaction.

Artificial Intelligence Banking In India:

According to PwC FinTech Trends Report (India) 2017, global investment in AI applications touched USD 5.1 billion (Euro 4.3 billion) in 2016. Not only PNB but banks like SBI, HDFC, ICICI, HSBC and Axis banks in India have turned towards AI.

- **State Bank of India (SBI)**
SBI launched a national hackathon called ‗Code For Bank' for developers, start-ups and students to come up with innovative ideas and solutions for banking sector that focuses on technologies such as predictive analytics, fintech/ blockchain, digital payments, IoT, AI, machine learning, BOTS and robotic process automation. The bank is currently using an AI- based solution developed by Chapdex (the winning team from its first hackathon), that captures the facial expressions of the customers and helps them in understanding the behaviour of its customers.

- **HDFC Bank**
HDFC bank has developed an AI- based chatbot called Eva‗ (Electronic Virtual Assistance), built by Bengaluru based Sense forth that has addressed over 2.7 million customer queries, interacted with over 530,000 unique users, and held 1.2 million conversations. The device can provide answers in less than 0.4 seconds and has in the first few days of its launch answered more than 100,000 queries from thousands of customers from 17 countries. The bank is also experimenting with in-store robotic applications called IRA (Intelligent Robotic Assistant).

- **ICICI Bank**
ICICI bank has deployed software robotics in over 200 business processes across various functions of the company. Calling it the robotic software the bank claims it to be the first in the country and among very few in the world to deploy this technology, that emulates human actions to automate and perform repetitive, high volume and time consuming business tasks.

- **Axis Bank**
Axis Bank recently launched an AI and NLP (Natural Language Processing) enabled app for conversational banking, to help consumers with financial and non-financial transactions, answer FAQs and get in touch with the bank for loans.

The Challenges Facing India's AI Development:

1. **AI-driven automation could result in obsolescence of some skills:** There are concerns that AI-based banking systems could change the nature of existing jobs and make some skills obsolete, resulting in job losses. Consequently, it might be a major challenge to ensure user acceptance of AI in banks.

2. **Privacy violation concerns:** The capability of most banking AI systems is enabled by amassing and analyzing vast volumes of customer-related data, including demographics, expenditure patterns, physical contact, credit card and debit card details, social media profiles, and so on. In turn, the privacy and safety of consumers is at stake when using AI.

3. **Potential digital divide:** Customers who may be lacking modern personal devices (such as PCs, smartphones and tablets), Internet connectivity, and ICT skills may not be able to take advantage of banking AI systems. People of lower socio-economic statuses may be rendered incapable to exploit banking AI.

4. **Loss of emotional "human touch":** AI cannot wholly replace human bankers and branch networks. The roles of human bankers should be rediscovered to foster close banker-customer contact.

5. **Deprivation of creativity and adaptability**: Overdependence on AI to automate decision-making and problem-solving processes could erode creativity and adaptability among employees.

6. **Restrictive AI implementation and operational resources**: The costs of implementing and operating a large-scale AI system could be extremely restrictive, especially for small banks with limited resources at their disposal. Other than the initial costs, competent data science talent would be required to sustain efficient and effective AI technology operations.

7. **Integrating AI with conventional banking processes:** Currently, there is little evidence concerning how to effectively align AI and conventional banking processes. Consequently, it may not be possible to realize maximum value from AI implementation.

8. **Lack of adequate quality datasets to train and test AI algorithms**: Most AI technologies require vast volumes of structured, semi-structured and unstructured datasets, which might not be always available.

Conclusion:

AI technology has triggered a major digital disruption that has affected the entire banking sector in the 21st century. This is primarily because AI solutions have the capacity to help banking institutions to innovate, make more informed decisions, and solve complex problems with greater levels of efficiency and effectiveness. Artificial intelligence has many benefits to offer for the banking sector. Artificial intelligence is changing business processes and customer-facing services in the banking sector in India. It is also being used to meet regulatory compliance, detect fraud, and assess individual creditworthiness. The application of AI has the potential to create more efficient business processes, offer personalized services, and assist in larger goals such as financial inclusion. Furthermore, predictive analytics, neural networks, machine learning, and other AI

technologies can be used to enable banks make more accurate predictions and respond to emerging issues in a timely manner and appropriately. Therefore, AI is a technology that can enable banks to stay ahead of market competition. However, there are many pitfalls that have to be addressed to ensure that the opportunities fronted by AI are optimally exploited. There is no doubt that the recent push towards digitalization is rapidly influencing the traditional banking models. However, it has also exposed the institutions to increasing cyber security threats and vulnerabilities. The banks are increasingly looking at emerging technologies such as block chain and analytics in creating an active defence mechanism against cybercrimes.

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