Banking 4.0: Artificial Intelligence and its applications in Indian Commercial Banks

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Suma S.R. [1]
Anupama S [2]

ABSTRACT

Technology has changed businesses and business models at a rapid speed, and the speed of change is accelerating with increasing momentum. Though innovations decide the sustainable growth and destiny of organisations in modern times, the application of Artificial Intelligence (AI) in enterprises offers tremendous opportunities and possibilities while taking data driver division making. The concept of AI has to be understood as a recreation of human knowledge by optimising machine proficiency for taking organisational decision making.

The applications and use of AI in certain industries has been much more in data driven organisations when compared with the other industries in certain industries especially in banking and financial service sector and banking in particular. Automations have transformed the routine and manual transactions to technology driven automated processes. The current article focuses on AI's applications in the banking sector, as well as the changes it has brought to India's commercial banks. The adaptation of AI in the banks not only provide improved customer experience and engaged platforms, rather it helps the banks in taking decisions that enhance the efficiency and effectiveness which has direct effect on the profitability of organisations.

Keywords: *Artificial Intelligence, Technology, Financial Sector, Banking Industry, Commercial Banks, Customer Service.*

1. INTRODUCTION

The rapid adoption of technologies has increased the dependence of IT in the financial services sector, especially in banking. Today banks have gone a long way from computerisation to core banking platforms, CRM to Enterprise systems, and further ahead by using business intelligence solutions to dig out useful data from the internal and external sources while operating in the highly competitive business environment.

Most of the leading banks in India use business intelligence solutions especially artificial intelligence to generate new businesses and retain their esteemed customers. Further, these intelligent systems also open out considerable opportunities for banks in various aspects of banking business including human asset management. Although the use and adoption of AI in Indian banks is not so advanced yet, most of the banking organisations have recognised the benefits of implementation of AI while operating in the turbulent business environment.

The present study aims at enlightening various ways through which banks derive benefits from the implementation of AI systems.

[1] ***Dr. Suma S.R.****: Associate Professor, Providence School of Business, Chengannur, Kerala.*

[2] ***Ms. Anupama S:*** *Assistant Professor, Providence School of Business, Chengannur, Kerala*

Corresponding Author*: [1] Dr. Suma S.R.: Associate Professor, Providence School of Business, Chengannur, Kerala.*

E-mail: sumnath@gmail.com;

2. AI: AN AID TO BANKING SECTOR

India's financial sector relies heavily on technology. The Indian banking sector is testing with AI to enhance client experience. The banking industry has embraced cutting-edge technology in a variety of ways, from basic banking and payment systems to risk management and, more recently, digital efforts.

Artificial intelligence (AI), as described by John McCarthy as "the science and engineering of making intelligent machines," has been around for decades. Because of its vast potential, its adoption has been dubbed the fourth industrial revolution. The banking industry, in particular, is undergoing a digital change. The banking business in India has evolved from a people-driven one to a machine-driven model in recent years. Global spending on AI applications has surged from $4 billion in 2015 to 5.1 billion dollars presently, according to a 2017 PwC Fintech India study.

In the fields of business, management, operations, and finance, the banking industry has discovered the usage of AI. If it is to keep abreast of the competitive times and provide speedy services to its consumers, the banking sector cannot remain unaffected by technology. AI is utilised for personalised financial services, underwriting, smart wallets, voice aided banking, application to assist in lending decisions, customer assistance, and digitization, to name a few. More banks are embracing new technologies like artificial intelligence (AI), cloud computing, and block chain to cut operating costs and boost efficiency. The expansion and development of the AI business will increase productivity while cutting prices. Emerging technologies such as block chain and analytics are being eagerly anticipated by banks as a live defence.

Banks are incorporating artificial intelligence into their front, middle, and back offices. The bank offices are a network of self-service terminals that provide consumers with a variety of value-added e-services. AI can assist with data structuring and sorting, as well as assisting the banking sector in utilising data to better customer relationships.

The impact of AI is far-reaching and even individual customers profit from its use. Because of the government's ambitions to drive India into a digital economy, AI is unavoidable in the banking sector. This could only be realised if India's financial sector made considerable use of AI. Artificial intelligence (AI) has emerged as a major game changer in the Indian banking industry.

3. WHY IS ARTIFICIAL INTELLIGENCE USED IN THE BANKING INDUSTRY?

Artificial intelligence holds a lot of promise for the banking industry's advancement and expansion.It automates and streamlines the working process. Here are some of the most important reasons for banks to use AI:

In the banking industry, there are numerous problems.

- Extensive challenges in the banking sector.
- Thrust for an activity that is based on interaction.
- Self-administration should be started in the branches.
- Reduce your workload.
- Obtain substantial insights by collecting and analysing relevant data.
- Boost banking revenue
- Systemize your risk management.
- To lessen the odds of being a victim of fraud
- Investing management
- assisting consumers in making rapid and productive decisions
- Customers want a variety of personalised solutions.
- Employee productivity is increasing.

- To assist in concentrating on productivity and efficiency.
- With the use of modern techniques, visualisation can be used to expand human potential.

4. REVIEW OF LITERATURE

Chan Kok Thim and Eric Seah (2011) In this study, we look at how to use neural networks to increase the feasibility of artificial intelligence in the real world. This paper describes the Efficient Frontier of Markowitz Theory and creates a neural framework heuristic to help finance professionals of all levels better grasp how AI can build appropriate portfolio capacity and deliver yields.

Ryoji Kashiwagi (2015) in his study examines how synthetic man-made AI is set foot in its third flowering phase, following a process referred as profound learning. Artificial intelligence is being applied in the financial sector for a range of applications. Businesses in the financial sector should make better use of artificial intelligence by using open innovation initiatives.

Mayur (2017) claims that India's financial sector has invested heavily in chatbots and artificial intelligence (AI) in order to improve customer service. ICICI Bank, YES Bank, and HDFC Bank are among the banks that are taking advantage of these chances, allowing customers to pay without touching a button. At three of its Mumbai, Kochi, and Bengaluru branches, HDFC Bank has installed a humanoid named Ira. FinoPaytech was financed by ICICI Bank, YES Bank supported 1,000 fintech start-ups through its Yes Fintech programme, and HDFC Bank developed "Industry Academia," a programme that brought together engineering and management schools. To offer financial planning and asset management services, Fisdom has partnered with Bank of Baroda and Lakshmi Vilas Bank. GOQii, a fitness technology firm based in the United States, has collaborated with Axis Bank..

Simran Jewandah **(2018)** indicates that the banking industry can't stay away from innovation if it wants to be serious about providing individualised service to its customers. Artificial intelligence enables customised financial administrations, smart wallets, underwriting, voice aided banking, application to assist with loan choices, client assistance, and digitization. It discusses AI's application and recommendations for India's leading banks. Computer-based intelligence has benefited in the detection of frauds, cost reductions, and revenue growth, all of which have improved the client experience. SBI, HDFC, ICICI, and Axis Bank were noted as having evolved into the advanced period through the usage of chatbots and automated programming.

Sunil Kumar (2018) examines the growth of artificial intelligence (AI) from its inception in the late 1950s and early 1960s to the present day, as computer storage and computational capabilities have grown. Renowned scholars have highlighted concerns about existential threats, safety, the economic slump, unemployment, and other challenges. Healthcare, education, cyber security, law, finance, information surfing, transportation, virtual assistants, ecommerce, customer service, and energy were all explored as part of the international AI scenario. The researchers looked at policy documents from the United States, the United Kingdom, Japan, Singapore, and even China. The paper concluded with a discussion of AI advancements in India. TCS, IBM, and Infosys are just a few of the IT behemoths that have made important contributions to AI development. India has a wealth of knowledge.

Nanda Kumar (2018) talks on the challenges that retail banking is facing as a result of disruptive technology like intelligent automation and competition from Fintech

start-ups.It focuses on how to use Robotic Process Automation (RPA) to maintain a competitive advantage and increase profitability by improving efficiency, accuracy, 24/7 operations, cutting costs, and offering customers with new services and a better experience. The association between four independent variables, namely security and privacy, dependability, usefulness, and human-like interaction, was explored using the dependent variable.

Vijai (2019) explains AI's conceptual understanding, types, and history, as well as its contribution to the banking sector's growth through the formation and support of various regulatory bodies, enabling for speedier adoption of cutting-edge technologies like AI and block chain technology. India's emergence as a tech hub has been aided by the establishment of regulatory organisations, university research divisions by various institutions, and the presence of significant IT corporations in the country. It has had a significant impact on business operations and customer service. The research also discusses the advantages and pitfalls of AI applications in India. Both governmental and private funding models should be supported in India to promote AI research growth. In order to address the needs of

5. RESEARCH METHODOLOGY

This section discusses the various methods used to collect data. The research is both descriptive and exploratory. The goal of the research is to improve the banking industry's grasp of artificial intelligence. Using previously acquired data, the research illuminates the current state of artificial intelligence. Quantitative data from both primary and secondary sources is included in the paper. The primary data was gathered through in-depth discussions with 100 clients of various banks. Secondary data was collected in order to acquire a better grasp of the research issue. Secondary data for the study was gathered from papers in online libraries and journals, publications, and other sources.

6. OBJECTIVES

As a result of the research, the following goals were established:

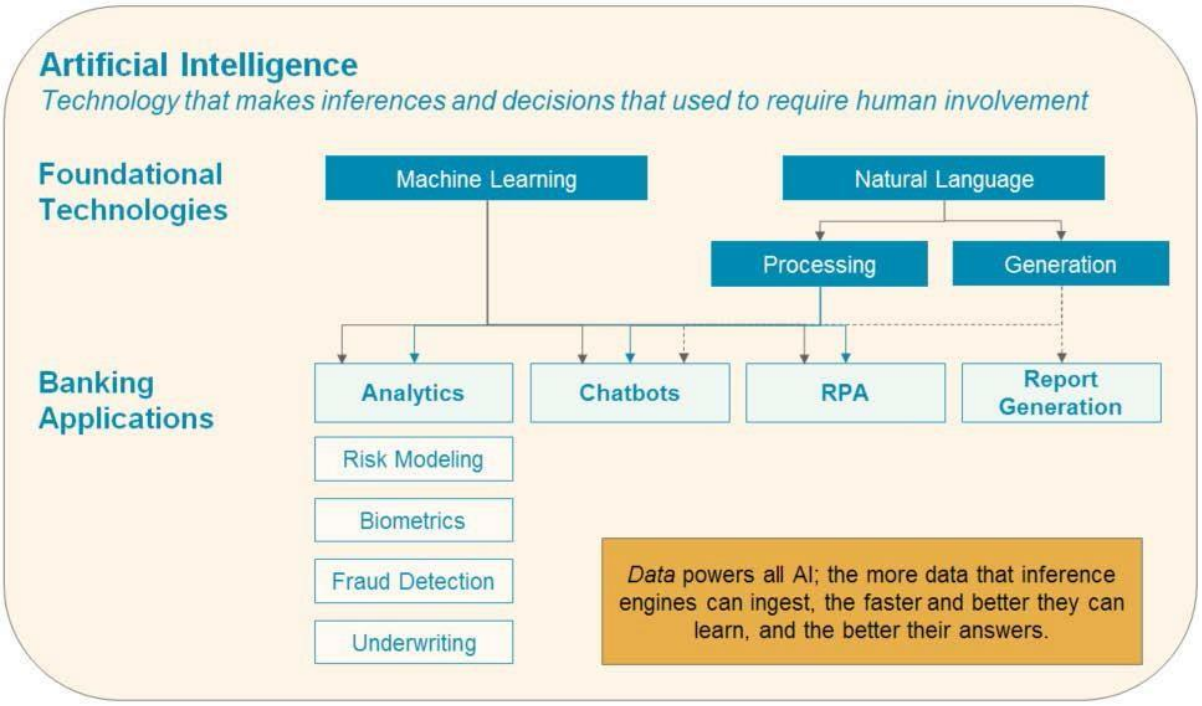
(1) To gain a deeper knowledge of artificial intelligence's application in the banking business.

(2)To investigate the influence of artificial intelligence in the banking sector and how AI is changing the profile of banking

7. ARTIFICIAL INTELLIGENCE IN BANKING

This article will be useful to bankers looking for an overview of AI practices in the banking industry. AI in banking can be regarded as a technological advancement that aided in the making of choices and decisions that required direct human inclusion.

The entirety of AI is supported by a series of vital and interconnected technologies centred on machine learning and natural language. Importantly, AI is about more than just improved innovation. It's not about faster processing, more informational indices, or even a large number of strictly implemented rules. These advancements have produced incredible results; but they are now executing old tasks better. One of AI's main strengths is its ability to respond probabilistically to legitimate sources of input. The four main AI applications today are Analytics, Chatbots, Robotic Process Automation (RPA), and Report Generation, which are based on the basic breakthroughs and applied in a banking setting. The outline beneath portrays the core AI connections between fundamental advances and banking applications, all of which depend on huge measures of information, AI's backbone.



Source: Celent analysis. Arrows represent influence of source on target

The banks can hardly wait to begin on their artificial intelligence venture since they should contend in a future loaded up with creative and pattern setting innovation.

Drive-thru Banking Service -. If you use this service, the banking exchanges should be possible without getting out from the vehicle. There is a way where the client can share data through a window. In July 2018, Clinc, an Ann Arbor-based start-up that created voice-controlled AI platforms for banking sector in the year of 2015, volunteered to help with a drive-through assembly. Its conversational AI development could understand orders even if people spoke with a heavy accent or had language barriers, and it could improve the dialogue.

Bank Stations - Artificial intelligence can be utilized at the front, centre, and administrative centres of banks. The bank stations are a collection of self-service terminals that provide customers with a wide range of important e-administrations, such as bill payments, government e-administrations, and so on. Bid data is now the industry norm, and banks are using it to revolutionise the sector. Artificial Intelligence is assisting the organisation in coordinating the data, and the banking sector is using the data to strengthen client relationships. To serve the e-age, AI is the fate of banking.

Passbook update kiosks – In recent years, the Indian banking sector has advanced from a people-headed to a machine-driven model. A passbook printing kiosk is a self-service machine that serving the clients.

Banks named State Bank of India and BOB, have done an outstanding job of introducing this feature. They have introduced self-service passbook counters, which allow consumers to print their own passbooks.

For example, Swayam (passbook printing kiosk) is a service offered by Indian Bank, SBI that employs barcode technology to allow clients to update their passbooks. Regardless of the way that banks have been recruiting, the assortment of ranges of skill set is moving, with a focus on front-end staff.

The Intelligent Banking Assistant - Chatbots – They are innovative technologies that work as an answering machine and provide constant service to customers. It is designed

to make human-computer interaction easier. They are examples of artificial intelligence in banking that are replacing front-desk areas at banks.

These Artificial Intelligence -driven devices furnish clients with a next-generation digitised and customised instinctive experience. SBI, an Indian bank, has created SIA (SBI Intelligent Assistant), a chatbot that assists customers with routine financial tasks in the same way that traditional bank staff do. It also answers NRI customers' questions by providing answers via the SBI gateway's chat box. Chatbots aid with basic tasks such as opening and cancelling accounts, transferring funds, and so on. In comparison to a phone call, the chatbot gives the customer more options by providing useful links for finishing the interaction. The chatbot can also provide quick availability and help customer service representatives minimise their workload.

Cash Deposit Machines - Cash Deposit Machines are self-aid terminals that permit you to put aside a cash deposit at any time. This help takes out the need to stand by in huge lines at banks to deposit cash. Each completed transaction generates a receipt for the customer. This machine can also be used to make payments to various accounts.

ATM Machine Helpline - These aid customers in contacting their banking firm in the event of a crisis, and client services are also available at ATMs. In addition, AI has been shown in ATMs. The following are the fragments that have been offered.

Machine learning in action includes AI for ATM security, machine vision ATM cameras, facial recognition for security and improved client experience, ATM machine care, and analysing ATM cash requests.

Mobile Banking - Mobile phones are becoming smarter all over the world. A major number of individuals are dedicated to mobile banking services, and that implies that versatile applications of banking appeal to them. Clients have promptly progressed to phone banking services. Having a personal attendant, regardless of whether it's Siri (Apple) or Alexa (Amazon) is delightful. Clients all across the world have praised it and expressed their delight with it.

Banking and Block chain Technology - A block chain is a distributed, decentralised, and sophisticated record. It is a database of digital data that is open to the public. AI is the cerebrum or motor that enables decision-making and aids in data analysis. Block chain includes encoded information, and Artificial Intelligence is the intellect that enables directing and controlling and assists in data analysis.

Block chain technology is beneficial to the digital currency sector; however this is not the case. Data security, fraud prevention, and other challenges associated with computerised transactions are addressed with block chain technology.

Algorithms based on AI and Fraud Detection – Algorithms in light of artificial intelligence and Fraud Detection - Artificial intelligence is based on problem solving operations. AI includes an assortment of rules, guidelines, critical thinking activities that computers must obey. AI uses behavioural indicators to make risk-reduction recommendations. Feedzai, a data science start-up, for example, utilises algorithms to detect fraud.

Algorithms are used in artificial intelligence and machine learning systems to analyse patterns and avoid financial fraud. Fraud detection has advanced and will continue in the coming years.

8. BANKING SECTOR OVERVIEW AND ARTIFICIAL INTELLIGENCE APPLICATION IN STRATEGY IMPLEMENTATION

Significant recent developments, such as demonetization and government-supported efforts aimed at establishing digital India, have pushed economy in India to go

cashless, but have also amassed a big amount of data in banks, needing quick, precise, and predictable record upkeep. Automation has been the backbone of modern banking since the 1990s, and the banking industry has long considered computers to be a vital part of its operations. Cash withdrawals, fund transfers, check book requests, and so on are examples. Because of critical changes in the economy, like expanded work volume, changes in purchaser inclinations, client mentalities, destinations, populace development, contenders, managerial essentials, and the need to have strong admittance to the executives and a safe financial climate for trades, the financial area has started to utilize AI to digitise the dreary labour-intensive operations. As a result, traditional branch banking has been changed into internet banking.. The objective of 'Advanced India' is to change India into a carefully empowered and informed economy. Technological advancements in computing, storage, mobile phones, and widespread usage of social media are assisting and supporting this movement. 'Digital India' aims to transform India into a digitally enabled and informed economy..

Organizations are heavily reliant on interconnection, computerization, machine learning, and continuing data processing in this era of change to combine actual creation/administrations with advanced innovations. This shift is alluded to as Industry 4.0, or the fourth modern revolution. It is a perfect platform for integrating digitalized advancements, such as artificial intelligence, with banking duties, which provides Banks with significant opportunities for profit while also reducing reaction time for their customers. As a result, both customers and banks will become increasingly interested in using AI to enable more productive, rapid, and unbroken processes. Whenever innovation is appropriately made due, it advances an adjustment of status, progress, and a greater for conveying services.

Professor John McCarthy of Sandford University, one of the principal architects, developed the term Artificial intelligence in 1955. The US Department of Defence began training computers to function as human-like forces in 1960. (Russell and Norvig, 2003). AI is a control of computerized advances that inserts human information into machines by planning and applying computations that empower machines to learn, change, and make courses of action all on their own from translation of information over an undefined time period, allowing tasks such as planning, critical thinking, learning, visual recognition, language processing, and so on to be precisely overseen (Bellman, 1978). Artificial Intelligence is referred as the ability for machines to do demonstrations that need knowledge, whether performed by humans or machines (Kurzweil, 1990), employing calculations that can perceive, reason, and act (Kurzweil, 1990). (Winston, 1992). From robots to machine learning and predictive analysis, Artificial Intelligence has made a significant contribution to technological development.

The most successful business framework was developed in the 1980s by Digital Equipment Corporation, and its commercial applications began flooding the market in 2005, with Apple, Microsoft, Amazon, and IBM all contributing to its growth (Russell and Norvig, 2003). In an Infosys evaluation of 1600 organization leaders in dynamic jobs, 75% of the executives considered artificial intelligence as a prominent element to the organization’s prosperity. By 2020, companies that have successfully implemented AI can expect a 39 per cent rise in revenue. According to Forbes magazine, AI can cut a company's operational costs by up to 22%. As a result, it is apparent that the banking industry has begun to include AI into its system execution in order to gain a competitive advantage in

terms of speedy, flawless, feasible, and proficient client care while also reducing branch visits.

9. FINDINGS

This study is based on information gathered from in-depth interviews with clients of a number of banking institutions. The majority of respondents believe that artificial intelligence is significant and that new advancements in AI are exciting. Artificial intelligence was found to be beneficial by 75 out of 100 banking respondents. For cash deposits, 92 out of 100 clients used an automated financial consultant. AI in banks has enhanced the speed of administrations, according to 83 of them. Artificial intelligence, according to the majority (84 out of 100), can improve bank security in a variety of ways. Artificial intelligence has become a vital instrument in the banking sector, according to 94 per cent of respondents. 12 out of 100 people do not have complete faith in computers; they require the assistance of bank personnel, and they prefer to visit banks in traditional ways.

10 CONCLUSION

Artificial Intelligence (AI) has shown to be an important part of future success.When judged by current banking features, AI has improved its reputation, but these features have dominated today's actual banking reality. At this time, just a few banks have begun to use AI or have adapted to new technologies. Despite the fact that AI is still in its infancy, banks are moving away from traditional banking and toward comfort banking.

The banking industry can benefit from artificial intelligence in a variety of ways. AI can acquire progressive modifications from financial organisations, whether it's an Android application development or an iOS application development. Through an app, banks and financial institutions may learn about their customers' habits and provide them with personalised information and a better experience. In India, banking services are considered standard and the country is eager to embrace AI technology. To hold on aware of the competition and to remain as an innovative organization, AI has become a critical device in the banking sector.

References

Bellman, R. (1978). An Introduction to Artificial Intelligence: Can Computers Think? San Francisco: Boyd & Fraser Pub. Co.

https://www.celent.com/insights/940768915

https://www.celent.com/insights/194471179

C Catalini, C Foster, R Nanda (2018) - tuck.dartmouth.edu Machine intelligence vs. human judgement in new venture finance

Jewandah, S. (2018). How Artificial Intelligence is changing the banking sector - A case study of top four Commercial Indian Banks. International Journal of Management,

Technology and Engineering. Retrieved from http://ijamtes.org/gallery/66.july%20ijmte%20-%20711.pdf

Kaur, N. (2020). Banking 4.0: “The Influence of Artificial Intelligence on the Banking Industry & How AI is Changing the Face of Modern Day Banks.” 11(6), 577–585. https://doi.org/10.34218/IJM.11.6.2020.049

Kurzweil, R. (1990). The Age of Intelligent Machines. MIT Press.

Russell, S., & Norvig, P. (2003). Artificial Intelligence-A Modern Approach. Dorling Kindersley (India) Pvt. Ltd. pp 16-25, 2nd ed.

Winston, P. H. (1992). Artificial Intelligence. Boston, MA, USA: Addison-Wesley Longman Publishing Co., Inc.

Thim, C.K., & Seah, E. (2010). Optimizing portfolio construction using artificial intelligence. 5th International Conference on Computer Sciences and Convergence Information Technology, 338-343.

Understanding the Investment into AI in Banking: Celent Digital Panel Series 6, July 2017

https://www.enterpriseedges.com/future-artificial-intelligence-banking-sector

https://www.nri.com/en/knowledge/publication/fis/lakyara/lst/2015/11/02