Transformation Aeon : Artificial Intelligence Powered Banking

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Abstract

"Machine learning is the last invention that humanity will ever need to make" – Nick Bostrom.

Banks are the backbone of financial system. The present technological advancement and the tremendous growth of information technology had bought a drastic transformation in the banking sector. The banking sector in India can be broadly be classified as banking companies, non-banking companies, and the regulatory institutions which regulates them. Though the automation of banking sector is at a nascent stage, the technology is observed to creep into every corner. It has been envisaged that the technological growth of banking helps in improved customer centric services, reduction of fraudulent risks, attainment of financial inclusion, and even more secured operations. Automation has facilitated a direct human involvement. Think about a virtual agent such as Siri, Alexa, Google home which helps us to get solutions instantly. Likewise, AI powered banking may enable a computer system to observe sense, interpret, evaluate, and interact as similar to humans. Thus, this paper tries to analyze the growth rate of Fintech in terms of the application of AI and proliferation of digitalization in banking which could enable relationship banking. Furthermore, the era of financial technology could be a wide opportunity of innovation and automation if AI undergoes a rapid and increased change of reality for financial institutions.

Keywords : Automation, Artificial Intelligence, banking, fintech, technology

JEL Classifications : G10, G15, M10, M20, M30

I. INTRODUCTION

The deployment of Artificial Intelligence (AI) technologies in the banking sector has been perceived to be increasing in the recent years. The concept of artificial intelligence has been observed since 1956 but it was not upto the reach in the past decades. However the development of technology has made AI applications become commercially feasible. AI is profound to be overpowering in every area of life, in business it is expected to bring a radical change by enhancing each and every business operations and functions. It has enabled a smart virtual environment where you can just access information and communicate with virtual assistants. The banking domain at this point has to be redefined along with the progressive emergence of automation. Imagine a virtual agent such as Siri, Alexa, and Google home which help us to get solutions instantly.

Likewise, AI powered banking may enable a computer system to observe sense, interpret, evaluate, and interact like humans. In a nutshell, AI helps a computer based virtual agent in thinking and sensing which the building chunks of human intelligence are. These technologies are implemented in both front end and back end processes. The unparalleled growth of Fintech in India can be due to the rapid increase of

mobile technology. Thus, the consumer looking forward for convenience and innovation remains as a reason to develop services that enhance technological practices such as mobile banking, internet banking etc. At present there are over a billion mobile phone users, 330 million internet users, and 240 million smart phone users in India, a glimpse ahead shows that the future of the banking will be collaborative, exciting, and upgraded.

II. MOTIVATION OF THE STUDY

The study focuses on the following objectives :

✎ To understand the rapid level of transformation in the banking sector with the emergence of man-made intelligence.

✎ To analyze the dominance of automation in financial technology.

✎ To identify the extent of readiness of banks to cope up with AI powered applications.

III. ARTIFICIAL INTELLIGENCE IN BANKING – A LITERARY REVISIT

Parsons, Gotlieb, and Denny [1] revealed effect of AI on banking efficiency. Computerization is one of the elements which improve the effectiveness of financial exchanges. They reasoned that better levels have been accomplished without related increment in the quantity of workers. Additionally, it has been workable for public sector banks and old private banks to improve their profitability and effectiveness by utilizing IT.

Burgt [2] said that trust is pivotal with regards to AI in banking. Complex AI advancements are new, and these will reduce efforts of banks administrators in a more extensive society in becoming comfortable with their applications. Banks must guarantee that this innovation is conveyed scrupulously over the financial framework, which may require certain progressions to the administrative system.

Latimore [3] stated that a region of extreme banking concentration for a long while has profited by technological enhancements even without AI. Major advances in handling data and information control has given human experts progressively integral tools. Couple this with AI progress, and firms can possibly reveal bits of knowledge that were earlier undiscoverable.

According to Goudarzi, Hickock, and Sinha [4] the utilization of AI can possibly make progressively proficient business firms offer customized administrations and aid in bigger objectives such as financial inclusion. Notwithstanding these advantages various moves exist for the advancement of AI in the finance area, such as enhancing purchaser trust, secured information and privacy of transactions. One way money related foundations are coping up with difficulties and seeking after advancement in the zone of AI is through associations with new businesses and fintech organizations.

In [5] it has been stated that the development of technology is both fast and great for banks and without a doubt, all endeavors should ground their reception systems and presumptions in actuality. In any case, paying little attention to beginning hiccups and development times for anticipated outcomes, banks should burn no time in executing their AI plans. Since AI is developing so rapidly, it doesn't permit banks the advantage of holding up till it develops, and the individuals who resist are always unable to find the pioneers. Speedy movers have another bit of advantage in that their AI frameworks will begin learning sooner than others, and will subsequently develop quicker too. With AI, the industry will experience a long journey of reconsidering banking, spreading over quite a long while, numerous achievements and at any rate a couple of difficulties.

Deloitte and Confederation of Indian Industry [6] analyzed that advancement in AI drives business development and the net worth, despite digital risks. Inventive advancements like SMS-based OTP and chip-based cards have helped the banks to execute security controls to alleviate customary digital risks. In any case, as the innovation has developed, assault vectors have additionally gotten progressively modern. Questions are currently being raised on advancements that were recently thought as secure. Cyber risks in disconnection seriously constrain our capacity to comprehend the total effect of digital hazard. There is a requirement for upgraded cyber risk evaluation system and testing strategy to persistently identify and secure against developing cyber dangers. While being secure is a higher priority than any time in recent memory, there is a need to likewise be continually careful and flexible in face of developing cyber risks.

In [7] it has been stated that it was the way of life of a

startup to attempt these things quicker and emphasize on advancements like AI. As they accumulate the information, there is the potential for more up-to-date FinTechs and challenger banks to occupy the market share, as they use technology and data to offer an undeniably increasingly valuable (and maybe all encompassing) experience of banking.

Sabharwal [8] revealed that none of the banks chose by him in his study except new private area banks utilized AI based applications. The new private area banks likewise utilized AI brainpower essentially for frivolous purposes like programmed cheque book re-order facility. Yes Bank utilized AI for employee performance assessment, credit assessment, and portfolio assessment.

IV. RESEARCH METHODOLOGY

The conceptual framework of the study was drafted on the basis of secondary data. The sources of data collection included various websites, survey reports, books, and articles. The study had been framed in such a way that it explored the rapid advancement of automation in banking industry and the extent of ability of the bankers to cope up with the change.

V. ARTIFICIAL INTELLIGENCE POWERED BANKING

Artificial Intelligence is technology that behaves intelligently using skills associated with human intelligence (e.g. ability to think, learn, and act autonomously).

The term Artificial Intelligence cannot be defined in with a single word as it is a combination of related technologies such as big data analytics, machine learning, deep learning, virtual agents, and chatbots which replace human intelligence.

Considering the banking business that remains in a precarious situation, as monetary elements stay delicate, new contenders proceed to assault, and buyers continue with their changing demands. In the midst of contracting edges, banks' pioneers are feeling the coercion from investors to support profit and revenue. Thus, Artificial Intelligence has not yet pitched up to leverage on its full-fledged adoption in the banking system.

Though the application of AI in the Indian banking sector is at a developing stage, the advantage is seen in terms of adoption of 'innovation centers' and running hackathons. This enables banks to have collaboration with fintech companies. The application of AI in banking enables detection of frauds, management of credit risk, better customer service, shaping strategies to detect money laundering, providing customized investment advices for the customers, and also to develop relationship banking. Thus, AI in banking sector is noticed to be one of the recent trends in the upcoming years.

VI. AREAS OF IMPLEMENTATION

The key areas of application of Artificial Intelligence can be classified as front end, middle end, and back end. As a result of advancement the banking sector undergoes a rapid change over its entire system.

(a) Front End

In order to retain their customers bank nowadays focus more on front end processes to personalize and improve customer services as this will also help to enhance sales and marketing, wealth advisory, and financial assistance can also be developed. A virtual assistant named Nina has been rendering a conversational customer service at Swedbank to help customers type their queries on its website and it helps them find answers. It may be seen that technology could help us find better solutions to problems with speed and accuracy.
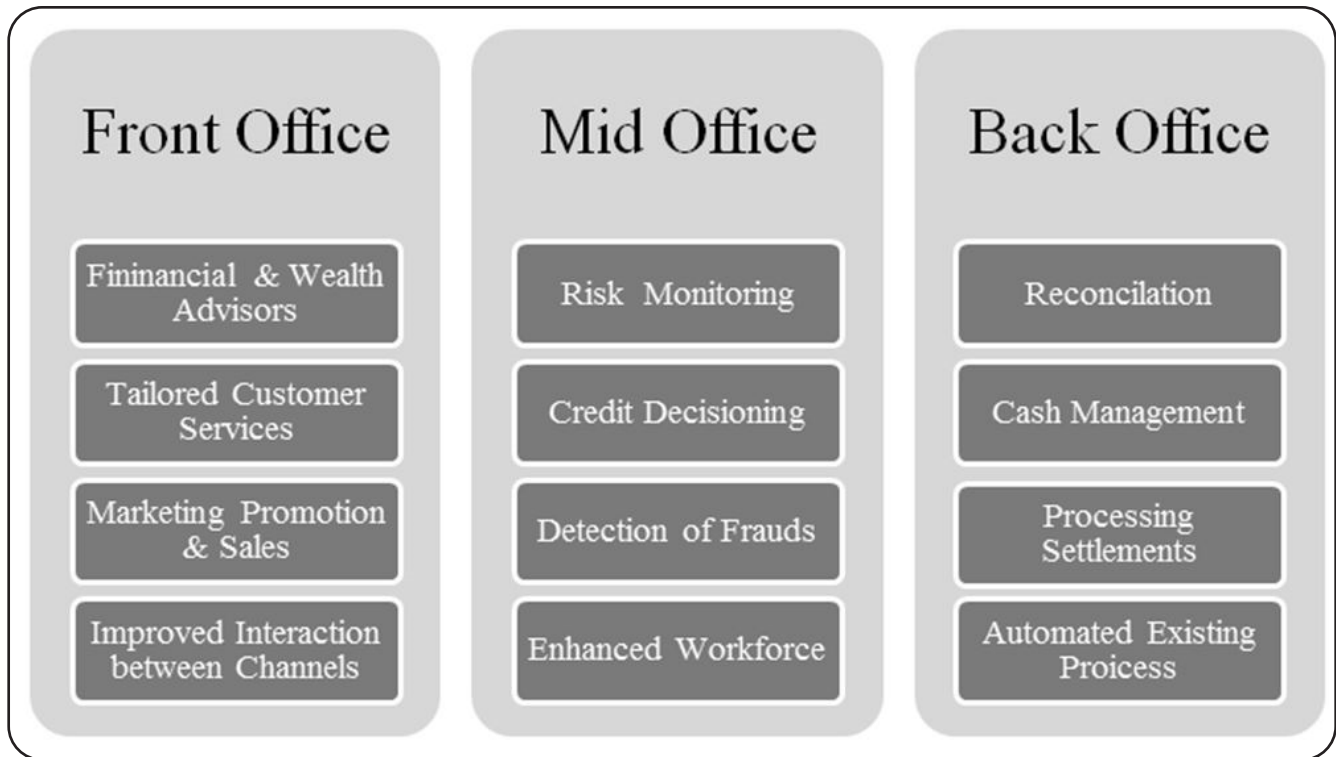
(b) Middle End

In the middle end, Artificial Intelligence can be an effective tool in detecting risk assessment, fraud detection, anti-money laundering, and in assessing the credit score. Machine learning capabilities help improve system capabilities to continuously learn from false positives and negatives. AI can also help to know about clients in a better manner.

(c) Back End

According to Accenture report [9] banks are observing 20-25% savings in their operations by applying intelligent assistance and artificial based systems in their back office. This could help banks have better reconciliation, management of cash, and liquidity and improved settlement process.

TABLE I.
AN INTEGRATED AI SOLUTION FOR BANKING OPERATIONS

Front Office	Mid Office	Back Office
Fininancial & Wealth Advisors	Risk Monitoring	Reconcilation
Tailored Customer Services	Credit Decisioning	Cash Management
Marketing Promotion & Sales	Detection of Frauds	Processing Settlements
Improved Interaction between Channels	Enhanced Workforce	Automated Existing Proicess

Source : https://www.bcsconsulting.com/blog/an-intelligent-future-for-banking-processes [14]

VII. THE WAY ARTIFICIAL INTELLIGENCE BENEFITS BANKING

The idea of implementing AI in banking sector is an indication that technology is finding its new way. The current scenario of banking has a huge requirement of automation because of consumer behavior and convenience. Deployment of Artificial Intelligence in banking could help tackle the digital wave of fintech sector. Artificial Intelligence can benefit banking in the following ways :

(a) Algotrading

It has been observed that Artificial Intelligent systems are responsible for almost 70% of trade today. Algotrade could enable to identify the fluctuations in financial markets and help in investment decision. It also provides a wide range of trading opportunities from the inputs. Thus, algotrade can be used in order to provide user friendly trading services.

(b) Detection of Fraudulent Risks

Artificial Intelligence has a remarkable impact on the detection of fraud, anti-money laundering, malpractices etc. The Bombay Stock Exchange has used AI assistance for detecting rumours since 2016. The FICO Falcon Fraud Management Solution is the advanced software that makes use of artificial intelligence to tackle transactional fraud.

(c) Chatbots for Customer Service

Chatbots will be a milestone in the digitalization of banking. Chatbots refers to the virtual assistants that are capable of predicting customer behaviour and providing services. They are much better when compared to chats which are not automated. These bots can predict spending habits and can advice customers on where they are spending more money. They can also provide credit score.
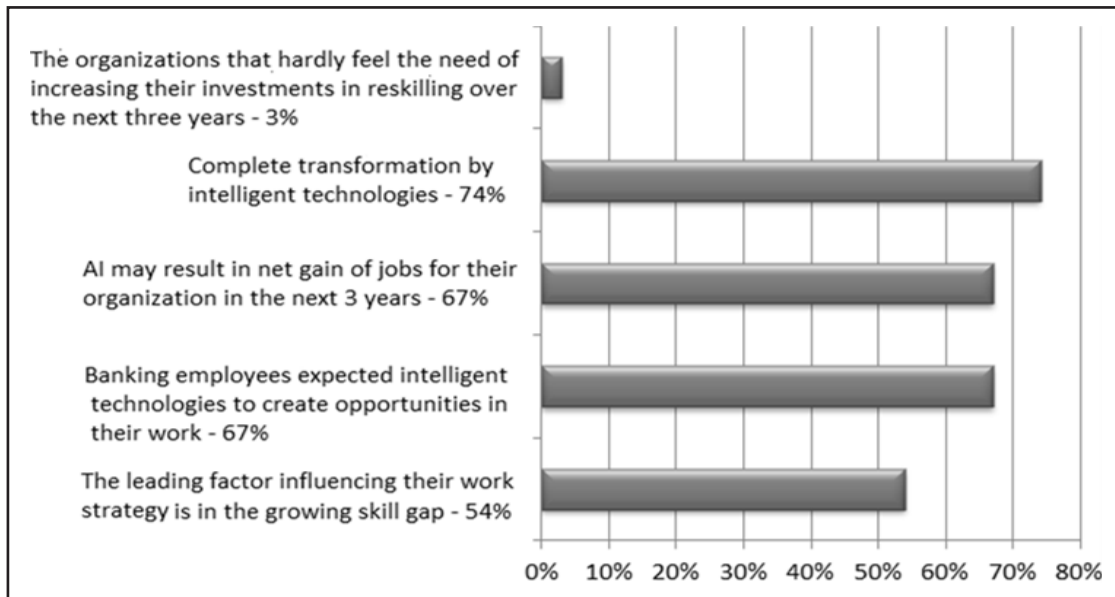
Fig. 1. AI Adopting Readiness of Banks
Source : https://www.accenture.com/in-en/insights/banking/smart-banking-ai [10]

(d) Forecast cash at ATMs

It is quite good to imagine an algorithm which could help us detect cash at ATM and to enable optimization technique for money saving.

(e) Facilitate Transaction

AI can be a source of support to have secured transactions of money. Banks have started to combine transactions with voice recognition which may enable a consolidated form of transaction. Thus, the transactions can be secured and can be productive by using AI methods.

(f) Robotic Process Automation (RPA)

RPA adopts a number of techniques to reproduce the day to day human roles automatically, more accurately, and these data inputs are examined and sent as an output for further processing. This may help in the reduction of manual work.

VIII. READINESS OF BANKS IN ADOPTING AI

Though the concept of artificial intelligence seems to have a warm welcome among the banking sector. The question here is whether the banking sector is ready for it? The readiness of banks determines the rapid advancement of technology to be seen in the fore coming future.

As per the survey [11] conducted by Accenture, it has been observed that between 2018 and 2022, banks that invest in AI and human-machine collaboration at the same rate as top-performing businesses could boost their revenue by an average of 34% and their employment levels by 14%. Thus, we can envisage that the upcoming future holds a way to welcome artificial intelligence technology.

IX. FUTURE OF AI AND BANKING

This paper tried to throw light upon the expected future of automation and technology in the banking sector. We predict that AI in banking sector is going to bring about a drastic change in the future. As per the FinTech [12] Trends India Report by PwC in 2017, the worldwide spending in Artificial Intelligence has contacted by $ 5.1 billion. The IHS Markit's [13] "Artificial Intelligence in Banking" report asserts that this expense had grown upto $ 41.1 billion by 2018, and is expected to reach $300 billion by 2030 [14]. This shows that AI has arrived at a phase where it has become moderate and productive enough for execution in monetary administrations. As per Deloitte, AI will give the base to expand advanced products and services. Further, Artificial Intelligence can possibly change customer

TABLE II.

AI APPLICATION USER BANKS

NAME OF USERS	AI SOLUTIONS	INTRODUCED YEAR
State Bank of India	Beta – testing SIA-SBI intelligent assistant using an AI-based solution developed by chapdex	2017
City Union Bank	Uses CUB Lakshmi Robot	2016
ICICI Bank	Uses Ipal, an AI-based Chatbot	2017
Axis Bank	Launched an AI & NLP enabled app developed by action AI	2018
Bank of Baroda	Uses AI powered robot ADI(Assisted Digital Interaction)	NA
Kotak Mahindra Bank	Uses AI solution 'Keya' by Quadratyx	2018
Canara Bank	Uses a humanoid robot called 'Mitra'	2017
HDFC Bank	Uses AI empowered Chatbot 'Eva' developed by Senseforth AI Research	2017
IndusInd Bank	Uses 'IndusAssist' powered with Amzon's virtual Assistant Alexa	2018
Union Bank of India	Uses a Chatbot Assistant UVA (Union Virtual Assistant)	2017
Andhra Bank	Uses AI Chatbot ABHi	2019

Source : https://dzone.com/articles/how-the-banking-industry-benefits-from-artificial [15]

interactions and build up totally new plans of action in banking. Thus, it is quite clear that the future of banking should be a faster in accepting AI trends. Banks must also be concerned with security issues to have secured and protective AI practices.

X. CONCLUSION

The rise of automation even though started decades ago, the present century tries to hold a greater place of making it real in larger scale. Technology has become an inevitable part of human life. The concept of Artificial Intelligence seems to be an evolution in the banking era. Its main purpose is to have a better interaction with customers, to increase efficiency of operations, and to be technologically viable. AI can bridge the gap between automation and human intelligence. Thus, it is the banking sector which is to be ahead in adopting this technology in order to fulfill the goal of AI. It can be concluded that the rise of automation and technology are the unstoppable forces that keep conquering in each sector, banking is not exceptional.

AUTHORS' CONTRIBUTIONS

Rucksar Begum conceived the idea of this paper on AI with Banking and has given insightful contributions towards the progress of research. Dr. R. Rajkumar has suggested valuable inputs on the article structure and framing of the article. Dr. R. Amudha reviewed the references to substantiate the outcome.

CONFLICT OF INTEREST

The authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest, or non-financial interest in the subject matter, or materials discussed in the manuscript.

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