Application of Artificial Intelligence in Promoting banking Sector – Rise of Automation and Technology

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Abstract:- 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 classified as banking companies, non-banking companies, and the regulatory institutions which regulates them. Though the automation of banking sector is at nascent stage, the rise of 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. Imagine a virtual agent such as Siri, Alexa, Google home which helps us to get solutions instantly.Likewise, the AI powered banking may enable a computer system to observe, sense, interpret, evaluate and interact as similar to humansThus this paper tries to analyze the growth rate of Fintechin 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 the fantasy of AI undergoes a rapid and increased change of reality among the financial institutions.

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

1. INTRODUCTION:

The deployment of 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 to become commercially feasible. It has enabled a smart virtual environment where you could just access information and communicable 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, Google home which helps us to get solutions instantly.

Likewise, the AI powered banking may enable a computer system to observe, sense, interpret, evaluate and interact as similar to humans. In a nut shell, AI helps a computer based virtualagent in thinking and sensing which are the building chunks of human intelligence. 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 remain as a reason to develop services that enhances technological practices such as mobile banking, internet banking and so on. At present there are over a billion mobile phone users, 330 million internet users and 240 million smartphone users in

India, a glimpse ahead shows that the future of the banking will be collaborative, exciting and upgraded.

2. REVIEW OF LITERATURE:

The article entitled, **'Artificial Intelligence in Banking'** by Dan Latimore (2017) stated that an area of intense banking focus for the last several years, analytics has benefited from technological improvements even without AI. Fundamental advances in processing power and data manipulation have given human analysts increasingly powerful tools. Couple this with machine learning progress, and firms have the potential to uncover insights previously undiscoverable.[1]

The working paper entitled, **'AI in Banking and Finance'** by Pranav M Bidare, Sidharth Ray and AayushRathi (2018) has analysed that Artificial intelligence is changing business processes and customer facing services in the finance 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. Despite these benefits a number of challenges still exist to the development of AI in the finance sector - a few being the diversity of languages hosted in India, consumer trust, data and capacity. One way financial institutions are overcoming challenges and pursuing innovation in

International Journal of Research in Advent Technology (IJRAT) Special Issue
E-ISSN: 2321-9637
Available online at www.ijrat.org
International Conference "ICFTWF-19", February 4th & 5th 2019

the area of AI is through partnerships with startups and fintech companies. From a regulatory perspective though there are a number of security standards financial institutions must adhere to - a comprehensive privacy legislation is needed to address the potential misuse of personal data. Furthermore, existing security standards should be harmonized and revisited in the context of potential threats specific to systems employing AI solutions. Below are a set of recommendations for consideration towards enabling innovation, successfully implementing AI solutions, and mitigating harms resulting from the use of AI in the finance sector in India.[2]

The article entitled, **'Artificial Intelligence Powered Banking'** by Infosys and Finacle (2017) has stated that while the technology's evolution is both rapid and impressive, banks, and indeed, all enterprises, should ground their adoption strategies and expectations in reality. Nevertheless, regardless of initial hiccups and gestation times for expected results, banks should waste no time in executing their AI plans. Because AI is evolving so quickly, it does not allow banks the luxury of waiting till it matures, and those who do, risk never being able to catch up with the leaders. Quick movers have another advantage in that their AI systems will start learning earlier than others, and will therefore evolve faster as well. With AI, the industry will go through a long voyage of reimagining banking, spanning several years, many milestones and at least a few challenges.[3]

The article entitled, 'Banking on the Future: Vision 2020' by Deloitte & Confederation of Indian Industry (2016) analysed that the very innovation that drive business growth and value also create first order cyber risks. Innovative technologies such as Chip-based cards and SMS-based OTP have helped the banks to implement security controls to mitigate traditional cyber risks. However, as the technology has evolved, attack vectors have also become more sophisticated. Questions are now being raised on technologies that were previously thought as secure. Cyber threats in isolation, severely limits our ability to understand the complete impact of cyber risk. There is a need for enhanced cyber risk assessment framework and testing methodology to continuously detect and protect against evolving cyber threats. While being secure is more important than ever, there is a need to also be constantly vigilant and resilient in face of evolving cyber threats.[4]

The article entitled, 'Artificial Intelligence and Digital Banking', Mapa (2016) stated that it's the culture of a startup to try these things faster and iterate on innovations like AI. As they gather the data through aggregation, there's the potential for newer FinTechs and challenger banks to steal market share, as they use data and technology to offer a far more useful (and perhaps holistic) banking experience.[5]

The article entitled 'The use of Artificial Intelligence (AI) based technological applications by Indian Banks', by Dr. MunishSabharwal (2014) stated that none of the banks selected by the researcher in his research except the new private sector banks use artificial intelligence based technological applications. The new private sector banks also use artificial intelligence mainly for petty purposes like automatic cheque book re-order facility. Yes Bank also uses artificial intelligence for Employees performance evaluation, Credit evaluation and portfolio analysis. [6]

Parsons, Gotlieb and Denny [1993] in their study deals with the impact of IT on banking productivity per se. Computerization is one of the factors which improves the efficiency of the banking transactions. They concluded that higher performance levels have been achieved without corresponding increase in the number of employees. Also, it has been possible for Public Sector Banks and Old Private Banks to improve their productivity and efficiency by using IT.[7]

Healy &Palepu [2001] in their study suggest that the use of technology can improve/enhance systems for administrative control such as enabling better management of risk, which if disclosed in regulatory reports to supervisors and in annual reports to investors, can improve bank transparency and enable the banks to reduce their cost of capital. Hence, technology can be the key to differentiation, competitive edge, and institutional survival.[8]

Rawani A M and M P Gupta [2002] in their study empirically explore the differences in the role of IS among public, private, and foreign banks. Results indicate that while, at present, only private and foreign banks have obtained strategic advantages using IT, public sector banks, although late, have also realized the importance of IT. It has been empirically proved that the future impact of IS does not vary significantly with the banking groups. This suggests that IS efforts put in by the public sector banks are in

International Journal of Research in Advent Technology (IJRAT) Special Issue
E-ISSN: 2321-9637
Available online at www.ijrat.org
International Conference "ICFTWF-19", February 4th & 5th 2019

the right direction and can be expected to give them a strategic advantage in future.[9]

Mittal &Dhingra [2007] in their study suggest that Indian banking industry has witnessed a remarkable development in the Informational Technology (IT) in last few years. Banking transactions are become easier and customer friendly due to the technological improvements. To play a supportive and key role, banks are providing with lots of services which are the combination of electronics and information technology, like, Automatic Teller Machines (ATMs, plastic money i.e. credit card, debit card and smart cards, phone banking, e- banking which is called by net-banking, etc. ATMs have emerged as the most favored channel for offering banking services to the customers in the world.[10]

Matthew Sainsbury, FST Media [2012] Artificial Intelligence (AI) has been identified as the next technological frontier for banks as they look to leverage their investment in mobile to drive greater customer engagement. Banks including Standard Chartered and Citi are developing AI solutions to assist with staff attrition and training, and reduce human error at all points in the engagement and transaction process. Banking executives see potential in AI programs to fulfil the role of a virtual personal assistant, following the success of Apple's Siri platform.[11]

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).[13]

 The term Artificial intelligence cannot be defined in a single terms as it's a combination of related technologies such as big data analytics, machine learning, deep learning, virtual agents and chatbots which replaces human intelligence.

Though the application of AI in Indian banking sector is at developing stage, the advantage is seen in terms of adoption of 'innovation centers' and running hackathons. This enables the banks to have collaboration with fintech companies. The application of AI in banking enables in the 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
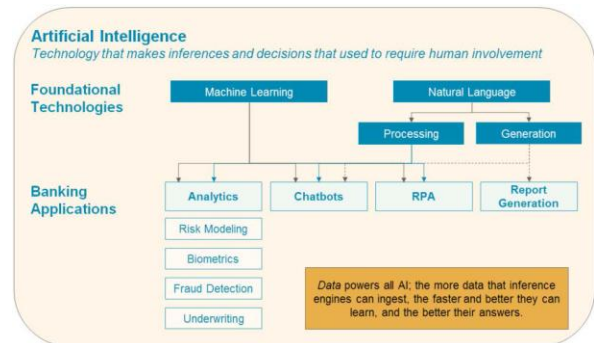
Source: Celent analysis. Arrows represent influence of source on target.

Areas of implementation:
The key areas of application of artificial intelligence can be classified under front end, middle end, and back end. The banking sector, thus as a result of advancement undergoes a rapid change over its entire system.

Front end:
Bank nowadays in order to retain their customers focus more on front end process to personalize and improve customer services, it will also help to enhance the sales and marketing and 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 to type their queries through website and help them to find answers. This may be seen that technology could help us to find better solutions to the problems with speed and accuracy.

Middle end:
In the middle end, artificial intelligence can be a effective tool in detecting risk assessments 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 the clients in a better manner.

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

International Journal of Research in Advent Technology (IJRAT) Special Issue
E-ISSN: 2321-9637
Available online at www.ijrat.org
International Conference "ICFTWF-19", February 4th & 5th 2019

Source: 14

The way Artificial intelligence benefits banking:
The idea of implementing AI in banking sector is a alarm that the technology is finding its new way. To be frank, the current scenario of banking is at huge quest of automation due to the consumer behavior and their convenience. Deployment of Artificial intelligence in banking could help to tackle the digital wave of fintech sector. The way how artificial intelligence benefits banking can be as below:

Algotrading:
It has been observed that Artificial intelligent systems are responsible for almost 70% of trade today. The algotrade could enable to identify the fluctuations at financial markets and helps in investment decision. It also provides a wide range of trading opportunities from the inputs. Thus the algotrade can be used in order to provide a user friendly tradingservices.

Detection of fraudulent risks:
Artificial intelligence has a remarkable impact in the detection of fraud, anti-money laundering, malpractices etc. The Bombay stock exchange has been find out to use a AI assistance for detecting rumor since 2016. The FICO Falcon Fraud Management Solution is the advanced software that made use of artificial intelligence to tackle transactional fraud.

Chatbots for customer service:

Chatbots will be a milestone in the digitalization of banking. The chatbots refers to the virtual assistant who are capable in predicting the customer behaviour and provide services. They are much better when compared to chats where it seems to be a single way conversation. These bots can predict the spending habits and could advice the customers as where they are spnding more money. They also can provide credit score.

Forecast cash at ATM's:
Its quite good to imagine a algorithm which could help us to detect cash at ATM and to enable optimization technique fr money saving.
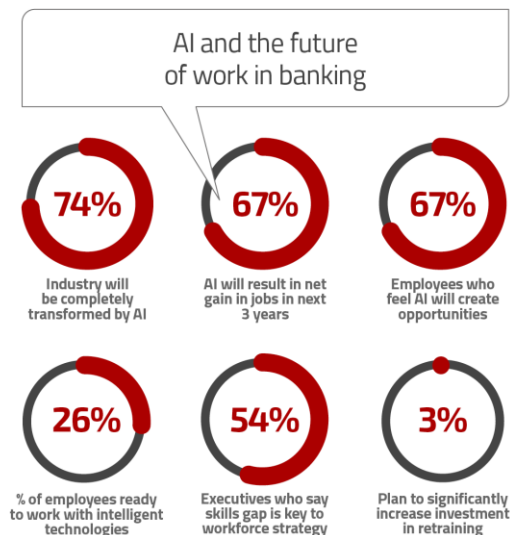
Facilitate transaction:
AI can be a source of support to have a secured transaction of money. Banks have started to combine transactions with voice recognition which may enable to have a consolidated form of transaction. Thus the transactions can be secured and productive by using Artificial intelligence methods.

Robotic process automation (RPA): RPA adopts a number of techniques to reproduce the day to day human role automatically, more accurately and these data inputs are examined and sent as an output for the further process. This may help in the reduction of manual work.

Readiness of Banks to adopt 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 determine the rapid advancement of technology to be seen in the fore coming future.

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As per the survey conducted by the Accenture it has been observed that the upcoming future "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%."[15] Thus we can envisage that the upcoming future holds a way to welcome Artificial intelligence technology.

Future of AI and banking:

The main aim of this paper tries to throw a light upon the expected future of bankingise of automation and the r. We have a prediction that the AI in banking sector is going to bring about a drastic change in the future. A FinTech Report on India that was released in the year 2017 said that global investment in AI applications reached $5.1 billion in 2016, up from $4.0 billion in 2015.As per the Accenture Banking Technology Vision 2017 report, four out of five bankers entrust that AI will be driving revolution in banking sector both in customer interaction and gathering information. Thus its quite visible that the future of banking should be a bit faster in accepting the AI trends, the banks must also be concerned with the security issues to have a secured and protective AI practices.

Development of AI:

Developers of AI:

Name of developers	Developed AI
HDFC Bank	Customer interface
DBS Bank ltd	Customer interface
Infosys Finacle	Across Focus Areas

User Banks:

NAME OF USERS	USING AI
State bank of india	Beta –testing SIA-SBI intelligent assistant using an al-based solution developed by chapdex
City union bank	Uses india 's first robot response service in a bank
Yes bank	Uses YES TAG uses al solution by Quadratyx
ICICI bank	Uses ipal,an al-based chatbot
DBS Bank	Uses an AI enabled platform
Axis Bank	Launched an AI & NLP enabled app developed by action AI
Royal bank of Scotland	Uses a virtual chatbot,luvo,powered by IBM Watson
Bank of baroda	Uses AI solution by quadratyx
Kotak Mahindra bank	Uses AI solution by quadratyx
Canara bank	Uses a humanoid robot called mitra

3. CONCLUSION:

The rise of automation even though started before decades, the present century tries to hold a greater place of making it real in larger scale. Technology, the thing that has become an inevitable part of human life. The concept of artificial intelligence seems to an evolution in the banking era. The main purpose of it is to have a better interaction with the customers, to increase the efficiency of operations and to be technologically viable. The term AI is observed tofufill the dream whichcan bridge the gap between the Automation and human intelligence. Thus it's the banking sector which is to be ahead in adopting this technology in order to fulfill the fantasy of AI to reality. It can be concluded that the rise of automation and technology are the unstoppable forces that keeps conquering in each sector, Banking is not exceptional.

References:

[1] Dan Latimore (2017), 'Artificial Intelligence in Banking',Celent, A division of Oliver Wyman, Inc.

[2] Pranav M Bidare, Sidharth Ray and AayushRathi (2018), 'AI in Banking and Finance', the Centre for internet and society, India.

[3] Artificial Intelligence Powered Banking', Infosys and Finacle (2016), India.

[4] 'Banking on the Future: Vision 2020', Deloitte & Confederation of Indian Industry (2016), India.

[5] Artificial Intelligence and Digital Banking', Mapa (2016), India.

[6] Dr. MunishSabharwal (2014) 'The use of Artificial Intelligence (AI) based technological applications by Indian Banks', International forum of researchers students and Academicians, Vol. 2, Issue 1.

[7] Parsons, Gotieb& Denny, "Productivity and Computers in Canadian Banking", Productivity Issues in Services at the Micro Level, Z. Griliches and J. Mairesse (Eds.): Kluwer, Boston (1993)

[8] Healy &Palepu, "Information asymmetry, corporate disclosure, and the capital markets: a review of the empirical disclosure literature', Journal of Accounting and Economics, Vol. 31, No. 1–3 (2001) pp. 405–410.

[9] A M Rawani and M P Gupta "Role of Information Systems in Banks: An Empirical Study in the Indian Context" Vikalpa Vol. 27, No. 4 (October-December 2002) pp.69-74

[10] Mittal and Dhingra, , "Investment in Information Technology and its Impact on Productivity and Profitability of Public Sector Banks in India", Productivity Journal, National Productivity Council, New Delhi (2007) pp.73-81

[11] Matthew Sainsbury, FST Media, "Artificial Intelligence leading the way for financial services technology innovation", accessed Nov 2013, <http://fst.asia/NewsArticle_details.aspx?Articlenewsid=56>

[12] Hamid EslamiNosratabadi, Ahmad Nadali, and SanazPourdarab , "Credit Assessment of Bank Customers by a Fuzzy Expert System Based on Rules Extracted from Association Rules", International Journal of Machine learning and Computing, Vol. 2, No. 5, October 2012.

[13] https://digitalwellbeing.org/artificial-intelligence-defined-useful-list-of-popular-definitions-from-business-and-science/

[14] https://www.google.com/search?q=artificial+intelligence+in+front,+bank,+middle+office+in+banks&safe=active&rlz=1C1CHBF_enIN820IN820&source=lnms&tbm=isch&sa=X&ved=0ahUKEwje75LIzJDgAhUIvI8KHWh7CR8Q_AUIDygC&biw=1366&bih=657#imgrc=A2Qeryd697bMBM:

[15] https://thefinancialbrand.com/72561/banking-artificial-intelligence-ai-human-training-future-of-work/

[16] https://digitalwellbeing.org/artificial-intelligence-defined-useful-list-of-popular-definitions-from-business-and-science/

[17] https://www.livemint.com/

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

[19] https://searchenterpriseai.techtarget.com/feature/AI-in-banking-industry-brings-operational-improvements

[20] https://blog.produvia.com/artificial-intelligence-ai-in-banking-c09cbb5dc3d1

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