INTERNATIONAL JOURNAL OF RESEARCH IN COMMERCE, IT & MANAGEMENT

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INTRODUCTION

REVIEW OF LITERATURE

NEED/IMPORTANCE OF THE STUDY

STATEMENT OF THE PROBLEM

OBJECTIVES

HYPOTHESIS (ES)

RESEARCH METHODOLOGY

RESULTS & DISCUSSION

FINDINGS

RECOMMENDATIONS/SUGGESTIONS

CONCLUSIONS

LIMITATIONS

SCOPE FOR FURTHER RESEARCH

REFERENCES

APPENDIX/ANNEXURE

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BOOKS

- Bowersox, Donald J., Closs, David J., (1996), "Logistical Management." Tata McGraw, Hill, New Delhi.

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- Kumar S. (2011): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.

ONLINE RESOURCES

- Always indicate the date that the source was accessed, as online resources are frequently updated or removed.

WEBSITES

- Garg, Bhavet (2011): Towards a New Gas Policy, Political Weekly, Viewed on January 01, 2012 http://epw.in/user/viewabstract.jsp

A STUDY ON IMPLEMENTATION OF ARTIFICIAL INTELLIGENCE IN INDIA'S BANKING SECTORS

A.P.SURIYA
STUDENT
PG DEPARTMENT OF COMMERCE
JAWAHARLAL NEHRU RAJKEEYA MAHAVIDYALAYA
PORT BLAIR

ABSTRACT
Banks are already offering a wide range of products integrated with technology and automation, the most common being ATM machines around us. Now moving to the next phase in the current Industry 4.0 era, Banking segments is all set to increase its strategy execution by leveraging newest digital technology so that its customers may practice speedy and secure processing of transactions. This study reveals, the advancement, acceptance, execution and potential opportunities of focusing on Artificial Intelligence (AI) for successful strategy execution in India's banking sector. In this study secondary data about the research effort done on AI in Banking Sector to find the current status of research as well as realistic application of AI in various parts of banking strategies e.g. surveillance, scam detection, ensure compliances, credit assessment, customer tune, handling repetitive large tasks etc. in general and focus on current developments in India's banking sector, inspire banking leaders to move their focus proactively towards leveraging Artificial Intelligence with an aim to bring in delight for customers.

KEYWORDS
artificial intelligence (AI), researchers, banking, technology, machine language, banking industry 4.0.

JEL CODES
G20, G21, O32, M15.

INTRODUCTION
Artificial intelligence in the current market becomes more pervasive. Business approaches are concerned with speedy decision making, business promotion, industry growth, profitability, productivity, cost reduction, capital formation, investments, market share, efficiency, effectiveness, customer satisfaction, their retention, achieving & managing customer delight, optimum utilization of resources, enriched products & services so that they may remain competitive. In the present Industry 4.0 era, all banking businesses are seriously influenced by technological innovations or absence thereof. This paper is an attempt to setup a connection between successful strategy execution and latest digital technologies in these areas with specific reference to India's Banking sector. Since banks are pivotal for economic development of nation's economy and India is moving ahead with an aim to achieve $ 5 trillion economy by the year 2024, so a standard shift is bound to take place in its banking sector, refining their strategy application by leveraging latest digital technologies, serving broader goals of balanced development of the entire nation. The most common example of claim of digital technology being virtual assistants enabled by banks on their websites. In this study the author explores such applications of technology, its evolution, implementation and future opportunities with focus being on Artificial Intelligence (AI) as a collaborator for successful strategy implementation in Indi's banking sector. Digital Technology is a critical element of the Information Technology (IT) strategy of every bank operating in the present agile Industry 4.0 era as every bank needs brightness into its people, customers, processes, tools, utilization trends and strategic goals.

LITERATURE REVIEW
Ability of the human mind to process information and solve problems has motivated scientists to take similar intelligence into machines (Shachmurove, 2002). Since banks have a very crucial role in economic development of a nation, so their successful strategy execution, leveraging state-of-the-art technologies, improve value not only to their own business but to the growth of the entire nation, hence banks need to keep step with increasing expectations of today's swiftly changing environment (Brauer, 2005), placing its strategies to ensure continuity of business, addition of customers as well as retention of existing customers (Zineldin, 2006), duly banks are trying various strategies to innovate new products and services to achieve this (Alam & Khokhar, 2006). A technology that can act like human, has ability to learn languages, execute physical tasks, mimic human decision making (Russell & Norvig, 2003), enables machines to carry out task that require human intelligence (Brachman, 2006) by combining various technique of machine learning, pattern recognition, logic & probability theory in addition to biologically inspired models (Duch, Swaminathan, & Meller, 2007) known as computational intelligence. Customers' trust in technologies paved the way for mobile banking payments (Donner & Tellez, 2008) because system quality and information quality are a significant influence on the customers' satisfaction and trust (Lee & Chung, 2009). Artificial Intelligence has made its way in gauging of bank performance (Fethi & Pasiouras, 2010) and Information technology is being abundantly used by banking sector across the globe (Vedapradha, Ravi, & Jebasingh, 2016) in its operations like accounting, auditing and assurance domain, easing out some of its most toughest tasks and assist in decision making by collecting, analyzing and creating accurate financial information (Davenport, 2016). Banks are proceeds towards next level to create Expert Support System (ESS) and Decision Support System (DSS) to make managerial decision-making function more informed, consequently executing strategies more effectively in critical areas like service (Castelli, Manzoni, & Popovic, 2016), credit risk appraisal, loan defaulters, profitable investments, interest rate inflation etc. (Ghodselahi & Amirmadhi, 2011) (Moro, Cortez, & Paulo, 2015) (Vedapradha, Ravi, & Jebasingh, 2016). Considering the need of powerful systems which can understand the patterns in the data of market conditions and can adjust financial strategies, so that pragmatic and prompt service may be provided to the customer (Nuseibeh, 2017), research scholars have conferred end-to-end Robotic Framework with detailed hardware and algorithmic aspects which can be initiate to a wide range of industries, including banking, to simplify their processes (Chakroborty, 2017). Main factors encouraging Artificial Intelligence into the banking sector are its aptness of low cost production, open source system & accessibility of the same; hence within next 3 years Artificial Intelligence is predicted to become the primary way banks interact with their customers – without depending on bank branches and cheque books (Sinha, 2017). India's banking sector is investing in Robotics and Artificial Intelligence to serve its modern tech savvy customers in an effective manner (Ayachit, 2017). Banking products have moved towards from the conventional banking of India (KUMAR, 2018). Application of innovative technologies by banks in execution of their strategies to perform efficiency is praiseworthy (Lagarde, 2018) and is expected to create their globally unified practices, policies and framework with the help of Artificial Intelligence (Erdélyi & Goldsmith, 2018). Strong positive relationship (R- coefficient = 0.859) has been observed between Artificial Intelligence and proper record keeping (Longinus, 2018) and Artificial Intelligence has strong prospects of transforming all banking operations (Ghurair, 2018) refining investment strategies, managing customers' data, carrying out risk estimation, curbing money laundering issues and adding value by reducing costs of money transfer while increasing accuracy (Sophia, 2018), thus widen the profitability, improving the quality of decisions made at different operational levels of management (VEDAPRADHA & HARIHARAN, 2018), Providing human resources for innovating & executing intended strategies aligned with organizations vision & betterment of economy (Kurode, 2018). At present employees of banks are performing many unproductive tasks of repetitive nature whereas availability of manpower for owning creative and decision-making roles is limited (Kurode, 2018). The above provides insight about technical, practical and strategic aspects of Artificial Intelligence and its contribution towards business strategy to help banks to take calls to adopt or not to adopt Artificial Intelligence. One study has found that the adoption of AI in the banking sector may add approx. $1 trillion to India's economy by 2035 (Lakshminarayana & Deepthi, 2019). The RBI has proactively promoted application of technology for implementing regulations and creating policy frameworks in India's banking sector under leadership of Dr. Raghuram Rajan and Urjit

Patel (Aazhvaar, 2019). Same is the case with a country like India, having a huge population with high percentage of rural or non tech savvy population, impeding pace of implementing services powered by technology (Kurode, 2018).

RESEARCH OBJECTIVES

This study is undertaken to focus on establishing and empowering strategy execution in India's Banking sector by leveraging Artificial Intelligence. Specific objectives of this study are:
1. The need of artificial intelligence in the Indian banking sector and how it is shifting the face of modern automated banks.
2. To inspect the state of affairs of Artificial Intelligence's application in India's banking sector.
3. To pull the focus of banking leadership from a reactive to proactive adoption of Artificial Intelligence for successful implementation of their strategies and give support to their vision.

RESEARCH METHODOLOGY

In this study, the author attempts to study the secondary data available in published data e.g., research papers, books, websites, newspapers etc. The research design is investigative and evocative. The research undertaken is exploratory as it focuses on secondary surveys in accumulation to qualitative and quantitative investigation. It is descriptive and analytical research as the current state of artificial intelligence in banking sector is enlightened via the facts and information previously collected.

BANKING SECTOR AND APPLICATION OF ARTIFICIAL INTELLIGENCE IN ITS STRATEGY IMPLEMENTATION

The current major events like demonetization and government subsidized initiatives of developing digital India have not only encouraged India's economy to become cashless, but also fetched in a massive amount of data in banks, demanding quick, exact and consistent updating & maintenance of records. Banking sector had made computers an integral part of its procedures and since the 1990's, automation became a basic pillar to modern banking, for example, money withdrawal, transfer of funds, arrangement of cheque books etc. (Moin & Ahmed, 2012) and now due to vast changes in economy, increased work volume, major shifts in consumer preference, new competitors, regulatory requirements and consistent need to have robust access management & secured banking setting for transactions, banking sector has started leveraging Artificial Intelligence to digitize the tedious manual tasks, determining future of economy, dropping strategy cycle, executing its strategies successfully, thus renovating traditional branch banking into mobile / online banking activities, pioneered by private sector banks of India (Sabharwal, 2014). Benefits of AI are resulting from its inter-connected working in cohesion, as summarized below:
1. Machine Learning creates clever machines which analyze data, identify patterns and bend its program / logic dynamically on its own to react in accordance with data, without being explicitly programmed. Used in Customer Service, Wealth Management, Threat Management, Fraud Discovery
2. Deep Learning creates an artificial mockup of the human brain and works with a non-linear line of analyzing data, thus enabling better decision making closer to the accuracy of the human brain. Used in: Fraud finding, identifying new business chances working within banking environment as well as on more social media platforms
3. Natural Language Processing allows machines to understand and study sentiments of humans based on their language i.e., text & speech and to respond accordingly. Used in: Feedback on products, services & offerings.
4. Speech Recognition, a sub-set of Natural Language Processing, aids machines to understand human spoken language based on Acoustic & Language modeling algorithms. Used in: Voice Banking, Confirmation based on customer's unique voice patterns
5. Natural Language Generation permits machines to generate natural language so that machines may work together with humans in their natural language. Used in: Machines can connect to human customers in human language in a smart and understandable manner
6. Passbook updation kiosks - Passbook printing kiosk is an automatic machine which enables customers to print their passbooks automatically. SBI, Bank of Baroda and Indian bank has installed this kiosks in an immense way. They have introduced self-service passbook kiosks wherein bank customers can print their passbooks on their own.

SUMMARY OF SIGNIFICANT OPPORTUNITIES FOR THE BANKING SECTOR TO UTILIZE ARTIFICIAL INTELLIGENCE

Based on the Literature reviewed, application of Artificial Intelligence in the banking sector can be summarized as follows: It is extremely important for banks to remain competitive and proactive in an Industry 4.0. They have to be dynamic, constantly taking and placing their decisions, accelerating changes in business processes with an aim to optimize the profitability as well as service delivery. This study analyzed the application of Artificial Intelligence for achieving success in executing strategies in the dynamic environment of the banking sector, considering end-to-end activities which are assigned to these intelligent machines. Summary of significant opportunities for the banking sector to utilize Artificial Intelligence are presented here-in-below:
1. Improving Profitability by reducing Strategy cycles, reducing costs on unnecessary tasks, increasing productivity, efficiency customer's loyalty and optimizing service delivery by becoming operationally lean.
2. Generating, driving and supporting execution of strategies based on data analysis and research.
3. Framing Regulations by transforming and re-engineering banking operations.
4. Elimination of human error and up-to-date record keeping, handling some of the most challenging aspects of accounting, auditing and assurance can be managed by Artificial Intelligence.
5. Enhancing CBS (core banking solutions) by operating at a much robust pace and being agile in response to market conditions, enable banks with a better go to market approach among different assets, managing customers portfolios by analyze their profile through algorithmically sorting based on research about financial institutions, loans, investments and augmenting this data with customers' approach each customer in personalized way.
6. Track the sensitive areas by developing customized secure environment as per relevant regulatory needs, scanning transactional & non-transactional logs to find dubious activities, deformity in patterns, warning signs of fraud attempts, collecting evidences, examine data for necessary conviction and responding to that in time, thus outperforming the criminals (Ray, 2017)
7. Credit assessment and decision can be strongly managed through Personal Assistant powered by Neural Network using classification models, inspect market conditions with reference to the lifestyle, appetite for risk, financial targets, individual portfolios, structured pattern recognition in past behavior of customers and time series predict adhering to banking credit standards, thus developing successful financial strategies from banks perspective which concurrently result in fruitful investments from customer's perspective.
8. Human bias and emotional interference can be minimized by intelligent machines to avoid distortion in the decision-making process, abridge time for business processes implementation, replying customers' queries without any frustration and self-interest of earning commission, thus uplifting productivity.
9. Artificial Intelligence powered Virtual Customer Assistant & Chat Bot engages customers in speech / text in human language, learns from their activities, understands their needs and provides suggestions and takes action accordingly, handling all the tasks from customer on-boarding to various customer services. They operate not only in the intra banking domain environment but also outside it on wider social media and messaging platforms also, the platforms which are meant for news, e-commerce and entertainment and thus affect customers' behavior towards banking products by conversing intelligently. Based on the set algorithms, these bots are designed to be intelligent enough to seamlessly hand over to a customer dealing with a human at any stage when such a need arises. Learning from past data is an essential element of Artificial Intelligence, such bots become more efficient with their increased use. Concerned bank officials can keep on enriching the database, based on which these bots respond, in order to keep step with the latest information and extensive coverage of subject matter. This combination of Artificial Intelligence and correct human input by banks adds to customer delight by fulfilling requests, solving problems and predicting customers' needs.

10. Humans freed by applying Artificial Intelligence into day-to-day tasks – including payment related jobs handled by Chat Bots, can be used for more value added and human centric service functions, motivating the employees to up-skill and re-skill themselves for shouldering higher responsibilities. Added skills would be to scale up the capacity during peak or emergency scenarios offering qualitative services to the customers and bank employees will be able to feel a better work-life balance.

11. Interactive Voice Responses (IVRs) transformation may sync with customers shifting from webpage search (Google) to the voice search (Google Assistant), enabling human-like correspondence, easing the waiting queues, reducing the dependence on call centers, KPOs & BPOs.

CHART 1
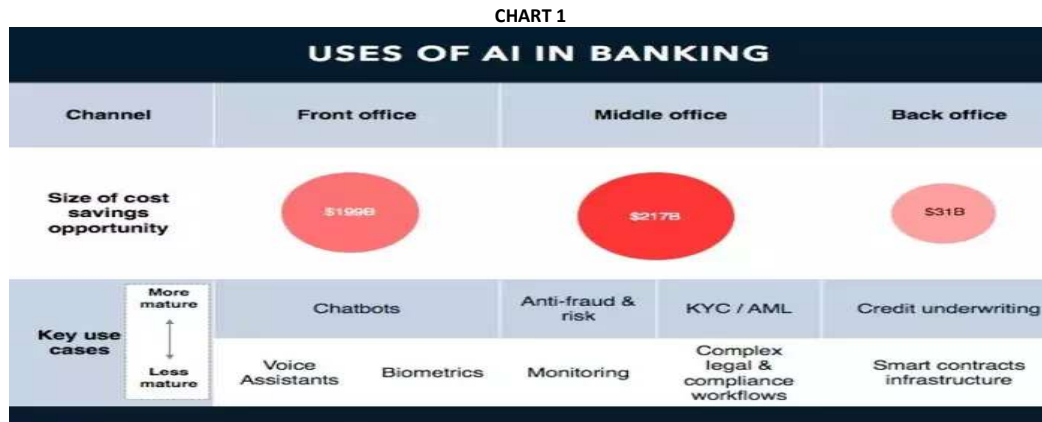
ARTIFICIAL INTELLIGENCE IN INDIA'S BANKING SECTOR

The wide literature reviewed on this topic, this study locates the possibilities of Artificial Intelligence for clinching successful implementation of strategies in India's banking sector because Artificial Intelligence understands the work flow of the banking sectors and restructures the activities to automate the same. Practical commencement of Artificial Intelligence in India's banking sector which are an integral part of activity and make use of customers in the form of quasi banker chatbots are mentioned below:

RBI

NPCI National Payment Corporation of India is working to bring down the cost of electronic transactions. (IDRBT) Institute of Development and Research in Banking Technology is studying opportunities and defiance in new technology areas.

ICICI BANK

It is India's first bank to install software robotics & automation in over 200 businesses across various functions e.g., retail banking, treasury, HRM etc. to perform repetitive, bulk tasks, reducing response time by approximately 60% with accuracy being 100%.

SBI

Propelled a national hackathon and is now using facial recognition technology based "Chapdex" developed by the winning team of the contest; chatbot "SIA" is active on the SBI website to interact with customers.

YES BANK

Yes Pay Bot, developed in partnership with Payjo – a leading AI banking platform, performs financial transactions in a personalized conversational manner on a real time basis. Chat bot "Yes Robot" is on its website.

HDFC

Chatbot EVA (Electronic Virtual Assistance) built by Sense forth AI Research, has handled the following since March, 2019: Addressed customer queries > over 2.7 million Interacted with unique users > 530,000 Held conversation > 1.2 million.

AXIS BANK

AI & NLP enabled apps to help consumers with financial and non-financial transactions, to answer FAQ and to assist customers" contextual interaction with the bank for loan and other products. Chat bot "Axis Aha!" is on its website.

AI-BASED ALGORITHMS AND FRAUD DETECTION

Algorithm is a set of programs, instructions or other problem-solving operations followed by computers. AI is very efficient in detecting patterns in real-time. It uses additional behavioral indicators to find suspicious transactions and offer solution for mitigating risk. For example, Feedzai, a data-science organization, implement algorithms to find and alert e-commerce fraud.

CHART 2: FRAUD DETECTION
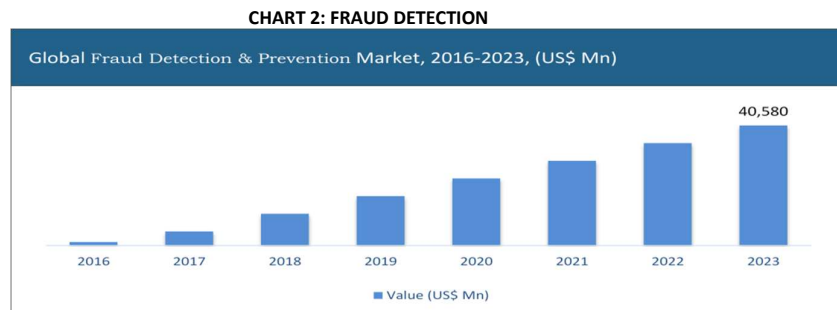
DISCUSSION AND SUGGESTION

The first aim of this study was to find the implementation possibilities of model & application of Artificial Intelligence in India's Banking sector. Researchers have arrived at this aim and concluding that the common of data found was that Artificial Intelligence as an extremely useful technology with great potential of benefiting the Indian banking sector by boosting its implementation of its strategies. From an implementation viewpoint, it was found innovation dynamics, determinants and direction of Artificial Intelligence adoption and usage. Scholars have also delivered upon implications such as security, accuracy, privacy etc. Second objective of this study was to verify the state of affairs of Artificial Intelligence application in the Banking sector. Response to this central research question i.e. "What was the part of Artificial Intelligence in successful policy implementation in the Indian banking sector "was found" Accenture Banking Technology Vision 2017" says that 87% of India's bankers accept Artificial Intelligence can enable banks with intelligent machines which create very human-like customer experience.

India's banking sector seem positive about Artificial Intelligence as its advantages are visible in positioning banks powerfully in multiple strategic area – Financial (decline of cost and increase in profitability), Human beings (surveillance, fraud discovery, acquittal human executives for more value add jobs), Operational (error-free, easy & automated use of resources) and Leadership (optimized alternative making, business encouragement & growth, customer pleasure). Sophisticated algorithms of Artificial Intelligence can optimize financial policy, can help in revenue creation models and can develop a host of other personalized tools for banks. As the conclusion of this study, India's banking industry is surely seen as all located to collaborate with Artificial Intelligence to attain success in its strategy execution, after all, life is all about keeping swiftness, evolving and altering with the passage of time.

Third purpose of this study was to investigate the capability of Artificial Intelligence to carry separate results for successful strategy execution in India's bank sector. This study has done deliberations, analysis, a broad review of application of Artificial Intelligence and after identify chance as per sec. 6, it evidences some vital discovery in this area, urging bank management to analysis their current state of affairs and lastly arriving at actionable opportunity where Artificial Intelligence is helpful for operations, decision making and improve efficiency of strategy execution in various vital areas of banks. Riding on speedy technological advancement, Artificial Intelligence is increasing at an exponential way, having ability to overhaul India's banking sectors amidst varying trends of present Industry 4.0 era & India's banking sector is no longer having the magnificence to apply a "wait & watch" policy about its acceptance. The RBI shortlisted seven global consultancy firms to implement artificial intelligence in Indian banks.

CONCLUSION

Artificial Intelligence is a favorable technology, the researcher is able to gather rich data from various secondary data sources, tracking & examine its evaluation, business verticals, applications etc. and fully examined the contribution of various scholars, to find with the research aim as mentioned above, finally reaching out to the conclusions to spot the application of Artificial Intelligence with specific reference to India's Banking Sector. The researchers have drawn practical attention of banking management to various strategic aspects of the banks having span of applying Artificial Intelligence, finally resulting into improved profitability in a sustainable way, thus providing a competitive edge to them. This study has also contributed towards a knowledge storehouse which helps in quickly picking up and applying most recent Artificial Intelligence innovations in various strategic areas. Hence, the implementation of artificial intelligence, it attracts more customers, and it helps bank for expansion. Banks can implement AI to satisfy the client experience with immediate response and automated cash withdrawal, deposit, online transitions, secure and fraud detection. The automated bank can reduce the work force of satisfying customers and make more concentrate on investment part. Thus, it can be concluded that with proactive application of AI in India's banking sector, effectiveness of its strategy implementation can be improved significantly.

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