Strategy of Artificial Intelligence in Banking Sector

Ashok Arora
Research Scholar;

Dr. Manju Dhahiya
Assoc Prof. Galgotias University

Abstract

Banks have already been providing a vast assortment of products and services, the majority of which are technology and automation-related. The most prevalent of these are the ATMs that may be found everywhere. Now that we've reached the next phase of the industry 4.0 era, the financial services industry is preparing to implement its strategies using the most advanced digital technology. This is being done in order to provide clients with transactions that are performed fast and securely. This study aimed to examine the development, adoption, and application of Artificial Intelligence (AI) for successful strategy implementation in India's banking sector, as well as the future potential of this field. For the purposes of this study, the authors conducted a comprehensive literature review and an examination of secondary data pertaining to research conducted on the subject of "Artificial Intelligence in the Banking Sector. Their objective was to assess the current state of research and practical application of artificial intelligence in various aspects of banking strategies, such as surveillance, fraud detection, ensuring compliances, credit assessment, customer service, and the management of monotonous voluminous tasks, and to focus on recent developments.

Keywords: Artificial Intelligence, Banking, Economy,Strategy Implementation.

Introduction

Business strategies focus on quick decision making, business promotion, industry growth, profitability, productivity, cost reduction, capital formation, investments, market share, efficiency, effectiveness, customer satisfaction and retention, achieving and managing customer delight, best use of resources, and improved products and services. In the age of Industry 4.0, the presence or absence of technological advances has a big effect on each of these parts of business, either for the better or for the worse. The goal of this study, which focuses on the Indian banking industry, is to try to find a link between the successful execution of strategy and the use of the latest digital technology in different business areas. Since banks are so important to the growth of a country's economy and India is trying to reach its goal of having a $5 trillion economy by 2024, it is inevitable that there will be a paradigm shift in its banking sector. India's banks will need to improve how they put their strategies into action by using the latest digital technologies. This will help them reach the bigger goal of achieving balanced economic growth across the country. The most common way that digital technology is being used is through the virtual assistants that banks can put on their websites. In this study, the author looks at other ways that technology can be used, as well as how it was made, how it is used, and what opportunities it might offer in the future. The main focus of this article is on how Artificial Intelligence (AI) can be used as a partner to help India's banking sector carry out its strategies more effectively. Every banking organization that is operating in the agile Industry 4.0 era needs to be able to see its people, customers, processes, tools, usage trends, and strategic goals, such as ensuring the best use of IT resources, which saves money, while still giving its customers world-class service. Because of this, digital technology is an important part of every bank's IT (Information Technology) strategy. At first, IT strategies for banks took a more traditional approach. But in the past few years, banks have and now is the time to use digital technology like artificial intelligence, which has the smart ability to connect a large number of processing elements, solve problems by processing information in a way that is similar to how a human brain would, and carry out strategies as planned. India's financial sector could grow and become more connected to the world economy if it used these kinds of technologies. The goal of this study, which is being done by researchers, is to look into the current state of artificial intelligence (AI) in India's banking industry as well as research that has already been done on the subject. This will help leaders in the banking industry put their plans into action successfully. Because of this, the researchers were able to describe the overall scope of the study and come up with a few specific goals. Because the focus of this study is on the evolution, implementation, and future opportunities of proactive AI use in India's banking sector, it is important to look into the current state of research in this area, as well as practical applications that have been made and future opportunities that can be reached through proactive AI use. Based on this study, a researcher shows how AI has made its way into many parts of India's banking sector, as well as how much more can be done in this business area.

Objective:-

★ To find out what research has been done on the concept and use of AI in the banking sector.
★ To look at the current state of AI's use in India's banking sector.
★ To find out how AI can be used to get different results for the successful implementation of strategy in India's banking sector.

Overview of the banking sector's AI strategy implementation:

In addition to encouraging India's economy to go cashless, recent big events like demonetization and government-sponsored programs to establish a digital India have also brought in a vast amount of data to banks, necessitating swift, accurate, and consistent record-updating and upkeep. These two recent significant occurrences have led to this. Since the 1990s, automation has emerged as a key tenet of contemporary banking, enabling operations like cash withdrawals, cash transfers, and cheque book orders. Computers have long been a crucial part of how the financial services sector conducts business (Moin & Ahmed, 2012) The banking industry has begun utilizing artificial intelligence to digitize the time-consuming manual tasks, shaping the future of the economy, reducing the stratospheric costs of labor, and meeting regulatory requirements as a result of the enormous shifts in the economy, increased work volume, significant changes in consumer preferences, customer objectives, growing population of young people, new competitors, and (Sabharwal, 2014). This project has significant support because to the extensive use of social media and the advancements in computer and data storage, mobile devices, and other fields of technology. The "Digital India" plan seeks to transform India into a knowledge-based, digitally enabled economy. India's need for digital payment solutions has been made abundantly obvious by recent developments in cashless commerce (Sharma & Agarwal, 2018). In this huge transition age that we are presently experiencing, connectivity, automation, machine learning, and real-time data processing are becoming more and more significant to enterprises. This is a result of companies' increased use of digital technologies to augment their physical production and services. The fourth industrial revolution is another name for this transition, which is known as Industry 4.0. The strongest argument is made here. for the purpose of incorporating digital technologies like artificial intelligence into banking processes as well, which offers huge potentials for reaping profits for banks and reduces response times for its clients (up to milliseconds). As a result, both the client and the bank will be increasingly interested in using AI to support successful, quick, and error-free processes. The proper management of technology encourages change in the status quo, progress, and an improvement in service delivery quality. A model of synthetic neurons was created in 1943 by Warren McCulloch and Walter Pitts. In 1951, Marvin Minsky and Dean Edmonds built the first neural network computer. This was the turning point in the development of the discipline that is now known as artificial intelligence (AI). One of the "Founding Fathers" of artificial intelligence, Professor John McCarthy of Sandford University, is credited with coining the phrase "artificial intelligence" in 1955 and defining it as "the science and engineering of building intelligent computers." The United States Department of Defense started training its computers to mimic human logic in 1960. (Russell & Norvig, 2003). A branch of computer science called artificial intelligence (AI) tries to give machines human intelligence. This is achieved through the creation and use of algorithms, which give computers the ability to analyze data over time, learn, adapt, and discover solutions on their own. This enables the mechanical management of tasks like planning, problem-solving, reasoning, learning, audio and visual recognition, natural language processing, and other comparable tasks (Bellman, 1978). The definition of AI is the ability of machines to execute tasks that require intellect from humans (Kurzweil, 1990). Utilizing computing that is able to perceive, reason, and take action, this capability is made possible (Winston, 1992). When AI technology moved its emphasis from robotics to machine learning and predictive analysis, it made a significant advancement. R1 — The first successful commercial expert system was developed by Digital Equipment Corporation in the 1980s, and its commercial applications started to flood the market in 2005. As a result, products like Siri, Cortana, Alexa, and Watson, among others, which were developed by Apple, Microsoft, Amazon, and IBM, respectively, were introduced. R2 — At Digital Equipment Corporation, the second successful commercial expert system went into operation in the 1990s (Russell & Norvig, 2003). Programming machines in computer languages like Prolog, C/C++, Java, and Python gives them the potential to think intelligently and similarly to humans, which is what artificial intelligence (AI) aims to achieve (SINDU, 2019). Infosys conducted a survey of 1600 business decision-makers, and the results revealed that 75% of those executives believed AI to be crucial to the success of their organization's strategy. Businesses who have already started implementing AI predict a revenue increase of about 39% by 2020. The application of AI can reduce operational expenses for firms by up to 22%, according to a Forbes magazine article. It should therefore come as no surprise that the banking industry has started incorporating AI into the implementation of its strategy in order to gain a competitive edge in terms of offering quick, error-free, effective, and efficient customer services while also significantly reducing customer visits to branches. A list of some of the advantages that can be attained through AI's interconnected building blocks cooperating harmoniously is provided below:

1. Machine Learning (ML) is the process of creating intelligent machines that can study data, recognize

patterns, and dynamically alter their program and logic on their own to respond in line with data, without being expressly programmed to do so. Customer Service, Wealth Management, Risk Management, and Fraud Detection are some examples.

2. Deep Learning (DL) uses a non-linear method of data analysis and develops an artificial replica of the human brain, it is able to provide improved decision making that is more comparable to the precision of the human brain. Detecting fraudulent activity and locating new business prospects both within the banking environment .

3. Natural Language Processing (NLP) makes it possible for computers to comprehend and evaluate the feelings expressed by humans based on the language they use (both text and speech), allowing them to respond appropriately. Feedback about an organization's products, services, and other offers are examples of use cases.

4. A subset of natural language processing known as speech recognition makes it possible for machines to understand human speech by using acoustic and language modeling methods. Voice Banking and Authentication based on Customers' Individual Voice Patterns are Two Use Cases for This Technology.

5. Natural Language Generation (also known as NLG) is a technology that enables machines to generate natural language, making it possible for machines to engage with humans in the humans' native language.AI are capable of intelligently and clearly conveying information to human clients in human language.

6. Visual Recognition makes use of DL in order to examine, comprehend, and recognize visual images. It then matches these images with larger data sets and returns a value that corresponds to the same. Image identification, the depositing of checks, and the payment of bills based on their images.

7. Optical Character Recognition makes it possible to convert handwritten, typed, and printed language into text that can be understood by machines by encoding it in a way that computers recognize. Conversion of physical documents into mechanical fields within computer systems are some examples of use cases.

Methodology:
This study examined secondary data from academic papers, books, websites, and newspapers. Secondary data has been analyzed and collected by other scholars. Material reviews analyses and analyses relevant literature to identify opportunities for improvement in the topic of study. Accordingly, a comprehensive literature assessment was conducted using the most extensive abstract and citation databases, internet websites, and newspapers, to explore the research objectives. In this procedure, researchers evaluated research papers, crosschecked & corroborated facts, and used qualitative material across databases to conduct this in-depth analysis in real-life context. After studying AI's evolution and existing implementation strategies, the current state of affairs in India's setting and its capabilities were analyzed. Researchers explored the same and provided their own views on drawing banking leadership's approach from reactive to proactive AI use for successful strategy implementation while maintaining focused on their organization's mission.

Literature Review
Business Strategies and Technology were found to be integrated in the last decade of the 20th century itself (Chester, 1994), and value of investments on technology vis-à-vis its productivity as well as economic benefits were being evaluated at the same time. This integration was done with the intention of revamping the business model (Brynjolfsson & Hitt, 2000). The capacity of the human brain to process information and find solutions to problems has inspired scientists to develop artificial intelligence that is comparable to that of the human brain (Shachmurove, 2002). Since banks play a very significant role in the economic development of a nation, the successful implementation of their strategy, utilizing state-of-the-art technologies, adds value not only to their own business but to the economy and growth of the entire nation. As a result, banks need to keep pace with the increasing expectations of today's rapidly changing environment (Brauer, 2005), aligning its strategies to ensure the continuation of business, the addition of customers, as well as the retention of existing customers (Alam & Khokhar, 2006). Computational intelligence is a technology that enables machines to carry out activities that require human intelligence (Brachman, 2006) by combining various techniques of machine learning, pattern recognition, logics & probability theory in addition to biologically inspired models (Duch, Swaminathan, &

Meller 2007). This technology can act like humans, has the ability to learn languages, accomplishes physical tasks, and emulate human decision making (Russel & Norvig, 2003). Because system quality and information quality are a significant influencer on the customers' satisfaction and trust (Lee & Chung, 2009), customers' faith in technologies paved the way for mobile banking payments (Donner & Tellez, 2008). Artificial intelligence has made its way in assessment of bank performance (Fethi & Pasiouras, 2010). Information technology is being extensively used by banking sector across the globe (Vedapradha, Ravi, & Jebasingh, 2016) in its operations (Davenport, 2016). Banks are moving toward the next level to create Expert Support Systems (ESS) and Decision Support Systems (DSS) to make managerial decision making more informed, resulting in the implementation of strategies more effectively in critical areas such as service quality (Castelli, Manzoni, & Popovic, 2016), credit risk appraisal, loan defaulters, profitable investments, interest rate inflation, etc. (Ghodselahi & Amirmadhi, 2011) (Moro, Cortez (Vedapradha, Ravi, & Jebasingh, 2016). Research scholars have developed an end-to-end robotic framework that includes detailed hardware and algorithmic aspects. This framework can be introduced to a wide variety of industries, including banking, in order to optimise their processes. Considering the need for dynamic systems that can understand patterns in the data of market conditions and can adjust financial strategies accordingly (Nuseibeh, 2017), these research scholars have developed this framework (Chakroborty, 2017). The main factors encouraging AI to enter the banking sector are its ability of low-cost production, open-source system, and accessibility of the same; as a result, it is anticipated that AI will become the primary way banks interact with their customers within the next three years, without depending on bank branches and physical cheque books (Sinha, 2017). The banking sector in India is making investments in robotics and artificial intelligence to better serve its customers, who are more computer savvy (Aya chit, 2017). The banking products available today are light years ahead of India's traditional banking system (KUMAR, 2018). It is commendable that banks are using novel technology in the execution of their goals to attain efficiency (Lagarde, 2018), and this is what is anticipated to result in the creation of their internationally uniform practices and policies and framework with the use of AI (Erdélyi & Goldsmith, 2018). [Citation needed] AI has strong potentials of transforming all banking operations (Ghurair, 2018), including refining investment strategies, managing customers' data, carrying out risk assessment, curbing money laundering issues, and adding value by reducing costs of money transfer while increasing accuracy levels (Sophia, 2018), thus increasing profitability, improving the AI has been observed to have a strong positive relationship (R-coefficient = 0.859) with proper record keeping (Longinus, 2018). (Kurode, 2018). At the moment, human personnel in banks are responsible for a great deal of wasteful work that is of a repetitive character. On the other hand, there is a limited supply of human manpower available to take on responsibilities that involve creativity and decision making (Kurode, 2018). The previous paragraph offers some helpful insights about the technical, practical, and strategic aspects of artificial intelligence, as well as its contribution to business strategy. These insights can assist financial institutions in making a decision regarding whether or not to implement AI. The researchers have already completed a sizeable portion of the task, and they are contributing significantly more information to the reservoir of knowledge on a daily basis. According to the findings of one study, the implementation of AI in the banking sector might add almost one trillion dollars to India's economy by the year 2035. (Lakshminarayana & Deepthi, 2019). Under the leadership of Dr. Raghuram Rajan and Urjit Patel, the Reserve Bank of India has actively supported the deployment of technology for the purpose of implementing rules and building policy frameworks in India's banking industry (Aazhvaar, 2019). However, the process of formulating a strategy is far simpler than that of successfully putting it into action. The same is true for a nation like India, which has a large population but a disproportionately high number of people living in rural areas or who lack enough technological knowledge, which slows down the rate at which technologically driven services are implemented (Kurode, 2018).

Artificial intelligence integration with the banking industry

In the current atmosphere of Industry 4.0, it is of the utmost importance for financial institutions to maintain their aggressiveness and competitiveness in the market. They are required to be dynamic, continuously taking and aligning their decisions, and accelerating changes in company operations with the intention of optimizing both the profitability and the delivery of services. This is a must. The objective of this research was to evaluate the use of artificial intelligence (AI) for the purpose of obtaining success in the process of implementing plans in an environment as dynamic as that of the banking industry. All activities, from beginning to end, which are to be completed by these intelligent devices, were taken into consideration. The following is a summary of a number of significant opportunities that exist for the financial services industry to make use of AI.

★ Creating, driving, and supporting the execution of strategies based on research and data analysis.
★ Increasing Profitability by Cutting Strategy Cycles, Cutting Costs on Redundant Tasks, Increasing Productivity and Efficiency, and Increasing Customer Loyalty while Optimizing Service Delivery by Becoming Operationally Lean
★ Adapting banking activities in order to comply with any applicable regulations by means of transformation and reengineering

★ Facilitating precise decision-making by presenting studied data together with suggested outcomes, so providing assistance to the leadership of the banking industry.

★ Improving core banking solutions by working at a much more robust pace and being agile in response to market conditions, providing banks with a better go-to market strategy across a variety of asset classes, managing customer portfolios by assessing their profile through algorithmic sorting based on research about financial institutions, loans, and investments, and then augmenting this data with customers' behavior to approach each customer in a personalized manner.

★ Conducting surveillance in sensitive areas by designing a bespoke secure environment in accordance with the applicable regulatory requirements, scanning transactional and non-transactional logs to identify suspicious activities, abnormalities in patterns, and early warning signs of attempts to commit fraud, collecting evidences, analyzing data for the necessary conviction, and responding to that in a timely manner, thereby outperforming the criminals who are attempting to commit fraud.

★ When a user is carrying out banking transactions, the Physical and Logical Access Management for Locker rooms and designated areas can be secured based on face recognition, mandatory authentication, authorization process, generating unique service token, and inbuilt anonymous continuous monitoring mechanism.

★ In labor-intensive, repetitive, tedious, monotonous, voluminous, time-consuming tasks, operational efficiency and customer delight can be achieved by ensuring rationalization, standardization, and swiftness in 100 percent error-free personalized and extremely intuitive service delivery. This significantly reduces the amount of time it takes for banks to complete their work.

★ Intelligent machines have the potential to reduce human bias and emotional interference in order to prevent distortions in the decision-making process, shorten the amount of time required for the implementation of business processes, answer customer questions without causing any frustration, and increase productivity as a result of the self-interest of earning commissions.

★ Credit assessment and decision can be effectively managed through a Personal Assistant powered by Neural Network using classification models, analyzing market conditions with reference to the lifestyle, appetite for risk, financial goals, individual portfolios, systematic pattern recognition in the previous behavior of customers, and time series forecasting adhering to banking credit standards. This results in the development of successful financial strategies from the perspective of banks, which simultaneously develop successful financial strategies.

★ Artificial intelligence has the potential to handle error-free and up-to-date record keeping, the elimination of human error, and the management of some of the most complex areas of the accounting, auditing, and assurance domain.

★ The AI-powered Virtual Customer Assistant and Chat Bot engages customers in speech or text in human language, learns from their activities and interactions, understands their behavior, and provides suggestions or takes action accordingly. It manages all of the tasks, from the initial customer onboarding to the various customer services.

★ The transformation of Interactive Voice Responses (IVRs) may coincide with customers moving away from webpage search (Google) and toward voice search (Google Assistant), enabling human-like interaction, shortening the waiting queues, minimizing dependence on call centers, KPOs, and BPOs, and consequently reducing the scope of human errors.

★ The manpower that is freed up by applying AI to day-to-day tasks, including jobs related to payment that are handled by Chat Bots, can be used for more value-added and human-centric service functions, motivating employees to up-skill and re-skill themselves for shouldering higher responsibilities. Additional benefits would include the ability to scale up capacity during peak or emergency scenarios, providing high-quality services to clients, and allowing bank workers to have a better work-life balance for themselves. These benefits would be added on top of existing benefits.

Using Artificial Intelligence in the Indian Banking Sector:

After reviewing the extensive literature on this topic, this study found the potentials of AI for attaining successful strategy implementation in India's banking industry since AI understands the workflow of the banking system and restructures the procedures to automate the same. The following are examples of practical applications of AI in India's banking sector that are becoming a part of daily life and benefiting clients in the form of quasi-banker chat bots:

The Reserve Bank of India: RBI and the National Payment Corporation of India (NPCI) are aiming to reduce the cost of electronic transactions. The Institute of Development and Research in Banking Technology (IDRBT) is researching new technology opportunities and problems.

SBI: Launched a national hackathon and is now utilizing face recognition technology-based "Chapdex" built by the contest's winning team; chatbot "SIA" is active on the SBI website to communicate with consumers.

Yes Bank: Yes, Pay Bot, created in collaboration with Payjo, a premier AI banking platform, processes financial transactions in real time in a customized conversational manner. On its website, the chat bot "Yes Robot" is serving.

HDFC: Since March 2019, the HDFC chatbot "EVA" (Electronic Virtual Assistance) designed by Sense forth AI Research has handled the following:
- Consumer inquiries for answered.
- Unique users' interaction
- People participation in the conversation

AXIS Bank: AI and NLP-enabled app to assist clients with financial and non-financial transactions, to answer FAQs, and to aid customers with contextual engagement with the bank for loan and other products. On its website, the chat bot "Axis Aha!" is available.

ICICI Bank: It is India's first bank to use software robotics and automation in over 200 business processes across various functions such as retail banking, treasury, and human resources to perform repetitive, high-volume tasks, reducing response time by approximately 60% while maintaining 100% accuracy. On its website, the chat bot "pal" is serving.

Conclusion

AI is a promising technology, so researchers gathered rich literature from various data sources, tracked & analyzed its evaluation, business opportunities, applications, etc., and thoroughly analyzed the contribution of various scholars to find connect with the research objectives as described above, ultimately reaching conclusions to identify the application of AI with specific reference to India's Banking Sector. Researchers achieved this purpose and a full description of the same is offered in the Literature Review section, finding that most researchers saw AI as an exceptionally beneficial technology with tremendous potential to benefit the banking sector by strengthening its tactics. Scholars have identified AI acceptance, diffusion, and usage patterns, drivers, and guidelines. Scholars have also discussed the security, reliability, and privacy concerns of AI in the banking sector, evaluating AI's architecture, design problems, and hardware prerequisites. AI can give banks intelligent machines that mimic human customer service. India's banking sector feels bullish about AI because its benefits are obvious in numerous important areas - cost reduction and profitability. Manpower (monitoring, fraud detection, freeing human executives for more value-added jobs Operational error-free, simpler, automated resource usage and Leadership optimized decision making, business promotion & growth, customer delight. AI algorithms can optimize financial policies, refine revenue models, and build new bank tools. This study concludes that India's banking sector is ready to partner with AI to implement its goal successfully. After all, life is about keeping pace, evolving, and changing through time. This study explored AI's ability to produce differentiated results for successful banking strategy execution in India. This study discussed, deliberated, analyzed, reviewed AI applications, and identified potential. AI is one of the most trustworthy and robust platforms, thus the banking sector is growing increasingly open to integrating it. However, India's banking sector has a long way to go before its AI integration reaches maturity.

Reference

1. Ardith, L., Letrozole, A. M., Pan niello, U., & Achille, C. (2019). Towards Industry 4.0. Business Process Management Journal , Bradford Vol. 25, Is. 2, pp: 323-346.
2. Awed, R. (2011). Considerations on Cloud Computing for CPAs. The CPA Journal , New York Vol. 81, Is. 9, Sep pp: 11-12.
3. Aya chit, M. M. (2017). ICT Innovation in Indian Banking Sector: Trends and Challenges. IOSR Journal of Business and Management (IOSR-JBM), PP 21-27.
4. Bellman, R. (1978). An Introduction to Artificial Intelligence: Can Computers Think? San Francisco: Boyd & Fraser Pub. Co.
5. Bigoli, H. (2018). Cloud Computing Deployment: What Have We Learned from Real Life Implementations and Practices. Journal of Strategic Innovation and Sustainability , West Palm Beach Vol. 13, Is. 1, Jul pp 36- 52.
6. Chester, A. N. (1994). Aligning Technology with Business Strategy. Research-Technology Management ,37(1), 25-32.

7. Davenport, T. (2016). Innovation in Audit Takes the Analytics, AI Routes. Audit Analytics, Cognitive Technologies, to set Accountants Free from Grunt Work. Depress Publisher.

8. Erdely, O. J., & Goldsmith, J. (2018). Regulating Artificial Intelligence Proposal for a Global Solution. AAAI/ACM Conference on Artificial Intelligence. Ethics and Society.

9. Fatha, M., & Pastorals, F. (2010). Assessing Bank Efficiency and Performance with Operational Research and Artificial Intelligence Techniques: A Survey. European Journal of Operational Research, Vol. 204 (2). pp. 189- 198.

10. Ghurair, A. A. (2018, February 3). Embracing artificial intelligence: Do UAE banks have a choice? Khaleej Times, pp. https://www.khaleejtimes.com/business/banking-finance/embracing-artificial-intelligence-do-uae- banks-have-a-choice.

11. Joshi, P. R., Islam, S., & Islam, S. (2017). A Framework for Cloud Based E-Government from the Perspectiveof Developing Countries. Future Internet , Basel Vol. 9, Is. 4, pp: 80.

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

13. Lagarde, C. J. (2018). Central Banking and Fintech: A Brave New World. Governance, Globalization, 12(1-2), 4-8.

14. Lakshmi Narayana, P. N., & Deepthi, B. R. (2019). Advent of Artificial Intelligence and its Impact on Top Leading Commercial Banks in India – Case Study. International Journal of Trend in Scientific Research and Development (IJTSRD), Volume – 3 | Issue – 4 | May-Jun, p 614 - 616.

15. Moro, S., Cortez , P., & Paulo, R. (2015). Business Intelligence in Banking. Expert Systems with Applications: An International Journal, Vol. 42(3), pp. 1314-1324.

16. Namath, K., & Pillai, R. (2013). A Model for Cost-Benefit Analysis of Cloud Computing. Journal of International Technology and Information Management , San Bernadino Vol. 22, Is. 3, pp: 95-II.

17. Oatmeal, E., & Same, G. (2018). Literature review of Industry 4.0 and related technologies. Journal of Intelligent Manufacturing , London (Jul) pp: 1-56.

18. Paddy, R. P., Patra, M. R., & Sat apathy, S. C. (2011). Cloud Computing: Security Issues and Research Challenges. IRACST - International Journal of Computer Science and Information Technology & Security (IJCSITS) , Vol. 1, No. 2, December, pp. 136 - 146.

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

20. Sabharwal, M. (2014). The use of Artificial Intelligence (AI) based technological applications by Indian Banks. International Journal of Artificial Intelligence and Agent Technology, 2. 1-5.

21. Srivastava, P., & Khan, R. (2018). A Review Paper on Cloud Computing. International Journals of Advanced Research in Computer Science and Software Engineering , ISSN: 2277-128X (Volume-8, Issue-6) pp. 17-20.

22. Technology, N. I. (2011, October 25). Final Version of NIST Cloud Computing Definition Published. Retrieved from https://www.nist.gov/news-events/news/2011/10/final-version-nist-cloud-computing-definition-published

23. Umar, A., Mehmood, A., Majeed, M. F., & Mugham, S. (2019). Innovative Citizen's Services through Public Cloud in Pakistan: User's Privacy Concerns and Impacts on Adoption. Mobile Networks and Applications , New York Vol. 24, Is. 1, Feb pp: 47-68.

24. Veda Radha, R., Ravi, H., & Debasing, R. (2016). TECHNOLOGY IN BUSINESS – A MAGIC WAND IN BANKING SECTOR. INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & RESEARCH TECHNOLOGY, 431 - 435.

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

26. Zhang, Q., Cheng, L., & Botana, R. (2010). Cloud computing: state-of-the-art and research challenges. Journalof Internet Services and Applications , May, Volume 1, Issue 1, pp 7–18.