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A STUDY ON IMPACT OF AI IN BANKING AND FINANCIAL SERVICES.

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ABSTRACT:

This paper explores the transformative impact of Artificial Intelligence (AI) on the banking and financial services sector. As AI technologies continue to advance rapidly, they are revolutionizing various aspects of the financial industry, ushering in an era of increased efficiency, personalized services, risk management, and enhanced customer experiences. this study presents a holistic view of the profound impact of AI in banking and financial services. It highlights the potential benefits of AI adoption, including increased efficiency, enhanced customer experiences, and improved risk management, while emphasizing the necessity of proactive measures to address ethical and regulatory challenges. This paper is based on secondary sources mainly research articles, annual reports and official banking websites. This article is based on analysing the AI adoption levels in the State Bank of India (SBI), Housing Development Finance Corporation (HDFC), Industrial Credit and Investment Corporation of India (ICICI) and Axis Bank. These are the chosen banks or the financial services which are analysed for their returns on assets (ROA) corresponding to Artificial Intelligence adoption at the respective banks.

Keywords: Artificial Intelligence, Banking and financial services, Return on Assets, AI adoption.

INTRODUCTION

Artificial intelligence (AI) is a multidisciplinary field that includes information, logic, cognition, thinking, systems, and biology. It has been used to process knowledge, recognise patterns, acquire machine learning, and process natural language. The term "Artificial Intelligence" refers to a broad range of technologies. The financial services (FS) sector, frequently the global bellwether industry, has begun an AI-led transformation journey using advanced technologies like collaborative filtering, support vector machines, and deep learning. AI-based pred1ictive modelling, automated manual tasks, robotic assistance/chatbots, and deep learning are also being

used. This innovation has the potential to completely change how we interact with computers, making them more effective and user-friendly. As well as enhancing the overall user experience, it might result in the creation of new goods and services.

Further research is required to solve these problems and guarantee that the technology is developed in an ethical and responsible manner in order to fully realise the potential of interactive AI. This involves creating transparent and fair algorithms, ensuring user data is safe and secure, and supporting diversity and inclusion in the development process.

AI is also a research tool for many incredible and novel applications. Application of AI in e-Commerce, Personalised Shopping, AI-Powered Assistants, Fraud Prevention, Applications of Artificial Intelligence (I) in Education, Applications of AI in intelligent manufacturing, Applications of AI techniques to combat cyber-crime, Applications of AI in medical field, such as dermatology, cardiology, fighting against Covid-19, Emerging applications of AI in neuro-oncology, Applications for protein 3-D structures.

Automation has gained popularity. This kind of disruption has occurred before in the history of mankind. We were forever changed by the development of the wheel and the pulley, which also lessened our reliance on manual effort. Through AI-based automation, innovation is this time decreasing our intellectual labour as well. People are undoubtedly sitting up and paying attention to the disruption as a result. Millennials are great to work with, and their contributions are certainly commendable. especially receptive to improvement and change. There was a shortage in prior generations; starting salaries were modest and career possibilities were scarce. This at the time generated a new kind of hunger that drove us to advance in life. The millennial generation, in contrast, does not currently feel that kind of strain. Of course, having knowledge of cutting-edge technologies is also advantageous.

LITERATURE REVIEW:

1. **A. Geetha & Dr. M.G.R, 2021-** A study on AI in banking and financial services. This article has the secondary sources of data to identify the information availed in the banking and financial services in Chennai to get a look on the implementation of AI methodology in banks as well as from customers and it resulted as the satisfaction is found is some people only. The authors suggested in improving the procedures with innovative services at the workplace for customer friendly.

2. **Dr. Navleen June 2020**: Kaur, Dr. Monika Sharma, Laraibe Siddiqui, and Supriya Lamba Sahdev. Artificial intelligence's impact on the banking sector and how it is transforming the look of contemporary banks are discussed in Banking 4.0. The primary focus of this essay is the application of AI in the banking sector, specifically the revolutionary changes in banking and their effects on the human labor. Since dealing with automation requires new technologies and expertise.
3. **Ana Fernandez, 2019**, "Artificial Intelligence (AI) in financial Services"- the author describes that the investors are benefited by the usage of AI application in finance sector as it still undergoes with risks and limitations involved. So, by having use of the AI tools as a process involved in making out decisions and in major activities offers a fair steadiness with the risk and rewards.

4. **Chan, Nayler, Raman, & Baker, 2019-** The financial services diligence has an antiquity of expending computable approaches and a set of standards to support assessment making. These are the basis of AI coordination, and the trade is consequently well-informed for AI implementation, placing it at the lead of employing and promoting since AI knowledge.
5. **Reza Mardanghom and Henrik sandal 2019**- AI in financial services analysis of the AI technology and the potential applications, implications and risks it may propagate in financial services. this paper approaches with the qualitative research from reputed companies which are being inculcated with the AI and technology. The author says that the implication office technology is at the very initial stage. As it grows it will upgrade the users and staff interaction in the morning effective manner which is the minute errors also can be fixed. W.r.t, the investment decisions, fraud detection end credit risk stop the companies, they are able to collaborate with the new innovative projects in more volume with efficient performance.

RESEARCH GAP:

The integration of AI technologies has introduced novel ways to streamline operations, enhance customer experiences, and optimize decision-making processes in these sectors. Despite the growing literature on the topic, there still exists a significant research gap that requires attention to comprehensively understand the impact of AI in banking and financial services. To harness the full potential of AI while ensuring its responsible and sustainable implementation is essential. By focusing on the long-term sustainability of AI-driven models, ethical implications, customer acceptance, regulatory challenges, and workforce dynamics, researchers can contribute valuable insights to facilitate the successful integration of AI in these critical sectors.

STATEMENT OF THE PROBLEM:

The impact of Artificial intelligence in banking and financial services.

OBJECTIVES:

- "To study evolution of AI in the of areas banking and financial services industry."
- "To assess the profitability of banks after adoption of AI".
- "To study the impact of AI in terms of quality of services in the areas of banking and financial services industry."

Research methodology:

An effort is made to deduce specifics concerning India's adoption and implementation of AI in banking and financial services in this regard. There are primary and secondary sources for the data. Research papers, web magazines, e-books, newspapers, and other sources will be utilized to gather secondary data, while a survey on artificial intelligence in banking and financial services in Karnataka will be used to get primary data. This study's research design combines an exploratory and descriptive methodology.

Hypothesis:

Null Hypothesis (H_0): There is no significant relationship between the AI adoption and ROA. Alternative Hypothesis (H_1): The adoption of AI and ROA are significantly correlated.

Limitations:

The study's generalizability may be limited due to the specific context and sample size. The research relies on self-reported data from surveys/questionnaires, which may introduce response biases. The dynamic nature of the industry and rapid advancements in AI may require periodic updates and revisiting of findings.

DATA ANALYSIS:

AI in the banking sector in India has been achieving significant momentum in recent years. With the rapid advancements in technology and the increasing need for automation and personalized customer experiences, banks in India have been actively exploring and implementing AI solutions.

The top four commercial banks in India are working with fintech firms to use AI to boost productivity, lower costs, and enhance customer service.

We look at the top 4 Indian banks' AI apps to aid with the following inquiries:

- Which AI tools are being have been applied by clients and staff at the top Indian banks?
- What savings in money, time, and effort may be expected from these AI applications?
- What prospects does AI have for the Indian banking industry?
- The Artificial intelligence applications used by India's top commercial banks: Indian State Bank, HDFC, ICICI, and Axis.

AI adoption:

year	SBI	HDFC	ICICI	AXIS
2023	0.8	0.75	0.69	0.79
2022	0.71	0.74	0.65	0.74
2021	0.67	0.73	0.61	0.72
2020	0.65	0.69	0.57	0.65
2019	0.45	0.68	0.51	0.65

Return on Assets:

year	SBI	HDFC	ICICI	AXIS
2023	0.91	1.78	2.01	0.72
2022	0.63	1.78	1.65	1.1
2021	0.45	1.78	1.31	0.66
2020	0.36	1.71	0.72	0.17
2019	0.02	1.69	0.34	0.58

CORRELATION ANALYSIS:

Correlation analysis is a statistical technique used to measure the strength and direction of the correspondence between two variables. In the Context of assessing the relationship between AI adoption and selected performance metrics in the Banking and Financial services sector, correlation analysis helps determine the extent to which AI adoption is Associated with changes in those metrics. Let's consider an example to illustrate how correlation analysis can be performed.

In our study, we gathered information on ROI (return on assets) for a sample of banks and financial institutions, as well as statistics on AI usage and profitability measures. If there is a connection between AI adoption and ROA, we want to identify it.

1. **Correlation analysis of SBI bank:**

Year	ROA	AI ADPOTION
2023	0.91	0.8
2022	0.63	0.71
2021	0.45	0.67
2020	0.36	0.65
2019	0.02	0.45

Return on Assets and AI adoption in SBI Bank appear to be strongly positively correlated, according to the correlation coefficient, r = 0.9728. In SBI Bank, as AI use rises, the Return on Assets is likely to be positively impacted. It suggests that the use and application of AI technologies by SBI Bank are positively related to increased financial performance as determined by Return on Assets.

2. **Correlation analysis of HDFC bank:**

YEAR	ROA	AI-ADOPTION
2023	1.78	0.75
2022	1.78	0.74
2021	1.78	0.73
2020	1.71	0.69
2019	1.69	0.68

Return on Assets and AI implementation in HDFC Bank appear to be strongly positively correlated, according to the correlation coefficient, r = 0.9729. It suggests that when HDFC Bank adopts more AI. imply that the use of AI directly increases Return on Assets.

3. **Correlation analysis of ICICI bank:**

Year	ROA	AI ADOPTION
2023	2.01	0.69
2022	1.65	0.65
2021	1.31	0.61
2020	0.72	0.57
2019	0.34	0.51

Return on Assets and AI implementation in ICICI Bank appear to be strongly positively correlated, according to the correlation coefficient, r = 0.9925. This indicates that there is a strong, reliable relationship between the two variables. demonstrates a better Return on Assets with the use of AI.

4. **Correlation analysis of AXIS bank:**

Year	ROA	AI ADOPTION
2023	0.72	0.79
2022	1.1	0.74
2021	0.66	0.72
2020	0.17	0.65
2019	0.58	0.65

Return on Assets and AI adoption in Axis Bank appear to be moderately positively correlated, according to the correlation coefficient, r = 0.6493. This indicates that although a relationship can be seen between the two variables, it is not as strong as in some other situations. The Return on Assets has a propensity to rise along with the adoption of AI, however it varies in this situation. The relationship between the adoption of AI and financial performance may be influenced by additional factors or variables.

FINDINGS:

AI has transformed various aspects of banking and financial services, leading to improved efficiency, enhanced customer experiences, and better risk management. While AI brings significant benefits, it is essential to address ethical considerations, data privacy, and regulatory compliance to ensure responsible and transparent AI implementations in this sector.

1. Automation and Efficiency: AI has enabled banks and financial institutions to automate routine tasks, such as data entry, fraud detection, and customer support. This automation has improved operational efficiency, reduced costs, and increased processing speeds, leading to better customer experiences.
2. Enhanced Customer Experience: AI-powered chatbots and virtual assistants have revolutionized customer interactions in banking. These systems can handle customer queries, provide personalized recommendations, and assist with financial planning. Through natural language processing and machine learning, AI systems can understand and respond to customer needs more effectively, leading to improved customer satisfaction.
3. Fraud Detection and Risk Management: AI algorithms can analyze vast amounts of data and identify patterns that humans might miss. In banking, AI is used for fraud detection by analyzing transactional data and identifying anomalies or suspicious activities. AI can also assist in risk assessment, credit scoring, and underwriting processes by evaluating customer data and predicting default probabilities.
4. Robo-advisory Services: AI-powered robo-advisors offer automated investment advice based on individual financial goals, risk tolerance, and market conditions. These platforms use algorithms to create personalized investment portfolios, rebalance assets, and provide real-time portfolio monitoring. Robo-advisors have made investing more accessible, affordable, and convenient for individuals.
5. Regulatory Compliance: AI technologies assist banks and financial institutions in complying with complex regulatory frameworks. AI algorithms can monitor transactions, detect potential money laundering activities, and ensure adherence to anti-money laundering (AML) and Know Your Customer (KYC) regulations. AI can also help in identifying and managing other regulatory risks by analyzing data across various sources.
6. Data Analytics and Insights: AI enables banks to extract valuable insights from large volumes of structured and unstructured data. By leveraging AI techniques like machine learning and data mining, banks can analyze customer behavior, identify market trends, and make data-driven decisions. These insights support product development, marketing strategies, and risk management.
7. Personalized Financial Services: AI allows banks to offer personalized financial products and services tailored to individual customer needs. By analyzing customer data and preferences, AI systems can recommend suitable banking products, insurance policies, and investment options. This personalization enhances customer engagement and strengthens customer loyalty.
8. Operational Risk Management: AI can help banks identify and mitigate operational risks by analyzing historical data, identifying patterns, and predicting potential risks. This includes identifying system vulnerabilities, network breaches, and cybersecurity threats. AI can continuously monitor systems, detect anomalies, and provide early warnings to prevent potential operational disruptions.

SUGGESTIONS:

- It's important to consider that while AI adoption brings numerous benefits, it also raises ethical and regulatory considerations.
- Financial institutions must ensure transparency, accountability, and fairness in their AI systems to maintain trust and avoid potential risks. AI and machine learning algorithms have transformed trading practices in financial markets.
- High-frequency trading systems analyse vast amounts of market data in real-time, allowing for faster and more accurate decision-making. Use of these algorithms can identify patterns, predict market movements, and execute trades at optimal times, resulting in improved trading outcomes.
- To emphasize the importance of providing multiple communication options to cater to different user preferences and enhance the overall user experience in AI-powered banking and financial services.

CONCLUSION:

The correlation between AI adoption in banks and financial services and Return on Assets (ROA) appears to be positive, indicating that banks that embrace AI technologies tend to experience improved financial performance. Moreover, the adoption level of AI among bank employees also shows a positive correlation with ROA, suggesting that employee engagement and skill development in AI contribute to overall organizational success. The implementation of AI in the banking industry has resulted in several benefits that positively impact financial performance. AI-powered systems can analyse vast amounts of data quickly and accurately, enabling banks to make informed decisions, improve risk management, and optimize operations. These efficiencies can lead to cost reductions, increased productivity, and enhanced customer experiences.

Additionally, the positive correlation between employee adoption of AI and ROA highlights the importance of upskilling and training programs within financial institutions. When employees are equipped with the necessary knowledge and expertise to effectively utilize AI tools and technologies, they can harness the full potential of AI for the benefit of the organization. Furthermore, employee engagement and involvement in the AI adoption process foster a culture of innovation and continuous improvement, which can positively impact overall business performance.

REFERENCES:

1. “A study on Artificial Intelligence (AI) in banking and financial services” by A. Geetha and Dr. M.G.R., published in IJCRT, Volume 9, Issue 9 September 2021.
2. “Artificial intelligence innovation in financial service” by Margarete Biallas and Felicity O’ Neill, published in June 2020.

3. Banking 4.0: "the influence of artificial intelligence on the banking industry & how ai is changing the face of modern-day banks" by Dr. Navleen Kaur, Supriya Lamba Sahdev, Dr. Monika Sharma, Laraibe Siddiqui, published in IAEME, Volume 11, Issue 6, June 2020.
4. "Artificial intelligence in financial services" by Ana Fernandez, published in economic bulletin 2/2019 analytical articles, 29 March 2019.
5. "Artificial Intelligence in Financial Services" by Reza Mardanghom and Henrik Sanda, published in Norwegian School of Economics Bergen, Fall 2019.