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STATEMENT OF THE PROBLEM
OBJECTIVES
HYPOTHESIS (ES)
RESEARCH METHODOLOGY
RESULTS & DISCUSSION
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USAGE OF ARTIFICIAL INTELLIGENCE IN INDIAN BANKS

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ABSTRACT
Artificial intelligence (AI) is catching fast across the world. The Indian banking sector is one among the early adopters of AI in the country. Banks are exploring and implementing technology in the front office and back office in various ways. AI is growing smarter from day to day. AI includes smarter chatbots for customer services, personalized services for individuals and introduction of an AI robot for self service in banks. This helps in reducing frauds and risks in the banking sector. In this paper, the author has discussed how AI is used in the banking sector, what are the benefits and the various challenges involved in application of AI in India.

KEYWORDS
banks, technology, artificial intelligence, influence & threats.

JEL CODES
G21, G38, O31, O32, O33.

INTRODUCTION
The Indian banking industry is witnessing a remarkable growth in the entire gamut of financial services. The Indian banks are on the verge of regulatory reforms, policy initiatives and technology evolution. These changes have brought a metamorphosis in the banking scenario. Some of the remarkable reforms of examples are Pradhan Mantri Jan Dhan Yojana, Atal Pension Yojana, payment banks, digital wallets have triggered the swift expansion of banks. This has prompted the entry of private players, new job creation in the sector. Banks have started competing with their peers and competitors. The advent of technology has created a competitive arena for both public sector banks and private sector banks to provide value added services to customers. The mode of offer of banking services were offered to the customers itself has changed with the introduction of technology in the banks. The emergence of fintech startups has brought innovation in the payment setups, borrowing and lending and customer relationship management. Hence it has become necessary for Indian banks on technology adoption, designing, managing the technology platform and the measures to address the challenges, frauds, risks involved on adoption of technology. Adoption of technology is not an overnight ride for the Indian banks but it started in the early 1980s itself with the usage of the ledger posting machine. Since then the Indian banks are one of the primary users of technology in all the facets of business. The digital revolution has changed gradually into virtual banking today. Understanding the banks in this changing environment has become a challenge. They need to constantly rejuvenate their competitive advantage driven by information technology and competitive pressure.

Meaning of Artificial Intelligence (AI): AI refers to the ability of machines to perform cognitive tasks like thinking, perceiving, learning, problem solving and decision making. At the outset, AI was developed to mimic human intelligence, but today it has grown beyond the expectations set at the primary stage. Advancement in data collection, processing, computation power, AI is now utilized to assign variety of tasks, enable connectivity and enhance productivity. (NITI Aayog Report, 2018)

AI is incredibly complex and doesn't represent only a single technology. AI will authorize banking organizations to completely redefine, ways of operation, launch innovative products and services and impact the customer's interventions. In the future, banks will find themselves competing with startup firms leveraging advanced technologies that increase or completely replace human workers with sophisticated technology.

OBJECTIVES OF THE STUDY
1. To understand the importance of AI in the banking industry.
2. To examine the influence of AI in banking related services
3. To identify with the various threats faced by banks on adoption of AI

RESEARCH METHODOLOGY ADOPTED IN THE STUDY
Secondary data has been used in the study. Various company reports, online journals and articles from newspapers are taken up in the study.

INFLUENCE OF AI ON BANKING RELATED SERVICES
1. **AI and Credit decisions:** Lending is an important business decision for banks. This decision has a direct and indirect impact on the economy. One of the critical aspects is the validation of creditworthiness of individuals or businesses seeking such loans. The more the banks have data about the borrower the better will be their credit assessment. AI provides for a faster, more accurate potential assessment of a potential borrower, at a lesser cost and accounts for a more powerful backed decision. The credit scoring provided by AI is based on sophisticated complex rules when compared to the traditional models used by the banks. This information helps the banker to distinguish high risk applicants with credit worthiness but not an extensive credit history. Usually the amount of loan is tied to the assessment based on the value of collateral and taking future value into consideration. Digital banks and loan issuing apps have started using machine learning algorithms to use alternative data to evaluate credit eligibility and provide personalized options. It is predicted that usage of AI will cut losses to a greater extent.
2. **AI and Risk Management**: It is difficult to overestimate the impact of AI in financial services when it comes to risk management. Enormous processing power allows huge amounts of data to be handled in a time and cognitive computing helps to manage both structured and unstructured data. This would be difficult for a human to do at one time. Algorithms analyze the history of risk involved cases and identify the early signs of potential future issues in credit decisions. AI in banking is being applied to those processes to eliminate the time intensive and error prone work involved in customer data from contracts. Enhanced handwriting recognition, natural language processing and other technologies with intelligent process automation tools are being used in back office operations to handle a variety of bank outflows.
3. **AI and Fraud Management**: With the number of credit cards, digital channels usage going up, the number of fraud cases has also augmented. AI has been successful in battling the financial fraud and the future is relatively bright because machine learning usage has relatively reduced the number of financial frauds cases. Fraud detection systems have helped the bankers to analyze the clients behavior, transactions, location.This helps to trigger a security mechanism when something suspicious is observed or contradicts the established spending pattern. The financial sector has faced a global economic loss of about $600bn as per a recent McAfee report. But as the technology landscape changes banks are rapidly changing ways to counter threats and frauds. New models based on AI and fraud management are being developed to discover fraudulent transactions.
4. **AI and Trading/Portfolio Management**: Robotic process automation plays a major role in settlement of security transactions through reconciliation and validation of information for security related transactions. Data driven investments has witnessed a steady increase over the past 5 years. It is also called

algorithmic, quantitative or high frequency trading. Intelligent trading systems have both structured and unstructured data and the processing time have reduced significantly. The prediction time for stock markets has become more accurate due to the fact that algorithms can test trading systems based on the past data and the validation level. Based on a specific investor's goal whether short term or long term, strong portfolio can be built with the help of AI.

5. **AI and individual investors:** AI has explored new ways to provide additional services to individual investors. AI has chatbots which offers instant self help solutions to customers in turn reducing the burden on the call centres. Such tools can check balances, schedule payments, look up account activity, give savings tips and more. A number of financial apps have been developed to helps individuals achieve financial goals. These intelligent systems track income level of the individual, essential recurring expenses and spending habits and come up with optimized plans and financial savings tips for the future. Some of the US Banks have developed apps which give reminders to pay bills, chart out their expenses and interact with the banker for any information in a rationalized manner.
6. **AI and process automation:** Robotic Process Automation (RPA) helps to cut operational costs and boosts productivity. This has made industry leader to look more for this. Variety of time consuming and repetitive tasks can be automated by intelligent character recognition. AI enabled software helps in generating reports after verification of data from documents and forms based on the various parameters. Employing robotic process automation for repetitive tasks has eliminated the scope for human error and allows the financial institution to refocus human efforts on tasks that require human involvement.
7. **AI effect on small banks:** Data and analytics have become a competitive edge for bank and financial services. Small banks are adopting AI slowly when compared to their larger counterparts. Hence they can look forward for collaborations with similarly situated entities who share a common interest and goal in advanced usage of AI. Small banks can take advantage of the technology despite the fact that it is not upto their budget
8. **AI and regulatory compliance:** Banking is one of the most regulated industries across the globe. Government uses their regulatory authority to make sure banks accept their bank profiles to avoid large scale default. They try to make sure bank customers are not using banks as a channel to do financial laundering and frauds. Banks have to comply with the regulations to know their customers, prevent money laundering, monitor money transfers, prevent money laundering and comply with various regulations. To perform all these activities, banks are looking at AI to monitor transactions, keeping an eye on customer behavior and log information to various compliance and regulatory systems.

THREATS POSED BY AI

Just in a short span of time AI has carved out a niche for itself in almost all the sectors of the economy. The banks have been one of the early adopters of AI with augmented usage of chatbots and virtual services.

1. **Loss of Jobs:** The augmented usage of AI in banks will lead to work reassignments, automation and job loss. AI with a view to increase enterprise productivity will reshape the way employees deliver their job assignments. This may lead to employee dissatisfaction paving way for more resignations, retrenchment, employee layoff. There is every chance that in the future the jobs of the teller, finance managers, customer service executive, loan processing officer, compliance officer may vanish from the banking scenario.
2. **Lack of clarity of processes:** Majority of the times deep learning models and neural networks used in AI have proven to be perfect in decision making but are not transparent enough to reveal the basis for such conclusions. This becomes a real challenge to the bankers to justify the same to the regulators as it is against the privacy principles. There is every chance that banks are exposed to various kinds of risks and biases in decision making.
3. **Time:** Considerable time is required to build optimal machine learning models to earn desired results.
4. **Cyber security:** Data is considered as the lifeblood of AI and any exposure arising from an unidentified source is prone to serious problems and has an impact on business. RBI has set up the Cyber Security Framework in Banks to have a board approved for assessment of monitoring and assessment mechanisms. It should be recognized that the cyber security policy should be distinct and separate from the complete information policy and promote the identification of risks and take appropriate measures to deal with them.
5. **Reduced customer loyalty:** Less customer contact and lack of essence of human touch may lead to customer loyalty. Banks have an emotional attachment as they help people realize their life dreams. With automation, all this is lost. The backward groups of society are the worst affected as they are unable to cope up to the digital divide.
6. **Lack of quality internet connectivity:** In a decade, India has taken the pride of jumping from a 4% internet connection to 30% in 2016. But the quality of the internet access has not increased at the same rate in this decade. The development of AI technologies is closely related to 5G networks, expected not to be deployed until 2020 and five years from then for complete development. Lack of quality internet even from mobile phones has restricted the users to utilize the full range of services available.

CONCLUSION

The benefits of AI are multiple in nature but the risks cannot be ignored. AI is changing the business processes and customer facing services in the financial sector of the country. Further it is also used to meet the regulatory compliances, detect different kinds of frauds and assess the individual credit worthiness of the customer. The application of AI has the potential to create more efficient business opportunities, offer personalized services and assist in achievement of larger targets in the country like financial inclusion. Despite multiple benefits still a number of problems hang around for the development of the AI sector- a few being different languages prevalent in the country, consumer trust, data and security. Security standards must be increased in the context of potential threats specific to systems employing AI solutions.

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