Role of Artificial Intelligence in Banking Services

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Abstract

The sector of Banking Industry has seen the effects of advanced technologies such as Artificial Intelligence and how it has changed and influenced the Banking Industry. The purpose of this paper is to discuss how AI is used and the history of Banking, the Applications, advantages and disadvantages of AI and of its future. AI has provided several benefits to the banking sector such as employees can work more efficiently, the organization can detect fraud and handle numerous accounts and customer requests more efficiently, and deliver personal experiences to customers, and the employees can devote most of their energies and time to more critical tasks of the organization. The authors discuss AI Banking with examples of HDFC, SBI, ICICI, JPMorgan, Bank of America, and the results achieved. Banking sectors can deliver instant services, manage the risks of an organization, and cut costs, however, the sector will suffer from the effect of privacy from the data the organization holds, the service the organization offers, the services will be biased, and the organization will suffer from regulatory compliance such as laws. With the knowledge that we have acquired, the effect of AI will be the most important aspect that is used to help the banking industry.

Keywords: Artificial Intelligence, Banking Services; Machine Learning; Fraud Detection; Customer Experience.

Introduction

Due to the rapid digital changes occurring in a diverse range of businesses, one sector that the changes have also impacted is the global bank. In the last ten years, the emergence of new technology, including big data, cloud computing, and the financial artificial intelligence (AI) have sped up the modernization of the financial services (Bhattacharya & Sinha, 2022). The processes of banking have been moving away from the traditional methods which relied heavily on manual work and paperwork, to new automated processes that are more efficient and centered around the data. There is an increased demand from clients to have their banking and other financial activities to be more efficient, safe and automated. Because of this demand, the clients expect to have the same level of service that they are used to from the e-commerce and telecommunication technology companies. Consequently, the financial service companies are integrating the AI technology more as a core strategy, since they view it as a major component to be embraced.

Given that no other technology is able to analyze and interpret trends and data at the same high speed and accuracy, banks have no choice to adopt AI technology. The traditional manual operations and processes would not be feasible.

With the volume of transactions, the velocity of cyber threats and the complexities of the banking operations, AI is able to improve the quality of banking operations and activities (Jain, 2023). Increase in decision making, service customization and the ability to automate the mundane and repetitive processes in banking are additional benefits to the adoption of AI technology. Predictive analytics is AI technology that helps banks to automate fraud detection and compliance, predict customer service needs, and provide 24-hour customer service through the automation of chat and virtual assistants. The adoption of AI is also the result of pressures to provide high quality and low cost banking services and is aimed at customer retention.

The focus of this particular problem statement is the considerable difficulties that traditional banking practices face in this digital age. Banking practices are manual and operationally inefficient. They are subject to significant human deficits, and are out of touch when it comes to market threats such as of cyber fraud, and other forms of sophisticated technology crime. The customer service of banking institutions is manual, where customers in banking hall(s) are left to queue for service, but service is not consistently rendered as the manual service processes (i.e. service scripts) are invariably not fit for purpose (Polireddi, 2024). Likewise, manual service processes saturate banking staff and do not empower staff to perform at higher skill levels. Fraud and cyber crime is invariably undetected and over controlled by traditional, static, rule-based fraud systems. These collective factors pose market inefficiencies for banking institutions, and exacerbate current levels of operational overburden. The efficiency of banking institutions is further challenged by the inaccuracy, and gaps in fraud and cyber crime loss control.

This paper aims to assess the role of AI in Banking Services by discussing its essential nature, applications, and the value it adds to financial institutions. This paper will further examine how AI tools facilitate better customer experience, improve fraud detection, and enhance efficiencies in bank operations. This paper will also define the particular technological components of AI that operate within the confines of a bank, and assess the consequences of these technologies for the future of the financial industry.

This document will also define other important areas that AI is being applied in Banking, such as service automation, credit scoring, fraud detection, robo-advising, and operational efficiency. Although the current applications of AI in financial services are the main focus of the paper, it will also discuss the ever-evolving nature of AI in financial services. Bankers, students, and researchers will benefit the most from the AI Applications in Banking Services.

Even though most people use the internet, there are still problems to solve. Operational inefficiencies, lagged service delivery, increase of fraud, and inconsistent customer service are problems that endure due to old digital systems and manual work processes. Outdated fraud detection systems use fixed models that have little to no success against the new cyber threats and advanced financial crimes. Outdated and inefficient customer service processes cause long wait times for service, irregular service, increase in employee burnout, and even lessen the banks ability to grow the business Polireddi. These problems focus in on the lack of potential and growth in the banking system.

Even though there is understanding of the use of AI in finance, there is still the lack of use of comparative research in understanding AI in banking workflow in India. Most banking research is on the single use of AI in fraud detection, for example, or in customer service chatbots. Very little incorporates the idea of AI in banking to it's uses, advantages, disadvantages, and future in a single research paper. This is the reason for this paper, structured research to modern banking systems and AI and banking, with examples.

Research Methodology

This study utilizes conceptual and descriptive approaches which are based on secondary data sources. Relying on information from artificial intelligence and banking services, the study analyzes scholarly journal articles, conference papers, industry reports, banking white papers, and other reliable websites. Data sources were selected from Google Scholar and reputable financial and technological journals to ensure quality.

This study analyzes the literature to determine which AI technologies are most prevalent, what

benefits and challenges they present, and how they are used in the banking system. It employs the case study approach to focus on top Indian and global banks which are HDFC Bank, SBI, ICICI Bank, JPMorgan Chase, and Bank of America to demonstrate the use of AI to achieve enhanced outcomes. To keep the focus on the conceptual aspects of the study, there is no collection of primary data and no statistical analysis. The focus is instead on constructing knowledge about AI in banking.

Conceptual Framework of Artificial Intelligence

The term "artificial intelligence" pertains to the phenomenon whereby human thought processes are mirrored within computers for the purpose of autonomous contemplation, learning, and task execution. More specifically, AI allows for the analysis of data, pattern recognition, and decision-making in a computer with little or no human supervision. In the banking sector, AI is not a solitary technological innovation, but rather a hybrid of intelligent systems that work in conjunction to enhance precision, efficiency, and customer satisfaction (Rahman et al., 2023). The financial sector's increasing dependence on AI is as a result of cognitive functionalities AI is able to perform, which include language comprehension, outcome prediction, and complex data pattern recognition.

Of the many technologies that comprise artificial intelligence, the most important one is machine learning (ML). ML allows systems to process data to improve a system's efficiency gradient, without requiring changes to a system from users. ML algorithms are essential to predicting the likelihood of a loan default, detecting fraud, and clustering customers by behavior. Another notable technology of artificial intelligence is natural language processing (NLP). NLP allows systems to comprehend and communicate with users in human language, and is used widely in customer service chatbots, automated email sorting, and voice systems used in banking (Kaya et al., 2019). Also, of great importance are technologies that automate the completion of forms, KYC (Know Your Customer) verification, and data entry, known as Robotic Process Automation (RPA). RPA technology allows banks to minimize the costs of manual work, and to reduce the costs incurred by making mistakes in the tasks automatically completed by the RPA. AI technologies such as Predictive Analytics provide great value to banking institutions. Predictive Analytics is the use of statistical algorithms in conjunction with AI to estimate future variables. Forecasting in Risk Management, Predicting Customer Behaviors, and Loan Assessment are some of the areas where banking institutions value Predictive Analytics the most.

Banks incorporate artificial intelligence across multiple strata; these include data acquisition, algorithmic processing, and model decision-making in real-time. The modern banking institution collects data in plenteous amounts via applications on customer's devices, transactional records, websites, and service/support feedback. AI technology works to analyze and create insights that help customize varied products and/or services, find and assess activities that may be fraudulently suspicious, and to enhance overall service delivery (Al-Ababneh et al., 2023). The stage of integrating collections/streams of data involves coupling AI solutions with existing core banking hardware to ensure seamless data interchanges across different banking infrastructure silos for instantaneous processing.

The advancement of artificial intelligence in banking technology has been gradual in impact, but, nevertheless, impactful. The technology was rudimentary; that is to say, it was limited to basic rule-based frameworks for such things as risk scoring of clients and auto/instant credit approvals. Gradual and steady improvements made it possible for banks to incorporate advanced systems for cloud computing and rational/analytical data processing as well as machine learning. By the 2010s, banks began use of chatbots on the 'front end' of the service model, use of automated tools for fraud detection, and algorithmic portfolio management guidance (Soni, 2019). It is in the banking sector that AI has been fully embraced in digital strategies and banks in the sector, for leadership records, designed digital 'ecosystems' whereby fully supportive ai tools are used throughout the service delivery continuum, from client onboarding to management of service delivery processes for investment and resource allocation. The banking sector continues to evolve

with investments in 'explainable AI', and pairing it with quantum computing, as well as machine learning; these technologies are expected to impact banking services significantly in the near to medium term.

Applications of AI in Banking

Several sectors within the banking industry have seen the incorporation of AI technologies across banking operations. This incorporation of AI technologies has changes how financial institution serve their clients, manage their risks, and manage their internal processes. One of the most noticeable uses of AI technologies is in the Automation of Customer Service, in which clients' questions can be instantaneously answered. AI technologies can automatically answer questions regarding a client's account balance, transaction history, loan eligibility, and can even register a client complaint without any human intervention (Ali et al., 2022). More sophisticated AI technologies use neural language processing to identify the goal of a client's question to provide a customized response. The availability of voice banking client AI technologies, which can be linked to home and smart devices, has further streamlined the use of client voice command to manage banking activities without the need to physically visit a bank.

An additional important use of AI includes Fraud Detection and Risk Management. In the past, fraud detection systems operated using a set of rules and could, therefore, only defend against known patterns. This is problematic, given that fraud techniques are constantly improving. With the use of machine learning, AI systems are able to analyze transactional data as it occurs and identify patterns that could signify fraud, including transactional irregularities and atypical spending behavior. These systems have a significant impact on avoiding fraud losses for financial institutions (Mehndiratta et al., 2023). AI holds value for operations relating to Anti-Money Laundering (AML) as well. When it comes to finding large manageable datasets. Artificial intelligence is far superior to human analysts working alone at finding potentially problematic networks and transactions along with non-compliance of guideline and doing it at finding large manageable datasets. This type of proactive risk management is much greater value to financial institutions as it provides them with greater safety and greater peace of mind in true compliance.

When it comes to AI in Credit Scoring and Loan Assessment, the impact is equally positive. Historical methodologies in credit scoring used a borrower's credit history and financial statements which are usually static. This is problematic as credit reports are intersectional, often out of date, and don't indicate a borrower's financial capability in debt repayment. Credit scoring machine learning models counter this with alternative data, such as, utility and mobile phone payment histories, employment history, and online activity. This allows financial institutions to score borrowers more accurately and extend credit to previously underserved communities.

Furthermore, with the adoption of AI within automated underwriting systems, financial organizations can process loan applications considerably faster, which greatly enhances the customer's experience.

For Personalized Financial Services, AI helps banks create tailored offerings. AI recommended systems calculate customers spending, investing, and goal progress to match customers with the product needed, whether it is a savings account, insurance, or investment. Mobile banking applications provide personal finance management tools that assist customers in budgeting, goal setting, and expense tracking. Customer retention and engagement are heightened because of the personalized approach.

By reallocating the accomplishment of duties from people to processes, the system also improves Operational Efficiency. Automated document processing systems use AI to cross process form data and conduct customer identity verification, anomaly detection, and other checks (Jakšič & Marinč, 2019). RPA also reduces the burden by performing tasks such as report generation, account reconciliation, and compliance verification in the back office. These systems reduce the potential for human error, increase efficiency, free up staff to focus on more complex tasks and improve efficiency.

Artificial Intelligence has been a catalyst for the beginning of robo-advisors in Investment & Wealth Management. Robo-advisors are automated tools

that handle investment portfolios through the use of algorithms. These tools determine the best possible investment portfolio for a user based on their risk tolerance, goals, and the current market conditions. AI is also useful in improving investment portfolios through the evaluation of the global financial market and predicting future changes. This helps wealth managers provide better services to their clients.

Benefits of AI in Banking

The rise of AI technology in the banking sector has led to the automation of several functions which has in turn improved the speed of operational service delivery which required human involvement in the past. Each time consuming tasks such as the assessment of a loan, KYC processing, and the response to a customer complaint, were take several minutes, with a positive impact operational efficiency as a greater number of clients could be serviced concurrently by the financial institutions. Furthermore, the advanced Back Office functions automation with the implemented artificial intelligence also greatly reduces operational expenses with the decreased human work force (Bhattacharya & Sinha, 2022). With the introduction of technology such as Robotic Process Automation (RPA), the execution of tasks that must be performed on a continuous basis is accomplished with greater efficiency and correctness, which in turn lowered the loss of money that was previously lost to human error in work functions.

Advanced fraud detection also constitutes a significant benefit as the detection of artificial intelligence is able to access large datasets, analyze them, and identify unusual and fraud-prone behavior. Fraud detection algorithms powered by artificial intelligence evolve to incorporate new fraud mechanisms and are more adaptable to changing fraud scenarios by using a dynamic approach than legacy systems that use inflexible regulations. This improves financial safety and encourages greater confidence in banking systems (Jain, 2023). Along with that, artificial intelligence improves banking interactions through personalization in the use of chatbots, robo-advisory, and mobile banking assistance technologies. Customers increased satisfaction and interaction through these tools which capture and recall customer behaviors to make suggestions fit to user profiles and quickly respond to user problems.

Challenges and Risks of AI Adoption

The incorporation of the technology of artificial intelligence to the banking sector encounters obstacles and the risk of technology of artificial intelligence. The foremost worry consists of the data privacy. Every AI system needs to use data from the customer to produce results. Since data is collected and used from from clients and customers, there exists the risk of data and inherent sensitive information being lost and potentially used illicitly, and failing to adhere to the industry protective regulations, banks may lose the trust of customers (Polireddi, 2024). Yet another challenge consists of bias that may and does occur with algorithms. This leads to unfair discrimination, and the lending practices result in different risk assessments that lead to discrimination and bias.

The costs of the implementation of the system itself is quite high and a challenge, and this is the obstacle of the technology. In the banking world, the smaller banks are the most impacted. Integrating, and developing the system, keeping the system updated, and along with the system, the process continues to be a financial challenge, and must have AI systems that have the most advanced technology. Cyber security threats from artificial intelligence are complex and systemic.

The demand for employment within the assigned task will also cause the concern of job loss due to automation of human activities in repetitive and clerical functions. While new jobs and opportunities in specialized AI-related areas are on the rise, the management of traditional workforces will have to change, and employees will need to adjust their skills to new functions or roles (Rahman et al., 2023). Then there are also the real and potential pains of the AI-related ecosystem. The crucial challenge is the pace of AI-related developments, which is oftentimes too fast for the relevant regulatory systems to keep up.

Case Studies

One of the first banks to adopt Artificial in Banking Technology in India is HDFC Bank with its EVA (Electronic Virtual Assistant) chatbot.

EVA handles customer queries in real-time and answers accounts, loans, and banking product related questions. EVA is designed to maximize service efficiency and accessibility. EVA has served millions of clients in reducing the workload of customer service representatives, and in turn, increasing the efficiency of the service provided by the bank.

The State Bank of India (SBI) is first in India to deploy AI technology on its digital platform YONO (You Only Need One). YONO uses AI to is personalize service offerings, analyze customer spending patterns and offer recommendations on appropriate financial products (Kaya et al., 2019). The objective was to create a comprehensive digital ecosystem in a single platform for banking, shopping, and assets management. SBI has AI-powered solution to foster Customer Engagement and Digital Banking in India.

One such example is ICICI Bank which has implemented Robotic Process Automation (RPA) in more than 700 internal processes. RPA takes over tasks such as data input, compliance check, and account parity. The intent has been to reduce human errors and expediate functions internally. As a result, higher accuracy, and quicker response times were achieved, along with a reduction in contunual costs. With respect to other countries, in a similar way, sana J.P. Morgan Chase uses its AI-focused tool COIN (Contract Intelligence) to automate the scanning of legal documents and contracts (Al-Ababneh et al., 2023). With the click of a button, she is able to predictive document process complexities every few seconds, a process for which hundreds of thousands of hours of labor were once needed. Likewise, with Bank of America Erica, an AI virtual assistant, she is able to provide and maintain and receive satisfaction with customer requests for managing a budget, tracking transactions, and an advisory role in finances. Complete guided monetary parameters were personalized and incredibly made financial an customer satisfaction.

Suggestions and Recommendations

Having looked at the use of AIs in the Banking Sector for Technological Adoption, the author provides the following comments of banks, regulators, and the academia. From the author's perspective, banks should assimilate the use of AIs in More Sophisticated Digital Frameworks that center around customer service, flexible operational delivery, and the ethical use of Ai. In high-stake areas like credit and loan decisions, banks should deploy transparent and accountable AIs that are explainable to avoid unfairness in bias in the process. Data security standards banks have adopted should meet international standards to help customers and banks maintain the trust that is the backbone of these relationships. To work with AIs, banks are required to upgrade their employees' digital skills not only to dispel employees' anxiety regarding losing their job but to ensure seamless shift to digital banking.

Those responsible for making and enforcing laws will need to make flexible rules to help figure out the rapid changes occurring in AI technology. Regulations should include balance protection, ethics of AI, and accountability. Working together, financial industry regulators, banks, and technology companies can shape the first draft of AI Governance in Finance. Educational researchers need to base future studies on primary data for empirical studies to gauge the impact of AI on banks, customer satisfaction and financial inclusion. Furthermore, the field will certainly benefit from studies on the degree to which public and private banks AI technology has developed.

Conclusion

This paper looks at many aspects of AI in Banking such as the foundational concepts, features of the system, or the advantages and challenges, and the case studies, etc. AI is a game changer, as multiple frauds in the banking sector, and customer data misuse, and even the customer experience went awfully wrong, but AI is the one that improves operational efficiency, and for that, the banking sector is grateful. Fusion of technologies like machine learning, neural language processing, predictive analytics, and robotic process automation is changing the banking sector. This paper looks at several top banks in India and elsewhere, showing how AI increases customer satisfaction by reducing costs of banking and provides speedier services. While the author was working on the research some challenges of AI such as data privacy, lack of transparency in AI

algorithms, risks of cyber attacks, and technological unemployment, etc. were faced. These challenges were lawfully mentioned to support the claim that AI is the greatest technology that can be implemented in the banking sector with the most positive results. Obvious to the greatest extent from this work, the integration of the most recent technologies can be promisingly effectively utilized.

This work supports the claim that the influence of artificial intelligence on the banking sector is more positive than negative. It will enable banks to compete in the economy as well as the digital world.

References

Al-Ababneh, H. A., et al. "Performance of Artificial Intelligence Technologies in Banking Institutions." WSEAS Transactions on Business and Economics, vol. 20, no. 1, 2023, pp. 307–317.

Ali, M. S., I. A. Swiety, and M. H. Mansour. "Evaluating the Role of Artificial Intelligence in the Automation of the Banking Services Industry: Evidence from Jordan." Humanities and Social Sciences Letters, vol. 10, no. 3, 2022, pp. 383–393.

Bhattacharya, C., and M. Sinha. "The Role of Artificial Intelligence in Banking for Leveraging Customer Experience." Australasian Accounting, Business and Finance Journal, vol. 16, no. 5, 2022.

Jakšič, M., and M. Marinč. "Relationship Banking and Information Technology: The Role of Artificial Intelligence and FinTech." Risk Management, vol. 21, no. 1, 2019, pp. 1–18.

Jain, R. "Role of Artificial Intelligence in Banking and Finance." Journal of Management and Science, vol. 13, no. 3, 2023, pp. 1–4.

Kaya, O., et al. Artificial Intelligence in Banking. Deutsche Bank AG, 2019.

Mehndiratta, N., G. Arora, and R. Bathla. "The Use of Artificial Intelligence in the Banking Industry." Proceedings of the 2023 International Conference on Recent Advances in Electrical, Electronics & Digital Healthcare Technologies (REEDCON), IEEE, 2023, pp. 588–591.

Polireddi, N. S. A. "An Effective Role of Artificial Intelligence and Machine Learning in the Banking Sector." Measurement: Sensors, vol. 33, 2024, article 101135.

Rahman, M., et al. "Adoption of Artificial Intelligence in Banking Services: An Empirical Analysis." International Journal of Emerging Markets, vol. 18, no. 10, 2023, pp. 4270–4300.

Soni, V. D. "Role of Artificial Intelligence in Combating Cyber Threats in Banking." International Engineering Journal for Research & Development, vol. 4, no. 1, 2019, P. 7.