International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Banking and Artificial Intelligence: Revolutionizing Financial Services

Sri Vidhya M V

Assistant Professor, Ayya Nadar Janaki Ammal Colleg , Madurai Kamarajar University, Madurai, Tamil Nadu, India

ABSTRACT:

The amalgamation of banking and artificial intelligence is swiftly reconfiguring the financial services domain, pushing beyond traditional limits and introducing a fresh epoch of creativity and effectiveness. This study captures the far-reaching influence of AI on banking, underscoring its contributions to improving customer interactions, managing risks, thwarting fraud, streamlining operations, and tailoring services. This study also is characterized as descriptive, with all the necessary and pertinent data sourced from a variety of journals, magazines containing published papers, and websites.

Keywords: Artificial Intelligence, Banking, Blockchain,Fraudulent operations, Fraudulent prevention.

1.INTRODUCTION:

Artificial intelligence has granted banks the means to redefine their interactions with customers. With the introduction of intelligent chatbots and virtual assistants, a novel era of personalized support is emerging, allowing customers to access real-time assistance, manage their accounts, and receive tailored financial guidance. This shift, in turn, has led to heightened customer satisfaction, decreased response times, and fortified customer relationships. Artificial Intelligence (AI) is the capacity of a machine or computer to imitate natural processes, including the acquisition and application of knowledge and skills. When a machine replicates human thought and decision-making, it qualifies as Artificial Intelligence.

The utilization of AI and sophisticated analytics in decision-making has revolutionized the competitiveness of smaller financial service providers, enabling them to rival larger institutions[5]. Within the banking sector, the adoption of AI technology has become particularly prominent. The integration of AI in this industry has notably increased, especially with the rise of online banking and self-service branch networks. Natural language processing (NLP) and machine learning systems are employed to automatically and dependably address customer inquiries, track savings and spending patterns, and facilitate financial transactions on behalf of customers.

2.REVIEW OF LIERATURE:

The researcher's 2018 study, "The Transformation of the Banking Sector through Artificial Intelligence: A Case Study of India's Leading Commercial Banks," The introduction of machine intelligence to the banking sector and its use in India's largest commercial banks are examined by Jewandah S. According to the report, although traditional banking methods are changing, these institutions

are gradually adopting cutting-edge technology like cloud computing, blockchain, and artificial intelligence. It's crucial to remember that they haven't quite embraced the AI revolution. In banking, people continue to be extremely important. In the near future, the Indian banking industry is aggressively looking for ways to incorporate AI to improve operational effectiveness and raise standards for customer care.

In his 2019 research, Mr. C. Vijay delves into the utilization of artificial intelligence within the Indian banking domain, elucidating both its benefits and the obstacles it presents. He explores how AI innovations in the realm of financial technology can augment the operations of the Indian banking sector.

3.OBJECTIVE:

- Investigate the integration of AI technologies in the entire spectrum of banking functions, spanning customer engagements, risk management, fraud prevention, and operational procedures.
- Examine and explore AI's function in risk management within the banking domain, delving into the utilization of predictive analytics and machine learning for the identification and mitigation of risks, including fraud detection and credit risk assessment.
- Assess the efficiency of AI systems in the detection and prevention of fraudulent activities within the banking sector.
- Offer perspectives on forthcoming trends and obstacles at the intersection of AI and banking.
- Investigate how AI technologies are enhancing operational efficiency within banking institutions.

4.RESEARCH METHODOLOGY:

The research methodology blends exploratory, descriptive, and explanatory approaches to gain a holistic understanding of how AI influences the banking sector[3]. Primary data is gathered directly through surveys, interviews, and questionnaires that involve a diverse array of stakeholders. Additionally, secondary data is sourced through extensive literature reviews. In light of the findings, actionable suggestions are offered to banks and policymakers, allowing them to harness the potential of AI while tackling associated challenges. The study also delves into emerging patterns and obstacles in the integration of AI within the banking industry.

5.THE BANKING LANDSCAPE TRANSFORMED BY AI:

Banks must not delay their adoption of artificial intelligence, as they need to remain competitive in a future marked by innovative and advanced technologies.

5.1 DRIVE-THRU BANKING:

A convenient service that enables customers to conduct transactions from the comfort of their cars, involves dedicated lanes where these transactions are facilitated through a window. In a move towards automation, Voice AI systems are under development to replace human staff in the drive-thru banking process. Notably, Clinc, a startup based in Ann Arbor, originally known for developing voice-powered AI platforms for banking in 2015, expanded its reach to drive-through ordering in July 2018. Their conversational AI innovation excels at understanding orders, even when faced with language barriers or heavy accents, and can make corrections during the conversation.

5.2 BANK STATIONS:

Banks have the opportunity to infuse artificial intelligence across their entire operational spectrum, spanning the front office, middle office, and back office. [4]The bank stations represent a network of self-service terminals that provide a diverse array of value-driven e-services to consumers, including bill payments and government e-services. In today's financial landscape, big data has become the benchmark, and its applications within the banking industry are sparking a profound transformation. AI plays a pivotal role in organizing and categorizing this data, and the banking sector harnesses its potential to enhance customer relationships. The future of banking is unequivocally tethered to Artificial Intelligence as it strives to cater to the demands of the modern customer.

5.3 PASSBOOK UPDATION KIOSK:

The Indian banking sector has undergone a transformative shift, transitioning from a primarily human-driven environment to one increasingly controlled by machines. A notable innovation in this evolution is the introduction of passbook printing kiosks, automated stations that empower customers to print their passbooks. Prominent Indian banks, including SBI and Bank of Baroda, have embraced this technology on a large scale by installing self-service passbook kiosks, granting customers the autonomy to generate their passbook records.

For example, SBI's "Swayam" passbook printing kiosk, utilizing barcode technology, streamlines the passbook updating process, making it hassle-free for customers. Although banks continue to hire personnel, the nature of the requisite skill sets is shifting, with an increased focus on cultivating front-end talent.

5.4 CHATBOX:

Intelligent Banking Companion with Conversational Capabilities. Chatbots and virtual assistants represent innovative instruments engineered to streamline the communication bridge between humans and computers. They stand as prime instances of AI integration in the banking sector, effectively supplanting traditional front-desk interactions at financial institutions. These AI-driven machines deliver highly personalized, digital interactions to customers, ushering in a new era of engagement. For instance, the State Bank of India (SBI) has introduced "SIA" (SBI Intelligent Assistant), a chatbot that seamlessly assists customers with everyday banking tasks, emulating the role of human bank representatives. Moreover, SIA excels in providing swift solutions to inquiries from NRI customers through the chatbox on SBI's portal.

5.5 RISK ASSESSMENT PROCESS:

Assessing the risk linked to loan approvals demands accuracy and privacy. This complex and crucial process can be notably simplified by incorporating artificial intelligence. AI excels in analyzing relevant data from prospective borrowers, processing and inspecting information related to recent financial activities, market trends, and the latest financial conduct. This enables AI to identify potential risks during the assessment of loan applications. Some key ways where AI is employed for risk assessment in banking, **Credit Evaluation**: AI employs algorithms to scrutinize an individual's credit history, transaction data, and even unconventional data sources for a thorough credit risk assessment. This empowers banks to render more precise lending judgments, even for individuals with limited credit backgrounds.

Detecting Deceit: AI serves as a real-time guardian against fraudulent activities, capable of discerning irregular transaction patterns, such as unusual spending habits or atypical geographic locations. When such anomalies arise, it promptly triggers alerts, prompting further scrutiny.

Anti-Money Laundering (AML): AI stands as a pivotal tool in singling out suspicious transactions that may hint at money laundering. With its prowess to sift through extensive transaction data, AI effectively identifies potentially illicit financial undertakings.

Market Risk Appraisal: AI algorithms dive into market data to provide profound insights into potential risks tied to investments and trading. This valuable knowledge equips banks to make well-informed decisions regarding their investment portfolios.

Management of Operational Risks: AI can foresee and mitigate operational vulnerabilities by dissecting data related to internal processes, customer grievances, and external factors that might impact the bank's day-to-day operations.

Analysis of Customer Behavior: AI expertly analyzes customer behavior and spending patterns, unearthing early indications of financial turmoil. This enables banks to intervene proactively and extend assistance to customers who may be grappling with financial hardships.

Compliance with Regulations: AI is an invaluable asset for ensuring banks adhere to ever-evolving regulations. It automates the monitoring of compliance and streamlines the generation of necessary reports required by regulatory authorities.

Supervision of Loan Portfolios: AI-powered tools play a pivotal role in loan portfolio management by flagging potential defaults and facilitating decisions on loan restructuring or collections.

Stress Testing: AI has the ability to simulate a variety of economic scenarios, providing a comprehensive assessment of how a bank's assets and liabilities would withstand challenging conditions. This aids in the evaluation of capital adequacy.

Risk Modeling: AI is harnessed to construct intricate risk models that factor in a wide spectrum of variables, substantially enhancing the precision of risk evaluations within banking operations.

5.6 CASH DEPOSIT MACHINE:

AI has the capability to perform image recognition and validate the legitimacy of banknotes. This technology aids in confirming the genuineness of deposited money, thereby diminishing the chances of counterfeit currency infiltrating the banking system. Furthermore, AI is employed to bolster the security of Cash Deposit Machine (CDM) transactions. It can identify unusual or deceitful behaviors, like multiple deposits of the same banknotes or attempts to interfere with the machine. When such activities are detected, AI algorithms can prompt alerts or implement preventive measures. CDMs equipped with AI often come with more user-friendly interfaces, utilizing natural language processing to comprehend and respond to customer inquiries or provide instructions. This streamlines the deposit process, especially for customers who may not be acquainted with the machine..

Utilizing artificial intelligence, CDMs' well-being can be continuously observed, allowing for predictive maintenance or repair needs based on usage patterns and sensor data. This forward-thinking maintenance strategy reduces disruptions and guarantees the constant availability of CDMs. Furthermore, AI-driven algorithms are capable of dissecting transaction data from CDMs to offer valuable insights into customer behaviors and usage trends. This data can empower banks to make informed choices regarding CDM placement, cash replenishment schedules, and various operational facets.

Incorporating AI-driven virtual assistants or chatbots into CDMs enables the provision of instant customer support. These virtual assistants are adept at addressing typical queries and resolving issues in real-time, thus enhancing the user-friendliness of the deposit procedure. AI can also be employed for facial recognition and biometric authentication, adding an additional security layer to CDM transactions, guaranteeing that only authorized individuals can operate the machine. Additionally, certain CDMs leverage AI-powered technologies for the sorting and accurate counting of cash, streamlining the deposit process and diminishing counting errors, which is advantageous for both customers and banks.

5.7 ATM AND MOBILE BANKING:

Automated Teller Machines (ATMs) enhanced with artificial intelligence deliver customized user experiences. They possess the capability to scrutinize a customer's transaction history and preferences, enabling the presentation of tailored choices. This might encompass suggesting common withdrawal amounts or presenting the preferred language and screen layout. Through AI algorithms, these ATMs forecast cash withdrawal behaviors, enabling the pre-loading of cash denominations that are statistically more likely to be employed. This not only curtails wait times but also elevates the overall customer experience.

In the realm of security, AI-powered fraud detection systems maintain real-time vigilance over ATM transactions. They possess the acumen to detect irregular or suspicious activities, promptly instigating alerts or temporarily deactivating the ATM to thwart fraudulent endeavors.For seamless cash management, AI is harnessed to optimize the operation of ATMs. It can accurately forecast when an ATM is on the verge of depleting its cash reserves, allowing banks to proactively replenish it. This strategic approach minimizes downtimes and customer inconveniences.In the realm of secure user authentication, certain ATMs incorporate cutting-edge features like facial recognition, palm vein scanning, or fingerprint recognition. AI takes center stage in ensuring the precision and reliability of these advanced biometric systems.

5.8 BLOCKCHAIN AND BANKING:

Artificial intelligence (AI) can play a pivotal role in elevating the efficiency of cross-border payments, expediting real-time settlement, and reducing the dependence on intermediaries. This transformation results in a more streamlined and cost-effective process.In the domain of blockchain-based financial transactions, AI takes center stage to bolster security[2]. It maintains continuous vigilance to detect any signs of fraudulent activities, promptly triggering alerts or interventions when unusual anomalies surface.

The fusion of AI and blockchain data ushers in a new era of credit scoring, characterized by precision and inclusivity. Lending decisions become faster, fairer, and more comprehensive as a broader spectrum of data is considered.Furthermore, the harmonious integration of blockchain and AI revolutionizes trade finance by automating document verification, curbing fraud, and enhancing transparency in the supply chain.

Blockchain's immutable ledger proves invaluable in rendering anti-money laundering (AML) and know-your-customer (KYC) compliance more efficient and dependable. AI lends a helping hand by automating the verification process, resulting in time and cost savings.AI-powered chatbots and virtual assistants adeptly handle customer inquiries pertaining to blockchain transactions, ensuring efficient user

support.The collaborative efforts of blockchain and AI give rise to decentralized and automated asset management platforms, optimizing portfolio management while reducing associated fees.

5.9 FRAUD DETECTION AND PREVENTION:

Artificial Intelligence (AI) plays a crucial role in fraud detection and prevention across various industries, including finance, e-commerce, healthcare, and more. AI systems, particularly machine learning models, are used to analyze large datasets and detect fraudulent activities in real-time or through retrospective analysis.

AI models can learn normal behavior patterns from historical data and identify anomalies or deviations from these patterns. Unusual transactions or behaviors can be flagged for further investigation. AI can recognize patterns[1] and trends associated with fraudulent activities, such as recurring tactics used by fraudsters. By identifying common fraud patterns, AI can help prevent new instances of similar fraudulent behavior. AI-based systems can continuously monitor transactions and activities as they occur. If an anomaly is detected, it can trigger real-time alerts, enabling swift action to prevent or mitigate potential fraud.

Fig1:Depicts number of breaches taken place in a decade

AI models use historical data to make predictions about potential future fraud. Figure 1 illustrates the number of data breaches happenen between the year 2010 to 2019. By analysing past fraud cases, these models can estimate the likelihood of fraud in new transactions or activities. AI can assess user behaviour and establish a baseline of normal behavior. Any deviations from this baseline can be a sign of potential fraud. This is especially useful in the context of account takeover and identity theft. Supervised machine learning models can be trained on labeled data to classify transactions or activities as either fraudulent or legitimate. Unsupervised models can identify unusual patterns without prior labels, making them suitable for detecting new and evolving fraud tactics. NLP can be employed to analyze text data, such as customer support chat logs or written communications, to identify potential fraud or suspicious messages.

In cases of cyber fraud, AI can analyze network traffic patterns to detect anomalies, intrusions, and unauthorized access attempts. AI-driven biometric systems, such as facial recognition and fingerprint scanning, enhance security and prevent identity fraud by verifying users' identities.AI can combine structured and unstructured data from multiple sources, such as transaction data, customer behavior, geolocation information, and more, to provide a comprehensive view for fraud detection. AI models can adapt to evolving fraud techniques by continuously learning from new data, ensuring that

they remain effective over time. AI can help minimize false positives, where legitimate transactions are flagged as fraudulent, by improving the accuracy of fraud detection algorithms.

6.EXAMINATION AND DISCOVERIES:

This analysis draws from data gathered from a sample of 150 survey participants. The study reveals that a significant portion of respondents in their mid-20s, 30s, and 40s are most influenced by artificial intelligence in the banking sector. These individuals also express a positive outlook on AI, viewing it as valuable and user-friendly. They are keen on the introduction of new AI innovations over time.

Approximately 75% of the total respondents, which translates to 112 individuals out of the 150 surveyed, consider the utilization of artificial intelligence in banking as advantageous. Around 10% remain uncertain about its benefits, while 4.5%, equivalent to 5 individuals, do not find it beneficial at all.The data further indicates that a substantial 58.9% of respondents, encompassing 88 out of 150, make use of automated financial advisors for their investment decisions. Moreover, 64.3% of the participants, or 96 individuals, affirm that the implementation of artificial intelligence in the banking system has enhanced the speed of services. In contrast, 13.4% (20 people) are unsure about the impact.

7.CONCLUSION:

Banking and Artificial Intelligence have forged a powerful alliance, bringing about a revolution in financial services. The incorporation of AI technologies into the banking sector has proven to be transformative, impacting every facet of the industry. In conclusion, the synergy between banking and AI has led to significant advancements in efficiency, security, and accessibility. Banking and Artificial Intelligence have formed a dynamic partnership, catalyzing a revolution within the realm of financial services. The infusion of AI technologies into the banking sector has, without a doubt, brought about transformation that has touched every corner of the industry. To sum it up, the synergy between the banking sector and AI has yielded significant progress in terms of operational efficiency, bolstered security, and broadened accessibility.The critical role played by AI, encompassing credit assessment, fraud detection, and risk management, has granted banks the capacity to render more informed judgments while mitigating risks. Additionally, AI-driven virtual assistants and chatbots have enriched the customer experience, resulting in the provision of banking services that are both user-friendly and highly efficient.With blockchain technology entering the mix, in conjunction with AI, a streamlining effect has been witnessed in areas like trade finance and asset management, offering an unparalleled level of transparency and security.It is of utmost importance, however, to tread carefully in the process of integrating AI and blockchain, keeping a watchful eye on regulatory adherence, data privacy, and security matters. As the financial landscape continues to evolve, the cooperative journey of banking and AI promises a future marked by improved services, heightened security, and an increased level of accessibility for all.

REFERENCE:

1. Dr.Bohdan Mytnuk,Oleksandr Tkachyk,Natalia Shakhovska ,Solomiia Fedushko in Application of Artificial Intelligence for Fraudulent Banking Operations Recognition
2. Chakraborty, C., & Joseph, A. (2017). Machine learning at central banks.
3. Dr Monika Sharma, Amity International Business School, Banking 4.0: -The Influence of Artificial Intelligence on the Banking Industry & How AI is Changing the Face of Modern Day Banks, June 2020, t, 11(6):577-585.

4. C. Vijai, St.Peter's Institute of Higher Education and Research, Chennai,India, Artificial Intelligence In Indian Banking Sector: Challenges And Opportunities, April 2019, International Journal of Advanced Research 7(5):1581-1587
5. Jewandah, S. (2018). How Artificial Intelligence is changing the banking sector - A case study of top four Commercial Indian Banks. International Journal of Management, Technology and Engineering. Retrieved from http://ijamtes.org/gallery/66.july%20ijmte%20-%20711.pdf