AN APPRAISAL OF THE LEGAL AND ETHICAL EFFECTS OF DEPLOYING ARTIFICIAL INTELLIGENCE IN BANKING TRANSACTIONS

Abstract
Artificial Intelligence (AI) is rapidly revolutionizing the systems of the world in a very alarming frequency. Virtually every sector of the economy is penetrated by AI technology. The banking system is among the industries experiencing the technological revolution introduced by AI. AI is now deployed to execute banking services including cash deposits and withdrawal, loan advancement, money transfer, customer account maintenance, credit worthiness evaluation, data analysis and management, etc. This evolving trend comes with antecedent benefits such as improved efficiency and speed in service delivery, risk reduction and financial security improvement. On the other hand, the innovation is not devoid of challenges including violation of protected rights by AI, data privacy security, infringement and liability issues resulting from the operations of AI in banking transactions. A major question to be addressed here is: who bears responsibility for legal liabilities incurred by AI in banking operations? The object of this work is inter alia to examine the ethical and legal liability issues arising from the operations of AI in banking transactions. Certain questions will be addressed here including the question of how the legal remedies for liabilities incurred by AI can be obtained. The work adopts doctrinal research approach comprising of primary and secondary sources of relevant materials. It is recommended that appropriate laws should be enacted to facilitate the conferment of the status of legal personality on AI and the AIs deployed for banking operations should first become artificial persons through incorporation to enable them enjoy legal rights and bear legal responsibilities for their actions.

Keywords: Artificial, Intelligence, Legal, Ethical, Dimensions, Effects, Deployment, Banking, Transactions.

1. Introduction

Artificial intelligence (AI) are electronic devices, machines or systems technically configured and designed to simulate human intelligence and to carry out intelligence-based tasks[1] that originally only human beings with natural mental and intellectual faculties can perform, such as reasoning, decision-making, problem solving, etc. AI has emerged as a revolutionary force in the financial services rendering industry to transform its operational paradigm.[2] This technological evolution has enabled financial institutions to harness advanced algorithm and data analytics for risk assessment enhancement, streamlining of credit approval processes and optimization of investment and portfolio management strategy.[3] From algorithm trading to fraud detection and customer services, AI has enabled financial institutions to streamline operations, improve efficiency and deliver personalized services.[4] The evolution of AI in financial services represents a paradigm shift in how financial institutions operate and interact with their customers. From enhancing operational efficiency to transforming customer experiences, AI's integration into financial services is a testament to the sector's adaptability and innovation.[5]

AI's contribution to personalized financial advisory services and automated customer support exemplifies a shift towards a more customer-centric banking model.[6] The impact of AI on finance is not limited to the operational level. It also extends to the strategic domain where AI technologies are used to inform investment decisions, optimize asset allocation and identify new market opportunities. AI's ability to process and analyze vast amount of data has provided financial analysts and investors with unprecedented insight into market trends and consumer behavior thereby enhancing the accuracy of financial forecasts and investment strategies.[7] The initial strategy of AI in finance was characterized by the application of linear regression models and basic statistical methods aimed at predicting market trends and analyzing consumer behavior. However, the advent of more sophisticated AI technologies such as neural networks and Natural Language Processing (NLP) has significantly expanded the capabilities of financial institutions in areas ranging from risk management to consumer service.[8] Financial institutions worldwide are employing digital tools such as AI to enhance their business operations and broaden access to financial services for multiple customers.[9] The vast fast-paced advancement in technology including AI and Machine Learning (ML) continues

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[1] A. Bassey, Artificial Intelligence and Intellectual Property Rights Protection: An Appraisal. *International Review of Law and Jurisprudence (IRLJ)* (International Centre for Law and Democracy Studies, in conjunction with Faculty of Law, Nnamdi Azikiwe University, Awka, Nigeria.) Vol. 6(2) May, 2024. P.77

[2] J. O. Coker, *et.al.* The Role of Legal Practitioners in Mitigating Corporate Risks in Nigeria: A Comprehensive Review of Existing Literature on the Strategies and Approaches Adopted by Legal Practitioners in Nigeria to Mitigate Corporate Risks. *Financial Accounting Research Journal.* Vol. 5(10). (2023), 309-332. (Culled from N. Uzougbo, *et.al.* Legal Accountability and Ethical Considerations of AI in financial Services. *GSC Advanced Research and Review*, (2024)19 (02), 130-142, p.2, *https://doi.org/10.30574/gsc arr. 2024. 19.2.0171*)

[3] N. Mehndiratta, *et.al.* May 2023, The Use of Artificial Intelligence in the Banking Industry. In *2023 International Conference on Recent Advances in Electrical, Electronic and Digital Healthcare Technologies* (REEDCON), (pp.588-591). IEEE. P.616

[4] N. Uzougbo, *et.al.,* Legal Accountability and Ethical Considerations of AI in financial Services. *GSC Advanced Research and Review*, (2024)19 (02), 130-142, p.2, *https://doi.org/10.30574/gsc arr. 2024. 19.2.0171*) p.2

[5] O. Adeyelu, Automatic Financial Regulatory Compliance with AI: A Review and Application Scenario. *Finance and Accounting Research Journal.* Vol. 6(4) 580-601. 17th April 2024. *www.fepbl.com* p.4

[6] N. Mehndiratta, *et.al. Op. cit.* p. 616

[7] O. Adeyelu, *et.al. Ethical Implications of AI in Financial Decision-Making: A Review with Real World Applications.* 17th April 2024 International Journal of Applied Research in Social Science. Vol. 6(4) 608-630. *www.researchgate.net* p.609-610

[8] I. Aldridge, (2023), The AI Revolution: From Linear Regression to Chat GPT and Beyond and How it all Connects to Finance. *The Journal of Portfolio Management,* 49(a), 64-77. *https://doi.org/10.3905/JPM.* 2023.1.519. (Culled from O. Adeyelu, *et.al. Ethical Implications of AI in Financial Decision-Making, Op.cit,* p.609

[9] Y. Asiedu-Danquah, *The Legal Aspects of AI-based financial Products and Services in Ghana.* 26th Dec. 2022. *www.linkedin com*

to create new opportunities for banks and other financial institutions. AI and ML systems in banking sector has attracted considerable amount of attention based on its potentials to promote the efficiency and accuracy of Anti-Money Laundering (AML) and Combating the Financing of Terrorism (CFT) operations.[10]

AI can be traced back to the late 1950s but significant growth in computing power and availability of data accelerated developments relatively of recent. The field of ML advanced significantly in the 1990s while Deep Learning (DL) took off in the 2010s. Although AI has caught the general public's imagination for decades, it was only when ChatGPT which is a Generative AI (Gen AI) Application was launched in late 2022 that AI became more readily and publicly accessible. This reignited the interest of the public in AI particularly in businesses like banking and other financial services.[11] The necessity of AI in enhancing compliance efficiency in financial services is evident in its ability to transform various aspects of financial operations. From improving decision-making and customer service to ensuring economic security and navigating regulatory complexities, AI's integration into financial services is not just beneficial but essential. As the financial sector continues to evolve, the role of AI in compliance will become increasingly significant, making it an indispensable tool in the arsenal of modern financial institutions.[12]

2. The Deployment of AI in Banking Transactions

AI systems are used not only by commercial banks and private financial sectors, but the central banks also assess the advantages of using AI in various aspects of their operations such as in monetary policy decision making, data collection and policy forecasting. For instance, AI is known to possess the capacity to improve information flow to the monetary policy committee at much lower cost.[13] In banking, ML is used in credit scoring valuation of collaterals, calculation of interest rate, charging and personalization of loan offers sometimes with the aid of synthetic data (i.e, data artificially generated by using algorithm, for example).[14] AI and ML have long been used in financial institutions for purposes such as automation of routine tasks, detecting fraud and making predictions.[15] The collective effort in employing AI for fraud detection signifies a broader commitment within the banking industry to leverage technological advancements for enhancing operational security.[16] The exploration of genetic algorithms for fraud detection in electric banking systems further demonstrates AI's versatility in combating financial fraud.[17] The development of sophisticated protective models, exemplifies the precision with which AI can evaluate loan repayment probabilities. These models significantly mitigate risks, offering a testament and confirmation to AI's transformative potentials in redefining traditional banking operations. The accuracy and reliability of these AI-driven assessment are instrumental in facilitating a more secure and efficient lending environment ultimately benefiting both banks and their clients.[18] AI is also known to have capacity to interpret and analyze vast datasets to inform credit and loan decisions.[19] AI simplifies procedures such as closing or blocking accounts, sending notifications and managing transactions.[20] Financial Lending institutions also capitalize on AI and ML tools to determine credit worthiness, streamline loan processing and improve business experience for borrowing customers. Also, AI enables lenders to scrutinize vast data and assists them in making informed decisions.[21]

According to Barefoot, banks are required by law to maintain Anti-Money Laundering (AML) systems to detect and report money movement that may indicate human trafficking and other crimes. She also observed that the United Nations Office on Drugs and Crimes estimates that less than 1% of financial crimes are caught. However, AI-enabled compliance system would have a fair better chance of flagging criminal rings.[22] AI systems assist in flagging the rapid movement of money into different accounts or transactions that significantly deviate from anticipated patterns. AI systems are becoming more useful and effective in identifying suspicious individual or transactions and to mule the accounts of organized groups that exploit the vulnerable population. AI fraud management systems can be used to prevent or detect suspicious payment and promptly alert financial institutions of usual transactions. This enables financial institutions to review and decide whether to approve or reject the seemingly irregular payment.[23]

Anti- Money Laundering (AML) is crucial in the operations of every financial institution. AI can help banks and other financial institutions (BFIs) to satisfy compliance requirements and to analyze large amounts of data from numerous online transactions to detect new transactional patterns, suspicious activities between individuals and entities, identify theft and data anomalies.[24] AI's application to accounting and financial reporting contributes to economic growth, innovation and the building of strong

[10] B. Adamyk, Legal Implication of Automated Suspicious Transaction Monitoring: Enhancing Integrity of AI. *Journal of Banking Regulation.* Vol. 25, Page 359-377, 6th Feb. 2024. *https://link.springer.com*

[11] J. Cristano, *et.al.* Financial Stability Institute (FSI): Regulating AI in the Financial Sector: Recent Development and Main Challenges. Dec. 2024. *https://www.bis.org.* p.6

[12] O. Adeyelyu, *Automatic Financial Regulatory Compliance with AI, op.cit.* p.4

[13] B. Adamyk, *op. cit.*

[14] J. Cristano, *et.al., op. cit* p. 11

[15] *Financial Stability Board, (FSB), The Financial Stability Implications of Artificial Intelligence.* 4th Nov. 2024 *https://www.fsb.org* p.9

[16] N. Mehndiratta, *op. cit.* p.617

[17] A. Al-Fatlaw, *et.al.* AI-Based Model for Fraud Detection in Bank Systems. *Journal of Fusion: Practice and Applications*. Vol.14 (1) 2024. 19-27. (Doi.*https://doi/10.54216FPA. 140102*). (Culled from N. Mehndiratta, *op. cit.* p. 617)

[18] N. Mehndiratta, *op. cit.* p. 616

[19] *Ibid*

[20] Y. Asiedu-Danquah, *op. cit*

[21] *ibid*

[22] *Risk Business, Artificial Intelligence in Banking: Risks and Benefits.* 21/11/2022. *https://riskbusiness.com*

[23] J. Crisanto, *op. cit.* p.11

[24] Y. Asiedu-Danquah, *op. cit.*

institutions by improving the accuracy and reliability of financial information.[25] In the area of auditing of financial documents which historically is labour-intensive, the process is now revolutionized by AI-powered solutions that streamline the alignment of financial reports with legal accounting standards.[26]

3. Examples and Instances of AI Technologies Executing Banking Operations

AI technology combined with ML employs algorithms that enable banks to examine and forecast client behavior and credit rating in order to generate tailored programs for their customers.[27] AI-powered algorithm can analyze vast amount of data and make accurate predictions. This enables financial institutions streamline their process, reduce cost and allocate resources effectively.[28] AI, ML and Robotic Process Automation Automation (RPA) algorithms increase operational efficiency and accuracy and reduce cost by automating time-consuming tasks. Banks currently leverage RPA to boost the speed of executing transactions and increase efficiency successfully. For example, JPMorgan Chase's CoiN Technology review documents and derives data from them much faster than humans can.[29]

Gen AI based virtual assistants can help banks employees find and make sense of complex information in contract documents and other documents like insurance policies, credit memos, trading information, loan application and financial statements thereby reducing errors and accelerating the process.[30] Gen AI assist banks in detecting fraud by analyzing data to identify usual patterns indicative of suspicious activity. They are also used in monitoring transactions and customer communications which allows banks to quickly investigate anomalies that may indicate scams or account manipulation. By recognizing fraud patterns, these devices effectively protect customers' accounts and assets.[31] Financial institutions where every service or product starts with a contract, terms of service or other agreement, Gen AI is particularly good at discovering and summarizing complex information such as mortgage-backed securities, contracts or customer holdings across various asset classes.[32] Gen AI helps banks employees to effectively find and understand information in financial contracts such as credit memos, lending and claims, etc. Gen AI also helps banks analysts to accelerate report generation by researching and summarizing vast economic data and other statistics from around the world. Also, Gen AI assist bankers to prepare for customer meeting by creating comprehensive and intuitive pitch books and other presentation materials that drive engaging conversation. Furthermore, Gen AI can help customers to find answers to problems such as resolving fraudulent transactions which will be easily available in the usual AI Chatbot or knowledge libraries.[33]

Chatbot is the best potential example of AI application in banking. The Deutsche Bank uses Gen AI's fast data processing and analysis potentials to improve risk calculations.[34] Gen AI-based Chatbots can guide borrowers through perplexing processes.[35] One of the best examples of AI Chatbots for banking apps is Erica, a virtual assistant from the bank of America. The AI Chatbot handles credit card debt reduction and card security updates efficiently. This led Erica to manage over 50 million client requests in 2019.[36] AI platforms like Kasisto's conversational AI platform 'KAI' assists banks in building their own Chatbots and virtual assistance rooted in AI reasoning and natural language understanding and generation. Kasisto's platform has been used by banking institutions like UAE-based digital bank Liv, DBS Bank, Standard Chartered Bank and TD. These banks use KAI – Based bots to walk customers through how to make international transfers, etc.[37] Gen AI powered Chatbots can also be more conversational which helps it provide improved customer service experiences. For example, it can speed up credit card fraud resolution.[38] Chatbot technology is one of the innovative and intriguing forms of AI software. It engages with clients using preprogrammed questions to provide polite effective communication and immediate issue resolution.[39] According to Dr. Kesavan, Chatbot addresses customers' questions without the need for human contact, but it also gathers data on customers' questions which may then be utilized to handle unforeseen issues in the future.[40]

Datavisor's ML uses big data and clustering algorithms for transaction fraud detection. Take data science company 'Feedzai', uses ML to help banks manage risk by monitoring transactions and raising alarm when necessary. With partnership with Citibank, it has introduced AI technology that watches for suspicious payment behavioral shifts among clients before payments are processed.[41] Danske Bank which is Denmark's largest bank uses AI for fraud detection by implementing fraud detection

[25] O. Adeyelu, *et.al. Ethical Implications of AI in Financial Decision-Making, op. cit.* p.613
[26] A. Berger *et.al.* (2023), *Towards Automated Regulatory Compliance Verification in Financial Auditing with Large Language Models.* In 2023 IEEE. International Conference on Big Data (BigData) (pp.4626-4633). IEEE. Doc: 10.1109/Big Data 59044.2023.10386518. (Culled from O. Adeyelu, *Automatic Financial Regulatory Compliance with AI: Op.cit.* p.4*)*
[27] A. Svoboda, The Impact of Artificial Intelligence on the Banking Industry. 10th Oct. 2023. *Journal of Banking and Finance Management*. Vol. 4(1) 2023 *https://doi.org/10.22259.2642-9144.0401002.* P.3
[28] J. Korsun, *6 Examples of AI in Financial Services and Banking.* 28th Oct. 2024. *https://djangostars.com*
[29] B. Evangelist, *AI in Banking – How Artificial Intelligence is Used in Banks.* 9th Jan. 2025. *https://appinventiv.com*
[30] V. Duk, *Generative AI and LLMs in Banking: Examples, Use, Cases, Limitations and Solutions.* 10th May 2024. *www.getdynamiq.ai*
[31] *Ibid*
[32] Z. Maufe, & T. Brown, *Five Generative AI Use Cases for the Financial Service Industry.* 3rd Oct. 2023. *https://clout.google.com*
[33] *Ibid*
[34] V. Duk, *Op. cit.*
[35] *Ibid*
[36] B. Evangelists, *Op. cit*
[37] S. Gossett, *17 AI Banking Examples You Should Know.* 23/1/2025. *https://builtin.com*
[38] Z. Maufe & T. Brown, *Op. cit.*
[39] A. Svobode, *Op. cit.* p.3
[40] *Ibid*
[41] S. Gossett, *Op. cit*

algorithm in its business. The Deep Learning tool increased the bank's fraud detection capacity by 50% and reduced false positives by 60%.[42] ML algorithms can analyze vast amount of data and identify patterns associated with fraudulent activities, enabling early detection and prevention.[43] Florida's South State Banks has trained ChatGPT to quickly access and analyze information. Bank employees use this machine for tasks such as composing emails, creating expensive reports, detecting suspicious activities and analyzing potential fraud.[44] AI and ML in banking use Deep Learning and Natural Language Processing (NLP) to read new compliance requirements for financial institutions and improve their decision-making process. Also, AI and ML in financial services help banks to process large volumes of data and predict the latest market trends. Advanced mobile apps powered by ML in banking helps evaluate market sentiments and suggest investment options.[45] Capital one AI uses virtual card numbers to prevent credit card fraud. Alphasense is an AI-based search engine that uses natural language processing to discover market trends.[46] Banks can use Large Language Models (LLMs) machines to analyze volumes of unstructured data to forecast trends and assess market risks, thereby improving risk management, reducing exposure to market volatility and enforcing regulatory compliance.[47] LLMs can speed up banks credit worthiness assessment through information analysis such as money transfer history, spending pattern and social data. LLM is also used in banks to help people fill loan or mortgage forms.[48] LLMs which are subset of Gen AI are trained on texts and languages and have a contextual understanding of human language and conversation. These capabilities can be particularly helpful in speeding up, automating, scaling and improving the customer services, marketing, sales and compliance requirements.[49]

4. Regulation of AI Technology Operations in Banking Transactions

Being an emerging technology, the regulation of AI in banking sector is still developing. Legal frameworks regulating the operations of AI are still very few. This has created some legal vacuum in this area which informs the clamour for the enactment of relevant laws to adequately address this legal void. Some attempts have been made to regulate the operations of AI in the form of statutes, regulations, proposals and recommendations, etc. for instance, in 2017, the European Parliament Resolution on Civil Law Rules on Robotics state that legal status must be given to autonomous robots to make good any damage they may cause.[50] Article 10(2) of the proposed EU AI Act stipulates that organizations with high risk AI systems such as financial service providers shall make use of training of data models and validation and testing of datasets. In addition, such organizations shall take proactive steps to outline relevant design choices and examine relevant possible data biases that may lead to the risk of cyber-security vulnerability. Article 14 requires that developers of such AI systems conduct periodic human oversight of such AI systems.[51]

AI and ML are data-oriented machines that predominantly rely on data to execute their operations. This inspired the inclusion of a provision in Section 17 of the Ghana Data Protection Act[52] which provides that 'any person who process data shall take into account certain fundamental principles, such as accountability, information quality and security and lawfulness of the processing'. This provision of the law is important because data protection law play a crucial role in regulating the use of AI financial services particularly with respect to the collection, processing and storage of personal data.[53] Such laws seek to protect individual's private rights and ensure that AI systems comply with principles of data minimization, purpose limitation and transparency.

In the European Union (EU), the General Data Protection Regulation (GDPR) sets strict standards for the processing of personal data, including requirements for obtaining consent, providing individuals with access to their data and implementing data protection measures. Other jurisdictions have also enacted some data protection laws that impose obligations on financial institutions using AI to safeguard customer information.[54] Consumer Protection Regulations are equally applied to ensure that bank customers are not subjected to unfair and deceptive practices by financial institutions using AI. Such regulations usually require financial institutions to disclose how AI issued in decision-making processes that affect consumers, such as credit scoring and loan approval.[55] Liability laws regulating the legal responsibilities of financial institutions deploying AI for use may be relied on to determine the question of liability for damage caused by AI system errors, misconduct or regulatory violations.[56]

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[42] B. Evangelists, *Op. cit.*
[43] J. Korsun, *Op. cit*
[44] V. Duk, *Op. cit.*
[45] B. Evangelists, *Op. cit*
[46] *Ibid*
[47] V. Duk, *Opsit*
[48] *Ibid*
[49] Z. Maufe & T. Brown Op. *cit.*
[50] Y. Asiedu-Danquah, *Op. cit.*
[51] B. Adamyk, *Op. cit.*
[52] 2012 (Act 843), *(See Y. Asiedu-Danquah, Op. cit)*
[53] H. E. Adama, *et.al),* (2024). *Economic Theory and Practical Impact of Digital Transformation in Supply Chain Optimization.* International Journal of Advanced Economic s. Vol. 6(4), 95-107. *Doi: 10.51594/ijae.v6i4.1072 Fair East Publishers. https://www.fepbl.co* (Culled from N. Uzougbo, *et.al. Op. cit.* p.2)
[54] N. Uzougbo, *et.al. Op. cit.* p.2
[55] *Ibid*
[56] G. U. Ebirim & B. Odonkor (2024), Enhancing Global Economic Inclusion with Fintech Innovations and Accessibility. *Finance and Accounting Research Journal.* Vol. 6(4). 648-673. (Culled from N. Uzougbo, *et.al. Op. cit.* p.2)

In addition, Consumer Protection Regulations may require financial institutions to provide mechanisms for consumers to challenge decisions made by AI systems and to ensure that AI systems do not discriminate against protected entities.[57] AI systems are equally required to comply with strict cyber security regulations and data protection regulations to safeguard sensitive consumer information.[58] Liability laws may equally address issues such as product liability, negligence and various other liabilities. In some jurisdictions, it may be based on fault or negligence.

In all, legal framework for AI in financial services is rapidly evolving to regulate this technological advancement. Financial institutions are required to stay abreast with this development to ensure the compliance of AI systems with applicable laws and regulations to mitigate legal and reputational risks.[59] These legal frameworks are designed to balance innovation and consumer protection to ensure the AI is used with a sense of responsibility and ethics in the financial service industry.[60]

5. Some Benefits of Deploying AI Systems in Banking Operations

Service Automation

AI can enhance customers' services in banks and make the service process flexible such as through personalized digital banking that meets customers' needs faster.[61] Financial regulations are complex and dynamic and banks are under obligation to ensure compliance with these regulations and laws such as customer regulation rules. AI can assist in automating compliance processes.[62] AI can help banks automate certain aspects of cyber security by the continuous monitoring and analysis of network traffic.[63] Application of AI technology in the banking industry without the assistance of human beings can be seen also when digital computers count money in a precise and speedy manner. This automation technology assistance results in reduction in work-related stress and mathematical counting errors associated with cash-counting.[64]

Accuracy and Efficiency

AI can assist banks to minimize manual errors in data processing, analytics, document processing, on boarding, customer interactions and other tasks.[65] The operational efficiency and accuracy of AI application in banking is largely attributed to AI's ability to process and analyze vast amount of data far beyond human capabilities. This capacity of AI also enables it to identify patterns and trends that could remain undiscovered.[66] Machine Learning Robotic Process Automation (RPA) has improved operational efficiency in the financial sector.[67] AI can be used to digitalize certain processes such as documents verification, answering customers' questions efficiently and accurately thereby enabling bank employees to focus on other strategic activities.[68] AI technologies, including Machine Learning algorithms and Deep Learning networks have been instrumental in refining risk assessment models, predicting market trends and improving customer experiences in the financial sector. For instance, AI-driven analytics have facilitated more accurate credit scoring systems by incorporating a broader array of data points thereby reducing the risk of default and enabling financial institutions to offer credit to a wider audience.[69]

Financial Decision-Making

Globally, external factors such as currency fluctuations, natural disaster and political instability seriously impact the banking and financial industries. In such volatile circumstances, extra caution is required in taking bank business decisions. Gen AI services in banking offers analytics that give a reasonably clear picture or what is to come and helps in taking informed decisions.[70] AI computing technology within the financial sector offers remarkable advancement in decision-making capabilities and operational efficiency.[71] With the emergence of AI in mobile banking, customers are now able to engage in more effective financial planning, get more insightful financial counseling and complete transactions in a more expedient and time-saving manner.[72] AI an ML in financial services also streamlines work flow, improves consistency and helps businesses to make informed decisions.[73]

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[57] N. Uzougbo, *et.al. Op. cit*. p.2)
[58] *Ibid* p.3
[59] *Ibid* 2
[60] *Ibid*
[61] *AI in Banking: Applications, Benefits and Examples.* 21/1/2025. *https://cloud.google.com*
[62] B. Adamyk, *op. cit*
[63] *AI in Banking*, *Op. cit.*
[64] A. Svoboda, *Op. cit.* p.4
[65] *AI in Banking, Op. cit.*
[66] O. Fares, *et.al.* (2023), Utilization of Artificial Intelligence in Banking Sector. A Systematic Literature Review. *Journal of Financial Services Marketing.* 28(4), 835-852. (Culled from O. Adeyelu, *et.al,* Ethical Implications of AI in Financial Decision-Making*, Op. cit*) p.612
[67] H. Parker, & S. Appel, (2021), *On the Path to Artificial Intelligence. The Effects of a Robotic Solution in a Financial Service Firm. South Africa Journal of Industrial Engineering.* 32(2), 37-47. Doc. 10.7/166/32-2-2390. (culled from O. Adeyely, *Automatic Financial Regulatory Compliance with AI, Op. cit*. p.11
[68] *AI in Banking*, *Op. cit*
[69] A. Taiwo, *et.al.* (2021) *The Flow in the Funnel: Modeling Organizational and Individual Decision-Making for Designing Financial AI-Based Systems Frontiers in Psychology.* 12. *https://doi.org/10.3389/fpsyg.2021.697101* (Culled from O. Adeyelu, *et al, Ethical Implications of AI in Financial Decision-Making, Op. cit*) p. 613
[70] B. Evangelists, *Op. cit.*
[71] O. Adeylu, *Ethical Implications of AI in Financial Decision-Making, Op. cit*. p. 613
[72] A. Svoboda, *Op. cit.* p.5
[73] Y. Asiedy-Danquah, *Op. cit*

Speed Enhancement
AI can accelerate how information is processed, how patterns are found and how relationships are discovered in data thereby producing faster trading communication, risk control, compliance management and decision-making etc in banking services. AI can also help customers complete financial tasks, find solutions to challenges to meet their goals, manage and control their finances faster and more easily.[74] AI assisted process of loan application and determination of eligibility for loans or credits is accelerated and the delivery of results is expedited.[75] Thus, in addition to efficiency optimization through automation, AI also takes over time-consuming tasks.[76]

Fraud and Risk Management
AI models have improved the ability to detect fraud and estimate risks. The number of fraudulent transactions conducted in financial institutions has dropped.[77] AI has also helped banks to spot risky applications by evaluating the probability of failure of clients to repay loans. It achieves this prediction in various ways such as by analyzing past behavioral patterns.[78] In addition to risk reduction, AI also strengthens banks resilience and turns the tide against fraud by leveraging advanced algorithms.[79]

Cost Reduction
The advent of AI in the banking industry has resulted in a huge reduction in the cost associated with manual operations such as paper works and printing. It is estimated that the use of AI technology in the financial industry would result in cost reduction of 416 billion USD by 2030.[80] Through its task automation system, AI improves efficiency thereby streamlining operations and optimize resource allocation.[81]

Privacy and Data Security
Data security in banking industry is enhanced by AI through continuous monitoring and identification of potential threats or anomalies, while protecting sensitive customer information for banks and its financial data.[82]

6. Major Challenges in Deploying AI for Banking Operations

Cost of Deploying AI Machines
The cost of deploying, operating and maintaining AI machines are sumptuous. The initial investment in AI infrastructure is substantial.[83]

Regulatory Setback
Although several jurisdictions have made some effort by enacting laws and regulations for the operation of AI in banking sector, which is still evolving, other jurisdictions are yet to enact any such laws in spite of the wide use of AI technologies.[84] Even where there are laws regulating AI operations in banking services, it has been discovered that a major challenge of this technology is compliance with regulatory framework designed for the control of AI services.[85] AI's capacity to always adhere to regulatory framework and legal stipulations cannot be guaranteed.[86]

Data Privacy and Security
The increasing reliance on AI algorithms has raised concerns regarding data privacy.[87] Fraudsters can identify vulnerabilities in complex AI systems.[88] Also, while predictive analytics can enhance customer segmentation and credit risk assessment, reliance on this model raises concerns regarding data privacy.[89]

System Error Vulnerability
The monetary authority of Singapore has observed that the increased use of AI and data analytics (AIDA) may heighten the risk of systematic misuse[90] and possible abuse and error. Due to the substantial potential cost of system errors that may lead to

[74] *AI in Banking, Op. cit*
[75] B. Evangelists, *Op. cit*
[76] *Software Mind, AI in Banking: Trends, Examples, Benefits and Challenges.* 26th Oct. 2023. *https://softwaremind.com*
[77] A. Svobode, *Op. cit.* p.6
[78] B. Evangelists, *Op. cit.*
[79] *Software Minds, Op. cit.*
[80] A. Svoboda, *Op. cit* p.3
[81] *Software Minds, Op. cit.*
[82] *Ibid*
[83] *Ibid*
[84] *Risk Business, op. cit*
[85] A. Adeyely, Automatic Financial Regulatory Compliance with AI: A Review and Application Scenario. *Finance and Accounting Research Journal, op. cit* p.4
[86] *Software Minds, Op. cit.*
[87] O. Adayelu *et.al*, *Ethical Implications of AI in Financial Decision-Making, Op. cit* . p. 609
[88] B. Adamyk, *Op. cit*
[89] O. Adayelu *et.al*, *Ethical Implications of AI in Financial Decision-Making, Op. cit* . p. 614
[90] In a guideline document titled: 'Principles to Promote FEAT (Fairness, Ethics, Accountability and Transparency), in the use of AI and Data Analytics in Singapore's Financial Sector.' (Culled from Risk Business, Artificial Intelligence in Banking, *Op. cit*)

financial loses and reputational damage, banks endeavor to exercise caution when implementing complex AI models for Anti-Money Laundering (AML) and Combating the Financing of Terrorism (CFT) activities.[91]

Data Anomaly and Uncertainty

AI and ML algorithm rely heavily on data for decision-making. Banks may encounter challenges in obtaining high-quality well-labeled training data, especially to mantle compliance related risk. Inadequate or bias data can produce errors in AI / ML models, which may undermine compliance requirements. Furthermore, certain types of data such as unstructured data from legal documents or regulatory updates may not be readily available or efficiently utilized by AI systems.[92] Thus, data vulnerabilities and complexities in AI technology integration and operations in financial sector is a major challenge.[93] Banks also encounter the challenge of data completeness, consistency and cleanliness and addressing these challenges is crucial in ensuring that AI-powered results are reliable.[94]

Shortage of AI Operating Experts

Being an evolving technology, trained and qualified experts in the area of AI technology operations are still few and scarce. Consequently, banks encounter the challenge of engaging and retaining skilled experts[95] to operate AI systems for the execution of relevant tasks.

7. Legal and Ethical Issues in the Use of AI Technology in Banking Operations

There are legal and ethical issues that may arise in the use of AI machines in banking transactions. Legal accountability of AI in financial services is a complex and evolving area that involves the allocation of responsibilities for AI decisions and actions as well as liability for AI errors or regulatory violations. One of the challenges in AI accountability is determining who takes responsibility for decisions made by AI systems.[96]

Since man has a measure of control over the deployment of AI machines, the machine can be programmed to operate in a way that will occasion bias thereby violating the rights of the victims of such bias. For instance, Wells Fargo, a notable financial institution was prosecuted over alleged bias perpetrated by the algorithm it deployed to approve mortgage applications. Wells Fargo algorithm labeled certain neighborhoods that are predominantly blacks as 'neighborhoods ineligible for rapid loan processing', meanwhile, services provided to white applicants in similar circumstances is without such bias. Consequently, Wells Fargo loan personnel told African American loan applicants who live in predominantly black neighborhood that they will not receive the same prompt application response as their white counterparts. It was also claimed in the lawsuit that black applicants were more likely to give up during the application process because of additional barriers they encountered as against the white applicants.[97] Furthermore, facts and information gathered from the lawsuit is that white applicants looking for mortgage who earned between US$ 0 and US$ 63, 000 per year were more likely to have their application approved by Wells Fargo than black applicants seeking to refinance their home loan who earned between US$ 120, 000 and US$ 168, 000 per year. As a result of Wells Fargo's action aimed at deterring black applicants, more than one-quarter of all black home owners who applied for home loan financing through Wells Fargo did not finish their application. Investigation conducted by Bloomberg found that Wells Fargo only approved 47% of loans applications from black borrowers in 2020 compared to 72% of white customers. Meanwhile, other lenders approved a total of 71% of their black customers' loan applications.[98] Since this alleged bias was perpetrated by algorithm that was deployed by Wells Fargo, the legal or ethical question here is, for the purpose of liability and accountability, who should be held accountable as between the algorithm machine and Wells Fargo? Also, can AIs that currently have no legal status bear legal responsibility?

There is an ongoing debate as to whether AI is a service or a product. It is argued that if AI is a 'Product' product liability regulation including strict liability rules applies, but if regarded as a 'Service', then the applicable legal standards is uncertain. It has been argued that both are mutually exclusive as AI is a product of the developer providing financial services for financial institutions.[99] The Sales of Goods Act[100] applicable in Ghana prescribes strict liability for product liability cases. In *NILSSON v. GENERAL MOTORS, LLC*[101] an Automatic Vehicle (AV) popularly known as self-driven car, veered off its lane and injured a motorist called Oscar Nilsson in San Francisco. The back-up driver was in the AV but was not operating it when the accident occurred. The motorist sued the manufacturer because the AV had driven negligently. However, the parties prevented the court from ruling on this special controversy as they reached amicable settlement. Consequently, the question of liability in such circumstance as between the owner of the AV and the developer of the AI operating it remains unanswered. It has been argued that robotics lack the capacity to acquire legal status either through the 'Natural Human Model' since robots cannot hold human rights, or the 'Legal Entity Model', as this will imply the existence of a natural person behind the legal entity, or the 'Anglo-

[91] B. Adamyk, *op. cit*
[92] *ibid*
[93] O. Adeyelu, *et.al*, *Ethical Implications of AI in Financial Decision-Making, Op. cit* . p. 613
[94] *Software Minds, Op. cit*
[95] *Ibid*
[96] N. Uzougbo, *Op. cit.* p.3
[97] *Risk Business, op. cit*
[98] *Ibid*
[99] Y. Asiedu-Danquah, *Op. cit.*
[100] 1962 (Act 137)
[101] No. 4: 18-CV-00471. (N.D. Cal. June 26, 2018), ECF No.34

Saxon Trust Model', since this requires human existence as a last resort.[102] The Expert Group on Liability and New Technologies appointed by the European Commission equally disagreed with adopting legal status 'Electronic Personhood' for AI stating that such a step was unnecessary. They postulated that harm caused by fully autonomous technologies could be attributed to a natural person or legal person by 'piercing the veil', but admits that ascribing electronic personhood to AI will only be viable if it helps legal systems tackle the challenges of emerging digital technologies.[103] The European Parliament suggest that legal personhood may be granted to a specific class of AI-based applications on functional grounds when it is preferable to alternate legal solutions that is justifiable on a case-by-case basis. The functional grounds are identifying *prima facie* a single person to hold responsible when it is impossible or too expensive to locate the agent controlling that risk especially when multiple parties are involved.[104]

8. Conclusion and Recommendations

The prevalence of modern financial transactions many of which are complex and technical has necessitated the invention of automated means of executing these transactions.[105] A bank is a financial institution involved in deposit, loan exchange or issue of money and transfer of funds[106] etc. The law has made it possible for business entities like commercial banks to be incorporated with distinct legal personality separate from its owners or managers. Incorporated bodies have legal rights and liabilities recognized and enforceable in law. They are artificial persons capable of suing and being sued in their corporate names.[107] In the course of executing its duties, AI machines have the disposition to create inventions and also cause problems including the violation of protected rights of other legal entities. Since AI systems currently lack the capacity to enjoy legal rights and to bear legal liabilities like natural and artificial persons, the puzzling question now is who is entitled to claim legal rights and to bear legal responsibility for the actions of AI in the process of executing banking transactions? It is hereby recommended that the appropriate means of addressing this puzzle is for AIs to become entitled to acquire the status of artificial or legal person. Relevant laws should be enacted in jurisdictions where AIs are deployed for banking services to enable AI acquire legal status. In effect, any bank deploying AI should ensure that the AI is incorporated as a legal person entitled to legal rights and obligations while the designer of the AI system as well as the managers of the bank and the programmers of the AI system deployed for services in the bank should be registered as the directors of the incorporated AI system who will be entitled to any legal claims and be liable to bear legal responsibilities for the actions executed by the AI deployed to render services in the bank. Through this means, AIs can claim rights and can be held legally accountable for their actions.

[102] Y. Asiedu-Danquah, *Op. cit*
[103] *ibid*
[104] *Ibid*
[105] A. Bassey, Cheques as Negotiable Instruments in the Law of banking: An Appraisal. (2021) *Port Harcourt Journal of Business Law*. Faculty of Law, Rivers State University, Port Harcourt, Nigeria. Vol. 8(1) April 2021 p.262
[106] M. Otu & A. Bassey, *An Appraisal of the Essential Principles of Bank Loans and the Elements of a Good Collateral Security.* (2021) *Port Harcourt Journal of Business Law*. Faculty of Law, Rivers State University, Port Harcourt, Nigeria. Vol. 8(2) Nov. 2021 p.62 (See B. Garner, *Op. cit.* p. 139)
[107] A. Bassey, An Appraisal of the Legal Machinery for the Protection of Company Stakeholders' Interests (2022) *African Journal of Law and Human Rights (AJLHR)*, International Center for Human Rights and Peace Studies, in Conjunction with the Faculty of Law, Nnamdi Azikiwe University, Awka, Nigeria. Vol. 6(2), Sept. 2022. P.30