Sarcouncil Journal of Economics and Business Management

ISSN(Online): 2945-3593

Volume- 05| Issue- 05| 2026

Review Article **Received**: 20-03-2026 | **Accepted**: 15-04-2026 | **Published**: 01-05-2026

Systemic Implications of Digital Assurance Technologies: A Narrative Review

Deborah Akuele Apaflo[1], William Kweku Afresi Buabin[2] and Yeboah Mary Magdalene[3]

[1]*University of Ghana, Accra, Ghana.*
[2]*Methodist University College, Ghana.*
[3]*University of Ghana Business School, Ghana*

Abstract: Digital assurance technologies and their embrace by the U.S. capital markets contribute to an ever-growing degree of integrity and transparency, trust, and systemic resilience. Artificial Intelligence (AI) and blockchain have turned into essential tools for enhancing financial due diligence and mitigating systemic risk. This review is to assess the extent to which the AI- and blockchain-based assurance mechanisms enhance financial oversight, audit quality, and market stability overall. The research employs a conceptual literature review and two case studies in the United States to examine both successful and unsuccessful implementations of digital assurance. The first one reviews a Nasdaq blockchain-based system of shareholder voting and validation of transactions that improved efficiency, transparency, and investor confidence. The second example provides the investigation of a failed model of digital assurance at Silvergate Bank, where liquidity stress and mistrust were caused by ineffective governance and the absence of cybersecurity. Results indicate that the controlled use of digital assurance technologies positively affects audit traceability and system reliability, whereas an inadequate supervision level can increase financial risks. The research concludes that regulatory-aligned and ethically oriented structures of assurance are critical to enhancing the resilience of U.S. capital markets, that standardized procedures, explainable artificial intelligence, and enhanced regulatory cooperation are necessary to ensure investor confidence.

Keywords: Digital Assurance; Artificial Intelligence and Blockchain; Systemic Risk, Market Integrity, U.S. Capital Markets.

INTRODUCTION

Economic stability and trust on the part of the investors depend on the integrity of the U.S. capital market (Jannatul *et al*., 2025). Blockchain technological progress, primarily related to AI and blockchain, provides new opportunities to improve the process of financial oversight and due diligence (Rane *et al*., 2023; Patil *et al*., 2025). This review analyzes the literature available on the contribution of these technologies in enhancing the United States Capital market integrity through improved transparency, accountability, and risk management. The objective of this review is to understand how AI and blockchain-based assurance systems can make financial markets stronger, through their impact on due diligence and systemic risk reduction. Also discussed are the regulatory and governance issues related to the deployment of these technologies on a large scale.

Relevance to the U.S. Capital Market

The United States capital market provides the foundation upon which the worldwide financial network relies. Thus, the reputation offered by the capital market has become an undeniably important factor in the health and success of the worldwide economy, hence, the integrity offered by the capital market cannot be overestimated in the modern world (Francisca, 2025). In the contemporary world, the rapid use of technology in the field of finance, including the emergence and development of cryptocurrencies and fintech, has made the governance and management of the capital markets in the world much more complex in numerous fields related to the development and use of technology. (Omarova, 2020; Allen *et al*., 2022). The use and development of digital assurance technology play a critical role in the governance and management of the capital markets in the modern world, in terms of ensuring transparency and the prevention and reduction of the risks and threats posed by the emergence and development of fraud in the contemporary world, in the opinions expressed in (Achebe *et al*., 2024; Al-Omush *et al*., 2025). Technology has the ability and capacity to play an important role in managing risks in the modern world, offering due diligence, as expressed in (Li *et al*., 2023). With regulatory authorities encouraging the adoption of stricter compliance practices, the implementation of AI and blockchain will ensure compliance with changing standards, thus supporting the strengthening of trust among market actors and eventually gaining the capital markets' stability (Bhumichai *et al*., 2024).

Current State of Research

The ongoing debate in the field of academia about the role and use of digital assurance technology bears witness to an emerging interest in its implications in the field of financial markets (Kraus *et al*., 2024; Mamanazarov *et al*., 2025). In this line, the latest works and studies show that

***Corresponding Author:** Deborah Akuele Apaflo

DOI-https://doi.org/10.5281/zenodo.19949444

there exists an emerging field of studies on the role and use of AI in bolstering the effectiveness of financial audit and compliance services (Gandhi, 2023). This focus has become an emerging field, particularly on the role and use of AI in bolstering the effectiveness of financial audit and related services. Similarly, the application and use of the innovative technology of blockchain in the field of post-trade settlements echo the growing recognition in the field about the role and use of technology and innovative solutions in bolstering the effectiveness and optimization of related services (EL Hassouni & Ouchekkir, 2024). Despite the limitations and challenges, the ongoing studies and works show that there remain emerging issues and concerns, particularly in terms of scalability, regulatory issues, and related data considerations (Grant & Agoro, 2021; Mohammed Abdul, 2024). Among these, the application and use of technology and innovative solutions of blockchain in promoting transparency remain in an emerging field, essentially beset by limitations and issues. These include, among others, the application and use of technology in the wider financial systems, particularly the technical and regulatory issues related to their use and application (Wang *et al*., 2025).

THEORETICAL FRAMEWORK

Digital Assurance Technologies

Technology in digital assurance includes the use of artificial intelligence, the concept of blockchain technology, and data analytics. These technologies increase the authenticity and effectiveness of the process involved in the financial aspects of the U.S. capital markets (Rane *et al*., 2023). The application and use of digital assurance technology in the U.S. have since led the major auditing companies, Deloitte and Klynveld Peat Marwick Goerdeler (KPMG), to develop AI and blockchain technology-enabled auditing systems that automate the assurance process and identify discrepancies within complex financial data sets (Yuan *et al*., 2025). The role and application of digital assurance technology in ensuring transparency and authenticity in the process involved in financial reporting have increased the effectiveness and success achieved in due diligence and financial reporting, eliminating the need for manual and biased decision-making at the same time (Basiru *et al*., 2023).

Furthermore, the role and application of the Securities and Exchange Commission (SEC) in ensuring the authenticity and transparency in the process involved in financial reporting in the U.S. have since involved the commission in the application and use of digital assurance technology in ensuring the effectiveness of investor protection and company accountability in the U.S. capital markets, particularly in the process involved in ensuring the authenticity and transparency in the financial reporting process in the U.S. capital markets (McLaughlin & Pinedo, 2023). In terms of functionality and application, the use and application of digital assurance technology in the U.S. capital markets have since mitigated the risks and threats posed by the process involved in financial misreporting and the process involved in financial fraud, offered by the concept and use of immutable data records and algorithmic assurance (Obodai *et al*., 2025). Finally, digital assurance technologies are the embodiment of a paradigm shift in the operationalization of trust, transparency, and verification of financial ecosystems (Beauty, 2025).

Market Integrity

Market integrity forms the basis of the stability and integrity of the capital markets in the U.S. through the promotion of fair and just access and distribution of information, as well as the prevention and protection against manipulation in the markets (Francisca, 2025). The role and development of digital technologies in the field of assurance in the financial markets have increased integrity in the markets through automation and increased transparency in the reporting and presentation of financial information (Al-Omush *et al*., 2025). AI and technology in the field of blockchain technologies increase the transparency and ability to track transactions and the monitoring and supervision of trading activities in relation to the prevention and protection against the likelihood and occurrence of insider trading and fraud in the markets (Rane *et al*., 2023). The technology and systems in the field of blockchain technologies and immutable records create an ability and platform through which ethical trade practices and ethics in the markets are enforced. The AI systems and advanced technologies in the field of risk management and risk analysis create an ability and platform through which the likelihood and risk factors in the markets, in relation to fair and ethical trade practices, are analyzed and detected in their early stages, and prevent the development and formation of risks and threats in the markets (Rane *et al*., 2023). It has also been acknowledged by the Federal Reserve and SEC that a data-driven assurance

Publisher: SARC Publisher

process may facilitate systemic risk oversight and fraud detection in securities trading and asset management (Del Caprio, 2025). Technological assurance ensures market integrity, which heightens investor confidence, reduces the cost of capital, and creates sustainable financial growth. Nonetheless, as much as technology leads to higher levels of transparency, it is also associated with risks of algorithmic opacities and cybersecurity drawbacks, which may erode trust that technology is intended to instill (Mohammed, 2025). Therefore, to maintain integrity in technologically mediated markets, sound governance, oversight, and ethical standards of AI are needed (Smith *et al*., 2025).

TECHNOLOGY-DRIVEN ASSURANCE MODELS

AI-Based Assurance Mechanisms

AI-enabled assurance systems are revolutionizing the field of financial auditing and due diligence, using data automation, anomaly detection, and improved fraudulent activity prediction in the U.S. capital markets (Del Caprio, 2025; Oko-Odion, 2025). These systems rely on the use of machine learning (ML), deep learning (DL), and natural language processing (NLP) in the processing and analysis of large sets of structured and unstructured financial data, pinning down irregularities with unprecedented accuracy and efficacy (Dash 2022; Rane *et al*., 2024). AI-enabled audit analytic tools, designed and provided by U.S. entities like Ernst & Young (EY) and PricewaterhouseCoopers (PwC), have considerably improved the assurance process in terms of reduced cost and increased efficacy and quality (Tanvir Rahman & Leila, 2025). AI-enabled systems help in real-time monitoring and detection of trade developments. In other words, they help in monitoring all suspicious transactions in the capital markets, ensuring regulatory and legal compliance, and the prevention and detection of fraudulent activities in the financial markets and institutions (Aziz & Andriansyah, 2023). In corporate governance, AI-enabled systems help in the proper identification and localization of high-risk areas and provide appropriate and adequate measures through trending in pre-existing models in their earlier instances (Del Caprio, 2025). However, there remain pertinent issues and questions related to the lack of transparency and ethics in the use and application of AI-enabled systems and frameworks, especially where the implementation and enforcement thereof are related and regulated by AI systems and models. In this respect, the Public Company Accounting Oversight Board (PCAOB) aims to provide and develop appropriate guidelines regarding AI-enabled assurance systems in auditing, ensuring transparency and accountability in auditing and assurance systems and models (Eulerich *et al*., 2025). Altogether, AI-based assurance systems increase the accuracy and speed of due diligence, which contributes to increased trust and stability in the U.S. capital markets.

Blockchain Assurance Mechanisms

The blockchain assurance mechanisms improve the reliability and transparency of financial reporting by generating records that are not tampered with and decentralized and are available to authorized stakeholders in real time (Eyo-Udo *et al*., 2025; Balogun *et al*., 2023). In U.S. capital markets, blockchain can support the automated process of verifying financial transactions and auditing continuously, reducing the power of human error and monopoly (Rane *et al*., 2023). Through smart contracts, organizations will be able to perform audit procedures and compliance inspections automatically, which guarantees compliance with laws and regulations including those determined by the SEC and the PCAOB (Alotaibi *et al*., 2025). The immutability of blockchain also minimizes the chances of fraud through reporting, as well as increases investor confidence trust due to the ability to generate a verifiable audit trail (Mohammed, 2025). The application of blockchain in shareholder voting of the shareholders and validated transactions by Nasdaq reflects the contribution it can make in enhancing transparency alongside operational efficiency (Jiménez Gómez, 2023). Also, blockchain enhances systemic resilience through decentralization of the verification process; so, the assurance system is not vulnerable to single-point failures (Reno & Roy, 2025). Scalability, interoperability, and energy efficiency are, however, key issues to mass adoption. It also needs regulatory acceptance and as well as standardized protocols, such that blockchain-based assurance would be seamlessly integrated into the overall financial ecosystem (Reno & Roy, 2025; Kukman & Gričar, 2025). Overall, blockchain technologies contribute to the improvement of financial integrity, the facilitation of auditing, and the establishment of the basis of trusted digital assurance (Mohammed, 2025).

Publisher: SARC Publisher

GOVERNANCE FRAMEWORKS

Regulatory Compliance

The integration of digital assurance technology in the U.S. capital markets environment has complex linkages with the dynamic process of regulatory compliance needs (Oyegbade *et al*., 2022). The implementation and use of AI technology and the adoption of blockchain technology need to work in consonance with the U.S. federal regulations, including the Securities Exchange Act of 1934, and the regulations set by the SEC, PCAOB, and Financial Industry Regulatory Authority, FINRA, respectively (Williams, 2024). These agencies have come to realize the potency and effectiveness offered by technology in making the process of regulatory compliance more efficient, even as they dwell on the need for accountability, data governance, and transparency in the use of AI technology and the implementation of blockchain technology, respectively (Bahangulu & Owusu-Berko, 2022).

The use of AI technology in the regulatory process enables the technology to read and interpret complicated regulations and changes in an autonomous manner, resulting in reduced costs and the need for oversight on the part of the complying company. Likewise, the use of blockchain technology enables the development of an audit trail, making it possible and enabling the regulators and authorities in the field of market oversight and regulation to engage in constant monitoring and supervision in a manner that attains real-time monitoring and reporting (Oluwaferanmi, 2025). The studies of digital audit trails showed that distributed ledger systems had the potential to enhance the effectiveness of oversight and fraud detection (Friday *et al*., 2023). However, the lack of portability of the assurance protocols and the fragmentation of the regulatory authority are still hindrances to harmonized adoption. Innovations in the future need to establish clear AI decision-making roles, privacy in blockchain operations, and interoperability between companies and regulators (Bhumichai *et al*., 2024). The compliance potential of digital assurance technologies cannot be completely explored without a balanced regulatory environment.

Stakeholder Engagement

Engaging stakeholders is integral to ensuring the successful integration of digital assurance technologies in the U.S. capital markets. Through collaboration among regulators, corporations, auditing firms, investors, and technology developers, there can be the development of effective and ethical assurance frameworks in technology (Friday *et al*., 2023). The stakeholders help in the development and implementation of dynamic governance policies, which can then respond appropriately and adequately to the dynamic changes in the capital markets and technology. Through collaboration between the SEC, PCAOB, and the major auditing firms, there has been an ensuing conversation on the development of digital audits technology and AI model explainability, respectively (Eulerich *et al*., 2025; Williams, 2024).

Stakeholder engagement also helps in the development of increased transparency and accountability in the auditing process, particularly in the application and use of AI and blockchain technology, respectively (Eyo-Udo *et al*., 2025; Balogun *et al*., 2023; Rane *et al*., 2023). There has also been the development of industry-wide collaborating platforms through the FinTech Working Group, initiated and organized by the Chamber of Commerce in the U.S. The platform enables the development of an interoperable assurance framework that addresses the technological and regulatory barriers in the industry (Chowdhury *et al*., 2025). Trust and understanding are, however, integral in ensuring successful stakeholder engagement, particularly because technology poses numerous threats, including the use and manipulation of data. There should be a sustained communication process, participatory governance, and transparency in digital assurance design to enhance acceptance (Igwe-Nmaju & Anadozie, 2022). Through technological alignment and prioritization of stakeholder needs, there can be increased trust and preparedness among the stakeholders in the U.S. capital markets (Dugbartey, 2025).

REGULATORY IMPLICATIONS

Adaptation of Regulatory Practices

The Securities and Exchange Commission in the United States and the Public Company Accounting Oversight Board have slowly changed their approach to the oversight process to accommodate the use of digital assurance technology in financial auditing and reporting services (Akinsola, 2025). The Digital Accountability in Financial Services represents an important milestone in the development of auditing guidelines related to the use of AI and blockchain assurance technologies (Al-Omush *et al*., 2025). Transparency, integrity,

Publisher: SARC Publisher

and explainability in data processing and use are at the forefront of these developments, and all AI models and systems in the field of financial assurance must meet the necessary ethical and regulatory requirements. The use of the immutable ledger in the field of blockchain technology has also influenced the SEC's plans for the development and use of technologies in the field, aiming to increase the transparency and accountability of the audit process and investor participation in the financial markets (Eyo-Udo *et al*., 2025). Similarly, the use and application of AI in ensuring monitoring and prevention of manipulation in the field of FINRA has become the subject of guidance related to AI technology and assurance tools in the field (Francisca, 2025). Training examiners in the field in relation to assessing digital audit systems and the evaluation and testing of AI systems in the field, in terms of bias and error, represents an important step in ensuring that the application and use of AI in the field are safe and secure (Krause, 2024). Regulatory harmonization, however, is still a problem because the rate of technological change usually overtakes the legislative process. The U.S. Treasury Financial Stability Oversight Council (FSOC) still notes the fact that systemic risk can be avoided; dynamic regulation must be utilized to integrate digital assurance technologies. Thus, adaptive governance becomes important to be resilient and to ensure that investors are confident in the changing digital financial ecosystem (Morelli, 2023).

Cybersecurity and Data Privacy Regulations

The extensive adoption of digital assurance technology heralds a host of cybersecurity and data privacy risks, and the U.S. regulatory environment must keep abreast in ensuring the integrity of the markets (Ijaiya & Odumuwagun, 2024). With the growing use of AI assurance systems and blockchain technology, the risks arising from theft, hacking, and manipulation on cybersecurity and data privacy fronts are now magnified and cannot be ignored (Rane *et al*., 2023). The SEC and Federal Trade Commission (FTC) have underlined the critical role and need for cybersecurity and, consequently, tougher cybersecurity disclosure regulations in financial reporting and auditing processes and procedures adopted by the SEC and other regulating bodies in the U.S. and other globally influential markets (Emmanuel, 2025). The mitigation of blockchain is partially found in its decentralized architecture, which minimizes the existence of single-point failures (Hassan *et al*., 2023). One of the weak areas, though, remains interface layers, particularly smart contracts and management of private keys (Li *et al*, 2023). Cybersecurity and Infrastructure Security Agency (CISA) and the National Institute of Standards and Technology (NIST) have announced new frameworks that promote a safe model deployment of AI and an encrypted ledger check for banks (Alam *et al*., 2025). Meanwhile, the California Consumer Privacy Act (CCPA) and the Gramm-Leach-Bliley Act (GLBA) are under reevaluation to guarantee that digital assurance practices meet data privacy requirements. Regulators have made securing sensitive information of investors and algorithm accountability a priority (Chintoh *et al*., 2025). By further integrating AI and blockchain into financial assurance frameworks, striking a balance between innovation and cybersecurity compliance is what will determine the strength of the U.S. capital markets (Adejumo & Ogburie, 2025).

Systemic Risk Mitigation

The convergence of Artificial Intelligence and Blockchain technologies in the U.S. capital markets has now become a critical tool in managing systemic risks, and this has led to increased transparency, predictability, and robustness in financial systems (Rane *et al*., 2023). AI risk analytics tools help in the monitoring of risks in the financial systems, and this enables the identification of suspicious activity in the markets in real-time, which aids in the prevention of risks before they become major problems in the financial systems (Dugbartey, 2025). The use of Blockchain technology helps in the management of risks because it provides irrevocable and verifiable transactional records, and this helps in the elimination of risks related to counterparts in the financial systems (Bihani *et al*., 2025). In the U.S., the Securities and Exchange Commission and the Financial Stability Oversight Council (FSOC) have begun analyzing the use of the blockchain audit trail in improving the transparency in the trading and settlement process in the stock markets (Shahid *et al*., 2025). This would correlate with the use of AI in macroprudential supervision by the Federal Reserve, aimed at evaluating the contagion risk scenario among banks and fintech firms (Jariwala, 2025). There have also been AI-boosted stress test tools using predictive models, simulating difficult-to-handle stresses in the financial sectors, enabling early warning signals (Taheri Hosseinkhani, 2025). With the integration of such tools into governance

Publisher: SARC Publisher

structures, the U.S. capital markets would offer even swifter methods in the management and mitigation of risks, hence eliminating the dangers posed by cascading failure. Technology assurance, therefore, enhances the certainty and integrity of the financial environment through the assurance offered by due diligence (Oko-Odion & Angela, 2025).

CHALLENGES AND CONSIDERATIONS

Ethical Issues

The digital assurance based on AI poses ethical issues concerning fairness, accountability, and transparency within the U.S. capital markets. Algorithms may recreate historical biases and lead to risk oversight and heavy risk results (Oko-Odion, 2025). To do that, systems with the focus on explainable AI, bias audit, and human supervision are necessary (Atoum, 2025). Organizations such as the IIA and PCAOB promote models of assurance, which are ethics-based (Schiff *et al*., 2024). Furthermore, the immutability of blockchain contradicts the privacy laws and requires the consideration of the SEC and FASB. This is guaranteed by Human-AI assurance that is equitable, which fosters confidence in the market and the technologies (Rodrigues, 2025).

Technological Limitations

Although AI and blockchain have advantages, the obstacles of technological incorporation are still coming in the way of complete integration in the U.S. capital markets. The weaknesses include poor data quality, interoperability, and incompatibility with legacy systems, which hamper efficiency (Tute *et al*., 2021; Del Caprio, 2025). It limits its adoption due to blockchain scalability and high implementation costs, and its interpretability due to the algorithmic blockchain opaque (Mohammed Abdul, 2024; Al-Omush *et al*., 2025). The traditional auditing resistance and uncertainty among regulators further slow the pace. The challenges can be overcome through joint efforts to create explainable AI systems, standard data protocols, and interoperable blockchain systems to create sustainable digital assurance (Patil *et al*., 2025).

CASE STUDIES

Case Study 1: Nasdaq's Blockchain Assurance Success

The use of blockchain assurance models by Nasdaq is one of the most successful use cases of distributed ledger technology (DLT) in the U.S. capital markets. In voting and post-settlement reconciliation systems, the Nasdaq blockchain platform has provided better transparency and efficiency in the validation process of transactions in an immutable and secure manner (Dhatterwal & Kaswan, 2023). Also, the application reduced the problem of reconciliation and audit trails, leading to better confidence in corporate governance structures among investors (Eyo-Udo *et al*., 2025). Moreover, the use of smart contracts has reduced the need for manual checks, ensuring better reliability and minimizing the risks involved in operations. The successful implementation has proven the ability of blockchain technology in supporting the integrity of the system by ensuring better access in real time and reducing the scope of fraud involved in the process (Rane *et al*., 2023). Moreover, the collaboration between Nasdaq and the SEC has provided an opportunity to stay within the framework provided by federal laws and regulations governing the stock exchange, setting an example in the integration of technology and regulations in the future (Krause, 2024). Overall, the case indicates that blockchain-based assurance models can enhance due diligence and transparency in the U.S. markets as well as promote sustainable digital trust.

Case Study 2: Silvergate Bank's Digital Assurance Integration Failed Practice

The collapse of Silvergate Bank in 2023 reveals the dangers posed by inefficient implementation in the U.S. financial system. Silvergate, the first bank in the industry to develop technology related to the use of blockchain in the transaction settlements needed for digital assets, was plagued by poorly designed governance structures and a lack of algorithmic management structures in its systems (Schumacher, 2024). The AI systems employed in the bank failed to identify the risks posed by the volatile crypto assets, leading to a situation where the risks were increased in the system (Jariwala, 2025). The lack of coordination between the SEC and the Financial Stability Oversight Council (FSOC) in the bank's structures exacerbated the problem, making the assurance process in the bank inefficient (Taheri Hosseinkhani, 2025). With the lack of liquidity in the digital assets, the bank's use, though immutable, failed to slow the process by which the capital was drained from the bank due to uncertainty in the market trends (Bihani *et al*., 2025). The case study illustrates that technological innovation that lacks strong governance and ethical controls and cybersecurity incorporations can destabilize institutions. It validates the need to harmonize digital assurance

Publisher: SARC Publisher

protocols that draw into focus AI predictive analytics and risk-based regulatory oversight to avert systemic breakdowns in the U.S. capital markets (Rodrigues, 2025).

Research Gap

Despite the growing interest in studying the transformative power of AI and blockchain in financial assurance, much work needs to be accomplished in their combined use cases under the regulatory frameworks in the United States. The available studies are only concerned with optimization and use cases, and there appears to be a lack of focus on the integration and application interfaces between AI algorithmic analyses and the use of the immutability property in the distributed ledger technology, blockchain technology, in the available studies in the field (Rane *et al*., 2023 & Mohammed, 2025). There appears to be a lack of empirical studies on the use of digital assurance systems in the combined mitigation of risks in the financial system, and the use still appears ineffective in ensuring adequate ethical issues in data privacy and management (Al-Omush *et al*. 2025). Besides, regulatory alignment frameworks between the SEC, PCAOB, and FSOC are not well developed to facilitate standardization and institutional trust (Francisca, 2025). There is also a lack of longitudinal data that would explore how digital assurance would impact its sustainability and scalability over the long term (Krause, 2024). As a result, integrative frameworks based on AI audit analytics alongside blockchain assurance with solid ethical and cybersecurity frameworks are necessary in future research to enhance systemic risk management and capital market resilience during the digital age (Patil *et al*., 2025).

Discussion and Findings

The literature and case study synthesis demonstrate that the effective implementation of digital assurance technologies can contribute greatly to the transparency, trust, and systemic stability of the U.S. capital markets. The success of Nasdaq shows that blockchain-based auditing can offer uncorrupted trails of transactions to enhance traceability and investor confidence in an organization (Eyo-Udo *et al*., 2025). On the other hand, the collapse of Silvergate Bank is an indicator of the harm of deploying such systems without effective regulation or ethical application of AI (Smith, 2024). Results indicate that the AI predictive power plays a significant role in detecting financial anomalies, whereas blockchain helps to ensure integrity by verifying it in a decentralized manner (Rane *et al*., 2023). Nevertheless, both technologies require standardized data standards, cybersecurity measures, and explicable AI systems to avoid abuse and failure of the whole system (Bhumichai *et al*., 2024). The overlap between technology and regulation, therefore, should be driven by adaptive governance where regulators like the SEC and FSOC are actively involved in the ongoing supervision. The study concludes that effective digital assurance adoption depends on the alignment of technological innovation with ethical, transparent, and regulatory principles, which helps to create resilient, trusted, and effective capital markets.

CONCLUSION

Digital assurance technologies are transforming the assurance and auditing landscape in U.S. capital markets through the powerful analytical capabilities of AI and the transparency of blockchain. In good hands, these technologies can strengthen financial due diligence, iron out systemic risk, and improve market integrity. The research indicates that, whereas success stories like Nasdaq show how technology can enhance accountability and efficiency, the number of unsuccessful cases like Silvergate show that innovation without ethical and regulatory alignment can disrupt institutions. Sustainable integration necessitates integrated governance structures, regulatory flexibility, and partnership with the stakeholders. In addition, interoperability between AI and blockchain systems should be established to create reliability and trust through the financial ecosystem. The development of digital assurance in the United States means a paradigm shift in financial management from reactive auditing to data-oriented, proactive auditing. Finally, the stability of the U.S. capital markets in the digital era is not only about how technologically advanced it is, but also about the effectiveness of the concerted efforts to make technology work in harmony with integrity, ethics, and regulatory coherence.

REFERENCES

1. Achebe, V. C., Ilori, O., & Isibor, N. J. "Enhancing data integrity and legal accountability: A blockchain-driven approach to corporate fraud risk management." *International Journal of Advanced Multidisplinary Reseach and Studies* 4.6 (2024): 2337-2349.
2. Adejumo, A., & Ogburie, C. "Strengthening finance with cybersecurity: Ensuring safer

Publisher: SARC Publisher

digital transactions." *World Journal of Advanced Research and Reviews* 25.3 (2025): 1527-1541.
3. Akinsola, K. "Regulatory Compliance and the Role of Corporate Governance in Preventing Financial Misstatements." *Available at SSRN 5126627* (2025).
4. Alam, M. A., Sarna, S. A., Rakibuzzaman, M., & Reza, J. "Strengthening cybersecurity protocols to safeguard US financial infrastructure against emerging threats." *Advances in Economics & Financial Studies* 3.2 (2025): 71-82.
5. Allen, F., Gu, X., & Jagtiani, J. "Fintech, cryptocurrencies, and CBDC: Financial structural transformation in China." *Journal of International Money and Finance* 124 (2022): 102625.
6. Al-Omush, A., Almasarwah, A., & Al-Wreikat, A. "Artificial intelligence in financial auditing: redefining accuracy and transparency in assurance services." *EDPACS* 70.6 (2025): 1-20.
7. Alotaibi, E. M., Kim, J., & Palmon, D. "Implementing a Capital Contract Framework for Silent Shareholders: The Role of Blockchain-Enabled Smart Contracts." *Journal of Emerging Technologies in Accounting* (2025): 1-20.
8. Asamoah, E., Narteh-Kofi, E., Adukpo, T. K., & Mensah, N. "The role of financial due diligence in safeguarding investment portfolios in the US capital market." *World Journal of Advanced Research and Reviews* 25.3 (2025): 901-908.
9. Atoum, I. "Revolutionizing AI governance: Addressing bias and ensuring accountability through the holistic AI governance framework." *International Journal of Advanced Computer Science & Applications* 16.2 (2025).
10. Aziz, L. A. R., & Andriansyah, Y. "The role artificial intelligence in modern banking: an exploration of AI-driven approaches for enhanced fraud prevention, risk management, and regulatory compliance." *Reviews of contemporary business analytics* 6.1 (2023): 110-132.
11. Bahangulu, J. K., & Owusu-Berko, L. "Algorithmic bias, data ethics, and governance: Ensuring fairness, transparency and compliance in AI-powered business analytics applications." *World Journal of Advanced Research and Reviews* 25.2 (2025): 1746-1763.
12. Balogun, E. D., Ogunsola, K. O., & Samuel, A. D. E. B. A. N. J. I. "Blockchain-enabled auditing: A conceptual model for financial transparency, regulatory compliance, and security." *Journal of Blockchain Technology and Financial Innovation* 11.2 (2023): 97-112.
13. Basiru, J. O., Ejiofor, C. L., Onukwulu, E. C., & Attah, R. "Enhancing financial reporting systems: A conceptual framework for integrating data analytics in business decision-making." *IRE Journals,[online]* 7.4 (2023): 587-606.
14. Beauty, A. M. "Explainable AI in data-driven finance: balancing algorithmic transparency with operational optimization demands." *Int J Adv Res Publ Rev* 2.6 (2025): 125-49.
15. Bhumichai, D., Smiliotopoulos, C., Benton, R., Kambourakis, G., & Damopoulos, D. "The convergence of artificial intelligence and blockchain: The state of play and the road ahead." *Information* 15.5 (2024): 268.
16. Bihani, D., Ubamadu, B. C., & Daraojimba, A. I. "The Intersection of Financial Modeling and Blockchain Technology: A Framework for Enhancing Portfolio Management and Risk Assessment." (2025).
17. Chintoh, G. A., Segun-Falade, O. D., Odionu, C. S., & Ekeh, A. H. "The role of AI in US consumer privacy: Developing new concepts for CCPA and GLBA compliance in smart services." *Gulf Journal of Advanced Business Research* 3.2 (2025): 549-560.
18. Chowdhury, T. E., Chowdhury, R., & Urbi, S. R. C. "Integrating artificial intelligence into business analytics: Sectoral adoption patterns and strategic implications in the United States." *Pathfinder of Research* 3.1 (2025): 72-97.
19. Dash, B. "Information Extraction from Unstructured Big Data: A Case Study of Deep Natural Language Processing in Fintech". University of the Cumberlands, (2022).
20. Del Caprio, L. "Artificial intelligence in auditing: Transforming risk assessment and fraud detection." (2025).
21. Dhatterwal, J. S., & Kaswan, K. S. "Role of blockchain technology in the financial market." (2023).
22. Dugbartey, A. N. "Systemic financial risks in an era of geopolitical tensions, climate change, and technological disruptions: Predictive analytics, stress testing and crisis response strategies." *International Journal of Science and Research Archive* 14.02 (2025): 1428-1448.

Publisher: SARC Publisher

23. EL HASSOUNI, L., & OUCHEKKIR, A. "Revolutionizing financial markets: the role of distributed ledger technology in payments, clearing, and settlements." *International Journal of Accounting Finance Auditing Management and Economics* 5.10 (2024): 198-226.
24. Emmanuel, A. A. "The impact of cybersecurity on financial reporting: Strengthening data integrity and regulatory compliance." *International Journal of Science and Research Archive* 14.2 (2025): 626-637.
25. Eulerich, M., Summers, S. L., & Wood, D. A. "Artificial Intelligence, Audit Risk, and Regulatory Uncertainty: A Refined Analytical Model of Auditor and Client Decisions Under PCAOB Scrutiny." *Audit Risk, and Regulatory Uncertainty: A Refined Analytical Model of Auditor and Client Decisions Under PCAOB Scrutiny (May 07, 2025)* (2025).
26. Eyo-Udo, N. L., Apeh, C. E., Bristol-Alagbariya, B., Udeh, C. A., & Ewim, C. P. M. "The evolution of blockchain technology in accounting: A review of its implications for transparency and accountability." *Account and financial management journal* 10.1 (2025): 2456-3374.
27. Francisca, A. Y. "Optimizing debt capital markets through quantitative risk models: enhancing financial stability and SME growth in the US." *International Journal of Research Publication and Reviews* 6.4 (2025): 4858-74.
28. Friday, S. C., Lawal, C. I., Ayodeji, D. C., & Sobowale, A. "Reviewing the effectiveness of digital audit tools in enhancing corporate transparency." *International Journal of Advanced Multidisciplinary Research and Studies* 6.4 (2024): 1679-1689.
29. Gandhi, S. T. "AI-Driven Compliance Audits: Enhancing Regulatory Adherence in Financial and| Legal Sectors." *International Journal of Advanced Research in Computer Science & Technology (IJARCST)* 6.5 (2023): 8981-8988.
30. Grant, O., & Agoro, H. "Trends in Network Compliance and Regulatory Challenges." (2021).
31. Igwe-Nmaju, C., & Anadozie, C. "Commanding digital trust in high-stakes sectors: communication strategies for sustaining stakeholder confidence amid technological risk." *World Journal of Advanced Research and Reviews* 15.3 (2022): 609-630.
32. Ijaiya, H., & Odumuwagun, O. O. "Advancing artificial intelligence and safeguarding data privacy: a comparative study of EU and US regulatory frameworks amid emerging cyber threats." *International Journal of Research Publication and Reviews* 5.12 (2024): 3357-3375.
33. Jannatul, F., Md Saiful, I., Md, S., & Gul Maqsood, S. "AI-Driven Investment Strategies Ethical Implications and Financial Performance in Volatile Markets." *American Journal of Business Practice* 2.8 (2025): 21-51.
34. Jariwala, M. "Artificial intelligence and blockchain and the growth of the FinTech industry." *Driving Socio-Economic Growth With AI and Blockchain*. IGI Global Scientific Publishing, 2025. 113-146.
35. Jiménez Gómez, B. S. "Blockchain as an opportunity to upgrade the right to vote in listed companies." (2023).
36. Kraus, S., Bouncken, R. B., & Yela Aránega, A. "The burgeoning role of literature review articles in management research: an introduction and outlook." *Review of Managerial Science* 18.2 (2024): 299-314.
37. Krause, D. "Addressing the challenges of auditing and testing for AI Bias: a comparative analysis of regulatory frameworks." *Available at SSRN 5050631* (2024).
38. Kukman, T., & Gričar, S. "Blockchain for quality: Advancing security, efficiency, and transparency in financial systems." *FinTech* 4.1 (2025): 7.
39. Li, H., Dang, R., Yao, Y., & Wang, H. "A review of approaches for detecting vulnerabilities in smart contracts within web 3.0 applications." *Blockchains* 1.1 (2023): 3-18.
40. Li, X., Wang, J., & Yang, C. "Risk prediction in financial management of listed companies based on optimized BP neural network under digital economy." *Neural Computing and Applications* 35.3 (2023): 2045-2058.
41. Mamanazarov, S., Khajiyeva, M., Abdullaeva, D., Yuldasheva, G., Azkhodjaeva, R., Pirnazarov, A., & Xamedova, N. "Innovating human capital development: The role of education, law, and economics through digital transformation." *Qubahan Academic Journal* 5.3 (2025): 78-113.
42. McLaughlin, J., & Pinedo, A. T. “Corporate finance and the securities laws.” Wolters Kluwer Law & Business, (2023).
43. Mohammed, A. "Blockchain-Driven Cybersecurity Audits: Securing Financial

Publisher: SARC Publisher

Systems with Trust and Transparency." *Authorea Preprints* (2025).
44. Mohammed Abdul, S. S. "Navigating blockchain's twin challenges: Scalability and regulatory compliance." *Blockchains* 2.3 (2024): 265-298.
45. Morelli, M. "Managing Relative Regulatory Inefficiencies in Complex Financial Systems." *U. Pa. J. Bus. L.* 25 (2023): 705.
46. Obodai, E. T., Akalia, R., & Buabin, W. K. A. "Digital Transformation in Financial Operations: A Review of Fintech Adoption and Its Implications for US Regulatory Policy and Market Stability." *Journal of Economics And Business Management* 4.10 (2025): 20-36.
47. Oko-Odion, C. "Ai-driven risk assessment models for financial markets: Enhancing predictive accuracy and fraud detection." *International Journal of Computer Applications Technology and Research* 14.04 (2025): 80-96.
48. Oko-Odion, C., & Angela, O. "Risk management frameworks for financial institutions in a rapidly changing economic landscape." *Int J Sci Res Arch* 14.1 (2025): 1182-1204.
49. Oluwaferanmi, A. "Smart Compliance: Opportunities and Pitfalls in Deploying AI-Blockchain Systems for Real-Time AML Monitoring." (2025).
50. Omarova, S. T. "Technology v technocracy: Fintech as a regulatory challenge." *Journal of Financial Regulation* 6.1 (2020): 75-124.
51. Owusu-Berko, L. "Advanced supply chain analytics: Leveraging digital twins, IoT and blockchain for resilient, data-driven business operations." *World Journal of Advanced Research and Reviews* 25.2 (2025): 1777-1799.
52. Oyegbade, I. K., Igwe, A. N., Ofodile, O. C., & Azubuike, C. "Transforming financial institutions with technology and strategic collaboration: Lessons from banking and capital markets." *International Journal of Multidisciplinary Research and Growth Evaluation* 4.6 (2022): 1118-1127.
53. Patil, A., Mishra, B., Chockalingam, S., Misra, S., & Kvalvik, P. "Securing financial systems through data sovereignty: a systematic review of approaches and regulations: A. Patil *et al*." *International Journal of Information Security* 24.4 (2025): 159.
54. Patil, C. S., Patil, A. P., & Patil, V. B. "Evolution of technologies: A comprehensive analysis of AI, blockchain, and big data analytics." *AI and Emerging Technologies*. CRC Press, 2024. 1-26.
55. Rane, N., Choudhary, S., & Rane, J. "Blockchain and Artificial Intelligence (AI) integration for revolutionizing security and transparency in finance." *Available at SSRN 4644253* (2023).
56. Rane, N. L., Paramesha, M., Choudhary, S. P., & Rane, J. "Machine learning and deep learning for big data analytics: A review of methods and applications." *Partners Universal International Innovation Journal* 2.3 (2024): 172-197.
57. Reno, S., & Roy, K. "Navigating the blockchain trilemma: A review of recent advances and emerging solutions in decentralization, security, and scalability optimization." *Computers, Materials & Continua* 84.2 (2025).
58. Rodrigues, M. A. "Digital Transformation: Building Trust in." *People-Centered Digital Technology for Ethical and Sustainable Business Practices* (2025): 105.
59. Schiff, D. S., Kelley, S., & Camacho Ibáñez, J. "The emergence of artificial intelligence ethics auditing." *Big Data & Society* 11.4 (2024): 20539517241299732.
60. Schumacher, L. V. "Central Bank digital currencies (CBDCs): exploring characteristics, risks and benefits." *Decoding digital assets: Distinguishing the dream from the dystopia in stablecoins, tokenized deposits, and central bank digital currencies*. Cham: Springer Nature Switzerland, 2024. 81-157.
61. Shahid, S., Ahmed, S., Nabi, G., Murtaza, M., & Solangi, A. "FinTech 4.0 and the Future of Global Finance: Blockchain, Artificial Intelligence, and Big Data as Catalysts of Digital Financial Innovation." *Inverge Journal of Social Sciences* 4.3 (2025): 364-379.
62. Smith, O., Johnson, J., & Hussain, K. "AI-Governed Commons: Integrating Ethical Rulemaking and Institutional Design for Sustainable Resource Management." (2025).
63. Taheri Hosseinkhani, N. "Blockchain Technology and Cryptocurrency: Transformations and Applications in Financial Markets." *Available at SSRN 5612550* (2025).
64. Tanvir Rahman, A., & Leila, E. "FINANCIAL RISK ANALYSIS AND FRAUD DETECTION TRENDS IN BIG 4 CONSULTING FIRMS (2020-2025) A DATA-DRIVEN APPROACH." *Journal of Adaptive Learning Technologies* 2.5 (2025): 1-10.

Publisher: SARC Publisher

65. Tute, E., Scheffner, I., & Marschollek, M. "A method for interoperable knowledge-based data quality assessment." *BMC medical informatics and decision making* 21.1 (2021): 93.
66. Wang, Z., Yu, L., & Zhou, L. "Navigating the blockchain-driven transformation in industry 4.0: opportunities and challenges for economic and management innovations." *Journal of the Knowledge Economy* 16.1 (2025): 3507-3549.
67. Williams, S. J. "Regulatory Personhood: The Elixir for Redundancy between the SEC and the PCAOB." . *John's L. Rev.* 98 (2024): 753.
68. Yuan, F., Zuo, Z., Jiang, Y., Shu, W., Tian, Z., Ye, C., & Peng, Y. "AI-driven optimization of blockchain scalability, security, and privacy protection." *Algorithms* 18.5 (2025): 263.
69. Zebari, G. M., & Al Musalhi, N. "A comprehensive review of integrating AI and blockchain security: Innovations, challenges, and future directions." *Security and Privacy* 8.5 (2025): e70094.

Source of support: Nil; **Conflict of interest:** Nil.

Cite this article as:
Apaflo, D. A., Buabin, W. K. A. & Magdalene, Y. M. "Systemic Implications of Digital Assurance Technologies: A Narrative Review." *Sarcouncil Journal of Economics and Business Management* 5.5 (2026): pp 20-30.

Publisher: SARC Publisher