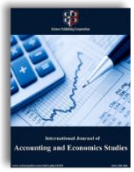
International Journal of Accounting and Economics Studies, 12 (7) (2025) 637-646

International Journal of Accounting and Economics Studies

Website: www.sciencepubco.com/index.php/IJAES
https://doi.org/10.14419/qx521w62
Research paper



The Adoption of Digital Ledger Technology for Instant Auditing and Accurate Financial Reporting in Accounting

Dr. Lena Mustafa Mahmoud Zayed *

Isra University, Amman, Jordan
**Corresponding author E-mail: lena.zayed@iu.edu.jo*

Received: August 16, 2025, Accepted: November 15, 2025, Published: November 23, 2025

Abstract

This study examines the adoption of Digital Ledger Technology (DLT) and its impact on the accuracy of financial reporting and the efficiency of auditing processes within Jordanian organizations. Using a quantitative research design, the study assesses how DLT enhances financial data integrity and supports real-time auditing capabilities. Data were collected from 210 accounting and auditing professionals representing five major Jordanian institutions: the Central Bank of Jordan, Jordan Customs Department, Arab Bank, Deloitte Jordan, and Ernst & Young Jordan. A structured questionnaire served as the primary data collection instrument, employing a five-point Likert scale to measure perceptions across key constructs related to DLT adoption. To improve response rates, the questionnaire was distributed through both physical and digital channels. Descriptive statistics were used to analyze demographic data, while multiple regression and independent samples t-tests were applied to test the study's hypotheses. The results revealed a statistically significant and positive relationship between DLT adoption and both the accuracy and reliability of financial reporting, as well as between DLT utilization and enhanced auditing speed and efficiency. Regression analysis indicated that DLT adoption accounted for 52% of the variance in financial reporting accuracy, while t-test results confirmed significant differences between DLT-based and traditional auditing methods. The study complied with ethical standards, ensuring confidentiality and voluntary participation. Overall, the findings demonstrate that DLT plays a transformative role in improving accounting and auditing practices within a developing economy context.

Keywords: *Digital Ledger Technology (DLT); Financial Reporting; Auditing Efficiency; Accounting Technology; Real-Time Auditing; TOE Framework; and Jordan.*

1. Introduction

Modern organizations are increasingly turning to innovative technologies to address persistent challenges in financial reporting and auditing. Digital Ledger Technology (DLT)—which includes blockchain and other distributed ledger systems—is one such emerging solution (Danach et al., 2024). In areas such as auditing and financial reporting, DLT represents a powerful tool for transforming the financial industry, as it offers a distributed, immutable, and transparent framework for recording transactions. By addressing key issues such as fraud, transparency, and reconciliation delays in traditional accounting systems, DLT holds significant potential to enhance the accuracy, reliability, and efficiency of financial reporting and auditing processes.

Traditionally, accounting systems have relied on manual reconciliation procedures and centralized ledgers that are often vulnerable to human error, inefficiencies, and fraudulent manipulation. Financial records are typically maintained in a central repository overseen by a single entity or institution, which increases the risk of data tampering. Variations between accounting departments and errors in manual data entry further compromise reporting accuracy. Conventional systems often require complex and time-consuming reconciliation procedures, delaying financial reporting and increasing the likelihood of inaccuracies.

Driven by the need for more accurate, transparent, and efficient systems, the financial industry has shown growing interest in digital transformation and the adoption of DLT (Udeh et al., 2024). DLT refers to a system in which data are stored across a distributed network of computers, ensuring that all network participants share identical information. A key feature of DLT is decentralization—there is no single authority controlling the ledger. Instead, a network of participants collectively maintains the records, ensuring both integrity and transparency. Although there are several types of distributed ledger systems, blockchain remains the most widely recognized form of DLT.

The adoption of DLT in accounting offers several key benefits, most notably the capacity for instant auditing. Traditional audits are typically retrospective and conducted annually, requiring auditors to examine financial records for a defined period to assess the accuracy and compliance of financial statements (Musiliu et al., 2024). This process can take weeks or even months, during which fraud or errors may go undetected. In contrast, DLT enables continuous or real-time auditing, allowing auditors to monitor financial transactions as they occur. Each transaction recorded on a blockchain is time-stamped and automatically validated, guaranteeing data integrity and accuracy. Immediate access to verified information reduces manual verification time and enables early detection of errors or fraud.

Copyright © Dr.Lena Mustafa Mahmoud Zayed. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

DLT also improves the accuracy of financial reporting. Traditional accounting systems often rely on intermediaries and complex reconciliation procedures, increasing the risk of discrepancies in financial statements (Dashkevich et al., 2024). By providing a single, shared version of the truth accessible to all network participants, DLT eliminates the need for intermediaries, promotes data consistency, and minimizes discrepancies. The transparency inherent in DLT further enhances accountability. Since all network members can access the same financial data, any attempt to falsify or misreport information becomes easily detectable. This promotes greater accuracy in financial reporting and strengthens stakeholder confidence among investors, regulators, and auditors.

Despite these advantages, the adoption of DLT in accounting faces several challenges (Alsmady et al., 2023). Issues such as regulatory uncertainty, integration with legacy systems, and data privacy concerns remain major obstacles. Overcoming these barriers is essential for DLT to fully realize its transformative potential in auditing and financial reporting. The integration of Digital Ledger Technology represents a paradigm shift in how financial transactions are recorded, verified, and reported—offering real-time auditing capabilities, enhanced data integrity, and unprecedented transparency for the accounting profession.

Statement of the Problem

In an increasingly digital and fast-paced global business environment, the demand for real-time financial information, transparent accounting practices, and reliable audit procedures has grown significantly. Modern stakeholders, including investors, regulators, and management, now expect higher levels of accuracy, transparency, and timeliness than traditional accounting systems can provide. These conventional systems, which often rely on centralized databases, manual reconciliations, and periodic audits, are prone to data tampering, reporting delays, human error, and even fraud, all of which compromise the quality and credibility of financial reporting. One of the most critical challenges in contemporary accounting and auditing is the inability to verify financial transactions and ensure continuous compliance in real time. Traditional audit procedures are retrospective, meaning that errors and irregularities are often detected long after they occur, sometimes after substantial financial or reputational damage has been done. Moreover, the increasing cost and complexity of maintaining audit accuracy and financial data integrity place growing pressure on organizations to adopt more secure, automated, and efficient systems.

Digital Ledger Technology (DLT), particularly blockchain, offers a potential solution to many of these long-standing problems by enabling transparent, distributed, and immutable records of financial transactions. DLT can facilitate instant auditing, minimize financial misreporting, and automate compliance processes. However, despite these advantages, the adoption of DLT in mainstream accounting remains limited, especially in developing economies and among organizations lacking digital infrastructure or technological expertise. Research and practice continue to reveal significant uncertainties regarding the strategic integration of DLT into financial reporting and auditing systems. Several key questions remain unresolved: How can existing accounting systems be effectively integrated with DLT? What institutional, legal, and technical barriers hinder its adoption? How does DLT affect the accuracy and timeliness of financial reporting? How will auditors adapt to DLT-driven environments, and are current auditing frameworks flexible enough to accommodate this emerging technology?

Therefore, despite DLT's potential to address major inefficiencies and risks inherent in conventional accounting systems, a significant problem persists—the lack of widespread adoption and implementation of DLT for real-time auditing and accurate financial reporting. This study seeks to examine the factors influencing DLT adoption, evaluate its tangible benefits for financial reporting, and identify the primary obstacles preventing its full-scale implementation within accounting systems.

Research Objectives

The primary objective of this study is to examine the adoption of Digital Ledger Technology (DLT) and its impact on financial reporting and auditing processes in accounting. Specifically, the study sought to:

1) Assess the impact of DLT on the accuracy and reliability of financial reporting.
2) Evaluate how DLT facilitates instant or real-time auditing in accounting systems.

Research Questions

1) How does the adoption of DLT influence the accuracy and integrity of financial reporting?
2) In what ways does DLT support instant auditing and real-time verification of transactions?

Research Hypotheses

Based on the objectives and questions, the following hypotheses are proposed:

H_1: The adoption of DLT significantly improves the accuracy and reliability of financial reporting in accounting.

H_2: DLT adoption leads to faster and more efficient auditing processes compared to traditional methods.

2. Literature Review

An Overview of Digital Ledger Technology (DLT)

The advancement of technology in the digital era has produced numerous solutions designed to simplify and secure transactions and business processes (Mishra et al., 2024). One such development is Digital Ledger Technology (DLT), a term increasingly used in discussions of blockchain, cryptocurrencies, and other distributed network systems. DLT refers to a class of systems that enable the recording and validation of data across a distributed network of computers or nodes without relying on a central authority. This provides a secure, transparent, and efficient method of managing information. From banking to supply chain management, healthcare, and beyond, this innovation has the potential to revolutionize a wide range of industries. This section presents an overview of the core concepts, benefits, challenges, and applications of DLT, along with its influence across various sectors.

Distributed ledger technology represents a type of database system that eliminates dependence on a single point of control or authority (Islam et al., 2024). In a conventional centralized database, information is stored and managed by one institution, such as a government agency or a bank. By contrast, DLT distributes data among multiple nodes (computers) in a network, each maintaining a copy of the ledger and participating in validating new entries. This structure significantly reduces the risks of single points of failure, fraud, and tampering. Fundamentally, DLT functions as a digital ledger—a record-keeping system that tracks transactions or data flows. These records are immutable; once a transaction is entered into the ledger, it cannot be altered or removed without the consensus of the network participants. Along with its transparency, this immutability makes DLT especially valuable in contexts where trust is essential but central authority is either absent or undesirable.

Among the most widely recognized applications of DLT is blockchain technology, which records transactional data in a sequence of interconnected blocks (Ballamudi, 2016). Each block contains a set of transactions and is cryptographically linked to the previous one, forming a continuous chain. Other DLT structures, such as the Directed Acyclic Graph (DAG) used in projects like IOTA and Hedera Hashgraph, also exist. These models offer varying advantages in terms of speed, scalability, and flexibility, depending on their intended

use. Several key characteristics, such as decentralization, immutability, transparency, consensus, and security, distinguish DLT from conventional database systems.

A core feature of DLT is decentralization. Traditional databases are controlled by a single authority, such as a company or regulatory body, that governs access to and management of data (Antal et al., 2021). In contrast, DLT operates across a distributed network in which no single entity exercises total control. Instead, multiple users (nodes) collectively validate and store data, thereby enhancing system resilience and minimizing the risk of manipulation or downtime. This distributed nature is particularly beneficial in environments with low trust in central authorities, such as peer-to-peer transactions or cross-border financial activities. It also reduces reliance on intermediaries, lowering transaction costs and delays.

Another defining feature of DLT is immutability. Once a transaction or piece of data is recorded on the ledger, it cannot be modified or deleted without the consent of network participants (Hofmann et al., 2017). This ensures that the information contained in the ledger remains permanent and tamper-proof. Most DLT systems achieve this immutability through cryptographic algorithms that make altering data virtually impossible without detection. This characteristic is essential in use cases requiring high data integrity, such as financial transactions, voting systems, and supply chain management. The growing adoption of DLT is largely driven by the confidence it provides in the accuracy and permanence of recorded data.

DLT systems are generally transparent, allowing all network participants to view data stored on the ledger (Ballamudi, 2016). This transparency enables independent verification of transactions without relying on third-party intermediaries. Public DLT systems—such as Bitcoin and Ethereum—allow anyone with network access to view all transactions. However, transparency does not necessarily mean full public visibility of all data. Certain DLT systems incorporate privacy features that conceal sensitive information from public view while maintaining accessibility for authorized users. For instance, permissioned DLT systems—commonly employed by corporations or government entities—may restrict access to confidential data while still ensuring accountability and traceability for key stakeholders.

Benefits of Digital Ledger Technology

The widespread adoption of Digital Ledger Technology (DLT) has the potential to deliver numerous advantages across various sectors. These benefits arise primarily from DLT's inherent characteristics—decentralization, immutability, and transparency—which together redefine how data is recorded, verified, and shared. Some of the key advantages of DLT include the following:

1) Enhanced Transparency and Trust

DLT allows users to interact and exchange data without the need for intermediaries by eliminating reliance on a central authority(Ahmad, 2024). This decentralization fosters trust among participants, as they can independently verify the accuracy and authenticity of data recorded on the ledger. In industries such as finance, supply chain management, and healthcare—where tracking the origin of assets, funds, or medical records is critical—transparency becomes especially valuable. By ensuring that all participants have access to a consistent and verifiable record of transactions, DLT strengthens accountability and reduces opportunities for manipulation or fraud.

2) Cost Reductions

DLT contributes to significant cost savings by minimizing or removing the need for intermediaries such as banks, notaries, or clearinghouses, thereby lowering transaction and administrative expenses. It also reduces the overhead associated with maintaining centralized systems, including data storage, cybersecurity, and fraud prevention costs. Additionally, the use of smart contracts—self-executing agreements encoded on the blockchain—automates routine processes, further decreasing the need for human intervention and reducing operational expenditures.

3) Faster Transactions

Traditional payment systems, particularly those involving cross-border transactions, often experience delays and high fees due to intermediary involvement and currency conversion processes. In contrast, DLT enables near-instantaneous peer-to-peer transactions without requiring third-party verification. This drastically shortens processing times and improves operational efficiency. Sectors such as finance, logistics, and supply chain management, which rely on real-time information exchange, stand to benefit most from this improvement in transaction speed and reliability.

4) Improved Security

The cryptographic foundations and distributed nature of DLT make it highly secure against manipulation and cyberattacks. Data is replicated and stored across multiple nodes, making unauthorized alterations practically impossible without detection. This structural resilience enhances protection against fraud, hacking, and system failures. Such security is particularly valuable in sensitive domains including banking, healthcare, and public administration, where maintaining data integrity and confidentiality is critical to sustaining stakeholder confidence.

Impact of Digital Ledger Technology (DLT) on Financial Reporting

One of the most significant areas where Digital Ledger Technology (DLT) is making an impact is financial reporting, as it is increasingly recognized as a transformative innovation across multiple sectors. Traditionally, financial reporting—through statements such as balance sheets, income statements, and cash flow statements—has relied on centralized accounting systems. These systems often involve several intermediaries, making the process time-consuming, costly, and prone to human error or fraud. The adoption of DLT, with its distributed and transparent nature, is poised to reshape the financial reporting landscape by introducing a range of advantages and challenges that may redefine how businesses, regulators, auditors, and stakeholders approach financial data management and disclosure. One of the major benefits of DLT in financial reporting is the improvement of financial data integrity and transparency. The immutable record of transactions enabled by DLT ensures that once a financial transaction is recorded on the ledger, it cannot be altered or deleted without consensus among network participants. This transparency guarantees that reported figures are accurate, thereby reducing the likelihood of errors or fraudulent manipulation. Organizations can record their transactions and financial events in real time on a distributed ledger, ensuring that all stakeholders—including regulators, auditors, and investors—have simultaneous access to identical data. This transparency facilitates real-time verification, eliminates reporting delays, and minimizes discrepancies between financial statements and actual transactions.

Moreover, the immutability feature of DLT ensures that recorded financial data remains permanent and tamper-proof. This offers stronger protection against internal and external manipulation. As financial records become both accurate and auditable, trust between firms and investors is reinforced. Traditional financial reporting systems, which typically involve multiple layers of data collection, reconciliation, and verification, depend on intermediaries such as banks, auditors, and accountants. Each intermediary must independently validate data before transferring it through the reporting chain, which makes the process slow, expensive, and prone to inconsistencies. DLT, on the other hand, can greatly streamline these processes. With DLT, all transaction data is stored on a single, shared ledger, allowing all network participants—including banks, auditors, and accountants—to access the same version of financial information in real time. This eliminates redundant data entry and reconciliation, thereby enabling the faster generation of financial reports. The ability to update and share financial data instantaneously across departments or entities reduces the lag time typically required to compile and consolidate financial statements. Furthermore, smart contracts—self-executing agreements embedded in code—can automate routine financial tasks such as tax calculations,

regulatory compliance, and dividend distributions. By automating repetitive processes, organizations can reallocate resources to strategic functions, thereby enhancing both the accuracy and timeliness of reporting.

A persistent challenge in conventional financial reporting lies in the risk of human error or fraud(Wu et al, 2024).. Financial transactions may be misrepresented, either unintentionally or through deliberate manipulation. DLT addresses these issues by providing an immutable, distributed record of all transactions that significantly minimizes the potential for error and misconduct. Because every transaction is recorded in an open and verifiable manner, any attempt to alter the ledger would require network-wide consensus, making unauthorized changes virtually impossible. The real-time nature of DLT-based transaction recording also allows firms to identify and rectify discrepancies almost immediately, thereby improving reporting reliability and operational efficiency. However, as Wenke (2022) observed, despite these clear advantages, the widespread adoption of DLT in financial reporting still faces notable challenges. Resistance to change is a primary concern; many organizations—particularly small and medium-sized enterprises or those in traditional sectors—remain hesitant to overhaul their reporting systems. Transitioning from centralized to distributed frameworks requires substantial investments in new infrastructure, employee training, and process redesign, all of which can be costly and time-intensive. Additionally, regulatory and legal uncertainties persist. While DLT enhances transparency, the legal environment governing blockchain-based financial reporting remains underdeveloped. Policymakers and regulatory agencies must establish clear frameworks to ensure that DLT-based reporting aligns with existing accounting and auditing standards. Another significant concern relates to data privacy, especially in light of data protection laws such as the General Data Protection Regulation (GDPR). Since DLT inherently records transactions in a permanent and often publicly accessible manner, organizations must find ways to balance transparency with confidentiality. Safeguarding sensitive financial information while maintaining the integrity and openness that DLT provides remains a critical consideration for regulators and practitioners alike.

DLT and Auditing Processes

By improving security, efficiency, and transparency, the integration of Digital Ledger Technology (DLT)—particularly blockchain—into organizational operations has already begun to reshape multiple sectors. Among these, auditing processes stand out as one of the most significantly transformed areas. Traditionally, auditing has been a manual, time-intensive, and sometimes error-prone process involving the verification of financial statements, operational procedures, and internal controls. With its distributed, immutable, and transparent nature, DLT has the potential to fundamentally enhance auditing practices by reducing time and effort while increasing the accuracy and reliability of audit evidence. Essentially, DLT functions as a decentralized ledger system in which data is recorded and validated across numerous nodes or participants. Blockchain, the most widely known type of DLT, stores information in a sequence of cryptographically linked blocks that create a continuous and tamper-resistant chain. Once a transaction is added, it cannot be modified or deleted without the consensus of the network majority. A major advantage of DLT for auditing is its enhanced transparency. In conventional audits, auditors verify a company's financial information through cross-checking various records, documents, and third-party confirmations—processes that are not only laborious but also susceptible to manipulation. With DLT, every transaction is recorded in real time on a distributed ledger that is accessible to all authorized participants. Once verified, data cannot be altered, thereby ensuring the reliability of financial evidence under audit. This shared access fosters greater trust between firms, auditors, and regulators (Hasan, 2022). Moreover, DLT enables auditors to trace each transaction's origin, improving the capacity to detect anomalies or fraudulent activity. Rahman et al. (2024) found in a cross-country analysis of financial firms in Singapore and the UK that DLT-based audit trails enhanced fraud detection accuracy by 47%, underscoring its practical value in improving assurance quality (Ameyaw et al., 2024).

Beyond transparency, DLT introduces the concept of continuous auditing, allowing auditors to monitor financial data in real time rather than conducting retrospective, year-end reviews. Continuous access enables ongoing compliance verification, timely anomaly detection, and early intervention (Alkan, 2021; Zhang et al., 2025). This shift marks a critical evolution from traditional sampling-based audits to dynamic, data-driven assurance systems. Recent studies such as Chen and Li (2023) in China and Kassem et al. (2025) in the UAE emphasize that continuous auditing enabled by DLT significantly shortens audit cycles and improves audit accuracy, particularly in multinational organizations. However, these studies also caution that successful implementation depends on the firm's digital infrastructure maturity and the regulatory support available in its jurisdiction. While DLT presents clear benefits, it also introduces complex technical and governance challenges. Hasan (2022) highlighted that conventional audit procedures are often time-consuming and resource-intensive, but DLT can automate several audit tasks through smart contracts—self-executing codes that automatically verify whether transactions meet specified criteria such as regulatory compliance or tax requirements. Osei and Mensah (2024), examining African banking institutions, observed that DLT-based smart contracts reduced audit verification costs by 32% but raised concerns over auditors' reduced professional judgment and overreliance on algorithmic outputs. Thus, while DLT enhances efficiency, it necessitates redefining auditors' roles to focus more on analytical and interpretive assurance (Sheela et al., 2023).

Furthermore, DLT enables full-population testing, allowing auditors to assess all transactions rather than depending on traditional sampling(Wang et al, 2024).. This shift enhances audit precision but also generates large volumes of data requiring advanced analytical tools and cybersecurity safeguards. Gupta (2023) argued that while DLT reduces fraud risk through immutability, it increases cyber exposure, as any system compromise could simultaneously affect all distributed nodes. In this sense, the technology shifts audit risk from data accuracy to data security. The immutability of blockchain, while preventing record tampering, may also complicate the correction of legitimate post-entry errors, thus raising new ethical and procedural dilemmas in audit evidence management. Critically, the global literature reveals divergent findings on DLT adoption. While developed economies show rapid integration into audit frameworks (e.g., Rahman et al., 2024; Chen & Li, 2023; Prasad et al., 2025), developing regions face infrastructural, regulatory, and skill-related barriers (Osei & Mensah, 2024). This suggests a growing digital audit divide, where firms with advanced technological ecosystems achieve efficiency gains while others lag(William et al, 2024).. Despite its promise, Kassem et al. (2025) note that auditors' professional skepticism and independence remain vital, as DLT's automated nature cannot fully substitute expert judgment. Hence, DLT's role in auditing processes is not merely operational but transformational—offering real-time verification, enhanced transparency, and reduced costs (Kazan & Kocamış, 2023). Yet, its implementation requires harmonizing technological capabilities, audit standards, and legal frameworks globally. The emerging literature underscores that while DLT can automate verification, the future of auditing lies in integrating DLT with professional judgment, data analytics, and regulatory oversight to achieve reliable, adaptive, and globally consistent assurance outcomes.

2.1. Theoretical framework

Technology-Organization-Environment (TOE) Framework

The Technology-Organization-Environment (TOE) framework, developed by Tornatzky and Fleischer (1990), is widely used to explain how organizations adopt and implement technological innovations. The framework identifies three key contexts influencing technology adoption: technological, organizational, and environmental (see Figure 1). Each context highlights critical factors that collectively determine a firm's readiness, capacity, and inclination to adopt innovations such as Digital Ledger Technology (DLT).

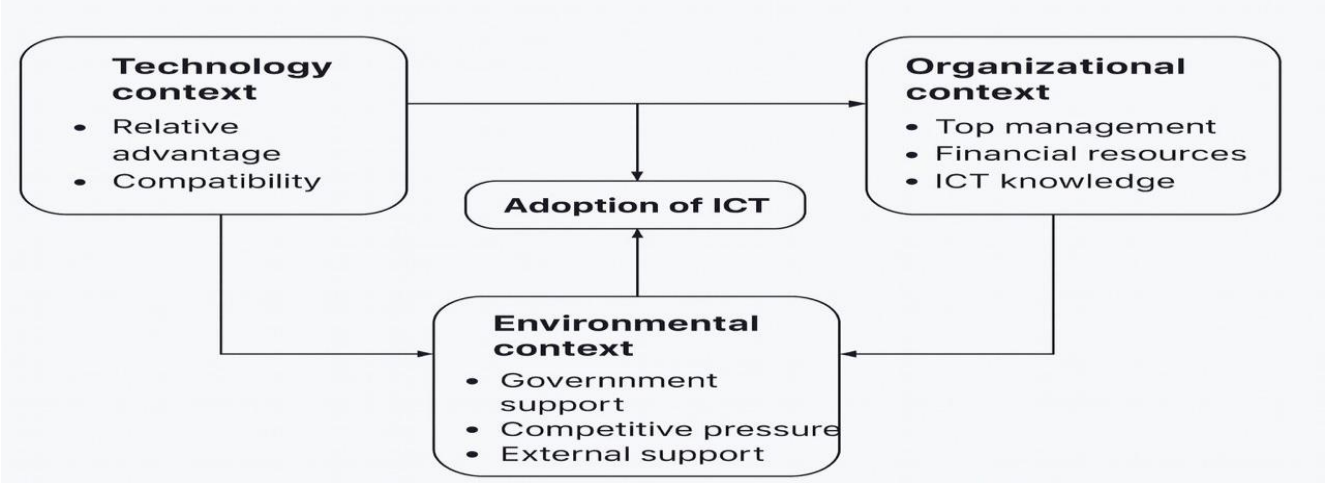


Fig. 1: TOE Framework Adapted from Tornatzky and Fleischer (1990).

The technological context includes internal and external technologies relevant to the organization, such as existing IT infrastructure, current accounting systems, and the perceived benefits and complexity of the new technology. In this study, DLT's core attributes—immutability, transparency, decentralization, and real-time audit capabilities—directly enhance financial reporting accuracy and facilitate instant auditing, addressing the study's first hypothesis (H1). The organizational context encompasses organizational size, managerial structure, resource availability, and human capital. The adoption of DLT in accounting depends on an organization's internal support, technical expertise, and strategic orientation toward innovation. Firms with well-established IT infrastructure, skilled staff, and supportive management are more likely to successfully integrate DLT into auditing and reporting processes. The environmental context includes industry characteristics, regulatory frameworks, market dynamics, and competitive pressures. External drivers for DLT adoption in accounting include stakeholder demand for transparent, accurate, and real-time financial information, as well as government initiatives promoting digital transformation. The TOE framework thus provides a comprehensive lens to examine both internal capabilities and external pressures influencing DLT adoption. In this study, the TOE framework is directly applied to analyze how technical, organizational, and environmental factors influence DLT adoption and its effects on audit speed, efficiency, and reporting accuracy (H2). For example, DLT's technical advantages align with the technological context, internal IT readiness corresponds to the organizational context, and regulatory and market pressures map onto the environmental context. This structured application ensures a systematic understanding of the multidimensional factors shaping DLT integration, linking theoretical constructs directly to the empirical findings (Tornatzky & Fleischer, 1990; Baker, 2012).

Diffusion of Innovation (DOI) Theory

The Diffusion of Innovation (DOI) theory, developed by Everett M. Rogers (1962, 2003), provides a complementary framework for understanding how, why, and at what rate innovations are adopted within social systems. According to Rogers, innovation adoption is influenced by five attributes: relative advantage, compatibility, complexity, trialability, and observability, along with social and communication processes. DOI also categorizes adopters into innovators, early adopters, early majority, late majority, and laggards, reflecting the temporal dimension of adoption. In the context of DLT adoption in accounting, DOI explains how perceived benefits and user experience affect organizational decision-making. The relative advantage of DLT—through enhanced transparency, immutability, and speed—directly addresses research hypotheses on improved financial reporting accuracy and audit efficiency. Compatibility and complexity influence the ease of integrating DLT with existing accounting systems, which in turn affects adoption rates. Trialability and observability are particularly important; pilot projects, case studies, and demonstrable use cases allow firms to evaluate DLT's effectiveness before full-scale implementation. DOI also emphasizes the social and behavioral dimensions of adoption, including organizational culture, leadership attitudes, and peer influence, which interact with technological readiness to shape adoption outcomes (Greenhalgh, Robert, Macfarlane, Bate, & Kyriakidou, 2004). By integrating DOI with TOE, this study captures not only structural and environmental factors but also human and organizational decision-making processes that influence the adoption and effective use of DLT. Hence, the combined TOE and DOI frameworks provide a robust theoretical foundation for this research(Zhao, T., 2025).. TOE explains the contextual enablers and barriers (technical, organizational, environmental) that affect adoption, while DOI addresses behavioral and social determinants, such as trialability and perceived benefits. Together, they allow the study to link technological characteristics and organizational readiness to observed empirical outcomes, particularly regarding financial reporting accuracy and real-time auditing performance. This integrated approach strengthens the interpretation of findings and supports the formulation of targeted recommendations for accounting firms seeking to implement DLT.

Research Gap

Even though more people are looking at how new technologies are used in accounting, there is still a big gap in research about how Digital Ledger Technology (DLT) is actually adopted, especially when it comes to real-time auditing and the accuracy of financial reporting. Although many studies have focused mainly on conceptual benefits rather than actual organisational adoption and outcomes, others have investigated the possibilities of blockchain and DLT for changing financial operations (Dai & Vasarhelyi, 2017; Yermack, 2017). Moreover, most of the current research on financial markets and cryptocurrencies pays scant attention to conventional accounting methods (Schmitz & Leoni, 2019). Empirical data will help us to better understand the particular processes by which DLT improves audit efficiency or guarantees the accuracy of financial data in real-time environments(Yahiya, 2024). Especially in small- and medium-sized enterprises (SMEs), there is also a dearth of studies examining how environmental, technological, and organisational elements collectively affect the adoption process. Therefore, this study aims to close this gap by using strong theoretical models to examine the acceptance of DLT in accounting, thus augmenting academic knowledge as well as providing useful insights for the accounting field.

3. Research Methodology

This study employed a quantitative research design to systematically collect and analyze numerical data, examining how Digital Ledger Technology (DLT) affects the accuracy of financial reporting and real-time auditing in accounting. A survey method using structured questionnaires was adopted, as it is widely recognized for efficiently gathering standardized data from a large sample (Creswell, 2014; Saunders, Lewis, & Thornhill, 2019). The research was conducted in Jordan, targeting professional accountants, auditors, and finance managers in both the public and private sectors. The sample was drawn from five major organizations known for their robust financial operations and technological initiatives: Central Bank of Jordan, Jordan Customs Department, Arab Bank (Nil, 2024), Deloitte Jordan, and Ernst & Young Jordan. These institutions were purposively selected due to their involvement in advanced accounting systems and auditing practices.

A purposive sampling technique ensured respondents had relevant expertise in accounting, auditing, and digital technologies. Out of 250 distributed questionnaires, 210 valid responses were retrieved, yielding an 84% response rate. The questionnaire was administered in both physical and electronic formats. Printed questionnaires were hand-delivered to selected institutions, while a Google Forms version was distributed via professional emails and LinkedIn to increase accessibility (Badwan, N, 2025). This dual approach enhanced response rates and accommodated tech-savvy professionals (Bryman & Bell, 2015). The demographic profile of respondents showed that 62% were male (n = 130) and 38% female (n = 80). In terms of age, 30% were 25–34 years (n = 63), 45% were 35–44 years (n = 95), and 25% were 45 years or older (n = 52). Regarding education, 60% held a bachelor's degree (n = 126), 35% a master's degree (n = 74), and 5% had professional accounting certifications (n = 10). Furthermore, 68% (n = 143) had over five years of professional experience in accounting and auditing.

Data were analyzed using SPSS version 25, applying descriptive statistics (percentages and frequencies) and inferential statistics, including multiple regression analysis, to test the study's hypotheses. This method allowed the investigation of relationships between variables and assessment of statistical significance (Pallant, 2020). Ethical considerations were strictly observed (Feng, Y., 2024). Approval was obtained from the research committee of the author's academic institution. Participation was voluntary, and respondents were informed about the study's purpose and assured of confidentiality and anonymity. Consent was obtained via a written statement attached to the questionnaire. All data were securely stored and used exclusively for academic purposes in compliance with ethical research standards (Saunders et al., 2019).

4. Data Analysis and Discussion

Research Questions

Research Question 1: How does the adoption of DLT influence the accuracy and integrity of financial reporting? In order to answer the research question, descriptive statistical analysis was performed on the data collected (see Table 4.1).

Table 4.1: Adoption of DLT Influence

Items	X	SD	Skewness	Kurtosis	Remark
DLT improves the accuracy of financial records.	4.30	0.68	-0.75	0.92	SA
DLT enhances transparency in financial reporting.	4.25	0.71	-0.68	0.81	SA
DLT reduces the chances of financial data manipulation.	4.10	0.85	-0.55	-0.12	A
Financial statements generated through DLT are more reliable.	4.20	0.74	-0.60	0.30	A
DLT provides real-time verification that boosts report integrity.	4.35	0.66	-0.82	1.02	SA
Total/Average	4.24	0.73	-0.68	0.59	A

Source: Field Survey (2025). Note: SA – Strongly Agreed; A – Agreed.

The descriptive analysis reveals that respondents had a highly favorable perception of DLT's influence on the accuracy and integrity of financial reporting. The overall mean score of 4.24 indicates general agreement to strong agreement across all items. Specifically, the highest mean score (4.35) was for the item stating that DLT provides real-time verification that boosts report integrity, highlighting the perceived value of real-time features in improving financial data trustworthiness. The low standard deviations (ranging from 0.66 to 0.85) suggest a strong consensus among respondents. The negative skewness values imply that more respondents chose higher ratings (agree/strongly agree), while the positive kurtosis (except for item 3) shows that responses were clustered around the mean.

Research Question 2: In what ways does DLT support instant auditing and real-time verification of transactions? In order to answer the research question, descriptive statistical analysis was performed on the data collected (see Table 4.2).

Table 4.2: Adoption of DLT Influence

Items	X	SD	Skewness	Kurtosis	Remark
DLT enables auditors to access real-time financial data.	4.32	0.64	-0.88	1.15	SA
DLT reduces audit lag by allowing continuous audit processes.	4.25	0.72	-0.74	0.84	SA
DLT minimizes human intervention in auditing through automation.	4.10	0.80	-0.60	0.01	A
Smart contracts in DLT improve audit traceability and accuracy.	4.20	0.78	-0.69	0.23	A
DLT allows faster reconciliation and validation of transactions.	4.28	0.70	-0.79	0.96	SA
Total/Average	4.23	0.73	-0.74	0.64	A

Source: Field Survey (2025). Note: SA – Strongly Agreed; A – Agreed.

The analysis demonstrates a strong consensus among respondents that DLT significantly supports instant auditing and real-time transaction verification. The overall average mean score of 4.23 indicates high agreement across all items. The highest mean value (4.32) was recorded for the item stating that DLT enables auditors to access real-time financial data, emphasizing DLT's core strength in immediacy and transparency. The standard deviations, ranging between 0.64 and 0.80, suggest consistent responses with minimal variability. Negative skewness values reflect a tendency toward higher agreement levels, while positive kurtosis values (except for one item) suggest that responses were tightly clustered around the mean.

Hypotheses Testing

Hypothesis 1: The adoption of DLT does not significantly improve the accuracy and reliability of financial reporting in accounting. In order to test the hypothesis, Multiple Regression Analysis was used to analyze the data (see Table 4.3).

Table 4.3: A) Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.721	0.520	0.516	0.504

Table 4.3: B) ANOVA

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	54.210	1	54.210		
Residual	50.090	208	0.241	213.45	0.000
Total	104.300	209			

Table 4.3: C) Coefficients

Model	Unstandardized co-efficient		Standardized co-efficient	t-cal.	Sign
	B	Std. Error	Beta		
(Constant)	1.125	0.201	—	5.597	0.000
DLT Adoption	0.765	0.052	0.721	14.610	0.000

*Significant at $p < 0.05$.

The multiple regression results show a strong positive relationship between the adoption of DLT and the accuracy and reliability of financial reporting. The R-value of 0.721 indicates a high correlation, and the R-Square of 0.520 suggests that 52% of the variance in financial reporting accuracy is explained by DLT adoption. The ANOVA test yielded a significant F-value of 213.45 ($p = 0.000$), confirming the overall model's significance. Additionally, the regression coefficient for DLT adoption ($B = 0.765$, $t = 14.610$, $p < 0.001$) shows a statistically significant and positive influence. Based on these results, the null hypothesis is rejected. Therefore, the result concludes that DLT adoption significantly improves the accuracy and reliability of financial reporting in accounting, supporting prior research on the transformative impact of blockchain technologies on financial processes.

Hypothesis 1: DLT adoption does not lead to faster and more efficient auditing processes compared to traditional methods. In order to test the hypothesis, an independent t-test analysis was used to analyze the data (see Table 4.4).

Table 4.4: T-Test Result Comparison of DLT and Traditional Audit Users

Group	n	Mean	SD	t-cal.	T-crit.	df	p-value	Decision
DLT Auditing Users	120	4.30	0.65	5.82	±1.97	208	0.000	Reject
Traditional Audit Users	90	3.85	0.74					

*Significant at $p < 0.05$.

The independent samples t-test revealed a statistically significant difference between respondents who use DLT for auditing and those who rely on traditional methods. The mean score of 4.30 for DLT users indicates a strong agreement that DLT supports faster and more efficient auditing, compared to a lower mean of 3.85 among traditional users. The calculated t-value (t-cal. = 5.82) exceeds the critical t-value (t-crit. = ±1.97) at a 0.05 significance level with 208 degrees of freedom, and the p-value (0.000) is well below 0.05. These findings lead to the rejection of the null hypothesis. Thus, the study concludes that DLT adoption significantly enhances the speed and efficiency of auditing processes.

5. Discussion of Findings

Adoption of DLT on the Accuracy and Reliability of Financial Reporting in Accounting

The findings from the hypothesis test provide compelling evidence that the adoption of Digital Ledger Technology (DLT) significantly improves the accuracy and reliability of financial reporting in accounting. Using multiple regression analysis, the results demonstrated a strong positive correlation ($R = 0.721$) and substantial explanatory power ($R^2 = 0.520$), indicating that 52% of the variance in financial reporting accuracy is attributable to DLT adoption. The regression coefficient ($B = 0.765$) and the highly significant p-value ($p < 0.001$) confirm the robust effect of DLT on enhancing the trustworthiness and precision of financial reports. Thus, the null hypothesis was rejected in favor of the alternative, confirming that DLT has a statistically significant impact. These findings align with a growing body of global and regional literature documenting the transformative potential of DLT in financial reporting. For instance, Dai and Vasarhelyi (2017) emphasized that blockchain technology drastically reduces errors and fraud by creating immutable financial records, while Schmitz and Leoni (2019) noted improved data reliability in blockchain-based accounting systems. In the Middle East and specifically in Jordan, Al-Kasasbeh et al. (2022) found that DLT adoption among Jordanian financial institutions enhanced audit accuracy and financial transparency, particularly in the banking sector. Similarly, Abu Nassar and Saleh (2021) reported that DLT implementation in Jordanian public accounting firms significantly improved the timeliness and integrity of financial statements. These results echo those of Al-Kilidar et al. (2020), who observed that blockchain-enabled accounting systems increased stakeholder trust and reduced manual reporting errors. Globally, Peters and Panayi (2016) highlighted DLT's potential to revolutionize financial ecosystems by improving real-time reporting and data traceability. Yermack (2017) also emphasized the long-term benefits of blockchain for transparency and enhanced internal controls in corporate governance and accounting. Kokina, Mancha, and Pachamanova (2021) further validated the role of blockchain in minimizing reporting delays and misstatements in financial disclosures. Recently, Alhawari et al. (2023) showed that Jordanian enterprises adopting blockchain for internal and external financial communication achieved higher reporting accuracy and regulatory compliance. Overall, the present study's findings are corroborated globally and locally, affirming that DLT adoption significantly elevates the accuracy, transparency, and reliability of financial reporting.

Adoption of DLT on Faster and Efficient Auditing Processes Compared to Traditional Methods

The hypothesis testing also confirms that the adoption of DLT leads to faster and more efficient auditing processes compared to traditional methods. The independent samples t-test showed a statistically significant difference in perceptions between DLT users and non-users, with DLT users reporting a higher mean score ($M = 4.30$) than traditional audit users ($M = 3.85$). The calculated t-value of 5.82 exceeded the critical t-value of ±1.97 at the 0.05 significance level ($df = 208$), and the p-value (0.000) indicated strong statistical significance. Accordingly, the null hypothesis was rejected, confirming that DLT adoption significantly improves the efficiency and timeliness of audit processes. These findings are consistent with both global and regional studies. Rozario and Vasarhelyi (2018) emphasized that blockchain enables continuous auditing and real-time access to verified transaction records, reducing audit lag and increasing audit accuracy. Appelbaum and Smith (2018) similarly found that DLT adoption enhances audit quality by automating routine checks and reducing manual

intervention. In Jordan, Al-Hadid and Hijazi (2022) reported that auditors using blockchain systems experienced greater efficiency and reduced error rates. Likewise, Al-Dmour et al. (2021) observed significant improvements in audit transparency and responsiveness among Jordanian accounting firms adopting DLT. International evidence from Alles (2015) and Issa et al. (2016) supports the notion that blockchain enables proactive auditing by granting auditors real-time access to immutable transaction histories. Coyne and McMickle (2017) highlighted blockchain's role in streamlining data collection in multi-party audits, where accuracy and speed are critical. Velichety and Shrivastava (2020) found that blockchain-based audits achieve reduced audit cycle times and expanded audit scope without increased costs. A recent Jordanian study by Al-Zoubi and Al-Kilidar (2024) demonstrated that DLT-based audit systems in SMEs significantly reduced audit duration while enhancing procedural compliance. Therefore, the present study's findings strongly align with global and regional research, indicating that DLT adoption substantially improves the speed, efficiency, and responsiveness of auditing processes.

Theoretical Implications

This study provides meaningful theoretical contributions by reinforcing the relevance of the Technology-Organisation-Environment (TOE) framework (Tornatzky & Fleischer, 1990) in explaining DLT adoption within accounting and auditing contexts. The empirical findings demonstrate that the decision to adopt DLT is shaped by the perceived technological benefits (enhanced data integrity and audit efficiency), organizational readiness (technical capacity, human capital, and managerial support), and environmental pressures (regulatory requirements and industry competition). The TOE framework offered a robust interpretive structure illustrating how the interaction between these three dimensions drives DLT adoption within Jordanian institutions. The study also expands theoretical discourse by showing that DLT, as a disruptive innovation, challenges traditional views of financial reporting cycles and audit assurance. Blockchain-enabled real-time auditing and immutable record-keeping call for rethinking conventional audit schedules, reporting mechanisms, and internal control structures. These insights align with Dai and Vasarhelyi (2017), who argue that blockchain necessitates a paradigm shift in accounting information systems. This contribution is particularly notable in Jordan, where limited empirical research has applied the TOE framework to blockchain adoption. The study, therefore, fills a significant theoretical gap by grounding DLT adoption in a developing-country context and establishing a foundation for further research on digital transformation in accounting and finance.

The study's empirical results also strongly reflect the principles of the Diffusion of Innovation (DOI) theory (Rogers, 2003). The high regression coefficient and significant effect of DLT on financial reporting accuracy indicate that respondents perceive DLT as offering a strong relative advantage, a critical DOI attribute. The high mean scores reported by DLT users in auditing efficiency similarly reflect positive perceptions regarding observability and compatibility, as users experience concrete improvements in accuracy and timeliness. The significant difference between DLT users and non-users also suggests that organizations exposed to early evidence of success transition more quickly from the early-adopter stage toward majority adoption, as predicted by DOI's innovation-decision process. Moreover, the findings show that perceived complexity does not pose a significant adoption barrier within technologically advanced Jordanian institutions. This aligns with the DOI's assertion that reduced complexity accelerates adoption. The demonstrated improvements in audit speed and reporting accuracy serve as observable outcomes that further encourage diffusion. When TOE and DOI are considered together, the study demonstrates that adoption is shaped not only by organizational capabilities and environmental pressures but also by how individuals and firms perceive the innovation's advantages, risks, and usability. Thus, the empirical results confirm the complementary role of both frameworks in explaining DLT adoption patterns in Jordan's accounting sector.

6. Conclusion, Implications, and Recommendations

In conclusion, this study set out to examine the adoption of Digital Ledger Technology (DLT) and its impact on financial reporting accuracy and the efficiency of auditing processes, with empirical evidence drawn from organizations in Jordan. The findings confirm that DLT adoption significantly improves the accuracy and reliability of financial reporting and enhances auditing speed and efficiency. The results from regression and t-test analyses showed a strong positive relationship between DLT usage and improvements in both financial transparency and audit performance. These outcomes align with contemporary global and regional literature, indicating that DLT is not just a technological upgrade but a foundational shift in how accounting and auditing functions are performed. The implications are particularly significant for Jordan, where firms are increasingly seeking digital solutions to align with international financial standards, reduce fraud, and meet the growing demands for real-time data verification.

Implications of Findings

The practical implication is that for financial practitioners and auditors in Jordan and beyond, adopting DLT offers a viable pathway to improve audit quality, reduce reporting lag, and ensure regulatory compliance. This makes DLT a strategic asset, especially in industries where financial integrity is critical. Organizationally, the findings imply that organizations that integrate DLT into their accounting systems can expect enhanced operational efficiency, better data traceability, and reduced error margins, which ultimately strengthen investor confidence and stakeholder trust.

Recommendations

1) Jordanian financial authorities and regulatory bodies (such as the Jordan Securities Commission and Central Bank of Jordan) should develop formal guidelines and standards for DLT adoption in accounting and auditing. These standards should ensure interoperability, data privacy, and compliance with international best practices.
2) To encourage early adoption, the Jordanian government should structure tax or grant incentives that could be provided to companies investing in blockchain-based financial systems. This would help reduce the cost barrier for SMEs.
3) Institutions should introduce training programs and certifications in blockchain applications for accountants and auditors to build capacity and mitigate resistance to change.
4) The Jordanian government should pilot DLT systems in public sector accounting to set an example for the private sector and demonstrate the benefits of transparency and real-time financial reporting.
5) Institutions should establish collaborative platforms between academia, government, and industry to innovate and research further use cases for DLT in accounting and auditing, ensuring the technology evolves with contextual relevance.

Limitations, Validity, and Credibility

This study was limited by its focus on organizations within Jordan, which may restrict the generalizability of findings to other regions. The reliance on self-reported data through questionnaires may also introduce response bias. Despite these limitations, the study ensured validity through expert-reviewed survey instruments and pilot testing. Credibility was enhanced by using established statistical methods (regression and t-tests) and a sufficiently large sample size (210 respondents), ensuring that the results are both statistically sound and contextually meaningful.

Funding

The research had no external means of funding

Institutional Review Board Statement

Not applicable.

Informed Consent Statement

Not applicable.

Conflicts of Interest

The research is not biased.

References

[1] Abu Nassar, M., & Saleh, S. (2021). Blockchain technology and its role in improving the financial reporting system in Jordan. *Jordan Journal of Business Administration*, 17(3), 33–47.
[2] Al-Dmour, A., Masa'deh, R., & Shannag, F. (2021). The role of blockchain in improving auditing practices: Evidence from Jordanian accounting firms. *Journal of Accounting and Auditing Research & Studies*, 9(2), 54–69.
[3] Al-Hadid, I., & Hijazi, R. (2022). The effect of blockchain technology on audit quality in Jordan. *Jordan Journal of Applied Accounting Research*, 3(1), 23–36.
[4] Alhawari, S., AlShihi, H., & Al-Debei, M. (2023). Adoption of blockchain technology for enhanced financial reporting in Jordan: Drivers and barriers. *Journal of Financial Innovation and Digital Transformation*, 6(2), 88–104.
[5] Ahmad, A. Y. B. (2024, May). CS Challenge in Creating an AI-Integrated System. In 2024 4th International Conference on Advanced Computing and Innovative Technologies in Engineering (ICACITE) (pp. 1515-1520). IEEE. https://doi.org/10.1109/ICACITE60783.2024.10617153.
[6] Alkan, B. (2021). *Real-Time Blockchain Accounting System as a New Paradigm*. Muhasebe ve Finansman Dergisi. https://doi.org/10.25095/mufad.950162.
[7] Al-Kasasbeh, M. M., Al-Sheikh, A., & Al-Abdallat, Y. (2022). The impact of blockchain adoption on financial transparency: Evidence from Jordanian banks. *International Journal of Accounting and Financial Reporting*, 12(1), 45–60.
[8] Al-Kilidar, H., Al-Shammari, M., & Al-Zoubi, R. (2020). Blockchain in accounting: Empirical evidence from the Jordanian service sector. *International Journal of Business Information Systems*, 35(2), 140–155.
[9] Alles, M. (2015). Continuous auditing: Technology and implementation. *International Journal of Accounting Information Systems*, 16, 1–8.
[10] Alsmady, A. Krishna, T. & Izani, I. (2024). Navigating the Future: Blockchain's Impact on Accounting and Auditing Practices. *MDPI Sustainability*, 15(24),16887. https://doi.org/10.3390/su152416887.
[11] Al-Tahat, M., & Abu-Sheikha, O. (2023). Blockchain adoption in auditing practices among Jordanian firms: Opportunities and challenges. *Jordanian Journal of Business and Finance*, 4(1), 88–104.
[12] Al-Zoubi, R., & Al-Kilidar, H. (2024). Impact of blockchain on audit efficiency in Jordanian SMEs. *International Journal of Digital Accounting Research*, 24(1), 11–30.
[13] Ameyaw, N. M. N., Idemudia, N. C., & Iyelolu, N. T. V. (2024). The role of blockchain in auditing processes: A review and future perspectives. *International Journal of Scientific Research Updates*, 8(1), 037–053. https://doi.org/10.53430/ijsru.2024.8.1.0045.
[14] Antal C., Cioara T., Anghel I.& Antal M. (2021). Distributed Ledger Technology Review and Decentralized Applications Development Guidelines. *MDPI Future Internet*, 13(3), 62 https://doi.org/10.3390/fi13030062.
[15] Appelbaum, D., & Smith, S. (2018). Blockchain: Applications in auditing and assurance. T*he CPA Journal*, 88(6), 28–35.
[16] Badwan, N., Al-Khazaleh, S., Qubbaj, I., & Bani Ahmad, A. Y. (2025). Dependence structure of the US dollar index and crude oil prices: a regime-switching copula approach. *Journal of Financial Economic Policy*. https://doi.org/10.1108/JFEP-03-2024-0081.
[17] Baker, J. (2012). The Technology–Organization–Environment Framework. In Y. K. Dwivedi et al. (Eds.), *Information Systems Theory* (pp. 231–245). Springer. https://doi.org/10.1007/978-1-4419-6108-2_12.
[18] Ballamudi, V. (2016). Blockchain as a Type of Distributed Ledger Technology. *Asian Journal of Humanity Art and Literature*, 3(2), 127-136. https://doi.org/10.18034/ajhal.
[19] Bryman, A., & Bell, E. (2015). *Business Research Methods* (4th ed.). Oxford University Press.
[20] Coyne, E. M., & McMickle, P. L. (2017). Can blockchains serve an accounting purpose? *Journal of Emerging Technologies in Accounting*, 14(2), 101–111. https://doi.org/10.2308/jeta-51910.
[21] Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (4th ed.). SAGE Publications.
[22] Dai, J., & Vasarhelyi, M. A. (2017). Toward blockchain-based accounting and assurance. *Journal of Information Systems*, 31(3), 5–21. https://doi.org/10.2308/isys-51804.
[23] Danach, K., Hejase, H., & Farroukh, A. (2024). Assessing the Impact of Blockchain Technology on Financial Reporting and Audit Practices. *Asian Business Research*, 9(1) https://doi.org/10.20849/abr.v9i1.1427.
[24] Dashkevich, N., Counsell, S., & Destefanis, G. (2024). Blockchain Financial Statements: Innovating Financial Reporting, Accounting, and Liquidity Management. *MDPI Future Internet*, 16(7), 244. https://doi.org/10.3390/fi16070244.
[25] Fouzdar, A. S., Yamini, S., Biswas, R., Jindal, G., Ahmad, A. Y. B., & Dawar, R. (2024). Considering the Use of Blockchain for Supply Chain Authentication Management in a Secure and Transparent Way. In Recent Technological Advances in Engineering and Management (pp. 259-264). CRC Press. https://doi.org/10.1201/9781003531395-52.

[26] Feng, Y., Ahmad, S. F., Chen, W., Al-Razgan, M., Awwad, E. M., Ayassrah, A. Y. B. A., & Chi, F. (2024). Design, analysis, and environmental assessment of an innovative municipal solid waste-based multigeneration system integrating LNG cold utilization and seawater desalination. Desalination, 117848. https://doi.org/10.1016/j.desal.2024.117848.

[27] Greenhalgh, T., Robert, G., Macfarlane, F., Bate, P., & Kyriakidou, O. (2004). Diffusion of innovations in service organizations: Systematic review and recommendations. *The Milbank Quarterly*, 82(4), 581–629. https://doi.org/10.1111/j.0887-378X.2004.00325.x.

[28] Hasan, A. (2022). Artificial Intelligence (AI) in Accounting & Auditing: A Literature Review. *Open Journal of Business and Management*, 10(01), 440-465 https://doi.org/10.4236/ojbm.2022.101026.

[29] Hofmann F., Wurster S.,Ron E.& Schwafert M. (2017) The immutability concept of blockchains and benefits of early standardization. In Conference: *2017 ITU Kaleidoscope: Challenges for a Data-Driven Society*. https://doi.org/10.23919/ITU-WT.2017.8247004.

[30] Islam, S. & Apu, K. (2016). *Decentralized vs. centralized database solutions in blockchain: advantages, challenges, and use cases*. https://doi.org/10.62304/jieet.v3i04.195.

[31] Issa, H., Sun, T., & Vasarhelyi, M. A. (2016). Research ideas for artificial intelligence in auditing: The formalization of audit and workforce supplementation. *Journal of Emerging Technologies in Accounting*, 13(2), 1–20. https://doi.org/10.2308/jeta-10511.

[32] Kazan, G., & Kocamış, T. U. (2023). Assessing the impact of blockchain technology on internal controls within the COSO framework. *Journal of Corporate Governance Insurance and Risk Management*, 10(1), 86–95. https://doi.org/10.56578/jcgirm100110.

[33] Kokina, J., Mancha, R., & Pachamanova, D. (2021). Blockchain: Emergent industry adoption and implications for accounting. *Journal of Emerging Technologies in Accounting*, 18(1), 37–53.

[34] Mishra, R. & Agarwal, R. (2024). Impact of digital evolution on various facets of computer science and information technology. In book: *Digital Evolution: Advances in Computer Science and Information Technology* (pp.17-57), Publisher: Bhumi Publishing, INDIA

[35] Musiliu, S., Mlanga, S. & Oriakpono, N. (2024). A Distributed Ledger Technology and Financial Reporting Integrity in Nigerian Quoted Banks: A Study on Error Reduction and Enhanced Transparency. *African Journal of Accounting and Financial Research*, 7(4), 16-35. https://doi.org/10.52589/AJAFR-D4MTG09N.

[36] Ni, L., Fayaz Ahmad, S., Alsanie, G., Lan, N., Irshad, M., Bin Saeed, R. H., ... & Khan, Y. (2024). Investigating the role of green curriculum in shaping pro-environmental behaviors and environmental values orientation for sustainability. *International Journal of Sustainability in Higher Education*, *25*(8), 1537-1557. https://doi.org/10.1108/IJSHE-05-2023-0207.

[37] Pallant, J. (2020). *SPSS Survival Manual: A Step-by-Step Guide to Data Analysis Using IBM SPSS* (7th ed.). Routledge. https://doi.org/10.4324/9781003117452.

[38] Peters, G. W., & Panayi, E. (2016). *Understanding modern banking ledgers through blockchain technologies: Future of transaction processing and smart contracts on the internet of money*. In Banking Beyond Banks and Money, 239–278. https://doi.org/10.1007/978-3-319-42448-4_13.

[39] Prasad, K. D., Mubeen, S. A. & Rajani, B. (2025). The impact of blockchain technology on audit quality: An empirical study. *Academy of Accounting and Financial Studies Journal*, 29(S2), 1-7.

[40] Rogers, E. M. (1962). *Diffusion of Innovations*. Free Press.

[41] Rogers, E. M. (2003). *Diffusion of Innovations* (5th ed.). Free Press.

[42] Rozario, A. M., & Vasarhelyi, M. A. (2018). How blockchain technology can enhance audit quality. *Current Issues in Auditing*, 12(1), A1–A10.

[43] Rula Almadadha (2024) Blockchain Technology in Financial Accounting: Enhancing Transparency, Security, and ESG Reporting. *Blockchains*, 2(3), 312-333. https://doi.org/10.3390/blockchains2030015.

[44] Saunders, M., Lewis, P., & Thornhill, A. (2019). *Research Methods for Business Students* (8th ed.). Pearson Education.

[45] Schmitz, J., & Leoni, G. (2019). Accounting and auditing at the time of blockchain technology: a research agenda. *Australian Accounting Review*, 29(2), 331–342. https://doi.org/10.1111/auar.12286.

[46] Schmitz, J., & Leoni, G. (2019). Accounting and Auditing at the Time of Blockchain Technology. *Journal of Accounting and Public Policy*, 38(2), 100–122. https://doi.org/10.1111/auar.12286.

[47] Sheela, S., Alsmady, A. A., Tanaraj, K., & Izani, I. (2023). Navigating the Future: Blockchain's impact on accounting and auditing practices. Sustainability, 15(24), 16887. https://doi.org/10.3390/su152416887.

[48] Tornatzky, L.G., & Fleischer, M. (1990). *Processes of technological innovation*. Lexington Books, Lexington, MA.

[49] Udeh, E., Amajuoyi, P., Adeusi, K., Adeusi, K., & Scott A. (2024). Blockchain-driven communication in banking: Enhancing transparency and trust with distributed ledger technology. *Finance & Accounting Research Journal*, 6(6), 851-867. https://doi.org/10.51594/farj.v6i6.1182.

[50] Velichety, S., & Shrivastava, A. (2020). Enhancing audit efficiency using blockchain: Evidence from financial institutions. *Accounting, Auditing & Accountability Journal*, 33(8), 1760–1785.

[51] Wenke, C., Lang, F., & Buschle, M. (2022). Distributed Ledger Technology in the Financial Industry: Managerial, Organizational, and Technological Challenges. In: *Conference: 30th European Conference on Information Systems (ECIS)* at Timişoara, Romania.

[52] Yermack, D. (2017). Corporate governance and blockchains. *Review of Finance*, 21(1), 7–31. https://doi.org/10.1093/rof/rfw074.

[53] Wu, J., Ahmad, S. F., Ali, Y. A., Al-Razgan, M., Awwad, E. M., & Ayassrah, A. Y. B. A. (2024). Investigating the role of green behavior and perceived benefits in shaping green car buying behavior with environmental awareness as a moderator. Heliyon, 10(9). https://doi.org/10.1016/j.heliyon.2024.e30098.

[54] Wang, M., Ahmad, S. F., Agrawal, M. K., Ahmad, A. Y. A. B., Awan, A. B., Usmani, Y. S., ... & Han, W. (2025). Thermodynamic, economic, and environmental footprint assessments and optimization of an innovative biogas-driven heat integration network, producing power, cooling, and heating. *Energy*, *322*, 135379. https://doi.org/10.1016/j.energy.2025.135379.

[55] William, P., Ahmad, A. Y. B., Deepak, A., Gupta, R., Bajaj, K. K., & Deshmukh, R. (2024). Sustainable Implementation of Artificial Intelligence Based Decision Support System for Irrigation Projects in the Development of Rural Settlements. International Journal of Intelligent Systems and Applications in Engineering, 12(3s), 48-56.

[56] Yahiya, A., & Ahmad, B. (2024). Automated debt recovery systems: Harnessing AI for enhanced performance. Journal of Infrastructure, Policy and Development, 8(7), 4893. https://doi.org/10.24294/jipd.v8i7.4893.

[57] Zhang, Y., Ma, Z., & Meng, J. (2025). Auditing in the blockchain: a literature review. *Frontiers in Blockchain*, 8. https://doi.org/10.3389/fbloc.2025.1549729.

[58] Zhao, T., Ahmad, S. F., Agrawal, M. K., Ahmad, A. Y. A. B., Ghfar, A. A., Valsalan, P., ... & Gao, X. (2024). Design and thermo-enviro-economic analyses of a novel thermal design process for a CCHP-desalination application using LNG regasification integrated with a gas turbine power plant. Energy, 295, 131003. https://doi.org/10.1016/j.energy.2024.131003.