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The Effect of Adopting Blockchain on Accounting Information Quality in Saudi Zakat, Tax and Customs Authority

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ABSTRACT

The study aimed to test the impact of applying block chain technology on improving the quality of accounting information in Saudi Zakat, Tax and Customs Authority, through a field study on a sample of 100 financial accountants working in the Financial and Administrative Affairs Agency at the Authority. The theoretical part of study concluded that, blockchain technology provides a secure and transparent system for recording data without the need for an intermediary, which enhances trust between parties. It also showed that the quality of information is measured by its ability to reflect reality accurately and reliably, and by its support for making rational decisions through characteristics such as relevance, understanding, comparison, and verification. While the field study concluded that there is a moral and positive impact of block chains on the quality of accounting information in the Zakat, Tax and Customs Authority, as well as for all dimensions of block chains represented by (verification, sharing, programmability, tracking), as the results showed that the verification feature affects a very large extent. On the quality of accounting information, by enhancing data integrity, accuracy, and reliability, it also showed that the sharing feature affects to a lesser extent than the verification feature But it contributes to accessing updated and reliable financial data, and the effect of programmability on the quality of accounting information is less than verification and sharing, but it contributes to reducing errors by reducing human intervention. Traceability is the property of blockchains that least affects the quality of accounting information, but it enhances transparency by enabling the source of inaccurate data to be identified. Accordingly, the study recommended developing the necessary technology to adopt block chains within accounting information systems.

Keywords: Blockchains - Accounting Information Quality - Zakat, Tax and Customs Authority - Verification - Participation - Programmability - Traceability.

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1. Introduction

The business environment is undergoing a fundamental transformation driven by the digital revolution, which has prompted organizations to restructure their operations and adopt advanced technologies. Among these, blockchain technology has emerged as a key innovation due to its ability to provide high levels of trust and security in recording and executing transactions without the need for intermediaries, relying instead on peer-to-peer interactions and cryptographic mechanisms. Blockchain functions as a distributed ledger in which transactions, once validated by network participants, cannot be altered or deleted; any unauthorized modification attempt triggers an immediate alert to all users and reveals its source. This ensures the integrity of data and the stability of the system, contributing to the widespread adoption of blockchain across various sectors, including financial services, government administration, healthcare, and education (Badr, 2023).

The use of blockchain technology aims to enhance transaction security through a structure composed of interconnected data blocks that record each transaction in an immutable manner, with access restricted only to authorized users through cryptographic keys that ensure both the validity and verification of entries (Miah et al., 2020). This technology provides an effective mechanism for establishing consensus over a unified digital ledger without reliance on intermediaries, thereby reducing the risk of manipulation or duplication of digital assets (Wang et al., 2018). Additionally, blockchain contributes to significantly reducing the processing time of international transactions from days to seconds, lowering administrative costs, and improving information security, while also facilitating the rapid issuance of commercial licenses for start-up enterprises (Shihab, 2018).

The business environment in the Kingdom of Saudi Arabia is experiencing rapid growth driven by globalization, which has become a key determinant of entrepreneurial success. This environment is shaped by economic, technological, and competitive factors, along with political and social stability. In accordance with its national vision, the Kingdom seeks to diversify its economy and promote environmental sustainability as a fundamental pillar for enhancing quality of life and fostering a vibrant society characterized by high levels of well-being (William et al., 2002; Al-Sharif, 2024).

The Zakat, Tax and Customs Authority plays a pivotal role in supporting the national economy and enhancing international trade flows, while also contributing to economic and security cooperation initiatives. In line with Saudi Vision 2030, the Authority has made notable progress in developing land border crossings by establishing strategic partnerships with public and private entities to adopt global best practices in infrastructure development and operations. These efforts aim to facilitate cross-border trade and strengthen the Kingdom's

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economic performance (Zakat, Tax and Customs Authority, 2022).

As economic, social, and technological developments continue to reshape business environments, accounting practices have evolved to become faster, more accurate, and more cost-effective. In response to these transformations, the accounting profession— particularly the Big Four auditing firms—has begun to adopt blockchain technology, signaling its growing application in accounting and the emergence of blockchain- based accounting systems. High-quality accounting information is characterized by relevance and reliability, which enhance its usefulness for decision-making and reduce uncertainty. Given the increasing volume of data generated today, there is a pressing need for more efficient systems for managing and securing financial information. In this context, blockchain technology offers a promising solution for improving accounting processes and enhancing the quality of financial information (Al-Jakhlab, 2021; Abdel-Majid, 2023).

The implementation of blockchain technology significantly enhances the quality of accounting disclosure by providing transparent, reliable, and cost-effective financial information that can be accessed by investors quickly, anytime and anywhere. Moreover, blockchain enables the availability of new forms of information, improves operational efficiency, reduces opportunities for manipulation and fraud in accounting records, and minimizes human errors, time, and costs (Al-Sharqawi, 2019).

The research problem is represented in addressing the following main question: What is the impact of adopting blockchain technology on the quality of accounting information in the Zakat, Tax and Customs Authority in Saudi Arabia? From this main question, several sub-questions emerge:

1. What is the effect of the verification characteristic of blockchain on the quality of accounting information in the Zakat, Tax and Customs Authority in Saudi Arabia?
2. What is the effect of the sharing characteristic of blockchain on the quality of accounting information in the Zakat, Tax and Customs Authority in Saudi Arabia?
3. What is the effect of the programmability characteristic of blockchain on the quality of accounting information in the Zakat, Tax and Customs Authority in Saudi Arabia?
4. What is the effect of the traceability characteristic of blockchain on the quality of accounting information in the Zakat, Tax and Customs Authority in Saudi Arabia?

The primary objective of this study is to examine the impact of adopting blockchain technology on the quality of accounting information within the Zakat, Tax and Customs Authority (ZTCA)

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in Saudi Arabia. This is achieved through an empirical study conducted on a sample of financial accountants working in the Financial and Administrative Affairs Agency of the Authority. The scientific significance of this research stems from addressing one of the most influential emerging technologies in the accounting and business environment, given the innovative operational capabilities enabled by blockchain, including verification, sharing, programmability, and traceability. These characteristics are expected to enhance the quality of financial reporting, particularly in terms of relevance and faithful representation. Moreover, the study highlights the implications of blockchain adoption for accounting and auditing practitioners, especially in light of the Kingdom's recent initiatives to implement this technology across several sectors such as ZTCA and the Saudi Central Bank. The practical contribution of this research lies in providing a framework to help the Authority assess the effectiveness and added value of blockchain in improving transparency, accuracy, and sustainability of financial reporting, thereby strengthening organizational competitiveness, continuity, and development.

The scope of this research is limited to examining the impact of adopting blockchain technology on the quality of accounting information within the Zakat, Tax and Customs Authority in Saudi Arabia, without addressing other modern technologies that may also influence information quality, such as artificial intelligence tools, machine learning, and big data analytics. To achieve the research objective within these boundaries, the remaining sections of the study will be organized as follows: previous studies, research methodology, and finally, conclusions and results.

2. Literature Review

2.1. Blockchain Technology

Blockchain technology represents one of the most significant contemporary digital innovations, fundamentally transforming mechanisms of data exchange and transaction management. Initially developed as the underlying infrastructure for cryptocurrencies, it has evolved into a versatile technological paradigm with applications spanning diverse economic and service sectors. Consequently, it has been characterized as the "Internet of Transactions," reflecting its ability to facilitate trusted exchanges without reliance on centralized intermediaries (Khalil & Alwani, 2023). At its core, blockchain operates as a distributed ledger that records transactions in a sequential and immutable manner, thereby enhancing trust, transparency, and verification efficiency.

From a conceptual standpoint, blockchain has been defined in various ways within the literature. Ruckeshause (2017) described it as a shared distributed database operating within a peer-to-peer architecture, secured through cryptographic techniques and consensus mechanisms that enable

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automated execution of predefined protocols. Similarly, Maher (2018) conceptualized it as a decentralized, chronologically linked, and tamper-resistant electronic ledger that allows independent verification of transactions. Viriyasitavat (2019) further emphasized its role in ensuring data integrity in complex networks through distributed verification systems.

From a functional perspective, blockchain serves as a platform for restructuring socio- economic exchange patterns. In this context, the "block" represents digital data, while the "chain" refers to the structural framework governing its storage. Notably, trust constitutes the foundational element of blockchain operations, preceding its purely technical dimensions (Bou Obaid, 2020). It is also defined as a system for recording cryptocurrency transactions across interconnected nodes (Al-Qaisi, 2021), as well as a digital ledger for validating and storing data (Saliha, 2022). Supporting this view, Ben Halima et al. (2022) described blockchain as a distributed commercial accounting system that records transactions across extensive networks, rendering unauthorized alterations practically infeasible. Likewise, Badawi et al. (2022) emphasized its decentralized nature, where records are continuously updated through shared verification and advanced cryptographic protocols.

Blockchain technology contributes significantly to improving organizational efficiency by enhancing the reliability and interconnectivity of records. As the blockchain grows, modifying earlier records becomes increasingly difficult, thereby strengthening trust among stakeholders, improving coordination, and reducing transaction processing time (George et al., 2019; Francisco, 2017). Additionally, the immutability of blockchain data minimizes errors and facilitates their detection, while reinforcing relationships among participants (Costa, 2018). Smart contracts further enhance efficiency by automating contractual execution without intermediaries, leading to improved productivity (Mann et al., 2018).

Moreover, blockchain is considered an advanced alternative to traditional databases, as it relies on decentralized distributed ledgers characterized by transparency, strong encryption, and resistance to manipulation (Min, 2018). Its importance stems from key technical features, including decentralization, chronological ordering, immutability, and high transparency (Yu et al., 2018). Among its most prominent attributes is traceability, which enables tracking of products and information flows across supply chains within immutable records. This supports anti-counterfeiting measures, enhances product safety, and enables rapid recall responses (NASSCOM, 2020). Additionally, shared transparency ensures that all participants access real-time data, reducing manipulation risks and improving operational efficiency (Bashir, 2018).

Blockchain also introduces continuous transaction verification through what is often referred to as a "third-entry accounting system," ensuring data accuracy and auditability while maintaining flexibility for network participation (Younes, 2022). Furthermore, its programmability through

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smart contracts—self-executing instructions triggered by predefined conditions—enables process automation, reduces errors, and enhances security and transparency. These features support the development of decentralized applications across various domains, including finance, gaming, and supply chain management (Zheng et al., 2018).

Overall, blockchain represents more than a data security or storage technology; it embodies a paradigm shift in the concept of trust within digital environments by transferring verification authority from centralized entities to distributed networks. This transformation fundamentally reshapes relationships between individuals and institutions in modern economic systems.

2.2 Blockchain Adoption in Saudi Arabia

Saudi Arabia has made significant progress in adopting digital technologies under Vision 2030, which aims to establish a knowledge-based, digitally driven economy. Blockchain has emerged as a key area of interest, supported by the establishment of the Digital Transformation Unit in 2017 to enhance integration between public and private sectors. This effort has been reinforced through partnerships with global firms such as Ripple to incorporate blockchain into banking systems (Badr, 2023).

Studies indicate a growing readiness for advanced technologies, with increased adoption of cloud computing among Saudi organizations paving the way for blockchain implementation (Ministry of Communications, 2019). Market reports suggest that the blockchain sector has experienced substantial growth, reflecting the Kingdom's recognition of its role in enhancing efficiency and governance.

At the practical level, Saudi Arabia has implemented several advanced digital platforms, such as Meras, Etimad, Absher, and Sehhaty, which demonstrate the country's capability to build integrated and reliable digital infrastructures. These initiatives collectively provide a strong foundation for future blockchain adoption.

Despite this progress, evidence suggests that blockchain has not yet been widely adopted in financial reporting practices among Saudi firms, indicating a gap between technological potential and practical implementation. This gap is largely attributed to the need for supportive regulatory and professional frameworks tailored to decentralized accounting models.

Regulatory efforts are currently focused on fostering innovation through initiatives such as the Emerging Technologies Regulatory Sandbox (2022), alongside the issuance of analytical reports and regulatory guidelines to facilitate blockchain adoption. Practical applications have also been introduced to enhance data reliability and reduce fraud.

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Furthermore, blockchain has been leveraged by the Zakat, Tax and Customs Authority to enhance accounting systems, particularly through the implementation of e- invoicing. This includes the use of standardized formats (e.g., XML and PDF/A-3) to enable real-time digital processing without human intervention. The integration of cryptographic stamps in invoices ensures data integrity by preventing post-issuance modifications, while non-resettable sequential numbering enhances traceability and reduces manipulation risks.

Collectively, these developments demonstrate that Saudi Arabia possesses both the technological infrastructure and regulatory momentum necessary to support the adoption of blockchain technology. However, there remains a significant research and practical gap concerning its actual implementation within accounting practices, which highlights the need for further empirical and analytical studies. Future expansion in the use of blockchain is expected to enhance transparency, reduce fraud, and improve the quality and reliability of financial reporting, thereby aligning with the requirements of the digital economy and the broader objectives of Saudi Vision 2030.

2.3 The Relationship Between Blockchain and Accounting Information Quality

The literature on the relationship between blockchain technology and accounting information quality is extensive and multidisciplinary, encompassing theoretical and empirical contributions across banking, commercial, and financial sectors in various countries. Overall, prior studies consistently converge on the view that blockchain adoption, through its inherent technological characteristics, plays a significant role in enhancing the qualitative attributes of accounting information, particularly relevance, faithful representation, transparency, and verifiability.

In this regard, Algrari (2019) identified a positive association between the quality of accounting information systems and the quality of accounting information, emphasizing the necessity of continuous system development to align with rapid technological advancements. Similarly, Al-Aqsa (2020) conceptualized blockchain as an evolutionary extension of accounting information systems, arguing that its effective implementation requires fundamental redesign of existing systems alongside the development of accountants' technical and digital competencies.

From a quality assurance perspective, Abdel Tawab (2020) found that blockchain adoption enhances accounting information quality by improving relevance and faithful representation, while also strengthening corporate governance mechanisms and reducing information asymmetry. These findings are consistent with Al-Hilalat (2021), who confirmed a statistically significant impact of blockchain technology on all qualitative characteristics of accounting information, including both fundamental and enhancing qualitative attributes.

Sectoral evidence further supports these conclusions. In the banking sector, Abu Arab (2021)

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highlighted that decentralized ledger systems contribute to secure financial transaction recording, thereby strengthening trust in financial data. Likewise, Al-Qaisi (2021) demonstrated that blockchain implementation in Jordanian banks improves financial reporting quality and enhances overall financial performance efficiency.

Within the Libyan context, Al-Shihibi (2022) reported that banking professionals perceive blockchain as a key enabler for improving financial reporting quality, recommending enhanced human capital development to support its adoption. In Saudi Arabia, Badr (2023) found that blockchain significantly reduces information asymmetry and enhances transparency, although its adoption remains more advanced in the service sector compared to business enterprises.

Recent empirical studies further reinforce these findings while also highlighting implementation constraints. Al-Razaz (2023) confirmed a significant positive effect of blockchain on accounting information quality and information asymmetry reduction; however, the study identified key barriers such as insufficient training and weak technological infrastructure. Similarly, Abdelhamid (2023) emphasized operational and governance-related challenges that hinder adoption, recommending reforms in accounting education to incorporate emerging technologies.

From a technological integration perspective, Al-Nuqoudi (2023) stressed the importance of integrating blockchain with XBRL to improve financial reporting quality through enhanced transparency and cryptographic data protection. Alkafaji (2023) further demonstrated that accountants' and auditors' familiarity with blockchain significantly improves accounting information quality, underscoring the importance of continuous professional training. In the same vein, Alwajid (2023) found a strong positive relationship between blockchain adoption and accounting information systems in Iraqi firms, highlighting the need for flexible system architectures compatible with technological evolution.

In Egypt, Mohamed et al. (2024) showed that blockchain mitigates the negative effects of accounting estimates by improving faithful representation, comparability, and verifiability. Similarly, Al Kerdem (2024) reported that both blockchain and cloud computing contribute to enhancing financial reporting quality and organizational performance. Hojaira (2024) also confirmed a positive relationship between blockchain adoption and accounting information systems in Algerian institutions, despite persistent challenges related to weak transparency and implementation constraints.

At a broader level, Maroua (2024) found that blockchain enhances data transparency and facilitates governmental transactions, which in turn improves the quality of financial reporting. Sang (2024), in the Vietnamese banking sector, further demonstrated that accounting information system quality acts as a mediating variable in the relationship between blockchain technology

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and organizational performance, highlighting the importance of technological readiness and professional training. In the Saudi context, Oraby (2024) confirmed that blockchain positively affects accounting and auditing functions, reduces transaction costs, and strengthens both trust and transparency.

Overall, the reviewed literature provides strong empirical and theoretical evidence that blockchain technology significantly enhances accounting information quality through multiple pathways, including improved transparency, reduced information asymmetry, strengthened verifiability, and increased system reliability. However, the literature also reveals that the magnitude of these benefits is contingent upon organizational readiness, regulatory support, and human capital capabilities. This indicates that while blockchain presents substantial potential for transforming accounting information systems, its effective implementation remains dependent on addressing structural, technical, and educational barriers. Based on the foregoing, the main research hypothesis can be formulated as follows:

Main Hypothesis: Blockchain technology has a statistically significant effect on accounting information quality at the Zakat, Tax and Customs Authority in Saudi Arabia.

From this, the following sub-hypotheses are derived:

- **H1:** The verification feature of blockchain has a statistically significant effect on accounting information quality at the Zakat, Tax and Customs Authority in Saudi Arabia.
- **H2:** The sharing feature of blockchain has a statistically significant effect on accounting information quality at the Zakat, Tax and Customs Authority in Saudi Arabia.
- **H3:** The programmability feature of blockchain has a statistically significant effect on accounting information quality at the Zakat, Tax and Customs Authority in Saudi Arabia.
- **H4:** The traceability feature of blockchain has a statistically significant effect on accounting information quality at the Zakat, Tax and Customs Authority in Saudi Arabia.

3. Research Methodology

3.1 Population and Sample of the Study

The study population consists of financial accountants working within the Financial and Administrative Affairs Agency at the Zakat, Tax and Customs Authority in the Kingdom of Saudi Arabia. Given the difficulty of conducting a full census of all members of the population, a purposive sampling technique was employed. The questionnaire link was distributed through various communication channels associated with the study population. The final sample

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comprised 100 respondents.

3.2 Measurement Instrument and Study Variables

The study relied on a questionnaire as the primary data collection instrument. The questionnaire was divided into five sections. The first section collected respondents' demographic and professional characteristics, including gender, age, educational level, years of experience, and professional certifications.

The second section included items designed to measure the effect of the "verification" feature of blockchain on accounting information quality. The third section focused on measuring the impact of the "sharing (transparency)" feature of blockchain on accounting information quality. The fourth section addressed the effect of the "programmability" feature, while the fifth section examined the impact of the "traceability" feature on accounting information quality.

Each blockchain feature was measured using eight items, resulting in a total set of statements designed to assess the influence of verification, sharing, programmability, and traceability on accounting information quality. A five-point Likert scale was used for all items, ranging from "Strongly Agree (5)" to "Strongly Disagree (1)".

3.3 Statistical Methods Used

The study employed appropriate statistical techniques using the Statistical Package for the Social Sciences (SPSS). These included frequency distributions and percentages, as well as graphical representations, to describe the general characteristics of the sample. Median and standard deviation were used to describe the level of respondents' agreement with the questionnaire items. In addition, the Sign Test (Sig Test) was applied to test the main hypothesis and the sub-hypotheses of the study.

3.4 Demographic Analysis

The results of the demographic analysis of participants in the study examining the impact of blockchain adoption on accounting information quality at the Zakat, Tax and Customs Authority revealed a diverse sample distribution. In terms of gender, males represented 59% of the respondents, while females accounted for 41%. Regarding age distribution, 25% of participants were between 25–30 years old, 30% were between 30–40 years, 9% were between 40–50 years, and the largest proportion, 36%, were above 50 years of age.

With respect to years of experience, 27% of respondents had less than 3 years of experience, 41% had between 4–6 years, and 32% had more than 6 years of professional experience. In terms of educational qualifications, master's degree holders constituted the highest proportion at 46%,

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followed by doctoral degree holders at 29%, bachelor's degree holders at 18%, and diploma holders at 7%.

Regarding professional certifications, Value Added Tax (VAT) specialists represented the largest group at 46%, followed by holders of the Saudi Organization for Chartered and Professional Accountants (SOCPA) certification at 31%, then Certified Management Accountants at 16%, and finally other certifications at 7%.

Overall, the demographic profile reflects a relatively well-qualified and experienced sample, which enhances the credibility and representativeness of the study findings.

3.5 Instrument Reliability

The reliability of the study instrument was assessed using Cronbach's Alpha coefficient, which is one of the most widely used measures for internal consistency reliability. This coefficient evaluates the extent to which items within a single scale are interrelated. Higher values of Cronbach's Alpha indicate stronger inter-item correlations, which in turn reflect a higher level of internal consistency and reliability of the measurement instrument.

The results of Cronbach's Alpha test for the study questionnaire dimensions, as well as the overall scale, indicated a total reliability coefficient of **0.946**, which reflects a very high level of internal consistency. The reliability coefficients for the four study dimensions ranged between **0.814 (minimum)** and **0.894 (maximum)**. These results indicate a high degree of homogeneity among all measurement items and confirm the strong capability of the instrument to accurately measure the main construct of the study.

Overall, these findings enhance the researchers' confidence in the reliability and validity of the study instrument, confirming its suitability for collecting accurate and dependable data that can support robust scientific conclusions.

4. Results of Testing the Main Hypothesis and Sub-Hypotheses

The results of the Sign Test for the first sub-hypothesis indicate statistically significant differences at a significance level of less than 0.001. The Z value was - 9.394, with 96 positive differences, compared to 2 negative differences and 2 tied values. Accordingly, the null hypothesis is rejected, and the alternative hypothesis is accepted, which states that the verification feature of blockchain has a statistically significant effect on accounting information quality at the Zakat, Tax and Customs Authority in Saudi Arabia. These findings highlight the importance of the verification feature in enhancing accounting information quality by improving its accuracy, reliability, and transparency.

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The results of the Sign Test for the second sub-hypothesis also reveal statistically significant differences at a significance level of less than 0.001, with a Z value of -8.471. The number of positive differences reached 90, compared to 6 negative differences and 4 tied values. Based on these results, the null hypothesis is rejected and the alternative hypothesis is accepted, indicating that the sharing (transparency) feature of blockchain significantly affects accounting information quality. This confirms the role of transparency in improving accounting information quality by enhancing accessibility, openness, and information exchange among relevant stakeholders.

The results of the third sub-hypothesis show statistically significant differences at a significance level of less than 0.001, with a Z value of -7.797. The number of positive differences was 86, compared to 9 negative differences and 5 tied values. Accordingly, the null hypothesis is rejected and the alternative hypothesis is accepted, confirming that the programmability feature of blockchain has a significant effect on accounting information quality. This underscores the importance of programmability in improving accounting information quality by enabling automated verification mechanisms, reducing human errors, and increasing data accuracy.

The results of the fourth sub-hypothesis indicate statistically significant differences at a significance level of less than 0.001, with a Z value of 8.384. The number of positive differences reached 91, compared to 7 negative differences and 2 tied values. Therefore, the null hypothesis is rejected and the alternative hypothesis is accepted, confirming that the traceability feature of blockchain significantly affects accounting information quality. This finding highlights the importance of traceability in enhancing accounting information quality by strengthening the ability to track data sources and identify any modifications made to them.

Based on the results of the four sub-hypotheses, all of which indicate a statistically significant effect of blockchain features (verification, sharing, programmability, and traceability) on accounting information quality at a significance level of less than 0.001, the main null hypothesis is rejected and the alternative hypothesis is accepted. This confirms that blockchain technology has a statistically significant effect on accounting information quality at the Zakat, Tax and Customs Authority in Saudi Arabia.

It is also noteworthy that the verification feature exhibited the strongest effect on accounting information quality, with the highest Z value (-9.394), followed by the sharing feature (-8.471), then the traceability feature (-8.384), and finally the programmability feature (-7.797). These results are consistent with the descriptive analysis, which showed that the verification feature recorded the highest mean score (4.47), followed by sharing (4.30), programmability (4.13), and traceability (4.05).

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Overall, these findings confirm the strong importance of blockchain adoption in enhancing accounting information quality within the Zakat, Tax and Customs Authority in Saudi Arabia, and highlight the need to further strengthen and develop blockchain features to maximize their benefits in the accounting domain.

5. Conclusion

The results indicate that the overall effect of blockchain adoption on accounting information quality at the Zakat, Tax and Customs Authority in Saudi Arabia is very high, with a mean score of 4.24, a standard deviation of 0.784, and a Z value of -8.900 based on the Sign Test.

In terms of the relative importance of blockchain features, the verification feature ranked first with a very high level of influence, followed by the sharing (transparency) feature, also with a very high level of influence. The programmability feature ranked third with a high level of influence, while the traceability feature ranked fourth with a high level of influence.

Accordingly, all alternative hypotheses were accepted based on the Sign Test results, which confirmed a statistically significant effect of all blockchain features on accounting information quality at a significance level of 0.001. Consequently, the main hypothesis of the study is also accepted, indicating that blockchain technology has a statistically significant impact on accounting information quality at the Zakat, Tax and Customs Authority in Saudi Arabia.

Blockchain technology provides a decentralized and secure system for recording data and transactions, characterized by transparency and immutability, which enhances trust among parties without the need for a central intermediary. Although its initial applications emerged with the advent of Bitcoin, blockchain has since expanded into multiple domains, including e-commerce, smart contracts, supply chain management, intellectual property protection, and governmental applications. Moreover, next- generation blockchain systems are continuously being developed to improve performance and achieve greater interoperability across systems.

Blockchain technology contributes to reducing costs, improving the efficiency of accountants and auditors, supporting transparency, accelerating transaction processing, and providing accurate real-time accounting information. These advantages position blockchain as an effective tool for advancing traditional accounting systems. However, despite its multiple benefits, blockchain adoption faces several challenges in the Saudi business environment, including limited general acceptance, high transaction costs, and the absence of a unified legal framework. These challenges necessitate clear regulatory policies and sustained governmental support to ensure successful implementation.

Given the variability of regulatory environments, the design of accounting information systems

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must be adapted to the specific context of each organization. This is consistent with Contingency Theory, which emphasizes aligning systems with internal organizational conditions such as administrative structure, staff expertise, and leadership support.

High-quality accounting information is characterized by relevance and reliability, in addition to other qualitative attributes such as understandability, comparability, verifiability, and timeliness. These criteria collectively indicate that information quality is ultimately measured by the extent to which it supports users in making rational and informed decisions.

In this regard, the Zakat, Tax and Customs Authority has adopted an advanced digital infrastructure based on electronic invoicing, Robotic Process Automation (RPA), and intelligent applications, positioning it among the leading government entities in digital transformation. This development has contributed to improved operational efficiency and reduced operational costs.

Nevertheless, the effective implementation of blockchain technology within the Authority requires strong political and regulatory support, in addition to the development of human competencies that integrate accounting expertise with technological capabilities. Such integration would enable the Authority to fully leverage the potential of blockchain as a future-oriented technological solution.

In light of the study objectives and the findings obtained, the researchers recommend that organizations and firms work on developing the necessary technological infrastructure to support the integration of blockchain technology within accounting information systems. This should be accompanied by the implementation of specialized training programs aimed at enhancing accountants' competencies in dealing with emerging technologies, particularly blockchain.

At the legislative level, it is recommended that policymakers develop clear and well- structured regulations governing the use of blockchain technology in both the public and private sectors, in a manner that ensures the protection of stakeholders' rights while simultaneously encouraging innovation and technological advancement.

Furthermore, greater coordination is required among regulatory bodies, such as the Zakat, Tax and Customs Authority, the Central Bank, and the Capital Market Authority, to ensure policy integration, avoid regulatory fragmentation, and promote the effective adoption of blockchain technology across different sectors.

Future research could explore several promising avenues in this field. First, examining the impact of blockchain technology adoption on the quality of digital financial reporting would provide deeper insights into how this technology influences reporting accuracy, transparency, and timeliness in digital environments.

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Second, further studies may investigate the effect of blockchain implementation on the value relevance of both assurance and advisory roles of internal auditing, particularly in enhancing audit effectiveness and strengthening governance mechanisms.

Third, additional research could focus on the impact of blockchain technology on cost management practices within industrial companies, especially in terms of cost reduction, efficiency improvement, and real-time cost monitoring enabled by distributed ledger systems.

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