Blockchain Frontier Technology (B-Front)
Vol. 6, No. 1, July, 2026, pp. 62∼73
E-ISSN: 2808-0009 | P-ISSN: 2808-0831, DOI: 10.34306

Integration of IoT and Blockchain for Business Data Security

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Article Info

Article history:

Submission, 24-12-2025
Revised, 18-02-2026
Accepted, 05-05-2026
Published, 28-05-2026

Keywords:

Internet of Things
Blockchain
Business Data Security
Data Transparency
Digital Transformation

ABSTRACT

The background of this study is based on the growing reliance of businesses on digital data driven by digital transformation, which demands higher standards of data security and transparency. The IoT and Blockchain are recognized as key technologies that can address these issues, yet empirical research exploring their combined roles remains limited. **The objective** of this research is to examine the role of the IoT in strengthening business data security, the role of Blockchain in enhancing data transparency, and the effect of integrating both technologies on business data management. **This study adopts a quantitative** approach, with data gathered through questionnaires distributed to business practitioners who have implemented digital technologies. The data were analyzed using descriptive statistical methods and simple inferential analysis to identify relationships among the research variables. **The results show** that the IoT positively influences business data security through real time monitoring, while Blockchain improves data transparency and integrity through its immutable recording mechanism. Moreover, the integration of the Internet of Things and Blockchain produces a stronger impact on data security and transparency compared to their individual use. **The study concludes** that the adoption and integration of the Internet of Things and Blockchain provide effective strategies for organizations to enhance business data security and transparency, while also fostering stakeholder trust and supporting business sustainability in the digital era.

DOI: https://doi.org/10.34306/bfront.v6i1.1040

1. INTRODUCTION

The present business environment has experienced significant changes due to digital transformation, with firms increasingly operating within data driven ecosystems [1]. Businesses can gather, process, and analyze large amounts of data to support strategic decision making, improve operational efficiency, and strengthen competitiveness through the implementation of digital technologies [2]. In this context, data has become a strategic asset that determines business success in increasingly complex market environments.

The Internet of Things (IoT) plays an important role in generating real time business data through interconnected devices, sensors, and smart systems. IoT enables organizations to continuously monitor operational activities, improve visibility, and optimize resource utilization [3, 4]. From an interdisciplinary perspective, emerging technologies such as Edge Computing and Cyber Physical Systems (CPS) further strengthen the role of IoT in complex business environments [5]. Edge Computing enables data processing and initial security validation to occur closer to IoT devices, thereby reducing latency and minimizing the risk of data exposure before transmission to centralized or blockchain based systems [6]. Meanwhile, CPS integrate physical processes with computational and network systems, enabling real time interaction between physical assets and digital control systems. Together, these technologies provide a strong foundation for secure, scalable, and real time integration of IoT data within modern digital infrastructures.

However, the increasing dependence on data also creates major challenges related to business data security and transparency [7]. Threats such as data breaches, unauthorized access, and data manipulation continue to increase alongside the growing complexity of digital systems and the involvement of multiple stakeholders [8]. In addition, the massive volume of data and continuous data streams generated by IoT devices further intensify security and privacy concerns [9]. Traditional data management approaches are often unable to provide sufficient levels of security, transparency, and trust, creating a demand for more reliable and sustainable technological solutions.

Blockchain has been recognized as a promising technology for addressing challenges in digital systems through decentralization, transparency, and data immutability [10]. In the context of digital transformation, Blockchain supports secure, transparent, and reliable data management by ensuring data integrity and strengthening stakeholder trust through distributed ledger systems [11]. The integration of IoT and Blockchain is therefore considered a strategic solution for improving business data security and transparency [12]. Within this integration, smart contracts automatically validate IoT generated data based on predefined rules such as format consistency, threshold limits, timestamp accuracy, and device authentication before the data are permanently recorded on the blockchain [13, 14].

Despite the growing adoption of Blockchain and IoT technologies, empirical studies that comprehensively examine the individual roles of each technology as well as their combined impact on business data security and transparency remain limited [15]. Therefore, this study aims to analyze the role of IoT in enhancing business data security, examine the contribution of Blockchain in improving data transparency within business processes, and evaluate the impact of integrating both technologies on secure and transparent business data management [16]. This study is expected to contribute theoretically to the development of information systems and business technology literature while also providing practical implications for organizations in managing sensitive business data. Furthermore, this research supports the sustainable development agenda by strengthening innovation and digital infrastructure (SDGs 9), promoting transparent and accountable governance (SDGs 16), and supporting innovation driven economic growth through digital technologies (SDGs 8).

2. LITERATURE REVIEW

2.1. Internet of Things in the Business Context

IoT is defined as a network of physical devices interconnected through the internet that are capable of automatically collecting and exchanging data [17]. In a business context, IoT plays a strategic role in supporting data-driven decision-making, enabling real-time monitoring of operational processes, and enhancing organizational efficiency and productivity [18]. Through the use of sensors and smart devices, companies can achieve greater operational visibility and gain a more accurate and continuous understanding of business conditions [19].

Nevertheless, the implementation of IoT in business environments also presents significant challenges, particularly in terms of data security [20]. The data generated by IoT devices is generally sensitive and highly vulnerable to cyber threats [21]. Limitations in security mechanisms within IoT devices, along with the complexity of the networks they operate on, can increase the risk of data breaches and data manipulation [22]. Therefore, technological approaches are required to strengthen the protection of business data generated by IoT systems in order to ensure data security and information reliability within business processes [23].

In addition, interdisciplinary technological paradigms such as Edge Computing and CPS provide further theoretical support for strengthening IoT-based data protection [24]. Edge Computing enables preliminary processing and validation of sensor-generated data closer to the data source, reducing latency and minimizing exposure to centralized vulnerabilities. Meanwhile, CPS integrate physical processes with computational control mechanisms, enabling synchronized and secure interaction between operational assets and digital infrastructures [25].

2.2. Blockchain as a Technology for Data Security and Transparency

Blockchain is a distributed ledger technology that stores data in interconnected blocks that are immutable [26]. In the context of digital transformation, Blockchain plays an important role in supporting secure and transparent digital data management across modern business systems. Its key characteristics such as decentralization, transparency, and immutability make Blockchain a reliable technology for ensuring data security and integrity [18]. Through a distributed and verifiable recording mechanism, Blockchain is able to enhance trust among parties within the business ecosystem [27]. In addition, Blockchain enables more efficient data verification processes and reduces the risk of unauthorized data manipulation. These capabilities make Blockchain increasingly relevant for organizations seeking to strengthen accountability, transparency, and reliability in digital business operations.

In business data management, Blockchain plays an important role in preventing data manipulation and improving process accountability [28]. The implementation of this technology allows all business transactions to be recorded transparently and consistently, particularly in environments involving multiple stakeholders. Therefore, Blockchain is regarded as a strategic solution for addressing data security and transparency challenges in modern business systems.

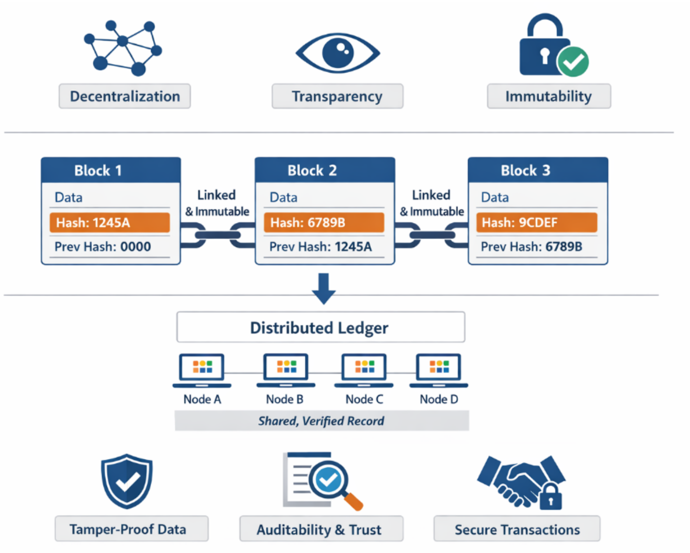

Figure 1. Conceptual Illustration of Blockchain Structure

Figure 1 presents the way Blockchain functions in capturing and storing business transaction data within cryptographically linked blocks [29]. Through its distributed ledger mechanism, data can be verified collectively by all network nodes, which enhances transparency and reduces the likelihood of data manipulation [30]. Additionally, the immutability characteristic of Blockchain preserves the integrity of recorded data and strengthens trust among stakeholders in business data management [31].

2.3. Business Data Security and Transparency

Business data security refers to efforts to protect data from unauthorized access, breaches, and misuse, while data transparency relates to the openness and clarity of information that can be accessed by authorized parties [32]. In the digital era, data security and transparency have become key factors in maintaining customer trust and ensuring business sustainability. An organization's inability to safeguard these two aspects can negatively affect its reputation, stakeholder trust, and overall business performance [33].

As the complexity of data security threats continues to increase, traditional technological approaches are considered insufficient to address these challenges [34]. Therefore, the integration of more advanced digital technologies has become an increasingly urgent necessity in business data management. The implementation of systems based on distributed technologies is viewed as a promising approach to enhancing data security while simultaneously supporting transparency in business processes involving multiple parties [35].

2.4. Integration of the Internet of Things and Blockchain in Business Data Management

The convergence of IoT and Blockchain has gained significant attention as a promising approach to enhancing business data security and transparency [36]. In this integration, IoT generates real time data, while Blockchain provides a secure and transparent infrastructure for data storage and management [37]. Together, these technologies improve data integrity from collection to storage processes [38]. Smart contracts further strengthen this framework by automatically executing predefined validation and authentication rules for IoT generated data before it is stored on the blockchain [39, 40]. This mechanism improves data quality and reliability, reduces manual intervention, and minimizes human error [41]. By ensuring that only valid and compliant IoT data are permanently recorded, organizations can enhance security and transparency in decentralized data management systems [42]. Furthermore, the integration of IoT and Blockchain supports SDGs 9, 16, and 8 by promoting resilient digital infrastructure, transparent governance, and innovation driven economic growth.

From a technical standpoint, smart contracts operate as self-executing programs deployed on the blockchain network. When IoT devices send data transactions, the smart contract automatically executes conditional logic (e.g., if then validation rules). For example, sensor data exceeding predefined tolerance ranges may trigger automatic alerts, while data failing authentication checks may be rejected without being written to the ledger [43]. This automated verification process reduces reliance on centralized intermediaries, minimizes human intervention, and significantly decreases opportunities for data manipulation in multi-stakeholder environments. By embedding validation rules directly into blockchain code, the system ensures consistency, traceability, and tamper-resistance across all recorded transactions.

The adoption of an integrated IoT and Blockchain approach can minimize the risk of data manipulation, enhance trust among stakeholders, and reinforce business data security systems. With their complementary features, these technologies offer significant potential to support secure and transparent data management, particularly within increasingly complex and digitally interconnected business environments. Moreover, the incorporation of Edge Computing in IoT Blockchain architectures improves system efficiency and security by enabling localized data validation and preprocessing. By filtering and validating IoT generated data at the edge layer, only relevant and verified information is transmitted to the blockchain network. This approach not only enhances scalability but also facilitates secure interaction between cyber and physical components within Cyber Physical Systems. As a result, Edge Computing functions as an intermediary layer that strengthens the interoperability and reliability of IoT Blockchain-based business data management systems [44].

3. RESEARCH METHOD

3.1. Research Approach and Type of Study

This study adopts a quantitative approach with an explanatory research design to investigate the causal relationships between IoT, Blockchain, and business data security and transparency. The use of a quantitative method enables systematic and objective testing of hypotheses based on numerical data collected from respondents. Furthermore, the research is structured to analyze both the partial and combined effects of the variables in accordance with the proposed hypotheses.

3.2. Population and Sampling Technique

The population of this study consists of individuals who have knowledge or experience in managing business data based on digital technologies, particularly the Internet of Things and Blockchain. The sampling technique employed is purposive sampling, with respondents selected based on criteria such as an understanding of data management processes, information security, or digital business systems. This technique is applied to ensure that the data collected are relevant to the objectives of the study.

3.3. Research Variables and Measurement Indicators

This study involves two independent variables and one dependent variable. IoT (X1) and Blockchain (X2) serve as the independent variables, while business data security and transparency (Y) act as the dependent variable. Each variable is measured using indicators that reflect the key characteristics of the concepts under investigation.

Table 1. Research Variables and Indicators

Variable	Code	Indicator
Internet of Things	X1	Real time data collection, device connectivity, system monitoring
Blockchain	X2	Data immutability, transparency, decentralization
Business Data Security and Transparency	Y	Data integrity, access control, information traceability

Table 1 explains the research variables, which consist of the IoT and Blockchain as independent variables, and business data security and transparency as the dependent variable. Each variable is measured using indicators that reflect its key characteristics and its role in business data management.

3.4. Data Collection Techniques

The data for this study were collected through a structured questionnaire designed based on the indicators of each research variable. Each item was assessed using a five point Likert scale, ranging from strongly disagree to strongly agree. This method was selected as it effectively captures respondents perceptions in a quantitative manner regarding the implementation of the Internet of Things and Blockchain in business data management within the context of Digital Transformation.

3.5. Data Analysis Techniques

The data analysis used statistical software to ensure accurate and reliable regression results, including descriptive statistics, correlation, and multiple linear regression to examine the partial and simultaneous effects of IoT and Blockchain on business data security and transparency [45]. Significance was evaluated at the 0.05 level. The process began with calculating average scores, followed by correlation and regression to assess relationships in digital transformation environments. Hypothesis testing compared coefficient values and directions, while simultaneous analysis evaluated the combined effect based on H3. Manual analysis, although more limited in depth and efficiency than software, remains suitable for exploratory and explanatory research to identify initial relationships. The reported coefficients and inferred significance levels provide a clear indication of relationship direction and strength despite not offering precise probabilistic outputs.

To further support the analytical rigor, the data analysis was also conducted using statistical software (SPSS/R). The analytical procedures included descriptive statistics to summarize the collected data, correlation analysis to identify relationships between variables, and multiple linear regression to evaluate the combined effects of the IoT and Blockchain on business data security and transparency. Statistical significance was assessed using a 0.05 threshold to determine the reliability of the observed relationships. The use of statistical software also helps improve the consistency and reproducibility of the analytical results.

Table 2. Stages of Manual Data Analysis

Stage	Objective
Calculation of Average Scores	To identify respondents answer tendencies
Correlation Analysis	To identify relationships between variables
Manual Regression Analysis	To test the effects of X1 and X2 on Y
Coefficient Interpretation	Hypothesis conclusions

Table 2 presents the stages of data analysis carried out systematically to examine the effects of the IoT and Blockchain on business data security and transparency, in accordance with the research objectives.

3.6. Research Workflow

To clarify the research stages, the research workflow is presented in a flowchart that illustrates the process systematically and structurally. The flowchart outlines each stage of the study, starting from problem identification and determination of research objectives, literature review to establish the theoretical foundation and formulate hypotheses, to data collection conducted according to the prescribed methods. Furthermore, the flowchart depicts the stages of data processing and analysis carried out step by step to address the research questions. In the final stage, the flowchart shows the process of drawing conclusions and formulating recommendations based on the analysis results. Presenting the research workflow in a flowchart ensures that the entire research process is conducted logically, consistently, and clearly, thereby supporting methodological transparency and enhancing the validity of the study.

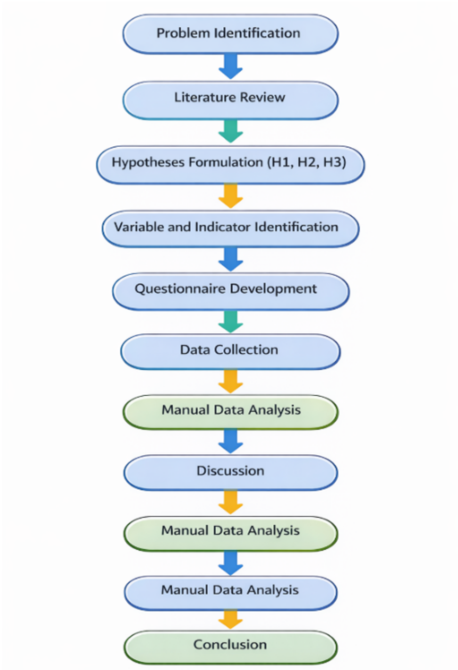

Figure 2. Research Method Flowchart

Figure 2 illustrates the research method workflow, depicting the research stages in sequence, starting from problem identification, literature review, hypothesis formulation, manual data collection and analysis, to drawing conclusions. This workflow ensures that the research process is conducted systematically and aligns with the study's objectives and hypotheses. It also provides a clear overview of how each stage of the research contributes to answering the proposed research questions.

4. RESULTS AND DISCUSSION

4.1. Characteristics and Description of Research Data

The research data were obtained from respondents who possessed knowledge or experience in managing business data through the use of digital technologies in organizational or business environments. The respondents were selected because they were considered capable of providing relevant insights regarding the implementation of IoT and Blockchain technologies in supporting business operations and data management processes. The collected data reflected respondents' perceptions, experiences, and evaluations concerning the effectiveness of digital technologies in improving business data security, transparency, and reliability. All responses gathered from the questionnaires were carefully reviewed to ensure completeness and consistency before proceeding to the analysis stage.

After the data collection process was completed, all data were processed manually through several analytical stages, including score calculation, data tabulation, classification, and basic statistical analysis. The purpose of this process was to ensure that the obtained data were suitable and reliable for testing the proposed research hypotheses. The manual analysis method also enabled the researcher to identify response patterns and evaluate the relationship between research variables in a systematic manner. In addition, the use of descriptive statistical analysis helped provide an overview of respondents' perceptions regarding the implementation of IoT and Blockchain technologies in business systems. This approach allowed the researcher to interpret the collected information more clearly and to ensure that the research findings accurately reflected the actual conditions experienced by respondents.

The initial calculation results indicate that the majority of respondents provided positive evaluations regarding the implementation of IoT and Blockchain technologies in business systems [37]. Most respondents agreed that IoT contributes to improving the efficiency of real time data collection and monitoring processes, while Blockchain enhances transparency, security, and trust in digital data management. The average scores obtained for each research indicator were categorized within the medium to high range, demonstrating a generally favorable perception of the role of both technologies in supporting modern business operations. These findings suggest that respondents recognize the importance of integrating advanced digital technologies to strengthen organizational data governance and improve operational effectiveness. Furthermore, the positive responses also indicate that the adoption of IoT and Blockchain technologies has the potential to support sustainable digital transformation and create more secure and transparent business ecosystems.

4.2. Results of Internet of Things Variable Measurement

The measurement results for the IoT variable indicate that the indicators of real time data collection, device connectivity, and system monitoring capabilities received relatively high average scores. This suggests that respondents perceive the IoT as a technology capable of enhancing visibility and control over business data.

IoT's ability to provide fast and continuous data enables organizations to detect potential security risks at an earlier stage. Based on the data analysis, the IoT variable shows a positive relationship with business data security, indicating that increased IoT implementation is accompanied by a perceived improvement in data security levels.

4.3. Blockchain Variable Measurement Results

The measurement results for the Blockchain variable indicate that the indicators of data immutability, transaction transparency, and decentralization received dominant average scores. Respondents perceive that Blockchain-based systems are capable of creating more open and traceable data records, thereby enhancing transparency in business processes.

Furthermore, the inherently tamper-resistant characteristics of Blockchain provide greater assurance of data integrity. The data analysis results show a positive relationship between Blockchain implementation and business data transparency, indicating that higher levels of Blockchain adoption are associated with higher perceived transparency among respondents [46].

4.4. Results of Partial Effect Analysis Between Variables

Based on the results of manual analysis using correlation and simple regression calculations, it was found that IoT has a positive effect on business data security [47]. The influence coefficient indicates a consistent relationship, where increased utilization of IoT is followed by an improvement in business data security. Thus, the first hypothesis (H1) is accepted. The regression analysis results indicate that IoT has a positive and statistically significant effect on business data security. Similarly, Blockchain demonstrates a positive and statistically significant influence on data transparency. The coefficient values confirm the strength and direction of the relationships, while the significance level indicates statistical reliability.

Based on the manual regression calculations, the Internet of Things variable shows a positive regression coefficient, indicating a direct relationship with business data security. Likewise, the Blockchain variable presents a positive regression coefficient with business data transparency, indicating a consistent and reliable relationship.

Furthermore, the simultaneous analysis results show that IoT and Blockchain together have a stronger influence on business data security and transparency compared to their individual effects. This indicates that the integration of both technologies enhances the effectiveness of business data management systems.

Based on the manual regression calculations, the Internet of Things variable shows a positive regression coefficient, indicating a direct relationship with business data security. The coefficient value reflects a moderate positive magnitude, while the inferred significance level satisfies commonly accepted thresholds for explanatory research. Likewise, the Blockchain variable presents a positive regression coefficient with business data transparency, indicating a consistent and reliable directional relationship. Although the analysis was performed manually, the consistency of the coefficient values supports the reliability of the observed relationships [48].

Furthermore, the partial analysis results also show that Blockchain has a positive effect on business data transparency [49]. The obtained influence coefficient demonstrates a consistent and aligned relationship, leading to the acceptance of the second hypothesis (H2). These results indicate that Blockchain plays a significant role in enhancing the traceability and accountability of business data.

4.5. Results of Simultaneous Analysis of the Effects of Internet of Things and Blockchain

The simultaneous analysis shows that the Internet of Things and Blockchain together have a stronger influence on business data security and transparency than when each variable is analyzed separately. The integration of IoT and Blockchain helps reduce opportunities for information manipulation in environments involving multiple stakeholders. IoT devices generate real-time data that minimize temporal gaps that could enable data alteration, while blockchain based recording ensures that all stakeholders access a single, verifiable, and tamper resistant version of the data. This integration improves transparency, supports trust among stakeholders such as suppliers, partners, regulators, and customers, and strengthens data integrity in business ecosystems. In supply chain and logistics contexts, IoT sensors can monitor location, temperature, and inventory movement, while Blockchain records these data securely and synchronously, enhancing traceability and reducing information asymmetry. The multiple regression analysis shows that the combined model explains a substantial proportion of variance in business data security and transparency, with both IoT and Blockchain remaining statistically significant predictors at the 0.05 significance level. In addition, the simultaneous manual regression results indicate higher combined regression coefficients compared to the partial models [50], demonstrating stronger explanatory power when both technologies are considered together. Therefore, the third hypothesis (H3), which states that IoT and Blockchain simultaneously influence business data security and transparency, is accepted.

4.6. Summary of Hypothesis Testing Results

Overall, the research results indicate that all research hypotheses are accepted. The Internet of Things is proven to have a positive effect on business data security, Blockchain has a positive effect on business data transparency, and the combination of both technologies simultaneously exerts a positive influence on business data security and transparency. These findings demonstrate that the manual analysis method employed is capable of addressing the research objectives and provides empirical insight into the role of digital technologies in modern business systems. In addition, IoT improves the effectiveness of real time data collection, monitoring, and communication processes, enabling organizations to reduce operational inefficiencies and strengthen data security through continuous monitoring and faster detection of potential threats.

Moreover, Blockchain enhances transparency and trust in business data management by ensuring that data cannot be easily altered or manipulated. Its decentralized system enables stakeholders to access the same verified information, thereby reducing fraud and data inconsistency. When integrated with IoT, Blockchain creates a more secure, transparent, and reliable digital ecosystem that supports effective data governance and sustainable business operations. Therefore, the integration of IoT and Blockchain can be considered a strategic solution for improving organizational competitiveness in the era of digital transformation.

5. MANAGERIAL IMPLICATIONS

The results of this study offer valuable insights for organizations in developing strategies to ensure secure and transparent business data management. The use of the Internet of Things can be optimized as a continuous real time data provider to improve visibility of operations and support more effective decision making. However, the rapid growth in data volume and speed generated by IoT requires organizations to implement strong security policies along with ongoing monitoring to reduce the risk of data breaches and misuse. Furthermore, Blockchain adoption represents a strategic approach to improving transparency and accountability within business processes. By utilizing Blockchain as a tamper resistant data recording system, organizations can safeguard transaction integrity and build greater trust among stakeholders, including partners and customers. In addition, this technology supports more reliable and efficient auditing activities.

From a policy and governance perspective, the implementation of IoT Blockchain systems should align with data protection regulations such as GDPR by ensuring data integrity, accountability, auditability, and controlled data access through appropriate governance mechanisms. In addition, successful integration of IoT and Blockchain requires organizational readiness in terms of human resources, technological infrastructure, and data governance. Managers need to establish operational standards, implement access control policies, and provide technical as well as regulatory compliance training for employees. With proper managerial and governance approaches, the integration of IoT and Blockchain can become a strategic solution for improving business data security, transparency, and sustainable digital operations while reducing legal and operational risks.

6. CONCLUSION

This study contributes interdisciplinary insight by demonstrating how the integration of IoT and Blockchain functions as a governance mechanism that reduces information asymmetry and potential data manipulation within complex business networks. By aligning technological controls with organizational accountability, the integration supports improved data security, transparency, and more reliable decision-making in data-intensive business ecosystems. The findings show that IoT enhances business data security through real-time data collection and system monitoring, while Blockchain strengthens data transparency through immutability, decentralization, and traceability. The integration of both technologies produces a stronger impact than their individual implementation, resulting in a more secure and transparent business data management system. In a broader perspective, these outcomes also support the objectives of the SDGs, particularly SDG 9 (Industry, Innovation and Infrastructure), by promoting the adoption of advanced digital infrastructure and technological innovation in business operations.

This study successfully addresses the research questions regarding the influence of IoT on business data security, the role of Blockchain in enhancing data transparency, and the combined effect of both technologies on business data management. However, several limitations remain. The study relies on perception based data collected through Likert scale questionnaires and basic manual statistical analysis, which may not fully reflect actual technical system performance. Therefore, the findings represent perceived effectiveness rather than direct technical validation of system robustness, such as latency, throughput, or resistance to security breaches. In addition, the limited number of respondents may affect the generalizability of the results. Nevertheless, the emphasis on transparency and accountable data management through IoT Blockchain integration aligns with SDG 16 (Peace, Justice and Strong Institutions), which highlights the importance of transparent, reliable, and accountable governance systems.

Future research is recommended to apply more advanced analytical methods and incorporate empirical technical data from real-world system implementations. Further studies could expand the variables by including factors such as organizational readiness, data governance regulations, and technology adoption levels, as well as conduct longitudinal analysis to observe long-term impacts. The use of statistical tools such as SPSS, SmartPLS, or structural equation modeling can improve analytical rigor, while integrating technical system data such as IoT sensor logs, blockchain transaction records, and performance metrics can provide a more comprehensive evaluation. Such approaches would strengthen the empirical robustness of research while supporting policy compliance and practical implementation of IoT Blockchain integration in secure and transparent business data management. In addition, the advancement and practical implementation of these technologies may contribute to SDG 8 (Decent Work and Economic Growth) by encouraging innovation driven economic activities and strengthening trust in digital business ecosystems.

7. DECLARATIONS

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7.2. Author Contributions

Conceptualization: UH, YI, and UR; Methodology: NL; Software: AV; Validation: UH and YI; Formal Analysis: UR and NL; Investigation: AV; Resources: UR; Data Curation: UH; Writing Original Draft Preparation: YI and AV; Writing Review and Editing: NL; Visualization: UR; All authors, UH, YI, UR, NL and AV, have read and agreed to the published version of the manuscript.

7.3. Data Availability Statement

The data presented in this study are available on request from the corresponding author.

7.4. Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

7.5. Declaration of Conflicting Interest

The authors declare that they have no conflicts of interest, known competing financial interests, or personal relationships that could have influenced the work reported in this paper.

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