

THE ROLE OF ACCOUNTING INFORMATION SYSTEMS AND BLOCKCHAIN IN IMPROVING PUBLIC SECTOR ACCOUNTABILITY IN INDONESIA

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Abstract

Accountability in public sector financial management is a central issue in promoting transparency and efficiency in governance, particularly at the regional and village levels. This study aims to analyze the role of Accounting Information Systems (AIS), blockchain technology, and e-Budgeting in strengthening public financial accountability in Indonesia. The method used is a qualitative literature review of eight relevant scientific documents and community service activities. The study results show that the implementation of an AIS (SIA) such as SISKEUDES (Village-Based Financial Information System) has been proven to improve the efficiency of village financial recording and reporting. Furthermore, e-Budgeting plays a crucial role in digital and transparent budget planning, while also opening up opportunities for public participation. Meanwhile, blockchain technology holds significant potential for creating a secure and tamper-proof real-time audit system, although its implementation still faces technical and regulatory hurdles. This study concludes that the synergy between SIA, e-Budgeting, and blockchain technology can create a more transparent, accountable, and technologically adaptive public financial governance ecosystem. Strengthening human resources, digital training, and integrated policy support are needed to optimize technology implementation in the Indonesian public sector.

Keywords: *Accounting Information System, e-Budgeting, Blockchain, Accountability, Village Finance, Transparency*

INTRODUCTION

In the digital era, the public sector in Indonesia faces increasing pressure to implement the principles of accountability, transparency, and efficiency in state financial management. The need for a fast, accurate, and accountable reporting system has prompted government agencies to adopt Accounting Information Systems (AIS) and begin exploring blockchain technology as part of public financial governance reforms (Mariana et al., 2025; Agustiningsih et al., 2025). AIS has been proven to support improved performance and efficiency in financial reporting, as demonstrated by the implementation of SISKEUDES in the management of Village Funds in Sari Makmur Village, which significantly contributed to the quality of village apparatus performance and village budget governance (Aprida & Arnova, 2025). Similar findings were also revealed by Agustiningsih et al. (2025), who stated that the use of digital accounting systems in the government sector has a direct impact on the timeliness and accuracy of financial reports.

Meanwhile, blockchain has emerged as a cutting-edge technological solution for real-time, manipulation-resistant public audits. This technology offers high transparency through permanent, decentralized transaction recording, as well as the potential to prevent fraud and improve government budget oversight (Parapat et al., 2025). However, its adoption in Indonesia still faces challenges such as fragmented IT systems, low human resource readiness, and the lack of an adequate regulatory framework (Parapat et al., 2025; Mariana et al., 2025). In practice, digital transformation in the public sector relies not only on technology but also on institutional readiness, changes in work culture, and cross-agency system integration (Rajagukguk et al., 2025). Human resource competitiveness is also key, as highlighted by Fauziyah et al. (2025), who emphasized the importance of practical training in supporting auditors' adaptation to modern audit

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technologies such as data analytics and AI. Therefore, this article aims to examine the strategic role of Accounting Information Systems and blockchain technology in improving public sector accountability in Indonesia, through a review of empirical studies and recent literature. The primary focus is on implementation challenges, the impact on financial reporting quality, and policy recommendations to support the success of digital reform in the public finance sector.

LITERATURE REVIEW

Accounting Information Systems in the Public Sector

An Accounting Information System (AIS) is a collection of human resources, procedures, and technology designed to process financial data into relevant information that can be used in decision-making. In the public sector, an AIS is a crucial instrument for supporting transparency, accountability, and efficiency in financial management (Sujarweni, in Aprida & Arnova, 2025). The implementation of AIS in village government, such as the use of the SISKEUDes application, has shown improvements in the quality of village apparatus performance and accelerated the planning, reporting, and budget accountability processes (Aprida & Arnova, 2025). Furthermore, AIS helps create more accurate, relevant, and timely financial reports, ultimately strengthening the integrity and public trust in government agencies (Agustiniingsih et al., 2025).

Blockchain Technology for Audit and Transparency

Blockchain technology offers a new approach to recording and reporting financial transactions, characterized by its decentralization, immutable nature, and transparency. In the public sector, blockchain enables real-time auditing, minimizing the risk of data manipulation and increasing public trust in state financial management (Parapat et al., 2025). A blockchain-based audit framework has the potential to support the implementation of International Public Sector Accounting Standards (IPSAS) by providing tamper-proof transaction evidence and facilitating cross-agency transaction tracking. However, the implementation of this technology faces various challenges, such as limited government digital infrastructure, the risk of cyberattacks (51% consensus attacks), and the lack of blockchain interoperability standards in the Indonesian public sector (Parapat et al., 2025).

Financial Accountability and Public Sector Reform

Accountability in the public sector is defined as the obligation of state administrators to answer and be accountable for the results of their activities to the public or authorized institutions (Rajagukguk et al., 2025). With the implementation of New Public Management (NPM), demands for accurate, performance-based financial reporting are increasing. Several studies have shown that government financial accountability can be improved through strengthening internal control systems and integrating digital technology into recording and reporting processes (Mariana et al., 2025). However, public sector reforms in Indonesia also face bureaucratic resistance, dual reporting between cash and accruals, and inadequate human resource preparedness.

The Role of HR and Technology Training in Digital Transformation

Digital transformation in the public sector cannot be effective without the support of adaptive human resources (HR) competent in the use of modern audit technology. Practical technology-based training, such as the use of analytical dashboards, data analytics, and blockchain, has been shown to improve auditors' work efficiency and professional competitiveness in the digital era (Fauziyah et al., 2025). Without continuous training and a shift in digital mindset, public accounting digitization efforts will face both technical and institutional obstacles (Rajagukguk et al., 2025). Therefore, human resource training and institutional modernization are key prerequisites for supporting technology-based public sector financial accountability.

RESEARCH METHODS

This research employs a qualitative approach with a literature review as the primary foundation for answering the problem formulation and achieving the study objectives. This approach was chosen because it is appropriate for exploring and synthesizing various perspectives, empirical study results, and relevant theories related to the application of Accounting Information Systems (AIS) and blockchain technology to improve public sector financial accountability in Indonesia. The data used in this study is secondary data, collected through document

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review, scientific journal articles, previous research findings, and relevant government regulations. The primary sources for this study are six selected scientific articles published in 2025, discussing:

1. Accounting Information System in Village Fund Management (Aprida & Arnova, 2025),
2. The impact of IT use on the quality of government financial reports (Agustiniingsih et al., 2025),
3. Digital transformation of public auditors (Fauziyah et al., 2025),
4. Accrual-based public sector accounting reform and IPSAS (Mariana et al., 2025; Rajagukguk et al., 2025),
5. Blockchain-based real-time audit framework in the public sector (Parapat et al., 2025).

Data analysis was conducted thematically and descriptively-qualitatively. Researchers identified key topics from each literature, such as the concept of accounting information systems, the potential of blockchain in public audits, financial accountability indicators, and the challenges of technology implementation in the public sector.

The analysis steps are carried out through:

1. Collection of literature from relevant sources (national and international journals),
2. Filtering and classification of content based on core themes and contribution to research objectives,
3. Synthesis of information, by comparing research results that are consistent or different,
4. Drawing conclusions that explain the relationship between information technology and increasing public sector accountability.

The literature used in this study was selected based on the following criteria:

1. Published in the last 10 years, with a focus on 2020–2025,
2. Relevant to the topics of accounting information systems, blockchain technology, public sector auditing, and financial accountability,
3. Have good scientific quality (nationally accredited journals, scientific proceedings, or indexed by SINTA/Scopus),
4. Derived from empirical studies, systematic literature studies, or case studies in the Indonesian context.

RESEARCH RESULTS AND DISCUSSION

Implementation of Accounting Information Systems (AIS) in the Public Sector

Accounting Information Systems (AIS) in the public sector are designed to support the recording, reporting, monitoring, and decision-making functions of government financial transactions. An AIS integrates information technology, accounting procedures, and internal controls to produce relevant, reliable, and auditable financial information. In the Indonesian context, the implementation of an AIS is also aimed at strengthening transparency, accountability, and efficiency in public budget use (Aprida & Arnova, 2025). The most concrete example of SIA implementation in the public sector is the use of the SISKEUDES (Village Financial System) application. A study conducted by Aprida & Arnova (2025) in Sari Makmur Village, Mukomuko Regency, showed that the implementation of SISKEUDES:

1. Facilitate the systematic preparation of the Village Budget,
2. Accelerate the process of financial reporting to the BPK and the inspectorate,
3. Improving village officials' understanding of budgetary responsibilities,
4. Strengthening transparency through easily accessible digital record-keeping.

Furthermore, training support from the Regional Development Planning Agency (DPMD) and village facilitators is key to the successful implementation of SIA at the village level. This finding is further supported by Nento & Anggita Zen, M (2025), who demonstrated the enthusiasm of village officials in understanding the basics of using a digital-based financial system and a desire to reduce reliance on manual record-keeping.

Findings from Julianti (2025) emphasize the importance of combining AIS and internal oversight in promoting regional financial accountability. The study shows that:

1. The existence of a good accounting system does not automatically guarantee accountability if it is not accompanied by an active monitoring system.
2. There is a positive relationship between the quality of AIS and internal control with the accountability of local government financial reports.
3. Compliance factors with procedures and regulations are important mediating variables in the effectiveness of SIA.

Thus, strengthening SIA needs to be accompanied by:

1. Standardization of data input procedures,
2. Separation of duties and transaction authorization,
3. System-based internal audit.

Despite its clear benefits, the implementation of SIA in the Indonesian public sector still faces several challenges, including:

Challenge	Explanation
Human Resources Capacity	Regional and village officials are still limited in their technical ability to operate AIS and read system-based accounting reports.
IT infrastructure	Not all villages or OPDs have adequate devices and networks to operate cloud-based or desktop applications.
Dependence on companion	At the village level, many processes are still carried out based on directions from facilitators, rather than the independent understanding of the apparatus.
Fragmentation of inter-agency systems	Central and regional financial information systems are often not integrated with each other.

Blockchain's Potential for Public Financial Auditing and Transparency

Blockchain is a distributed ledger-based technology with unique characteristics: transparency, immutability, decentralization, and real-time auditability. This technology has significant potential to revolutionize public sector financial reporting systems because it can create an information system that cannot be manipulated and can be accessed simultaneously by multiple stakeholders (Parapat et al., 2025). Blockchain allows every transaction to be recorded in an interconnected block, validated by network consensus. This creates an immutable audit trail that can be accessed at any time without unilateral modification. In the public sector, this is particularly relevant for monitoring the use of regional and village budgets and preventing corruption or manipulation of financial reporting data.

Parapat et al.'s (2025) research proposes a blockchain-based audit framework for the public sector, which includes:

1. Smart contract based transaction validation,
2. Real-time automated auditing,
3. Encrypted hash code based monitoring for each budget transaction.

This concept is considered to be able to strengthen the implementation of accrual-based accounting and support international reporting standards such as IPSAS, which emphasize transparency and traceability of information.

Despite its enormous potential, the level of understanding and readiness for blockchain implementation at the grassroots level remains very low, as revealed in a community service activity by Henro et al. (2025). In this activity, the team provided education and simulations of blockchain technology to village officials, particularly in the context of Village Fund management.

The results show that:

1. The majority of participants do not yet understand the basic concepts of blockchain, either technically or functionally.
2. There is enthusiasm about blockchain's potential to prevent misuse of funds and speed up reporting.
3. However, there is no adequate digital infrastructure, and the use of financial recording systems is still carried out semi-manually in many villages.

This PKM activity emphasizes that practical education and technical assistance are essential to bridge the gap between the potential of technology and the reality of its use in the local public sector. In addition to technical

understanding, Yanti (2025) emphasized that internal oversight and regulatory consistency also determine the effectiveness of accounting technology in creating accountability. Although blockchain promises total transparency, without support from:

1. Active supervision from the inspectorate,
2. Integration of information systems between institutions, and
3. Regulations that accommodate disruptive technologies,

In addition, the risk of cyberattacks such as 51% attacks, as well as the fragmentation of government digital systems (which currently operate independently), are structural obstacles to realizing blockchain as a standard for public sector financial oversight.

Implementation of E-Budgeting as a Digital Innovation for Village Financial Transparency

Digital transformation in public financial management is not only limited to accounting information systems or cutting-edge technologies such as blockchain, but also includes the adoption of e-Budgeting applications that function to compile, manage, and publish budgets digitally and openly. One form of e-Budgeting implementation at the village level is highlighted through community service activities by Nento & Anggita Zen. M (2025), who provided direct training to village officials in using a website-based e-Budgeting platform to improve Village Fund accountability.

e-Budgeting allows:

1. Structured, documented and digitalized budget preparation,
2. Reduction of budget manipulation or mark-up practices,
3. Increasing public access to budget information,
4. Increasing community involvement in development planning.

The training conducted in the PKM activity showed that the majority of village officials were enthusiastic about using technology that could simplify the budget planning process, as well as reduce dependence on physical files and Excel which had become the habit. In the training conducted by the service team, participants were introduced to a simple yet systematic e-Budgeting interface, starting from:

1. Input program activities and budget sources,
2. Scheduling of activity realization,
3. Output visualization of budget transparency reports and graphs.

However, some key challenges were also identified:

1. Digital literacy is still low, especially in operating computers and browsers,
2. Unlimited internet network in some villages,
3. There are no formal regulations or village regulations that require e-Budgeting to be implemented consistently.

Comparison of e-Budgeting and Accounting Information Systems (AIS) in Village Financial Management

Digital transformation in public sector financial management, particularly at the village level, can be achieved through various technological approaches. Two frequently used systems are e-Budgeting and Accounting Information Systems (AIS). While both aim to improve efficiency and accountability, they have distinct yet complementary functions, scopes, and characteristics.

1. e-Budgeting is a web-based system used to digitally compile, document, and publish budgets. Its primary focus is on initial budget planning and transparency.
2. An AIS is an information system that manages the recording, reporting, and control of existing financial processes. Its primary focus is on budget implementation and accountability.

In other words, e-Budgeting is closer to the ex-ante stage (before realization), while SIA operates at the ex-post stage (after budget realization). In practice, these two systems can and should be integrated to create a transparent, efficient, and accountable village financial cycle. e-Budgeting plays a role in opening up space for community participation, while the SIA ensures transaction traceability and accurate financial reporting. For example, the budget prepared through village e-Budgeting can directly become the initial input reference in SIA applications such as SISKEUDES, thereby avoiding duplication of work and increasing consistency between plans and realization.

Synergy of Technology and Human Resources as the Key to Accountability

The digitalization of public sector accounting depends not only on technology but also on the readiness of human resources (HR) and institutional change management. According to Fauziyah et al. (2025), practical digital-based training in Public Accounting Firms has been shown to improve work efficiency and auditor readiness to adopt new technologies. Meanwhile, Rajagukguk et al. (2025) stated that public sector accounting reform must be in line with strengthening a work culture that is adaptive to technological change. Challenges such as resistance to new systems, information system fragmentation, and limited human resource capacity still hamper the effective implementation of digital accounting. Furthermore, Mariana et al. (2025) emphasize the importance of support from policymakers and the existence of accrual-based public sector accounting regulations and IPSAS. Without regulations that encourage data transparency and system consistency, digital transformation will remain mere talk without optimal execution.

CONCLUSION AND SUGGESTIONS

This study shows that the implementation of Accounting Information Systems (AIS), blockchain technology, and e-Budgeting plays an important role in improving the accountability and transparency of public sector finances, especially at the village government level.

1. Accounting Information Systems (AIS) have proven effective in improving the efficiency of financial recording and reporting. Systems like SISKEUDes have positively impacted data accuracy, ease of auditing, and public trust in Village Fund management.
2. Blockchain technology offers significant potential for building an unmanipulated, real-time, and decentralized public financial oversight system. However, its implementation still faces challenges in terms of infrastructure, regulatory readiness, and technical understanding among public officials.
3. e-Budgeting, as a web-based budget preparation and publication system, serves to strengthen transparency at the budget planning stage. Training experiences at the village level have shown that e-Budgeting is more readily accepted as an initial entry point for digitalizing public finances, especially in the context of limited digital literacy.
4. A comparison of SIA and e-Budgeting shows that they have distinct yet complementary roles. E-Budgeting contributes to transparency in the planning stage (ex-ante), while SIA manages implementation and reporting (ex-post). Ideally, both should be integrated into a single, comprehensive and transparent financial governance cycle.

Based on the conclusions above, several recommendations that can be given to strengthen public sector accountability through technology are as follows:

1. Central and regional governments need to encourage integration between e-Budgeting and SIA into a comprehensive digital financial system, with synchronization between planning and realization data.
2. Ongoing training for village officials and public financial management agencies is essential, particularly regarding the use of applications, understanding public accounting concepts, and awareness of the importance of budget transparency.
3. Pilot projects for implementing blockchain audits can be initiated in specific sectors (e.g., grant funds, social assistance, or Village Funds) with clear regulatory support and robust security infrastructure.
4. Developing mandatory regulations for digital-based budget transparency, such as requiring the publication of budget plans and realizations through the e-Budgeting portal, to strengthen public participation and oversight.
5. Collaboration between academics, practitioners, and the government is crucial in developing digital financial governance models that are appropriate to the Indonesian context and adaptive to local dynamics.

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