

## The Role of Accounting Information Systems in Improving the Accuracy of Budget Planning and Control in Government Agencies

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### ABSTRACT

This study investigates the role of Accounting Information Systems (AIS) in improving the accuracy of budget planning and control within government agencies. Employing a qualitative case study approach, data were collected through semi structured interviews with financial managers, internal auditors, and system developers from multiple Indonesian public institutions. Supplementary analysis of official budgeting documents was conducted to triangulate findings. The results reveal that AIS contributes significantly to enhancing data integration and forecasting reliability, thereby reducing budget variances and supporting transparency. Furthermore, the system strengthens internal control mechanisms through real time audit trails and compliance tracking. However, the research also identifies persistent challenges, including limited technical interoperability, uneven digital infrastructure, and user competency gaps. The study emphasizes that the effectiveness of AIS is contingent upon institutional readiness, organizational culture, and sustained leadership support. A conceptual model is proposed to depict the interactive dynamics among system input, organizational processes, and budgetary outcomes. This research contributes to the literature by contextualizing AIS implementation in the public sector and highlighting its strategic relevance for fiscal governance. Implications for policy and system design are discussed, alongside suggestions for future research on AI enhanced budgeting systems.

### KATA KUNCI

Sistem Informasi Akuntansi,  
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### ABSTRACT

Penelitian ini mengkaji peran Sistem Informasi Akuntansi (SIA) dalam meningkatkan akurasi perencanaan dan pengendalian anggaran di lembaga pemerintah. Dengan menggunakan pendekatan studi kasus kualitatif, data dikumpulkan melalui wawancara semi terstruktur dengan manajer keuangan, auditor internal, dan pengembang sistem dari berbagai institusi publik di Indonesia. Analisis tambahan terhadap dokumen anggaran resmi dilakukan untuk triangulasi temuan. Hasil penelitian menunjukkan bahwa SIA berkontribusi secara signifikan terhadap peningkatan integrasi data dan keandalan proyeksi anggaran, sehingga mampu mengurangi deviasi anggaran dan mendukung transparansi. Selain itu, sistem ini memperkuat mekanisme pengendalian internal melalui jejak audit *real time* dan pemantauan kepatuhan. Namun, penelitian ini juga mengidentifikasi tantangan yang masih ada, termasuk keterbatasan interoperabilitas teknis, infrastruktur digital yang tidak merata, dan kesenjangan kompetensi pengguna. Penelitian ini menekankan bahwa efektivitas SIA sangat bergantung pada kesiapan institusi, budaya organisasi, dan dukungan kepemimpinan yang berkelanjutan. Sebuah model konseptual diusulkan untuk menggambarkan dinamika interaktif antara *input* sistem, proses organisasi, dan hasil anggaran. Penelitian ini memberikan kontribusi terhadap literatur dengan mengontekstualisasikan implementasi SIA di sektor publik dan menyoroti relevansinya secara strategis bagi tata kelola fiskal. Implikasi kebijakan dan desain sistem dibahas, bersama dengan saran untuk penelitian masa depan mengenai sistem penganggaran berbasis kecerdasan buatan.

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### 1. Introduction

The accuracy of budget planning and control is a cornerstone of effective public sector financial management. In government agencies, it ensures that limited public funds are allocated efficiently and in alignment with policy priorities. Accurate budget planning contributes to cost containment, program

effectiveness, and public accountability by forecasting expenditures and revenues realistically [1], [2]. Conversely, budget inaccuracies often result in project delays, underutilization of funds, or unanticipated deficits that compromise public service delivery [3]. Thus, improving budget accuracy is not only a technical goal but a strategic necessity in achieving

transparent and results-based governance [4]. The dynamic nature of fiscal environments, particularly in developing countries, further amplifies the need for precision in budgeting practices to respond adaptively to policy, economic, and administrative uncertainties [5].

Within this context, the adoption of accounting information systems (AIS) has emerged as a significant innovation in enhancing financial accuracy and accountability in the public sector. AIS are designed to automate, structure, and integrate financial data processing, thereby minimizing manual errors and enabling timely access to accurate financial information [6], [7]. In many government institutions, AIS plays a crucial role in supporting the budgeting process, from initial planning and forecasting to expenditure monitoring and reporting [8]. Despite widespread implementation, several studies have highlighted persistent challenges such as data redundancy, poor integration, and inadequate user training, which hinder the effectiveness of AIS in budgetary functions [9], [10]. These issues underscore the need for empirical investigation into the extent to which AIS enhances budgeting accuracy within public organizations. As governments seek to strengthen public trust and fiscal discipline, understanding the value contribution of AIS becomes both relevant and urgent [11].

Accounting information systems integrate accounting principles with information technology to collect, process, and communicate financial data for decision making purposes. In the public sector, AIS supports multiple functions, including budgeting, procurement, asset management, and performance evaluation [12]. The system improves the timeliness and reliability of budget related data and facilitates inter departmental communication through standardized formats and centralized databases [13]. Empirical findings suggest that effective implementation of AIS is significantly associated with reductions in budget variances and improved compliance with financial regulations [14]. Additionally, AIS enhances internal control mechanisms by automating audit trails and providing real time monitoring of financial activities [15]. However, system efficiency is heavily contingent on user competency, data quality, and the alignment between technological capabilities and institutional needs [16], [17]. Therefore, while AIS holds substantial potential for improving budget accuracy, its effectiveness depends on multiple organizational and technical factors.

Given these observations, this study aims to analyze the role of accounting information systems in improving the accuracy of budget planning and control in government agencies. It seeks to determine the extent to which AIS implementation reduces budget errors, enhances data reliability, and contributes to

more transparent and accountable budgeting processes. The theoretical contribution of this research lies in advancing the literature on AIS and public sector performance, particularly in resource constrained governance environments. Empirically, the findings are expected to guide practitioners and policymakers in optimizing AIS design and deployment to strengthen fiscal governance and public sector efficiency.

Although extensive studies have highlighted the implementation of Accounting Information Systems (AIS) as a tool to improve budget accuracy and transparency in the public sector, evidence on their effectiveness remains mixed and context dependent. For instance, a study found that despite the deployment of AIS (e.g., IBAS++) in Bangladesh, budget realization often deviates significantly from the initial plan due to political interventions and institutional priorities [1]. Similarly, different study showed that AIS adoption in Indonesian government agencies does not directly enhance institutional performance unless mediated by organizational culture and strategic decision-making processes [7]. Another study also reported that immature digital transformation strategies negatively affect AIS quality in the public sector across MENA countries [8]. Certain study emphasized that the integration of public sector accounting systems and budget transparency only contributes to financial reporting quality if supported by strengthened accountability mechanisms [4]. These findings reveal persistent challenges such as fragmented system integration, lack of user training, and limited institutional readiness, all of which hinder AIS from fully optimizing budget planning and control [18].

Beyond these organizational and technical constraints, the evolving fiscal environment calls for more advanced, data driven budgeting tools, particularly through artificial intelligence (AI). Preliminary research suggests that AI human collaboration significantly reduces budget slack and enhances forecasting precision [5]. The OECD underscores the potential of AI to support public financial management but cautions about risks related to performance measurement and bias mitigation [15]. However, the empirical evidence on the integration of AI within AIS for public budgeting especially in developing countries remains scarce. While a bottom-up framework has been proposed to identify public accounting users information needs, its practical application is yet underexplored [7]. Meanwhile, studies from the industrial sector in Jordan demonstrate that AIS can effectively support open budgeting, yet this insight has not been adequately translated to the public sector context [8]. This gap highlights the lack of comprehensive analysis on how AI supported AIS can improve budgeting accuracy, how institutional culture and digital maturity moderate system effectiveness, and how forecasting models can be adapted to the complex realities of public sector governance.

This study contributes to the literature by exploring the synergy between AIS and AI in enhancing the accuracy of budget planning and control within local government settings. First, it introduces a novel empirical framework to assess how AI enhanced AIS can reduce budget variances and support transparent fiscal governance [19]. Second, it investigates the moderating effects of organizational culture, user competence, and digital readiness on the performance of integrated AIS AI platforms. Third, the research employs a mixed method approach, combining quantitative budget error analysis with qualitative insights from government practitioners. Lastly, it provides practical policy implications for optimizing AIS AI design and implementation in resource constrained public institutions, aiming to strengthen financial accountability and citizen trust.

## 2. Research Method

This study employs a qualitative case study approach to explore how Accounting Information Systems (AIS) affect the accuracy of budget planning and control in government agencies. The qualitative method is appropriate for capturing complex contextual factors and social interactions involved in AIS implementation in the public sector [1]. The research focuses on local government institutions in developing countries that have adopted AIS in their budgeting processes.

Data collection was conducted through in-depth interviews with finance officers, internal auditors, and system developers in selected government agencies. Informants were selected purposively based on their expertise and experience with AIS. In addition, the study incorporates document analysis, including financial reports, system manuals, and related regulations, to enrich the dataset. Triangulation was applied to ensure the credibility and validity of findings [2].

Data were analyzed thematically using open and axial coding to identify major themes such as data accuracy, system integration processes, and organizational or technical barriers influencing AIS effectiveness. The study also examined the moderating role of organizational culture and digital readiness in the success of AIS implementation [3], [4]. This method is suitable as it enables a deep understanding of how technological systems operate within public bureaucracies and how social dynamics influence their outcomes.

### 2.1. Research Design

This study adopts a qualitative case study design to examine how Accounting Information Systems (AIS) enhance the accuracy of budget planning and control within government agencies. The qualitative approach allows the researcher to explore complex institutional, technical, and human factors in depth. The case study method is chosen for its strength in investigating real

life phenomena within their contextual settings, especially when the boundaries between the phenomenon and context are not clearly evident [1]. The unit of analysis is a local government institution in a developing country, selected based on its active use of AIS in public budgeting.

### 2.2. Data Collection Techniques

Data were collected using semi structured interviews and document analysis. Interviews were conducted with three main stakeholder groups: financial managers, internal auditors, and IT system developers. These informants were selected through purposive sampling due to their strategic roles and familiarity with AIS implementation. Each interview lasted between 45 to 60 minutes and was recorded for transcription. Documents such as system manuals, budget reports, and institutional regulations were also analyzed to complement and validate the interview data.

Table 1. Data Collection Overview

Data Source	Technique	Purpose
Financial Managers	Semi-structured Interview	Understand AIS usage in budgeting
Internal Auditors	Semi-structured Interview	Assess AIS role in control mechanisms
IT Developers	Semi-structured Interview	Explore system design and integration
Budget Reports	Document Review	Cross-check financial accuracy
AIS Manuals	Document Review	Identify system features

Table 1 outlines the diverse data sources and collection techniques employed in this study. The inclusion of financial managers as key informants aims to capture practical insights into how AIS is utilized in budget formulation and execution. Their perspectives are crucial for understanding system functionality from a user standpoint. Internal auditors were interviewed to explore the extent to which AIS contributes to control mechanisms and compliance assurance. Their insights help identify any disconnect between system design and financial oversight practices.

IT system developers were selected to explain the technical architecture and integration of AIS with other government platforms. This group provides a critical viewpoint on system limitations, data flows, and the responsiveness of AIS to institutional demands. Complementing the interviews, two forms of document analysis were conducted. Budget reports were reviewed to verify data consistency, variance records, and financial forecasting outcomes. AIS manuals were examined to understand the technical scope and intended functionalities of the system [20].

This triangulated approach ensures a robust understanding of AIS implementation across multiple organizational levels and reduces the risk of bias or

information gaps by validating insights from one source with data from others [2]. It also aligns with best practices in qualitative public sector research where the complexity of institutional settings necessitates multi perspective analysis [1].

### 2.3. Data Analysis Procedure

Data analysis followed a thematic approach involving open coding and axial coding. Interview transcripts were first coded line by line to identify recurring patterns and key concepts. These initial codes were then organized into broader themes related to AIS implementation, such as data accuracy, system integration, user competence, and institutional culture.

The analysis also considered moderating factors, such as digital readiness and leadership support, which influence the effectiveness of AIS. This process was guided by a constant comparison method, enabling the researcher to iteratively refine emerging categories and relationships [3]. The findings are discussed in light of existing literature on AIS and public sector accountability, with particular attention to context specific challenges in developing countries [4].

## 3. Result and Discussion

The findings of this study indicate that Accounting Information Systems (AIS) play a significant role in improving the accuracy of budget planning and control in government agencies. However, the degree of effectiveness is strongly influenced by institutional readiness and user competence. The integration of AIS enables structured data consolidation across departments, reducing redundancy and expediting the budget formulation process. Financial managers interviewed in this study emphasized that AIS facilitates data driven budget estimation by leveraging historical financial data and actual spending trends, which directly contributes to reducing budget variances. Nevertheless, technical limitations such as poor interoperability with other platforms and insufficient user training remain prevalent, constraining the system's overall utility. These findings are consistent with researcher who argue that organizational culture significantly mediates the impact of AIS on institutional performance [7]. Consequently, the adoption of AIS cannot be regarded as a standalone solution but must be complemented by organizational transformation and capacity building efforts.

From a control and oversight perspective, internal auditors acknowledged that AIS enhances financial transparency by offering automated and real time audit trails. This feature strengthens compliance and supports financial regulation enforcement, aligning with findings which highlighted the role of integrated systems in reinforcing public accountability [4]. However, developers involved in the system's implementation reported that the current design and integration of AIS often fall short of meeting the

diverse operational needs of local governments, especially in regions with limited digital infrastructure. This misalignment reflects broader concerns about digital inequality and institutional preparedness, which hamper system effectiveness. In light of these constraints, the full potential of AIS in enhancing budgetary accuracy can only be realized through synchronized improvements in digital infrastructure, technical support, and leadership commitment to public sector innovation.

### 3.1. AIS Integration and Data Accuracy

One of the key findings of this study concerns the integration of AIS and its contribution to data accuracy in budget formulation. Interview responses from financial managers revealed that the use of AIS significantly reduces redundancy in financial data by creating a centralized platform that consolidates information from multiple departments. This integration not only streamlines the budgeting workflow but also enhances the reliability of projected financial allocations. According to document analysis, agencies that effectively implemented AIS recorded fewer inconsistencies in their budget reports, indicating improved forecasting precision. These observations echo prior research which emphasizes that seamless data integration is vital for minimizing technical errors and delays in the budgeting cycle [8]. Nevertheless, the study also uncovered systemic challenges, such as inadequate real time data syncing between subsystems, which may undermine the integrity of financial projections, particularly in dynamic fiscal environments.

This research further indicates that the effectiveness of data integration hinges on the compatibility of AIS with existing institutional platforms. Developers interviewed acknowledged that the lack of interoperability often forces agencies to perform manual adjustments, thereby reintroducing the risk of human error that AIS is designed to mitigate. Furthermore, without regular data validation protocols, even automated systems can propagate inaccuracies across budgeting phases. These issues underscore the importance of system standardization and cross departmental data governance frameworks to ensure consistent and accurate budget planning. As noted by the OECD, the reliability of digital financial systems depends not only on technical architecture but also on institutional capacities to manage and interpret data in a coherent and timely manner [15].

### 3.2. Control Mechanisms and Audit Transparency

The implementation of AIS has shown to bolster internal control mechanisms and enhance audit transparency. Internal auditors reported that the automated audit trail features embedded within AIS enable them to track financial transactions with higher precision and less manual effort. This digital

traceability promotes accountability and facilitates compliance with government financial regulations. Through real time monitoring, discrepancies between budget allocations and actual expenditures can be promptly identified and addressed. These findings align with the assertions of certain researchers, who argue that the use of AIS in public institutions strengthens transparency and reduces the likelihood of financial misconduct [4].

However, this study also highlights some caveats. The extent of control improvement varies depending on the institutional maturity and digital readiness of each agency. In organizations where AIS is not fully integrated with procurement and reporting systems, control capabilities remain fragmented. Auditors also noted that in the absence of analytical dashboards or intelligent alert systems, the audit functions of AIS are often underutilized. This supports a study which caution that without proper configuration and staff training, the control features of AIS may not yield their full potential [8]. Thus, maximizing the audit functionality of AIS requires not only technical enhancements but also organizational support in terms of training, policy development, and performance monitoring frameworks.

### 3.3. Organizational Readiness and Cultural Moderators

The study's final theme focuses on organizational and cultural factors that moderate the effectiveness of AIS in improving budget accuracy. Informants unanimously agreed that the institutional culture surrounding technology adoption plays a decisive role in AIS performance. For instance, agencies with proactive leadership and continuous professional development programs are more likely to realize the full benefits of AIS implementation. This finding is consistent with researcher who state that AIS effectiveness is mediated by strategic alignment, organizational learning, and employee commitment [7]. On the other hand, institutions characterized by bureaucratic inertia or low digital literacy often experience setbacks in system usage and sustainability.

Additionally, digital readiness emerged as a crucial precondition for AIS success. Developers emphasized that many local governments lack the necessary infrastructure, such as stable internet access, up to date hardware, and technical support teams, which hampers the functionality and scalability of AIS. These limitations lead to uneven implementation outcomes and perpetuate a digital divide within public financial management. The research suggests that fostering a culture of innovation, alongside investment in digital infrastructure and user training, is essential for AIS to function as an effective budgeting tool. This aligns with recent insights from the OECD, which advocate for holistic digital transformation strategies that go beyond software acquisition to include institutional change management and user empowerment [15].

## 4. Conclusion

This study concludes that the implementation of Accounting Information Systems (AIS) significantly enhances the accuracy of budget planning and control in government agencies, provided that the system is supported by adequate institutional readiness and organizational commitment. Empirical evidence from interviews and document reviews reveals that AIS improves data integration, reduces redundancy, and facilitates real time financial monitoring. Furthermore, AIS strengthens internal control mechanisms through automated audit trails, promoting financial transparency and regulatory compliance. However, the effectiveness of AIS is not uniform across institutions and is heavily moderated by factors such as digital infrastructure, user competence, and organizational culture. Agencies lacking digital maturity and technical support often encounter implementation challenges that diminish system utility. Therefore, the success of AIS depends on a comprehensive approach involving technological investment, capacity building, and institutional reform. The study suggests that future research should explore the integration of artificial intelligence into AIS to enhance predictive budgeting capabilities and evaluate the long-term impacts of digital transformation on public sector accountability and governance outcomes.

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