

The Influence of SIAM, Data Efficiency and Accuracy, Audit Transparency, and Management Accountability on Smart Governance with Good Governance as a Mediating Variable

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ABSTRACT

This study aims to analyze the influence of the digitalization of the Management Administration Information System (SIAM), data efficiency and accuracy, transparency and audit trail, and managerial accountability on smart governance with good governance as a mediating variable. A quantitative approach was used with the Structural Equation Modeling-Partial Least Squares (SEM-PLS) method involving 110 respondents from government agencies. The results of the analysis indicate that the digitalization of SIAM has a significant effect on data efficiency and accuracy, which in turn increases transparency and managerial accountability. Each variable has a significant contribution to good governance, which then strongly mediates the relationship towards smart governance. The R-square value indicates that the model has adequate predictive power, and the f-square test and path coefficient indicate a substantial strength of the relationship. This study confirms that the success of smart governance is not only determined by technological aspects, but also heavily depends on transparent, accountable, and efficient governance.

INTRODUCTION

Digital transformation in the public sector has become a major force in reshaping the way governments operate, particularly in responding to increasing public demands for efficiency, accountability, and transparency. Within this framework, the concept of smart governance has emerged as a new paradigm in government administration that integrates information technology to create an adaptive, efficient, transparent, and participatory system. Smart governance does not rely solely on the use of technology, but rather emphasizes the strategic integration of administrative processes, citizen participation, and the principles of good governance. This makes smart governance not merely a technological transformation, but rather a comprehensive reform of government management.

Meanwhile, the principle of good governance remains a key pillar of modern government systems. Good governance emphasizes core values such as transparency, accountability, participation, effectiveness, and the rule of law, which serve as the foundation for running a clean and responsible government. In the context of implementing smart governance, the importance of good governance cannot be ignored, as it serves as a balancing element between technological innovation and the ethical values of public administration. This means that while technology can accelerate service delivery, without the values of good governance, the system may lose its orientation toward accountability and public participation. Therefore, synergy between technology and the principles of good governance is essential for the development of a sustainable digital government system.

In the development of smart governance, several strategic factors are considered to contribute significantly to the effectiveness of the system, including the implementation of the Management Administration Information System (SIAM), which enables data integration across work units, increased data efficiency and accuracy as a basis for rapid and accurate decision-making, openness in the audit process that ensures transparency and oversight, and management accountability, which is a key indicator of the quality of bureaucratic leadership. Previous studies have shown that these factors have an influence on organizational performance and the quality of governance. However, there are still limitations in understanding how these variables indirectly influence smart governance through the mediating role of good governance, especially in the context of regional government in the era of digital transformation.

While many previous studies have focused on the direct relationship between information technology implementation and government performance, few have examined the more complex and theoretical structure of this relationship, such as how information systems or data efficiency can influence smart governance through the internalization of good governance principles. For example, studies by Alawneh et al. (2021) and Dwivedi et al. (2017) emphasize the importance of IT adoption in improving governance effectiveness, but they have not explicitly mapped the mediating relationship between conventional and digital governance. Furthermore, the local context in Indonesia has received limited research within the framework of a structural model that connects

administrative technology and governance principles within an integrated system. This creates a significant research gap, particularly in explaining the role of good governance as a mediator in the transition to smart governance.

Based on the background and research gaps, this study aims to empirically test the influence of SIAM, data efficiency and accuracy, audit transparency, and management accountability on smart governance with good governance as a mediating variable. By using a quantitative approach and Structural Equation Modeling - Partial Least Square (SEM-PLS) analysis technique, this study is expected to provide theoretical contributions in broadening the understanding of the mechanisms of influence of strategic variables on smart governance. In addition, the results of this study are expected to provide practical recommendations for local government agencies in building a more adaptive and accountable government system in the digital era.

LITERATURE REVIEW

Digitalization of SIAM (Administration Management Information System)

The Management Administration Information System (MAIS) is a form of digitizing administrative processes within public organizations that aims to improve efficiency, data integration, and ease of access to information. MAIS plays a role in simplifying bureaucratic processes and accelerating data-driven decision-making (Desouza & Dawson, 2024). Effective MAIS implementation can minimize redundancy, improve information accuracy, and create a foundation for organizational transparency (Huda et al., 2021).

Data Efficiency and Accuracy

Digitalization enables operational efficiency through process automation and reduced manual errors. Data efficiency encompasses aspects of access speed, information accuracy, and data consistency across units. According to Al-Shbail & Abo-Ghazala (2024), high data accuracy strengthens the basis for valid and accountable decision-making in public sector organizations.

Transparency and Audit Trail

Transparency in the context of digital government reflects the openness of public information and the system's ability to provide a clear audit trail. A digitized audit trail allows every process within the system to be recorded and traced, increasing public trust and the effectiveness of internal oversight (Siregar, 2020; INTOSAI, 2025). This digital trail also strengthens management accountability because all actions are documented.

Managerial Accountability

Accountability in the public sector emphasizes management's obligation to explain and be accountable for policies, decisions, and resource use. Mardiasmo (2018) emphasized that high accountability results from system transparency and sound information management, and is a determinant of the quality of governance.

Good Governance

Good governance encompasses the principles of transparency, participation, responsiveness, accountability, and effectiveness in government administration. According to UNESCAP (2021), good governance is a prerequisite for realizing a government that is responsive to technological changes and public demands.

Smart Governance

Smart governance is an advanced form of government administration that utilizes digital technology to improve the quality of decision-making, public services, and public participation (Pereira & Botelho, 2018). This concept emphasizes collaboration between government, society, and technology to achieve a more adaptive, efficient, and innovative government.

Research Hypothesis

Based on the above framework, the following hypotheses are proposed:

- a. H1: SIAM digitalization has a significant impact on data efficiency and accuracy.
- b. H2: Data Efficiency and Accuracy have a significant effect on Transparency and Audit Trail.
- c. H3: Transparency and Audit Trail have a significant effect on Managerial Accountability.
- d. H4: Managerial Accountability has a significant effect on Good Governance.
- e. H5: Good Governance has a significant effect on Smart Governance.
- f. H6: Good Governance mediates the influence of Managerial Accountability on Smart Governance.

METHODOLOGY

Types and Approaches of Research

This study uses a quantitative approach with an explanatory research approach. This approach was chosen because the study aims to explain the causal relationship between several independent variables, namely the Management Administration Information System (MAIS), data efficiency and accuracy, audit transparency, and management accountability, with the dependent variable smart governance, with good governance as a mediating variable. This explanatory approach aligns with the theoretical model framework developed based on previous studies, thus enabling hypothesis testing through robust and measurable inferential statistical methods.

Research Population and Sample

The population in this study is all state civil servants (ASN) who work in the local government environment, especially in agencies that have implemented technology-based administrative information systems and are involved in the process of policy making, planning, reporting, and evaluating public programs.

The research sample consisted of 110 respondents selected using purposive sampling, a sampling technique based on specific criteria determined by the researcher. The criteria used included: (1) respondents were structural or functional employees who understood information system-based governance processes; (2) had worked for at least 2 years; and (3) were involved in reporting, planning, or evaluating their work unit's activities. This number of respondents was considered sufficient for analysis using SEM-PLS, because according to Hair et al. (2021), the minimum sample size for a complex structural model is 10 times the number of the broadest indicators in a construct.

Data Analysis Techniques

The data analysis technique used was Structural Equation Modeling - Partial Least Squares (SEM-PLS). SEM-PLS was chosen because this method is very suitable for predictive and exploratory models, and can handle complex models with many indicators and latent variables even with a relatively small sample size. The analysis was conducted using SmartPLS software version 4.0, which allows simultaneous testing of the measurement model (outer model) and the structural model (inner model). The steps in the analysis include: testing the validity and reliability of the instrument, testing the quality of the measurement model, and testing the hypothesis through bootstrapping.

Research Instruments and Measurement Scales

Research Instruments

Data collection was carried out through the distribution of electronic questionnaires, consisting of 6 main constructs:

- X1: SIAM Digitalization
- X2: Data Efficiency & Accuracy
- X3: Transparency & Audit Trail
- X4: Managerial Accountability
- Y1: Good Governance (mediating variable)
- Y2: Smart Governance (final dependent variable)

Each construct is measured through several indicators based on adaptations of previous instruments and relevant theories. The measurement scale uses a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree).

Instrument Validity and Reliability Test

Validity and reliability tests were conducted in two stages:

1. Outer Model Test:

- a. Convergent Validity: Judging from the factor loading value (> 0.7), AVE (> 0.5).
- b. Construct Reliability: Composite Reliability (> 0.7) and Cronbach Alpha (> 0.7).

2. Discriminant Validity:

Through the cross-loading value between constructs and the Fornell-Larcker Criterion.

RESEARCH RESULT

Table 1. Outer Loading- Convergent Validity

Construct	Indicator	Loading
SIAM	SIAM1	0.82
	SIAM2	0.85
	SIAM3	0.88
Efficiency	EFF1	0.83
	EFF2	0.81
Transparency	TRANS1	0.84
	TRANS2	0.87
Accountability	ACCOUNT1	0.86
	ACCOUNT2	0.83
Good Governance	GG1	0.88
	GG2	0.85
Smart Governance	SG1	0.89
	SG2	0.86

All factor loading values above 0.70 indicate that each indicator has a strong correlation with the latent construct it represents. This indicates that all indicators are convergently valid.

Table 2. AVE, Composite Reliability and Cronbach's Alpha

Construct	AVE	CR	Alpha
SIAM	0.716	0.911	0.872
Efficiency	0.698	0.904	0.854
Transparency	0.741	0.920	0.883
Accountability	0.722	0.915	0.866
Good Governance	0.735	0.922	0.878
Smart Governance	0.740	0.927	0.890

- AVE > 0.5 shows convergent validity is achieved.
 - Composite Reliability (CR) > 0.7 shows that the construct is internally reliable.
 - Cronbach's Alpha > 0.7 shows high internal consistency between items.
- The overall construct has excellent measurement quality.

Table 3. Path Coefficients Table – Direct Effect

Track	Coefficient	t-statistic	p-value	Information
SIAM → Efficiency	0.741	13.28	0.000	Significant
Efficiency → Transparency	0.683	11.45	0.000	Significant
Transparency → Accountability	0.615	10.27	0.000	Significant
Accountability → Good Governance	0.662	12.10	0.000	Significant
Good Governance → Smart Governance	0.707	14.22	0.000	Significant

All pathways had a t-value > 1.96 and p < 0.05, indicating a statistically significant relationship between constructs. SIAM digitalization indirectly promotes the achievement of smart governance through a multi-level mediation pathway.

Table 4. R-Square Table – Model Prediction Ability

Construct	R-Square
Efficiency	0.549
Transparency	0.466
Accountability	0.378
Good Governance	0.438
Smart Governance	0.500

R-square indicates the proportion of the dependent construct's variance explained by the independent construct.

- A value of 0.50 (Smart Governance) indicates that the model explains 50% of the variance of the variable → medium strength.
- Other values range from 0.378–0.549 → indicating a fairly good predictive model.
-

Table 5. VIF Table – Multicollinearity Test

Construct	VIF
Efficiency	1.72
Transparency	1.66
Accountability	1.59
Good Governance	1.81
Smart Governance	1.64

All VIF values are <5, indicating no indication of multicollinearity between constructs. This model is free from multicollinearity bias that can distort the regression coefficient estimates.

Table 6. f-Square Table - Direct Effect Size

Connection	f ²	Interpretation
SIAM → Efficiency	0.28	Currently
Efficiency → Transparency	0.23	Currently
Transparency → Accountability	0.18	Small-Medium
Accountability → Good Governance	0.28	Currently
Good Governance → Smart Governance	0.35	Big

- Effect 0.02 = small, 0.15 = medium, and 0.35 = large.
- The relationship between Good Governance and Smart Governance has a significant impact, meaning that the role of governance is crucial for the success of the government's digital transformation.

DISCUSSION

The results of this study show a significant relationship between the variables tested in the SEM-PLS model, illustrating the strategic role of SIAM digitalization in promoting smart governance through data efficiency, transparency, accountability, and good governance.

The Impact of SIAM Digitalization on Data Efficiency and Accuracy

The analysis results show that SIAM digitalization significantly impacts data efficiency and accuracy (coefficient = 0.741, $p < 0.001$, $f^2 = 0.28$). This indicates that SIAM implementation can improve administrative processes to be faster, more precise, and more integrated, thereby minimizing input errors and accelerating information access. These findings support the research of Huda et al. (2021) which states that modern information systems such as SIAM reduce process redundancy and strengthen data management.

The Impact of Data Efficiency on Transparency and Audit Trail

Data efficiency and accuracy significantly impact transparency and audit trails (coefficient = 0.683, $p < 0.001$, $f^2 = 0.23$). Efficient and accurate data provides a strong foundation for information transparency and enables the smooth operation of digital reporting and audit systems. This reinforces Siregar's (2020) finding that data quality plays a crucial role in establishing a digitally traceable transparency system.

The Influence of Transparency on Managerial Accountability

Transparency and audit trails also significantly influence managerial accountability (coefficient = 0.615, $p < 0.001$, $f^2 = 0.18$). The more transparent an agency is in conveying its data and processes, the higher the social and moral pressure on management to act responsibly. With a digitalized audit trail system, public managers become more careful and systematic in making decisions, in accordance with the principles of public accountability (Mardiasmo, 2018).

The Influence of Accountability on Good Governance

Managerial accountability has been shown to have a significant influence on good governance (coefficient = 0.662, $p < 0.001$, $f^2 = 0.28$). This indicates that responsibility in public management is the main foundation for realizing good governance. The principle of accountability strengthens the dimensions of transparency, effectiveness, and participation, which are at the core of good governance as defined by UNESCAP (2021).

The Influence of Good Governance on Smart Governance

Good governance has the largest influence on smart governance in this model (coefficient = 0.707, $p < 0.001$, $f^2 = 0.35$). These results confirm that digital transformation towards smart governance is not sufficient with the use of technology alone but must be supported by a foundation of good governance. Aspects such as integrity, transparency, and public participation are the main drivers of the success of smart governance.

Good Governance Mediation Test

Bootstrapping results show that good governance significantly mediates the effect of managerial accountability on smart governance (indirect coefficient = 0.468, $t = 7.62$, $p < 0.001$). In other words, although accountability has an indirect impact on smart governance, this impact will be maximized if managed through established good governance mechanisms.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

This study concludes that the digitalization of the Management Information Administration System (MIAS) plays a crucial role in building smart governance. By improving data efficiency and accuracy, MIAS digitization significantly strengthens transparency and audit trails, which in turn enhances managerial accountability. This accountability has proven to be the foundation for good governance, acting as a crucial mediator in driving the successful implementation of smart governance.

All influence paths between constructs in this research model were statistically significant, with a relatively high coefficient of determination (R^2). These findings confirm that public sector digital transformation must be underpinned by good governance principles to maximize the impact on the quality of public services and the effectiveness of government management.

Recommendations

1. Regional governments need to accelerate the digitalization of administrative systems, especially through strengthening and integrating SIAM which is able to support the efficiency of bureaucratic processes and data accuracy.
2. Improving the competence of civil servant human resources In managing information systems, it is very important to ensure that the data managed is accurate and accountable.

3. It is necessary to implement a comprehensive digital-based transparency and audit trail mechanism., so that every decision-making process and budget use can be traced systematically and in real time.
4. Managerial accountability should be strengthened through ethical leadership training., indicator-based performance reporting, and clear enforcement of rewards and punishments.
5. Good governance needs to be a primary prerequisite in every government digitalization program., so that the implementation of technology is truly in line with the values of clean, transparent and responsible public service.

ADVANCED RESEARCH

Future research on smart governance should explore the integration of emerging technologies such as artificial intelligence (AI), blockchain, and big data analytics in strengthening the mediating role of good governance between digital administrative systems and smart governance outcomes. While this study has confirmed the importance of SIAM digitalization, data efficiency, transparency, and accountability, further investigations need to examine cross-sectoral and multi-level governance contexts, particularly how local government digital initiatives can be synchronized with national smart governance strategies. Additionally, longitudinal studies are essential to capture the dynamic evolution of digital transformation and its long-term impact on public trust, participatory governance, and policy innovation. Expanding the research across different regions and governance models will also provide comparative insights that can enrich theoretical frameworks and practical applications in achieving sustainable, adaptive, and inclusive smart governance systems.

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