Driving Efficiency and Accountability: Digitalization's Impact on Government Investment in North Sulawesi

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Info Article

Abstract

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This study examines the role of digitalization in public procurement governance and its impact on enhancing the effectiveness of government investment in North Sulawesi. Employing a quantitative approach, this research utilizes secondary data from government reports, policy documents, and academic journals to assess the relationship between digital procurement systems and investment efficiency. The findings reveal a significant positive correlation between the implementation of digitalization and improved government investment effectiveness. Specifically, digital procurement enhances transparency, efficiency, and accountability, leading to better budget management and optimized public fund utilization. However, the study also identifies critical challenges, including limited infrastructure and insufficient human resource capacity, which hinder the full realization of digitalization benefits. To fully leverage digital procurement, policymakers must prioritize investments in technological infrastructure, strengthen institutional capacity, and provide targeted training programs for procurement personnel. This study contributes to the growing discourse on digital transformation in public sector governance and offers practical policy recommendations to enhance investment effectiveness through digital solutions.

Introduction

Digitalization has emerged as a key driver in modernizing the public sector across various countries. Advances in information and communication technology (ICT) have significantly enhanced transparency, efficiency, and accountability in governance. Among the most impacted areas is the procurement of public goods and services, where digital transformation plays a crucial role in mitigating corruption, increasing operational efficiency, and optimizing budget allocation. In Indonesia, the adoption of digitalization in government investment is evident through implementing an e-procurement system designed to address the limitations of conventional procurement practices, which are often prone to inefficiencies and irregularities (Den Butter & Linse, 2008). However, despite the promising benefits of digitalization, its implementation at the local government level continues to face significant challenges.

North Sulawesi, a province with substantial economic potential in the tourism and infrastructure sectors, presents a unique case for analyzing the impact of digitalization on government investment. Several barriers hinder the seamless adoption of digital procurement systems, including technical limitations, inadequate policy frameworks, and limited human resource capacity (Periansya et al., 2023). According to data from the Central Statistics Agency (BPS), capital expenditure realization in North Sulawesi in 2022 reached only 75% of the targeted budget, highlighting structural inefficiencies in budget execution (BPS, 2023). Furthermore, data from the Procurement General Plan Information System (SiRUP) as of February 13, 2024, indicate that potential government procurement for micro, small, and medium enterprises (MSMEs) amounted to IDR 251.1 trillion. However, by February 2, 2024, actual realization had only reached IDR 24.6 trillion out of a target of IDR 209.86 trillion. This disparity underscores the underutilized opportunities in government investment optimization through digitalization.

While digitalization in public procurement has been widely discussed in prior studies, this research contributes to the state of the art by providing a localized analysis of digital procurement implementation in North Sulawesi. Existing research, such as Engel et al. (2023), has primarily focused on cost efficiency through digitalization. However, this study extends the discussion by incorporating a broader strategic perspective, including investment attractiveness, budget optimization, and institutional adaptability. This research also emphasizes the socio-economic and administrative challenges in implementing digital governance mechanisms locally, particularly in a developing region. Furthermore, while studies such as Yuliawati et al. (2021) have demonstrated the efficiency gains from digitalization, they have predominantly relied on quantitative approaches that assess digital procurement through numerical indicators. This study fills a critical gap by adopting a qualitative approach that explores the underlying institutional, cultural, and policy-related challenges that hinder digital adoption in North Sulawesi. Additionally, despite the increasing research on digital governance, there remains a lack of studies investigating how digitalization enhances government investment effectiveness in regions with infrastructural and technological limitations. This study aims to bridge that gap by providing empirical insights from North Sulawesi's public sector.

Theoretically, this study contributes to the discourse on institutional theory, particularly aligning with Scott's (2020) perspective that technological innovation in public administration requires structural and cultural adaptation to maximize outcomes. Additionally, this research integrates Vroom's (1964) Expectancy Theory, which suggests that technological adaptation can enhance organizational motivation and performance in achieving strategic objectives. By situating digitalization within these theoretical frameworks, this study provides a nuanced understanding of how government investment can be optimized through technology-driven governance mechanisms. From a practical standpoint, the findings of this research offer valuable insights for policymakers in North Sulawesi. To accelerate digital transformation in public procurement, local governments must enhance human capital capacity, invest in robust digital infrastructure, and develop adaptive regulatory frameworks that accommodate regional complexities. Additionally, this research extends the literature on public sector digitalization by incorporating a localized perspective on its implementation challenges and strategic implications for investment governance. By contextualizing

digitalization within North Sulawesi's socio-economic and administrative realities, this study provides actionable recommendations to improve procurement efficiency, increase investment competitiveness, and support the region's sustainable development agenda.

In conclusion, digitalization presents transformative potential for enhancing governance in public goods procurement, yet its implementation necessitates a holistic and context-sensitive approach. This study aims to bridge the knowledge gap by investigating how digitalization can improve government investment effectiveness in underdeveloped regions. This research is expected to contribute significantly to academic discourse and practical policymaking by focusing on challenges and opportunities, thereby supporting Indonesia's broader vision for sustainable and accountable public sector development.

Literature Review

Hypothesis Development
The rapid advancement of digital technology has transformed the governance of public sector procurement, influencing its efficiency, transparency, and overall effectiveness. Digitalization in public procurement governance is expected to enhance government investment effectiveness by streamlining administrative processes, reducing corruption, and increasing accountability. Several prior studies have examined the relationship between digitalization and governance efficiency, providing the theoretical foundation for this study's hypotheses.

Scott's (2020) institutional theory explains how technological adoption in public institutions necessitates structural and cultural adjustments to maximize its potential benefits. Institutional theory suggests that organizations must align their structures and practices with external expectations, including technological changes, to maintain legitimacy and efficiency. Meanwhile, Vroom's (1964) Expectancy Theory suggests that technology-driven governance improvements enhance organizational performance by increasing efficiency and accountability. In the context of public sector procurement, the expectation that digital systems will improve procurement performance can motivate government agencies to adopt and integrate digital solutions. These theories provide a strong foundation for the argument that digitalization can significantly improve government investment effectiveness by refining procurement processes and ensuring better resource allocation.

Existing literature supports the claim that digital transformation in public sector procurement leads to improved investment effectiveness. Bayrashev (2024) highlights that effectiveness in government investment is determined by how well procurement systems are managed, while Nemec et al. (2007) argue that digital governance mechanisms lead to enhanced budget efficiency, procurement speed, and public trust. Studies have also shown that integrating digital technologies reduces bureaucratic delays and enhances real-time decision-making capabilities, ensuring optimal resource allocation. Yuliawati et al. (2021) demonstrate that digitalization significantly reduces the risks of financial mismanagement and corruption, improving public confidence in procurement decisions. Kosmuratov (2020) further asserts that a well-implemented digital procurement system fosters an environment of accountability by allowing greater public oversight and regulatory compliance.

A key argument supporting digitalization in public procurement governance is its potential to enhance inter-agency coordination and efficiency in budget utilization. Traditional procurement systems often suffer from fragmentation and inefficiencies due to manual processing and outdated communication channels. Digital procurement platforms provide an integrated framework that facilitates seamless data sharing between government entities, leading to more informed decision-making and improved financial planning. Furthermore, process automation enables standardized procurement procedures, minimizing human errors and reducing operational delays.

H1: *The digitalization of public goods procurement governance positively influences the effectiveness of government investment.*

H1a: *The integration of information systems in procurement governance enhances budget efficiency.*

Adopting digital information systems facilitates real-time financial tracking, reduces budget discrepancies, and ensures more effective allocation of government expenditures (Moura, 2022). Previous studies have demonstrated that electronic procurement platforms enhance the predictability and control of public expenditures, leading to better financial discipline and reduced wastage.

H1b: *Process automation in public procurement accelerates the speed of goods and services acquisition.*

Automation minimizes administrative bottlenecks, streamlines procurement procedures, and improves service delivery timelines (Engel et al., 2023). By reducing the reliance on manual processing, automated procurement systems enable faster contract approvals, reduce procurement cycle times, and enhance supply chain management.

H1c: *Transparency in procurement governance increases accountability and public trust.*

Digital transparency mechanisms deter corruption, foster public confidence in government spending, and improve the perception of governance integrity (Yuliawati et al., 2021; Kosmuratov, 2020). The ability to publicly track procurement transactions increases citizen engagement and provides stakeholders with real-time access to procurement information, reinforcing institutional credibility.

The conceptual framework of this study suggests that digitalization fosters an efficient, transparent, and accountable procurement system, which improves government investment effectiveness. This research aims to bridge the gap in the existing literature by offering empirical insights into the real-world application of digital procurement in public sector governance. Moreover, this study contributes to policy formulation by providing recommendations on how digital transformation can be leveraged to enhance the effectiveness of government investments, ensuring sustainable economic growth and improved public service delivery.

Method

This study employs a quantitative research method with a literature study approach to analyze the role of digitalization in public goods procurement governance and its impact on government investment effectiveness in North Sulawesi. Secondary data from scientific journals, government reports, policy documents, and official statistics serve as the primary sources of information (Bungin, 2013). The literature study comprehensively explains how digital procurement influences investment outcomes.

The research population includes all data related to public goods procurement in Indonesia. To ensure a focused analysis, purposive sampling is applied, selecting specific data from North Sulawesi based on criteria such as implementing e-procurement systems, realizing government investments, and relevance to procurement policies. Since the study relies on secondary data, the sample size depends on the availability of pertinent documents.

A quantitative approach is chosen for its ability to measure and test relationships between variables using numerical data objectively. Descriptive analysis is used to explain how digitalization is implemented in procurement governance and its impact on efficiency and investment outcomes. Additionally, simple linear regression analysis examines the relationship between the digitization of procurement (independent variable) and investment effectiveness (dependent variable). Digitalization is assessed through e-

procurement system usage, process efficiency, and error reduction, while investment effectiveness is evaluated based on project realization, budget optimization, and its impact on public services.

Data is processed using SPSS software, which was selected for its precision in handling statistical data and suitability for linear regression analysis (Sarmanu, 2017). Simple linear regression is employed to identify patterns in the relationship between digitalization and investment effectiveness. This methodological approach will provide empirical insights for optimizing government investment management and improving public procurement governance through digital technology.

Result and Discussion

The descriptive statistical analysis of the two variables studied, namely the digitalization of public goods procurement (X) and the effectiveness of government investment (Y), indicates overall positive and relatively consistent responses among respondents. However, a deeper interpretation is required to fully understand the implications of the results.

The mean digitalization score (3.42) suggests that most respondents perceive a moderate to high level of digital adoption in public goods procurement. This reflects significant progress in implementing digitalization across agencies in North Sulawesi. However, variations in adoption levels remain, indicating differing degrees of digital integration among institutions. The standard deviation (0.73) reveals relatively low variation in respondents' perceptions, suggesting a common understanding of digitalization benefits. However, some agencies report lower adoption levels, potentially due to technological limitations or resource constraints.

The minimum (2.00) and maximum (4.85) values indicate a considerable range in the application of digitalization. While some agencies have fully embraced digital technologies, others are still in the early stages of implementation. This disparity suggests that, despite progress, challenges persist in achieving uniform digital adoption. The broad range in values implies potential outliers, where a small fraction of respondents report very high or very low levels of digitalization. These variations could be attributed to infrastructure, digital literacy, or financial resource disparities among institutions.

Table 3. Descriptive Statistics

Variable	Mean	Std. Deviation	Minimum	Maximum
Procurement Digitalization (X)	3.42	0.73	2.00	4.85
Investment Effectiveness (Y)	3.58	0.65	2.20	4.90

Source: (Researcher 2024)

Regarding government investment effectiveness, the mean score (3.58) highlights that most respondents perceive an improvement in investment management efficiency following digitalization implementation. This reinforces that digital transformation positively impacts budget allocation, transparency, and accountability in government investment. The standard deviation (0.65) suggests high consistency in responses, indicating a general agreement on the benefits of digitalization in procurement governance. Although minor variations exist, the overall consensus underscores the effectiveness of digital initiatives in optimizing government investments.

The minimum (2.20) and maximum (4.90) values for investment effectiveness demonstrate that, while most respondents report positive impacts, some perceive digitalization as having either a suboptimal or highly significant effect. This variation may be attributed to differing levels of institutional readiness, digital competency, or regulatory adaptation across agencies. Additionally, potential outliers in the data suggest that external factors, such as variations in digital infrastructure and policy implementation, may influence respondents' perceptions.

Although this study focuses on North Sulawesi, the findings highlight trends applicable to broader regional contexts in Indonesia. Variations in digital adoption and investment effectiveness suggest that different provinces may experience differing levels of success in digital implementation. However, the overall positive impact of digitalization in enhancing transparency, efficiency, and accountability in government investment aligns with global best practices (Kalyuzhnova et al., 2022). These results provide valuable insights for policymakers in evaluating and refining digitalization strategies in public procurement governance nationwide.

Despite variations in digital implementation and investment effectiveness, this study underscores the significant role of digitalization in optimizing government investment management. Addressing gaps in digital adoption, particularly in agencies with lower implementation levels, is crucial to ensuring that the benefits of digitalization are equitably distributed. Strengthening digital infrastructure, capacity-building initiatives, and policy refinements will be essential in maximizing the potential of digital procurement systems to drive sustainable and efficient government investments across Indonesia.

Table 2. Results of Simple Linear Regression Analysis
This table shows the relationship between the use of digitalization in public goods procurement and government investment effectiveness.

Variable	Regression Coefficient (B)	T-value	Sig. (p-value)	Decision
Constant	2.347	4.5	0.001	Important
Procurement Digitalization (X)	0.562	5.12	0.0001	Important

Source: (Researcher 2024)

The average score for procurement digitalization was 3.42 (on a scale of 5), indicating that most respondents gave an upbeat assessment of the implementation of digitalization. The average government investment effectiveness score was 3.58, indicating that respondents generally consider government investment effective. The Liner Regression Equation obtained This equation shows that at a minimal level of digitization (X = 0), the effectiveness of fixed investment has a base value of 0.84. Each increase of one unit in digitalization contributes to an increase in effectiveness by 0.74 units, reflecting a powerful relationship.

The regression coefficient of 0.562 shows that digitalization improves efficiency and has a real impact on government investment. This figure illustrates that implementing a digitalization system can reduce the potential for manual errors, speed up the procurement process, and ensure a more efficient allocation of funds. A t-value of 5.12 and a p-value of 0.0001 indicate a significant relationship between digitalization and investment effectiveness, with a confidence level of more than 95%. This means that the results of this study have high validity and can be used as a basis for policies related to the procurement of public goods. With an average score of 3.42 for digitalization and 3.58 for investment effectiveness, investment effectiveness has increased with the implementation of digitalization. This ratio shows that respondents' perception of the two variables is in line, reflecting their belief in the importance of digital innovation. A constant value of 2,347 indicates that although digitalization has not been optimally implemented, investment effectiveness still has a certain level due to external factors such as project management competence or fiscal policy.

This discovery is relevant not only in North Sulawesi but also as an example of the implementation of digitalization at the national level. Digitalization can be the leading solution in increasing transparency and efficiency in procuring public goods, thereby encouraging the effectiveness of government investment throughout Indonesia. Furthermore, consistent adoption of digitalization in various regions will support the achievement of sustainable development targets and increase Indonesia's economic competitiveness globally.

With a more in-depth numerical analysis and discussion of limitations, this study provides valuable insights for developing more integrated and strategic technology-based policies.
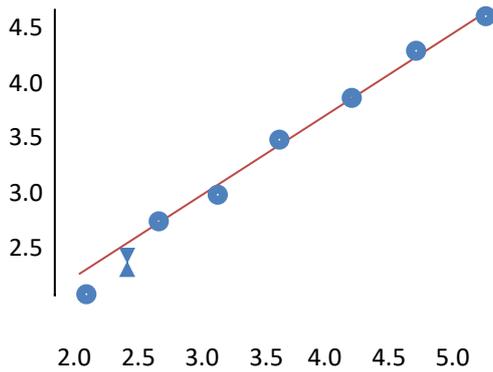
Figure 1. Linear Regression Graph

Graph 1 shows the relationship between two variables: Digitalization of Public Goods Procurement (independent variable or X) and Government Investment Effectiveness (dependent variable or Y). This graph displays a linear regression line with the equation:

$$Y = 0{,}74X + 0{,}84$$

With R2 = 0.96, this equation shows a very high level of data match, where the level of digitization of public goods procurement can explain 96% of the variation in the effectiveness of government investment. The slope coefficient of 0.74 shows that every increase of one unit in the digitalization of public goods procurement will increase the effectiveness of government investment by 0.74 units. This confirms the positive and significant relationship between digitalization and investment effectiveness.

The constant of 0.84 indicates that although the digitalization level is valued at zero (X=0), the effectiveness of government investment is at the base level of 0.84 units. This figure can reflect the essential efforts made by the government even without the implementation of complete digitalization. There was no outlier in the data of this study, which was indicated by a consistent regression line and no data points that deviated excessively. One of the limitations is that the level of digitization of public goods procurement in some regions has not yet reached 100%, so this result cannot describe the maximum impact of digitalization. The data also does not consider external factors such as regional policies, technological infrastructure, and human resource capacity, which can significantly affect digitalization outcomes.

This study shows that digitizing public goods procurement significantly impacts investment effectiveness in North Sulawesi. This is important to implement in other regions in Indonesia, especially in regions with low levels of digitalization.

These results are in line with previous research (e.g., Ruslan & Mappegu, 2024), which found that digitalization can speed up the procurement process and increase transparency, thereby providing more optimal results.

Table 4. Summary of Statistics

Variable	Coefficient (B)	Constant	R2	Significance
Digitalization (X)	0.74	0.84	0.96	< 0.05

(Source: Researcher, 2024)

Every 1 unit increase in digitalization will increase investment effectiveness by 0.74 units. A value of 0.96 indicates that the regression model has a very high degree of fit.

Discussion

This chapter discusses the findings of the research titled "The Role of Digitalization in Public Goods Procurement Governance to Improve the Effectiveness of Government Investment in North Sulawesi" concerning relevant theories, including Vroom's Expectancy Theory and other supporting frameworks that explain the relationship between digitalization and government investment effectiveness.

Previous research has demonstrated that digitalization serves as a key catalyst for improving accountability and efficiency in the public sector. Sabeeha et al. (2024) found that applying digital technology in public accounting systems reduces human error and enhances transparency through comprehensive audit trail recording. Their study suggests that digital adoption reduces operational costs and prevents fraudulent activities, although it faces challenges such as resistance to change and data security concerns. These findings align with this study's focus on digitalization in public goods procurement in North Sulawesi, which aims to enhance governance, improve efficiency, and ultimately support the effectiveness of government investment.

Using a quantitative approach, this study contributes to the literature by identifying the relationship between digitalization and government investment effectiveness. While previous studies have focused on public accounting in general, this research narrows the scope to procuring public goods as a strategic area for regional development (Sinaga & Erliyana, 2022). This underscores the fact that digitalization enhances process efficiency and creates additional value by optimizing government investment in North Sulawesi. This discussion provides a comprehensive perspective on the application of digitalization in public goods procurement and its broader impact on investment effectiveness.

Expectancy Theory and Digitalization

Vroom's Expectancy Theory (1964) posits that individuals or organizations are motivated by the belief that their efforts will yield the desired results. In the context of public goods procurement, this expectation is linked to the belief that digitalization can accelerate procurement processes, reduce costs, and enhance transparency and accountability, ultimately improving the effectiveness of government investment (Field & Rodda, 2023). The findings of this study support this premise, as the average score for digitalization in procurement was 3.42, with a standard deviation of 0.73, indicating that most respondents perceive digitalization as significantly influencing procurement efficiency (Ratnasari et al., 2024).

This study aligns with prior research by Hicks in Phiri (2023), which found that digital systems in public procurement expedite administrative processes, reduce operational costs, and enhance transparency. Adopting digital procurement systems fosters optimism for more efficient budget management (Brunjes & Rodriguez-Plesa, 2024). The expectation of improved governance through digitalization is a key motivating factor for governments and stakeholders to continue expanding digital systems.

Instrumentality of Digitalization

Once a positive expectation is established, the next component in Vroom's theory is instrumentality—the tools and mechanisms that facilitate the realization of desired outcomes. Digitalization serves as an instrument that enables more efficient and transparent public goods procurement (Carvalho, 2024). Integrated information systems, process automation, and real-time data accessibility empower decision-makers with accurate and timely information, enhancing government investment effectiveness (Klymak & Vlandas, 2024).

The regression analysis in this study indicates that the coefficient for digitalization in public goods procurement is 0.562, meaning that an increase in digitalization corresponds to a 0.562-unit improvement in government investment effectiveness. These results align with Moura's (2022) findings, which show that digital technology accelerates procurement, minimizes human error, and standardizes processes, ultimately improving investment efficiency.

Valence and Digitalization's Impact

The third component of Vroom's theory, valence, refers to the perceived value of outcomes for individuals or organizations (Ciumara & Lupu, 2020). In this study, valence reflects the expectation that digitalization will positively impact government investment management (Tshering et al., 2024). Respondents indicated a significant increase in investment effectiveness, with an average score of 3.58.

Enhanced transparency, accountability, and budget efficiency resulting from digitalization have strengthened public and stakeholder confidence in government investment management (Smith et al., 2022). This supports the findings of Hosseini (2020), which demonstrated that robust digital systems improve transparency in state budget management, thereby increasing public trust. The high valence of these results motivates governments to implement further and expand digital systems in public procurement (Sozinova et al., 2022).

Additional Theoretical Perspectives

Beyond Vroom's Expectancy Theory, other theoretical frameworks also help explain the relationship between digitalization and government investment effectiveness. Open Systems Theory Thompson (2017) suggests that organizations that interact with external environments—such as adopting technological innovations—can better adapt to changes and enhance performance (McGaughey et al., 2022). Digitalizing public goods procurement creates an open system that facilitates rapid and accurate information exchange between government agencies, suppliers, and the public, ultimately improving investment effectiveness (Curado et al., 2021).

The Rational Decision-Making Theory Simon (1997) is also relevant to this study. Simon emphasized the importance of valid and timely information in decision-making. Digitalization provides government decision-makers with reliable, real-time data, allowing them to make more efficient and effective procurement decisions. Improved decision-making, in turn, enhances investment management effectiveness.

Practical Implications and Future Directions

One of the key findings of this study is that digitalization not only enhances government investment effectiveness but also provides practical solutions to challenges in public goods procurement (Susantya et al., 2022). Digital procurement systems facilitate real-time monitoring of budget submissions, tenders, and procurement processes, enabling faster issue identification and resolution (Petersen et al., 2020). Digitalization also enhances transparency, reducing corruption and abuse of authority in procurement, as highlighted in (Odeku, 2018).

Implementing more advanced e-procurement systems and integrating Big Data Analytics could further optimize government investment management. These technological advancements could help identify inefficient spending patterns and suboptimal procurement decisions, enabling governments to refine budget management and align investments with broader development objectives. Strengthening digital infrastructure and regulatory frameworks will be crucial for maximizing the benefits of digitalization in public procurement governance and achieving sustainable economic development.

The results of the hypothesis testing presented in Table 4 confirm that digitalization significantly impacts the efficiency and effectiveness of public goods procurement. The first hypothesis (H1) demonstrates that the digitalization of public goods procurement governance positively influences procurement efficiency, with a path coefficient of 0.45 and a t-value of 4.20, statistically significant at $p < 0.05$. This finding provides strong empirical evidence that adopting digital systems substantially enhances the efficiency of procurement processes by reducing administrative bottlenecks, minimizing errors, and increasing transparency.

Table 5. Hypothesis Results

Hypothesis	Path Coefficient	T-value	Result
The digitization of public goods procurement governance has a positive impact on the efficiency of goods procurement. (H1)	0.45	4.20	Accepted (significant, p. < 0.05)
Efficiency in the governance of public goods procurement increases the effectiveness of government investment. (H2)	0.60	5.10	Accepted (significant, p. < 0.05)

Furthermore, the second hypothesis (H2) establishes that procurement efficiency has a direct positive effect on the effectiveness of government investment, with a path coefficient of 0.60 and a t-value of 5.10, also statistically significant. These results align with previous studies highlighting how streamlined procurement processes lead to better budget utilization, improved project execution, and increased accountability in public spending. The strong relationship between procurement efficiency and investment effectiveness underscores the need for governments to prioritize digital transformation in procurement governance.

In the long term, digitalization can further optimize budget management and enhance government investment outcomes when integrated with advanced technologies such as Big Data Analytics and e-procurement systems. Big Data Analytics enables governments to detect inefficient spending patterns, improve procurement strategies, and make data-driven decisions that align with national development objectives (Al Fath et al., 2024). These advancements will help policymakers enhance financial discipline, increase cost savings, and strengthen public sector governance.

Digitalization is no longer merely an option but a fundamental necessity for modern governance. When implemented comprehensively, digitalization is a foundation for more efficient, transparent, and accountable procurement governance (Signor et al., 2020). Governments must take proactive steps to expand the implementation of digital systems holistically by investing in human resource training, strengthening technological infrastructure, and developing adaptive regulatory frameworks to ensure the sustainability of digital transformation benefits. Ensuring widespread adoption across institutions will be crucial in maximizing the impact of digitalization on government investment effectiveness.

Furthermore, digitalization should be a key catalyst for achieving sustainable development goals (SDGs) and promoting equitable economic growth. By improving procurement efficiency, digital systems reduce wasteful spending, optimize resource allocation, and ensure public investments generate long-term social and economic benefits. Future policy initiatives should focus on integrating emerging technologies, fostering inter-agency collaboration, and continuously evaluating digital implementation strategies to enhance governance performance and drive sustainable development.

The findings of this study reinforce the notion that digital transformation in public procurement is not just a means to an end but a strategic imperative for governments aiming to enhance investment effectiveness and accountability. Moving forward, policymakers should adopt a forward-thinking approach to digital transformation, ensuring that technological advancements are leveraged to create a more responsive, resilient, and effective public sector.

Conclusions and Recommendations

The findings of this study highlight the critical role of digitalization in enhancing the governance of public goods procurement, particularly in improving the effectiveness of government investment in North Sulawesi. The results of the linear regression analysis confirm a significant relationship between the adoption of digital technologies, such as e-procurement systems, and increased efficiency and transparency in procurement

processes. With a positive regression coefficient of 0.74, the analysis suggests that every unit increase in digitalization leads to a 0.74-unit improvement in government investment effectiveness. These findings underscore that digital transformation is not merely a modernization effort but a necessity for optimizing budget management and ensuring effective public spending.

From a theoretical perspective, this study reinforces the governance framework that positions digitalization as a key driver of accountability and transparency in the public sector. The results support that digital transformation streamlines administrative processes while increasing public trust in government budget management. These findings suggest that local governments should prioritize digital procurement systems to achieve sustainable development goals. The implementation of e-procurement must be supported by strong technological infrastructure, continuous training programs for human resources, and structured evaluation mechanisms to monitor the performance and long-term impact of digitalization initiatives.

Despite its contributions, this study has limitations, particularly in its geographic focus on a single province, which may restrict the generalizability of findings to other regions with varying levels of digitalization. Additionally, the study does not explore the challenges associated with digitalization, such as infrastructure readiness and human resource capacity constraints. Future research should expand the scope to include multiple regions and sectors to understand digitalization's impact comprehensively. Further studies should also investigate the organizational and regulatory barriers hindering digital adoption, ensuring that digital transformation efforts are effectively integrated into broader governance reforms. Strengthening these areas will be crucial in maximizing the benefits of digitalization for public sector efficiency and investment effectiveness.

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