

Research Article

Optimizing Public Asset Management through Digital Integration, Accountability, and Sustainable Local Government Policies

Ady Setiawan¹, Ayat Taufik Arevin², Yimmi Syavardie³

Universitas Teknologi Surabaya, Indonesia ¹

Universitas Asa Indonesia, Indonesia ²

Institut Teknologi dan Bisnis Haji Agus Salim, Indonesia ³

Corresponding Author, Email: pakdeairnewo3@gmail.com

Abstract

Public asset management is a critical component in enhancing the efficiency, transparency, and sustainability of local governance. However, many regions in Indonesia continue to face challenges such as data inaccuracy, underutilized assets, and weak oversight systems. This study aims to propose a strategic framework for optimizing public asset management by integrating digital technology, reinforcing governance accountability, and developing sustainable local policies. A qualitative method with a systematic literature review design was employed, analyzing recent academic literature, government reports, and policy documents published between 2019 and 2024. The findings reveal that digital integration through platforms such as Geographic Information Systems (GIS), cloud-based asset tracking, and AI-powered analytics significantly improves asset visibility, utilization efficiency, and monitoring. Furthermore, accountability measures—including public audits, transparent budgeting, and civic engagement—enhance trust and reduce risks of corruption. Additionally, sustainable local policies that incorporate ESG principles, circular economy models, and public-private partnerships contribute to long-term asset value and community welfare. The synergy between these three strategic pillars—digitalization, accountability, and sustainability—produces a responsive and adaptive asset management system. This research contributes to the development of a conceptual model linking digital transparency with policy effectiveness and operational efficiency. It is expected to serve



as a practical guide for local governments in formulating integrated asset governance strategies that align with the evolving demands of public service delivery.

Keywords: Digital Governance, Public Asset Management, Sustainability Policy.

INTRODUCTION

Public asset management is one of the fundamental pillars of efficient and accountable governance (Hehanussa, 2024). Public assets, including land, buildings, service vehicles, and operational equipment, play a crucial role in supporting public service delivery (Botutihe, 2024). However, asset management in the public sector often faces numerous challenges, such as inaccurate data, suboptimal utilization, and weak oversight systems (Didi et al., 2025). As a result, government-owned assets are at risk of being misused or failing to deliver maximum value to the community (Ismail & Listiyaningsih, 2025).

Public assets refer to all resources or properties owned and managed by the state or government institutions for the benefit of society. These assets can include land, buildings, infrastructure, public facilities, and movable goods such as official vehicles. Effective public asset management is crucial as it reflects the transparency, efficiency, and accountability of governance. According to Botutihe (2024), public asset management in Indonesia still faces challenges in areas such as inventory, utilization, and oversight, which affect the overall effectiveness of public services. In practice, poor management of public assets often leads to budget inefficiencies and potential corruption.

In recent years, new approaches to public asset management have emerged, such as public-private collaborations and the digitalization of asset inventory systems. For example, Puspitarini et al. (2024) highlight the importance of creating added value through partnerships with the private sector to maximize the benefits of state-owned assets. Meanwhile, Ismail and Listiyaningsih (2025) emphasize the need for tighter oversight of state property governance to ensure transparency and accountability. These strategies align with the value-for-money principle in public service delivery. Therefore, effective public asset management not only preserves the economic value of assets but also strengthens public trust in government institutions.

In the digital era, technological transformation offers great potential to enhance public asset management systems. The implementation of digitalization through asset

information systems can improve transparency, efficiency, and monitoring of state and regional government-owned assets (Puspitarini et al., 2024). The use of cloud-based or integrated systems enables real-time asset tracking, reduces the risk of asset loss, and facilitates internal audits (Mardiasmo, 2020). However, not all regions in Indonesia have maximized the use of this technology due to limited infrastructure, budget constraints, or a lack of skilled human resources (Dewi & Prasetyo, 2022).

Accountability is a crucial element in public asset management. Local governments have a moral and legal responsibility to manage assets transparently and responsibly (Rosdiana & Sitorus, 2023). When accountability is neglected, the risks of corruption, budget inefficiency, and poor public service quality increase (Zulkarnaen et al., 2023). Therefore, enhancing accountability must go hand in hand with digital integration to create a credible asset management system (Ramadhan & Setiawan, 2023).

Local government policy also plays a vital role in asset management. Governments need to develop regulations that are adaptive to changes and sustainable in implementation (Fitriani et al., 2021). Policies such as optimizing idle assets, rental schemes, and public-private partnerships have become common strategies in local asset management (Siregar & Wibowo, 2023). However, without long-term planning and accurate data systems, these policies are difficult to implement effectively (Latief & Fauzan, 2024).

The urgency of this research lies in the need for a more effective, accountable, and sustainable public asset management system, supported by digital technology and progressive regional policy. Amid growing demands for budget efficiency and improved public service quality, sound asset management is a critical prerequisite to meet the evolving needs of local governance (Kurniawati & Andriani, 2022).

Previous research by Puspitarini et al. (2024) showed that digitalization accelerates the inventory process and reduces asset maintenance costs. Meanwhile, Ismail & Listiyaningsih (2025) highlighted the importance of technology-based supervision systems in ensuring data integrity. Research by Rosdiana & Sitorus (2023) emphasized that asset management accountability significantly correlates with public service quality. However, studies that integrate the three aspects—digitalization, accountability, and local government policy—into a unified public asset management framework remain limited.

This study aims to analyze and propose strategies for optimizing public asset

management through digital integration, improved governance accountability, and strengthened sustainable local policies. The research is expected to contribute both theoretically and practically to policymakers in the public sector, particularly in enhancing the efficiency and transparency of local asset management.

METHOD

This study employs a qualitative approach with a literature review design. A literature study is chosen to analyze and synthesize various theoretical concepts, empirical findings, and policy practices related to public asset management—specifically in the context of digital integration, governance accountability, and sustainable local government policies. According to Creswell (2016), qualitative research allows researchers to explore phenomena in-depth through reflective analysis of relevant written sources.

Data Sources

The data sources in this research are secondary data, including scholarly articles, academic books, government reports, regional regulations, and research institution publications. These sources are obtained through academic databases such as Google Scholar, DOAJ, SINTA, and Garuda. To ensure the relevance and recency of the study, only literature published within the last five years (2019–2024) is selected.

Data Collection Techniques

Data were collected using a systematic literature review technique. Inclusion criteria were applied to select literature that discusses core topics such as public asset management, digital governance, accountability mechanisms, and sustainable regional policies. Exclusion criteria were applied to non-peer-reviewed sources, irrelevant materials, and those published before 2019. The collection process involved reference documentation, thematic classification, and content synthesis aligned with the research objectives.

Data Analysis Methods

The data were analyzed using a content analysis method. The analysis involved identifying, categorizing, and interpreting research findings to uncover themes,

patterns, and knowledge gaps. According to Krippendorff (2019), content analysis enables researchers to extract meaning structures from texts and evaluate conceptual interrelations contextually. A descriptive-analytical approach was also applied to formulate conclusions and propose a conceptual framework for digital-based and policy-driven public asset management strategies.

Research Contribution

This methodology is expected to produce both conceptual and practical contributions for local governments, academic researchers, and stakeholders in designing more transparent, efficient, and sustainable public asset management systems.

RESULT AND DISCUSSION

The following table presents the findings from 10 selected academic articles, carefully screened from a broader literature search. Each article highlights key themes related to public asset management, digital integration, accountability, and sustainable local government policy. These studies collectively provide a conceptual and empirical foundation for optimizing asset management in public institutions.

Table 1. Literature Review

No.	Article Title	Authors	Year
1	Urban Smartization and Efficient Governance	Fathi, S., & Zare, Z.	2024
2	Role of Public-Private Partnerships (PPPs) in Enhancing Oil Sector Development	Aniceto, K.	2025
3	AI and Digital Health in Developing Countries	Karami, M., & Madloul, H.	2025
4	Digital Infrastructure and Local Government Efficiency	Loikkanen, H. A.	2023
5	Sustainable Asset Management for Local Authorities	Ferreira, M., et al.	2022
6	Transparency and Accountability in Smart Government	Al-Hadhrami, A., et al.	2021
7	Digital Transformation and Urban Governance	Ramaswamy, R., & Samanta, S.	2020

No.	Article Title	Authors	Year
8	Public Asset Management and the Role of Data Analytics	Lin, J., & Kim, H.	2023
9	Building Digital Capacity in Local Government	Tsoukalas, I., et al.	2024
10	Sustainability-Oriented Smart Cities	Sánchez-Teba, E., et al.	2021

The synthesis of the selected articles from the literature review on “Optimizing Public Asset Management through Digital Integration, Accountability, and Sustainable Local Government Policies” reveals a rich body of knowledge that interweaves theoretical frameworks with empirical insights. These studies collectively emphasize the transformative impact of digital technologies, evolving governance models, and sustainability imperatives on the way public assets are managed at the local government level.

One of the core themes observed across the literature is the increasing relevance of smart city frameworks as a vehicle for public asset optimization. The work by Fathi and Zare (2024) illustrates how urban smartization enhances governance efficiency by integrating digital infrastructure with asset monitoring tools. Their study demonstrates that smart governance does not only improve service delivery but also embeds transparency and accountability mechanisms within public institutions. In this framework, technologies such as IoT (Internet of Things), real-time data platforms, and urban dashboards are central to tracking asset performance and informing proactive maintenance strategies. Smartization, as argued, becomes a strategic policy move to reduce waste, increase responsiveness, and ensure inclusive urban services (Fathi & Zare, 2024).

The discussion of Public-Private Partnerships (PPPs) as a strategic mechanism for improving asset governance is brought forth in the article by Aniceto (2025). The study focuses on the oil sector in South Sudan, but the principles are scalable to broader public infrastructure management. It highlights the use of digital platforms in PPP arrangements to ensure transparency, streamline project execution, and distribute accountability across multiple stakeholders. Digital integration allows for automated compliance checks and performance-based budgeting, enhancing trust and lowering operational inefficiencies. This partnership model serves as a vehicle for local

governments to adopt digital practices even when technological capacity is low, leveraging private expertise and capital (Aniceto, 2025).

Artificial Intelligence (AI) integration into public systems, especially in developing regions, has been critically evaluated by Karami and Madloul (2025). Their paper underscores how AI-enabled systems can overcome administrative inertia and optimize service delivery through predictive analytics and resource forecasting. The research also warns of digital divides, calling for policies that are culturally and contextually adaptive, especially when introducing high-tech tools in communities with low digital literacy. AI's potential in asset management lies in its ability to detect inefficiencies in real time, forecast infrastructure degradation, and reduce human error in public reporting (Karami & Madloul, 2025).

The foundational role of digital infrastructure is emphasized by Loikkanen (2023), who examined the impact of connectivity and integrated platforms on local government decision-making. The findings highlight that areas with robust digital infrastructure tend to make faster, more accurate budget allocations for asset rehabilitation and replacement. Cloud-based asset registries, digital twin simulations, and integrated GIS systems were shown to improve asset visibility, especially for geographically dispersed municipalities. Importantly, digital infrastructure was not just seen as a technical asset but as a strategic enabler of governance reform (Loikkanen, 2023).

Sustainability, a cornerstone of long-term asset management, is given detailed treatment in the article by Ferreira et al. (2022). They present a life cycle approach to public asset management, proposing that governments adopt circular economy principles when planning asset investments. Their model incorporates sustainability assessments during the acquisition, utilization, and decommissioning stages of public assets. Notably, the authors call for the use of environmental impact metrics embedded within digital asset management tools to inform policy decisions, especially in the context of climate change resilience (Ferreira et al., 2022).

Transparency and accountability through blockchain-enabled systems have been explored by Al-Hadhrami et al. (2021). Their study makes the case for using decentralized ledgers to improve public trust, particularly in corruption-prone contexts. Blockchain not only ensures tamper-proof documentation of asset transactions but also allows citizens to verify how public resources are allocated and maintained. By recording

maintenance schedules, ownership transfers, and budgetary allocations in immutable systems, local governments can foster public participation and reduce administrative fraud (Al-Hadhrami et al., 2021).

Another dimension addressed is fiscal accountability linked to digital transformation, as seen in the work of Ramaswamy and Samanta (2020). Their study focuses on how digitization enables more transparent and participatory budgeting processes. Tools such as open data portals, digital reporting apps, and civic tech platforms encourage citizen oversight and push governments toward performance-based asset budgeting. The authors argue that digital feedback loops between residents and municipalities contribute to more equitable distribution of infrastructure investment and maintenance (Ramaswamy & Samanta, 2020).

Lin and Kim (2023) examine the role of data analytics in optimizing the operational performance of public assets. Through case studies, they demonstrate how municipalities use sensor data and usage logs to predict infrastructure failures and prioritize asset maintenance. Their analysis suggests that predictive asset analytics can reduce maintenance costs by up to 30% and improve asset uptime significantly. Data-driven asset management also supports more objective decision-making, reducing political interference in infrastructure spending (Lin & Kim, 2023).

Further, Tsoukalas et al. (2024) explore how building digital capacity within municipal institutions is crucial for realizing the potential of technology in asset governance. The study notes that without sufficient training, digital tools are often underutilized or misapplied. Hence, capacity-building programs, institutional reform, and cross-sectoral digital leadership are needed to support sustainable asset governance. The paper emphasizes that digitalization must be accompanied by organizational readiness and policy coherence (Tsoukalas et al., 2024).

Lastly, the article by Sánchez-Teba et al. (2021) explores the interface between smart city policies and sustainability. They argue that smart initiatives must be anchored in broader urban sustainability goals such as carbon neutrality, social inclusion, and adaptive infrastructure. The integration of renewable energy systems into public infrastructure, for example, not only reduces operational costs but also strengthens the long-term viability of public assets. This synergy between smart and green cities redefines asset management from a purely technical process to a holistic urban strategy (Sánchez-Teba et al., 2021).

Discussion

Digital Integration in Public Asset Management

Digitalization serves as a strategic component in reforming public asset management. Digital-based asset management systems (such as GIS, e-asset tracking, and blockchain) enable more accurate recording, higher transparency, and greater efficiency in asset utilization.

Analytical Findings:

1. Digital asset registers provide real-time visibility of asset status and conditions, supporting data-driven decision-making.
2. Technologies such as IoT and AI can be employed for asset monitoring, prolonging asset lifespans and reducing long-term maintenance costs.

Strategic Implications:

1. Local governments need to develop reliable IT infrastructure and invest in skilled human resources capable of managing digital systems.
2. Cross-sector collaboration is required to build interoperable asset data systems among public institutions.

Governance Accountability in Asset Management

Accountability is a fundamental pillar in establishing transparent and trustworthy asset governance. In this context, information transparency, regular audits, and public participation are crucial elements for reinforcing accountability.

Analytical Findings:

1. The lack of publicly accessible asset reports creates opportunities for misuse, inefficiencies, and corruption.
2. Implementing performance-based budgeting and strengthening internal audit systems can enhance asset management accountability.

Recommended Strategies:

1. Mandate the periodic publication of asset reports through official digital government platforms.
2. Strengthen the role of the Audit Board (BPK), regional inspectorates, and independent audit institutions.

Sustainable Local Government Policies

Public asset management must align with sustainability principles—environmental, social, and economic. This means not only preserving asset value over the long term but also ensuring that public assets are used equitably to improve community welfare

Analytical Findings:

1. Many regional assets are underutilized or idle, despite having the potential to generate Local Own-Source Revenue (PAD) through utilization partnerships.
2. Some local governments have started to adopt circular economy and green infrastructure policies in their asset management practices.

Recommended Strategies:

1. Develop asset policies based on ESG principles (Environmental, Social, Governance).
2. Integrate sustainability considerations into the Regional Medium-Term Development Plan (RPJMD).

Interconnection Between the Three Strategic Pillars

These three approaches—digital integration, accountability, and sustainable policies—are inherently interconnected. Their synergy leads to a responsive, efficient, and trustworthy public asset management system.

Proposed Theoretical Model:

1. Digital integration → improves data accuracy & transparency
2. Transparency → enhances accountability
3. Accountability → drives sustainable, results-based policy formulation

CONCLUSION

This study concludes that the optimization of public asset management requires an integrated approach involving digital technology, strengthened accountability, and the formulation of sustainable local policies. Digital systems significantly improve asset traceability, reduce human error, and enable predictive maintenance through real-time analytics. Accountability, ensured by transparent audits and citizen involvement, promotes trust and curbs corruption. Meanwhile, sustainability-oriented policies ensure long-term value preservation and social inclusiveness in asset utilization.

Practical Recommendations

For local governments, it is imperative to invest in digital infrastructure and workforce training to ensure the proper implementation of integrated asset management platforms. Establishing standardized reporting systems and mandating public access to asset information through digital portals can enhance transparency and participation. Policies should prioritize the utilization of idle assets through collaboration with private sectors and embed ESG criteria into every asset lifecycle decision. Furthermore, aligning asset strategies with long-term development plans (RPJMD) will ensure coherence and resilience.

Suggestions for Future Research

Further studies are recommended to empirically test the proposed theoretical model in diverse regional contexts. Comparative case studies across provinces can help identify contextual success factors and scalability of digital asset governance. Additionally, interdisciplinary research integrating economics, technology, and public policy would enrich the understanding of how asset optimization impacts fiscal health, service delivery, and citizen satisfaction. The inclusion of emerging technologies such as blockchain and digital twins in future studies may also offer new pathways for innovation in public sector asset management.

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