ASSESSING THE IMMOVABLE ASSET DATA QUALITY: THE CRITICAL ROLE OF PEOPLE, PROCESS, AND TECHNOLOGY ACROSS PUBLIC SECTOR

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Abstract
This paper explores the quality of immovable asset data across public sectors, focusing on the interdependent roles of people, processes, and technology. Note that high-quality data is essential for effective asset management, policy–making, and service delivery. However, ensuring data quality in the public sector presents unique challenges due to the complex and often fragmented nature of public sector operations. This research identifies key factors influencing data quality in public sector asset management and proposes a comprehensive framework for assessing and improving immovable asset data quality. The study combines literature reviews, case studies, and expert interviews to provide a holistic understanding of the critical role of people, processes, and technology in achieving high-quality immovable asset data. Therefore, ensuring the quality of immovable asset data is a critical challenge for public sector organizations. Immovable assets, such as buildings, roads, and infrastructure, are foundational to public service delivery and economic development. Effective management of these assets relies heavily on data accuracy, completeness, and reliability. Moreover, poor data quality can lead to suboptimal decision-making, increased costs, and inefficiencies in asset utilization and maintenance. This research paper investigates the factors influencing data quality in public sector immovable asset management, focusing on the critical roles of people, processes, and technology.

Keywords: *Asset Management; Immovable Asset Management; Asset Management Information System; Data Quality*

INTRODUCTION

In the realm of asset management, data quality is paramount, as decisions regarding maintenance, investment, and resource allocation hinge on the integrity of data. The dimensions of data quality – accuracy, completeness, consistency, and reliability – are essential for effective asset management. Katina et al. (2021) emphasized that traditional asset management frameworks are often inadequate in addressing the complexity, uncertainty, and interdependencies inherent in modern systems, especially in the context of sustainability. Meanwhile, data quality refers to the condition of data, which can be assessed based on specific attributes such as accuracy, completeness, reliability, relevance, and timeliness (Mashoufi et al., 2023). In essence, high-quality data ensures that all the critical information regarding asset performance is precise, current, and easily accessible, thereby supporting sound decision-making processes (Foidl & Felderer, 2023). This underscores the significance of maintaining data that is not only accurate but also relevant to the context and needs of the organization. As such, reliable data forms the backbone of strategic decisions, particularly in

managing immovable assets where up-to-date information can drive timely interventions, resource allocation, and long-term planning. Without data that meets these standards, decision-makers may face challenges that hinder the efficiency and effectiveness of asset management practices. Furthermore, issues with data quality can result in significant financial losses and operational inefficiencies, making it imperative for public sector organizations to prioritize data quality to ensure efficient asset management and service delivery. At the same time, immovable assets, such as buildings, land, and infrastructure, are critical components of public sector portfolios. Note that effective management of these assets requires accurate, complete, and timely data. However, public sector entities often struggle with factors like outdated systems and limited human capital. High-quality data is crucial for informed decision-making, efficient resource allocation, and transparent governance. Therefore, accurate data helps in planning maintenance activities, budgeting, and complying with regulatory requirements, whereas poor data quality can lead to costly errors, inefficiencies, and a loss of public trust.

People are critical to ensuring data quality, as their skills, commitment, and motivation directly influence data management outcomes. Human factors, including management commitment, extrinsic rewards, and motivation, are pivotal in managing public immovable assets. According to the Resource-Based View (RBV), human capital is a critical component of organizational success (Gerhart & Feng, 2021). Effective data management requires skilled and motivated personnel committed to maintaining high data quality standards. As such, thematic analysis of participant responses in this study highlighted management commitment and extrinsic rewards as key sub-themes. Consequently, participants emphasized the significance of proper training, clear roles and responsibilities, and motivation through rewards to enhance data quality. For instance, Participant 4 noted that ensuring data quality starts with creating accurate data and adhering to structured procedures, underscoring the critical role of people in the data quality process. Notably, technology is a crucial enabler of data quality in asset management. Thus, effective implementation of technology, system integration, and information system configuration are essential for managing large volumes of data accurately and efficiently. The literature suggests that modern data management tools and systems can significantly enhance data quality by automating data collection, validation, and analysis processes (Batini & Scannapieco, 2006). Furthermore, participants in this study underscored the importance of technology in simplifying data collection and ensuring data accuracy. For example, Participant 3 highlighted that technology should facilitate easy data collection and management, reducing human error and enhancing data reliability. In addition, system integration ensures that disparate data sources are consolidated, providing a single source of truth for asset management.

The design of data collection processes and the identification of barriers to data quality are critical for effective asset management. Other than that, standardized processes ensure that data is collected consistently and accurately across different departments and functions (Otto & Reichert, 2014). The participants in this study emphasized the need for simplified and standardized data collection processes to improve data quality. Participant 2 stressed the importance of standard procedures and codes to ensure consistency and facilitate data analysis. Additionally, addressing barriers such as data privacy and online threats is crucial for maintaining data integrity. Participant 4 highlighted that having solid processes in place, along with people training and technology, is essential for improving data quality. Combining the insights from the literature and participant responses, this paper proposes an integrative

framework for improving immovable asset data quality in public sector organizations. The framework emphasizes the interdependent roles of people, processes, and technology in ensuring high data quality. Therefore, by focusing on training and development, standardized processes, and advanced technological tools, public sector organizations can enhance their data management practices, leading to better asset management and service delivery.

Moreover, when developing processes, it is essential that they are streamlined to ensure data reliability. The findings also highlight that the capability of the organization's technology or system to organize and systematically manage data is crucial, especially considering the need for Life Cycle Costing (LCC) data of assets. The study further underscores that asset information is essential for organizational strategic planning, yet the current data systems do not fully reflect the LCC of immovable assets. This signals the need to generate key outputs for effective asset management through data analysis of these assets. Correspondingly, the interview also brought attention to the importance of open-source solutions that facilitate communication and information sharing between systems with integrated operational control, alongside the necessity for a central data repository. It is vital to implement structured processes to support those involved in the data quality initiative. In addition, these processes should be clearly outlined before the initiative begins, establishing the rules and guidelines for activities related to the creation or manipulation of data. This encompasses defining the people, procedures, and technologies integral to the data quality efforts. Additionally, maintaining a data quality issue log within the organization creates a structured way to track and categorize incidents. This enables the organization to assess the severity of issues and uncover patterns that may be indicative of deeper, systemic data quality problems (Otto & Ofner, 2011).

The implementation of high data quality standards is crucial for managing public immovable assets effectively. Key data quality dimensions include accuracy, completeness, consistency, timeliness, accessibility, relevance, integrity, usability, and security. Subsequently, accurate data ensures effective decision-making, while completeness provides detailed asset information for maintenance and performance. Meanwhile, consistency prevents errors and ensures uniform data usage across departments. At the same time, timeliness allows for proactive asset management, and accessibility facilitates quick decision-making. Relevance ensures data applicability to strategic goals, and integrity maintains data accuracy and coherence over time. In addition, usability makes data comprehensible for decision-makers, and security protects data from unauthorized access. Investing in high-quality data improves decision-making, operational effectiveness, compliance, and technology integration. Hence, detailed and timely data aids in proactive maintenance, operational coordination, and secure data management, enhancing overall asset management. Organizations must deepen their commitment to data management dimensions to improve public asset management.

In the modern economy, effective asset management drives growth and innovation despite challenges such as funding and bureaucracy. International standards guide the development of asset management systems, ensuring that management goals are met and positively impacting financial health and profitability. By emphasizing all dimensions of data quality, organizations can develop robust asset management strategies that support long-term business survival and growth. Note that improved asset management positively impacts financial health and profitability, emphasizing the significance of all data quality dimensions

in asset management strategies. Moreover, effective profit reinvestment in fixed assets is crucial for business survival and growth, highlighting the integral role of data quality in asset management.

The commitment to high data quality standards in managing public immovable assets is crucial for ensuring effective governance, strategic resource allocation, and the overall efficiency of public services. Thus, by integrating people, technology, and processes within a comprehensive framework, public sector organizations can significantly enhance their asset management practices, thereby fostering greater public trust and contributing to economic stability and growth.

METHOD

The foundational conceptual framework for this study was developed through an extensive review of the literature, which highlighted the critical dimensions that influence data quality in asset management. These dimensions are specifically categorized into People, Technology, and Organizational Processes. The conceptual framework, depicted in Figure 1, encompasses various key components under these categories, each playing a unique role in shaping the overall strategy for managing immovable asset data quality.

The "People" dimension focuses on the human factors essential for maintaining high data quality standards. This includes the skills, commitment, and motivation of personnel involved in data management. Notably, effective training programs, clear roles and responsibilities, and motivational incentives are vital components. This dimension underscores the importance of management commitment and the need for a skilled workforce to ensure data accuracy, completeness, and reliability. Meanwhile, the "Technology" dimension highlights the role of advanced technological tools and systems in enhancing data quality. This includes the implementation of modern data management tools, system integration, and information system configuration. Technology facilitates the automation of data collection, validation, and analysis processes, reducing human error and ensuring consistent and accurate data. The integration of disparate data sources into a cohesive system provides a single source of truth, which is crucial for effective asset management.

The "Organizational Processes" dimension emphasizes the importance of standardized and simplified data collection processes. Standard procedures and codes ensure consistency and accuracy across different departments and functions. This dimension also addresses barriers to data quality, such as data privacy concerns and online threats, by implementing robust processes and security measures. Effective process design and management are crucial for maintaining data integrity and facilitating seamless data analysis. Underpinning the framework are the specific dimensions of data quality: accuracy, completeness, consistency, timeliness, accessibility, relevance, integrity, usability, and security. These dimensions are essential for ensuring that data is reliable and useful for decision-making, resource allocation, and compliance with regulatory requirements. As such, accurate and complete data provide detailed information for maintenance and performance assessments. On the other hand, consistency ensures uniform data usage across the organization, while timeliness and accessibility support proactive asset management and quick decision-making. Relevance ensures data aligns with strategic goals, integrity maintains data coherence over time, usability makes data comprehensible for stakeholders, and security protects data from unauthorized access.

The integrative framework proposed in this study combines insights from the literature and participant responses. It emphasizes the interdependent roles of people, processes, and technology in ensuring high data quality. By focusing on training and development, standardized processes, and advanced technological tools, public sector organizations can enhance their data management practices. At the same time, this holistic approach leads to better asset management and improved service delivery. The implementation of high data quality standards is crucial for managing public immovable assets effectively. Furthermore, investing in quality data enhances decision-making, operational effectiveness, compliance, and technology integration. Considering the perspective of government immovable asset data quality, the significance of accurate and reliable data becomes even more pronounced. Government assets, such as public buildings, infrastructure, and land, are substantial in terms of both financial value and public utility. Moreover, accurate data is essential for the efficient allocation of resources, planning of maintenance activities, and adherence to regulatory requirements. High-quality data supports transparency and accountability, which are critical for maintaining public trust and ensuring that taxpayer funds are used effectively.

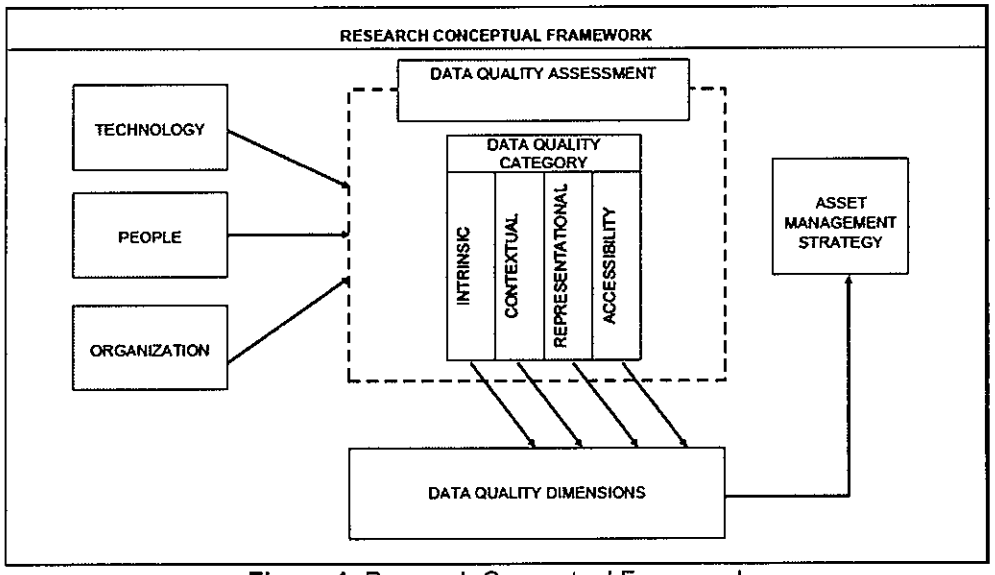

Figure 1. Research Conceptual Framework

The initial framework serves as a blueprint for identifying the key components that impact the effectiveness of data management strategies within the context of immovable assets. The framework emphasizes three main dimensions: People, Technology, and Organization. People involve human factors such as management commitment, staff competencies, and motivation, all of which are crucial for maintaining data quality and integrity. Meanwhile, technology focuses on the technological infrastructure, including data management systems and integration capabilities, which are essential for efficient data processing and storage. The organization covers the processes and structural aspects of data governance necessary for establishing a robust data quality framework. To enrich and validate the initial theoretical framework, empirical data were collected through expert interviews, focus group discussions, and exploratory questionnaires. This multi-method approach provided a deeper understanding of the practical aspects of data quality management. Consequently, expert interviews offered insights into industry-specific challenges and best practices, highlighting the roles of technology and organizational strategies in enhancing data quality. Focus group discussions facilitated interactive discourse, revealing common issues and collective insights into the

organizational and human factors influencing data quality. On the other hand, exploratory questionnaires quantified practitioners' perceptions, providing empirical support for the relationships proposed in the initial conceptual framework and identifying new dimensions pertinent to the asset management industry.

The integration of empirical data involves detailed expert interviews, focus group discussions, and exploratory questionnaires. Expert interviews provided essential insights into key aspects of management commitment, technology implementation, and system integration capabilities, helping to understand their practical implications on data quality. Meanwhile, focus group discussions gathered collective feedback on personnel competencies and training, extrinsic rewards and motivation, and the effectiveness of data collection processes. Accordingly, these interactions highlighted critical areas of improvement and affirmed the significance of robust process designs in enhancing data quality. Exploratory questionnaires provided a statistical backbone for the structural model, validating the relationships between constructs and assessing the direct and indirect effects of People, Technology, and Processes on data quality dimensions such as Accuracy, Reliability, and Timeliness. The structural model specification positions People, Technology, and Processes as independent variables fundamentally influencing various aspects of data quality. Management commitment is hypothesized to directly impact Accuracy and Reliability, reflecting the top-down influence on data management practices. Notably, data quality dimensions serve as dependent variables, exploring how well each aspect of data quality is supported by the underlying processes and systems in place. Path specification, based on empirical evidence, suggests specific linkages and interactions, such as the role of technology in enhancing data security and completeness through technological integration capabilities.

In Partial Least Squares-Structural Equation Modelling (PLS-SEM), specifying the measurement model involves defining how Latent Variables (LV), also known as constructs, are measured using observed variables or indicators (Hair et al., 2019). Hence, determining whether these constructs are reflective, or formative is crucial, as this distinction affects the direction of causality between constructs and their indicators (Hair et al., 2017). Reflective indicators are assumed to be effects of the LV, implying that changes in the LV will lead to corresponding changes in the indicators (Andreev et al., 1981). This suggests that all indicators in a reflective model are expected to be highly correlated since they reflect the same underlying construct. For instance, in a research study, constructs like "People," "Technology," "Process," and "Data Quality" are modelled reflectively, indicating that each indicator depends on the construct it measures. This is visually depicted in Figure 2, where reflective indicators exhibit high intercorrelation, illustrating their collective reflection of the LV. Conversely, formative measurement models posit that the indicators cause the LV (Haenlein & Kaplan, 2004). In this case, each indicator contributes uniquely to the formation of the construct, meaning the indicators can have positive, negative, or zero correlations with each other. Moreover, formative indicators collectively define the construct, and altering or removing an indicator can significantly change the meaning of the construct. This is particularly crucial when modelling constructs formed by distinct attributes, such as organizational resources or capabilities.

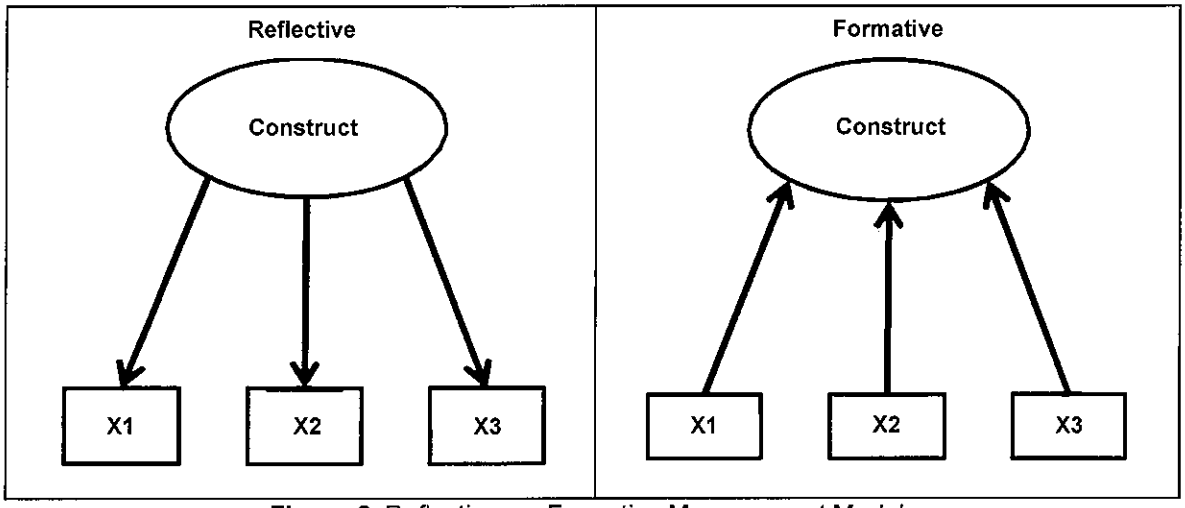

Figure 2. Reflective vs. Formative Measurement Models

Reflective measurement models are widely used in business research and are based on classical true-score test theory and factor analysis models (Henseler et al. 2009). In these models, indicators are designed to measure the same underlying LV, and changes in the LV cause corresponding changes in the indicators. Reflective models assume that causality flows from the construct to the indicators, meaning that variations in the construct lead to variations in its indicators. For example, in a study involving the construct "People," indicators might reflect various aspects of human resources in asset and facility management. If the "People" construct improves, all related indicators should demonstrate improvement. Note that indicators in a reflective model are expected to be highly correlated and interchangeable, meaning that removing an indicator does not affect the construct's validity, provided that reliability is maintained (Coltman et al., 2008).

On the other hand, formative measurement models operate differently. In these models, indicators are not necessarily correlated and do not measure the same underlying phenomenon. Instead, formative indicators cause the LV, with each indicator capturing a different component of the construct. This implies that any change in the indicators alters the conceptual domain of the construct. For example, for a construct like "Technological Tools," specified formatively, each indicator would represent different aspects of technology, such as software, hardware, training, and support. However, changes in any of these indicators would reshape the "Technological Tools" construct. Formative indicators are not interchangeable, and careful selection of indicators is crucial, as deleting or adding an indicator changes the nature of the construct. Proper identification of constructs as either reflective or formative has significant implications for research outcomes. As such, misidentifying constructs can lead to biased results and misinterpretations. Furthermore, correctly identifying the constructs ensures the use of appropriate analytical methods and tools, which is essential for accurate measurement and interpretation. Thus, theoretical considerations should guide the decision to specify a construct as reflective or formative based on the study's objectives and conceptual framework. This differentiation is crucial since constructs are not inherently reflective or formative. The specification depends on the conceptualization of the construct and the study's objectives. Accordingly, failing to differentiate between reflective and formative constructs can result in severely biased results.

In the context of this study, the use of reflective measurement models aligns with the theoretical framework, where constructs such as "People," "Technology," "Process," and "Data Quality" are expected to influence their indicators. The high intercorrelation among indicators in reflective models supports the idea that these indicators collectively reflect the underlying constructs. For instance, "People" is measured by indicators such as management commitment, employee competence, and adherence to standards. Note that these indicators are expected to move together, reflecting the overall construct of human resource effectiveness in asset and facility management. Similarly, "Technology" is assessed by indicators like IT infrastructure and MIS support, which should be highly correlated as they collectively capture the technological support for asset management. Specifying the measurement model is a foundational step in PLS-SEM analysis. Therefore, understanding the distinction between reflective and formative measurement models is critical for correctly specifying the constructs in PLS-SEM analysis. Reflective models, with their high indicator intercorrelation, are suitable for constructs where indicators are effects of the LV. Formative models, on the other hand, are appropriate when indicators form the construct and may not be correlated. By correctly identifying whether constructs are reflective or formative and ensuring appropriate indicators, the study can achieve robust and credible results. This process aligns with methodological recommendations and underscores the importance of theoretical grounding in developing and validating constructs in research. This careful consideration enhances the validity and reliability of the research findings, providing a solid basis for subsequent analysis and interpretation.

RESULTS AND DISCUSSION

The management of public immovable assets hinges on the quality of data, which is profoundly influenced by several critical factors, primarily the people involved in data management. However, effective management of public immovable assets depends on data quality, which is shaped primarily by human factors such as staff expertise, motivation, and leadership. The intersection of human factors, technology, and process design creates a complex landscape that demands critical examination. As such, the RBV underscores the importance of human capital as a key asset for achieving competitive advantage, emphasizing that the integration of skilled personnel is vital in this domain. This notion is reinforced by insights from various participants, who highlight that effective data management begins with a commitment to quality, supported by both management and the motivation of the individuals involved. Management commitment is a cornerstone of data quality. As noted by Participant 1, the establishment of a robust data management system requires a strong focus on data quality. This commitment ensures that the data management practices align with organizational goals and that the systems in place can produce reliable data. However, despite the acceptance of these practices, there remains a need for increased emphasis on both the quality of the data itself and the systems used to manage it. Participant 2 also emphasized that technology alone is insufficient. It must be complemented by the expertise of experienced personnel who can validate and verify data, ensuring its accuracy.

For government agencies managing immovable assets, the commitment from senior management is crucial. This commitment translates into prioritizing data quality and allocating resources to develop and implement robust data management systems. Thus, effective management must not only endorse the importance of data quality but also actively support initiatives that enhance it. This involves setting clear standards, providing necessary

training, and fostering a culture where data integrity is paramount. As emphasized by Participant 1, while the development of management systems is necessary, it is equally vital to focus on the quality of the data itself. This suggests that government agencies must establish a cultural shift where data quality is perceived as a strategic asset rather than just a technical requirement. Furthermore, the RBV highlights that skilled personnel are a valuable resource that can offer a competitive advantage. In government asset management, this means investing in training and development programs to enhance the capabilities of staff involved in data management. Participant 2's observation underscored the need for experienced personnel who can validate and verify data effectively. This is particularly crucial in the public sector, where data accuracy impacts operational efficiency and public trust and accountability.

Motivation and extrinsic rewards play a significant role in enhancing data quality. Government agencies must design data management processes that consider the human factors involved. Thus, simplifying data collection procedures and providing incentives for accurate data entry can significantly enhance motivation and performance. Participant 5 highlighted that simplifying data collection processes can improve motivation and the quality of data entry. When data collection is streamlined and less burdensome, individuals are more likely to produce accurate and reliable data. Participant 6 reinforced this by noting that while technology is essential for data management, the human element remains crucial for validating data and avoiding inaccuracies. This is particularly relevant in government settings where bureaucratic procedures can often be cumbersome. Streamlining these processes and recognizing the efforts of data collectors can improve overall data quality.

Participant 6's perspective on the importance of human oversight in conjunction with technology highlighted the need for a balanced approach. Despite technological advancements, experienced personnel remain essential for data validation and accuracy. Hence, government agencies must ensure that their data management strategies incorporate both advanced technological tools and the expertise of skilled staff to mitigate errors and ensure the reliability of data.

Technology plays a pivotal role in managing government immovable assets by enhancing data quality by automating processes, reducing human error, and ensuring data consistency. Advanced systems can streamline data collection, improve accuracy, and facilitate effective data management. Participant 3's emphasis on using technology to simplify data collection and enhance integration underscored the importance of implementing systems that support seamless data management. Accordingly, government agencies must invest in technologies that enable effective data collection, integration, and analysis, ensuring that these systems are aligned with organizational needs and capable of handling large volumes of data. Furthermore, system integration is crucial for managing the complex data environments typical of government asset management. Integrating various data systems helps prevent redundancy, reduces errors, and enhances overall data reliability. As noted by Participant 1, technology should complement human efforts by providing tools that enhance data accuracy and management capabilities. Therefore, government agencies must ensure that their systems are capable of integrating with other platforms, facilitating efficient data exchange, and supporting comprehensive data analysis.

Participant 7 further emphasized that experienced and motivated personnel are necessary to address challenges in data maintenance and quality assurance, ensuring that data management processes remain effective and reliable. Technological implementation and system integration are also critical components in ensuring data quality. Participant 3 highlighted that technology should be employed to simplify data collection and improve accuracy. Notably, open-source systems that facilitate communication and integration between different platforms are particularly valuable, as they help address issues such as data redundancy and integration, thereby enhancing overall system efficiency. Additionally, system integration ensures that data systems can effectively manage interfaces and relationships, contributing to data reliability and effectiveness, as noted by Participant 1.

Furthermore, the configuration of information systems is essential for reliable data management. Participant 4 stressed the importance of keeping up with technological advancements to avoid falling behind in data management practices. Effective information systems should streamline data collection and access, supporting improved data quality. A well-designed data collection process is crucial for maintaining data quality, as highlighted by Participant 2. Simplified procedures and standardization facilitate effective data collection and analysis, helping to overcome policy challenges and improve overall efficiency. Addressing barriers to data quality, such as data privacy concerns and online threats, is also critical. Participant 4 emphasized the need for robust processes to manage these challenges effectively. Participant 7 added that large volumes of data and maintenance issues can complicate data registration and management, making it essential to have well-defined processes and competent personnel in place. Overall, establishing comprehensive frameworks that integrate the right people, technology, and processes is key to ensuring data reliability and supporting better decision-making and strategic planning in public immovable asset management. Based on the empirical data, the conceptual framework has been thoroughly refined to facilitate SEM-PLS analysis. This refinement allows for a precise examination of how the factors of People, Technology, and Organization impact various categories of Data Quality–namely Intrinsic, Contextual, Representational, and Accessibility (Lee et al., 2006) (Pipino et al., 2002). These data quality categories, in turn, significantly influence the overarching Asset Management Strategy, offering a structured method to enhance asset management practices through improved data quality.

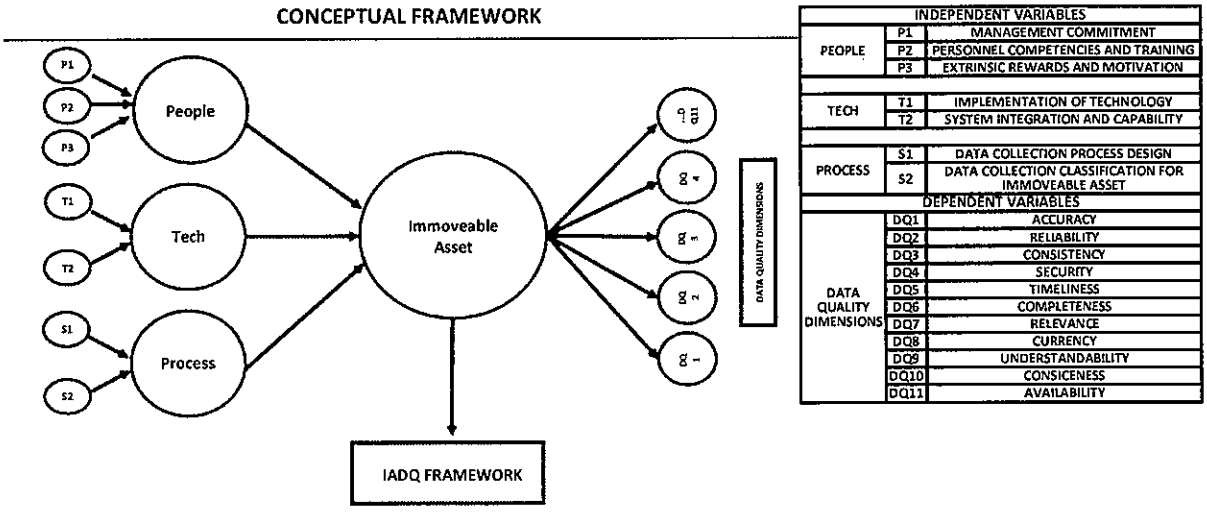

Figure 3. Refined Conceptual Framework Using Integration of Empirical Data

The SEM-PLS framework was meticulously developed to explore and validate the intricate relationships between People, Technology, Process, and Data Quality dimensions. The refinement of the structural model was guided by empirical data collected from diverse sources. This data was instrumental in shaping the model to accurately capture and reflect the complexities inherent in managing data quality for immovable asset management. Figure 3 below illustrates the structural model, demonstrating how each element interconnects and contributes to a comprehensive asset management strategy. This model underscores the critical role of data quality in optimizing asset management and highlights the interplay between various factors that influence data quality and, ultimately, asset management effectiveness.

CONCLUSION

The pivotal role of people in maintaining high data quality is crucial and cannot be underestimated. Human elements such as management commitment, extrinsic rewards, and overall motivation are essential in the management of public immovable assets. The RBV of the firm posits that human capital is a key driver of organizational success (Gerhart & Feng, 2021). Effective data management demands not only skilled personnel but also individuals who are motivated and committed to upholding stringent data quality standards. Furthermore, the analysis of participant feedback in this study underscored the importance of management dedication and the provision of extrinsic rewards as significant factors. Participants emphasized that proper training, clearly defined roles and responsibilities, and motivation through incentives are crucial for enhancing data quality. For instance, Participant 4 highlighted that maintaining data quality begins with creating accurate data and adhering to structured procedures, highlighting the fundamental role of personnel in ensuring robust data quality.

Technology plays a fundamental role in enabling high data quality in asset management. The effective deployment of technological solutions, system integration, and proper configuration of information systems are critical for managing extensive data volumes with precision and efficiency. Moreover, existing literature suggests that advanced data management tools and systems can substantially improve data quality by automating data collection, validation, and analysis processes (Batini & Scannapieco, 2006). Participants in this study stressed the importance of leveraging technology to streamline data collection processes and ensure data accuracy. For instance, Participant 3 noted that technology should simplify data management and minimize human error, thus enhancing data reliability. Moreover, system integration is vital for consolidating disparate data sources into a unified repository, which serves as a single source of truth for effective asset management.

The design and implementation of data collection processes are vital for effective asset management. Standardized processes ensure that data is gathered consistently and accurately across various departments and functions (Otto & Reichert, 2014). Participants in this study highlighted the necessity of having simplified and standardized data collection procedures to enhance data quality. In particular, Participant 2 emphasized that standardized procedures and codes are essential for ensuring consistency and facilitating comprehensive data analysis. Additionally, addressing potential barriers such as data privacy concerns and online security threats is critical for preserving data integrity. Participant 4 highlighted that solid processes,

combined with effective training and technological support, are crucial for improving data quality.

This framework highlights the critical interplay between people, processes, and technology in ensuring high-quality data for effective asset management. Therefore, by prioritizing training and professional development, implementing standardized processes, and utilizing advanced technological tools, public sector organizations can significantly improve their data management practices. This, in turn, will lead to more effective asset management and enhanced service delivery.

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