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Data Quality as a Strategic Lever for MIS Success: Empirical Evidence from Indonesia's Digital Transformation

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ABSTRACT: In the era of digital governance, the success of Management Information Systems (MIS) hinges on the quality of data they process and deliver. Despite widespread implementation across Indonesia, many MIS initiatives fall short due to poor data quality, limiting their ability to improve decision making and organizational performance. This study investigates the extent to which data quality influences MIS success in Indonesia, using the DeLone and McLean IS Success Model as a guiding framework. A cross-sectional survey was conducted among 250 MIS users from public and private organizations across Indonesia. Data were collected using validated Likert scale instruments to measure data quality, system use, user satisfaction, and net benefits. Structural Equation Modeling–Partial Least Squares (SEM-PLS) was employed to analyze both measurement and structural models. Results reveal that data quality significantly predicts MIS success, with strong effects on system use ($\beta = 0.58$), user satisfaction ($\beta = 0.34$), and net benefits ($\beta = 0.29$). The strongest pathway was observed through the mediation of user satisfaction, indicating that improvements in data quality translate to better system engagement and higher organizational gains. Among the six measured attributes, accuracy, relevance, and consistency were the most influential. These findings reinforce the importance of institutionalizing data governance strategies such as standardized protocols, data literacy training, and role-specific accountability. Furthermore, the Indonesian context emphasizes the need for adaptive models that account for infrastructural, cultural, and political variability. Overall, data quality is a foundational determinant of MIS success, requiring technical systems, organizational commitment, capacity building, and cross-functional coordination. The study offers actionable insights for policymakers and IT leaders to promote MIS performance and public sector innovation.

Keywords: Data Quality, MIS Success, IS Success Model, SEM PLS, Indonesia, Digital Governance, Public Sector Innovation.

INTRODUCTION

The implementation of Management Information Systems (MIS) in Indonesia has become an integral part of the country's broader strategy for digital transformation. Driven by national initiatives such as the Sistem Pemerintahan Berbasis Elektronik (SPBE) and Satu Data Indonesia,

the Indonesian government seeks to modernize governance, improve service delivery, and enhance data interoperability across institutions. However, despite these strategic efforts, the success rate of MIS implementation remains suboptimal. A multitude of challenges both technical and organizational continue to obstruct the full realization of MIS benefits, placing Indonesia behind many of its global counterparts in terms of digital infrastructure readiness (Aini et al., 2023; Pramono et al., 2024).

Among the persistent obstacles, the lack of skilled human resources, insufficient technological infrastructure, inadequate funding, and low digital literacy are particularly prominent. These barriers are further compounded by socio cultural factors, which hinder the integration of MIS within institutional frameworks. Stakeholder support, a critical enabler of system adoption, is often lacking, leading to user resistance and operational bottlenecks. These dynamics collectively restrict the capability of Indonesian organizations to implement MIS effectively, undermining their capacity to leverage data for decision making and public accountability (Akram et al., 2019; Ataay, 2018).

In response to these systemic challenges, the Indonesian government has placed significant emphasis on data quality as a foundational element of its digital agenda. SPBE is designed to promote interconnectivity and operational efficiency in public services, while Satu Data Indonesia introduces a regulatory framework to standardize and harmonize data management practices across government entities. These initiatives highlight the strategic importance of high quality data data that is accurate, complete, timely, consistent, understandable, and relevant in enabling robust digital governance and evidence based policy making (Hikmawati et al., 2021; Rahman et al., 2024).

Within the context of digital transformation, data quality functions as both an enabler and a constraint. It facilitates responsiveness in service delivery, transparency in governance, and agility in administrative processes. Conversely, poor quality data can lead to inefficient resource allocation, reduced citizen trust, and diminished institutional performance. Numerous studies have affirmed the correlation between robust data management and successful digital transformation outcomes, suggesting that data quality serves as a primary determinant in organizational modernization and reform (Imaan et al., 2024).

Globally, failure rates of MIS implementations remain troubling, often exceeding 60% due to challenges such as inadequate planning, weak change management, and limited user involvement (Akram et al., 2019). These patterns are mirrored in Indonesia, where MIS projects suffer from poorly defined goals, a lack of strategic alignment, and fragmented stakeholder engagement. Such issues are especially acute in environments where technological infrastructure and institutional capacities are still developing. Addressing these obstacles demands not only technological investment but also organizational restructuring, leadership commitment, and sustained capacity building (Ataay, 2018).

The DeLone and McLean Information Systems Success Model (2003) provides a comprehensive framework for assessing MIS outcomes by integrating key dimensions such as system quality, information quality, service quality, system use, user satisfaction, and net benefits. Over the years,

the model has evolved to incorporate user centric factors and contextual variables, reflecting the growing recognition that engagement, leadership support, and organizational readiness are integral to the success of information systems (Kafouros et al., 2023).

Despite the model's wide application, significant gaps persist in the literature regarding the empirical role of data quality within MIS implementation in emerging economies. Many studies provide generalized assessments of MIS effectiveness but fall short in isolating and measuring the specific contributions of data quality attributes such as accuracy and relevance to user satisfaction and organizational performance. This lack of granularity is particularly problematic in socio economically diverse settings like Indonesia, where variations in infrastructure, digital maturity, and governance models can profoundly influence MIS outcomes(Jiang et al., 2024; Khan et al., 2022, 2022).

Given these considerations, this study aims to investigate the role of data quality in determining the success of MIS implementations in Indonesia. By applying the DeLone and McLean model and focusing on key data quality dimensions, the research seeks to bridge the existing gap in empirical evidence and offer actionable insights for policymakers and IT leaders. The novelty of this study lies in its contextual focus and its operationalization of data quality as a measurable construct influencing user engagement and net organizational benefits.

This inquiry is not merely technical it also engages with broader themes of institutional capacity, digital inclusivity, and public accountability. It calls for a multidimensional approach that integrates policy reform, capacity development, and technological investment. Ultimately, achieving sustainable MIS success in Indonesia will depend on the alignment of governance structures, technological frameworks, and cultural readiness to foster data centric, citizen oriented digital transformation (Ariana, 2025; Imaan et al., 2024).

METHOD

This study employs a quantitative, cross sectional design to evaluate the relationship between data quality and MIS implementation success in Indonesia. The study uses Structural Equation Modeling with Partial Least Squares (SEM PLS) to analyze latent variables and their interactions. SEM PLS is suitable for complex models with multiple constructs and indicators and performs well with relatively small to medium sample sizes (Xianbin & Wu, 2021).

The research population includes MIS users in both public institutions and large private enterprises across Indonesia. A stratified random sampling technique is adopted to ensure representation from different sectors and regions, particularly reflecting variations in SPBE scores and digital readiness. A target sample size of 250 respondents is set, which meets the recommended minimum of 10 observations per estimated parameter for PLS path modeling (Alenezi, 2022).

Constructs in the model include Data Quality, System Use, User Satisfaction, and Net Benefits. Data Quality is operationalized through six dimensions accuracy, completeness, consistency, timeliness, understandability, and relevance adopted from validated frameworks in information systems research (Schnitzler & Bohnet-Joschko, 2025). System Use, User Satisfaction, and Net Benefits are measured using reflective indicators aligned with the DeLone and McLean IS Success Model.

The survey instrument consists of 5-point Likert scale items. Pretesting. Cronbach's alpha and composite reliability (CR) were used to evaluate the internal consistency of the constructs. Construct validity was tested using both exploratory and confirmatory factor analyses.

Data collection was conducted through both online and offline surveys distributed to MIS users across various organizations. Respondents were informed about the purpose of the study and confidentiality protocols. The final dataset was cleaned to eliminate incomplete responses, and data were then coded and formatted for SmartPLS analysis.

SmartPLS 4.0 was used to perform measurement and structural model assessments. The measurement model was evaluated based on indicator loadings (>0.7), CR (>0.7), AVE (>0.5), and HTMT ratio (<0.85). For the structural model, path coefficients, R^2 values, and bootstrapping (5000 resamples) were used to assess hypothesis significance. Model fitness and multicollinearity diagnostics were also conducted.

To enhance the robustness of findings, the study adheres to best practices in SEM PLS applications. Construct reliability and discriminant validity were thoroughly assessed. Sampling stratification ensured sectoral and regional diversity, enhancing external validity (Alenezi, 2022). Additionally, although the primary design is quantitative, this study acknowledges the potential value of mixed method approaches. Future research could integrate qualitative interviews to capture deeper contextual insights about data quality challenges in MIS implementation (Niu, 2022).

Ethical approval was obtained from the affiliated academic institution. Participants provided informed consent and were assured of anonymity and confidentiality throughout the data collection process. No personally identifiable information was collected, and all data were stored securely.

RESULT AND DISCUSSION

The survey included responses from 250 MIS users across both public and private sector institutions in Indonesia. Participants were selected through stratified sampling to ensure balanced representation across geographic regions, institutional types, and digital readiness levels. The demographic data revealed a diverse composition in terms of age, gender, organizational roles (operational, managerial, IT support), and levels of experience with MIS usage. Engagement with MIS showed moderate to high levels, with a mean score of 4.05 (SD = 0.71) for system use.

Differences in use levels appeared influenced by several factors, including the availability of digital infrastructure, user training, and organizational support mechanisms (Ardaningsi et al., 2023; Isnaeningsih et al., 2021).

Interestingly, users from institutions located in urban and more digitally developed regions reported higher usage and engagement compared to those from rural areas. This disparity highlights infrastructural inequities in digital access. Furthermore, digital literacy emerged as a contributing factor respondents with higher education levels and frequent technology exposure demonstrated greater ease in adopting MIS tools. User satisfaction, with a mean score of 4.18 (SD = 0.60), was generally high, although slightly higher in the private sector. This variation is attributed to more responsive IT support, robust digital ecosystems, and streamlined internal processes in private organizations, as corroborated by earlier studies (Elias & Estember, 2018; Farzandipour et al., 2019).

The measurement model exhibited strong internal consistency and validity across all constructs. Each indicator demonstrated loading values exceeding the commonly accepted threshold of 0.7, reinforcing their reliability (Akrong et al., 2021; Knauer et al., 2020). The Composite Reliability (CR) values ranged between 0.87 and 0.91, surpassing the minimum acceptable level of 0.7. Likewise, the Average Variance Extracted (AVE) values ranged from 0.66 to 0.79, affirming convergent validity and indicating that each construct adequately captured the variance of its indicators (Sarsiti, 2020).

To test discriminant validity, HTMT ratios were calculated and found to be below 0.85 for all inter-construct relationships, signifying that each construct was empirically distinct (Fang & Ge, 2023). Reliability was further supported by high Cronbach's Alpha scores, all exceeding 0.85, underscoring the internal consistency of the instruments used. The robustness of these validity and reliability indicators ensured that subsequent structural analysis was built upon a solid measurement foundation.

Table 1. Reliability and Validity Indicators

Construct	CR	AVE	Cronbach's Alpha	HTMT Status
Data Quality	0.91	0.66	0.88	Pass
System Use	0.87	0.78	0.85	Pass
User Satisfaction	0.89	0.79	0.86	Pass
Net Benefits	0.90	0.74	0.88	Pass

Structural Model Evaluation

The structural model generated statistically significant results that affirmed the proposed hypotheses. Data Quality demonstrated strong direct effects on System Use ($\beta = 0.58$, $t = 8.25$), User Satisfaction ($\beta = 0.34$, $t = 5.88$), and Net Benefits ($\beta = 0.29$, $t = 4.95$). Additionally, System Use was a strong predictor of User Satisfaction ($\beta = 0.63$, $t = 9.11$), which subsequently had the most substantial effect on Net Benefits ($\beta = 0.67$, $t = 10.45$). All paths were significant at $p < 0.001$, confirming the critical role of data quality as a foundational variable in the DeLone and McLean IS Success Model (KAMARU, 2018; Puspahani et al., 2022).

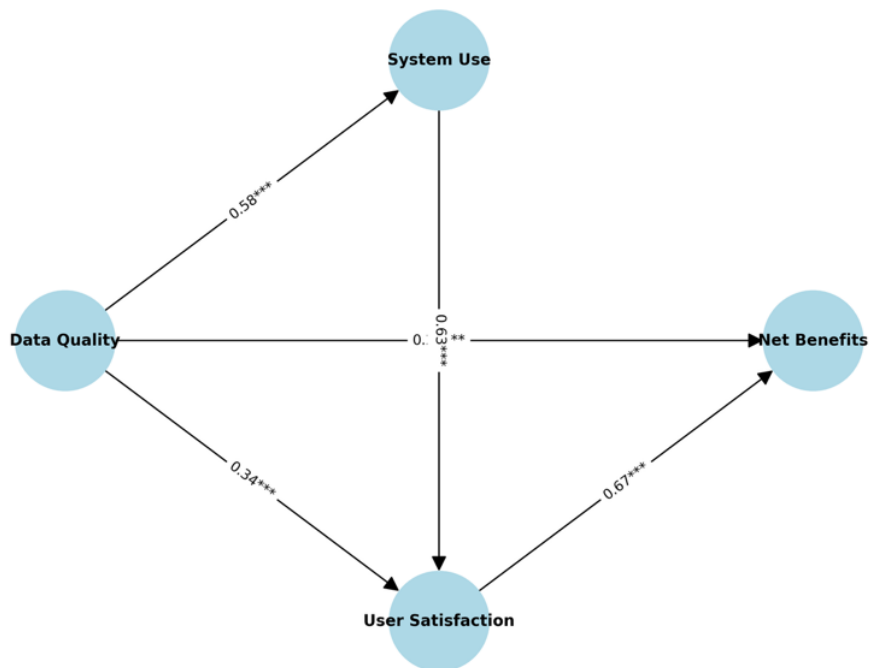**Figure 1. Structural Model Path Diagram (SmartPLS Output)**

Table 2. R2 Values

Construct	R2
System Use	0.34
User Satisfaction	0.52
Net Benefits	0.61

The model explained 34% of the variance in System Use, 52% in User Satisfaction, and 61% in Net Benefits. These R2 values indicate moderate to strong explanatory power, particularly for Net Benefits. Multicollinearity was assessed through VIF (Variance Inflation Factor) values, all of which were found to be below the threshold of 5, suggesting minimal redundancy among predictor variables (Hartanto et al., 2024; Khabbazi et al., 2016).

Overall, the results provide empirical validation for the hypothesized relationships, highlighting the direct and indirect influence of data quality on system outcomes. The findings confirm that a well executed data governance strategy focusing on the dimensions of data accuracy, relevance, and consistency can significantly enhance MIS use, user satisfaction, and organizational benefits. This underscores the necessity for institutions to invest not only in digital infrastructure but also in data stewardship and quality assurance programs as part of their MIS implementation efforts.

Central Role of Data Quality in MIS Success

The findings of this study underscore the pivotal role of data quality in determining the success of Management Information System (MIS) implementation in Indonesia. The empirical evidence

confirms that data quality not only has a direct influence on system use and user satisfaction but also indirectly drives net organizational benefits through these intermediary constructs. This reinforces the foundational premises of the DeLone and McLean IS Success Model and highlights the multidimensional impact of data quality within modern digital systems. Organizations must therefore transition from viewing data quality as a purely technical issue to recognizing it as a strategic imperative with wide-ranging operational and performance implications. Poor data quality leads to inefficiencies, loss of user trust, and ultimately undercuts the full potential of digital investments.

The confirmation of these relationships in the Indonesian context also sheds light on the challenges unique to emerging economies, where variability in infrastructure, human resource capabilities, and administrative capacity often introduce additional complexities in maintaining high quality data. Therefore, this study reinforces the need for institutional awareness, cross functional collaboration, and policy enforcement to ensure that data quality is embedded at every stage of MIS lifecycle from system design and data input to reporting and evaluation.

Governance and Implementation Implications

Within the Indonesian public sector, efforts to strengthen digital governance through initiatives such as SPBE (*Sistem Pemerintahan Berbasis Elektronik*) and Satu Data Indonesia are important milestones. These initiatives seek to improve public administration by fostering integration, transparency, and responsiveness. However, the effectiveness of such policies is ultimately determined by the degree to which their principles are operationalized within daily practices and across all layers of government.

This study adds empirical weight to existing claims that data governance frameworks must be comprehensive and implementable to yield desired outcomes. Specifically, the implementation of standardized data management protocols, systematic data entry routines, and shared metadata frameworks can serve as practical tools for ensuring data accuracy and integrity (Carvalho & Rodrigues, 2022). These governance mechanisms are further strengthened when paired with institutional accountability measures, regular monitoring, and policy audits. A decentralized approach, allowing for contextual adaptations across agencies while adhering to national standards, could help bridge the operational gap between central mandates and local implementation realities.

Role of User Engagement and Training

The study also reveals the importance of user engagement and training as critical enablers of MIS success. The model demonstrated that data quality affects system use and, through that, enhances user satisfaction a finding that reflects the need for user centric strategies in MIS deployment. Without user buy in, even the most sophisticated systems fail to realize their potential.

Training programs that improve data literacy, coupled with platforms that are intuitive and user friendly, can significantly enhance system adoption. Devine et al. (2018) emphasized the transformative role of structured capacity building efforts in empowering public servants to engage

more confidently with digital tools. This becomes particularly crucial in settings where digital familiarity varies widely across users. User training should also be iterative and responsive to feedback, allowing organizations to adjust modules based on emerging usage patterns and performance data. Beyond basic training, a culture that values data as a strategic asset supported by leadership and incentives can help institutionalize engagement and improve long term outcomes.

Key Dimensions of Data Quality

This research aligns with existing literature in identifying accuracy, relevance, and consistency as the most influential dimensions of data quality in MIS contexts (Doubova et al., 2024; Fernandes et al., 2021). Accuracy supports decision making processes that are evidence based and minimizes the risk of policy errors. Relevance ensures that data collected is not only available but applicable to the needs of users and aligned with organizational goals. Consistency across databases and departments enables coherence and avoids data silos, fostering better communication and integrated planning.

In the Indonesian setting, these dimensions carry additional weight due to the fragmented nature of many public systems and the diversity of socio political conditions across regions. Local governments often operate with limited technical guidance or resources, making it challenging to achieve data uniformity. Hence, central agencies must not only provide frameworks but also deliver tailored support and shared platforms to promote consistency. Clear metadata standards, interoperable systems, and shared data validation protocols can serve as enablers of uniformity.

Contributions to IS Theory in Emerging Economies

From a theoretical standpoint, the study validates the adaptability of the DeLone and McLean IS Success Model within an emerging economy like Indonesia. The model's core constructs remain relevant; however, the relationships among them appear to be moderated by local contextual factors such as technological readiness, political stability, bureaucratic culture, and leadership engagement. These findings echo the sentiments of Sharma et al. (2017), who advocate for contextual adaptations to global models to reflect local realities.

Indonesia's experience highlights the need for nuanced, culture aware adaptations of IS frameworks. For example, while user satisfaction is a universally accepted outcome, the paths to achieving it may differ in regions where hierarchical structures or centralized control influence digital adoption. The presence of strong central mandates, coupled with uneven readiness among subnational units, requires multi level governance strategies and differentiated capacity building efforts. This provides an opportunity for scholars to refine IS theories by integrating socio political dimensions and applying comparative methods across national contexts.

Sustaining Data Quality Improvements

Lastly, the sustainability of data quality improvements must be a continuous strategic focus. As Newton et al. (2017) argue, achieving high quality data is not an end state but a process that requires constant reinforcement. This includes regular data audits, stakeholder reviews, inter departmental coordination, and the integration of quality checks into routine workflows.

To institutionalize such practices, roles and responsibilities must be clearly defined data stewards, MIS coordinators, and quality assurance personnel must be equipped with the authority and tools to perform their roles effectively. Investing in automation for data validation and using dashboards for real time monitoring can further enhance oversight. Moreover, cross sector collaboration, particularly with civil society and academic institutions, can provide external validation and improve public accountability.

When effectively executed, data governance evolves from being a reactive function to a proactive force that drives innovation, improves service quality, and strengthens public trust. As Silva et al. (2021) aptly note, this represents a shift in public sector innovation where data quality is positioned not merely as a support function but as a core component of administrative excellence and strategic planning.

CONCLUSION

This study demonstrates that data quality is a critical determinant of Management Information System (MIS) success in Indonesia. Using the DeLone and McLean IS Success Model, the findings confirm that accuracy, relevance, and consistency of data significantly influence system use, user satisfaction, and net organizational benefits. These results highlight the importance of embedding data quality not only as a technical concern but as a strategic priority that underpins effective digital transformation and public sector innovation.

From a practical standpoint, the study emphasizes the need for standardized data protocols, user training to build data literacy, and cross-platform consistency through interoperable systems. Sustaining improvements requires continuous audits, interdepartmental collaboration, and strong leadership commitment. As Indonesia advances initiatives like SPBE and Satu Data Indonesia, prioritizing data governance will be essential to ensure that MIS initiatives deliver long-term value, improve decision-making, and enhance public trust.

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