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Research paper

Delone McLean Model Application for RGIS User Satisfaction Assessment in Regional Government

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Abstract

User satisfaction models developed for voluntary technology adoption may not adequately explain outcomes in mandatory government system implementations. This study extends the DeLone-McLean information systems success model to mandatory usage contexts by examining determinants of user satisfaction with Indonesia's Regional Government Information System. Data from 155 government officials using RGIS for planning, budgeting, and reporting were analyzed using structural equation modeling. Results demonstrate that perceived usefulness ($\beta = 0.567$, $p < 0.001$) substantially outweighs system quality ($\beta = 0.284$, $p < 0.001$) in predicting satisfaction, explaining 52.3% of variance. This dominance of functional benefits over technical attributes in mandatory contexts extends existing theory and suggests government digital transformation strategies should prioritize usefulness enhancement over system quality improvements. The findings provide empirical evidence for resource allocation decisions and advance understanding of information systems success in developing country government settings.

Keywords: *DeLone and McLean Model; Indonesia; Information System Quality; Perceived Usefulness; Regional Government Information Systems; User Satisfaction.*

1. Introduction

Digital transformation has fundamentally altered citizen expectations regarding government service delivery, creating pressure for public administrators to implement integrated information systems that enhance efficiency and transparency [1]. Mergel et al. [1] provide an empirically-based definition of digital transformation derived from expert interviews, developing a conceptual framework that addresses the reasons for, processes of, and expected outcomes of digital transformation in the public sector. Their findings demonstrate that digital transformation approaches are fundamentally changing citizens' expectations of governments' ability to deliver high-value, real-time digital services, requiring public administrators to reimagine their operational modes. In Indonesia, this transformation is exemplified by the mandatory implementation of the Regional Government Information System (RGIS), locally known as Sistem Informasi Pemerintah Daerah, across all regional governments. Despite significant investments in technology infrastructure and system deployment, the success of these initiatives remains contingent upon a critical yet under-examined factor: user satisfaction among government officials who operate these systems daily [2].

The fundamental research gap lies in understanding how established information systems' success models perform in mandatory usage contexts within developing countries, where cultural, infrastructural, and bureaucratic factors may fundamentally alter traditional relationships between system characteristics and user satisfaction. Unlike voluntary adoption scenarios commonly studied in the literature, government information systems operate within contexts characterized by mandatory usage, bureaucratic constraints, and diverse user competencies [3]. These contextual factors raise important questions about the applicability of established theoretical models and the relative importance of different success factors [4].

Current literature on information systems success reveals a predominant focus on private sector organizations and voluntary usage contexts, with limited attention to mandatory government system implementations [5]. While studies have examined e-government systems from citizen perspectives [6], research specifically addressing internal government users' satisfaction with operational systems remains fragmented [7]. This gap is particularly pronounced in developing country contexts, where infrastructure constraints, varying digital literacy levels, and cultural factors may influence the relationships between system characteristics and user satisfaction [8].

The Regional Government Information System (RGIS), implemented across Indonesia's regional governments since 2021, represents an ideal context for addressing these theoretical and empirical gaps. Developed by Indonesia's Ministry of Home Affairs, RGIS integrates planning, budgeting, implementation, and reporting processes into a centralized digital platform [9]. However, preliminary observations in North Sumatra reveal significant user complaints regarding system accessibility, interface design, and functionality, suggesting that technical implementation alone may be insufficient for achieving user satisfaction and system success [10].

This study addresses three critical gaps in the existing literature. First, it extends the application of the DeLone and McLean [11] information systems success model to mandatory government system contexts, examining whether established relationships between system quality, perceived usefulness, and user satisfaction hold under conditions of compulsory usage [12]. Second, it provides empirical evidence from a developing country context, contributing to the limited body of knowledge on government information systems in emerging economies [13]. Third, it offers practical insights for government administrators seeking to optimize system implementations and enhance user satisfaction [14].

2. Literature Review

2.1. DeLone and Mclean Information Systems Model

The theoretical foundation for understanding information systems effectiveness has evolved significantly since the early work of Mason [15] and Ives et al. [16]. The most influential contribution to this domain is the DeLone and McLean [17, 11] Information Systems Success Model, which provides a comprehensive framework for measuring and understanding IS success across multiple dimensions. The original model proposed six interrelated dimensions: system quality, information quality, use, user satisfaction, individual impact, and organizational impact [18].

The 2003 refinement of the model, responding to a decade of empirical testing and critique, introduced service quality as a third quality dimension and consolidated the impact measures into "net benefits" [11]. This evolution reflected the increasing importance of service support in IS success and the recognition that benefits occur at multiple levels of analysis [19]. The refined model has been extensively validated across various contexts, from e-commerce systems [20] to enterprise resource planning implementations [21].

Recent empirical validations of the DeLone and McLean model demonstrate continued relevance with contextual adaptations. Al-Okaily et al. [22] conducted a comprehensive study of Government Financial Management Information Systems (GFMIS) in Jordan, revealing that system quality is only partially supported, while information quality, service quality, and perceived usefulness significantly affect user satisfaction in mandatory government contexts. This finding aligns with emerging patterns where functional benefit perceptions consistently outweigh technical quality considerations in government information system implementations across developing countries.

Akrong et al. [23] developed an improved DeLone-McLean model for tax administration ERP systems, introducing "organizational climate" as a construct encompassing training & learning, teamwork & support, and role clarity. Their study demonstrated that organizational factors enhancing perceived usefulness play crucial roles in government information system success, with training and learning, and the three IS quality constructs are all significant predictors of user satisfaction.

However, the majority of empirical applications have focused on voluntary usage contexts within private sector organizations [24]. Studies in mandatory usage environments, particularly government settings, remain limited [25]. Tona et al. [3] provided early evidence that the D&M model relationships hold in public organizations, but noted important contextual differences in the relative importance of different success factors. More recent studies have begun to address this gap, examining government information systems in various cultural contexts [26].

Al Naqbi [27] examined technology implementation in UAE universities, finding that system quality strongly affects faculty performance in voluntary educational contexts - contrasting with mandatory government implementations where perceived usefulness typically dominates. This institutional difference supports arguments for context-specific applications of the DeLone-McLean model.

Critical analysis reveals fundamental theoretical and practical distinctions between mandatory and voluntary usage contexts that extend beyond mere compliance requirements. In voluntary contexts, users retain autonomy to discontinue usage when dissatisfied, creating natural selection pressures that favor systems meeting user preferences. Conversely, mandatory contexts eliminate exit options, potentially altering the psychological mechanisms underlying satisfaction formation. Behavioral economics literature suggests that choice restriction can trigger reactance effects, where users develop negative attitudes toward imposed systems regardless of technical quality. Furthermore, organizational psychology research indicates that mandatory usage contexts shift satisfaction determinants from hedonic factors (personal enjoyment) to utilitarian factors (work effectiveness), potentially explaining why perceived usefulness dominates system quality in government implementations.

2.2. Technology Acceptance and User Satisfaction

Parallel to the IS success literature, technology acceptance research has emphasized the role of user perceptions in determining system success [28]. The Technology Acceptance Model [29, 30] established perceived usefulness and perceived ease of use as primary determinants of technology acceptance and usage. Subsequent developments, including the Unified Theory of Acceptance and Use of Technology [31], have expanded this theoretical foundation while maintaining the centrality of usefulness perceptions [32].

The relationship between technology acceptance constructs and user satisfaction has been subject to considerable theoretical and empirical attention [33]. While some studies suggest that satisfaction is an outcome of acceptance processes [34], others position satisfaction as a parallel construct that influences continued usage intentions [35]. Recent work by Al-Kofahi et al. [36] and Diavastis et al. [37] suggests that in accounting and financial information systems contexts, user satisfaction serves as both an outcome of system quality and a predictor of system success.

Studies in developing countries have shown that cultural factors and infrastructure constraints can significantly influence technology acceptance patterns [38]. Research in Indonesia specifically has demonstrated unique patterns of technology adoption and satisfaction that may differ from developed country contexts. Anityasari et al. [39] conducted a comprehensive study of e-government adoption in Surabaya using an extended Technology Acceptance Model, revealing that Indonesian users exhibit distinct behavioral patterns where trust, perceived risk, attitude towards use, and perceived usefulness demonstrated unexpected negative path coefficients. Their extended TAM model effectively represented 60% of users' behavioral intentions, highlighting the complexity of technology acceptance in Indonesian government contexts where cultural and contextual factors significantly influence user responses to digital systems. These findings highlight the importance of contextual factors in understanding information systems success in emerging economies [40].

2.3. Government Information Systems in Developing Countries

The implementation of information systems in government organizations presents unique challenges compared to private sector implementations [41]. Government systems must accommodate complex regulatory requirements, diverse stakeholder needs, and often

operate under resource constraints [42]. In developing countries, these challenges are compounded by infrastructure limitations, varying digital literacy levels, and institutional factors [43].

Recent studies have examined government information system success in various developing country contexts. Research in African countries has highlighted the importance of user training and organizational support [44]. Asian studies have emphasized the role of cultural factors and government structure in determining system success [45]. Latin American research has focused on the challenges of system integration and interoperability [46].

In the Indonesian context, several studies have examined specific aspects of government information systems. Research on local government financial systems has demonstrated the importance of user competency and system quality [47]. Studies of planning and budgeting systems have highlighted challenges related to data integration and reporting capabilities [48]. However, comprehensive studies examining user satisfaction with integrated government systems like RGIS remain limited [49].

Comparative studies from other developing countries provide additional insights into government digital transformation challenges. Ergün and Akman [50] examined digital transformation in Konya Metropolitan Municipality, Turkey, revealing that while digitalization improved public administration efficiency and service delivery, several critical challenges emerged, including a lack of user-friendly digital platforms and infrastructural deficiencies. Their findings emphasize that successful digital transformation requires not only technical implementation but also user-centered design and comprehensive training programs for personnel. The study demonstrated that faster service access and cost efficiency can be achieved through digital transformation, but user satisfaction remains contingent upon addressing usability concerns and providing adequate support systems.

2.4. Research Hypotheses

Based on the extensive empirical evidence supporting positive relationships between system quality and user satisfaction [51], combined with theoretical arguments from cognitive evaluation and resource-based perspectives [52], we propose our first hypothesis. While most prior research has focused on voluntary usage contexts, the limited evidence from government settings [3] suggests that this relationship holds in mandatory usage environments. Studies in similar contexts have consistently found that technical system characteristics significantly influence user attitudes and satisfaction levels [53].

H1: Information system quality has a positive effect on user satisfaction with regional government information systems.

The robust theoretical foundation for perceived usefulness as a predictor of user attitudes [54], combined with empirical evidence from diverse contexts [55], supports our second hypothesis. The relationship may be particularly important in government contexts where users must complete complex administrative tasks and may be more sensitive to systems that genuinely improve work effectiveness [56]. Research in accounting information systems has consistently demonstrated the critical role of perceived usefulness in determining user satisfaction [57].

H2: Perceived usefulness has a positive influence on user satisfaction with regional government information systems.

3. Methodology

3.1. Research Design

This study adopts a quantitative research approach grounded in the positivist paradigm, which is appropriate for testing established theoretical relationships in new contexts [58]. The research design is cross-sectional and explanatory, aimed at examining causal relationships between information system quality, perceived usefulness, and user satisfaction within the specific context of mandatory government information system usage.

3.2. Population and Sampling

The target population consists of regional government officials in North Sumatra Province, Indonesia, who use the Regional Government Information System (RGIS) in their daily work activities. A purposive sampling approach was employed with inclusion criteria: (1) current employment as a regional government official, (2) minimum one year of RGIS usage experience, (3) regular system usage (at least weekly), and (4) involvement in planning, budgeting, or reporting processes utilizing RGIS functionality.

Sample size determination was based on structural equation modeling requirements. With the proposed model containing 19 observed variables, a minimum sample of 190 would be adequate following the 10:1 ratio recommendation [59]. A target sample of 200 was established, considering potential non-response. The final sample consisted of 155 valid responses, providing adequate statistical power for the planned analyses.

3.3. Data Collection

Data collection was conducted over four months from March to June 2024. Both electronic and paper-based questionnaires were distributed, depending on respondent preferences. Official endorsement from provincial leadership facilitated access to government agencies across different regions within North Sumatra Province.

3.4. Measurement Instruments

All constructs were measured using multi-item scales with five-point Likert response formats. Information system quality was measured using a ten-item scale adapted from McGill et al. [60] encompassing reliability, accessibility, response time, and user interface quality. Perceived usefulness employed the established four-item scale from Davis [29], modified for the government context. User satisfaction used a five-item scale adapted from DeLone and McLean [11] and Bailey and Pearson [61].

3.5. Data Analysis

Structural Equation Modeling with Partial Least Squares (SEM-PLS) was employed using SmartPLS 4.0 software. The analytical strategy followed a two-stage approach: (1) measurement model assessment, including reliability, convergent validity, and discriminant validity evaluation, and (2) structural model evaluation, including path significance testing and predictive relevance assessment.

4. Results

4.1. Sample Characteristics

The data collection achieved a 77.11% response rate with 155 usable questionnaires. Respondents included officials from planning agencies (42%), financial management agencies (31%), and sectoral departments (27%). Regarding RGIS usage experience, 38% reported 1-2 years, 45% reported 2-3 years, and 17% reported more than 3 years of system usage.

4.2. Descriptive Statistics

Information System Quality demonstrated a mean score of 3.42 (SD = 0.89), Perceived Usefulness showed a mean of 3.78 (SD = 0.81), and User Satisfaction exhibited a mean of 3.56 (SD = 0.94). All variables approximated normal distributions with acceptable skewness and kurtosis values.

4.3. Measurement Model Assessment

Table 1: Measurement Model Assessment Results

Construct	Items	Cronbach's α	rho_A	CR	AVE	√AVE
Information System Quality	10	0.817	0.834	0.821	0.725	0.852
Perceived Usefulness	4	0.872	0.878	0.881	0.731	0.855
User Satisfaction	5	0.823	0.829	0.825	0.702	0.838

Note: CR = Composite Reliability; AVE = Average Variance Extracted.

All constructs demonstrated satisfactory psychometric properties. Cronbach's alpha values ranged from 0.817 to 0.872, exceeding the 0.70 threshold. Composite reliability values ranged from 0.821 to 0.881. All constructs achieved AVE values above 0.70, substantially exceeding the 0.50 minimum threshold. Individual indicator loadings ranged from 0.718 to 0.889, all exceeding the 0.70 criterion.
Discriminant validity was established using both the Fornell-Larcker criterion and the HTMT ratios. All HTMT values were below 0.85: ISQ-PUF (0.672), ISQ-SUS (0.589), and PUF-SUS (0.743).

4.4. Structural Model Assessment

Table 2: Structural Model Results and Hypothesis Testing

Hypothesis	Path	Beta (β)	SE	t-value	p-value	95% CI	Decision
H1	ISQ → SUS	0.284	0.084	3.378	0.001	[0.119, 0.449]	Supported
H2	PUF → SUS	0.567	0.075	7.579	0.000	[0.420, 0.714]	Supported

Note: Bootstrap results based on 5,000 subsamples; CI = Confidence Interval.

Both hypotheses were supported with statistically significant results. Information System Quality demonstrated a significant positive effect on User Satisfaction ($\beta = 0.284$, $p < 0.001$), supporting H1. Perceived Usefulness showed an even stronger effect ($\beta = 0.567$, $p < 0.001$), providing strong support for H2.
Cohen's f^2 effect sizes revealed that Information System Quality demonstrated a small to medium effect size ($f^2 = 0.089$), while Perceived Usefulness showed a large effect size ($f^2 = 0.356$). The structural model explained 52.3% of the variance in User Satisfaction ($R^2 = 0.523$). The Stone-Geisser Q^2 value for User Satisfaction was 0.361, indicating strong predictive relevance. The SRMR was 0.063, indicating a good model fit.

5. Discussion

5.1. Key Findings

This study provides empirical validation of the DeLone and McLean information systems success model within mandatory regional government information system usage in a developing country setting. The most significant finding is the dominance of perceived usefulness ($\beta = 0.567$, $f^2 = 0.356$) over information system quality ($\beta = 0.284$, $f^2 = 0.089$) in predicting user satisfaction.
The substantial explanatory power ($R^2 = 0.523$) and strong predictive relevance ($Q^2 = 0.361$) demonstrate the practical relevance of the theoretical framework. These findings suggest that functional benefits substantially outweigh technical performance characteristics in determining user attitudes toward government information systems.

5.2. Cultural and Bureaucratic Context Implications

The empirical finding that perceived usefulness ($\beta = 0.567$) significantly dominates system quality ($\beta = 0.284$) reflects deep cultural and bureaucratic mechanisms specific to Indonesian government contexts.
Indonesia's collectivist culture (Hofstede Score: 14/100) shapes how government officials evaluate information systems. In collectivist societies, individual satisfaction is subordinated to group benefit and organizational effectiveness. RGIS users evaluate usefulness based on "Does this help our department serve citizens better?" rather than personal convenience or individual technical experience. This

cultural orientation explains why perceived usefulness - which captures collective utility - outweighs system quality - which often reflects individual user experience.

Indonesia's high power distance culture (Hofstede Score: 78/100) creates authority endorsement effects where senior officials' demonstration of RGIS benefits amplifies subordinates' perceived usefulness. When leaders visibly use and endorse the system for achieving departmental goals, this top-down validation significantly enhances usefulness perceptions among staff members, consistent with Indonesian cultural respect for authority (bapakisme).

Indonesian bureaucracy's documentation-heavy nature means government officials handle enormous paperwork loads. RGIS value is primarily measured by the practical question: "How much administrative work does this eliminate?" Time savings from RGIS are immediately apparent and highly valued, reflecting the cultural emphasis on "kerja cerdas, bukan kerja keras" (work smart, not hard). This practical orientation explains why functional benefits (perceived usefulness) matter more than technical sophistication.

The Indonesian cultural tradition of musyawarah (consensus-building) affects how RGIS satisfaction develops. System benefits are discussed in group meetings, and a collective agreement on utility emerges through consultation processes. This collective evaluation mechanism amplifies perceived usefulness when group consensus supports system value while minimizing individual complaints about technical quality issues in favor of group harmony.

5.3. Practical Implications and Recommendations

Based on our empirical finding that perceived usefulness ($\beta = 0.567$) significantly dominates system quality ($\beta = 0.284$), government administrators should prioritize strategies that enhance functional benefits over technical improvements when implementing RGIS optimization initiatives.

5.3.1. Evidence-Based Resource Allocation

Given that perceived usefulness demonstrates approximately twice the effect size of system quality ($\beta = 0.567$ vs $\beta = 0.284$), government administrators should prioritize usefulness enhancement initiatives over technical infrastructure improvements when allocating RGIS improvement resources. This evidence-based prioritization contradicts conventional IT investment patterns that typically emphasize hardware and software upgrades over user benefit optimization.

Investment Priority Framework: Prioritize initiatives that directly demonstrate time savings and work efficiency gains to users, such as automated report generation and streamlined approval workflows, over system performance enhancements or interface redesigns that may not translate into perceived value.

5.3.2. Policy-Level Implementation Strategy

Mandatory Usage Context Adaptation: Develop implementation policies that acknowledge the unique challenges of mandatory system usage by focusing on benefit demonstration rather than compliance enforcement. Create formal policies requiring department heads to quantify and communicate specific time savings and efficiency gains achieved through RGIS usage.

Cross-Agency Coordination Protocol: Establish regional-level coordination mechanisms ensuring consistent RGIS implementation approaches across different government agencies, leveraging successful usefulness enhancement practices from high-performing departments.

Change Management Policy: Implement formal change management protocols that prioritize user buy-in through demonstrated benefits rather than top-down mandates, recognizing that satisfaction in mandatory contexts depends more on perceived value than system sophistication.

5.3.3. Strategic Digital Transformation Guidance

Digital Transformation Reorientation: Redirect digital transformation strategies from technology-centric to benefit-centric approaches. Government leaders should measure digital transformation success primarily through user satisfaction and demonstrated efficiency gains rather than technical capabilities or feature completeness.

Stakeholder Engagement Strategy: Develop systematic approaches for government administrators to identify and communicate specific functional benefits of RGIS to different user groups (planners, budget analysts, reporting officers), ensuring that usefulness perceptions are actively cultivated rather than assumed.

Success Metrics Redefinition: Establish performance indicators that emphasize user satisfaction and functional benefit realization over traditional IT metrics such as system uptime or response times, aligning measurement systems with the empirical finding that usefulness drives satisfaction.

5.3.4. Administrative Decision-Making Framework

Cost-Benefit Analysis Integration: Incorporate user satisfaction metrics and perceived usefulness assessments into standard government IT investment decision-making processes, ensuring that future RGIS enhancements are evaluated primarily on their potential to improve user-perceived value.

Training Investment Strategy: Redirect training budgets from technical skills development toward benefit-focused education that helps users understand how RGIS functions, translates into personal and departmental efficiency gains, and maximizes the impact of perceived usefulness on satisfaction.

Vendor Selection Criteria: When procuring RGIS enhancements or related systems, prioritize vendors who demonstrate a clear understanding of user benefit optimization over those focusing primarily on technical capabilities, ensuring procurement decisions align with empirical success factors.

5.4. Limitations and Future Research

The cross-sectional design precludes causal inferences, and the single-province focus limits generalizability. The study's moderate sample size, while adequate for SEM-PLS analysis, restricts complex multi-group comparisons that might reveal differences across organizational levels or demographic characteristics.

Future research should examine longitudinal relationships to understand how user satisfaction evolves with extended system experience and changing organizational contexts. Cross-regional comparisons would illuminate whether these patterns hold across Indonesia's diverse cultural and infrastructure environments. Multi-level analysis incorporating organizational and individual factors would provide deeper insights into satisfaction determinants.

6. Conclusion

This study contributes to the limited literature on government information systems success in developing countries by providing empirical validation of established theoretical models in mandatory usage contexts. The findings indicate that both information system quality and perceived usefulness significantly influence user satisfaction with RGIS, with perceived usefulness being the dominant predictor. These results offer evidence-based guidance for government digital transformation initiatives and highlight the importance of user satisfaction in achieving successful system implementations.

The cultural and bureaucratic context analysis reveals that Indonesian collectivist values and hierarchical structures create specific patterns where functional collective benefits consistently outweigh individual technical experiences. These findings support user-centered approaches to system design, training programs emphasizing practical benefits, and organizational change strategies that align with cultural values prioritizing collective utility and practical outcomes.

The real-world impact of improved user satisfaction extends beyond individual user experience to broader governmental effectiveness and democratic accountability. Enhanced user satisfaction with RGIS directly translates to improved government efficiency through reduced processing times, decreased administrative errors, and streamlined inter-agency coordination. When government officials experience higher satisfaction with digital systems, they demonstrate increased compliance with data quality standards, more consistent system usage, and greater willingness to leverage advanced features, ultimately improving the accuracy and timeliness of public service delivery.

Furthermore, satisfied RGIS users contribute to enhanced governmental transparency by maintaining more comprehensive digital records, generating more reliable reporting data, and facilitating better audit trails. This improved data quality enables more evidence-based policy decisions and strengthens public trust in government operations. The economic implications are substantial: higher user satisfaction reduces training costs, minimizes system resistance, and decreases the likelihood of workaround behaviors that compromise data integrity and operational efficiency.

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