

EVALUATION OF THE IMPLEMENTATION OF SERVICE MANAGEMENT SYSTEMS IN GOVERNMENT AGENCIES USING THE DELONE AND MCLEAN MODEL

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ABSTRACT

The implementation of service management systems plays a crucial role in maintaining and enhancing the quality of services for users, including within government institutions. However, challenges such as slow system access and suboptimal features can affect service quality and user satisfaction. This study aims to evaluate the implementation of service management systems in government agencies using the DeLone and McLean model as the evaluation framework. A quantitative approach was employed through a survey method, involving respondents who are system users within the selected government institution. The research instrument was developed based on the six dimensions of the DeLone and McLean model: system quality, information quality, service quality, use, user satisfaction, and net benefits. The collected data were analyzed using Structural Equation Modeling - Partial Least Squares (SEM-PLS) to examine the relationships among variables. The results indicate that service quality and information quality have a significant impact on user satisfaction, while system quality does not significantly affect user satisfaction. Furthermore, user satisfaction and system use positively contribute to the net benefits perceived by the organization. These findings suggest that optimizing the service management system should focus on improving quality and meeting user needs. The contribution of this research is to provide data-driven recommendations for policymakers in optimizing service management systems in government agencies.

Keywords: system evaluation, service management system, government agency, DeLone and McLean, user satisfaction.

I. INTRODUCTION

Improving the quality of public services has become a primary focus in the bureaucratic reform efforts of government agencies. One strategic initiative undertaken is the implementation of service management systems based on information technology to ensure effective, efficient, and accountable service delivery. These systems enable centralized recording, monitoring, and management of service requests and support real-time decision-making processes.

However, in practice, service management systems in government environments often face numerous challenges, such as slow system access, a mismatch between available features and user needs, and suboptimal levels of user satisfaction. Therefore, a comprehensive system evaluation is

necessary to assess the effectiveness of its implementation and provide a sound basis for future development decisions.

The DeLone and McLean Model (2003) is a comprehensive information system evaluation framework that has been widely used across various sectors, including the public sector. This model evaluates information system success through six key dimensions: system quality, information quality, service quality, use, user satisfaction, and net benefits. Previous studies, such as (Ernawati et al., 2021), have demonstrated the model's capability to identify the critical factors that influence system implementation success.

This study aims to evaluate the implementation of service management systems in government agencies using the DeLone and McLean model. The main focus is to identify the key variables that influence system success and provide data-driven recommendations for optimizing the system in the future.

II. LITERATURE REVIEW

Information Systems and Service Management

An information system is an integration of information technology, business processes, and individual activities that utilize technology to collect, store, and manage data to support organizational management and operations. In an organizational context, information systems serve as the convergence of technology, processes, and human resources to support both operational and managerial functions. Meanwhile, service management refers to the activities of planning, organizing, operating, and supervising services to ensure alignment with organizational objectives (Firmansyah & Mahardhika, 2018).

Service Management Information Systems in Government Agencies

To support government institutions in fulfilling their duties in various administrative functions, the implementation of reliable Information and Communication Technology (ICT) governance is essential and should follow good governance principles. One example of good ICT governance practice within public agencies is the adoption of quality and service management systems along with information security standards based on international best practices. To facilitate implementation, government agencies often utilize service management information systems. These applications aid in recording, monitoring, and managing ICT service processes.

A concrete example of implementing information systems in government service management is the development of systems for managing civil registration documents, such as birth and death certificates. (Ridho Pratama et al., 2023) emphasize that implementing information systems in the Department of Population and Civil Registration (Disdukcapil) can enhance service quality by simplifying access for citizens who previously faced procedural complexities. Furthermore, effective implementation of service management information systems can reduce bureaucracy and accelerate decision-making processes. As highlighted by (Karim & Fachrie, 2024), mobile-based citizen complaint systems can improve interactions between government institutions and the public.

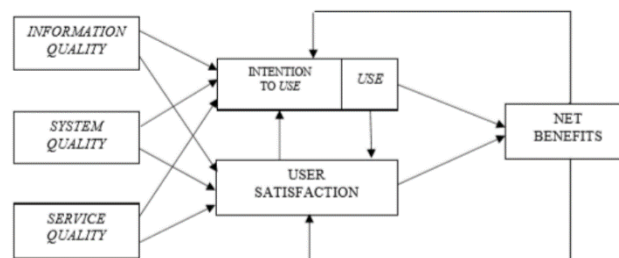
Additionally, evaluating and measuring service management systems is critical for improving and optimizing public services. (Fatmawati et al., 2022) found that the implementation of web-based information systems in public institutions can significantly influence user satisfaction, which in turn reflects the effectiveness of service management. Therefore, the continuous and strategic use of information technology in government environments can enhance service management and deliver substantial benefits to society.

Information System Success Evaluation Model: DeLone and McLean

The DeLone and McLean (2003) model is one of the most influential frameworks for evaluating information system success. It was developed through research that explored various dimensions of information systems and their impact on organizations, particularly in the context of IT implementation. The model consists of six interrelated dimensions: system quality, information quality, service quality, use, user satisfaction, and net benefits.

1. **System Quality** encompasses how an information system is designed and implemented, including its technical performance, stability, and ease of use. High system quality enables users to interact more effectively, which can improve user satisfaction and encourage more frequent system use. This is supported by DeLone and McLean (1992), who stated that a reliable and responsive system positively influences usage.
2. **Information Quality** focuses on the accuracy, clarity, relevance, and timeliness of the information generated by the system. High-quality information is crucial for supporting organizational decision-making. Studies have shown that organizations that provide accurate and reliable information tend to achieve higher user satisfaction and greater business value. (Ginting et al., 2023) emphasized that information quality serves as a bridge between the system and user satisfaction.
3. **Service Quality** refers to the support provided to users, including training, maintenance, and after-sales services. Good service quality creates a positive user experience and is essential for encouraging favorable evaluations of the information system. (Sholihin, 2021) found that responsive and professional service significantly contributes to user satisfaction.
4. **System Use** relates to how frequently and intensively users engage with the information system. High levels of usage indicate that the system meets user needs and functions effectively. Various studies have examined the relationship between system use and user satisfaction, highlighting that active use enhances satisfaction and the perceived benefits of the system.
5. **User Satisfaction** is a key indicator of how satisfied users are with the system based on its quality of information, service, and system performance. It can be measured through surveys and feedback and helps organizations evaluate system effectiveness. Dissatisfaction in this area may lead to decreased usage and overall system failure. (Rungkati & Hendrawan, 2023) affirmed that user satisfaction plays a crucial role in evaluating information systems.
6. **Net Benefits** refer to the final outcomes that an organization achieves from using the system, including operational efficiency, cost reduction, productivity improvement, and better customer service. The DeLone and McLean model posits that all six dimensions are interconnected and collectively contribute to increased organizational benefits (Ananda & Setyowati, 2022).

Compared to other models such as the Technology Acceptance Model (TAM) and Task-Technology Fit (TTF), the DeLone and McLean model provides a more comprehensive framework for evaluating information system success. While TAM focuses on user acceptance and TTF examines the fit between tasks and technology, the DeLone and McLean model considers technical, user interaction, and business impact aspects in an integrated manner. Hence, this model offers a deeper and more holistic perspective on information system success and its implications for organizations.

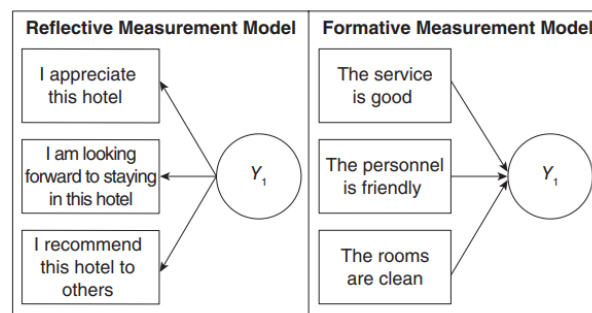


Source : (Delone & Mclean, 2003)

Figure 1. Delone and McLean Update Model

Quantitative Method and PLS-SEM Analysis

This study employed a quantitative method to analyze the relationships among variables within the DeLone and McLean model. Data were collected using a Likert-scale-based questionnaire and analyzed through the Partial Least Squares - Structural Equation Modeling (PLS-SEM) approach using SmartPLS software. PLS-SEM was chosen due to its ability to handle complex models and small sample sizes, as well as its flexibility in assessing model validity and reliability through both reflective and formative measurement models.



Source: (Sarstedt et al., 2017)

Figure 2. Reflective and Formative Measurement

According to (Hair et al., 2021), the PLS path model consists of two sub-models: the measurement model (also referred to as the outer model in PLS-SEM) and the structural model (also known as the inner model in PLS-SEM).

Table 1. PLS-SEM Evaluation Model

Measurement Evaluation Model	
Reflective Measurement Model	Formative Measurement Model
• Internal consistency (Cronbach's alpha, composite reliability) • Convergent validity (indicator reliability, average variance extracted) • Discriminant validity	• Convergent validity • Collinearity between indicators • Significance and relevance of outer weights
Structural Measurement Model	
• Coefficients of determination (R^2) • Predictive relevance (Q^2) • Size and significance of path coefficients • f^2 effect sizes • q^2 effect sizes	

Source: (Sarstedt et al., 2017)

III. METHODS

This study employed a quantitative approach to evaluate the success of implementing a service management information system in a government agency. The evaluation was based on the DeLone and

McLean (2003) model, which includes six main variables: system quality, information quality, service quality, use, user satisfaction, and net benefits.

Population and Sample

The population of this study consisted of employees within a government agency who actively use the service management information system. A non-probability sampling technique was applied, using purposive sampling. Respondents were selected based on specific criteria, such as the frequency of system use and their roles in IT services. Based on the Slovin formula, a total of 89 respondents were selected as the sample.

Data Collection Technique

Data were collected through an online questionnaire distributed to users of the service management information system. The questionnaire was developed based on indicators from each variable in the DeLone and McLean model. Each item was measured using a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

Research Model

This study adopted the DeLone and McLean model to evaluate the success of the service management information system implementation, consisting of six interrelated key variables.

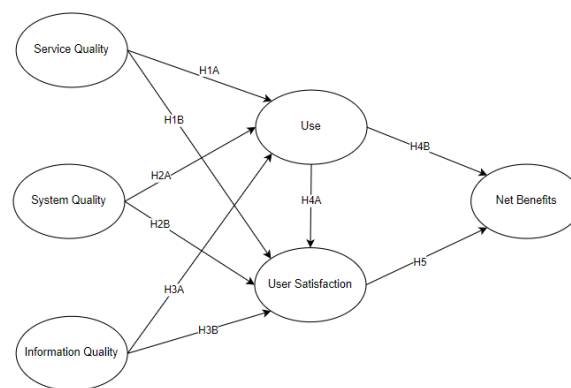


Figure 3. DeLone and McLean Research Model

The hypotheses proposed in this study are as follows:

- a) H1A: Service quality has a significant influence on system use.
- b) H1B: Service quality has a significant influence on user satisfaction.
- c) H2A: System quality has a significant influence on system use.
- d) H2B: System quality has a significant influence on user satisfaction.
- e) H3A: Information quality has a significant influence on system use.
- f) H3B: Information quality has a significant influence on user satisfaction.
- g) H4A: System use has a significant influence on user satisfaction.
- h) H4B: System use has a significant influence on net benefits.
- i) H5: User satisfaction has a significant influence on net benefits.

Data Analysis Technique

The collected data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with reflective measurement models, using SmartPLS version 3.2.9. PLS was chosen due to its ability to test relationships between latent variables simultaneously, even with relatively small sample sizes. The analysis was conducted in two stages:

1. Evaluation of the Measurement Model (Outer Model): This stage assessed the validity and reliability of the constructs. The criteria used are as follows:

Table 2. Measurement Model Criteria

Indicator	Criterion	Reference
<i>Cronbach's Alpha</i>	> 0,70	Hair et al (2017)
composite realibility	≥ 0,70	Hair et al (2017)
<i>outer loading</i>	≥ 0,60	Chin (2010)
average variance extracted (AVE)	≥ 0,50	Hair et al (2017)
cross-loading	AVE Root > inter-variable correlation	Hair et al (2017)
Fronell-Lacker	AVE Root > inter-variable correlation	Hair et al (2017)

2. Evaluation of the Structural Model (Inner Model): This stage assessed the relationships between latent variables. The following criteria were used:

Table 3. Structural Model Criteria

Inicator	Criterion	Reference
Multicollinearity Test	Vif < 5	Hair et al (2017)
p-value	< 0,05	Hair et al (2017)
R Square	High = (0,75), Medium = (0,50), Low = (0,25)	Hair et al (2021)
F Square	Tinggi = (0,35), Medium = (0,15), Low = (0,02)	Cohen (1988)
Q Square	> 0	Hair et al (2017)
SRMR	< 0,10	Hair et al (2017)

IV. RESULTS AND DISCUSSION

Measurement Model Testing Results (Outer Model)

The outer model assessment was conducted to ensure the validity and reliability of the indicators used in the study. The results show that all loading factor values exceeded the minimum threshold of 0.6, indicating a strong correlation between each indicator and its respective construct. Additionally, the Average Variance Extracted (AVE) values for each variable were above 0.5, signifying good convergent validity. The Composite Reliability (CR) and Cronbach's Alpha values for all constructs were above 0.7, demonstrating strong internal reliability.

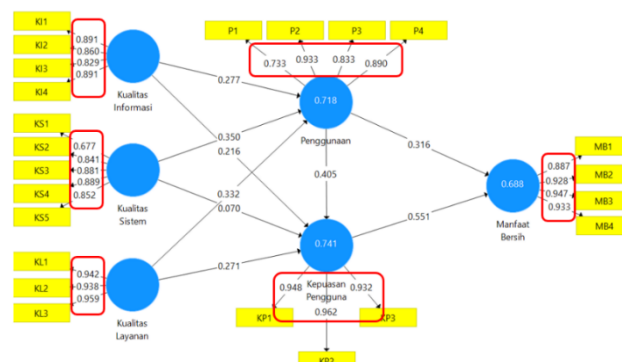


Figure 4. Path Model Outer Loadings

The discriminant validity test using the cross-loading method also showed that each indicator had higher loadings on its corresponding latent variable than on other latent variables. The Fornell-

Larcker criterion confirmed that the square root of each AVE value was greater than the inter-construct correlations.

Table 4. Fornell-Larcker Criterion Results

	User Satisfaction	Information Quality	Service Quality	System Quality	Net Benefits	Use
User Satisfaction	0,947					
Information Quality	0,716	0,868				
Service Quality	0,753	0,596	0,946			
System Quality	0,729	0,690	0,717	0,831		
Net Benefits	0,809	0,762	0,640	0,662	0,924	
Use	0,817	0,716	0,747	0,778	0,766	0,851

Structural Model Testing Results (Inner Model)

The inner model test was conducted to examine the relationships between latent variables. Based on the multicollinearity test among variables, the results indicate that all inner VIF values are below 5, suggesting the absence of multicollinearity issues. Meanwhile, the hypothesis testing using p-values shows that one hypothesis is rejected, namely the effect of system quality on user satisfaction, with a p-value of 0.528.

The analysis revealed R-square values of 0.741 for User Satisfaction, 0.718 for Use, and 0.688 for Net Benefits. These values indicate that the model can explain more than 50% of the variance in each dependent variable. The Q-square values for User Satisfaction, Use, and Net Benefits exceeded 0.5, demonstrating good predictive relevance.

Table 5. R Square Values

	R Square	R Square Adjusted
User Satisfaction	0,741	0,729
Net Benefits	0,688	0,681
Use	0,718	0,708

The f-square effect size values for each relationship among variables are summarized as follows:

- Information Quality → Use: 0.137 (approaching medium effect)
- Information Quality → User Satisfaction: 0.080 (small effect)
- System Quality → User Satisfaction: 0.006 (very weak/no effect)
- System Quality → Use: 0.164 (medium effect)
- Service Quality → User Satisfaction: 0.112 (small effect)
- Service Quality → Use: 0.182 (medium effect)
- Use → User Satisfaction: 0.179 (medium effect)
- Use → Net Benefits: 0.106 (small effect)

- i) User Satisfaction → Net Benefits: 0.324 (approaching large effect)

The SRMR value obtained was 0.054, indicating that the proposed model fits well with the empirical data.

Discussion

The results of this study indicate that Information Quality has a significant influence on both system use and user satisfaction, although its effect on user satisfaction is relatively weak. This finding is consistent with (Ernawati et al., 2021), who emphasized the importance of information quality in fostering user engagement.

Regarding System Quality, the results show a significant and positive effect on system use but no significant effect on user satisfaction. This suggests that while the system's technical features (such as availability, reliability, response time, and usability) encourage usage, they are not sufficient to generate a high level of user satisfaction. Weak system performance, such as slow response times, appears to be a contributing factor to lower satisfaction levels.

Despite the non-significant impact on satisfaction, the positive direction of the relationship implies that improving system quality may lead to higher user satisfaction in the future. This aligns with the findings of (DeLone & McLean, 2016), who highlighted system quality as a key determinant of IS success from the user perspective.

Service Quality was found to have a positive and significant effect on both user satisfaction and system use. This demonstrates the importance of technical support and assistance in encouraging users to engage with the system and enhancing their overall satisfaction.

However, based on the f-square test, the contribution of service quality to user satisfaction was categorized as small. This indicates that although the relationship is significant, the influence is still relatively weak and requires improvement.

Overall, the DeLone and McLean model proved to be effective in evaluating the implementation of service management information systems in government institutions. These findings provide a valuable foundation for future decision-making aimed at improving the quality and performance of such systems.

V. CONCLUSION

Conclusion

This study aimed to evaluate the success of implementing a Service Management Information System in a government agency using the DeLone and McLean model. Based on the analysis conducted using the PLS-SEM approach, the following conclusions were drawn:

1. Information quality has a significant effect on both system use and user satisfaction, although its effect on satisfaction is relatively low.
2. System quality and service quality both have weak effects on user satisfaction, indicating the need for improvements in technical aspects and support services of the system.
3. System use does not have a significant impact on user satisfaction. This implies that technical performance issues, such as slow response time, may contribute to low user satisfaction and are insufficient to create a positive user experience.
4. User satisfaction has a considerable impact on the net benefits perceived by the organization, emphasizing the importance of user experience as a critical indicator of system success.
5. The DeLone and McLean model has proven effective in comprehensively evaluating the implementation of service management systems in government agencies, particularly in identifying key variables that contribute to the system's success.

The DeLone and McLean model has proven effective in comprehensively evaluating the implementation of service management systems in government agencies, particularly in identifying key variables that contribute to the system's success

Recommendations

Based on the findings, the following recommendations are proposed:

1. Improve system quality by enhancing technical performance, stability, and ease of access to increase user satisfaction.
2. Optimize the relevance and accuracy of information content to better meet user needs, as information quality plays a critical role in encouraging system use.
3. Strengthen technical support services, such as the responsiveness of helpdesk teams and the availability of accessible system documentation, to improve service quality.
4. Provide regular training and user outreach to increase system utilization and ensure users fully understand the available features.
5. Implement continuous data-driven evaluation to ensure that the system remains adaptive to evolving organizational and user needs.

This study may serve as a preliminary reference for other government institutions seeking to evaluate information systems using the DeLone and McLean model. Future research is recommended to explore external factors such as organizational culture or digital leadership, which may influence system success.

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