

Analysis of the Successful Implementation of a Disaster Management Information System in Supporting Effective Disaster Response Decision-Making Using the DeLone and McLean IS Success Model

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Abstract. Disaster management requires accurate, reliable, and timely information to support effective decision making, particularly during emergency response situations. This study evaluates selected dimensions of DMIS implementation success - System Quality, Information Quality, User Satisfaction, and Decision-Making Effectiveness at the Regional Disaster Management Agency (Badan Penanggulangan Bencana Daerah - BPBD) of Langsa City.

Purpose: This study evaluates whether System Quality and Information Quality are associated with Decision-Making Effectiveness directly and through User Satisfaction in the implementation of a Disaster Management Information System.

Methods/Study design/approach: A quantitative approach was employed involving 35 employees of BPBD Langsa City who use disaster-management information systems. A saturated sampling technique was applied because the entire population was included as respondents. Data were collected using a five-point Likert-scale questionnaire and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS. The analysis consisted of measurement model evaluation and structural model evaluation.

Result/Findings: The measurement model demonstrated satisfactory validity and reliability, with all outer loading values exceeding 0.70, composite reliability values ranging from 0.908 to 0.937, and Average Variance Extracted values ranging from 0.665 to 0.749. System Quality had a positive and significant effect on Decision-Making Effectiveness ($\beta = 0.362$; $t = 2.779$; $p = 0.009$). Information Quality had a positive but non-significant effect ($\beta = 0.245$; $t = 1.710$; $p = 0.096$), while User Satisfaction also showed a positive but statistically non-significant effect at the 5% significance level ($\beta = 0.317$; $t = 2.021$; $p = 0.051$). The model explained 54.6% of the variance in Decision-Making Effectiveness.

Novelty/Originality/Value: This study extends the application of the DeLone and McLean IS Success Model to the public-sector disaster-management context by positioning Decision-Making Effectiveness as the organizational outcome of Disaster Management Information System implementation and User Satisfaction as a mediating construct.

Keywords: Disaster Management Information System, DeLone and McLean, System Quality, Information Quality, User Satisfaction, Decision-Making Effectiveness

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INTRODUCTION

Natural disasters can generate substantial social, economic, environmental, and infrastructural impacts, requiring public institutions to make rapid and accurate decisions based on reliable information. In Indonesia, digital government initiatives have increasingly been used to improve information accessibility, coordination, and institutional performance [1]. Evidence from public-sector digital transformation also shows that information-technology governance can influence organizational transformation and performance [2]-[3]. In disaster management, these capabilities are particularly important because local response decisions depend on whether information can be accessed rapidly, interpreted correctly, and coordinated across responsible units. In the BPBD Langsa context, this creates a practical evaluation problem: the availability of a Disaster Management Information System (DMIS) alone does not establish that the information it provides is sufficiently reliable, timely, and usable for operational decision making. This condition highlights the need to evaluate not only the availability of the DMIS, but also the quality of

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the system and information it provides, users' satisfaction, and its contribution to operational decision making.

At the local-government level, disaster-management agencies must process reports, verify incident information, coordinate response personnel, and determine appropriate actions within a limited time [4]-[5]. These activities require information that is not only available but also accurate, timely, and usable by different users according to their operational roles. The use of a DMIS is intended to facilitate these activities by providing information and communication support during disaster response [6]. However, the existence of an information system does not necessarily indicate that its implementation effectively supports decision making. Therefore, evaluating a DMIS requires consideration of both technical and user-oriented dimensions rather than merely confirming whether the system is available and operational.

Although digital technologies provide considerable potential for disaster management, the availability of a system does not automatically indicate successful implementation. The DeLone and McLean Information Systems Success Model provides a framework for evaluating information-system success through dimensions related to System Quality, Information Quality, Use, User Satisfaction, and Net Benefits [7]-[8]. In disaster response, the value of an information system should ultimately be interpreted in relation to its ability to support effective operational decisions, because decision making under emergency conditions requires the conversion of available information into timely and appropriate action [9]. In this study, selected dimensions of the model are adapted to examine System Quality, Information Quality, User Satisfaction, and Decision-Making Effectiveness as an organizational outcome.

The organizational context is equally important. Coordination between disaster-management agencies and other public institutions is a critical component of disaster response [10]-[11], while disaster-specific resource management requires reliable information for planning and operational continuity [12]. Post-disaster recovery studies in Aceh also emphasize the importance of institutional preparedness and policy implementation after disaster events [13]. More broadly, cross-sector communication has been identified as an important element in the implementation of public programs involving multiple actors [14]. These findings suggest that technological quality, information quality, user response, and organizational coordination should be considered together when evaluating information-system implementation in the public sector.

Information-system evaluation in disaster management has been approached from several technical and operational perspectives [8]. MAGMA Indonesia demonstrates how an e-government platform can support geological-disaster mitigation, emphasizing the role of digital information access in mitigation activities [15]. GIS-based network analysis has focused on evacuation-route planning [16], while GIS integrated with optimization has addressed disaster-logistics allocation [17]. Mobile GIS has also been used to map clean-water resources in affected areas [18], and long-range communication technologies have been proposed to strengthen emergency communication [19]-[20]. These studies demonstrate the importance of information technology for different disaster-management functions, including mitigation, evacuation, logistics, resource identification, and emergency communication. However, their evaluation emphases remain largely focused on specific technological capabilities or operational functions rather than on a common information-systems success framework. Consequently, technical capability or functional implementation alone does not indicate whether users perceive the system and its information as satisfactory or whether the system contributes to effective operational decisions. This methodological gap indicates the need for an integrated information-systems perspective that connects System Quality and Information Quality with User Satisfaction and Decision-Making Effectiveness.

Based on this research gap, this study evaluates selected dimensions of Disaster Management Information System implementation success at BPBD Langsa City by adapting the DeLone and McLean IS Success Model [7]. In this study, implementation success is operationalized through the relationships among System Quality, Information Quality, User Satisfaction, and Decision-Making Effectiveness, which are examined using Partial Least Squares Structural Equation Modeling (PLS-SEM). The study contributes to information-systems research by contextualizing IS-success evaluation within disaster management and by positioning Decision-Making Effectiveness as an explicit organizational outcome.

METHODS

This study employed a quantitative approach to evaluate selected dimensions of Disaster Management Information System implementation success at BPBD Langsa City. The research model was developed by adapting the DeLone and McLean Information Systems Success Model. Four constructs were analyzed: System Quality (X1), Information Quality (X2), User Satisfaction (Z), and Decision-Making Effectiveness (Y) [7].

The research process consisted of several stages, as illustrated in Figure 1, including identification of the research problem, development of the conceptual model and research instrument, questionnaire distribution, data collection, measurement model evaluation, structural model evaluation, hypothesis testing using bootstrapping, and interpretation of the research findings. The instrument-development process was aligned with the identified operational problem and the constructs specified in the proposed evaluation model.

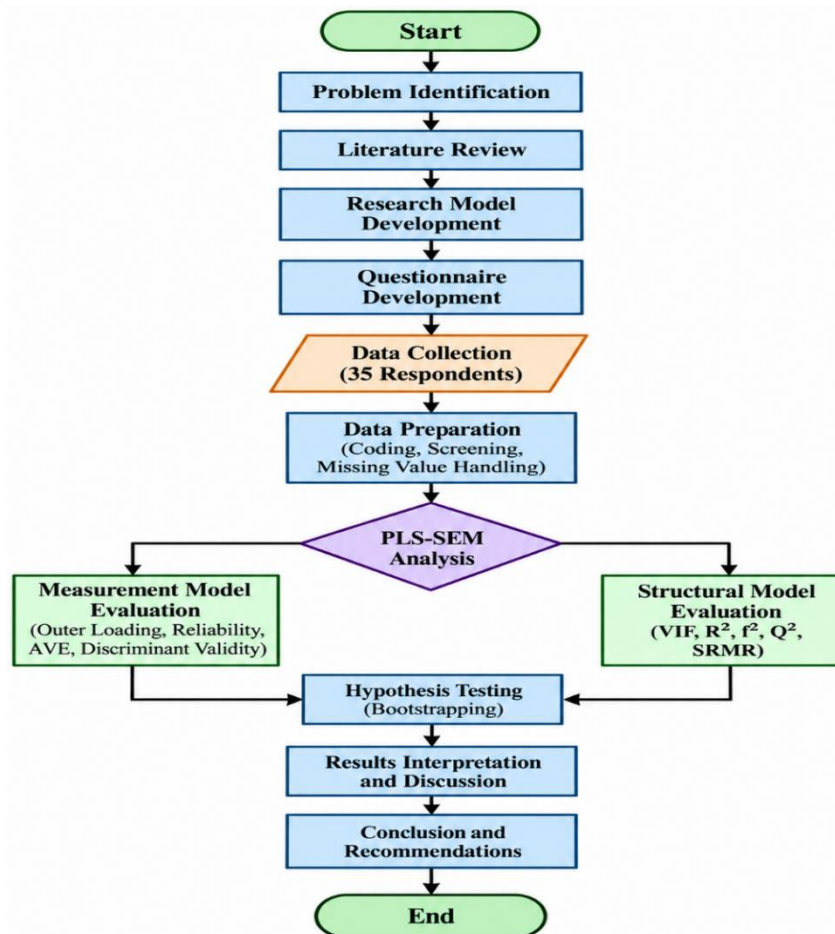


Figure 1. Research stages

Population and Data Collection

The population of this study consisted of 35 active employees of the Regional Disaster Management Agency (Badan Penanggulangan Bencana Daerah - BPBD) of Langsa City who had access to and experience in using the Disaster Management Information System (DMIS) based on the *Panic Button* application. The DMIS has been implemented and operated by BPBD Langsa City since January 2024 to support early warning, emergency reporting, incident monitoring, and disaster response coordination. Data collection was conducted from June to July 2026.

Considering the relatively small population and the specific characteristics of the system users, this study employed a total sampling (census) technique, in which all members of the target population who met the respondent criteria were included in the study. Thus, the final sample consisted of 35 respondents. The

eligibility criteria included active BPBD Langsa City employees who had access to the DMIS and had experience operating the system in carrying out their respective duties.

The respondents represented different operational roles within BPBD Langsa City, including managerial and structural personnel, Pusdalops (Operations Control Center) operators, Rapid Response Team (TRC) and field personnel, and administrative and evaluation staff. Managerial personnel primarily used the system dashboard for monitoring, report validation, and supporting emergency response decisions. Pusdalops operators used the system for monitoring incoming reports, verifying information, and coordinating responses, while TRC and field personnel used the system to receive response information, update handling status, and report field conditions. Administrative and evaluation staff used historical system data for reporting, evaluation, and disaster-data archiving.

The frequency of DMIS use varied according to the respondents' operational roles. Pusdalops operators generally used the system on a daily basis as part of routine monitoring duties, whereas field and managerial personnel used the system according to operational needs, particularly when potential or actual disaster events occurred. Since the system had been operational since January 2024, respondents had experience using the system within the operational period preceding data collection, although the individual duration of use could vary according to their respective assignments.

Data were collected using a structured questionnaire with a five-point Likert scale. Before completing the questionnaire, all respondents received an informed consent statement explaining the purpose of the study, the voluntary nature of participation, and the confidentiality of the information provided. The data-collection process was conducted with official permission from BPBD Langsa City through the Research Data Collection Permission Letter No. 2441/DST/UN.54.6/PT.01.05/2026.

Research Variables

The research model consists of four latent variables. System Quality (X1) and Information Quality (X2) are positioned as exogenous variables, User Satisfaction (Z) as the mediating variable, and Decision-Making Effectiveness (Y) as the endogenous variable. Each construct was measured using five reflective indicators. System Quality was measured using X1.1–X1.5, Information Quality using X2.1–X2.5, User Satisfaction using Z1–Z5, and Decision-Making Effectiveness using Y1–Y5.

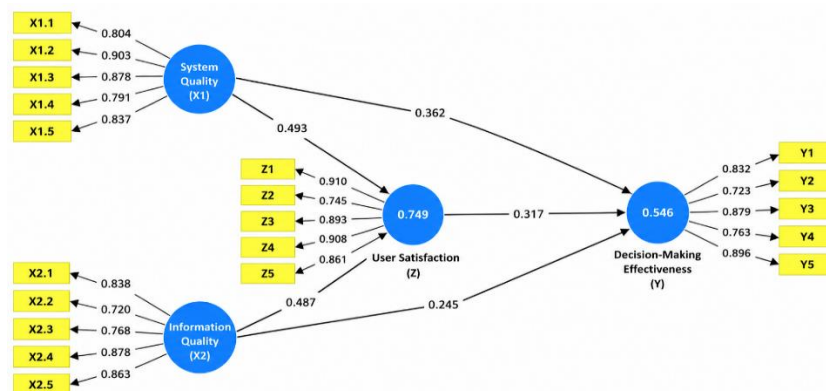


Figure 2. Research model

PLS-SEM Analysis

The collected data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS. The analysis consisted of two main stages: measurement model evaluation (*outer model*) and structural model evaluation (*inner model*). The measurement model was evaluated using outer loading, Cronbach's alpha, rho_A, composite reliability, Average Variance Extracted (AVE), Fornell-Larcker criterion, cross loading, and Heterotrait-Monotrait Ratio (HTMT). Indicators with outer loading values greater than 0.70 were considered to have satisfactory convergent validity. Construct reliability was established when Cronbach's alpha and composite reliability exceeded 0.70, while AVE values greater than 0.50 indicated satisfactory convergent validity. The structural model was evaluated using the Variance Inflation Factor (VIF), path coefficients, bootstrapping, coefficient of determination (R^2), effect size (f^2),

predictive relevance (Q^2), and Standardized Root Mean Square Residual (SRMR). A relationship was considered statistically significant when the t-statistic exceeded 1.96 and the p-value was below 0.05.

RESULT AND DISCUSSION

The evaluation of the Disaster Management Information System (DMIS) was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM). The analysis consisted of two main stages: measurement model assessment and structural model assessment. The measurement model was evaluated to determine indicator validity, construct reliability, convergent validity, and discriminant validity. Subsequently, the structural model was assessed to examine explanatory power, effect size, predictive relevance, and the significance of the hypothesized relationships among System Quality, Information Quality, User Satisfaction, and Decision-Making Effectiveness.

Measurement Model Evaluation

The measurement model was first evaluated using outer loading values to determine whether each indicator adequately represents its corresponding latent construct. An indicator is considered to demonstrate satisfactory convergent validity when its outer loading value exceeds 0.70. The results are presented in Table 1.

Table 1. Outer Loading Results

Indicator	X1	X2	M	Y	Result
X1.1	0,804				Valid
X1.2	0,903				Valid
X1.3	0,878				Valid
X1.4	0,791				Valid
X1.5	0,837				Valid
X2.1		0,838			Valid
X2.2		0,720			Valid
X2.3		0,768			Valid
X2.4		0,878			Valid
X2.5		0,863			Valid
Z1			0,910		Valid
Z2			0,745		Valid
Z3			0,893		Valid
Z4			0,908		Valid
Z5			0,861		Valid
Y1				0,832	Valid
Y2				0,723	Valid
Y3				0,879	Valid
Y4				0,763	Valid
Y5				0,896	Valid

As shown in Table 1, all indicators have outer loading values above 0.70, ranging from 0.720 to 0.910. Therefore, all indicators satisfy the convergent validity criterion and no indicator needs to be removed from the measurement model. The highest loading is observed for Z1 (0.910), followed by Z4 (0.908) and X1.2 (0.903). These results indicate that the indicators adequately represent their respective constructs. The measurement model was subsequently evaluated through internal consistency reliability and Average Variance Extracted (AVE). The results are presented in Table 2.

Table 2. Reliability and Convergent Validity

Construct	Cronbach's Alpha	rho_A	Composite Reliability	AVE	Result
System Quality (X1)	0,899	0,894	0,925	0,712	Reliable and Valid
Information Quality (X2)	0,875	0,874	0,908	0,665	Reliable and Valid
User Satisfaction (Z)	0,915	0,916	0,937	0,749	Reliable and Valid
Decision-Making Effectiveness (Y)	0,877	0,883	0,912	0,675	Reliable and Valid

Table 2 shows that Cronbach's Alpha values range from 0.875 to 0.915, while Composite Reliability values range from 0.908 to 0.937. All values exceed the recommended threshold of 0.70, indicating satisfactory

internal consistency reliability. In addition, AVE values range from 0.665 to 0.749, exceeding the minimum threshold of 0.50. Thus, the four constructs demonstrate adequate reliability and convergent validity.

Discriminant Validity

Discriminant validity was evaluated to ensure that each construct measures a concept that is empirically distinct from the other constructs. The assessment was conducted using the Fornell-Larcker criterion and the Heterotrait-Monotrait Ratio (HTMT), as presented in Table 3.

Table 3. Discriminant Validity Assessment Using the Fornell-Larcker Criterion

Construct	X1	X2	Z	Y
System Quality (X1)	0,844			
Information Quality (X2)	0,230	0,815		
User Satisfaction (Z)	0,626	0,451	0,866	
Decision-Making Effectiveness (Y)	0,617	0,471	0,654	0,821

The diagonal values in Table 3 represent the square root of the AVE for each construct. System Quality has a value of 0.844, Information Quality 0.815, User Satisfaction 0.866, and Decision-Making Effectiveness 0.821. Each diagonal value is higher than the corresponding inter-construct correlations. Therefore, the Fornell-Larcker criterion indicates satisfactory discriminant validity. To strengthen the discriminant validity assessment, HTMT was also examined, as presented in Table 4.

Table 4. Heterotrait-Monotrait Ratio (HTMT)

Construct Pair	HTMT	Result
System Quality ↔ Information Quality	0,290	Satisfied
System Quality ↔ User Satisfaction	0,685	Satisfied
System Quality ↔ Decision-Making Effectiveness	0,682	Satisfied
Information Quality ↔ User Satisfaction	0,477	Satisfied
Information Quality ↔ Decision-Making Effectiveness	0,501	Satisfied
User Satisfaction ↔ Decision-Making Effectiveness	0,715	Satisfied

All HTMT values are below the threshold of 0.90. The highest HTMT value is observed between User Satisfaction and Decision-Making Effectiveness (0.715), whereas the lowest is between System Quality and Information Quality (0.290). These findings confirm that the constructs in the proposed model are sufficiently distinct from one another. Overall, the measurement model satisfies the reliability, convergent validity, and discriminant validity requirements, allowing the analysis to proceed to the structural model. The satisfactory measurement properties are important because empirical evaluation depends on whether the selected indicators consistently represent the constructs being assessed. Across different applied settings, researchers have evaluated technology-enabled effectiveness through user responses and measurable outcomes [21], organizational risk-management effectiveness [22], accountability-system implementation [23], work-partner motivation and hygiene factors, and organizational adaptation through online strategies. These studies address different substantive domains and are not treated as direct evidence for disaster-management information systems; rather, they illustrate the broader methodological importance of matching indicators and evaluation criteria to the specific organizational outcome under investigation.

Structural Model Evaluation

After establishing the adequacy of the measurement model, the structural model was evaluated to determine the relationships among the latent variables. Collinearity was initially examined using the Variance Inflation Factor (VIF). The VIF values for System Quality, Information Quality, and User Satisfaction in predicting Decision-Making Effectiveness are 1.655, 1.262, and 1.967, respectively. Since all VIF values are below 5, the model does not indicate problematic multicollinearity among the predictor constructs. The explanatory power of the structural model was subsequently assessed using the coefficient of determination (R^2), as presented in Table 5.

Table 5. Coefficient of Determination (R^2)

Endogenous Construct	R^2	Adjust R^2	Interpretation
Decision-Making Effectiveness (Y)	0,546	0,502	Moderate

The R^2 value of 0.546 indicates that System Quality, Information Quality, and User Satisfaction collectively explain 54.6% of the variance in Decision-Making Effectiveness. The remaining 45.4% is associated with other determinants that are not incorporated into the current structural model. The adjusted R^2 value of 0.502 further demonstrates moderate explanatory capability. This finding is relevant in the context of disaster management because decision-making effectiveness is unlikely to depend exclusively on information-system characteristics. Disaster-response decisions may also be influenced by inter-agency coordination [10], resource-management requirements [12], post-disaster institutional readiness [13], and cross-sector communication [14]. Therefore, an explanatory power of 54.6% indicates that the information-system factors incorporated into this study constitute an important component of decision effectiveness while leaving room for organizational and environmental determinants.

Effect Size (f^2)

The contribution of each predictor to Decision-Making Effectiveness was further evaluated using effect size (f^2). The results are shown in Table 6.

Relationship	f^2	Interpretation
System Quality → Decision-Making Effectiveness	0,175	Medium
Information Quality → Decision-Making Effectiveness	0,105	Small
User Satisfaction → Decision-Making Effectiveness	0,112	Small

System Quality has the largest effect size on Decision-Making Effectiveness, with $f^2 = 0.175$, which indicates a medium effect. In comparison, Information Quality ($f^2 = 0.105$) and User Satisfaction ($f^2 = 0.112$) demonstrate relatively small effects. These findings suggest that the technical performance of the system contributes more strongly to decision-making effectiveness than the other predictors included in the current structural model.

Predictive Relevance and Model Fit

Predictive relevance was assessed using the Stone-Geisser Q^2 value. The analysis produced a Q^2 value of 0.546, which is greater than zero. This indicates that the model possesses predictive relevance for Decision-Making Effectiveness. The Standardized Root Mean Square Residual (SRMR) was also examined to evaluate model fit. The SRMR value obtained was 0.114, exceeding the criterion of 0.08 used in this study. Consequently, the model demonstrates meaningful explanatory and predictive capability based on R^2 and Q^2 , but its overall model fit remains suboptimal. This result suggests that refinement of the structural model may be required, particularly by considering additional determinants of disaster-response decision making.

Hypothesis Testing

Hypothesis testing was conducted using the bootstrapping procedure to evaluate the significance of the direct and indirect relationships among System Quality (X1), Information Quality (X2), User Satisfaction (Z), and Decision-Making Effectiveness (Y). A hypothesis was considered supported when the t-statistic exceeded 1.96 and the p-value was below 0.05. The direct effects are presented in Table 7, while the mediating effects of User Satisfaction are presented in Table 8.

Hypothesis	Relationship	Path Coefficient (β)	t-statistic	p-value	Decision
H1	System Quality (X1) → Decision-Making Effectiveness (Y)	0.362	2.779	0.009	Supported
H2	Information Quality (X2) → Decision-Making Effectiveness (Y)	0.245	1.710	0.096	Not Supported
H3	User Satisfaction (Z) → Decision-Making Effectiveness (Y)	0.317	2.021	0.051	Not Supported
H4	System Quality (X1) → User Satisfaction (Z)	0.493	2.757	0.006	Supported
H5	Information Quality (X2) → User Satisfaction (Z)	0.487	2.690	0.007	Supported

As presented in Table 8, three of the five direct hypotheses are supported. System Quality has a positive and significant effect on both Decision-Making Effectiveness and User Satisfaction. Information Quality significantly influences User Satisfaction but does not demonstrate a significant direct effect on Decision-Making Effectiveness. Meanwhile, User Satisfaction has a positive but statistically non-significant direct effect on Decision-Making Effectiveness at the 5% significance level.

For **H1**, System Quality has a positive and significant effect on Decision-Making Effectiveness ($\beta = 0.362$; $t = 2.779$; $p = 0.009$). Therefore, H1 is supported. This result indicates that improvements in the technical characteristics of the Disaster Management Information System contribute to more effective disaster-response decision making. A reliable, accessible, responsive, and technically stable system can facilitate rapid access to operational information and minimize technical barriers during disaster-response activities.

For **H2**, Information Quality has a positive but non-significant effect on Decision-Making Effectiveness ($\beta = 0.245$; $t = 1.710$; $p = 0.096$). Therefore, H2 is not supported. Although better information quality tends to improve decision effectiveness, accurate, relevant, complete, and timely information alone may not automatically lead to effective disaster-response decisions. Decision making in emergency response requires information to be interpreted and converted into appropriate action [9], while coordination among responsible institutions may also determine whether information can be used effectively [10].

For **H3**, User Satisfaction has a positive effect on Decision-Making Effectiveness ($\beta = 0.317$; $t = 2.021$; $p = 0.051$). Although the t-statistic exceeds 1.96, the p-value is slightly above the 0.05 threshold. Consequently, H3 is not supported at the 5% significance level. Nevertheless, the positive coefficient and the p-value close to the significance threshold indicate a tendency for higher User Satisfaction to be associated with greater Decision-Making Effectiveness. This suggests that satisfaction with the system may contribute to decision support, although it is not sufficient as an independent direct determinant.

For **H4**, System Quality has a positive and significant effect on User Satisfaction ($\beta = 0.493$; $t = 2.757$; $p = 0.006$). Therefore, H4 is supported. This finding demonstrates that improvements in system reliability, accessibility, responsiveness, ease of use, and technical functionality increase users' satisfaction with the Disaster Management Information System. Users are more likely to evaluate the system positively when it operates consistently and facilitates their operational activities without significant technical difficulties.

For **H5**, Information Quality has a positive and significant effect on User Satisfaction ($\beta = 0.487$; $t = 2.690$; $p = 0.007$). Therefore, H5 is supported. The result indicates that users tend to be more satisfied when the information provided by the system is accurate, relevant, complete, understandable, and timely. This finding emphasizes that User Satisfaction is influenced not only by technical system performance but also by the quality of the information generated by the system.

Mediation Effect of User Satisfaction

In addition to the direct relationships, this study examines the mediating role of User Satisfaction in the relationships between System Quality and Information Quality toward Decision-Making Effectiveness. The mediation analysis was conducted using the *Specific Indirect Effects* generated through the bootstrapping procedure. The results are presented in Table 8.

Table 8. Specific Indirect Effects

Hypothesis	Relationship	Path Coefficient (β)	t-statistic	p-value	Decision
H6	System Quality (X1) $\rightarrow$ User Satisfaction (Z) $\rightarrow$ Decision-Making Effectiveness (Y)	0.156	2.351	0.019	Supported
H7	Information Quality (X2) $\rightarrow$ User Satisfaction (Z) $\rightarrow$ Decision-Making Effectiveness (Y)	0.154	2.244	0.025	Supported

As shown in Table 9, both indirect relationships are statistically significant. These results indicate that User Satisfaction plays a mediating role in the relationships between System Quality and Information Quality toward Decision-Making Effectiveness.

For **H6**, the indirect effect of System Quality on Decision-Making Effectiveness through User Satisfaction is positive and significant ($\beta = 0.156$; $t = 2.351$; $p = 0.019$). Therefore, H6 is supported. This finding demonstrates that improvements in System Quality can increase User Satisfaction, which subsequently contributes to greater Decision-Making Effectiveness. Thus, the contribution of System Quality to disaster-response decision making occurs not only through its direct effect but also through users' positive evaluation of the system.

For **H7**, Information Quality has a positive and significant indirect effect on Decision-Making Effectiveness through User Satisfaction ($\beta = 0.154$; $t = 2.244$; $p = 0.025$). Therefore, H7 is supported. This result is particularly important because the direct effect of Information Quality on Decision-Making Effectiveness in H2 is not significant, whereas its indirect effect through User Satisfaction is significant. The finding suggests that the contribution of Information Quality to decision-making effectiveness operates through users' satisfaction with the information provided by the system.

Overall Hypothesis Testing Results

To provide a concise overview of the structural model, the results of all seven hypotheses are summarized in Table 9.

Table 9. Summary of Hypothesis Testing

Hypothesis	Relationship	(β)	p-value	Decision
H1	System Quality (X1) $\rightarrow$ Decision-Making Effectiveness (Y)	0.362	0.009	Supported
H2	Information Quality (X2) $\rightarrow$ Decision-Making Effectiveness (Y)	0.245	0.096	Not Supported
H3	User Satisfaction (Z) $\rightarrow$ Decision-Making Effectiveness (Y)	0.317	0.051	Not Supported
H4	System Quality (X1) $\rightarrow$ User Satisfaction (Z)	0.493	0.006	Supported
H5	Information Quality (X2) $\rightarrow$ User Satisfaction (Z)	0.487	0.007	Supported
H6	System Quality (X1) $\rightarrow$ User Satisfaction (Z) $\rightarrow$ Decision-Making Effectiveness (Y)	0.156	0.019	Supported
H7	Information Quality (X2) $\rightarrow$ User Satisfaction (Z) $\rightarrow$ Decision-Making Effectiveness (Y)	0.154	0.025	Supported

Overall, five of the seven proposed hypotheses are supported. System Quality demonstrates a significant direct effect on Decision-Making Effectiveness and User Satisfaction, whereas Information Quality significantly affects User Satisfaction but does not directly affect Decision-Making Effectiveness. User Satisfaction itself does not show a statistically significant direct effect on Decision-Making Effectiveness at the 5% level. However, the significant indirect effects in H6 and H7 indicate that User Satisfaction serves as an important mechanism connecting the technical and informational characteristics of the system with Decision-Making Effectiveness.

The results provide an important interpretation of the adapted DeLone and McLean IS Success Model [7] in the context of disaster management. System Quality emerges as an important technological determinant because it has both a significant direct effect on Decision-Making Effectiveness and an indirect effect through User Satisfaction. Meanwhile, Information Quality primarily contributes to Decision-Making Effectiveness through User Satisfaction rather than through a statistically significant direct relationship. These findings indicate that the successful implementation of a Disaster Management Information System depends not only on the technical reliability and quality of information produced by the system, but also on how these characteristics shape users' satisfaction and subsequently support disaster-response decision processes [14].

CONCLUSION

This study evaluated selected dimensions of Disaster Management Information System (DMIS) implementation success in supporting disaster-response decision making at BPBD Langsa City using an adapted DeLone and McLean Information Systems Success Model. The results demonstrate that System Quality plays a central role within the evaluated model, as it has a positive and significant direct effect on Decision-Making Effectiveness ($\beta = 0.362$; $p = 0.009$) and User Satisfaction ($\beta = 0.493$; $p = 0.006$). Information Quality also significantly influences User Satisfaction ($\beta = 0.487$; $p = 0.007$), although its direct effect on Decision-Making Effectiveness is not statistically significant ($\beta = 0.245$; $p = 0.096$).

Similarly, User Satisfaction shows a positive but non-significant direct effect on Decision-Making Effectiveness ($\beta = 0.317$; $p = 0.051$). The mediation analysis further indicates that User Satisfaction significantly mediates the effects of both System Quality ($\beta = 0.156$; $p = 0.019$) and Information Quality ($\beta = 0.154$; $p = 0.025$) on Decision-Making Effectiveness. Overall, five of the seven proposed hypotheses are supported, indicating that the evaluated dimensions of DMIS implementation success involve not only the technical and informational characteristics of the system but also how these characteristics shape users' satisfaction. These findings highlight the importance of improving system reliability, accessibility, responsiveness, and information quality while simultaneously strengthening the user experience of DMIS.

From a practical perspective, BPBD Langsa City can prioritize these aspects to enhance the contribution of information systems to faster and more effective disaster-response decisions. Future studies are recommended to involve larger samples, examine disaster-management institutions in different regions, and incorporate additional organizational factors such as user competence, inter-agency coordination, and institutional readiness to provide a more comprehensive explanation of DMIS success. These implications should be interpreted within the wider disaster-management environment, where coordination, resource management, institutional readiness, and cross-sector communication also shape operational effectiveness [10]–[14].

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