

SIMRS Success through User Satisfaction Using DeLone McLean and Demographic Factors

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ABSTRACT

Digital transformation in the healthcare sector encourages hospitals to adopt Hospital Information Systems (HIS), known in Indonesia as SIMRS to improve service efficiency and data management quality. However, the success of SIMRS implementation is strongly influenced by system quality, information quality, service quality, and users' perceptions of the technology. This study aims to evaluate the success factors of SIMRS at RSIJ Pondok Kopi by integrating Perceived Usefulness and demographic factors into the DeLone and McLean (D&M) Information System Success Model through user satisfaction. This research method is a quantitative design with *cross sectional* study using the PLS-SEM approach. The sample consisted of 62 SIMRS users selected using a total sampling technique. The study was conducted from May to August 2025. The results show that information quality and system quality significantly affect perceived usefulness, perceived usefulness significantly affects user satisfaction, and user satisfaction significantly affects net benefits. In addition, perceived usefulness has a significant indirect effect on net benefits. Meanwhile, demographic factors are not the main determinants of SIMRS success. Therefore, hospital management is recommended to prioritize improving information quality to optimize the effectiveness of SIMRS implementation.

Keywords: Delone & Mclean; Demographic Factors; Hospital Information Systems; Perceived Usefulness; User Satisfaction

INTRODUCTION

Hospital Information Systems (HIS), known in Indonesia as SIMRS, have become a vital infrastructure in supporting digital transformation in hospitals. SIMRS enables improvements in patient data accuracy, operational efficiency, and information-based decision making. Nevertheless, its implementation often encounters both technical and non-technical challenges that affect system performance, user acceptance, and overall success. Evaluating the effectiveness of SIMRS is therefore essential to ensure that the system delivers optimal benefits for healthcare organizations and their users. One of the most widely adopted frameworks for assessing information system success is the DeLone and McLean Information System Success Model, which consists of system quality, information quality, service quality, use, user satisfaction, and net benefits (1).

Previous studies have extended this model by incorporating additional factors such as perceived usefulness and user characteristics to better explain system acceptance and impact in healthcare environments. Research based on the Technology Acceptance Model (TAM) emphasizes that perceived usefulness is a key determinant of users' attitudes, satisfaction, and intention to use information systems (2). Similarly, studies in health information systems show that system quality, information quality, and service quality have significant positive effects on perceived usefulness and user satisfaction (3)(4). These findings indicate that the technical and informational aspects of a system strongly shape how users evaluate its usefulness and performance.

Other studies have reported that user satisfaction significantly influences net benefits, confirming the core structure of the DeLone and McLean model in hospital settings. Hidayah et al. (2024) demonstrated that net benefits are closely associated with user satisfaction in the evaluation of hospital information systems (5). Similarly, Putra & Darmawan (2021) found that system quality, information quality, and service quality significantly affect user satisfaction in the Hospital Administrative Information System (SIARS)(6). Kurniawan (2020) combined the DeLone and McLean model with TAM and showed that system quality and perceived ease of use influence perceived usefulness, while service quality, perceived ease of use, and perceived usefulness significantly affect user satisfaction, which in turn impacts net benefits (7).

In addition to system-related factors, demographic characteristics have been widely examined in technology adoption research, particularly in the Unified Theory of Acceptance and Use of Technology (UTAUT). Variables such as age, gender, education level, and work experience are often treated as moderators of technology acceptance (8). However, their effects on concrete outcomes such as user satisfaction and net benefits remain inconsistent. Ainaa Azmi et al. (2022) found that demographic factors significantly influenced satisfaction with electronic medical record systems, where users with diploma-level education were more likely to be satisfied than those with higher education, and female users showed higher satisfaction levels than male users (9). These mixed findings indicate that the role of demographic factors in determining HIS success is still debatable and context-dependent.

Despite the extensive literature, most studies examine perceived usefulness or demographic factors separately, or treat demographic variables merely as moderators without fully integrating them into the DeLone and McLean success framework. Moreover, empirical evidence that combines system quality dimensions, perceived usefulness, demographic factors, user satisfaction, and net benefits in a single integrated model, particularly in Indonesian hospital settings, remains limited. This gap highlights the need for further research that systematically incorporates these variables into a unified evaluation framework.

A preliminary study conducted at RSIJ Pondok Kopi through interviews with several SIMRS users revealed that system performance remains a major concern. Although SIMRS has been implemented since 2018 and has undergone several improvements, users still experience slow system response, especially during data entry and data retrieval processes. The system also frequently encounters technical errors and accessibility problems, particularly during peak usage hours when many users access the system simultaneously. These conditions reduce efficiency and create difficulties in situations where healthcare services must be delivered quickly and accurately. Such findings indicate that system quality is closely related to the perceived benefits and satisfaction of users.

The novelty of this study lies in the integration of perceived usefulness and demographic factors directly into the DeLone and McLean Information System Success Model through user satisfaction as a mediating variable. Unlike previous studies that examined these variables partially or separately, this research proposes a more comprehensive model that simultaneously evaluates technical quality dimensions, users' perceptions, and demographic characteristics in explaining SIMRS success. In addition, this study extends the prior research by developing a more integrative analytical framework to better capture the multidimensional nature of SIMRS success in a hospital environment.

Therefore, the objective of this study is to evaluate the success factors of SIMRS at RSIJ Pondok Kopi by integrating perceived usefulness and demographic factors (age, education level, work period, and gender) into the DeLone and McLean Information System Success Model through user satisfaction. This study is expected to contribute academically by refining the application of the DeLone and McLean model in healthcare information systems and practically by providing evidence-based recommendations for hospital management to improve SIMRS performance and effectiveness.

METHODS

This study employed a quantitative approach using Partial Least Square–Structural Equation Modeling (PLS-SEM) with SmartPLS version 3.0. The population and sample consisted of 62 SIMRS users at RSIJ Pondok Kopi. A saturated sampling technique was applied, in which all members of the population were included as research respondents. The research was conducted from May to August 2025. Data were collected using a structured questionnaire developed based on the DeLone and McLean Information System Success (D&M IS Success) Model, which was modified by adding the constructs of Perceived Usefulness and Demographic Factors. The independent variables in this study included System Quality, Information Quality, Service Quality, Perceived Usefulness, User Satisfaction, and Demographic Factors, namely Age, Work Period, Education Level, and Gender. The dependent variable was Net Benefit.

Data analysis was conducted in two main stages: the measurement model (outer model) and the structural model (inner model). The outer model evaluation aimed to assess the validity and reliability of the measurement instruments using four criteria (10):

- a. Convergent validity, assessed by outer loading values ≥ 0.70 .
- b. Discriminant validity, where the square root of AVE must be greater than the correlations among latent variables and $AVE \geq 0.50$.
- c. Collinearity test (VIF), with criteria:
 - 1) $VIF \geq 5$ indicates serious multicollinearity,
 - 2) VIF between 3–5 indicates potential collinearity,
 - 3) $VIF < 3$ indicates no serious multicollinearity.
- d. Reliability test, where Composite Reliability and Cronbach's Alpha values ≥ 0.70 indicate high reliability. For explanatory research, Composite Reliability between 0.60–0.70 and Cronbach's Alpha > 0.60 are still acceptable (11).

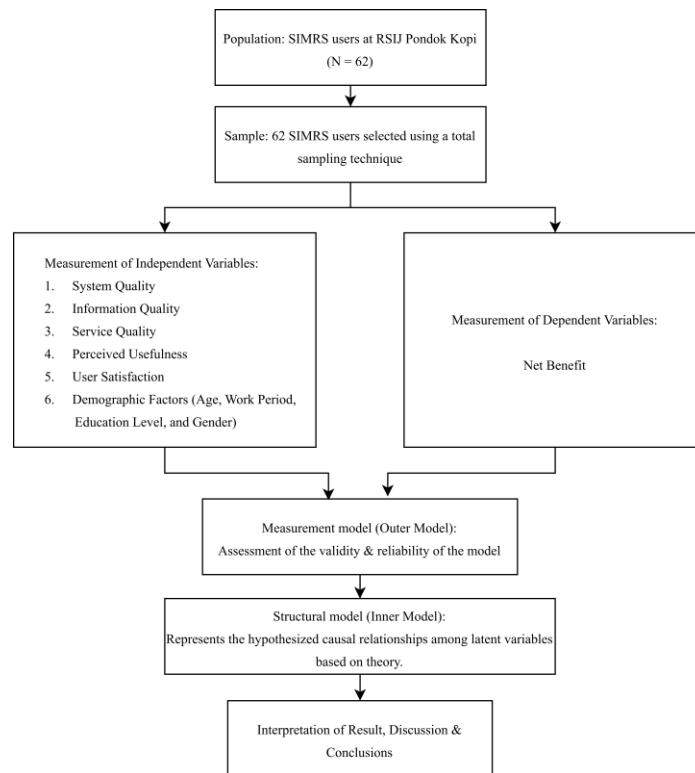


Figure 1. Research Stages Flowchart

After the outer model evaluation, the inner model was assessed using (10):

- a. Coefficient of determination (R^2):
 - 1) $R^2 = 0.75$ (strong),
 - 2) $R^2 = 0.50$ (moderate),
 - 3) $R^2 = 0.25$ (weak).
- b. Effect size (f^2):
 - 1) 0.02 (small effect),
 - 2) 0.15 (medium effect),
 - 3) 0.35 (large effect).
- c. Model fit (Goodness of Fit) using SRMR (Standardized Root Mean Square Residual):
 - 1) $SRMR \leq 0.08$ indicates good fit,
 - 2) $SRMR 0.08-0.10$ indicates acceptable fit,
 - 3) $SRMR \geq 0.10$ indicates poor fit

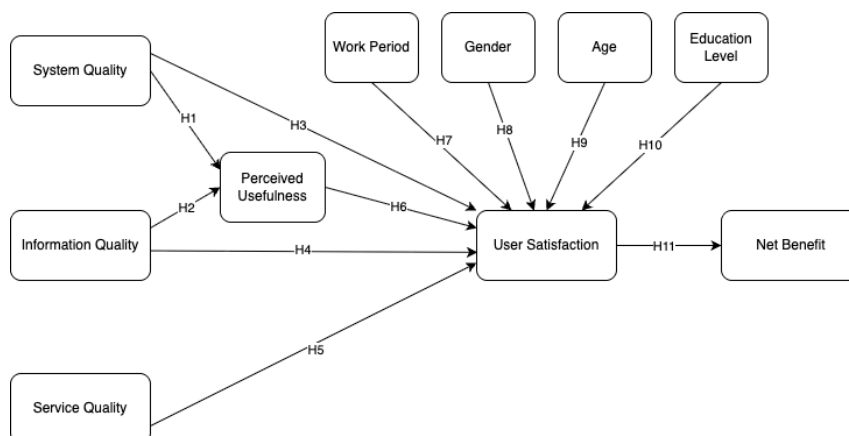


Figure 2 Research Conceptual Framework

After that, a bootstrapping procedure was conducted to test the significance of the path coefficients, where hypotheses were considered accepted if the p-value was < 0.05 (t-values > 1.960). The research hypotheses are as follows:

1. Hypothesis 1: System quality (SQ) has a significant effect on perceived usefulness (PU).
2. Hypothesis 2: Information quality (IQ) has a significant effect on perceived usefulness (PU).
3. Hypothesis 3: System quality (SQ) has a significant effect on user satisfaction (US).
4. Hypothesis 4: Information quality (IQ) has a significant effect on user satisfaction (US).
5. Hypothesis 5: Service quality (SEQ) has a significant effect on user satisfaction (US).
6. Hypothesis 6: Perceived usefulness (PU) has a significant effect on user satisfaction (US) .
7. Hypothesis 7: Work period (WP) has a significant effect on user satisfaction (US).
8. Hypothesis 8: Gender has a significant effect on user satisfaction (US).
9. Hypothesis 9: Age has a significant effect on user satisfaction (US).
10. Hypothesis 10: Education level (EL) has a significant effect on user satisfaction (US).
11. Hypothesis 11: User satisfaction (US) has a significant effect on net benefit (NB).

RESULTS

This study was conducted at RSIJ Pondok Kopi involving 62 respondents who were SIMRS users. The data were collected using a questionnaire based on each research variable and were analyzed using SmartPLS version 3.2.9 with a professional license (30-day free trial). The stages of analysis followed the procedures described in the research method, which are explained as follows.

Outer Model

The outer model evaluation was conducted to assess the validity and reliability of the measurement model using four testing criteria: convergent validity, discriminant validity, collinearity test, and reliability test. Validity testing was performed to determine the ability of the research instrument to measure each variable, while reliability testing was used to examine the consistency of the measurement instrument and the consistency of respondents' answers. The analysis began by constructing the research path model, as shown in the following figure 3.

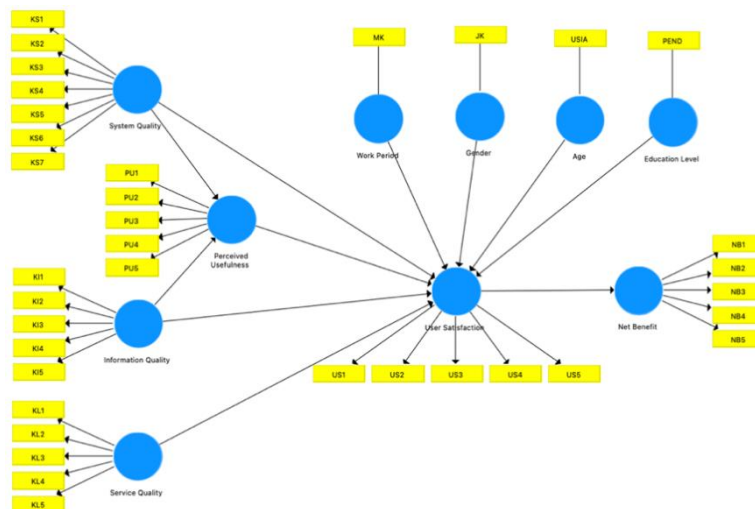


Figure 3 Research Path Model

a. Convergent Validity Test

This test was conducted to assess the relationship between each construct and its indicators. The measurement was based on the outer loading values, with the rule of thumb applied in this study being outer loading ≥ 0.70 considered valid, and outer loading < 0.70 considered invalid. The results are presented as follows.

Table 1 Outer Loading (Stage 1)

	SQ	IQ	SEQ	PU	US	NB	Age	WP	Gender	EL
SQ1	0,508									
SQ2	0,496									
SQ3	0,522									
SQ4	0,736									
SQ5	0,628									
SQ6	0,732									
SQ7	0,737									

	SQ	IQ	SEQ	PU	US	NB	Age	WP	Gender	EL
IQ1		0,645								
IQ2		0,684								
IQ3		0,800								
IQ4		0,760								
IQ5		0,806								
SEQ1			0,709							
SEQ2			0,570							
SEQ3			0,714							
SEQ4			0,752							
SEQ5			0,577							
PU1				0,536						
PU2				0,693						
PU3				0,714						
PU4				0,765						
PU5				0,627						
US1					0,758					
US2					0,665					
US3					0,792					
US4					0,715					
US5					0,831					
NB1						0,473				
NB2						0,693				
NB3						0,687				
NB4						0,786				
NB5						0,743				
Age							1,000			
WP								1,000		
Gender									1,000	
EL										1,000

The results obtained from the first-stage PLS Algorithm are shown in the following figure 4.

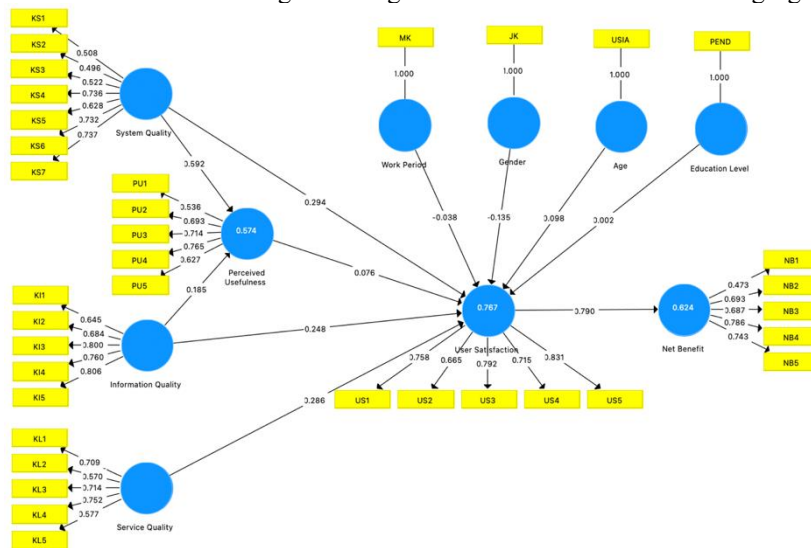


Figure 4 Path Model (Stage 1)

The results of Stage 1 showed that several indicators did not meet the rule of thumb, namely KS1, KS2, KS3, KS5, KI1, KI2, KL2, KL5, PU1, PU2, PU5, US2, NB1, NB2, and NB3. Therefore, these indicators were removed from the model. After removing these items, the analysis was conducted again until the model satisfied the required criteria. The results of the second-stage analysis are shown below.

Table 2 Outer Loading (Stage 2)

	SQ	IQ	SEQ	PU	US	NB	Age	WP	Gender	EL
SQ4	0,838									
SQ6	0,745									

	SQ	IQ	SEQ	PU	US	NB	Age	WP	Gender	EL
SQ 7	0,867									
IQ3		0,851								
IQ 4		0,757								
SEQ5		0,889								
SEQ1			0,777							
SEQ3			0,741							
SEQ4			0,845							
PU3				0,837						
PU4				0,765						
US1					0,800					
US3					0,793					
US4					0,717					
US5					0,847					
NB4						0,872				
NB5						0,877				
Age							1,000			
WP								1,000		
Gender									1,000	
EL										1,000

The results obtained from the second-stage PLS Algorithm are presented in the following figure 5.

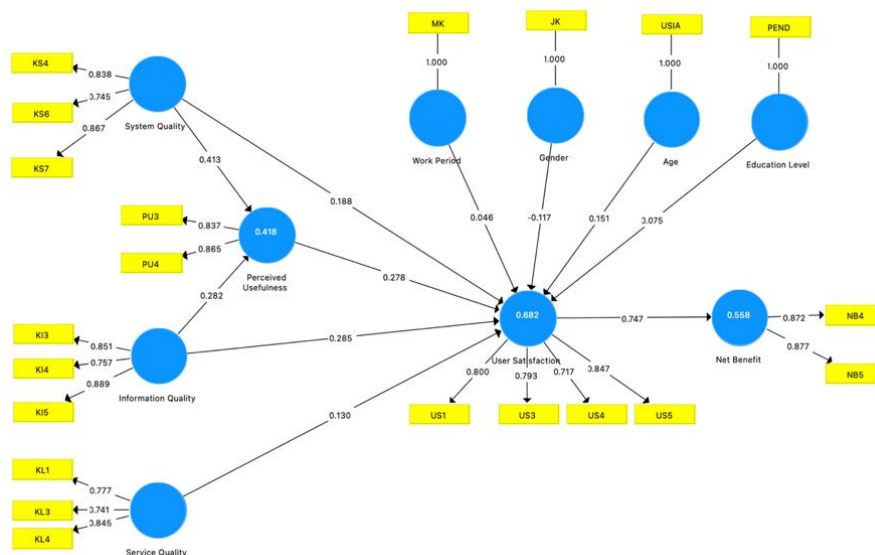


Figure 5 Path Model (Stage 2)

The results of Stage 2 indicate that all loading factor values have met the rule of thumb, meaning that the correlation (loading factor) between indicators and their respective constructs has satisfied the convergent validity requirement of ≥ 0.70 .

b. Discriminant Validity Test

This test was used to examine whether the indicators of a particular latent variable were distinct from the indicators of other latent variables, thus confirming that each indicator was appropriate to explain its respective construct. Discriminant validity was assessed by comparing the cross-loading values, where the loading of an indicator on its associated construct must be higher than its loadings on other constructs. The cross-loading results of this study are presented as follows.

Table 3 Cross-Loading for Discriminant Validity Test

	SQ	IQ	SEQ	PU	US	NB	Age	WP	Gender	EL
SQ4	0,838	0,532	0,539	0,536	0,631	0,528	0,135	-0,015	-0,151	-0,120
SQ6	0,745	0,696	0,581	0,449	0,577	0,376	0,269	-0,115	0,051	0,240
SQ7	0,867	0,555	0,658	0,525	0,512	0,554	0,123	-0,001	-0,057	0,135
IQ3	0,620	0,851	0,553	0,519	0,622	0,526	0,123	-0,080	0,119	0,181
IQ4	0,571	0,757	0,448	0,391	0,573	0,491	0,264	-0,004	-0,162	0,207
IQ5	0,619	0,889	0,624	0,533	0,589	0,546	0,229	-0,187	0,200	0,380

	SQ	IQ	SEQ	PU	US	NB	Age	WP	Gender	EL
SEQ1	0,617	0,633	0,777	0,627	0,518	0,468	0,174	-0,066	0,006	0,140
SEQ3	0,577	0,393	0,741	0,585	0,433	0,429	0,118	-0,102	0,085	0,096
SEQ4	0,534	0,511	0,845	0,414	0,625	0,440	0,250	-0,088	0,070	0,239
PU3	0,541	0,377	0,579	0,837	0,563	0,356	0,079	-0,115	-0,113	0,057
PU4	0,511	0,602	0,561	0,765	0,584	0,472	0,102	-0,084	0,049	0,235
US1	0,579	0,585	0,500	0,707	0,800	0,537	0,247	-0,115	-0,100	0,156
US3	0,590	0,551	0,583	0,391	0,793	0,703	0,348	-0,139	-0,028	0,217
US4	0,437	0,455	0,492	0,494	0,717	0,442	0,158	-0,092	-0,175	0,229
US5	0,602	0,648	0,560	0,548	0,847	0,651	0,198	-0,055	-0,075	0,164
NB4	0,500	0,579	0,469	0,408	0,647	0,872	0,294	0,102	-0,040	0,114
NB5	0,542	0,514	0,513	0,446	0,659	0,877	0,198	-0,075	-0,075	0,257
Age	0,212	0,242	0,238	0,107	0,305	0,280	1,000	-0,591	-0,073	0,046
WP	-0,052	-0,112	-0,107	-0,116	-0,126	0,014	-0,591	1,000	-0,113	-0,115
Gender	-0,069	0,075	0,067	-0,033	-0,113	-0,066	-0,073	-0,113	1,000	0,167
EL	0,093	0,308	0,210	0,176	0,239	0,213	0,046	-0,115	0,167	1,000

The table shows that the correlation between each variable and its indicators is higher than the correlation between the indicators and other variables, indicating good discriminant validity. Another method to assess discriminant validity is by comparing the square root of the Average Variance Extracted (AVE) for each construct with the correlations among constructs. A model has good discriminant validity if the square root of AVE for each construct is greater than the correlations with other constructs. The results are shown in the following table.

Table 4 Correlation Matrix Based on the Square Root of AVE

	Age	EL	Gender	IQ	NB	PU	SEQ	SQ	US	WP
Age	1,000									
EL	0,046	1,000								
Gender	-0,073	0,167	1,000							
IQ	0,242	0,308	0,075	0,834						
NB	0,280	0,213	-0,066	0,625	0,874					
PU	0,107	0,176	-0,033	0,581	0,489	0,851				
SEQ	0,238	0,210	0,067	0,653	0,562	0,669	0,789			
SQ	0,212	0,093	-0,069	0,724	0,596	0,617	0,722	0,819		
US	0,305	0,239	-0,113	0,713	0,747	0,674	0,676	0,704	0,791	
WP	-0,591	-0,115	-0,113	-0,112	0,014	-0,116	-0,107	-0,052	-0,126	1,000

From the table, it can be seen that the square root of AVE for each construct is greater than the correlations among constructs, indicating that the model satisfies discriminant validity. In addition, the AVE values have also met the rule of thumb of ≥ 0.50 , as shown in the following table.

Table 5 AVE (Average Variance Extracted) Values

Variable	AVE
Age	1,000
Education Level	1,000
Gender	1,000
Information Quality	0,696
Net Benefit	0,764
Perceived Usefulness	0,724
Service Quality	0,622
System Quality	0,670
User Satisfaction	0,625
Work Period	1,000

c. Collinearity Test

The collinearity test using the Variance Inflation Factor (VIF) was applied in the PLS-SEM analysis to examine whether multicollinearity existed among the independent variables. The VIF criteria are as follows:

- 1) VIF ≥ 5 indicates significant or high multicollinearity,
- 2) VIF between 3 and 5 indicates potential collinearity,
- 3) VIF < 3 indicates no serious multicollinearity problem.

Table 6 VIF (Variance Inflation Factor) Results

Question items	VIF
IQ3	1,840

Question items	VIF
IQ4	1,409
IQ5	2,118
SEQ1	1,331
SEQ3	1,348
SEQ4	1,423
SQ4	1,721
SQ6	1,327
SQ7	1,960
WP	1,000
NB4	1,387
NB5	1,387
ED	1,000
PU3	1,253
PU4	1,253
US1	1,682
US3	1,633
US4	1,458
US5	1,934
Age	1,000
Gender	1,000

Based on the table above, all VIF values are below 3, indicating that there is no serious multicollinearity and that collinearity is not a problematic issue in this model.

d. Reliability Test

The reliability test aims to measure the consistency of the indicators in representing their respective latent variables, ensuring that the indicators measure the same construct consistently. A construct is considered to have high reliability if the Composite Reliability or Cronbach’s Alpha value is greater than 0.70. However, for explanatory research, Composite Reliability values above 0.70 and Cronbach’s Alpha values above 0.60 are still acceptable. Therefore, this study applied the standards of Composite Reliability > 0.70 and Cronbach’s Alpha > 0.60. The results of the reliability test are shown below.

Table 7 Cronbach’s Alpha and Composite Reliability Results

Variable	Cronbach’s Alpha	Composite Reliability
Age	1,000	1,000
Education Level	1,000	1,000
Gender	1,000	1,000
Information Quality	0,780	0,872
Net Benefit	0,691	0,866
Perceived Usefulness	0,620	0,840
Service Quality	0,699	0,831
System Quality	0,751	0,859
User Satisfaction	0,800	0,869
Work Period	1,000	1,000

Based on the table above, it can be concluded that all variables have very good reliability, as they have met the required standards for both Cronbach’s Alpha and Composite Reliability.

Inner Model

The inner model evaluation was conducted to examine the effects of each variable/construct and to identify the significant relationships among variables in accordance with the research hypotheses. This stage included several tests, namely the R-Square test, F-Square test, and model fit test (Goodness of Fit), specifically the Standardized Root Mean Square Residual (SRMR).

a. Coefficient of Determination Test (R-Squared)

The R-Square test was used to measure the predictive accuracy of the model. The R-Square values are categorized into three criteria: an R-Square value of 0.75 indicates strong predictive accuracy, 0.50 indicates moderate predictive accuracy, and 0.25 indicates weak predictive accuracy (10). The results of the coefficient of determination are presented in the following table and figure.

Table 8 Results of the Coefficient of Determination (R-Square)

Variable	R-Square	R-Square Adjusted
Net Benefit	0,558	0,550

Variable	R-Square	R-Square Adjusted
Perceived Usefulness	0,418	0,399
User Satisfaction	0,682	0,634

Based on the table above, it can be seen that the predictive accuracy (coefficient of determination) of the model for Net Benefit (NB) is 0.558, which indicates moderate accuracy. This means that User Satisfaction (US) is able to explain 55.8% of the variance in Net Benefit (NB), while the remaining 44.2% is influenced by other factors outside this research model.

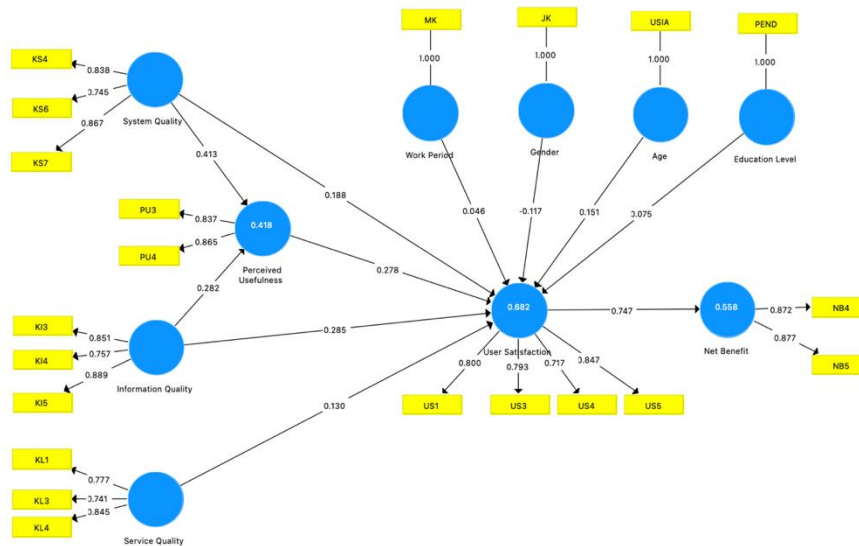


Figure 6 Coefficient of Determination (R-Square) Values

Furthermore, the predictive accuracy of the R-Square model for Perceived Usefulness (PU) is 0.418, which indicates weak predictive accuracy. This shows that System Quality (SQ) and Information Quality (IQ) explain 41.8% of the variance in Perceived Usefulness (PU), while the remaining 58.2% is influenced by other factors outside this research model.

The predictive accuracy of the R-Square model for User Satisfaction (US) is 0.682, which indicates moderate predictive accuracy. Thus, System Quality (SQ), Information Quality (IQ), Service Quality (SEQ), Perceived Usefulness (PU), Age, Gender, Work Period, and Education Level explain 68.2% of the variance in User Satisfaction (US), while the remaining 31.8% is explained by other factors outside this research model.

b. Effect Size Test (F-Squared)

The F-Square test was used to assess the relative impact or effect of each independent variable on the dependent variable. This test focuses on the specific contribution of each predictor. The F-Square values are categorized as follows: 0.02 indicates a small effect, 0.15 indicates a medium effect, and 0.35 indicates a large effect (10). The results of the F-Square test are presented in the following table.

Table 9 Effect Size (F-Square) Results

	Age	EL	Gender	IQ	NB	PU	SEQ	SQ	US	WP
Age									0,040	
EL									0,015	
Gender									0,038	
IQ						0,065			0,096	
NB										
PU									0,116	
SEQ									0,019	
SQ								0,139	0,036	
US						1,262				
WP									0,004	

Based on the table above, it is found that:

1. Age has a small effect on User Satisfaction (US) with an f^2 value of 0.040.
2. Education Level (EL) has a small effect on User Satisfaction (US) with an f^2 value of 0.015.
3. Gender has a small effect on User Satisfaction (US) with an f^2 value of 0.048.

4. Information Quality (IQ) has a small effect on Perceived Usefulness (PU) and User Satisfaction (US) with f^2 values of 0.065 and 0.096, respectively.
5. Perceived Usefulness (PU) has a small effect on User Satisfaction (US) with an f^2 value of 0.116.
6. Service Quality (SEQ) has a small effect on User Satisfaction (US) with an f^2 value of 0.019.
7. System Quality (SQ) has a small effect on Perceived Usefulness (PU) and User Satisfaction (US) with f^2 values of 0.139 and 0.036, respectively.
8. Work Period (WP) has a small effect on User Satisfaction (US) with an f^2 value of 0.004.
9. In contrast, User Satisfaction (US) has a large effect on Net Benefit (NB) with an f^2 value of 1.262.

c. Goodness of Fit (SRMR Test)

The SRMR (Standardized Root Mean Square Residual) test is an important measure to assess the goodness of fit of a model in PLS-SEM using SmartPLS. The SRMR value indicates how well the model fits the empirical data by measuring the difference between the covariance matrix predicted by the model and the sample covariance matrix. The criteria for SRMR values are (10):

- 1) $SRMR \leq 0.08$ indicates a good fit,
- 2) SRMR between 0.08 and 0.10 indicates an acceptable fit,
- 3) $SRMR \geq 0.10$ indicates a poor fit.

The SRMR test results are presented in the following table.

Table 10 SRMR Model Fit Results

SRMR	Saturated Model	Estimated Model	Kesesuaian Model
	0,086	0,091	<i>acceptable fit</i>

Based on the table above, the SRMR value of the saturated model is 0.086 and that of the estimated model is 0.091. Both values are below the tolerance threshold of 0.10, indicating that the research model has an acceptable fit and is still considered appropriate. Thus, the model is able to explain most of the variance in the data and the relationships among latent variables are consistent with the empirical data.

Hypothesis Testing (Bootstrapping)

The bootstrapping test is a statistical technique used to estimate the significance and robustness of the path coefficients in PLS-SEM. It improves the accuracy of hypothesis testing and supports the interpretation of path coefficients. The path coefficient represents the strength and direction of the relationship between two latent variables. A positive coefficient indicates a direct relationship, where a higher value reflects a stronger influence of the exogenous (independent) variable on the endogenous (dependent) variable, while a negative coefficient indicates an inverse relationship.

According to Hair et al. (2021), the magnitude of path coefficients can be categorized as follows (10):

- a. 0.00–0.19: weak effect,
- b. 0.20–0.39: moderate effect,
- c. 0.40–0.69: strong effect,
- d. 0.70–0.89: very strong effect,
- e. 0.90–1.00: extremely strong effect.

If the p-value is less than 0.05 ($p < 0.05$), the effect is considered statistically significant. The results of the bootstrapping analysis are illustrated in the following figure and path coefficient table.

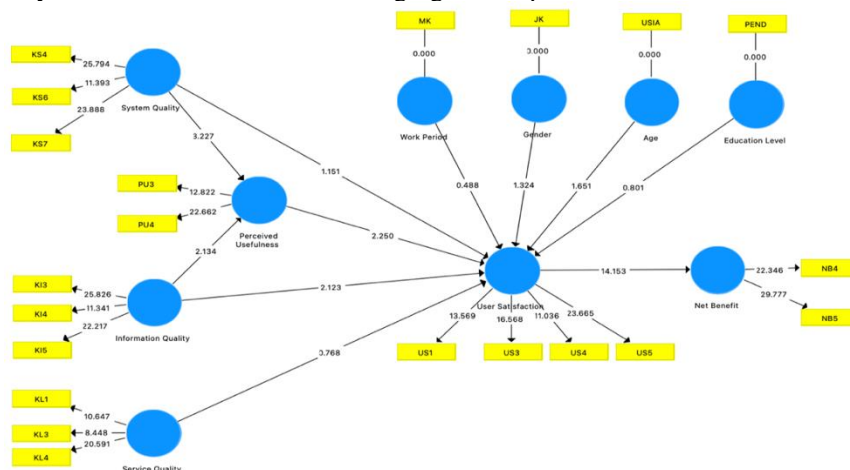


Figure 7 Path Coefficient Output in the Structural Model Evaluation

Based on the analysis shown in Figure 4 and Table 10, the path coefficient of System Quality (SQ) on Perceived Usefulness (PU) is 0.413, indicating a moderately positive relationship. The t-statistic value of 3.227 and p-value of 0.001 indicate that the effect of System Quality (SQ) on Perceived Usefulness (PU) is statistically significant.

Table 11 Hypothesis Testing Results

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P-Values
System Quality → Perceived Usefulness	0,413	0,406	0,128	3,227	0,001*
Information Quality → Perceived Usefulness	0,282	0,285	0,132	2,134	0,033*
System Quality → User Satisfaction	0,188	0,192	0,163	1,151	0,250
Information Quality → User Satisfaction	0,285	0,286	0,134	2,123	0,034*
Service Quality → User Satisfaction	0,130	0,149	0,169	0,768	0,443
Perceived Usefulness → User Satisfaction	0,278	0,257	0,124	2,250	0,025*
Work Period → User Satisfaction	0,046	0,044	0,094	0,488	0,625
Gender → User Satisfaction	-0,117	-0,124	0,088	1,324	0,186
Age → User Satisfaction	0,151	0,134	0,091	1,651	0,099
Education Level → User Satisfaction	0,075	0,080	0,094	0,801	0,424
User Satisfaction → Net Benefit	0,747	0,751	0,053	14,153	0,000*

The hypothesis testing results indicate that out of the eleven proposed hypotheses, five were accepted and six were rejected. System Quality (SQ) and Information Quality (IQ) were found to have positive and significant effects on Perceived Usefulness (PU) ($p < 0.05$), indicating that system quality and information quality play important roles in enhancing users' perceived usefulness of the SIMRS. Furthermore, Information Quality (IQ) and Perceived Usefulness (PU) also showed positive and significant effects on User Satisfaction (US) ($p < 0.05$), suggesting that user satisfaction is mainly determined by the quality of information generated by the system and the benefits perceived from its use. In contrast, System Quality (SQ) and Service Quality (SEQ) did not have significant effects on User Satisfaction (US), indicating that system and service quality have not yet been able to directly increase user satisfaction. In addition, demographic factors including Work Period, Gender, Age, and Education Level also did not show significant effects on User Satisfaction (US), implying that differences in individual user characteristics are not determining factors of satisfaction in using the SIMRS. Finally, User Satisfaction (US) had a very strong and significant positive effect on Net Benefit (NB), confirming that user satisfaction is a key factor in achieving the net benefits of SIMRS implementation at RSIJ Pondok Kopi.

DISCUSSION

Based on the analysis results, the path coefficient value of System Quality (SQ) on Perceived Usefulness (PU) is 0.413, indicating a moderate positive relationship. The t-statistic value of 3.227 and p-value of 0.001 indicate that the relationship between System Quality (SQ) and Perceived Usefulness (PU) is statistically significant. This means that an improvement in System Quality (SQ) will significantly increase Perceived Usefulness (PU). Therefore, the result of hypothesis testing 1 confirms a positive effect of system quality on perceived usefulness ($p\text{-value} = 0.001 < 0.05$), and the hypothesis is accepted. This finding is consistent with the study conducted by Tiana et al. (2016) which showed that system quality has a significant positive effect on perceived usefulness. This occurs because users experience the benefits of high system quality, making them confident in using the system, as reflected in ease of use, access speed, system reliability, system flexibility, and system security when using the system (12). System and service quality influence satisfaction and performance mainly through usage, indicating that without active user interaction, technical quality alone may not directly affect perceived usefulness. This shows that system quality can become insignificant when users do not optimally engage with the system, emphasizing the importance of user-centered development and support (13).

The path coefficient value of Information Quality (IQ) on Perceived Usefulness (PU) is 0.282, indicating a moderate positive relationship. The t-statistic value of 2.134 and p-value of 0.033 show that the relationship between Information Quality (IQ) and Perceived Usefulness (PU) is statistically significant. This means that an improvement in Information Quality (IQ) will significantly increase Perceived Usefulness (PU). Thus, hypothesis testing 2 confirms a positive effect of information quality on perceived usefulness ($p\text{-value} = 0.033 < 0.05$), and the hypothesis is accepted. The results of this study indicate that information quality significantly influences the perceived usefulness of SIMRS at RSIJ Pondok Kopi ($0.033 < 0.05$). Accurate, timely, and relevant information increases staff confidence that SIMRS can support their work. This is in line with the DeLone & McLean (2003)

model, which positions information quality as a key determinant of information system success (1). A study by Ayu et al. (2022) also showed that information quality significantly affects perceived usefulness in information system implementation (14). Alipour et al. (2019) found a significant positive correlation between system quality, information quality, and perceived usefulness in the acceptance of Hospital Information Systems (15). In addition, Batini et al. (2009) emphasized that good information quality strengthens perceived usefulness in e-government systems (16). Therefore, providing valid and reliable data through SIMRS is a key factor in enhancing its usefulness for staff. In the context of RSIJ Pondok Kopi, the quality of content and reports provided by SIMRS contributes substantially to staff perceptions of usefulness.

The path coefficient value of System Quality (SQ) on User Satisfaction (US) is 0.188, indicating a weak positive relationship. The t-statistic value of 1.151 and p-value of 0.250 show that the relationship is not statistically significant. This means that an improvement in System Quality (SQ) does not significantly increase User Satisfaction (US). Therefore, hypothesis testing 3, which proposed a positive effect of system quality on user satisfaction, is rejected ($p\text{-value} = 0.250 > 0.05$). The results indicate that there is no significant effect of System Quality on User Satisfaction in SIMRS at RSIJ Pondok Kopi. This finding is consistent with Yuniarti (2021), who reported no significant positive relationship between system quality and user satisfaction (17). Although the DeLone & McLean model positions system quality as a determinant of user satisfaction, meta-analyses suggest that this relationship is often inconsistent or statistically weak (1). For example, Shim & Jo (2020) found that system quality did not significantly affect user satisfaction with the National Health Information Portal (NHIP) (18). Thus, this study supports previous findings that the effect of system quality on user satisfaction is not always significant.

The path coefficient value of Information Quality (IQ) on User Satisfaction (US) is 0.285, indicating a moderate positive relationship. The t-statistic value of 2.123 and p-value of 0.034 indicate a statistically significant relationship. This means that improving Information Quality (IQ) will significantly increase User Satisfaction (US). Hence, hypothesis testing 4 is accepted ($p\text{-value} = 0.034 < 0.05$). This finding is consistent with Shim & Jo (2020) who showed that information quality significantly influences user satisfaction in the National Health Information Portal (18). It is also in line with Tiana et al. (2016) who found that information quality significantly affects user satisfaction in information systems (12). A study in Makassar also reported that information quality has a strong effect on SIMRS user satisfaction (19). Furthermore, Ojo (2017) found that information quality is significantly related to user satisfaction (20). Thus, the results of this study are consistent with several previous studies, confirming the importance of information quality in determining user satisfaction.

The path coefficient value of Service Quality (SEQ) on User Satisfaction (US) is 0.130, indicating a weak positive relationship. The t-statistic value of 0.768 and p-value of 0.443 indicate that the relationship is not statistically significant. This means that an improvement in Service Quality (SEQ) does not significantly increase User Satisfaction (US). Therefore, hypothesis testing 5 is rejected ($p\text{-value} = 0.443 > 0.05$). This finding is in line with Puspita et al. (2020) who found no significant direct effect of service quality on user satisfaction ($p = 0.062$) (21). This suggests that although technical support is important, users may evaluate service quality based on how the system is applied in daily practice. Therefore, improvements in service quality are still necessary, even if their direct effect on satisfaction is not statistically significant.

The path coefficient value of Perceived Usefulness (PU) on User Satisfaction (US) is 0.278, indicating a moderate positive relationship. The t-statistic value of 2.250 and p-value of 0.025 indicate that the relationship is statistically significant. This means that an increase in Perceived Usefulness (PU) will significantly increase User Satisfaction (US). Therefore, hypothesis testing 6 is accepted ($p\text{-value} = 0.025 < 0.05$). This finding supports the Technology Acceptance Model (TAM) proposed by Davis (2013) which states that perceived usefulness is a primary predictor of attitudes toward system use (22). When staff feel that SIMRS genuinely helps them in their work, their satisfaction with the system increases. This result is also consistent with Johansen (2024) who found a significant relationship between perceived usefulness and satisfaction among private hospital SIMRS users in North Jakarta (23). In the context of Hospital Information Systems (HIS), higher perceived usefulness leads to greater user satisfaction (24). Therefore, the higher the perceived usefulness of SIMRS, the higher the user satisfaction.

The path coefficient value of Work Period (WP) on User Satisfaction (US) is 0.046, indicating a weak positive relationship. The t-statistic value of 0.488 and p-value of 0.625 indicate that the relationship is not statistically significant. Thus, hypothesis testing 7 is rejected ($p\text{-value} = 0.625 > 0.05$). Then, the path coefficient value of Gender on User Satisfaction (US) is -0.117, indicating a weak relationship, and the t-statistic value of 1.324 with a p-value of 0.186 indicates no statistical significance. Therefore, hypothesis testing 8 is rejected. Similarly, the path coefficient value of Age on User Satisfaction (US) is 0.151, with a t-statistic value of 1.651 and p-value of 0.099, showing no significant effect. Hence, hypothesis testing 9 is rejected. The path coefficient value of Education Level (EL) on User Satisfaction (US) is 0.075, with a t-statistic value of 0.801 and p-value of 0.424, indicating no significant effect. Therefore, hypothesis testing 10 is rejected. These results indicate that

demographic factors, including work period, education level, age, and gender, do not significantly influence SIMRS user satisfaction at RSIJ Pondok Kopi. Although Venkatesh et al. (2003) stated that age, gender, and experience influence technology acceptance, they do not necessarily influence user satisfaction. This suggests that satisfaction is more strongly influenced by technical quality and perceived benefits than by personal characteristics (25). The DeLone & McLean (2003) model also emphasizes that system quality, information quality, and service quality affect user satisfaction, while demographic variables are typically treated as control variables rather than primary determinants (1). In professional settings such as hospitals, the effects of demographic factors on satisfaction are often weak due to standardized training and homogeneous organizational culture. This is supported by previous studies showing that age does not significantly affect user satisfaction (26)(27). In contrast, some studies in other sectors, such as banking, have shown that demographic factors may influence perceptions or loyalty, as found by Seiler et al. (2013). This difference may be due to the more personal nature of financial services compared to hospital information systems (28). Therefore, the findings of this study are consistent with the view that demographic characteristics do not significantly affect SIMRS user satisfaction at RSIJ Pondok Kopi.

Finally, the path coefficient value of User Satisfaction (US) on Net Benefit (NB) is 0.747, indicating a very strong positive relationship. The t-statistic value of 14.153 and p-value of 0.000 indicate that this relationship is statistically significant. This means that an increase in User Satisfaction (US) will significantly increase Net Benefit (NB). Therefore, hypothesis testing 11 is accepted ($p\text{-value} = 0.000 < 0.05$). This finding confirms that user satisfaction significantly influences the net benefits of SIMRS at RSIJ Pondok Kopi. According to DeLone & McLean (2003), user satisfaction is a key variable that determines the net benefits of an information system. Simply using a system is not sufficient if users are not satisfied; satisfaction strengthens the realization of net benefits. The higher the level of user satisfaction, the greater the benefits perceived both at the individual and organizational levels. Other studies have also found a significant relationship between user satisfaction and net benefits in various contexts, including e-government systems in Indonesia (29) and hospital information systems (30)(31)(32). Another study by Fadillah (2024) also showed that user satisfaction has a positive effect on net benefits, with a coefficient value of 0.495 or 49.5% (33). In addition, according to Herlina et al. (2025), to improve user satisfaction and the benefits of information systems, organizations need to optimally pay attention to system quality, information quality, and service quality (34). When users feel satisfied, their performance tends to improve, which in turn positively affects the smooth operation and overall effectiveness of organizational activities (35). These consistent findings demonstrate that satisfied users are more likely to use the system consistently and effectively, thereby improving work efficiency and service quality. The very strong and significant relationship found in this study further emphasizes that SIMRS at RSIJ Pondok Kopi becomes truly valuable for the organization when users are satisfied, as satisfied staff are more likely to use the system optimally, supporting operational efficiency and improving healthcare service quality.

CONCLUSION

The hypothesis testing results show that five out of eleven proposed hypotheses were supported. Information Quality and System Quality significantly influence Perceived Usefulness, while Information Quality and Perceived Usefulness significantly affect User Satisfaction. User Satisfaction demonstrates the strongest positive effect on Net Benefit, and Perceived Usefulness also contributes indirectly to Net Benefit through User Satisfaction. In contrast, Service Quality and demographic factors (work period, gender, age, and education level) do not significantly affect User Satisfaction. Overall, the findings confirm that information quality, system quality, and perceived usefulness are key determinants of SIMRS success at RSIJ Pondok Kopi, whereas demographic characteristics play a relatively minor role. These results highlight the importance of strengthening information quality as a strategic priority to enhance user satisfaction and optimize net benefits. However, this study has several limitations. The relatively small sample size ($n = 62$) and the inclusion of multiple variables may have reduced statistical power and influenced unsupported relationships. Additionally, the study was conducted in a single hospital, limiting generalizability to other healthcare settings. Future research should involve larger samples across multiple hospitals, incorporate additional variables such as system usage intensity, organizational support, and training effectiveness, and apply longitudinal designs to better examine the sustainability of SIMRS success over time.

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REFERENCES

1. DeLone WH, McLean ER. The DeLone and McLean model of information systems success: A ten-year update. *Journal of Management Information Systems*. 2003;19(4):9–30.
2. Kim Y, Lee HS. Quality, perceived usefulness, user satisfaction, and intention to use: An empirical study of ubiquitous personal robot service. *Asian Soc Sci*. 2014 May 29;10(11):1–16.
3. Nirwanto N, Andarwati M. End-User Satisfaction an an Impact of the System Quality Information Quality, and Top Management Support, upon the Perceived Usefulness of Technology Utilization. *Journal of Marketing development and Competitiveness*. 2019;13(1).
4. Kalankesh LR, Nasiry Z, Fein R, Damanabi S. Factors Influencing User Satisfaction with Information Systems: A Systematic Review. *Galen Medical Journal*. 2020 Jun 26;9:e1686.
5. Hidayah N, Asmo Sutrisno T, Sri Wariyanti A. Evaluasi Implementasi Sistem Informasi Manajemen Rumah Sakit dengan Metode Delon dan Mclean di RSUD Dr. Doris Sylvanus Kalimantan Tengah. In: *Prosiding Seminar Nasional dan Rakernas PORMIKI X. Procedia of Engineering and Life Science*; 2024.
6. Putra DS, Darmawan MA. Analisis Kepuasan Pengguna Sistem Informasi Administrasi Rumah Sakit (SIARS) dengan Model Delone and Mclean. *JURNAL SISTEM INFORMASI BISNIS*. 2021 Sep 1;11(1):78–85.
7. Kurniawan H. PENGUKURAN KEBERHASILAN SISTEM INFORMASI DENGAN PENDEKATAN DELONE AND MCLEAN IS SUCCESS MODEL DAN TAM. UIN SYARIF HIDAYATULLAH; 2020.
8. Marikyan D, Papagiannidis S. Unified Theory of Acceptance and Use of Technology [Internet]. 2025 [cited 2025 Sep 19]. Available from: <https://open.ncl.ac.uk/>
9. Ainaa Azmi N, Mahmud A, Abd Rahman A. SATISFACTION LEVEL AND ITS ASSOCIATED FACTORS AMONG GOVERNMENT ELECTRONIC MEDICAL RECORD SYSTEM USERS IN KLANG VALLEY. *Malaysian Journal of Public Health Medicine*. 2022;2022(2):77–86.
10. Hair JF, Tomas G, Hult M, Ringle CM, Sarstedt M. Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R [Internet]. Switzerland: Springer; 2021 [cited 2025 Sep 19]. Available from: <https://link.springer.com/book/10.1007/978-3-030-80519-7>
11. Hendrizal D. ANALISIS PENGGUNAAN SISTEM INFORMASI LABORATORIUM PADA PEGAWAI BALAI BESAR TEKNIK KESEHATAN LINGKUNGAN DAN PENGENDALIAN PENYAKIT (BBTKLPP) YOGYAKARTA. [Yogyakarta]: Universitas Gadjah Mada; 2017.
12. Tiana, Sugiharto B, Umiyati I. ANALYSIS OF SYSTEM QUALITY, INFORMATION QUALITY AND PERCEIVED USEFULNESS TO USER SATISFACTION. *Jurnal of Accounting for Sustainable Society (JASS)*. 2016;1(1).
13. Ramadhan MI, Rizal E. Analysis of Information System Quality on User Satisfaction of the Regional Financial Management Information System (SIPKD) Using the Delone & Mclean Model in the East Jakarta Administration Mayor's Government. *Jurnal Sisfokom (Sistem Informasi dan Komputer)*. 2025 Jul 27;14(3):342–8.
14. Ayu D, Avriyanti M, Handriana T. Pengaruh Perceived Quality Terhadap Perceived Usefulness, Dan Perceived Easy Of Use Serta Dampaknya Pada Satisfaction Pada Konsumen M-Commerce Shopee Indonesia. *Ekonika : Jurnal Ekonomi Universitas Kadiri [Internet]*. 2022;(1). Available from: <http://ojs.unik-kediri.ac.id/index.php/ekonika>
15. Alipour J, Mehdipour Y, Karimi A. Factors Affecting Acceptance of Hospital Information Systems in Public Hospitals of Zahedan University of Medical Sciences: A Cross-Sectional Study. *J Med Life*. 2019;2019(4):403–10.
16. Batini C, Viscusi G, Cherubini D. GovQual: A quality driven methodology for E-Government project planning. *Gov Inf Q*. 2009 Jan;26(1):106–17.
17. Yuniarti IF. Pengaruh Kualitas Sistem, Kualitas Informasi, Kualitas Pelayanan pada Kepuasan Pengguna dan Dampaknya pada Manfaat Bersih (Penelitian terhadap Sistem Informasi Surveilans Penyakit Tidak Menular di Kota Palembang). *Jurnal Epidemiologi Kesehatan Komunitas*. 2021;6.
18. Shim M, Jo HS. What quality factors matter in enhancing the perceived benefits of online health information sites? Application of the updated DeLone and McLean Information Systems Success Model. *Int J Med Inform*. 2020 May 1;137.
19. Sari N, Ervianingsih E, Zahran I. Pengaruh Kualitas Sistem, Kualitas Informasi dan Kualitas Layanan Terhadap Kepuasan Pengguna Sistem Informasi Manajemen RS “X” Kota Palopo. *Jurnal Surya Medika*. 2023 Aug 27;9(2):219–24.

20. Ojo AI. Validation of the delone and mclean information systems success model. *Healthc Inform Res.* 2017 Jan 1;23(1):60–6.
21. Puspita SC, Supriyantoro ., Hasyim . Analysis of Hospital Information System Implementation Using the Human-Organization-Technology (HOT) Fit Method: A Case Study Hospital in Indonesia. *European Journal of Business and Management Research.* 2020 Nov 7;5(6).
22. Davis FD. Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information technology. *JSTOR [Internet].* 2013 [cited 2025 Sep 19];13(3):319–40. Available from: <http://www.jstor.org>
23. Johansen. PERAN KUALITAS SISTEM INFORMASI DAN PERCEIVED USEFULNESS DALAM MENINGKATKAN KEPUASAN PASIEN RUMAH SAKIT SWASTA. 2024;
24. Ologeanu-Taddei R, Morquin D, Bourret R. Understanding the Perceived Usefulness and the Ease of Use of a Hospital Information System: The case of a French University Hospital. In: *Studies in Health Technology and Informatics.* IOS Press; 2015. p. 531–5.
25. Venkatesh V, Morris MG, Davis GB, Davis FD. User Acceptance of Information Technology: Toward a Unified View. *MIS Q.* 2003;27(3):425–78.
26. Lasinrang L, Adhani R, Shadiqi MA, Arifin S, Bakhriansyah M. User Satisfaction Management Information System Hospitals in Kuala Pembuang Regional General Hospital. *Jurnal Berkala Kesehatan.* 2024 May 29;10(1):1.
27. Hastuti R, Paramarta V, Utojo W, Rulia, Kasasih, Yuliaty F. Pengaruh Usia, Kepercayaan dan Persepsi Terhadap Kepuasan Pengguna Layanan Telemedisin. *PARADOKS Jurnal Ilmu Ekonomi.* 2025;8(2).
28. Seiler V, Rudolf M, Krume T. The influence of socio-demographic variables on customer satisfaction and loyalty in the private banking industry. *International Journal of Bank Marketing.* 2013 Jun 7;31(4):235–58.
29. Rahmatullah R, Habibi A, Khaeruddin K, Yaqin LN, Alharmali TM, Fauzee MSO, et al. A study of user satisfaction and net benefits in indonesia through the DeLone and McLean Model for E-Government success. *Discover Sustainability.* 2025 Dec 1;6(1).
30. Cho KW, Bae SK, Ryu JH, Kim KN, An CH, Chae YM. Performance evaluation of public hospital information systems by the information system success model. *Healthc Inform Res.* 2015 Jan 1;21(1):43–8.
31. Eka Saputri D. ANALYSIS OF FACTORS INFLUENCING THE USE, USER SATISFACTION AND NET BENEFITS FOR USERS OF ELECTRONIC MEDICAL RECORDS (EMR) AT RSIA SITTI KHADIJAH MAKASSAR. *Frontiers in Health Informatics [Internet].* 2024;5(5):13. Available from: www.healthinformaticsjournal.comwww.healthinformaticsjournal.com
32. Mastuti Kartini A, Fadli S, Fahmi H. JISA (Jurnal Informatika dan Sains) The DeLone and McLean Model for Measuring Success Hospital Management Information System Case Study: Praya Regional Hospital. 2025;
33. Fadilah MR. ANALISIS KESUKSESAN MODEL DELONE DAN MCLEAN PADA APLIKASI MOBILE BIMA+ BERDASARKAN PERSPEKTIF PENGGUNA DI KOTA SURABAYA. [Surabaya]: UNIVERSITAS DINAMIKA; 2024.
34. Herlina H, Veri J. Analisis Keberhasilan Sistem Informasi Manajemen Menggunakan Model Delone dan Mclean. *Indo-MathEdu Intellectuals Journal.* 2025 May 16;6(3):3009–16.
35. Haura TU, Suwondo S, Novianty I. The Evaluation of Information System Success of the Delone & Mclean Model in Sistem Informasi Manajemen Daerah Barang Milik Daerah. *Indonesian Accounting Research Journal.* 2021;1(2):224–32.