Mantik Journal, 8 (3) (2024), ISSN 2685-4236 (Online)

Published by: Institute of Computer Science (IOCS)

Jurnal Mantik

Journal homepage: www.iocscience.org/ejournal/index.php/mantik

Assessment of e-puskesmas utilization at kuranji public health center padang using the delone & mclean model

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A R T I C L E I N F O

Article history:

Received Sep 17, 2024
Revised Sep 28, 2024
Accepted Oct 16, 2024

Keywords:

DeLone and McLean;
E-Puskesmas;
Health services;
Public health centers.

ABSTRACT

To improve the efficiency of health service operations, the Padang City Government adopted the E-Puskesmas service system through the Kuranji public health center. In accordance with Ministry of Health standards that integrate public health center information systems, the E-Puskesmas system is a web-based public health center management application that seeks to support the delivery of health services, including patient registration, poly-level services to the health department level, and online and integrated reporting. This study serves as a measure of how well the E-Puskesmas application is used. Six evaluation variables make up the DeLone and McLean method: usage, user satisfaction, system quality, information quality, and net benefits. To measure how well the E-Puskesmas works in improving the performance of the staff of Kuranji Health Center in Padang City, the DeLone and McLean approach will be used as a model. It is expected that this model will allow the identification of elements that facilitate or hinder the use of E-Puskesmas, thus becoming a valuable tool for future evaluation and improvement. All independent variables affect the dependent variable and provide positive benefits for the health center. However, some challenges remain in the implementation of E-Puskesmas, including unstable internet connectivity and access rights for using E-Puskesmas.

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1. INTRODUCTION

Puskesmas, another name for the Community Health Center, is a medical facility that offers programs for promotion, prevention, treatment, and rehabilitation. Puskesmas coordinates fundamental public health initiatives (UKM) and individual health initiatives (UKP) (Permenkes, 2014). The planning, implementation, and monitoring steps that are evaluated are referred to as health service management. Puskesmas also coordinate the reporting and recording of actions related to health data and information. The way in which the PHC management information system is used reflects this. The use of an integrated PHC management information system is the management of patient data and information, starting from registration or registration, research activities (diagnostics), and patient care.

One of the Puskesmas management systems that is used and supports excellent and guaranteed basic health services is the e-puskesmas application system (Saputro, 2017). The goal of the e-Puskesmas application system (Haryani, 2019) is to serve as an information system based on digital technology that will help Puskesmas administer and provide health services more easily. Developing a health system that is more effective, sensitive to community needs, and concentrated on providing high-quality healthcare services is another objective of e-Puskesmas. It is anticipated that the deployment of e-Puskesmas will yield substantial advantages in enhancing public health conditions and optimizing health care administration.

One of the benefits of e-Puskesmas is that it incentivizes all of them to compete in delivering the highest caliber of service to all service users and in updating the data reporting system. Furthermore, the community can receive ideal service, and all data is gathered in e-Puskesmas. (Luh Yulia Adiningsih, 2023).

A Puskemas will offer the best possible medical care. In order to determine the circumstances and elements involved in the present and the future, it is crucial to measure the degree of user preparedness.

A model called the DeLone and McLean model is used to gauge an information system's effectiveness from the perspective of its users. This approach has six measuring factors: Net Benefits, System Quality, Information Quality, Usage, and User Satisfaction. Numerous research have updated this model to take into account the advancements in information technology. System quality, information quality, user happiness, system utilization, and system impact on the user or business continue to be the key points of emphasis (Muji Ernawati E. H., 2021).

According to DeLone and McLean (Delone, 2003), net benefits are impacted by system, information, and service quality, which also has an impact on user use and satisfaction. Although positive utilization will lead to increased user happiness, usage should come before user contentment. A happier user base will pique interest in using, which will lead to usage. Net benefits will increase user satisfaction and usage interest (Lidya Stefany Wara, 2021).

Delone & McLean Model (Wahyuni T. , 2011) is crucial to the assessment of information systems because it offers a thorough framework for gauging the effectiveness and impact of using information systems in businesses. This approach has been used in numerous research projects and business sectors to determine the elements that lead to the successful adoption of information technology. This model assists companies in identifying areas that require improvement and ways to increase the effectiveness of employing information technology in attaining their goals by taking into account a variety of dimensions and complex elements.

This study is to examine the assessment of the e-Puskesmas success model using the DeLone and McLean information system model, based on the researchers' preliminary investigation E-Puskesmas is one of the systems in use at Kuranji public health center Padang City. The DeLone and McLean information system success model's factors are tested for their influence on E-Puskesmas users, namely Kuranji public health center Padang City, in order to evaluate this model. In this test, the applicability of DeLone and McLean's model to measure E-Puskesmas success will be determined.

Based on the initial survey that has been conducted, the Kuranji Health Center has been using the E-Puskesmas application since January 2017. To date, there has been no research using the DeLone & McLean model to evaluate E-Puskesmas, so it is necessary to conduct an evaluation of E-Puskesmas to determine the strategic steps that the Kuranji Health Center should take moving forward.

2. RESEARCH METHOD

The research technique is essentially a scientific method of collecting data for specific purposes and objectives. A research variable is an attribute or value of people, objects, or activities that researchers have selected for analysis and subsequent conclusion-making based on specific variations (Nani Agustina, 2019). This research was conducted in May 2024 at the Kuranji Health Center, located at Kuranji Highway, Number. 26, Padang City.

For this quantitative research study, observational investigations, questionnaire distribution, and literature evaluation were the methods of data collecting. Validity and reliability testing were carried out utilizing the Delone and McLean model at the completion stage. In this study, the population consists of employees of the Kuranji Health Center in Padang. A questionnaire created using Google Forms was distributed to employees who directly use E-Puskesmas. A total of 27 employees who were not providing services at the time were gathered in the health center hall and given a Google Form link that could be answered directly by the respondents. The variables used in this study consist of System Quality, Information Quality, Service Quality, Use, User Satisfaction, and Net Benefit (Delone, 2003):

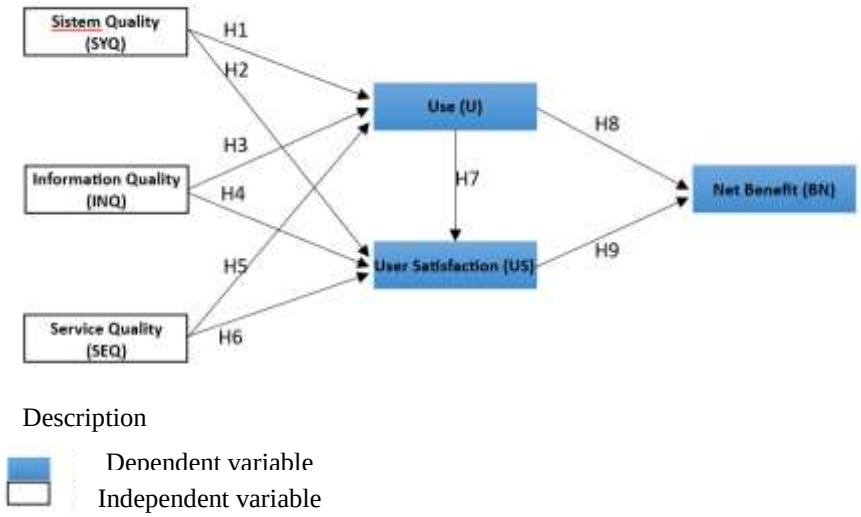

Figure 1. Research Model

The hypotheses formulated in this study are: H1: System Quality affects users, H2: System Quality affects user satisfaction, H3: Information Quality affects users, H4: Information Quality affects user satisfaction, H5: Service Quality affects users, H6: Service Quality affects user satisfaction, H7: System Use affects user satisfaction, H8: System Use affects net benefits, H9: User satisfaction affects net benefits.

After you have identified the variables, identify the indicators that each variable in the research model reflects. The indications of each variable are shown in Table 1 (Saidatul, 2022).

Table 1. Research Indicator Variable

Variabel	Referensi	Indikator	Kode
Informtion Quuality (IQ)	(Pujo Hari Saputro, 2015)	Accuracy	IQ1
		Relevance	IQ2
		Completeness	IQ3
		Timeless	IQ4
		Understandbility	IQ5

System Quality (SQ)	(Delone W.H, 1992)	Ease of use	SYQ1
		Responsiveness	SYQ2
		Privacy	SYQ3
		Respon Time	SYQ4
		Reability	SYQ5
		Security	SYQ6
		Access	SYQ7
Service Quality (SEQ)		Responsiveness	SEQ1
		Assurance	SEQ2
		Emphaty	SEQ3
Use (U)	(Livari, 2005)	Frequency of use	U1
Use Satisfaction (US)		Information	US1
		Satisfaction	
		Overall Satisfaction	US2
		System Satisfaction	US3
Net Benefit	(Davis, 1989)	Peningkatan pengetahuan	NB1
		Hemat Waktu	NB2
		Peningkatan kinerja	NB3
		Transparan	NB4

3. RESULTS AND DISCUSSIONS

Instrument Validity Test, We must do a validity test to evaluate the questionnaire's correctness and accuracy by contrasting each item's r-count value with its r-table value. The relevant r-table value in this instance, with 27 respondents, is 0.367. For every questionnaire item, the r-count must be determined as part of the process. Next, contrast the value of r-count with r-table. If the r-count is more than 0.367, the questionnaire item is deemed genuine; if not, it is deemed invalid. (Sitinjak, 2006).

Table 2. Validity Test Result

No	Var	R count	R table	Ket
1.	IQ1	0,637	0,381	Valid
2.	IQ2	0,627	0,381	Valid
3.	IQ3	0,567	0,381	Valid
4.	IQ4	0,688	0,381	Valid
5.	IQ5	0,812	0,381	Valid
6.	SYQ1	0,678	0,381	Valid
7.	SYQ2	0,677	0,381	Valid
8.	SYQ3	0,841	0,381	Valid
9.	SYQ4	0,858	0,381	Valid
10.	SYQ5	0,684	0,381	Valid
11.	SYQ6	0,868	0,381	Valid
12.	SYQ7	0,655	0,381	Valid
13.	SEQ1	0,650	0,381	Valid
14.	SEQ2	0,664	0,381	Valid
15.	SEQ3	0,747	0,381	Valid
16.	U1	0,756	0,381	Valid
17.	US1	0,791	0,381	Valid
18.	US2	0,817	0,381	Valid
19.	US3	0,601	0,381	Valid
20.	NB1	0,786	0,381	Valid
21.	NB2	0,637	0,381	Valid
22.	NB3	0,591	0,381	Valid
23.	NB4	0,793	0,381	Valid

Test for Instrument Reliability, The reliability test's objective is to evaluate the questionnaire's consistency as a research measurement tool. A variable is considered reliable if its Cronbach's Alpha value is 0.6 or more. This statement aims to provide a concise and understandable explanation of the objectives and specifications of the reliability test (Widodo, 2016).

Table 3. Reliability Test Results

No	Var	Cronbach's Alpha	Ket
1.	IQ1	0,954	Valid
2.	IQ2	0,954	Valid
3.	IQ3	0,954	Valid
4.	IQ4	0,954	Valid
5.	IQ5	0,951	Valid
6.	SYQ1	0,953	Valid
7.	SYQ2	0,953	Valid
8.	SYQ3	0,951	Valid
9.	SYQ4	0,951	Valid
10.	SYQ5	0,953	Valid
11.	SYQ6	0,950	Valid
12.	SYQ7	0,953	Valid
13.	SEQ1	0,952	Valid
14.	SEQ2	0,953	Valid
15.	SEQ3	0,953	Valid
16.	U1	0,953	Valid
17.	US1	0,952	Valid
18.	US2	0,951	Valid
19.	US3	0,954	Valid
20.	NB1	0,952	Valid
21.	NB2	0,954	Valid
22.	NB3	0,954	Valid
23.	NB4	0,952	Valid

Outer Model Test, Finding the correlation between latent variables and their indicators is the goal of this test. Using SmartPLS software, testing was done with the partial least squares (PLS) method.

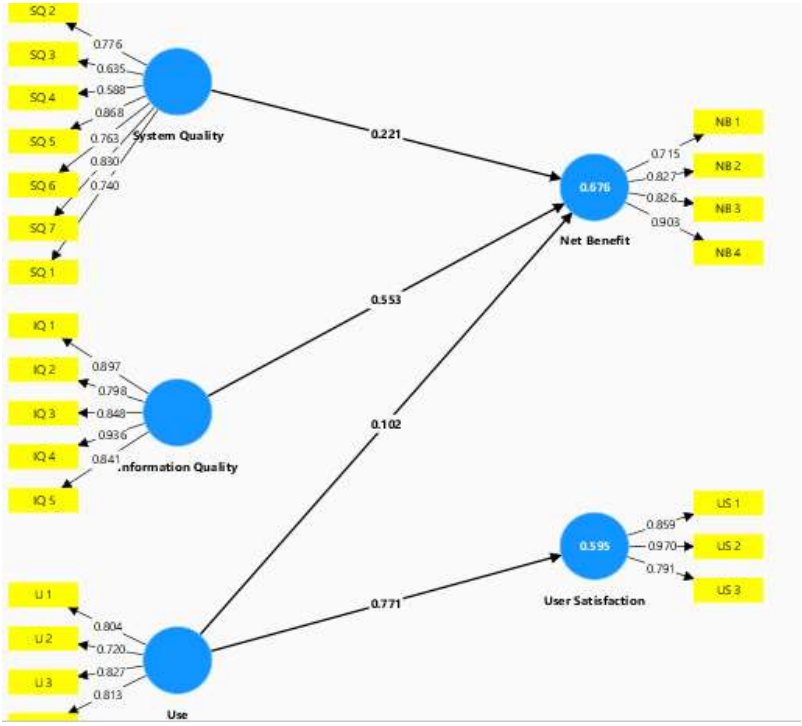

Figure 2. Outer Model Test Results

Convergent Validity measures the extent to which different indicators measure the same construct validly. An indicator is declared valid if its factor loading value is at least 0.7.

	Information Quality	Net Benefit	System Quality	Use	User Satisfaction
IQ 1	0.897				
IQ 2	0.798				
IQ 3	0.848				
IQ 4	0.936				
IQ 5	0.841				
NB 1		0.715			
NB 2		0.827			
NB 3		0.826			
NB 4		0.903			
SQ 2			0.776		
SQ 3			0.635		
SQ 4			0.588		
SQ 5			0.868		
SQ 6			0.763		
SQ 7			0.830		
U 1				0.804	
U 2				0.720	
U 3				0.827	
U 4				0.813	
US 1					0.859
US 2					0.970
US 3					0.791
SQ 1			0.740		

Figure 3. Table Convergent Test Results

In Figure 3, it can be explained that there are 2 indicators that have a factor loading value ≤ 0.7. So it can be interpreted that SQ3 and SQ4 are declared invalid because they have a value of 0.635 and 0.588.

Composite Reability to calculate the degree of consistency between the indicators used to measure a concept. A construct with high reliability and indicators that consistently represent the same construct are indicated by a good Composite Reliability rating, which is often above 0.7.

Table 4. Composite Reliability Test Results

Variabel	Composite Reability
Information Quality	0,937
Net Benefit	0,891
System Quality	0,898
Use	0,871
Use Satisfaction	0,908

Because every variable displays a value of ≥0.7, it can be deduced that the composite dependability value is said to be realizable. This demonstrates how highly stable and consistent the instrument being utilized is.

The percentage of indicator variance that the concept explains as opposed to the error variance is determined using the Averange Variance Extracted (AVE) test. This test helps determine the extent to which the concept explains the symptoms. A concept is considered to have good convergent validity if it can explain more than half of the variance of its indicators, as shown by an AVE value of 0.5 or higher (Ghozali, 2014).

Table 5. Averange Variance Extracted (AVE) Test Results

Variabel	Averange Variance Extracted (AVE)
Information Quality	0,748
Net Benefit	0,673
System Quality	0,560
Use	0,628
Use Satisfaction	0,768

Based on the test findings above, it can be inferred that these variables have an Averange variance Estracted (AVE) value greater than 0.5, indicating that they have a reasonably good construct value.

Inner Model Test The goal of structural model analysis, also known as structural equation modeling or SEM-based modeling, is to assess how the latent variables, or constructs, in the model relate to one another. This test assesses how effectively the structural model captures the link between these variables and focuses on the relationship between constructs. Researchers can evaluate the structural model's applicability and correctness in understanding the link between latent variables by administering this test.

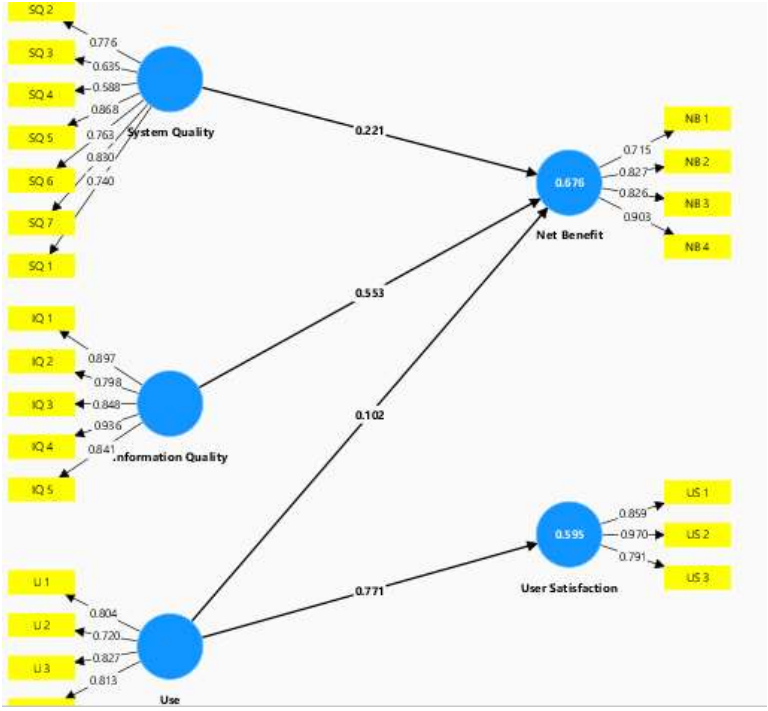

Figure 4. Inner Model Test Results

Test for Path Coefficients, Structural modeling, or model analysis based on structural equation modeling (SEM), aims to assess the nature and degree of the relationship between latent variables (constructs) in the model. A route coefficient that expresses a value of ≥0.1 signifies the extent to which one latent variable influences another latent variable. By evaluating the Path Coefficient, researchers can determine the significance and level of influence of each relationship in the model as well as how well the model represents the link between latent variables.

Table 6. Path Cofficient Test Results

Variabel	Path Cofficient
IQ →NB	0,553
SQ→NB	0,221

U→NB	0,102
U→US	0,771

Given that every variable in the preceding table has a path value of ≥0.1, it is possible to draw the conclusion that all of the factors have a considerable impact.

R^2 test , which determines how much of the variation of the dependent latent variable the structural model can explain. The R2 number indicates the proportion of the dependent variable's variance that the independent variables in the model explain. A lower R2 value indicates that the dependent variable's variance may not be adequately explained by the model, while a higher number indicates that the model does a better job of doing so.

Table 7. R-Square Test Results

Variabel	R-Square
Net Benefit	0,676
User Satisfaction	0,595

According to the test results above, User Satisfaction has a moderate value of ≥ 0.333, while the Net Benefit variable has a strong measurement value of ≥ 670.

T-Static Tests were conducted with the boostrapping method using a two-tailed test.

Table 8. T-Static Test Results

Variabel	T-Statis	P-Value
IQ →NB	1,913	0,056
SQ→NB	0,890	0,368
U→NB	0,368	0,713
U→US	7,056	0,000

The variable is approved according to the test findings because its t-Static value is less than 1.96. Fit of the Model The model is considered appropriate or suitable as the SMRS value of 0.148 is smaller than 0.10 and 0.08.

Table 9. Model Fit Test Results

Fit Summary	Estimed Model
SRMR	0,148
d_ULS	6,080
d_G	237,139
Chi_Square	∞
NFI	n/a

All questions posed have been tested for validity and reliability and are deemed valid. The results of the research found that all independent variables affect the dependent variable and have a positive impact on the implementation of E-Puskesmas. However, based on observations made, several issues were found, including unstable internet connectivity and access rights issues in E-Puskesmas. This aligns with research conducted by (Wahyuni A. , 2023) and (Tarigan & Maksum, 2022), who also stated that the control aspect of E-Puskesmas is still lacking

4. CONCLUSION

This study found that among the characteristics examined—information quality, service quality, system quality, actual use, user satisfaction, and net benefits—there is a consistent correlation between the variables and quality. Future service improvements should be a priority to enhance the quality of E-Puskesmas, including providing training for employees, increasing internet capacity to ensure stable application performance, and

proposing access rights for each user of E-Puskesmas. The success of E-Puskesmas Kuranji in Padang City is assessed through the application of the DeLone and McLean methodology. Additionally, the variables of the DeLone and McLean model were modified to create a proposed questionnaire that can be used to evaluate the performance of E-Puskesmas Kuranji in Padang City

The study found that among the characteristics examined—information quality, service quality, system quality, actual use, usage satisfaction, and net benefits—there is a consistent correlation between variables and quality. Future service improvements should be a priority to enhance the quality of E-Puskesmas, including providing training for employees, increasing internet capacity to ensure stable application performance, and proposing access rights for each user of E-Puskesmas. The success of Padang City's Kuranji E-Puskesmas was assessed through the application of the DeLone and McLean methodology. Additionally, the DeLone and McLean model's variables were changed to provide a proposed questionnaire that may be used to evaluate E-Puskesmas Kuranji Padang City's performance.

ACKNOWLEDGEMENTS

The Iris Foundation and Apikes Iris provided financing and assistance for this research project through the Iris 2024 Internal Research Grant Program, for which the authors are grateful. We also thank the Kuranji Health Center's head and all of the employees and medical professionals that took part in this program. We also thank the Iris Research Team, the Head of the Iris Research and Community Service Institute, and any those parties that we are unable to name individually for their contributions to this initiative.

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