The DeLone and McLean Model for Measuring Success Hospital Management Information System Case Study: Praya Regional Hospital

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Abstract − The advancement of information technology in the health sector encourages hospitals to implement Hospital Management Information Systems (SIMRS) to improve efficiency, effectiveness, and service quality. This study aims to measure the success rate of SIMRS implementation at Praya Regional Hospital using the DeLone and McLean model, which includes six variables: system quality, information quality, service quality, usage, user satisfaction, and net benefits. Data was collected through distributing questionnaires to 101 respondents in all service units of RSUD Praya. The analysis was conducted using the Structural Equation Modeling-Partial Least Square (SEM-PLS) method. The results showed that only three of the nine hypotheses proposed proved significant, namely the effect of user satisfaction on net benefits, service quality on usage, and usage on net benefits. These findings indicate that technical aspects and system services need to be improved to achieve optimal SIMRS implementation. This research contributes to the evaluation of hospital information systems and can serve as a reference in making future system development decisions.

Keywords – DeLone and McLean Model; SIMRS; SEM-PLS; Information System Evaluation

I. INTRODUCTION

In the era of globalization, advances in information technology have had a major influence in various fields, including the health sector. As a health care facility, hospitals are required to provide fast, accurate, and quality services [1]. To support its operations, the execution of a Healing center Administration Data Framework (SIMRS) may be a must, as stipulated in Permenkes RI Number 82 of 2013. SIMRS points to move forward effectiveness, viability, execution, and polished skill in healing center management while expanding access and improving service quality [2]. SIMRS implementation requires readiness from various parties, including medical personnel, doctors, and patients, so that the system can run optimally [3].

RSUD Praya Lombok Tengah, as a type B hospital, has implemented the Hospital Management Information System (SIMRS) in almost all installation units. However, in its implementation there are still some obstacles, such as frequent network disruptions; the input feature of lab support results in the inpatient installation; the patient service history data feature, as well as some annoying pop-ups; long data storage; the cursor does not auto-focus on the input form; and management support that is not yet optimal. These problems result in service delays and inaccuracies in data filling, which in turn can affect the quality of services provided [4].

The successful usage of the Healing Center Administration Data Framework (SIMRS) can be measured using the DeLone & McLean model, which consists of six main variables: system quality, information quality, service quality, usage, user satisfaction, and net benefits [5]. This model is used to evaluate the effectiveness of the system and its positive and negative impacts [6]. Previous research shows the data quality, framework quality, and benefit quality have a critical impact on client utilization and fulfillment [3]. However, some studies reveal inconsistencies in the relationship between system quality and net benefits obtained [1].

Human, organizational, and technological factors play a crucial role in the successful implementation of Hospital Management Information System (SIMRS) [7]. One of the main challenges is the low level of user participation in the system development process. Initial interviews showed that some users experienced difficulties in operating SIMRS, especially when network or server disruptions occurred. Therefore, technical support as well as training for hospital staff is needed to improve the effectiveness of system use.

This study aims to identify the supporting and inhibiting factors in the implementation of SIMRS at Praya Regional Hospital. In addition, this study also evaluates the relationship between information quality, system quality, and service quality to the level of use, user satisfaction, and net benefits generated by the system. The results of this study are expected to provide a clearer insight into the level of success of SIMRS implementation and become a reference for the hospital in improving the performance of information systems and the quality of patient services.

II. RESEARCH METHODOLOGY

A. DeLone and McLean Information System Success Measures

The DeLone and McLean model began to be developed in 1949 by Shannon and Weaver and Mason in 1949, as well as other information systems research [8].

The DeLone and McLean Information System success model is linked to system quality in measuring technological success, which is defined as the accuracy and efficiency of a system as an information producer, while information quality calculates semantic success, which is defined as the success of a piece of information in providing the desired meaning, user variables, and user satisfaction separately affect the two elements [2]. The positive and negative effects of the user component measures can be seen in the results of measuring user satisfaction. Afterwards, users and user satisfaction have an impact on individuals and organizations [3]. The DeLone and McLean success model from 1992 can be seen in Figure 1.
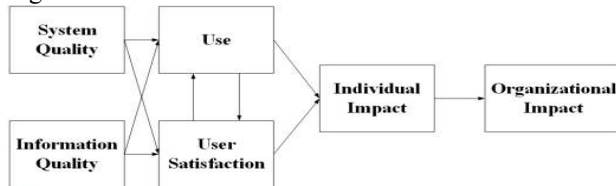

Fig 1. Information System success model [4]

DeLone and McLean improved the best form of information systems released in 2003 [5]. The latest DeLone and McLean success model can be seen in figure 2.
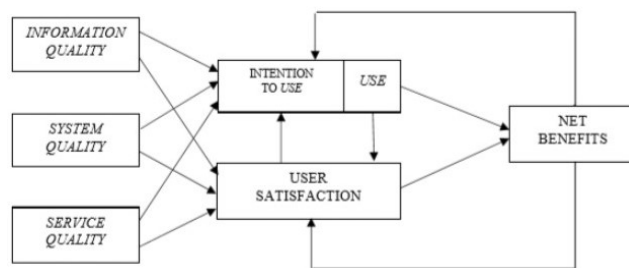

Fig 2. Information System success model [5]

B. Hypothesis

According to [9], the hypothesis is the initial perspective of the problem item under study, translated into a question item display. Hypotheses can also be described as theoretical responses to the formulation of research questions rather than as empirical answers.

Hypotheses have 3 forms that can be used in taking research answers, including the following:

1) Descriptive Hypothesis is the answer to the problem regarding the formulation of research problems.
2) Comparative Hypothesis is a problem perspective based on comparative problems.
3) Associative Hypothesis is the initial answer to the relationship problem.

C. Population and Sample

According to Sugiyono [9], The term "population" refers to the category of things or individuals that researchers use to examine and make conclusions because they have a certain number and characteristics, while the sample represents only a small part of the size and makeup of the population. If the size of the population causes the researcher to be unable to review the entire population due to restrictions, the researcher to use a sample from the population. Based on several population factors collected

and analyzed, the results aim to describe the characteristics of all population factors.

Quantitative analysis of sample data produces statistics that are used to estimate population parameters. Statistics are numerical measurements calculated from sample measurements, and parameters are numerical descriptive measurements where the calculations are derived from population measures. Sample statistics are used to draw conclusions about population measurements [10].

D. Sampling Technique

Sampling technique is a method for selecting or obtaining samples from a population to be used as research material. Researchers can make generalizations about the characteristics of population members by analyzing samples or understanding the quality of sample subjects [11]. This research takes a non-probability sampling model with a saturated sample technique [12]. Non-probability sampling is a procedure for obtaining a sample where each element or group of the population is not given the same opportunity to be sampled, while a saturated sample is a method of sampling from the entire population [13].

E. Measurement Technique

The estimation demonstration is assessed by checking the legitimacy and unwavering quality of the pointers that make up the idle factors. In measuring the external show, there are three arrangements, to be specific: focalized legitimacy, discriminant legitimacy, or utilizing normal fluctuation extricated and developing unwavering quality in measuring utilizing composite unwavering quality and Cronbach's alpha [14].

F. Structural Equation Modeling (SEM)

SEM is a multivariate statistical model that allows analysts to predict the influence and attachment between many variables [15]. SEM crucially offers reliability in conducting path analysis [16]. Path analysis is the relationship between intervening and dependent variables. Researchers clearly define what one variable contributes to another, usually displayed in the form of a diagram [17].

G. Partial Least Square (PLS)

PLS is similar to variance-based SEM formation, which allows testing the simultaneous formation of measured and structural. The structural model is used for testing causality, while the measurement model is used as a measure of validity and reliability (testing hypotheses with predictive formation) [18]. Latent variables can be described by PLS accompanied by measurements using their indicators [19]. The use of PLS is because the data does not depend on assumptions, normal distribution is also not required, and it is not a requirement to have a large sample size. PLS is used to process data and answer existing hypotheses [18].

H. Research Stage

This thesis has five research stages, starting from the planning stage to the documentation stage, as shown in Figure 3.
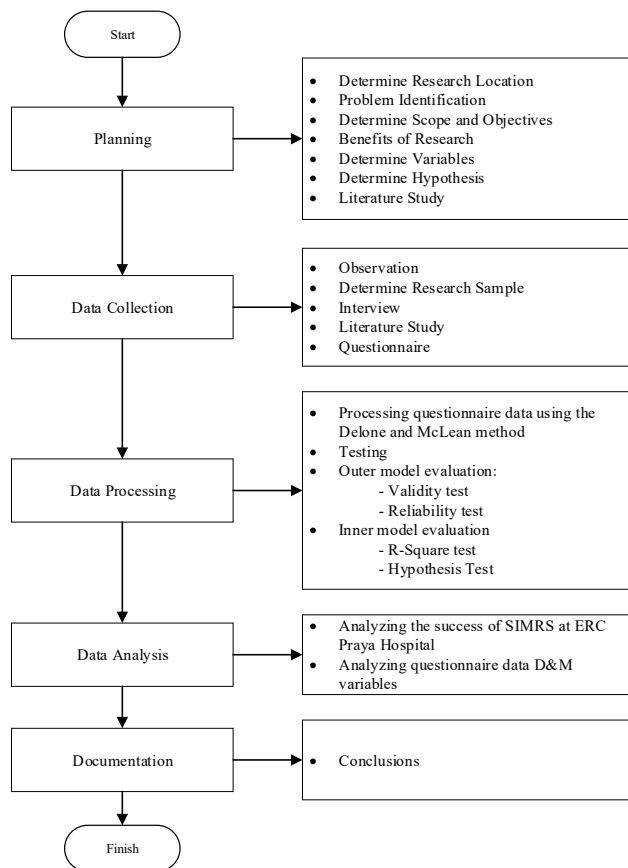
Fig 3. Flowchart of Research Methodology

I. Planning Stage

Ensuring the problems contained in the research regarding the successful implementation of SIMSR at Praya Hospital, determining the place of research, identifying problems, determining the scope and objectives, and benefits of research. This research will determine whether SIMRS users are satisfied and find out the problems they face when using the system.

1) Determining the Place of Research

The first stage carried out is to determine the research location as a case study that will be researched later. This research takes a case study at Praya Central Lombok Hospital, and then the researcher makes observations first to see the conditions that exist at Praya Hospital. Researchers entered a research permit to the general department of the hospital.

2) Problem Identification

Problem identification is carried out after the stage of determining the place of research is completed. Problem identification is carried out by looking at the situation of the case study under study, namely by looking at SIMRS, so that it can be identified how to analyze the success of the hospital management information system in the RSUD Praya, especially in all service units that are directly involved in using SIMRS.

3) Determining Scope and Objectives

The scope is taken based on the interconnected and related parts of the hospital installation, namely the Medical Record Service Unit at Praya Regional Hospital. The goal is for researchers to focus more on research results that are more effective and efficient.

4) Benefits of Research

The benefits of research at Praya Hospital were carried out to find out and improve user perceptions in the Medical Record Service Unit about user success on SIMRS.

5) Determining Variables

The variable formation in this study applies the DeLone and McLean method, which has three main variables, namely, variable X consisting of system quality, information quality, and service quality. Variable Y consists of usage, user satisfaction, and net benefits, which are determining variables.

6) Determining the Hypothesis

The hypothesis designed will be tested to prove whether the hypothesis is correct or not. The conceptual DeLone and McLean method is shown in Figure 4.
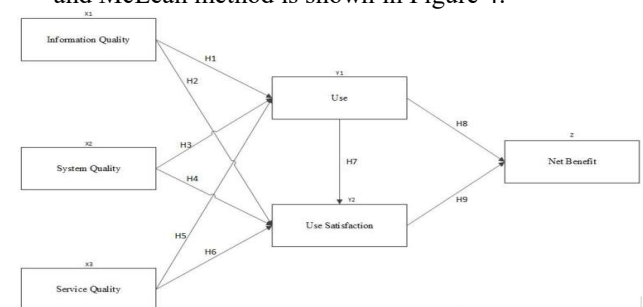

Fig 4. Hypothesis

The conceptual description of the hypothesis taken from the previously described research [20] is shown in Table 2.

Table 2. Hypothesis Description [21]

Hypothesis	Description
1	Information quality has a positive influence on usage.
2	Information quality has a positive influence on user satisfaction.
3	System quality has a positive influence on usage.
4	System quality has a positive influence on user satisfaction.
5	Service quality has a positive influence on usage.
6	Service quality has a positive influence on user satisfaction.
7	Usage has a positive influence on user satisfaction.
8	Usage has a positive influence on net benefits.
9	Usage satisfaction has a positive influence on net benefits.

7) Literature Study

The procurement of literature studies has the aim of producing information or explanations of theories that will be referred to in research and that will support problem solving. There are two data in the literature study, namely:

1) Primary

Primary data is a way of retrieving information directly from the original source within the scope of the research site. Data obtained through sources who know directly the condition of the object of research, namely the Medical Record Service Unit. Through the data obtained, they will be used as respondents in the study.

2) Secondary

Secondary data is a method whose origin is outside the research target; the data is obtained based on books and journals, both national and international, related to the DeLone and McLean success method.

J. Data Collection Stage

The step is obtained from the continuation of the first flow. The purpose of this stage is to make it easier for researchers to find out information and facilitate research. The activities carried out include:

1) Observation

Observing at Praya Central Lombok Hospital, the purpose of observation is to ask questions about the object under study, namely the Medical Record Service Unit.

2) Determining the Research Sample

SIMRS users in the Medical Record Service Unit totaled 101 employees, all of whom were used as samples in this study, namely the Medical Record Service Unit. Tests were taken utilizing non-probability testing procedures with soaked tests. In the inquiry [10], about the soaked test procedure, the assurance of the test is that all individuals of the populace are utilized as tests

3) Interview

At this stage the researcher meets directly to ask questions about the object under study, namely the Medical Record Service Unit. The intended targets are the SIMRS admin and employees assigned to the Medical Record Service Unit. Preparation for observations and interviews is to make a timeline of observations and interviews, then present observation sheets. The observation and interview timeline can be seen in Table 3.

Table 3. Observation Timeline

Stage	Activities	Result
1	Visiting the research site, introducing yourself and adapting to the environment, and interviewing one of the employees aimed at finding profile information, organizational structure, and how SIMRS management works in the Medical Records Service Unit.	The results obtained are a. Getting to know the staff in the SIMRS Medical Record Service Unit. (Appendix F). b. Interview List (Appendix A) c. Organizational Structure Data and Company Profile d. How the Medical Record Service Unit is managed.
2	The activities carried out are a. Observation on SIMRS Medical Record Service Unit. b. Observing the Medical Record Service Unit.	Obtaining a SIMRS printscreen at the Medical Record Service Unit. (Appendix B).

4) Questionnaire

Observation is done by distributing questionnaires as a way of collecting data. The questionnaire in this study was built to determine the success of the Medical Record Service Unit that has been used at Praya Central Lombok Hospital (Appendix C). After the questionnaire was distributed, the next requirement test was carried out by testing the validity and reliability of the data. Validity testing is used to know whether all research items or indicators proposed to measure

research variables are valid. Variables are determined based on the DeLone and McLean method in making questionnaires. Based on research conducted [22], the variables and questionnaire statements obtained from a summary of sources on the DeLone and McLean model variables in this final project can be seen in Table 4.

Table 4. Variables and Questionnaire Statements

No	Indicator	Source	Statement
1	**Information Quality**		
	Completeness	[23]	SIMRS produces complete information according to the user's work needs.
	Accuracy		SIMRS provides information according to actual data.
	Reliability		Users can rely on the data to fulfill their information needs for work.
	Data Update		SIMRS provides information that is current and always updated.
2	**System Quality**		
	System Flexibility	[23]	SIMRS can be used easily and change the available data according to work needs.
	System Integration		SIMRS interaction with users and agencies can be done very well.
	Response Time		SIMRS has good access speed so that it can help users in completing work.
	Language		The language referred to by SIMRS is very easy to understand.
	Convenience of Access		SIMRS is very comfortable and easy to use.
	Error Fixing		SIMRS provides repair facilities if it fails.
3	**Service Quality**		
	Empathy	[21]	SIMRS provides some feedback that may be useful for the user's work.
	System Response		SIMRS responds according to what the user does.
4	**Use**		
	Total Access	[21]	Users routinely use SIMRS.
	Daily Used Time		Users have used SIMRS for a long time.
5	**Use Satisfaction**		
	Information Satisfaction.	[21]	Users are satisfied with the features and functions in the system.
	Overall Satisfaction.		Users are satisfied with the information available because it suits their needs.
6	**Net Benefits**		
	Speed of Task Completion.	[24]	SIMRS helps users in completing work quickly.
	Job Performance.		SIMRS impacts user performance for the better.
	Effectiveness.		SIMRS makes users more effective at work
	Ease of Work.		SIMRS makes it easier for users to do work.
	Usability.		SIMRS is very useful in completing the work of Hospital activities

III. RESULTS AND DISCUSSION

A. Demographic Characteristics of Respondents

Based on the results of distributing questionnaires A questionnaire distributed via Google Forms to SIMRS users obtained data on 101 respondents with the following characteristics:
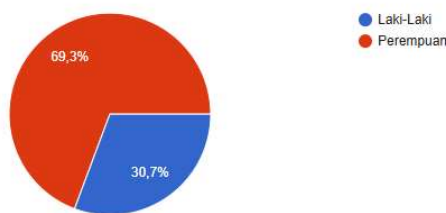
101 jawaban

Fig 5: Percentage of Respondent Gender

Figure 5 displays the percentage of respondent gender. It can be seen that of the 101 respondents, 69.3% were female and 30.7% were male. So that the research is dominated by female respondents.

B.   Respondents' Education Level

Based on Figure 6, of 101 respondents, the majority (54.5%) have an undergraduate education (S1), followed by 34.7% with a Diploma Three (D3), and 10.9% answered other. This research is dominated by respondents with a bachelor's degree.
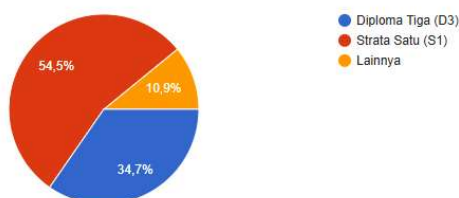
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Fig 6. Percentage of Respondents' Education Level

C.   Training on the use of SIMRS

Based on Figure 7, the majority of respondents (96%) have participated in training activities using SIMRS, and 4% have not participated in training activities. This study was dominated by respondents who had participated in training activities on the use of SIMRS.
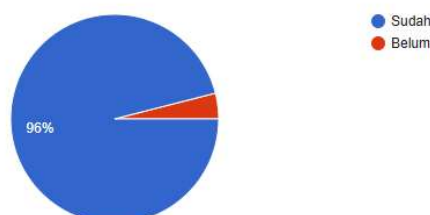
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Fig 7. Percentage of respondents who have participated in SIMRS training activities.

D.   Period of SIMRS Use

Based on Figure 8, most of the respondents' SIMRS user period is more than 5 years (45.5%), followed by 27.7% of respondents who have used SIMRS for more than 2 yearsd 26.7% of respondents who have used SIMRS for less than 2 years. So that the research is dominated by respondents who have used SIMRS for more than 5 years.
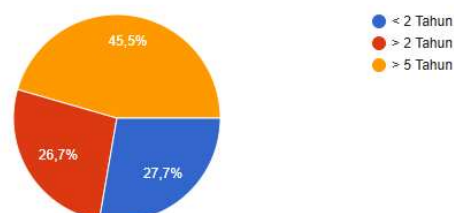
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Fig 8. Percentage of SIMRS usage period

E.   Outer Model

Testing the measurement model or outer model is carried out to determine the validity and reliability seen from the attachment between variables and each indicator.

1.   Convergent Validity

The outputs of this test are convergent validity and reliability [25].

Table 5. Outer Loadings Value

	(IQ)	(NB)	(PP)	(SQ)	(U)	(US)
IQ1	0.829					
IQ2	0.713					
IQ3	0.844					
IQ4	0.794					
KP1			0.913			
KP2			0.892			
NB1		0.834				
NB2		0.890				
NB3		0.868				
NB4		0.872				
NB5		0.765				
SQ1				0.661		
SQ2				0.673		
SQ3				0.654		
SQ4				0.703		
SQ5				0.901		
SQ6				0.901		
U1					0.959	
U2					0.909	
US1						0.905
US2						0.917

Table 5 shows that the outer loadings value on the variable indicators of system quality, information quality, service quality, user satisfaction, use, and benefits has met the minimum limit of 0.6. All variable indicators have met the minimum outer loadings value limit so that they have met the convergent validity standard.

2.   Discriminant Validity

Discriminant validity can be seen in the Average Variance Extracted value, as in Table 6.

Table 6. Average Variance Extracted (AVE) Value

Variable	Average Variance Extracted (AVE)
Information Quality (IQ)	0.634
Net Benefits (NB)	0.717
Service Quality (PP)	0.815
System Quality (SQ)	0.573
Use (U)	0.873
User Satisfaction (US)	0.830

In table 6, all variables have met the Average Variance Extracted (AVE) value, which is 0.5, so that they have met convergent validity. For the next testing stage, namely reliability, by looking at the Cronbach's alpha value and the composite reliability value.

3. Reliability Test

Table 7. Cronbach's Alpha and Composite Reliability Values

	Cronbach's alpha	Composite reliability (rho_c)
Information Quality (IQ)	0.809	0.874
Net Benefits (NB)	0.902	0.927
Service Quality (PP)	0.773	0.898
System Quality (SQ)	0.851	0.887
Use (U)	0.860	0.932
User Satisfaction (US)	0.796	0.907

The Cronbach's alpha and composite reliability values of all variables are more than 0.70, so all variables are reliable.

F. Inner Model

The structural model (inner model) defines the relationship between latent constructs by looking at the results of the parameter coefficient estimate and its significance level. The structural model is generated as follows:
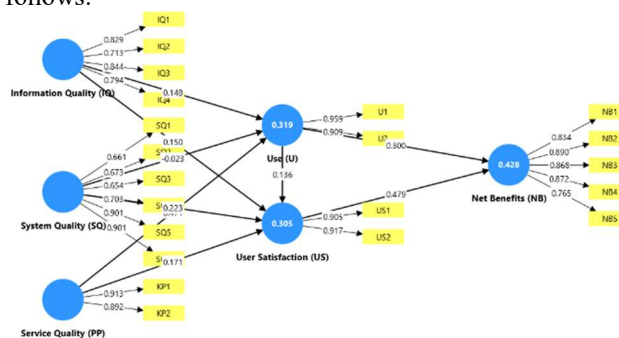

Fig 9. User Page Display

Structural model testing is seen from several indicators, namely R-squares, f-squares, and goodness of fit models.

1. R-Square

There are three categories in gathering R-square values. In case the R-square estimate is 0.75, it is within the solid category; for an R-square estimate of 0.50, it is within the direct category, and 0.25 is within the powerless category [26]. The R-square estimate of the subordinate variable gotten in this investigation can be seen in table 8.

Table 8. R-Square Value

Variable	*R-square*	**Prediction Model**
User Satisfaction (US)	0.305	Weakness
Use (U)	0.319	Weakness
Net Benefits (NB)	0.428	Weakness

After calculating through SmartPLS 4 in accordance with the table above, it explains that the user satisfaction variable has an r-square value of 0.305. This means that the effect of information quality, system quality, service quality, and usage on user satisfaction is 30.5%. The r-square value on the usage variable is 0.319; this means that the effect of information quality, system quality, and service quality on usage is 31.9%. The r-square value on the net benefit variable is 0.428. This means that the effect of SIMRS users and user satisfaction on net benefits is 42.8%.

2. F-Square

F-square is a measure used to assess the relative impact of an influencing variable (exogenous) on the influenced variable (endogenous). The amount of substantive influence is classified into 3, namely 0.02 (small/bad), 0.15 (medium/sufficient), and 0.35 (large/good) (Setiaman, 2023).

Table 9. F-Square Value

Variable Relationship	**F-Square**	**Substantive Effect**
Use Satisfaction (US) -> Net Benefits (NB)	0.345	Small
Information Quality (IQ) -> Use Satisfaction (US)	0.015	Small
Information Quality (IQ) -> Use (U)	0.014	Small
Service Quality (KP) -> Use Satisfaction (US)	0.020	Medium
Service Quality (KP) -> Use (U)	0.163	Small
System Quality (SQ) -> Use Satisfaction (US)	0.041	Small
System Quality (SQ) -> Use (U)	0.000	Small
Use (U) -> Use Satisfaction (US)	0.017	small
Use (U) -> Net Benefit (NB)	0.135	Small

G. Goodness of Fit

This menu is designed to ensure the system runs smoothly and securely. In addition, system and database updates can be managed through this menu to maintain optimal website performance.

Table 10. Model Goodness of Fit Test Results

| No	**Structural Model**	*Cut-Off Value*	**Estimated**	**Description**
1	SRMR	< 0,10	0.160	Bad Fit
2	d_ULS	> 0,05	5.877	Fit
3	d_G	> 0,05	1.250	Fit
4	Chi-Square	< 0,05	590.334	Fit
5	NFI	Approaching 1	0.614	Fit

Based on the results of the PLS goodness-of-fit model test in table 10, it shows that the SRMR value of the PLS model is 0.160, which is higher than 0.10, indicating that the model is not good. For the d_ULS output result, namely 5.877, the result is higher than 0.05, which means it shows a good model. For the d_G output result, namely 1.250, the result is higher than 0.05, indicating a good model. The chi-square result is 590.334, which is higher than 0.05 and means the model is good. The NFI output results show a result of 0.614, meaning that the model is well accepted.

H. Hypothesis Testing

The accepted and rejected path coefficient results can be seen in table 11 below:

Table 11. Path Coefficient on Model Testing

No	**Variable**	**t-count**	**p-value**	**Description**
1	Use Satisfaction (US) → Net Benefits (NB)	5.749	0.000	Accepted
2	Information Quality (IQ) → Use Satisfaction (US)	0.907	0.364	Rejected
3	Information Quality (IQ) → Use (U)	1.147	0.252	Rejected
4	Service Quality (KP) → Use Satisfaction (US)	0.986	0.324	Rejected
5	Service Quality (KP) → Use (U)	3.965	0.000	Accepted
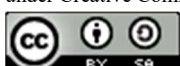
6	System Quality (SQ) → Use Satisfaction (US)	1.689	0.091	Rejected
7	System Quality (SQ) → Use (U)	0.054	0.957	Rejected
8	Use (U) → Use Satisfaction (US)	1.427	0.154	Rejected
9	Use (U) → Net Benefits (NB)	2.551	0.011	Accepted

Based on the table above, the results of testing each hypothesis based on the results of t-statistics and sig values on path coefficients are explained as follows:

1. H1: Use Satisfaction (US) has a significant effect on Net Benefits (NB) The t-count value = 5,749 and p-value = 0.000, so the hypothesis is accepted.
2. H2: Information Quality (IQ) has no significant effect on Use Satisfaction (US) The t-count value = 0.907 and p-value = 0.364, so the hypothesis is rejected.
3. H3: Information Quality (IQ) has no significant effect on Use (U) The t-count value = 1.147 and p-value = 0.252, so the hypothesis is rejected.
4. H4: Service Quality (KP) has no significant effect on Use Satisfaction (US) The t-count value = 0.986 and p-value = 0.324, so the hypothesis is rejected.
5. H5: Service Quality (KP) has a significant effect on Use (U) The t-count value = 3.965 and the p-value = 0.0, so the hypothesis is accepted.
6. H6: System Quality (SQ) has no significant effect on User Satisfaction (US) The t-count value = 1.689 and p-value = 0.091, so the hypothesis is rejected.
7. H7: System Quality (SQ) has no significant effect on Use (U). The t-count value = 0.054 and the p-value = 0.957, so the hypothesis is rejected.
8. H8: Use (U) has no significant effect on Use Satisfaction (US) The t-count value = 1.427 and p-value = 0.154, so the hypothesis is rejected.

IV. CONCLUSION

Based on the results of research on the implementation of the Hospital Management Information System (SIMRS) at Praya Regional Hospital using the DeLone and McLean model, it can be concluded that of the nine hypotheses proposed, only three hypotheses were accepted, namely that user satisfaction has a significant effect on net benefits, service quality has a significant effect on usage, and usage has a significant effect on net benefits. The other six hypotheses were rejected because they did not meet the required significance and t_values, indicating that information quality, system quality, and most aspects of use have not been able to have a significant effect on user satisfaction or on the use of SIMRS directly. In general, the outer model test results show that all indicators in this study meet the validity and reliability criteria. However, the R-square values for the user satisfaction, usage, and net benefit variables are in the weak category, which means that the independent variables only explain a small part of the variation that occurs in the dependent variable. In addition, the goodness-of-fit test results show that there are some weaknesses in the fit of the model, especially in the SRMR value, which still exceeds the ideal threshold. In addition, to obtain more in-depth results, further research is recommended to be carried out by involving other service units and considering external variables outside the DeLone and McLean model that may also affect the successful implementation of hospital information systems.

REFERENCES

[1] S. A. Azni, "Analisis Parameter Keberhasilan Sistem Informasi Manajemen Rumah Sakit (SIMRS) dengan Metode DeLone dan McLean (Studi Kasus Pada Rumah Sakit Swasta di Kota Padang)," Universitas Andalas, 2023.

[2] B. Alferi, T. D. Wulan, and F. A. Susanto, "EVALUASI KESUKSESAN SISTEM PENDAFTARAN ONLINE DI RSI SURABAYA DENGAN MENGGUNAKAN METODE (DELONE & MCLEAN)," in PROSIDING NATIONAL CONFERENCE FOR UMMAH, 2020, vol. 1, no. 1.

[3] A. Annur, "Implementasi Sistem Informasi Manajemen Rumah Sakit (SIMRS) RSUD Natuna dengan Pendekatan DeLone Dan McLean," Universitas Islam Sultan Agung Semarang, 2024.

[4] W. H. DeLone and E. R. McLean, "Information systems success measurement," Foundations and Trends® in Information Systems, vol. 2, no. 1, pp. 1-116, 2016.

[5] P. H. Saputro, A. D. Budiyanto, and A. Santoso, "Model DeLone and McLean untuk mengukur kesuksesan e-government Kota Pekalongan," Scientific Journal of Informatics, vol. 2, no. 1, pp. 1-8, 2015.

[6] N. Agustina and E. Sutinah, "Model Delone dan McLean Untuk Menguji Kesuksesan Aplikasi Mobile Penerimaan Mahasiswa Baru," InfoTekJar (Jurnal Nas. Inform. dan Teknol. Jaringan), vol. 3, no. 2, pp. 76-82, 2019.

[7] R. P. S. Ringo and H. Hendri, "Model Delone Dan Mclean Untuk Mengukur Kesuksesan Pada Aplikasi PeduliLindungi Dimasa Pandemi Covid-19," Jurnal Informatika Dan Rekayasa Komputer (JAKAKOM), vol. 2, no. 2, pp. 207-215, 2022.

[8] A. Anfal, "Pengaruh Kualitas Pelayanan Dan Citra Rumah Sakit Terhadap Tingkat Kepuasan Pasien Rawat Inap Rumah Sakit Umum Sundari Medan Tahun 2018," Excellent Midwifery Journal, vol. 3, no. 2, pp. 1-19, 2020.

[9] D. Sugiyono, "Metode penelitian pendidikan pendekatan kuantitatif, kualitatif dan R&D," 2013.

[10] A. Syamil et al., Akuntansi manajemen: Konsep-konsep dasar akuntansi manajemen era digital. PT. Sonpedia Publishing Indonesia, 2023.

[11] M. Ernawati, E. H. Hermaliani, and D. N. Sulistyowati, "Penerapan DeLone and McLean Model untuk Mengukur Kesuksesan Aplikasi Akademik Mahasiswa Berbasis Mobile," IKRA-ITH Informatika: Jurnal Komputer dan Informatika, vol. 5, no. 1, pp. 58-67, 2021.

[12] A. Chusen, A. Wulansari, and E. M. Safitri, "Evaluasi Kesuksesan Sistem Informasi Rumah Sakit Dengan Pendekatan Model DeLone dan

McLean," *Jurnal Ilmiah Komputasi,* vol. 23, no. 4, pp. 485-494, 2024.

[13] Y. R. Permana, M. Halid, U. Hasanah, R. P. A. Putra, and I. Ikhwan, "Faktor Kesuksesan SIM-RS Berdasarkan Teori DeLone and McLean di Rumah Sakit Umum Daerah Kota Mataram," *J-REMI: Jurnal Rekam Medik dan Informasi Kesehatan,* vol. 4, no. 2, pp. 83-88, 2023.

[14] R. Jumardi, E. Nugroho, and I. Hidayah, "Analisis Kesuksesan Implementasi Sistem Informasi Skripsi pada Program Studi Teknik Informatika Universitas Pembangunan Nasional "Veteran" Yogyakarta," in *Seminar Nasional Aplikasi Teknologi Informasi (SNATi),* 2015.

[15] F. S. Rahayu, R. Apriliyanto, and Y. S. P. W. Putro, "Analisis Kesuksesan Sistem Informasi Kemahasiswaan (SIKMA) dengan Pendekatan Model DeLone dan McLean," *Indonesian Journal of Information Systems,* vol. 1, no. 1, pp. 34-46, 2018.

[16] I. Ghozali and H. Latan, "Partial least squares konsep, teknik dan aplikasi menggunakan program smartpls 3.0 untuk penelitian empiris," *Semarang: Badan Penerbit UNDIP,* vol. 4, no. 1, pp. 35-46, 2015.

[17] A. Wicaksono, *Metodologi Penelitian Pendidikan: Pengantar Ringkas.* Garudhawaca, 2022.

[18] R. Ramadhani and N. S. Bina, *Statistika Penelitian Pendidikan: Analisis Perhitungan Matematis dan Aplikasi SPSS.* Prenada Media, 2021.

[19] Z. S. Syafhil and L. Kartika, "Analisis Kesuksesan Karir Alumni Program Mahasiswa Berprestasi Di Perguruan Tinggi," *Perspekt. Ilmu Pendidik,* vol. 35, no. 1, pp. 9-24, 2021.

[20] M. T. Taufik and S. Hajar, "Analisis kualitas pelayanan penerbitan e-ktp melalui aplikasi lakse pada dinas kependudukan dan pencatatan sipil kota batam," *Jurnal Kolaboratif Sains,* vol. 6, no. 5, pp. 453-468, 2023.

[21] W. H. DeLone and E. R. McLean, "The DeLone and McLean model of information systems success: a ten-year update," *Journal of management information systems,* vol. 19, no. 4, pp. 9-30, 2003.

[22] I. K. Widyawati, R. R. R. Wasita, and I. G. N. M. Nugraha, "Analisis Penerapan Sistem Manajemen Rumah Sakit dengan Menggunakan Metode DeLone & McLean di Rumah Sakit Wira Bhakti Mataram," *Jurnal Informasi Kesehatan Indonesia,* vol. 10, no. 1, pp. 35-49, 2024.

[23] J. Iivari, "An empirical test of the DeLone-McLean model of information system success," *ACM SIGMIS Database: the DATABASE for Advances in Information Systems,* vol. 36, no. 2, pp. 8-27, 2005.

[24] F. D. Davis, "Perceived usefulness, perceived ease of use, and user acceptance of information technology," *MIS quarterly,* pp. 319-340, 1989.

[25] R. P. Putra, A. Wibowo, Y. Farlina, and D. Susilawati, "Penerapan Model Delone And Mclean Website Sistem Informasi Akademik STIKES Sukabumi," *Swabumi,* vol. 10, no. 1, pp. 44-54, 2022.

[26] A. E. Johan, "Pengaruh User Experience dan Kepercayaan Terhadap Kepuasan Pengguna Mobile Application E-Wallet DANA Menggunakan Metode DeLone & McLean," Fakultas Sains dan Teknologi UIN Syarif Hidayatullah Jakarta, 2023.