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Sipkumhamai Application Success Analysis Using the Delone and Mclean Model

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ABSTRACT

Evidence-based policy aims to increase the efficiency and effectiveness of policy settings and increase alternative opportunities. The Legal and Human Rights Policy Strategy Agency created the SIPKUMHAMAI application to support evidence-based legal and human rights policies, support legal and human rights research with better data, and provide information to the public about legal and human rights issues. It is very important to make efforts to provide comprehensive and systematic data and information on legal and human rights issues originating from real situations on the ground. In addition to overall legal and human rights issues, this data and information can be used to find out more about the causes of legal and human rights problems, identify deficiencies in law enforcement and human rights protection, and carry out analyzes and provide various recommendations to strengthen systems and mechanisms for enforcing law and human rights in Indonesia. To achieve this goal, a system evaluation must be carried out to determine which components need to be improved. This is necessary to determine whether the system used provides significant benefits for users and the organization. Using the Delone and McLean model, from the six relationships of Information System Success Model, it was obtained that only Hypothesis 7, Hypothesis 8, and Hypothesis 9 were significantly supported and accepted by the data. These findings provide several implications for eGovernment research and practice, especially regarding how to maximize applications. This paper concludes by discussing the limitations that the proposed hypotheses are not fully supported by the research results.

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INTRODUCTION

The development of artificial intelligence (AI) has developed into one of the most important and interesting elements in the field of technology in the last few decades. Changing processes that have been established for years or even decades, moreover, on the scale of huge productions, is a serious challenge (Kraus et al., 2022). AI refers to the ability of computers to mimic or imitate the human brain's ability to learn, plan, solve problems, and make decisions based on existing data. AI emphasizes that technology is often focused on automating certain types of tasks: tasks that are thought to involve intelligence when people perform them (Surden, 2019).

In formulating an effective policy, one must avoid the connotation or use of the word political, which is often considered to contain biased meaning and represent partiality due to interests. When a policy is created, it needs to be implemented and the policy results need to be as close as possible to the policy

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maker's expectations. Evidence-based policies are intended to increase the effectiveness and efficiency of policy frameworks and alternative options. To implement evidence-based policies, good data and analytical skills are needed (Firdaus, 2022).

To support evidence-based policy making, the Legal and Human Rights Research and Development Agency, which has now transformed into the Legal and Human Rights Policy Strategy Agency, built an application called SIPKUMHAMAI. SIPKUMHAMAI is a Legal and Human Rights Research Information System based on Artificial Intelligence technology and built for the purposes of: supporting the development of legal and human rights policies based on evidence; providing support for better legal and human rights research with complete data; and providing information to the public about legal and human rights issues. It is very important to make efforts to provide data and information on legal and human rights issues in a comprehensive and systematic manner. This is an important effort that must be carried out based on actual local conditions. Apart from legal and human rights issues, this data and information can be used to find out more about the root causes of legal and human rights problems, identify deficiencies in law enforcement and human rights protection, as well as carry out analysis and produce various suggestions to improve the system and mechanism for enforcing law and human rights in Indonesia.

To achieve these goals, a system evaluation must be conducted to determine which parts of the system require repair, upgrade, or maintenance. This is necessary to be able to find out whether the system used has a significant positive impact on users and the organization. Evaluating the success of an Information System implementation is a complicated phenomenon because many factors and measures must be considered to evaluate its success (Amriani & Iskandar, 2019).

The DeLone and McLean (D&M) model as in Figure 1 is a model that is commonly used in measuring and evaluating the success of information systems, and is often referred to as the D&M IS Success Model. The D&M model shows that user use and satisfaction are influenced by system and information quality (Wara et al., 2021). The D&M model, built by Mason and based on Shannon and Weaver's communication model (Dias et al., 2022), calculates the success of Information Systems by assuming that the processes are similar to Communication Systems (Andriyanto et al., 2021). The D&M model evaluates the success of information systems that can influence individuals in the organization and the organization as a whole (Kurniawan et al., 2020). Six measures of the success of an information system are described in the D&M model. Information quality (information quality); system quality (system quality); service quality (service quality); usability (use); user satisfaction (user satisfaction); and net benefits are the six elements or measurement factors of this model (Fahirah et al., 2020)

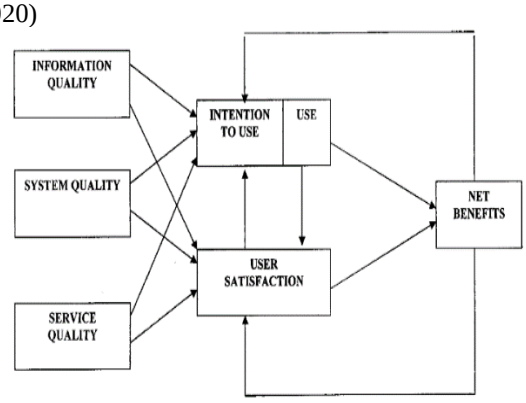

Figure 1. D&M Model Update (Shim & Jo, 2020).

Research on the influence of the D&M model on the level of success of information systems on user satisfaction shows that user satisfaction is highly dependent on the quality of the system and information. Other studies show that the factors that most influence user satisfaction are system quality and service quality (Pramudito et al., 2023), so that user satisfaction has an impact on net benefits. However, only a few studies have been conducted to assess the success of the e-Government system

This study aims to analyze the success of SIPKUMHAMAI using six variables from D&M: information quality, system quality, service quality, usability, user satisfaction, and net benefits. It is hoped that the results of this study can be used as a reference for application development and as input to maximize its usefulness and provide a useful framework for evaluating the success of the e-Government system.

RESEARCH METHOD

This research aims to find out how effective the SIPKUMHAMAI application is from the user's perspective using quantitative descriptive research methodology. Samples of application user respondents in various regional offices of the Ministry of Law and Human Rights were collected using a random sampling method. In determining the number of samples, the Partial Least Squares Structural Equation Modeling (PLS-SEM) model was used. For data with a small sample size, a sample size of at least 10 times the largest number of formative indicators used to evaluate the construct is required, as well as 10 times the largest number of inner model paths that are directly connected to a particular construct in the inner model (Rian Marliana, 2020). At the research stage, a questionnaire-based survey method was used as a tool. To obtain primary data, a questionnaire with questions in table 1 was distributed to respondents who used the SIPKUMHAMAI application. This method is based on the D&M model implemented through the use of Google Forms.

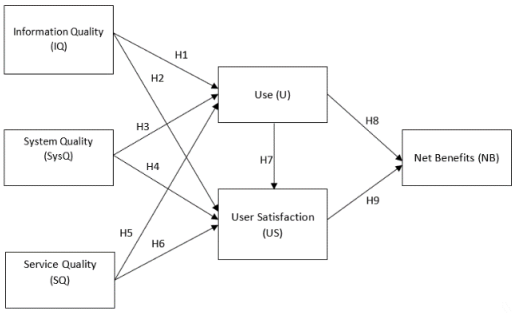

Figure 2. Hypothesis Model (H) Research.

This research examines 9 hypotheses as in Figure 2, namely: Hypothesis 1 (H1) tests whether Information Quality (IQ) influences Use (U) significantly, Hypothesis 2 (H2) tests whether Information Quality (IQ) influences User Satisfaction (US) Hypothesis 3 (H3) tests whether System Quality (SysQ) influences Use (U) significantly, Hypothesis 4 (H4) tests whether System Quality (SysQ) influences User Satisfaction (US) significantly, Hypothesis 5 (H5) tests Does Service Quality (SQ) influence Use (U) significantly, Hypothesis 6 (H6) tests whether Service Quality (SQ) influences User Satisfaction (US) significantly, Hypothesis 7 (H7) tests whether Use (U) influences User Satisfaction (US) significantly, Hypothesis 8 (H8) tests whether Use (U) influences Net Benefits (NB) significantly, Hypothesis 9 (H9) tests whether User Satisfaction (US) influences Net Benefits (NB) significantly.

Table 1. Shows research indicators and D&M model variables

Variable		Indicator
SysQ	SysQ1	I find the SIPKUMHAM Application easy to use
	SysQ2	I found it easy to learn how to operate the SIPKUMHAM App
	SysQ3	I find it easy to navigate the SIPKUMHAM Application
	SysQ4	I feel that the SIPKUMHAM Application allows me to easily find the information I am looking for
	SysQ5	I feel the SIPKUMHAM Application is well structured
	SysQ6	The SIPKUMHAM application allows me to create individual accounts with login-id and password
IQ	IQ1	Saya merasa infomasi yang ditampilkan oleh Aplikasi SIPKUMHAM adalah benar
	IQ2	I feel that the information displayed by the SIPKUMHAM Application is useful and fits its purpose
	IQ3	The information provided by the SIPKUMHAM Application is the latest information
	IQ4	The information provided by the SIPKUMHAM Application is clear. The information provided by the SIPKUMHAM Application is clear
SQ	SQ1	The SIPKUMHAM application is available at any time
	SQ2	There is adequate technical support from the SIPKUMHAM Application provider
	SQ3	The SIPKUMHAM application can be relied on to provide information as needed
	SQ4	The SIPKUMHAM Application output is in accordance with the work process
	SQ5	The SIPKUMHAM application is safe and protects privacy
US	US1	I feel the SIPKUMHAM Application is interesting and should be used
	US2	The SIPKUMHAM application has met user needs
	US3	I feel that the SIPKUMHAM Application has met my knowledge or information processing needs
	US4	Overall, I am satisfied with the SIPKUMHAM Application
U	U1	I feel the SIPKUMHAM Application is useful for me
	U2	I will use SIPKUMHAM App in future
	U3	I will use the SIPKUMHAM App often in the future
NB	NB1	The SIPKUMHAM application helps overcome the limitations of paper-based systems
	NB3	SIPKUMHAM app saves my time
	NB3	The SIPKUMHAM application helps solve problems in society

The questionnaire used contains 25 questions, including 6 questions for the System Quality dimension, 4 questions for the Information Quality dimension, 5 questions for the Service Quality dimension, 4 questions for the User Satisfaction dimension, 3 questions for the Use dimension, and 3 questions for the Net Benefits dimension. The perception, attitude or opinion of a person or group about an event or phenomenon can be measured using a Likert scale (Pranatawijaya et al., 2019) in table 2. This scale includes 5 answer choices and is used to assess each question with categories ranging from "strongly disagree" on one pole to "strongly agree" on the other pole (Kusmaryono et al., 2022).

Table 2. The Likert scale

No.	Perception	Score
1	Strongly Disagree	1
2	Disagree	2
3	Neutral	3
4	Agree	4
5	Strongly Agree	5

RESULTS AND DISCUSSION

1. Respondent Demographics

Table 3. Shows the demographics of respondents

Characteristics		Total	Percentage (%)
Gender	Woman	29	42.6
	Man	39	57.4
Age	25 – 30	10	14.7
	31 – 35	12	17.7
	36 – 40	19	27.9
	41 – 45	9	13.2
	46 – 50	6	8.8
	51 – 55	9	13.2
	56 – 60	3	4.4
Education	Elementary School	0	0
	Junior High School	0	0
	Senior High School	8	11.8
	Diploma III (D3)	0	0
	Bachelor (S1)	36	52.9
	Postgraduate (S2)	23	33.8
	Doctor (S3)	1	1.5

Table 4. The number of respondents calculated based on research locus

Regional Office	Number of people
Nanggroe Aceh Darussalam	6
Bali	5
Bangka Belitung	10
West Java	4
East Java	7
West Kalimantan	10
South Kalimantan	3
East Kalimantan	4
Riau Islands	2
North Maluku	3
West Nusa Tenggara	7
Riau	3
West Sumatera	4

In this research, 68 employees from the Regional Office of the Ministry of Law and Human Rights in table 4 with gender, age and education in table 3, were asked whether they had used or often used the SIPKUMHAMAI application. This is done to ensure that employees have used it or use it frequently.

2. Model Testing

At this stage, Convergent Validity, Discriminant Validity, and Reliability Testing are carried out to evaluate the relationship between each indicator and latent variables. The PLS-SEM method is used to apply the partial regression model which is carried out iteratively in two stages. In the first step, construct scores are estimated. In the second step, the outer loading value, path coefficients, and R2 value are estimated (Rian Marliana, 2020). Figure 3 below shows the results of parameter estimation carried out using the PLS-SEM algorithm:

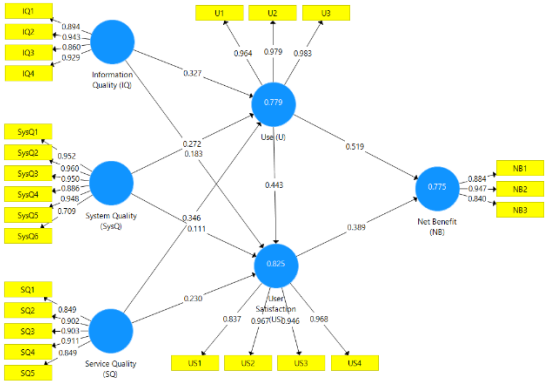

Figure 3. Model Parameter Estimation

Convergent Validity testing is used to test the validity of each relationship between indicators and constructs and latent variables. To evaluate it, the outer loading value is used (Siagian et al., 2019). If the correlation value is greater than 0.70, the indicator value is considered valid (Andriyani et al., 2020). The calculation results using the SmartPLS application which uses the PLS algorithm are shown in table 5. According to the perception of SIPKUMHAMAI users, each indicator has an outer loading value greater than 0.70. This shows that Convergent Validity has a high validity value and is considered valid. The analysis can also be continued with Discriminant Validity testing.

Table 5. Outer Loading

	IQ	NB	SQ	SysQ	U	US
IQ1	0.894					
IQ2	0.943					
IQ3	0.860					
IQ4	0.929					
NB1		0.884				
NB2		0.947				
NB3		0.840				
SQ1			0.849			

	IQ	NB	SQ	SysQ	U	US
SQ2			0.902			
SQ3			0.903			
SQ4			0.911			
SQ5			0.849			
SysQ1				0.952		
SysQ2				0.960		
SysQ3				0.950		
SysQ4				0.886		
SysQ5				0.948		
SysQ6				0.709		
U1					0.964	
U2					0.979	
U3					0.983	
US1						0.837
US2						0.967
US3						0.946
US4						0.968

Discriminant validity is based on several criteria and takes into account sampling error (Cheung et al., 2024). To evaluate discriminant validity, the cross loading correlation value with latent variables must be greater than the correlation with other latent variables (Chandra & Novita, 2020). Table 6 shows that the correlation value of indicators with their constructs is greater than the correlation values between indicators and other constructs. This shows that discriminant validity has a high value.

In table 7, it can be seen that each Cronbach's Alpha variable has a value above 0.50, Composite Reliability has a value above 0.70, and Average Variance Extracted (AVE) has a value above 0.70. A construct is considered valid and reliable if the AVE value is more than 0.50, the composite reliability is more than 0.70, and the Cronbach's Alpha value is more than 0.70 (Thung, 2019) thus, the model used can be used to test further hypotheses.

Table 6. Shows Cross Loading

	IQ	NB	SQ	SysQ	U	US
IQ1	0.894	0.663	0.740	0.605	0.730	0.716
IQ2	0.943	0.768	0.829	0.669	0.753	0.806
IQ3	0.860	0.771	0.792	0.642	0.727	0.770
IQ4	0.929	0.701	0.812	0.626	0.766	0.700
NB1	0.675	0.884	0.689	0.672	0.734	0.688
NB2	0.725	0.947	0.743	0.756	0.745	0.751
NB3	0.735	0.840	0.753	0.759	0.811	0.806
SQ1	0.770	0.713	0.849	0.719	0.717	0.700
SQ2	0.707	0.789	0.902	0.790	0.780	0.772
SQ3	0.797	0.749	0.903	0.728	0.720	0.805
SQ4	0.797	0.682	0.911	0.736	0.828	0.766
SQ5	0.800	0.693	0.849	0.678	0.736	0.761
SysQ1	0.691	0.803	0.757	0.952	0.779	0.685
SysQ2	0.653	0.753	0.805	0.960	0.795	0.747
SysQ3	0.692	0.830	0.785	0.950	0.805	0.767
SysQ4	0.591	0.729	0.748	0.886	0.633	0.732
SysQ5	0.679	0.764	0.801	0.948	0.757	0.763
SysQ6	0.474	0.551	0.566	0.709	0.424	0.492
U1	0.806	0.836	0.861	0.752	0.964	0.896
U2	0.800	0.827	0.834	0.780	0.979	0.835
U3	0.794	0.853	0.812	0.771	0.983	0.835
US1	0.665	0.789	0.714	0.710	0.851	0.837
US2	0.768	0.792	0.840	0.725	0.823	0.967
US3	0.816	0.770	0.810	0.732	0.763	0.946
US4	0.823	0.791	0.841	0.730	0.829	0.968

Table 7. Shows Cronbach's Alpha, Composite Reliability and Average Variance Extracted (AVE)

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
IQ	0.928	0.949	0.823
NB	0.869	0.920	0.794
SQ	0.929	0.947	0.780
SysQ	0.954	0.964	0.819
U	0.974	0.983	0.951
US	0.947	0.963	0.867

In the coefficient of determination test, the R2 value that is considered sufficient is 0.50 and will be considered weak if it is 0.25 (Aziz et al., 2020), this can mean that the sample used for regression can describe at least half of the total population as a whole, and can provide a more accurate explanation. Table 8 shows that the test results have a value above 0.50 for the Net Benefit, Use and User Satisfaction variables, so they can be categorized into the Good category.

Table 8. The Coefficient of Determination (R2)

	R^2	R^2 Adjusted
NB	0.775	0.768
U	0.779	0.768
US	0.825	0.814

Table 9. Shows Path Coefficient and T-Statistics

	O	M	STDEV	T Statistics O/STDEV
IQ -> U	0.327	0.297	0.216	1.509
IQ -> US	0.183	0.178	0.194	0.944
SQ ->	0.346	0.358	0.240	1.441

	O	M	STDEV	T Statistics O/STDEV
U SQ -> US	0.230	0.280	0.242	0.951
SysQ -> U	0.272	0.292	0.160	1.696
SysQ -> US	0.111	0.127	0.153	0.728
U -> NB	0.519	0.512	0.154	3.377
U -> US	0.443	0.382	0.211	2.096
US -> NB	0.389	0.398	0.150	2.592

Table 9 shows the results of hypothesis testing where IQ and U have a parameter coefficient value of 0.216 and a t-statistic value of 1.509. The results prove that the coefficient value of each parameter is positive, but the t-statistic value is smaller than the t-table value (1.996) which indicates that IQ does not have a significant influence on U. Therefore H1 is rejected

IQ and US have a parameter coefficient value of 0.194 and a t-statistic value of 0.944. The results prove that the coefficient value of each parameter is positive, but the t-statistic value is smaller than the t-table value (1.996) which shows that IQ does not have a significant influence on US. Therefore H2 is rejected.

SysQ and U have a parameter coefficient value of 0.160 and a t-statistic value of 1.696. The results prove that the coefficient value of each parameter is positive, but the t-statistic value is smaller than the t-table value (1.996) which indicates that SysQ does not have a significant influence on U. Therefore, H3 is rejected.

SysQ and US have a parameter coefficient value of 0.153 and a t-statistic value of 0.728. The results prove that the coefficient value of each parameter is positive, but the t-statistic value is smaller than the t-table value (1.996) which shows that SysQ does not have a significant influence on US. Therefore H4 is rejected.

SQ and U have a parameter coefficient value of 0.240 and a t-statistic value of 1.441. The results prove that the coefficient value of each parameter is positive, but the t-statistic value is smaller than the t-table value (1.996) which indicates that SQ does not have a significant influence on U. Therefore, H5 is rejected.

SQ and US have a parameter coefficient value of 0.242 and a t-statistic value of 0.951. The results prove that the coefficient value of each parameter is positive, but the t-statistic value is smaller than the t-table value (1.996) which shows that SQ does not have a significant influence on US. Therefore H6 is rejected.

U and US have a parameter coefficient value of 0.211 and a t-statistic value of 2.096. The results prove that the coefficient value of each parameter is positive, and the t-statistic value is greater than the t-table value (1.996) which shows that U has a significant positive effect on US. Therefore H7 is accepted.

U and NB have a parameter coefficient value of 0.154 and a t-statistic value of 3.377. The results prove that the coefficient value of each parameter is positive, and the t-statistic value is greater than the t-table value (1.996) which shows that U has a significant positive effect on NB. Therefore H8 is accepted.

US and NB have a parameter coefficient value of 0.150 and a t-statistic value of 2.592. The results prove that the coefficient value of each parameter is positive, and the t-statistic value is greater than the t-table value (1.996) which shows that US has a significant positive effect on NB. Therefore H9 is accepted.

CONCLUSION

Research conducted regarding the analysis of SIPKUMHAMAI's success with the D&M model and PLS-SEM structural equation modeling shows that the proposed hypothesis is not fully supported by the research results. IQ, SysQ, and SQ do not have a significant impact on U, and US. On the other hand, U has a significant impact on US and NB, and US has a significant impact on NB.

Therefore, variables that do not have a significant influence must be identified. Further analysis is needed to clarify the relationships between these variables and corroborate the findings that have been made. In addition, further studies are needed to gain a better understanding of the complexity of the relationships between these variables and to provide deeper insight into how to improve the quality of SIPKUMHAMAI services.

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