

# **AN ANALYSIS OF THE IMPLEMENTATION OF HOSPITAL MANAGEMENT INFORMATION SYSTEM BY USING DeLone and McLean METHOD AT Dr. ABDOER RAHEM SITUBONDO HOSPITAL**

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**Abstract.** The hospital management information system is an attempt to present the accurate, on time and as needed information to support the processes of management functions and decisions making in providing health services at the Hospital. The problems faced by users of hospital management information system at Dr. Abdoer Rahem Situbondo obtained from the interviews, including: system quality, information quality, service quality, user intensity, system user, user's satisfaction and net benefit. This research is a quantitative analytic research that used path analysis test. This research assessed users' perception of hospital management information systems by using DeLone and McLean method. The researchers used DeLone and McLean method because it matched the characteristics of problems at Dr. Abdoer Rahem Situbondo Hospital. The problems were: system quality, information quality, service quality, user intensity, system user, user's satisfaction and net benefit. The results of this research were that the system quality had a significant effect on the user intensity which indicated by the T-value  $3.82 > 1.96$ , the information quality had a significant effect on the user intensity which indicated by the T-value  $8.82 > 1.96$ . From the research results, the hospital is expected to develop a management information system or sistem informasi manajemen (SIM) application based on the hospital needs as the health service provider for the community.

## **1. Introduction**

A preliminary survey about the hospital management information system at Abdoer Rahem Situbondo hospital had been done by the researchers. The researchers conducted interviews with the heads of Hospital Information System Installation, Emergency Department, Inpatient Department, Operating Room or Operatie Kamer (OK) Department, Central Sterile Supply Department (CSSD), High Care Unit (HCU) Department, Intensive Care Unit (ICU) Department, Laboratory, Pharmacy Department, Nutrition Department, and Radiology Department which totaling 9 people who were related to the hospital management information system. From the interviews results obtained information that all hospital installations had implemented the hospital management information system. The problems faced by users of the hospital management information system which obtained from the interviews were: 1) System Quality: the incompatibility of the system with the service delivery process for patients. For example, the Emergency Care Installation or Instalasi Rawat Darurat (IRD) officer would enter the results of the Airway, Breathing, Circulation, Disability, and Exposure examination data to the hospital management information system. However, the contents in the hospital management information system template did not exist, while this data were very much needed to handle patients; 2) Information Quality: the information produced by the system was still incomplete; 3) Service Quality: the users still had difficulty inputting the data; 4) User Intensity and System User: the users did not implement the hospital management information system by using tablets (Android Phones)

that had been provided by the hospital management; 5) User's Satisfaction: The results of the survey by the subjectivity of the hospital management information system users from 9 installation heads stated that there were 4 people satisfied and 5 people who were not satisfied.

From the problems above, negative impacts were felt by the hospital. The information quality produced by the hospital management information system was not qualified. Information is said to be not qualified if the information is not fast, incomplete, inaccurate, and irrelevant [1]. Based on the problems and negative impacts related to hospital management information systems above, the researchers had a solution to solve the problems by analyzing the implementation of hospital management information system using the DeLone and McLean method. There are several methods that can be used to conduct an analysis of the hospital management information systems implementation, including Theory Acceptance Model (TAM) method, PIECES and End User Computing Satisfaction (EUCS) methods [2]. The TAM method is used to describe the acceptance perception of ease in using the SIM. While the PIECES method is used to describe the performance, economy, security, efficiency and service of information systems. The DeLone and McLean method is used to describe and analyze the system quality, information quality, service quality, user intensity, system users, user satisfaction and net benefit [3]. From the explanation above, the researchers chose the DeLone and McLean method because it matched the characteristics of problems at Dr. Abdoer Rahem Situbondo Hospital that were the quality of the system, information quality, service quality, user intensity, system user and user's satisfaction.

In accordance with the result of a research done by Roldan & Leal in 2003 [4] about executive information system which showed that system quality and information quality positively influenced the users' satisfaction of the hospital management information system. In line with the result of a research done by Abdul Latih [5] on the siskohat success analysis by using the DeLone and McLean method showed that information quality had a significant effect on users' satisfaction of the management information system. In accordance with the result of a research done by Masrek et al [6] in 2010 about the effectiveness of library academic portal showed that system quality, information quality, service quality had a significant effect on users' satisfaction of the management information system.

DeLone and McLean [7] argue that there are several important things that support the need for information technology in organizations. This is related to the decision making process that is not based on the information, the available information is not relevant, the information is not used by the management, the information is not on time, too much information, the available information is not accurate, and the data is not flexible. Based on this, an information system that can support the decision making is needed. The researchers conducted this research on 4 variables.

## **2. Research Method**

This research is a quantitative analytic research with a cross-sectional approach. Quantitative analytical research method is a research that based on the positivism philosophy, which is used to examine certain populations or samples. The sample determination is generally done by probability sampling, the data collection is using research instruments, the data analysis is using quantitative or statistical in order to test the hypothesis that has been set [8]. This research was classified as quantitative because the data analysis is quantitative.

## **3. Result and Discussions**

### **3.1 Identifying system quality, information quality, service quality and user intensity of hospital management information systems at Dr. Abdoer Rahem Situbondo.**

The descriptive results covering testing of 110 respondents with 0 missing values for the mean, median, the most frequent value (mode), and the identification total number of

Quality System or Kualitas Sistem (KS), Information Quality or Kualitas Informasi (KI), Service Quality or Kualitas Layanan (KL) and User Intensity or Intensitas Pengguna (IP) were listed in the table below.

Table 5.1 The descriptive of mean, media, and mode

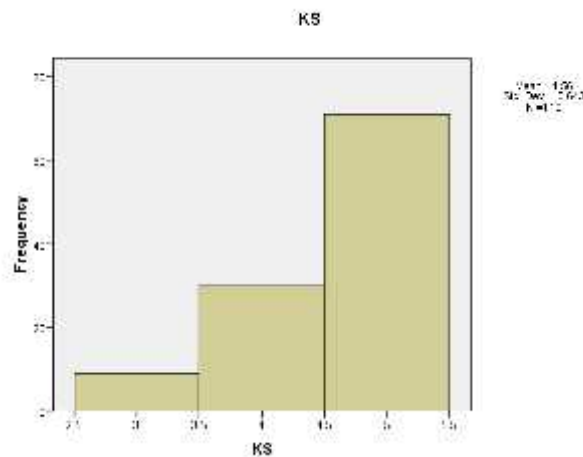
		Statistics			
		KS	KI	KL	IP
N	Valid	110	110	110	110
	Missing	0	0	0	0
Mean		4.56	4.65	4.57	4.71
Median		5.00	5.00	5.00	5.00
Mode		5	5	5	5

Based on the table above it could be seen that the KS, KI, KL and IP variables had mean, median, mode values. The mean values of the KS variable was 4.56, the KI variable was 4.65, the KL variable was 4.57, and the IP variable was 4.71. The median values for the KS variable was 5.00, the KI variable was 5.00, the KL variable was 5.00, and the IP variable was 5.00. The mode values in the KS variable was 5, the KI variable was 5, the KL variable was 5, and the IP variable was 5.

#### KS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	9	8.2	8.2	8.2
	good	30	27.3	27.3	35.5
	very good	71	64.5	64.5	100.0
	Total	110	100.0	100.0	

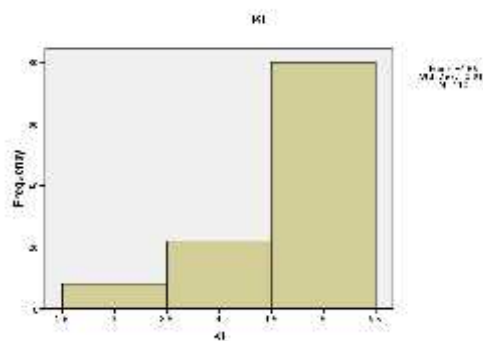
Based on the table above, it could be seen that the system quality variable showed that there were 71 people stated very good, 30 people stated good and 9 people were neutral. For simplicity it could be seen in the histogram below.



KI

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid neutral	8	7.3	7.3	7.3
good	22	20.0	20.0	27.3
bad	80	72.7	72.7	100.0
Total	110	100.0	100.0	

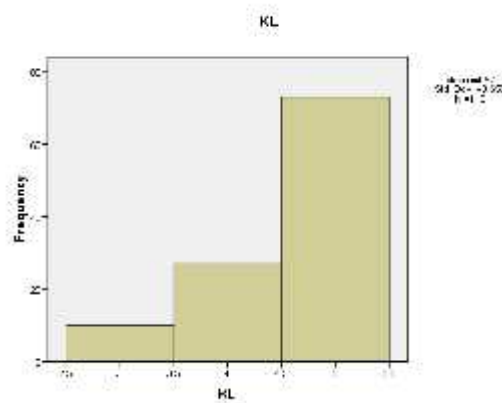
Based on the table above, it was known that the information system variable showed that there were 80 people stated bad, 22 people stated good and 8 people were neutral. For simplicity it could be seen in the histogram below.



KL

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid neutral	10	9.1	9.1	9.1
good	27	24.5	24.5	33.6
very good	73	66.4	66.4	100.0
Total	110	100.0	100.0	

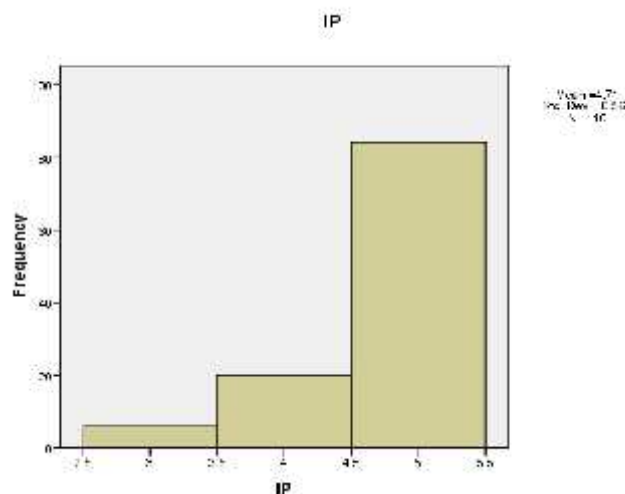
Based on the above table, it could be seen that the service quality variable showed that there were 73 people stated very good, 27 people stated good and 10 people were neutral. For simplicity it could be seen in the histogram below.



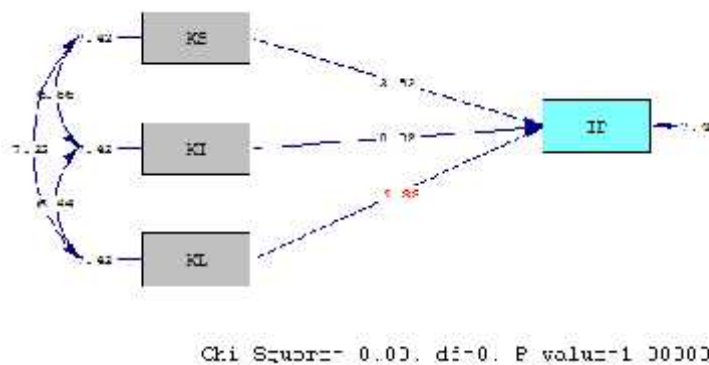
IP

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid neutral	6	5.5	5.5	5.5
good	20	18.2	18.2	23.6
very good	84	76.4	76.4	100.0
Total	110	100.0	100.0	

Based on the table above, it could be seen that the user intensity variable showed that there were 84 people stated very good, 20 people stated good and 6 people were neutral. For simplicity it could be seen in the histogram below.



**3.2 Analyzing the system quality, information quality, service quality toward the user intensity by using DeLone and McLean method at Dr. Abdoer Rahem Situbondo Hospital.**

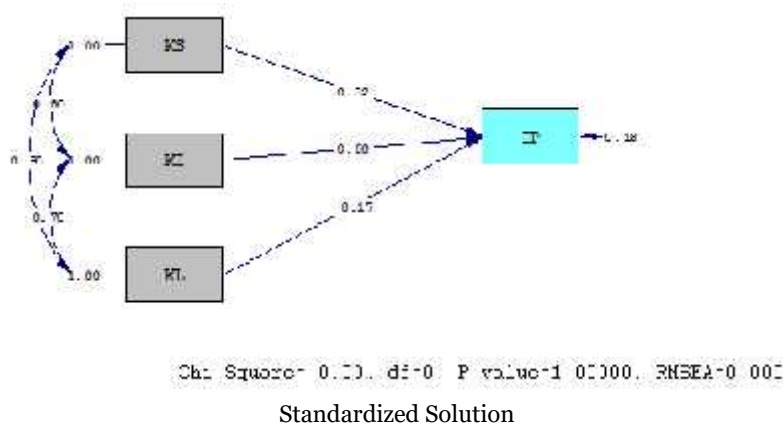


T-Value Test

The picture above is T-VALUE to determine whether or not there was an influence of the system quality on the user intensity. So that it could be known the influence amount between variables of the research based on the conceptual framework. The Regression Test provided an explanation of the influence amount and the significance of the influence between variables. A coefficient is stated to have a significant effect if it has a T-value  $>1.96$ . The system quality variable image on user intensity had a T-Value of  $3.82 > T$ -standard  $1.96$  so it was significant. Thus it could be concluded that the system quality had an influence on user intensity as indicated by the black arrow.

The picture of the information quality variable on the user intensity had a T-Value of  $8.82 > T$ -standard  $1.96$  so that was significant. Thus it could be concluded that the information quality had an influence on the user intensity as indicated by a black arrow.

The picture of service quality variable on user intensity had a T-Value of  $-1.33 < T$ -standard  $1.96$  so it was not significant. Thus it could be concluded that service quality did not affect the user intensity as indicated by the red arrow. In this case the researchers provided an explanation that good system quality, good information quality and good service quality increased the intensity of SIMRS user.



Standardized Solution

The picture above is a standardized solution to show the system quality influence, information quality, and service quality on user intensity. The standard coefficient of system quality on user intensity was  $0.52$ . This means that if the value of system quality increased by 1 standard deviation, then the value of user intensity increased by  $0.52$  times the standard deviation. The information quality standard coefficient on user intensity was  $0.60$ . This means that if the value of information quality increased by 1 standard deviation, then the value of user satisfaction increased by  $0.60$  times the standard deviation. The standard coefficient of service quality on user intensity was  $-0.17$ . This means that if the value of

service quality increased by 1 standard deviation, then the value of user satisfaction increased by -0.17 times the standard deviation.

### 3.3 Preparing recommendations for hospitals that are using model that related to the implementation of hospital management information system.

VARIABLE	STANDARDIZED SOLUTION			
	Loading Factor ( $\lambda \geq 0,50$ )	Inf.	Significance ( $T\text{-value} = \text{sig} = \text{black}$ )	Inf.
KS - IP	0,52	Valid	3,82	Significant
KI - IP	0,60	Valid	8,82	Significant
KL - IP	-0,17	invalid	-1,33	Not significant

The KS standard coefficient on IP was 0.52. This means that if the KS value increased by 1 standard deviation, then the IP value increased by 0.52 times the standard deviation. The calculated value of the t-value of this path was  $3.82 > T\text{-standard } 1.96$  so it was significant. Thus it could be concluded that KS had an influence on IP.

The standard coefficient of KI on IP was 0.60. This means that if the KI value increased by 1 standard deviation, then the IP value increased by 0.60 times the standard deviation. The calculated value of the t-value of this path was  $8.82 > T\text{-standard } 1.96$  so it was significant. Thus it could be concluded that KI had an influence on IP.

The standard coefficient of KL for IP was -0.17. This means that if the KL value increased by 1 standard deviation, then the IP value increased by -0.17 times the standard deviation. The calculated value of the t-value of this path was  $-1.33 < T\text{-standard } 1.96$  so it was not significant. Thus it could be concluded that KL had no significant effect on IP.

GFT Size	Criteria	Model Indicator	Result	Information
<b>P- value</b>	$\geq 0,05$	1,000	1,000	Perfect fit
<b>RMSEA</b>	$\leq 0,08$	0,000	0,000	Perfect fit

### 4. Conclusion

From the path analysis results above, it could be seen that the goodness of fit indicator of this model showed the test results that met the criteria of the fit model. Thus it could be concluded that the proposed model was fit to the data. This means that the model was able to produce the same covariance matrix/population correlation matrix as the sample data covariance matrix/correlation matrix. Then the model parameter estimation results were reliable to be applied to the population.

### 5. Acknowledgement

Thank you to Politeknik Negeri Jember for the PDP research with funding from DRPM 2018.