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Analysis of Cloud Computing Usage In Vocational School Environment Using Delone MClean

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Abstract*— Data is very important. In today's era, any activity will involve data. Likewise, schools of course have large piles of data. A lot of data needs to be stored so that it can be managed better, the storage certainly requires a computer system in the form of a server. The server itself has several types that can be used, one of which is a local server and a cloud server. Of the several types of servers, of course, there are many variants of servers that are applied by agencies, especially in this case educational institutions or schools. In this study, several secondary schools were taken to compare which one had a higher success rate of implementation. The analysis was carried out using the Delone McClean method. The result is that the implementation of local servers has a higher success rate than cloud servers.

Keywords: Cloud Server, Local Server, Delone MClean

I. INTRODUCTION

Data is one of the most vital things in today's world. Because it is important, data storage is one thing that needs attention. Data storage now has many variations, including through cloud servers or conventional storage systems. These two things have their respective advantages and disadvantages. Referring to its use, many companies and agencies implement these two types of servers. With the number and shift of data use from conventional to digital, the use of digital data storage is something that needs to be owned by agencies, including educational institutions such as schools. This research data examine schools that use two types of servers, namely cloud servers, and local servers. These two types of servers are the types of servers that are widely used. This type of server has its advantages and disadvantages. This study will compare the success rate of implementation of the two types of servers in school education institutions. The schools that are sampled are schools that use local servers and schools that use cloud servers or those that use both. Analysis of the success rate using the Delone Mc Clean method to measure the success rate of the two types of servers used.

As a research reinforcement, a research reference regarding the successful application of technology using the Delon Mclean model in smart city development was written by Rizal Rachman in 2021 which resulted in a success percentage of system implementation of 73.4%. [1]. The same thing has also been done by Ruth Johana et al in a study that analyzed success in E-Commerce which got the results that there was a significant influence between the quality system on user satisfaction in E-Commerce such as Bukalapak, Lazada, and Shopee. [2]. Dicky Prayudi et al have also applied the Delon Mclean method in the case of the Hermina hospital mobile application, the results of the model in this study using a modified DeLone and McLean model with an R-square value of 0.61 for the user satisfaction variable, which means user satisfaction with the registration application on the model. This can be explained by user ease, system quality, and service quality by 61% [3].

Another success measurement has also been carried out by Ratna Kartika Wijayati et al who conducted measurements on the online attendance information system, the result is that the impact of use is proven that there is a strong relationship and influence between variables [4]. Miftah Muhammad et al by taking the case on the hospital information system produced a study that stated that the use of the system, user satisfaction, and organization will affect the net benefits that will be felt by users [5]. The scheduling system can also be measured using Delone McLean with the incorporation of other methods, namely Cobit, this is as done by Tarwoto et al which produces the conclusion in the form of a correlation between the success of the information system and the maturity level of the information system (H0 is rejected), but the correlation is not too strong or significant. (0.38) [6].

Najma Imtiaz Ali et al in their writings modified Delone Mclean which resulted in conclusions in the form of a proposed research mode both the data. This means that it can be applied and can be applied practically in the e-commerce business [7]. In the Medan City Government Accounting Information System, research using the Delon Mclean method by Azizul Kholis et al concluded that of the 10 hypotheses proposed there were 4 (four) alternative hypotheses that were accepted, and the rest were unacceptable or had no effect and were not , significant. [8].

Henky Bayu Seta et al publish their writings by taking the object of the implementation of e-learning, the result is that the satisfaction felt by users is influenced by the quality of the technical system and the quality of the education system. use is influenced by the quality of the technical system, the

quality of the education system, and the perceived satisfaction of users [9]. In addition to using Delone Mc Clean, the technique of measuring the maturity of a system can be done by measuring using COBIT. As written by Azriel C Nurcahyo et al by conducting network analysis [10]. The last is a research reference from Muhartini Salim who makes the academic portal a place for testing, the results are that the quality of the system affects user satisfaction with academic portals and the quality of academic portal information affects user satisfaction [11]

II. RESEARCH METHODS

2.1. Stage Research

The stages in this research begin with the study literature and continue with data collection. The data collected was analyzed using Delone Mc Clean to get the level of success in the implementation of cloud servers and local servers. Flow details are shown in Figure *1*.

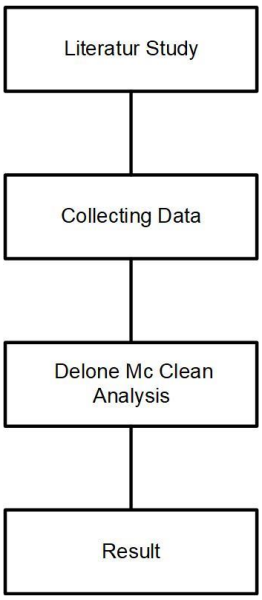

Figure 1. Alur Penelitian

2.2. Delone Mc Clean

William H. Delone and Ephraim R. McLean were the first to introduce the success model of information systems. The first research was conducted in 1992 to identify the factors that lead to the success of information systems. Then the model developed by Delone and McLean quickly received a response because this model is simple, valid, and needed to be a reference in evaluating an information system that can be implemented successfully. Delone and McLean 1992 developed a model they called the Delone and McLean information system success model [12].

There has been a change in the role of information systems in the 10 years since the Delone and McLean model was first introduced, so Delone and McLean 2003 improved and updated the model. As for some additional points such as:

1. Added service quality variable
2. Adding the dimension of the intensity of use (intention to use) as an alternative to the dimension of use (use)
3. Combining individual impact and organizational impact into one variable, namely net benefits

III. RESULT AND ANALYSIS

The data used in this study were from 14 schools with 30 respondents each. The details of the data distribution are shown in Table 1.

Table 1. School Data

Using Local Server	Using Cloud Server	Using Cloud and Local
10	4	4

School data using a local server is shown in Table 2.

Table 2. Local Server User Data

No	School	Specification Local Server
1	Smk Assalam	"Dell R160
2	SMK Budhi Warman 2	RAM 64gb
3	SMK Harapan Bangsa	processor Intel(R) Xeon(R) CPU X5650 @ 2.67GHz
4	SMKN 3 DEPOK	Disk 1TB"
5	SMK Citra Negara	-
6	SMK AL MUHAJIRIN	- 2 x Intel Xeon Silver 4214R 2.4G, 24c
7	SMKN 22 Jakarta	Xeon, 8 core 16 thread ram 32gb hd 300gb
8	SMKN 2 Jember	Centos Linux Server
9	SMK YAJ	Xeon 4 core, ram 16g, ssd
10	SMK POLIMEDIK DEPOK	Linux GNU

While data on cloud server users are shown in Table 3.

Table 3. Cloud Server User Data

No	School	Specification Cloud Server
1	SMK Citra Negara	- 2 x Intel Xeon Silver 4214R 2.4G, 7c
2	SMK AL MUHAJIRIN	2 core ram 2GB, ssd30GB, unlimited bandwidth
3	SMKN 22 Jakarta	Google Cloud
4	SMK POLIMEDIK DEPOK	Cloud Server VMWare

The application of the Delone Mc Clean method uses 6 components with each code shown in Table 4.

Table 4. Code Component

Component	Code
Information Quality	IQ
System Quality	SQ
Service Quality	SEQ
Use	U
User Satisfaction	US
Net Benefit	NB

Mapping using Delone Mc Clean analysis follows the direction map of System Quality, Information Quality, and Service Quality directed to Intention to Use and User Satisfaction and then from Intention to Use and User Satisfaction will be tested for its effect on Net Benefit or according to the roadmap in
Figure *2*

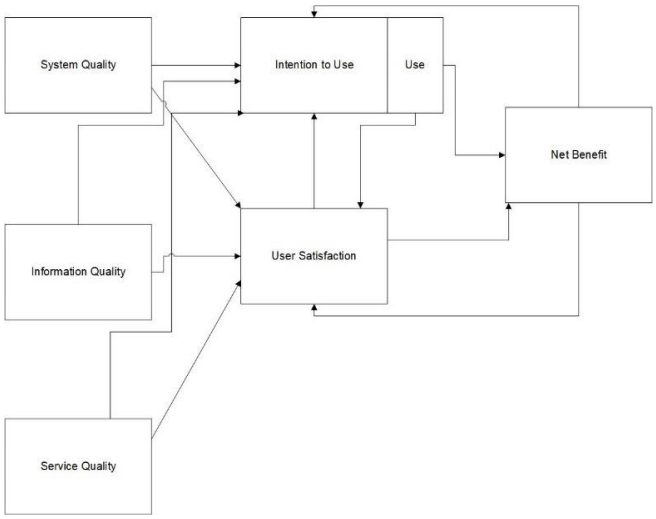

Figure 2. Concept Delone Mc Clean

Then to analyze the research data using Delone Mc Clean, hypotheses were made from each component with details in Table 5.Table *5*.

Table 5. Hypotesis

Hypotesis Code	Detail
H1a	The quality of the system (system quality) will have a positive and significant effect on the use (use);
H1b	System quality will have a positive and significant effect
H2a	The quality of information (information system) will have a positive and significant effect on the use of the system (use);
H2b	The quality of information (information system) will have a positive and significant effect on user satisfaction (user satisfaction);
H3a	Service quality (service quality) will have a positive and significant effect on the use of the system (use);
H3b	Service quality will have a positive and significant effect on user satisfaction;
H4a	The use of the system (use) will have a positive and significant effect on user satisfaction, and vice versa;
H4b	The use of the system (use) will have a positive and significant effect on the net results obtained (net benefit);
H5	User satisfaction will have a positive and significant effect on the net results obtained (net benefit);
H6	The net result (net benefit) will have a positive and significant effect on the use of the system (use) and user satisfaction (user satisfaction).

For the hypotheses that have been compiled, a testing scheme is carried out with data testing, to get the results of acceptance or success rates from the local and cloud servers so that the final results of the comparison between the two systems are obtained. Hypothesis testing needs to be divided into two, namely for local server users and cloud users. Local server data is shown in Table 6. and cloud server data on Table 7.Table *7*.

Table 6. Data Local Server

Code	Hypotheses Schema	Value	Result
H1a	SQ->U	0,928	Invalid
	SQ->U	0,565	Invalid
H1b	SQ->US	0,821	Invalid
	SQ->US	0,291	Valid
H2a	IQ->U	0,826	Valid
	IQ->U	0,996	Valid
H2b	IQ->US	0,01	Valid
	IQ->US	0,03	Valid
H3a	SQ->U	0,031	Invalid
	SQ->U	0,000	Invalid
H3b	SQ->US	0,001	Invalid
	SQ->US	0,021	Valid
H4a	U->US	0,09	Valid
	U->US	0,00	Valid
H4b	U->NB	0,002	Valid

	U->NB	0,001	Valid
	U->NB	0,081	Invalid
	U->NB	0,000	Valid
	U->NB	0,002	Invalid
H5	US->NB	0,003	Valid
	US->NB	0,01	Valid
	US->NB	0,01	Valid
	US->NB	0,00	Valid
	US->NB	0,02	Valid
H6	NB->US	0,00	Valid
	NB->US	0,00	Valid

Table 7. Data Server Cloud

Code	Hypotheses Schema	Value	Result
H1a	SQ->U	0,826	Invalid
	SQ->U	0,996	Invalid
H1b	SQ->US	0,528	Invalid
	SQ->US	0,615	Invalid
H2a	IQ->U	0,02	Valid
	IQ->U	0,04	Valid
H2b	IQ->US	0,143	Valid
	IQ->US	0,018	Valid
H3a	SQ->U	0,775	Invalid
	SQ->U	0,676	Invalid
H3b	SQ->US	0,54	Invalid
	SQ->US	0,036	Valid
H4a	U->US	0,03	Valid
	U->US	0,107	Valid
H4b	U->NB	0,039	Valid
	U->NB	0,144	Valid
	U->NB	0,706	Invalid
	U->NB	0,234	Valid
	U->NB	0,745	Invalid
H5	US->NB	0,00	Valid
	US->NB	0,02	Valid
	US->NB	0,01	Valid
	US->NB	0,031	Valid
	US->NB	0,07	Valid
H6	NB->US	0,01	Valid
	NB->US	0,01	Valid

The recap of the results of the data test is 23 valid data testing on the local server and 17 valid data on the cloud server test, while the invalid data on the local server is 2 data and 8 data on the cloud server, while the details of the data are shown in Figure 3.

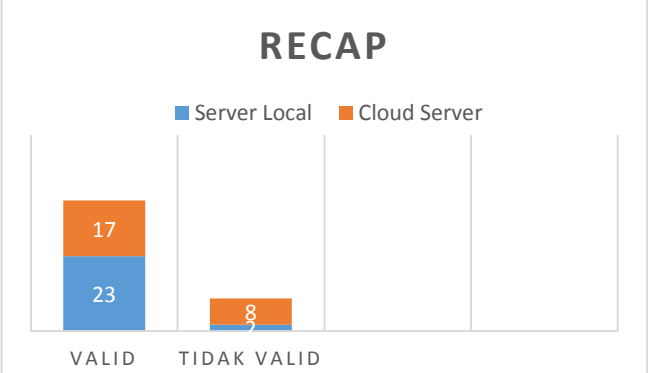

Figure 3. Rekap Hasil

VI. CONCLUSION

The conclusions that can be drawn from this research are:

1. Data is taken from secondary schools to get an overview of the successful implementation of local servers and cloud servers.
2. The data used from 12 schools were taken from 4 schools using local servers and 4 schools using cloud servers for the same quantity of data.
3. With the Delone Mc Clean method, the use of local servers is more successful than cloud servers in high schools.

The suggestions in this research are:

1. Can apply other methods to measure success in the same case.
2. Addition of population data to see more varied research results.
3. Comparing the application of other methods with the Delone Mc Clean method to measure a higher level of effectiveness.

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