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DeLone and McLean Model Testing upon The Information System Implementation of New Student Enrolment at Junior High school Level in Pekalongan City

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Abstract— The information technology based Information System in education has been used in responding the change and as a tool in maintaining efficiency and effectiveness, especially for the online system of new student admission (*PPDB*). The Pekalongan City Education, since 2014, has developed an online junior high school New Student Admission application. This system was built to handle the process of admitting new students, from registration, selection to announcement of selection result. Even though it has been implemented for 6 years, the measurement of the success of implementing PPDB online has not been carried out. The purpose of researching is to determine the success of implementing the PPDB online information system for junior high school level. The modified DeLone and McLean model was used to measure the success of online *PPDB*. Research respondents were all admin and operators of the online PPDB system as many as 92 respondents. The data analysis method for processing variables used linear regression statistical analysis. The test results show that system quality, information quality, service quality, and user satisfaction have a significant and significant effect on net benefits, so that users benefit from the online PPDB information system.

Keywords—DeLone and McLean Method, Information, System.

1. Introduction

One area that has had the impact of using information technology based information system is education.The information system that supported by information technology has given a positive impact in many sectors, one of it is education. Information system in the field of education is used as a tool to improve management efficiency, and provide benefits that are develop into an effective information system. The information system that is built effectively means that the information system is successful.

The Pekalongan City Education Office, since 2014, has developed an online junior high school level New Student Admissions (PPDB) application. This system was built to handle the process of admitting new students, from registration, selection, to the announcement of the selection results. This system was developed to serve the admission process for new junior high school students, as well as a means of delivering information carried out online. The development of an online student admission information system, aims to improve the quality of education services, create a new student admission system that makes it easy for users, with the availability of an accurate school database. This system is used as a means of delivering information to support school performance, as well as providing information services to users. Even though it has been implemented for 6 years, the measurement of the success of online PPDB implementation has not been carried out.

Many researchers have conducted empirical testing of DeLone and McLean's models. The variables used to measure the success of the information system are system quality, information quality, use, user satisfaction, individual impact and organizational impact [1]. Modification of DeLone and McLean's other researchers have tested the DeLone and McLean's model has been done, which includes variables of service quality, individual impact, and organizational impact are converted into net benefit variables [2].

The results of empirical testing of DeLone and McLean's models show the inconsistency between one another. Several studies have shown that system quality and information quality are significant independent variables on user satisfaction [3]. Other studies have shown that system quality and information quality are independent variables that are not significant to user satisfaction [4]. The inconsistency of the results of testing the DeLone and McLean models carried out by the researchers in several fields of research opens up opportunities for research to be carried out on the different research object.

The aim of the research was to determine the success of implementing the PPDB online information system for junior high school, which was developed by the by Pekalongan City Education Office. The method used to determine the successful implementation of the online PPDB information system developed by the Education Office in this research adopts a modified DeLone and McLean model, which consist of 6 variables that influence the successful implementation of the system, they are system quality variable, information quality, service quality, use, user satisfaction, and net benefits [2].

2. Method

2.1. Information System Success Model of Delone and McLean Model

DeLone and McLean's model is one of the frameworks used to evaluate the successful implementation of information systems. The variables use in the modified DeLone and McLean models is system quality, information quality, service quality, use, user satisfaction, and net benefits. In the DeLone and McLean model research, it is stated that the variables of information quality, system quality, and service quality have a positive effect on use and user satisfaction, then the variables of use and user satisfaction have a positive effect on net benefits [2]. DeLone and McLean information system success model can be seen in the following Figure :

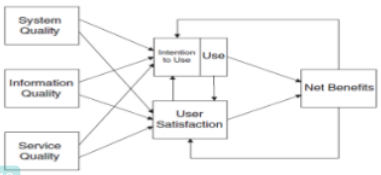

Figure 1 : DeLone and McLean Models [2]

This model can be used, and has many researchers used the method in measuring the success of the system, like the previous research [5], an d [6], that the model is used as the preliminary base hypothesis to be the reference in composing the questionnaire for measuring the success implementation of online PPDB.

2.2. *Hypothesis*

By DeLone and McLean model the preliminary hypothesis are yielded as the following:

H1. System Quality, Information Quality, and service quality will contribute and give significant impact to the use

H2. System Quality, Information Quality, and service quality will contribute and give significant impact to the user satisfaction.

After the system quality, information quality, and service quality are yielded, hence continued with the hypothesis in determining the relation among the use, user satisfaction, and net benefit.

H3. The use, the user satisfaction will contribute and give significant impact to the net benefit.

H4. System quality, information quality, service quality, and user satisfaction to the net benefit.

H5. User satisfaction is an intervening variable between system quality, information quality, and service quality to the net benefit.

2.3. Research Sample

All school operators, verification operators, school administrator, and administrator of the Pekalongan City Education Office were the research samples, which determined by random sampling of 92 people.

2.4. Operational Variable Definition

The variable used is a variable suit to the hypothesis suggested that refer to DeLone and McLean model variable, they are variable:

a. System Quality
   System quality describe how the performance of information system in maintaining the information process. Iindicator showed by the system flexibility, system availability, speed response, system reliability, easy to use, response consistency, easy to learn, and integrated completeness.
b. Information Quality
   Information quality showed all shapes or the report resulted by information system. The indicator showing the information qualities are completeness, accuracy, reliability, up to date, flexibility, and relevancy.
c. Service Quality
   Service quality is a comparison between customer expectation and perception from the real service experienced. The indicator used in rating the service qualities are quality assurance given by the system, system care for user input, and system accuracy in giving the response of usage.
d. The Use
   The use is the usage of the system itself. Indicators in rating the use are use frequency and the aim of use.
e. User satisfaction
   This variable is indicated by an indicator of user satisfaction assessment, including satisfaction with the information generated by the system, and overall satisfaction with all system.
f. Net benefit
   Net benefit is a net result and benefit experienced by user after implementing the information system. The indicator in rating net benefit using 5 out of 6 items adapted from net benefit perception ratio, they are speed in finishing the task, work performance, effectiveness, work easiness, and security in work.

2.5. Validity and Reliability Instruments

Validity and reliability is a measurement to support the research conclusion in giving the description that is close to the real condition and the research is completely reliable. The validity of each indicator in questionnaire, showed when product moment correlation coefficient is > 0,3 [7]. Reliability is used to determine how far the measurement tool is reliable. The reliability testing criteria is when Cronbach's Alpha > 0.6 [8].

2.6. Analysis Method

The analysis method used in this research is multiple regression analysis with intervening variable. The linier regression test is used in examining the relation among a dependent variable with one or other independent variables.

3. Result and discussion

3.1. Respondent Demographics

The questionnaire is sent by e-mail to 92 respondents, with the complete profil of the respondents participating as the object of the research may be seen in table 1 and table 2 as the following :

Table 1. Profile based on education

Education	Amount	%
High School	13	14%
Diploma 3	20	22%
Undergraduate	58	63%
Graduate	1	1%
Total	92	100%

Table 2. Profile based on position

Position	Amount	%
SD admission Operator	48	52%
MI admission Operator	1	1%
SMP admission Operator	14	15%
MTS admission Operator	1	1%
Verification Operator	15	16%
Administrator	3	3%
School Administrator	10	11%
Total	92	100%

3.2. Validity Test

The validity test upon the questions showed by product moment correlation coefficient rate > 0.3. the validity test upon independent and dependet variable may be seen in table 3 as the following :

Table 3. Validity Test Rekapitulation

System Quality	Correlation coefficient
X1.1. Sistem Flexibility	0.695
X1.2. System Availability	0.678
X1.3. Speed of Response	0.689
X1.4. System Reliability	0.706
X1.5. The easiness of use	0.743
X1.6. Response Consistency	0.761
X1.7. Easy to learn	0.790
X1.8. Integrated Completeness	0.741
Information Quality	Pearson Correlation Score
X2.1. Completeness	0.828
X2.2. Accuracy	0.842
X2.3. Reliability	0.820
X2.4. Up to date	0.721
X2.5. Flexibility	0.742
Service Quality	Pearson Correlation Score
X3.1. Assurance	0.758
X3.2. Emphaty	0.844
X3.3. Response Quality	0.821
X3.4. Accuracy	0.783
The Use	Pearson Correlation Score
Y1.1. Use Frequency	0.949
Y1.2. The Aim of use	0.941
User Satisfaction	Nilai Pearson Correlation
Y1.1. Information Satisfaction Rating	0.939
Y1.2. System Satisfaction Rating	0.948
Net Benefit	Nilai Pearson Correlation
Y1.1. Speed in finishing the work	0.778
Y1.2. Work performance	0.885
Y1.3. Effectiveness	0.885
Y1.4. Ease of work	0.831
Y1.5. Use of work	0.784

Based on the validity test result, all question used in measuring the user satisfaction resulted the Pearson Correlation Score > 0.3, it means all questions used are valid.

3.3. Reliability Test

Reliability Test showed by Cronbach's Alpha score > 0.6. the reliability test for independent and dependent variable may be seen in table 4 as follows :

Table 4. Reliability Test Recapitulation

Variable	Cronbach's Alpha
System Quality	0.891
Information Quality	0.867
Service Quality	0.808
Use	0.875
Customer Satisfaction	0.875
Net Benefit	0.880

From all variable reliability test result (system quality variable, information variable,service quality, use, user satisfaction, and net benefit the Cronbach's Alpha score is > 0.6, it means the tool used in measuring the system quality, information quality, service quality, use, user satisfaction and net benefit is reliable.

3.4. Hypothesis Test Result

After completing the validity and reliability test, the next stage is to do the regression analysis to test the hypothesis. The analysis used is multiple regression analysis with intervening variable and the result of the hypothesis as follows :

3.4.1. Hypothesis Test 1

Hypothesis Test 1 (H1) stated if system quality, information quality, and service quality will influence significantly to the use. The result of H1 testing may be seen in table 5 and 6 as follows :

Table 5. Summary Model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.555[a]	.309	.285	.846

a. Predictors: (Constant), Kualitas Sistem, Kualitas Informasi, Kualitas Layanan

Based on the analysis test result from table 5 above, the R correlation coefficient score is 0.555, it means the relation among X1 variable (system quality), X2 (information quality), and X3 (Service Quality) with Y variable (use) is strong enough. Whereas R square score is 0.309 it means

Table 6. Anova

	Sum of	Mean

30.9% of Y variabel (use) influenced by variable X1 (system quality), variable X2 (information quality), and variable X3 (service quality). Whilst the rest 69.1% of variable Y (use) influenced by other variables out of the research.

The score of F test result is 13.090 with sig 0.000 < 0.05, it means the score is significant (H0 rejected) since less than 0.05, there is a simultaneous influence among Y variable (use) with X1 variabel (system quality), X2 (information quality), X3 (service quality). Based on F test showed that H1 is accepted, it means the system quality, information quality and service quality has significant influence to the use.

3.4.2. Hypothesis Test 2

The Hypothesis Test 2 (H2) stated if the system quality, information quality, and service quality will give a significant influence to user satisfaction. The result of H2 test may be seen in table 7, 8, and 9 as follows :

Table 7. Summary Model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.557[a]	.311	.287	.864

a. Predictors: (Constant), System Quality, Information Quality, Service Quality

Based on the analysis result of table 7 above, the R correlation coefficient is 0.557, it means the relation among X1 variable (system quality), X2 (information quality), and X3 (Service Quality) with Y variable (user satisfaction) is strong enough. Whereas the R Square score is 0.311, it means 31.1% of Y variable influenced by X1 variable (system quality), X2 variable (information quality), and X3 variable (service quality). Whilst the rest of 68.9% Y (variable user satisfaction influenced by other variables out of the research.

Table 8. Anova

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	29.616	3	9.872	13.225	.000[b]
	Residual	65.688	88	.746		
	Total	95.304	91			

a. Dependent Variable: Use Satisfaction
b. Predictors: (Constant), Service Quality, System Quality, Information Quality

The amount of F test is 13.225 with sig 0.000 < 0.05, it means the score is significant (H0 rejected) for less than 0.05, there is a simultaneous influence among Y variable (user satisfaction) with X1 variable X1 (system quality), X2 (information quality), X3 (service quality). Based on F test showed H2 accepted, it proven that the system quality, information quality, and service quality has significant influence to user satisfaction.

The t test of X1 (system quality) yielded the sig score 0.03 < 0.05, it means partially the X1 variable (system quality) stated significant and influence the Y variable (user satisfaction), whereas X2 t test (information quality) resulted sig score 0.266 > 0.05, it means partially the X2 variable (information quality) stated not significant and has no influence to Y variable (user satisfaction), and X3 t test (service quality) has sig score 0.277 > 0.05, it means X3 variable (service quality) partially stated not significant and has no influence to Y variable (user satisfaction)

3.4.3. Hypothesis Test 3

The hypothesis test (H3) stated if the use, user satisfaction will have significant influence to the net benefit. The result of H3 test may be seen in table 10 and 11 as follows :

Table 10. Summary Model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.808[a]	.653	.645	1.289

a. Predictors: (Constant), user satisfaction, Use

Based on the analysis test result of table 10 above, the R correlation coefficient is 0.808, it means the X1 variable relation (use), X2 (user satisfaction), with Y variable (net benefit) is definitely strong. Whereas the R square score is 0.653 it means 65.3% of Y variable (net benefit) influence by X1 variable, X2 variable (user satisfaction). Whilst the rest 34.7% of Y variable (net benefit) influenced by other va

Table 11. Anova

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	278.064	2	139.032	83.724	.000[b]
	Residual	147.794	89	1.661		
	Total	425.859	91			

a. Dependent Variable: Net benefit
b. Predictors: (Constant), User Satisfaction, Use

The scor of F test result is 83.724 with the sig 0.000 < 0.05, it means the score stated significant (H0 rejected) for less than 0.05, simultaneously there is an influence among Y variable (net benefit) with X1 variable (use), X2 (user satisfaction). Based on F test showed that H3 is accepted, it

Table 9. Coefficients

Model	Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.

proven that use and user satisfaction, has significant influence to net benefit.

3.4.4. Hypothesis Test 4

Hypothesis Test 4 (H4) stated if system quality, information quality, service quality, and user satisfaction will have significant influence to the net benefit. The result of H4 tes may be seen in table 12 and 13 as follows :

Table 12. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.734[a]	.539	.518	1.502

a. Predictors: (Constant), Kepuasan Pengguna, Kualitas system, Kualitas Informasi, Kualitas Layanan

Based on the analysis result of table 12 above, the R correlation coefficient score is 0.734, it means the realtion of X1 variable (system quality), X2 (information quality), X3 (service quality), and X4 (user satisfaction) with Y variable (net benefit) is strong. Whereas the R square score is 0.539, it means 53.9% of Y variable (net benefit) influenced by X1 variable (system quality), X2 (information quality), X3 (service quality), and X4 (user satisfaction). Whilst the rest 46.1% of Y variable (net benefit) influenced by other variables out of the research.

Table 13. Anova

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	229.614	4	57.404	25.448	.000[b]
	Residual	196.245	87	2.256		
	Total	425.859	91			

a. Dependent Variable: ManNet Benefit
b. Predictors: (Constant), User Satisfaction, System Quality, Information Quality, System Quality

The F test score is 25.448 with the sig 0.000 < 0.05, it means the score is significant (H0 rejected) for less than 0.05, there is simultaneous influence among Y variabel Y (net benefit) with X1 variabel (system quality), X2 (information quality), X3 (service quality), and X4 (user satisfaction). Based on F test showed H4 is accepted, means proven that thenet benefit has significant influence to system quality, information quality, service quality and user satisfaction.

3.4.5. Hypothesis Test 5

Hypothesis Test 5 (H5) stated if user satisfaction is an intervening variable of system quality, information quality, and service quality with net benefit. The H5 test result may be seen in table 14 as follows :

Table 14. Coefficients

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	4.605	1.663		2.768	.007
	System Quality	.101	.085	.176	1.184	.240
	Information Quality	.049	.130	.059	.374	.709
	Service Quality	.217	.169	.178	1.283	.203
	User Satisfaction	.970	.185	.459	5.232	.000

a. Dependent Variable: Net Benefit

To prove that user satisfaction is an intervening variable of system quality, information quality, and service quality with net benefit done by examining the multiplication of indirect beta that must be > than the direct beta, and the result as the following :

1. The indirect relation of beta multiplication of system quality with net benefit = 0.524 * 0.459 = 0.241. The direct relation of beta multiplication of system quality with net benefit = 0.176. Since 0.241 > 0.176, thus the user satisfaction variable is an intervening variable between system quality and net benefit.
2. The indirect relation of beta multipliclation of information quality with net benefit = 0.214 * 0.459 = 0.098. The direct relation of beta multipliclation of information quality with net benefit = 0.059. Since 0.098 > 0.059, thus the user satisfaction is an intervening variable between information quality and net benefit.
3. The indirect relation of beta multipliclation of service quality with net benefit = 0.203 * 0.459 = 0.093. The direct relation of beta multipliclation of service quality with net benefit = 0.178. Since 0.093 < 0.178, thus the user satisfaction is not an intervening variable between service quality and net benefit.

From the beta multiplication of indirect and direct relation, it may be concluded that user satisfaction is an intervening variable of system quality, and information quality with net benefit, yet user satisfaction is a direct variable and not an intervening variable of service quality with net benefit.

4. Conclusion

The research background is various research that tested the success of the informations system using DeLone and McLean model, thus the 5 hypothesis is developed. After doing the 5 hypothesis testing, the test result stated that the information system success model of DeLone and McLean proven to be empirically significant in the success of online PPDB information system implementation for junior highschool level in Pekalongan city. The result of each hypothesis is as detailed :

1. System Quality, information quality, and service quality has significant influence to the use.
2. System quality, information quality, and service quality has significant influence to user satisfaction
3. Use, user satisfaction has significant influence to net benefit.
4. Net benefit has significant influence to system quality, information quality, service quality and user satisfaction.
5. From the beta multiplication result of indirect and direct relation, it may be comcluded that user satisfaction is an intervening variable of system quality and information quality with net benefit, yet user satisfaction as a direct

variable is not an intervening variable on service quality with net benefit.

References

[1]. DeLone, W. H., McLean, E.R, "Information System Succes : The Quest for the Dependent Variabel," Journal of Management Information Systems vol. 3. No. 4, pp. 60 – 95, 1992.

[2]. DeLone, W. H. dan Ephraim R. McLean, "The DeLone and McLean Model of Information Systems Success: A Ten – Year Update," Journal of Management Information Systems/Spring, vol. 19. No. 4, pp. 9 – 30, 2003.

[3]. DeLone, W. H. dan Ephraim R. McLean, "The DeLone and McLean Model of Information Systems Success: A Ten – Year Update," Journal of Management Information Systems/Spring, vol. 19. No. 4, pp. 9 – 30, 2003.

[4]. Roldan, J.L, and Leal, A, A, Validation Test of an Adaption of The DeLone and McLean Model in The Spanish EIS Field, Idea Group Publishing, 2003.

[5] Yusti Farlina, Jamal Maulana H, "Kajian Kepuasan Pengguna Informasi Peserta Didik baru (PPDB) online," Indonesian Journal on Computer and Information Technology, vol. 2 No. 2 November, pp. 48 - 54, 2017.

[6] Upi Dwi Desi Y, Syifa Nur Rochmah, "Penerapan Metode DeLone dan McLean Dalam Mengukur Kesuksesan PPDB online Pada MTsN 1 Bekasi," Inti Nusa Mandiri, vol. 14 No. 1 Agustus, 2019.

[7] Sugiyono, Metode Penelitian Kuantitatif, Kualitatif dan R & D, Bandung: Alfabeta, 2009

[8] A. E. Wibowo, Metodologi Penelitian, Bandung: Rineka Cipta, 2012.

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