Evaluation Information System Success of the PPDB Information System in SMP Negeri 16 Samarinda using DeLone and McLean’s Model

Kusno Harianto, Azahari, Farhan Aufa Azhar

Abstract—Information System Success Analysis is a structured process of objects, with certain tools, with the aim of knowing whether the information system is successful or not in its application and getting the desired results from the object of research. In this study the data collection methods to be used were questionnaires, interviews, and literature study which were the theoretical foundations to be used. The model to be used is DeLone and McLean with SMP Negeri 16 Samarinda as a case study. With this research using the DeLone and McLean models, it aims to find out how successful the New Student Admissions (PPDB) information system is from the user's point of view, where the users are prospective students and the PPDB committee and whether the PPDB Online information system is very useful or not.

Keywords—Analysis, Success, Information System, PPDB Online, City of Samarinda, Using DeLone and McLean Models.

I. INTRODUCTION

Website of the New Student Admissions (PPDB) Online is used as an information system designed by the Ministry of Education and Culture to select new student admissions for public schools in various provinces in Indonesia. SMP Negeri 16 Samarinda is one of the public schools in the province of East Kalimantan which uses the PPDB website as a medium for registering new students.

Acceptance of new students is usually done manually by filling out the registration form and completing the requirements by parents and prospective new students, and they also have to come to school in person. In this way, the organizers of admitting new prospective students also experience difficulties, other difficulties also occur when they are going to do itslection sorting value of prospective students manually. This method means making it longer and slower to be completed.

With this description of the problem, the web-based PPDB is used as a service base and continues to be improved, so that it is hoped that it will provide convenience for students and parents to the public in registering, of course it will also make it easier for organizers or admissions officers for prospective new students. PPDB system

Online is designed in such a way with the aim of making it easy for prospective students to enroll. By using the online PPDB website, it makes it easy to find information regarding the implementation of the selection of new student admissions and registering through devices connected to the internet (Kurniawan, 2012).

A quality website can affect user satisfaction in using the website. The DeLone and McLean models are the right models in measuring the quality of a website (Adiyan, 2015). The DeLone and McLean models have been tested for validity and quickly received responses from researchers because the model developed is quite simple and is considered quite valid for all types of information systems, this model has six measures of success, namely system quality, information quality, service quality, use, user satisfaction, and net benefits (Saputro, 2015).

Based on the description of the background, it can be concluded that this study discusses the effect of quality website in its use as a new student admissions website and the influence of website quality in providing information to users regarding the process of admitting new students.

II. LITERATURE REVIEWS

A. Data

The word data comes from DATUM which means material or a collection of facts used for the purposes of an analysis, discussion, scientific presentation, or statistical test. When viewed according to the origin of the source, the data is divided into 2 groups, namely primary data and secondary data. So that every research definitely requires data as material for analysis. According to Siregar (2013), data is raw material that needs to be processed so as to produce information or information, both qualitative and quantitative that shows facts. According to Indrajani (2014), data are raw facts or observations which are usually about physical phenomena or business transactions, in data there is an
objective measure of the attributes (characteristics) of an entity, data can also be interpreted as a representation of facts that represent an object, such as customers, employees, students, and others (Joseph, 2014).

B. Analysis
According to Sugiyono (2014), analysis in general is an ability to solve or describe a material or information into smaller components so that it is easier to understand. Analysis requires creative power and high intellectual abilities. There is no specific way that can be followed to conduct an analysis, so that each researcher must find his own method that he feels is suitable for the nature of his research. The same material can be classified differently by different researchers (Arikunto, 2010).

C. System Analysis
According to Mulyani (2016), system analysis in general is the elaboration of a complete information system into its various component parts with the intention that we can evaluate various kinds of problems that arise in the system. System analysis is a research technique for a system by describing the components of the system with the aim of studying the components themselves, as well as their relationship with other components that make up the system so that a decision or conclusion can be obtained regarding the system, whether it is the weakness or strengths of the system (Arief, 2014).

D. Online PPDB Information System
According to Isa (2012), information systems consist of humans, machines and methods of a company to carry out an operational activity of the company concerned with data to produce information. Information systems may involve, for example, computers along with storage media machines, office machines (fax machines, copiers), communication equipment (controllers, modems, routers and others), data storage media and others (Ridwan, 2013).

Whereas PPDB online is a service system designed to facilitate the automation of the implementation of New Student Admissions (PPDB), from the registration process, selection, to the announcement of real-time-based selection results via the internet (William and Ephraim, 2016).

From the opinion above, it can be concluded that the online PPDB information system is an integrated system for processing data about the acceptance of new students.

III. RESEARCH METHODS

A. Information Systems Success Model
In 1992, DeLone and McLean conducted a study which aimed to find out the aspects that influence the success of information systems (Sutabri, 2012). The DeLone and McLean model explains that the measurement of information system success is categorized into 6 broad categories, namely system quality, information quality, use, user satisfaction, individual impact, and organizational impact. DeLone and McLean's success model (Dewi, 2019) can be seen in Picture 1.

![Picture 1. Model IS Success DeLone and McLean in 1992]

DeLone and McLean refined their IS Success model. The improvements made by DeLone and McLean are as follows.
1. Adding service quality variables (Service Quality).
2. Combining individual impact variables and organizational impacts into net benefits (Net Benefits).
3. Adding aspects of the desire to use (Intention To Use) on the use variable (Use) to measure user behavior.
4. Adding feedback from the variable net benefits (Net Benefits) to the variable use (Use) and user satisfaction (User Satisfaction).

In model refinement DeLone and McLean can be seen in Picture 2.

![Picture 2. Improvements to the DeLone and McLean models]

IV. RESULTS AND DISCUSSION

A. Respondent Data
Before distributing the questionnaires to the respondents, the researcher first calculated how many samples would be taken later from the existing population, while the total population (Gunawan, 2018) can be seen in Table 1.

<table>
<thead>
<tr>
<th>No</th>
<th>Respondents</th>
<th>Total Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Student</td>
<td>189</td>
</tr>
<tr>
<td>2</td>
<td>PPDB committee</td>
<td>31</td>
</tr>
<tr>
<td>3</td>
<td>Parents of Students</td>
<td>189</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>409</td>
</tr>
</tbody>
</table>

B. Research Instruments
The instruments used in this study are based on the theory of successful information systems according to DeLone and McLean. There are 5 statements of 5 indicators for system quality, which can be seen in Table 2.
Table 2. Instrument for system quality

<table>
<thead>
<tr>
<th>Variable</th>
<th>Indicator</th>
<th>No</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Quality (KS)</td>
<td>Ease of use</td>
<td>KS1</td>
<td>The display design of the PPBD Online information system makes it easy to use</td>
</tr>
<tr>
<td></td>
<td>Access speed</td>
<td>KS2</td>
<td>The PPDB Online information system can be accessed quickly</td>
</tr>
<tr>
<td></td>
<td>System reliability</td>
<td>KS3</td>
<td>There is no damage to the PPDB Online information system</td>
</tr>
<tr>
<td></td>
<td>The use of specific functions</td>
<td>KS4</td>
<td>The features run properly and can be opened via a smartphone</td>
</tr>
<tr>
<td></td>
<td>Response time</td>
<td>KS5</td>
<td>PPBD Online information system response time is fast</td>
</tr>
</tbody>
</table>

The instrument for the quality of advanced information is 1 statement of 1 indicator, which can be seen in Table 3.

Table 3. Instruments for the quality of information

<table>
<thead>
<tr>
<th>Variable</th>
<th>Indicator</th>
<th>No</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information Quality (KI)</td>
<td>accuracy</td>
<td>KI1</td>
<td>The PPDB Online information system provides accurate and correct information</td>
</tr>
</tbody>
</table>

There are 5 statements of 4 indicators for the quality of advanced information, which can be seen in Table 4.

Table 4. Instruments for advanced information quality

<table>
<thead>
<tr>
<th>Variable</th>
<th>Indicator</th>
<th>No</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Completeness</td>
<td>KI2</td>
<td>The PPDB Online information system provides complete information</td>
</tr>
<tr>
<td></td>
<td>Punctuality</td>
<td>KI3</td>
<td>The PPDB Online information system displays timely information</td>
</tr>
<tr>
<td></td>
<td>Reliability</td>
<td>KI4</td>
<td>The resulting information is easy to read and understand</td>
</tr>
<tr>
<td></td>
<td>Relevant</td>
<td>KI5</td>
<td>The PPDB Online information system provides relevant and new information</td>
</tr>
</tbody>
</table>

The instrument for the service quality variable contains 5 statements of 3 indicators, which can be seen in Table 5.

Table 5. Instruments for service quality

<table>
<thead>
<tr>
<th>Variable</th>
<th>Indicator</th>
<th>No</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service quality (KP)</td>
<td>Response speed and accuracy</td>
<td>KP1</td>
<td>Admin provides a fast response to user requests</td>
</tr>
<tr>
<td></td>
<td>Engineering ability</td>
<td>KP2</td>
<td>Admin provides proper information on user requests</td>
</tr>
<tr>
<td></td>
<td>After service</td>
<td>KP3</td>
<td>The PPDB Online information system is managed by a professional admin</td>
</tr>
<tr>
<td></td>
<td></td>
<td>KP4</td>
<td>Admin works quickly and precisely</td>
</tr>
<tr>
<td></td>
<td></td>
<td>KP5</td>
<td>The PPDB Online information system is useful as it should be</td>
</tr>
</tbody>
</table>

There are 5 statements for user satisfaction from 2 indicators, which can be seen in Table 6.

Table 6. Instrument for user satisfaction

<table>
<thead>
<tr>
<th>Variable</th>
<th>Indicator</th>
<th>No</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Satisfaction (KG)</td>
<td>Satisfaction with user information</td>
<td>KG1</td>
<td>The PPDB Online information system generates the appropriate information at the will of the user</td>
</tr>
<tr>
<td></td>
<td>User satisfaction with the interface</td>
<td>KG2</td>
<td>The PPDB Online information system produces correct information</td>
</tr>
<tr>
<td></td>
<td></td>
<td>KG3</td>
<td>Display in the PPBD Online information system can meet user satisfaction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>KG4</td>
<td>Display in the PPDB Online information system according to user needs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>KG5</td>
<td>Display in the PPDB Online information system is easy for users to use</td>
</tr>
</tbody>
</table>
C. Residual Normality Test

Following are the results of the residual normality test on the variables Information Quality, System Quality, Service Quality on User Satisfaction can be seen in Picture 3.

![Normal P-P Plot of Regression Standardized Residuals](image)

Picture 3. Residual Normality Test with Graphical Method

From the Picture 3, test the residual normality of the variable information quality, system quality, service quality on user satisfaction can be seen in the output above, we can see that the plotting points contained in the PP Plot image always follow and approach the diagonal line, but at the end of the line the diagonal, but at the end at the point x = 1.0 and y = 1.0 the points still follow the diagonal line. Therefore, as a guideline for decision making in the normality test, it can be concluded that the residual values are normally distributed. Thus, the assumption of normality for residual values in simple linear regression analysis in this study can be fulfilled (Muharto and Ambarita, 2016).

D. Hypothesis test

Testing the hypothesis in this study was carried out using a simple linear regression analysis technique. Simple linear regression analysis is used for only one independent variable (independent) and one dependent variable (independent). The data used for the simple linear regression test are interval scale data (Sudaryono, 2016). Calculation of manual hypothesis testing and assisted by using SPSS 25 software and using the value of t table in attachment 3.

E. System Quality on User Satisfaction

The constant \( a = \frac{N(\sum X Y) - (\sum X)(\sum Y)}{N(\sum X^2) - (\sum X)^2} = \frac{80(34335) - (1627)(1676)}{80(33651) - (2647129)} = 0.44 \)

constant \( b = \frac{N(\sum X Y) - (\sum X)(\sum Y)}{N(\sum X^2) - (\sum X)^2} = \frac{80(34335) - (1627)(1676)}{80(33651) - (2647129)} = 0.44 \)

The simple linear regression equation, \( Y = a + bX = 11.92 + 0.44X \)

Correlation value between \( X \) and \( Y \) variables, \( r = \sqrt{\frac{(N(\sum X^2)(\sum Y^2) - (\sum X)(\sum Y)^2)}{[N(\sum X^2) - (\sum X)^2]^{1/2}[N(\sum Y^2) - (\sum Y)^2]^{1/2}}} = \frac{80(34335) - (1627)(1676)}{(80)(33651 - (2647129)(80)(35556 - (2808975)) = 0.499 \)

The percentage of contribution of variable \( X \) to variable \( Y \), \( KP = r^2 \times 100\% = 0.249 = 24.9\% \)

\[ T_{test} = t_{value} = \frac{r\sqrt{N-2}}{\sqrt{1-r^2}} = \frac{0.449 \times 8.831}{0.866} = 5.09 \]

Determine the value of t table \( t(\alpha/2)(N-2) = t(0.05/2)(80-2) = 1.992 \)

Hypothesis conclusion:

Based on the Test Rules test
1) \( t \) count > t table, where \( t \) count is 5.09, while \( t \) table is 1.992, so 5.09 > 1.992. Then there is an influence between system quality and user satisfaction.
2) Make a hypothesis in the form of a sentence
Ho: There is no influence between system quality and user satisfaction
Ha : There is an influence between system quality and user satisfaction.

3) The decision is that there is a significant influence between system quality and user satisfaction, and Ha is accepted. The simple regression analysis test of system quality on user satisfaction can be seen in Table 7.

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients (B)</th>
<th>standard Coefficients (Betas)</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>[11.925, 1.788]</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>System Quality</td>
<td>[0.444, 0.087]</td>
<td>0.000</td>
</tr>
</tbody>
</table>

F. Information Quality on User Satisfaction

---
The constant 
\[ a = \frac{N \sum(Y)(\sum(\sum(X^2)) - (\sum(X))(\sum(X) \sum(Y)))}{N(\sum(X)^2) - (\sum(X))^2} \]
\[ b = \frac{N \sum(X)(\sum(\sum(Y))) - (\sum(X))(\sum(Y))}{N(\sum(X)^2) - (\sum(X))^2} \]

Simple linear regression equation, \( Y = a + bX = 6.438 + 0.694 X \)

Correlation value between variables \( X \) and \( Y \),
\[ r = \frac{N \sum(X \sum(Y)) - \sum(X) \sum(Y)}{\sqrt{N (\sum(X^2) - (\sum(X))^2)(\sum(Y^2) - (\sum(Y))^2)}} \]
\[ = \frac{80(35389) - (1674)(1676)}{\sqrt{80(35439) - (2799829)(80(35556) - (2808976)}} = 0.706 \]

The percentage contribution of variable \( X \) to variable \( Y \),
\[ KP = r^2 x 100\% = 0.498 \times 100\% = 49.8\% \]

T test, \( t_{value} = \frac{r \sqrt{n-2}}{\sqrt{1-(r)^2}} \) = \( \frac{0.706 \times \sqrt{80-2}}{\sqrt{1-(0.706)^2}} = 8.79 \)

Determine the value of \( t_{table} = t_{(\alpha/2)(N-2)} = t_{(0.05/2)(80-2)} = 1.992 \)

Hypothesis conclusion:
1) \( t_{count} > t_{table} \), where \( t_{count} = 8.79 \), while \( t_{table} = 1.992 \). Then there is an influence between the quality of information and user satisfaction.

2) Make a hypothesis in the form of a sentence
\( Ho: \) There is no influence between the quality of information and user satisfaction
\( Ha: \) There is an influence between the quality of information and user satisfaction.

3) The conclusion is that there is a significant influence between the quality of information and user satisfaction, and Ha is accepted.

Simple regression analysis test the quality of information on user satisfaction can be seen in Table 8.

### Table 8. Simple Regression Analysis Test of Information Quality on User Satisfaction

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6.438</td>
</tr>
</tbody>
</table>

The constant \( a = \frac{N \sum(Y)(\sum(X^2)) - (\sum(X))(\sum(X) \sum(Y)))}{N(\sum(X)^2) - (\sum(X))^2} \) = \( \frac{(1676)(35439) - (1674)(1673)35414}{80(35439) - (2799829)} = 4.09 \)

Constant \( b = \frac{N \sum(X)(\sum(Y)) - (\sum(X))(\sum(Y))}{N(\sum(X^2) - (\sum(X))^2)} \) = \( \frac{80(35439) - (2799829)(80(35556) - (2808976)}{80(35439) - (2799829)(80(35556) - (2808976)} = 0.80 \)

The simple linear regression equation, \( Y = a + bX = 4.09 + 0.80 X \)

Correlation value between variables \( X \) and \( Y \),
\[ r = \frac{N \sum(X \sum(Y)) - \sum(X) \sum(Y)}{\sqrt{N (\sum(X^2) - (\sum(X))^2)(\sum(Y^2) - (\sum(Y))^2)}} \]
\[ = \frac{80(35414) - (1673)(1676)}{\sqrt{80(35439) - (2799829)(80(35556) - (2808976)}} = 0.814 \]

The percentage contribution of variable \( X \) to variable \( Y \),
\[ KP = r^2 x 100\% = 0.662 \times 100\% = 66.2\% \]

T test, \( t_{value} = \frac{r \sqrt{n-2}}{\sqrt{1-(r)^2}} \) = \( \frac{0.814 \times \sqrt{80-2}}{\sqrt{1-(0.814)^2}} = 12.36 \)

Determine the value of \( t_{table} = t_{(\alpha/2)(N-2)} = t_{(0.05/2)(80-2)} = 1.992 \)

Hypothesis conclusion:
1) \( t_{count} > t_{table} \), where \( t_{count} = 12.36 \), while \( t_{table} = 1.992 \). Then there is an influence between service quality and user satisfaction.

2) Make a hypothesis in the form of a sentence
\( Ho: \) There is no influence between service quality and user satisfaction
\( Ha: \) There is an influence between service quality and user satisfaction.

3) The conclusion is that there is a significant influence between service quality and user satisfaction, and Ha is accepted.

Simple regression analysis test of service quality on user satisfaction can be seen in Table 9.
### Table 9. Simple Regression Analysis Test of Service Quality on User Satisfaction

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>standard Coefficients</th>
<th>Betas</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>std. error</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>4.093</td>
<td>1.372</td>
</tr>
<tr>
<td></td>
<td>Service quality</td>
<td>.806</td>
<td>.065</td>
</tr>
</tbody>
</table>

### V. CONCLUSION

The test results with simple linear regression on the system quality variable on user satisfaction obtained $t_{count} = 5.090 > t_{table}$ 1.992 so that it can be interpreted that there is an influence between system quality variables and user satisfaction. Gageon system quality such as ease of use, speed of access, system reliability, usability of specific functions, and response time have an influence on user satisfaction. The contribution made by system quality to user satisfaction is 24.9%.

The test results with simple linear regression on the variable quality of information on user satisfaction obtained the value of $t_{count} = 8.797 > t_{table}$ 1.992 so that it can be interpreted that there is an influence between the variable quality of information and user satisfaction. The metrics on information quality are accuracy, completeness, timeliness, reliability, and relevance have an influence on user satisfaction. The contribution made by the quality of information on user satisfaction is 49.8%.

The test results with simple linear regression on the variable service quality on user satisfaction obtained $t_{value} = 12.368 > t_{table}$ 1.992 so that it can be interpreted that there is an influence between service quality variables and user satisfaction. The yardsticks for quality of service are speed and accuracyresponse, technical ability, after service have an influence on user satisfaction. The contribution made by service quality to user satisfaction was 66.2%.

### REFERENCES


