Academic Information System In Higher Education : Applicating Delone and Mclean Model

by Gregorius Paulus Tahu Anik Yuesti

Academic Information System In Higher Education : Applicating Delone and Mclean Model

Gregorius Paulus Tahu[1], Anik Yuesti[2]

[1]*Economic Faculty, Universitas Mahasaraswati, Denpasar, Indonesia*
[2]*Jl. Kamboja No.11A, Dangin Puri Kangin, Denpasar Utara, Kota Denpasar, Bali*

ABSTRACT-

This Study uses descriptive analysis by using the Delone and McLean Model which is used to predict the success of academic information systems in several universities in Bali. By using a simple random sampling technique obtained a sample of some universities in Bali such as Universitas Mahasaraswati, Warmadewa and Dhyna Pura. The collection of data was conducted by questionnaires and interviews. Data analysis was done using Path Analysis with Structural Equation Modeling (SEM). The result shown that there is a positive relationship between the quality of the system with the use and satisfaction of users, a positive relationship between the quality of information with the use and satisfaction of users, a positive relationship between the quality of service with the use and satisfaction of users, a positive relationship between the use and satisfaction of users, a positive relationship between use and satisfaction users of net benefits. Thus, it can be concluded that all hypotheses are accepted

Keywords: Delone and McLean Model, information system, Universities, Academic.

1. INTRODUCTION

Along with the development of technology and information, Universities tried to implement an academic information system due to the many problems encountered. In this case the university is trying to improve its performance by implementing an academic information system. Academic information system is a must for every institution of higher education. Almost all universities have implemented academic information system. Some Universities in Bali are several of the tertiary institutions that have implemented academic information system to facilitate the activities of students, lecturers, and academic staff. With different academic and user systems, management and appearance will also be different.

Academic information system as the main information media related to academics, plays an important role in the administration of administrative operations, lecturer performance, and makes it easier for students to get educational and administrative information such as checking grades, filling out Study Plan Cards (KRS) online, printing attendance lists, and various other benefits. According to Satoto (2009) Academic Information System is software used to present information and organize administration related to academic activities. Academic Information System is compiled from various kinds of data that are managed and processed as automatically as possible with tools and methods so as to produce the information needed for the implementation of academic activities.

This system aims to support the implementation of education, so that universities can provide better and more effective information services to their communities, both inside and outside the tertiary institutions through the internet. Various needs in the field of education and the regulations that surround it are so high that academic management in an educational institution is a very time-consuming work, energy and mind. Therefore, an academic information system is built to answer directly the problems and needs of universities for academic management.

The problem that often occurs in tertiary institutions in general is the limitation of data processing that starts from the data processing for the prospective student entrance examination screen, the announcement of the results of prospective students who graduated, the re-registration process, both for prospective new students and students who have become college students. This is one of the processes of interaction between the internal parts of universities or educational institutions that process data with certain processes and procedures, with users who in this case are students.

This is the basis for conducting research related to Academic Information Systems in several universities in Bali with the DeLone and McLean model approach. The DeLone and McLean model approaches used in this study refer to research that has been done by several previous researchers such as Kerta and Suryawan (2013), Fadhel (2015), Sultono, K.B. Seminar., and Erizal. (2015), Sirsat and Sirsat (2016), Santos, A. D. Santoso, A. J. and Setyohadi, D. B., (2017), Robo, Salahudin & Setyohadi, Djoko & Santoso, Albertus. (2018), Yakubu and Dasuki (2018). While this study uses the DeLone and McLean theory to determine the academic information system at several universities in Bali such as Universitas Mahasaraswati, Warmadewa and Dhyna Pura with the Path Analysis hypothesis test based on the scale of the data used is the ordinal using Structural Equation Modeling (SEM).

In accordance with the existing background, the research problem can be formulated as follows:

1)   Is there a relationship between the system quality variable to the use variable in the Academic Information System of Universities?
2)   Is there a relationship between the system quality variable to the user satisfaction variable in the Academic Information System of Universities?
3)   Is there a relationship between the information quality variable to the use variable in the Academic Information System of Universities?
4)   Is there a relationship between the information quality variable to the user satisfaction variable in the Academic Information System of Universities?
5)   Is there a relationship between the service quality variable to the use variable in the Academic Information System of Universities?
6)   Is there a relationship between the service quality variable to the user satisfaction variable in the Academic Information System of Universities?
7)   Is there a relationship between the use variable and the user satisfaction variable in the Academic Information System of Universities?
8)   Is there a relationship between the use variable and the net benefit variable in the Academic Information System of Universities?
9)   Is there a relationship between the user satisfaction variable on the net benefits variable in the Academic Information System of Universities?

2. LITERATURE REVIEW

2.1 Academic Information System

Before discuss about academic information system it is better to discuss in advance what is meant by the information system itself. Information systems are a combination of work procedures, information, users, and information technology that are organized to achieve goals in an organization (Alter, 1992). According to Loudon and Loudon (2004), information systems are a collection of interconnected components, collecting, process, and store and distribute information to support decision making and supervision in an organization.

Information system is a system within an organization that meeting the needs of daily transaction processing, supporting operations, managerial and strategic activities of an organization, and provide certain outside parties with required reports (Jogiyanto, 2005). According to O'Brien (2005) the notion of information systems is any regular combination of people, hardware, software, computer networks and data communications (networks communications), and databases that collect, change and spread information in an organizational form.

Meanwhile according to Satoto (2009) the academic information system is software used to present information and organize administration related to academic activities. By using software like this is expected to be an academic administrative activity well managed and the required information can be obtained with easy and fast.

2.2 Delone and Mclean Model

Delone & Mclean's information system success model theory begins developed based on initial research in 1992. The theory known as the D&M IS Success Theory which explains that proposed model reflects the dependence of the six measures of information system success. DeLone and McLean (1992) base their model on a process model that consists of three process components, namely the creation and use of information systems and the consequences or impacts of a system use. Each of these processes is necessary, but not sufficient for a condition to produce an outcome.

The DeLone and McLean (1992) model is based on causal processes and relationships from the dimensions in the model. This model does not measure all six dimensions measuring the success of the information system independently but measuring it overall one affects the other.

In 2003, DeLone and McLean updated the D&M model which was introduced in 1992. Expansion that has been carried out by DeLone and McLean are entering service quality variables, so that information system success has 6 main variables namely information quality, system quality, service quality, users, satisfaction users and net benefits as follow:
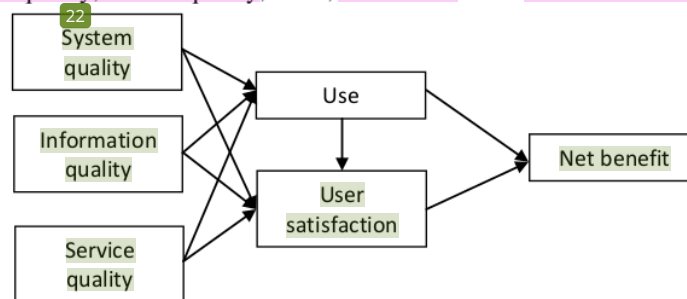

Figure 1. The model of Delone and Mclean's information system

In this information system success model, there are changes, namely:
a) Addition of service quality provided by information systems developers.
b) Merging between individual impact and organizational impact into one, namely net benefits.

Each element in the D&M IS Success Model is still needed elaborated further so that it can be more easily used as a measuring tool for know the level of success of an information system. Every item these have been grouped as follows:

a) System quality
   The quality of the system is used to measure the quality of system information itself, both software and hardware. System quality is performance from a system that refers to how good the hardware is, software, policies, procedures of information systems can be provide information on user needs (Delone, 1992). Meanwhile, according to Chen (2010) that quality of the system is a measure of processing the information system itself. System quality measured subjectively by the user, so that the quality of the system is used is the quality of the system. The indicator used is replicating from Iivari (2005) research consists of 6 measurement scales namely, system flexibility, system integration, time to response, error recovery, convenience of access and language.

b) Information quality
   Information quality can be interpreted as measuring the quality of content from information systems (Ong et al., 2009). Similar to the quality of the system, the quality of information in question is the quality of information measured subjectively by the user, hereinafter referred to perceived information quality. Iivari (2005) uses five scales namely measurement, completeness, precision, reliability, data is always updated (currency), the format of output.

c) Service quality
   Quality of service as a comparison of customer expectations with the perception of the real service they receive. According to DeLone and McLean (2003) there are three components that affect service quality and indicators is, assurance, empathy system and the responsiveness system.

d) Use
   Usage refers to how often the user uses the system information. In relation to this it is important to distinguish whether its use includes necessity that can not be avoided or volunteer. This variable is measured by the indicators used only consisting of one item that is how often the user (user) uses the system that information (frequency of use) (Jogiyanto, 2007)

e) User satisfaction
   User satisfaction is a response and bait feedback that is raised by the user after using the information system. Attitude users of information systems are a subjective criterion regarding how much the user likes the system used.

f) Net benefits
   Net benefits are net results or benefits felt by individuals and also the organization after implementing the information system. This article used five of the six items adapted from the usability measure at Davis. F. (1989) that is, speed of gathering tasks, Job performance, effectiveness, ease of job, usefulness in work

3. METHOD

The research method used in this research is descriptive method with the approach used is a quantitative approach, namely research using numbers and analyzed using statistics to solve a problem. The sampling technique in this study used simple sampling technique in which a population of some universities in Bali such as Mahasaraswati, Warmadewa and Dhyna Pura. Furthermore, the data analysis in this study is descriptive analysis using the DeLone and McLean model by examining the relationships between variables measured by indicators and analyzed descriptively through frequency distribution tables in the form of percentages. The variables used in this study refer to the theory of DeLone and McLean 2003 which consists of six variables, namely the independent variable there are three variables namely system quality, information quality, and service quality. Between the variables there are two variables, namely usage and user satisfaction. The dependent variable consists of only one variable, namely net benefit. The collection of data was conducted by questionnaires and interviews. Data analysis was done using Path Analysis with Structural Equation Modeling (SEM)

4. RESULT AND DISCUSSION

4.1 Result

Based on the results of data processing related to academic information system for some universities in Bali such as Mahasaraswati, Warmadewa and Dhyna Pura using the DeLone and McLean model can be seen in the following figure:
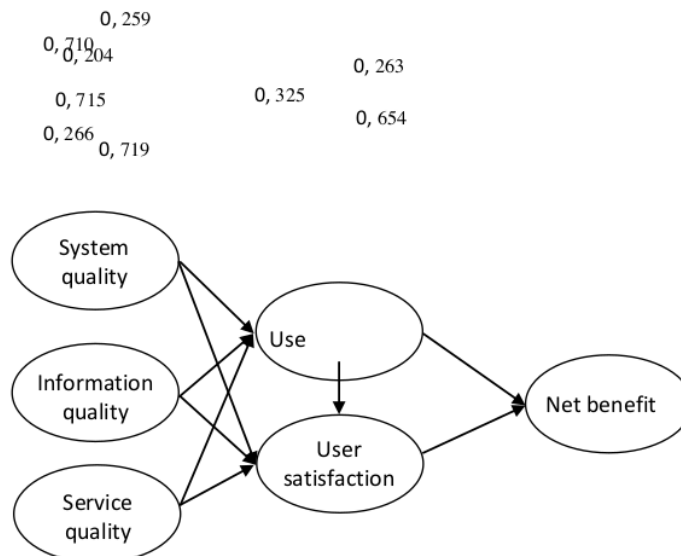

Figure 2. SEM Result Structural Model

From figure 2 above then the SEM results of data processing are as follow:

Table 1.
SEM Result Structural Model

No.	Inter-Variable Relationship	Coefficient	p-value	Remark
1	System quality → Use	0,259	0.011	Accepted
2	system quality → user satisfaction	0,710	0,000	Accepted
3	information quality → Use	0,204	0,045	Accepted
4	information quality → user satisfaction	0,715	0,000	Accepted
5	service quality → Use	0,266	0,008	Accepted
6	service quality → user satisfaction	0,719	0,001	Accepted
7	Use → user satisfaction	0,325	0,001	Accepted
8	Use → net benefit	0,263	0,009	Accepted
9	user satisfaction → net benefit	0,654	0,000	Accepted

Based on table 1, the significance value is 0.011. With a significance value <0.05 then H1 is accepted, while the correlation between the variables of the system quality to the use variable is 0.259. So it can be concluded that there is a positive relationship between the system quality variable on the use variable in the academic information system although it is still relatively low. Because the relationship is positive coefficient indicates a direct relationship. This means that the higher value of System Quality, the higher value of Use

Based on table 1, the significance value is 0.000. With a significance value <0.05 then H2 is accepted, while the correlation between the variables of the system quality to the user satisfaction variable is 0.710. So it can be concluded that there is a positive relationship between the system quality variable on the user satisfaction variable in the academic information system which is fairly high. Because the relationship is positive coefficient indicates a direct relationship. This means that the higher value of System Quality, the higher value of User Satisfaction.

Based on table 1, the significance value is 0.045. With a significance value <0.05 then H3 is accepted, while the correlation between the variables of the information quality to the use variable is 0,204. So it can be concluded that there is a positive relationship between the information quality variable on the use variable in the academic information system although it is still relatively low. Because the relationship is positive coefficient indicates a direct relationship. This means that the higher value of information quality, the higher value of Use

Based on table 1, the significance value is 0.000. With a significance value <0.05 then H4 is accepted, while the correlation between the variables of the information quality to the user satisfaction variable is 0,715. So it can be concluded that there is a positive relationship between the information quality variable on the user satisfaction variable in the academic information system which is fairly high. Because the relationship is positive coefficient indicates a direct relationship. This means that the higher value of information quality, the higher value of User Satisfaction.

Based on table 1, the significance value is 0.008. With a significance value <0.05 then H5 is accepted, while the correlation between the variables of the service quality to the use variable

is 0,266. So it can be concluded that there is a positive relationship between the service quality variable on the use variable in the academic information system although it is still relatively low. Because the relationship is positive coefficient indicates a direct relationship. This means that the higher value of service quality, the higher value of Use

Based on table 1, the significance value is 0.001. With a significance value <0.05 then H6 is accepted, while the correlation between the variables of the service quality to the user satisfaction variable is 0,719. So it can be concluded that there is a positive relationship between the service quality variable on the user satisfaction variable in the academic information system which is fairly high. Because the relationship is positive coefficient indicates a direct relationship. This means that the higher value of service quality, the higher value of User Satisfaction.

Based on table 1, the significance value is 0.001. With a significance value <0.05 then H7 is accepted, while the correlation between the variables of the use to the user satisfaction variable is 0,325. So it can be concluded that there is a positive relationship between the use variable on the user satisfaction variable in the academic information system although it is still relatively low. Because the relationship is positive coefficient indicates a direct relationship. This means that the higher value of use, the higher value of user satisfaction

Based on table 1, the significance value is 0.009. With a significance value <0.05 then H8 is accepted, while the correlation between the variables of the use to the net benefit variable is 0,263. So it can be concluded that there is a positive relationship between the use variable on the net benefit variable in the academic information system although it is still relatively low. Because the relationship is positive coefficient indicates a direct relationship. This means that the higher value of use, the higher value of net benefit

Based on table 1, the significance value is 0.000. With a significance value <0.05 then H9 is accepted, while the correlation between the variables of the user satisfaction to the net benefit variable is 0,654. So it can be concluded that there is a positive relationship between the user satisfaction variable on the net benefit variable in the academic information system which is fairly high. Because the relationship is positive coefficient indicates a direct relationship. This means that the higher value of user satisfaction, the higher value of net benefit.

5. DISCUSSION

Based on the results of testing the hypotheses put forward in this study were all accepted. There are 3 levels of correlation on the relationship between these variables, namely a) between the quality of the system and the use, between the quality of information and usage, between the quality of service and usage, between use and user satisfaction, and between use and net benefits has a low correlation category. b) between system quality and user satisfaction, between information quality and user satisfaction, between service quality and user satisfaction has a high correlation category. c) between user satisfaction and net benefits has a significant correlation category.

Meanwhile, when referring to the theory put forward by Mclean and DeLone (2003) it is explained that an information system is said to be effective if there are positive relationships between the variables studied. In addition, Declone and Mclen stated that if a high system quality is associated with user satisfaction and net benefits. The higher the level of user satisfaction, the impact of the use of the system will also be positive. So that all variables are said to have a positive relationship or information system said to be effective. Conversely, if the quality of the system is getting worse which results in unsatisfactory users then surely there will be no benefit for users in using the system.

From these explanations, the effectiveness of academic information systems is said to be effective with a low level of effectiveness. This is because the independent variable x (system quality, information quality, and service quality) to the variable between y1 (usage) has a low correlation level so that the intermediate variable (use) to the dependent variable (net benefits) also has a low level of relationship.

This research contributes to the successful model of information system by adding confirmatory factor analysis to the six variables of information system success based on the DeLone and McLean's theory that is the system quality, information quality, service quality, use, user satisfaction and net benefit. There are nine hypothesis are constructed in this research that is relationship exists in the success model of academic information system. After the hypothesis testing proposed in this research, all hypotheses are significant.

When compared with the results of this study with the results of research conducted by DeLone and McLean, it provides the same hypothesis as DeLone and McLean's research. The results of this study also support several previous studies though there are some differences from the results of the hypothesis test, for example by Sultono, K.B. Seminar., and Erizal. (2015) stated that SEM analysis result show that all research variables and indicators have significant relations, also that the academic information system quality (system quality, information quality and service quality (toward user satisfaction has a significant impact. Sirsat and Sirsat (2016) in their research stated that hypothesized relationships between the six success variables are significantly or marginally supported to the information system.

While Robo, Salahudin & Setyohadi, Djoko & Santoso, Albertus (2018) in their research shown that the quality of information and system does not affect the user, but it affects user satisfaction, service quality affects user and user satisfaction, user satisfaction affects user, user affects net benefit and user satisfaction affects net benefit.

Yakubu and Dasuki (2018) also stated that of the variables referring to the DeLone and McLean models only 5 hypotheses are proven to have a significant relationship which is the quality antecedents with the exception of service quality significantly influenced behavioral intentions of students to use Canvas which is the exact reverse as observed in the relationship between user satisfaction and the quality antecedents, where only service quality was found to significantly influence user satisfaction. User satisfaction was found to influence actual usage but was non-significant in its relationship with behavioral intentions. The final relationship is between, behavioral intentions and actual usage and this was found to be significant.

6. CONCLUSIONS AND SUGGESTIONS

5. 1. Conclusions
Based on the results and discussion above, it can be concluded that academic information systems of several universities in Bali such as Mahasaraswati, Warmadewa and Dhyna Pura are said to be effective with a low level of effectiveness known from the correlation coefficient values of more than 0.20 and less than 0.40 (0.20 <kk < 0.40) and shown by the positive relationship between (1) system quality and usage, (2) system quality and user satisfaction, (3) information quality and usage, (4) information quality and user satisfaction, (5) service quality and usage, (6) service quality and user satisfaction, (7) usage and user satisfaction, (8) use and net benefits, (9) user satisfaction with net benefits.

5.2 Suggestions
Based on the conclusions of the above research, some suggestions for can be done models for predicting academic information systems of several universities in Bali such as

Mahasaraswati, Warmadewa and Dhyna using the Declone and Mclen model. Future research should expand the research sample by using a large sample gathered elsewhere is required for further generalization of the instrument.

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