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IMPLEMENTATION DELONE & MCLEAN IS SUCCESS MODEL FOR RESEARCH AND COMMUNITY SERVICE MANAGEMENT INFORMATION SYSTEM EVALUATION

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Abstract

SRIKANDI is an information system managed by LPPM that manages research and lecturer service within the UPN "Veteran" Yogyakarta. SRKANDI in its implementation has never been evaluated, therefore in this reserach SRIKANDI was evaluated. The evaluation was carried out using the DeLone & McLean IS Success Model with 150 data obtained from distributing questionnaires to lecturers who had used SRIKANDI. The approach used in this research is quantitative by using regression analysis to test the twelve hypotheses that exist with the successful implementation of SRIKANDI as an information system.

Keywords: DeLone & McLean IS Succes Model, IS Evaluation, Research and Community Service Information System

INTRODUCTION

Information systems were becoming more crucial at this time, especially in the organization. Organizations today make information systems a support system and have become “something” that must exist in the organization. Organizational goals can be linked to information system goals [1], which makes the information system could be a matter relevant to an organization. The purpose of the existence of an information system is to support management, operations, and decision-making. Based on that, organizations will be assisted to manage and improve their business processes. Information systems have an essential role in organizations that make information systems continue to be improved and evaluated.

Information technology is constantly evolving, and when it is applied in organizations, information technology/systems have the potential to cause problems [2]. In some cases, the implementation of an information system that is carried out incorrectly will most likely result in failure [3]. According [4], 25% of all information systems projects were disbanded, while 60% were over budget, 75% did not have the desired quality, and less than 1% were delivered under the agreed budget and time and delivered the desired quality. Therefore, it is necessary to

evaluate the application of information systems to avoid the problems previously mentioned.

Evaluation of information systems is one thing that must be done to find out that the information system has been successfully implemented. Evaluation of the effectiveness or success of information systems is essential in the field of information systems both in research and practice [5]. There are many models proposed that can be used as guidelines or references for evaluating information systems, one of them is the information system success model proposed by William H. DeLone and Ephraim R. McLean named Delone and McLean IS Success Model.

The Institute for Research and Community Service, often called LPPM is one of the institutions in universities in Indonesia. Usually, as an institution, LPPM is responsible for facilitating and managing research and community service at the university. Similar to LPPM in general, LPPM UPN "Veteran" Yogyakarta is an institution that is responsible for managing and facilitating research and community service for all the academic community of UPN Veterans Yogyakarta. In carrying out its function, LPPM is assisted by an information system to manage research and community service within UPN Veterans Yogyakarta, namely SRIKANDI.

In an implementation, SRIKANDI faced several obstacles in its operation. The most common operational constraint found in SRIKANDI is an inaccessible system that disrupts research productivity within the UPN Veterans Yogyakarta, which makes users doubt the system's quality. However, until now, there has not been a thorough evaluation of SRIKANDI.

In order to overcome the problems of SRIKANDI, it is necessary to conduct a research to evaluate SRIKANDI. Evaluating the performance of Information Systems is a must where this idea arises from the importance of Information Technology in the effectiveness and efficiency of work processes in an organization (Platisa & Balaban, 2009). Based on the description of the problems previously mentioned, the solution given is the evaluation of SRIKANDI using the DeLone & McLean IS Success Model. A quantitative approach will be used to support the evaluation. Based on the proposed solutions to the problems mentioned previously, this research is expected to provide recommendations in developing SRIKANDI so that LPPM can effectively and efficiently carry out its duties as the institution responsible for managing research and community service at UPN Veterans Yogyakarta.

LITERATURE REVIEW

Delone and Mclean For IS Success

The DeLone and McLean model is a model used to measure the success of information systems. This model was proposed by William H. DeLone and Ephraim R. McLean in 1992. The DeLone & McLean model is a model that measures the success of a system that is considered quite valid because of its simplicity and fast

response. At the beginning of its emergence, the DeLone & McLean model identified six variables: system quality, information quality, usage, user satisfaction, individual impact, and organizational impact [6]. Since DeLone & McLean published the model in 1992, many researchers have provided input on the model. The changes in the models published in 2003 are additional variables of service quality and combine individual and organizational impact into net benefits.

The DeLone and McLean model state that service quality, information quality, and system quality positively affect intention to use, user satisfaction, and net benefits have shown in figure 1. The following is an explanation of the variables used in the DeLone and McLean Models:

1. **Information Quality** - The information quality dimension describes the desired characteristics of the information system results. Measurements on this dimension focus on measuring the quality of information generated by the information system and its usefulness to users, so this dimension is referred to as the dimension that is the basis for creating user satisfaction [7]. Based on that statement, the quality of information is measured based on the user's perception of the information produced by the information system.
2. **System Quality** - Information System that uses a combination of software and hardware [8]. Measurement of system quality focuses on usability and performance characteristics of the system being analyzed [7]. Based on the explanation of the quality of the system, it can be seen that the measurement of the quality of the information system is a subjective measurement because it is based on the user's perception of the experience gained from using an information system.
3. **Service Quality** - A form of measuring the success of information systems with services provided by information system developers that will be accepted by users [8]. Service quality is a component part of the success of a system. The indicators used to measure service quality are assurance, empathy, and responsiveness [9].
4. **Intention to Use** - The intention to use dimension describes the level and procedure for using the information system by users. Users who have the intention to use information systems will show attitudes and efforts to continue using information systems in order to obtain information or to fulfill their interests, and will use the experience of using information systems as a basis for providing recommendations to other parties [10].
5. **User Satisfaction** - User responses to the information system their used [8]. The user satisfaction dimension describes the level of satisfaction felt by users after using an information system [7]. From the concept of application success proposed by DeLone and McLean, measurement of user satisfaction can be done

by focusing on measuring user satisfaction with the information generated by the system, and overall user satisfaction.

6. **Net Benefit** - The net benefits of an information system are benefits that can be felt by all its users, both at the individual and organizational levels. Operationally, this benefit can be in the form of the impact of an information system that is able to increase work efficiency and effectiveness, reduce error rates, facilitate communication [11].

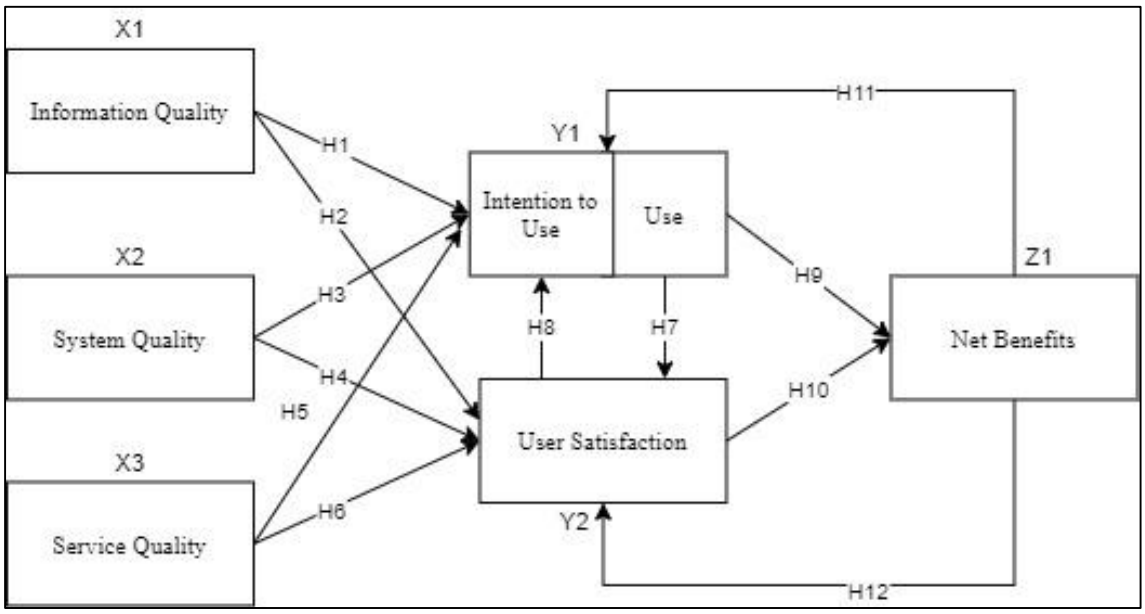

Figure 1 DeLone & McLean Model

In measuring the success of information systems using the DeLone and McLean model by identifying six interrelated variables, namely system quality, information quality, service quality, use/intention to use, user satisfaction, and net benefits which are considered quite valid because of their simplicity. Measuring the success of a system is very important because it can find out what factors influence the success or failure of a system so that it can be taken into consideration for developing a system that is still considered not good. Based on the Delone and McLean model that will be implemented for the evaluation of the SRIKANDI application, the following hypothesis is formulated:

- H1: System quality is suspected to have a significant effect on Intention to use
- H2: System quality is suspected to have a significant effect on User satisfaction
- H3: Information quality is suspected to have a significant effect on Intention to use
- H4: Information quality is suspected to have a significant effect on User satisfaction

- H5: Service quality is suspected to have a significant effect on Intention to use
- H6: Service quality is suspected to have a significant effect on User satisfaction
- H7: Intention to use is suspected to have a significant effect on User satisfaction
- H8: User satisfaction is suspected to have a significant effect on Intention to use
- H9: Intention to Use is suspected to have a significant effect on Net benefits
- H10: User satisfaction is suspected to have a significant effect on net benefits
- H11: Net Benefits is suspected to have a significant effect on Intention to use
- H12: Net Benefits are suspected to have a significant effect on User satisfaction

RESEARCH METHODOLOGY

The data used in this research were taken in April – July 2021. The sample in this research were lecturers who had applied for internal research grants through the SRIKANDI system from 2019 to 2021. Questionnaires are distributed by sending lecturers in short messages, including a link to fill out the questionnaire. One hundred fifty respondents filled out the questionnaire. The questionnaire uses a Likert scale of 1-5. Questions on the questionnaire are made to answer the hypotheses formulated previously with the help of references from previous studies. This study adopts DeLone & McLean 2003 as a model to measure the success of the SRIKANDI system implementation. There are six variables in the model, including information quality (IQ), system quality (SQ), service quality (SRQ), intention to use (IU), user satisfaction (US), and net benefit (NB). The quantitative approach is used to analyze the data that has been obtained. In this quantitative approach, the validity and reliability of the data are tested first to ensure the data is suitable for analysis. Then hypothesis testing is carried out to determine whether the implementation of the SRIKANDI system has been successful.

FINDING AND DISCUSSION

A total of 150 data collected were analyzed. The characteristics of the respondents were found to be quite diverse. Factors are focused on gender, age, faculty from which the respondent is from, and how long they have submitted internal research through the SRIKANDI application.

Based on 150 respondents, 58% were male and 42% female. Judging from the age characteristics, most respondents are in the age range of 51-60 years which is 34.7%. For faculty background, 27.3% of respondents came from the Faculty of Mineral Technology, and 52% had submitted research through SRIKANDI for the

last two years. For more complete data related to the characteristics of respondents, see table 1.

Table 1 Demographic Information of Respondents

			(**N = 150**)
		Sample Size	**Ratio (%)**
Gender	Male	87	58
	Female	63	42
Age	<=30 Tahun	17	11.3
	31 - 40 Tahun	28	18.7
	41 - 50 Tahun	33	22
	51 - 60 Tahun	52	34.7
	> 60 Tahun	20	13.3
Faculty	Faculty of Economics and Business	28	18.7
	Faculty of Social and Political Science	17	11.3
	Faculty of Agriculture	28	18.7
	Faculty of Industrial Engineering	36	24.0
	Faculty of Mineral Technology	41	27.3
Internal Research Submission Year through SRIKANDI	One Year	72	48
	Two Year	78	52

After conducting a descriptive analysis on the characteristics of the respondents, perform the data testing. Data testing is carried out as a condition for testing the hypothesis. The data test carried out is the validity and reliability test of the data. The validity test results show that each indicator has an R-value above the standard and a significance value > 0.05, which means the data is valid. Meanwhile, for the reliability test, the results indicated that the Cronbach's alpha value for each variable showed a number > 0.6, which means the data is reliable.

After testing the data with the results of the data being valid and reliable, it is possible to test the hypothesis. There are twelve hypotheses tested by the regression method. The results of hypothesis testing are as below:

- H1: System quality is suspected to have a significant effect on Intention to use. Hypothesis accepted because the p-value < 0.05 and with t_{value} = 11.708 ($t_{value} > t_{table}$)
- H2: System quality is suspected to have a significant effect on User satisfaction. Hypothesis accepted because the p-value < 0.05 with t_{value} = 14.445 ($t_{value} > t_{table}$)
- H3: Information quality is suspected to have a significant effect on Intention to use. Hypothesis accepted because the p-value < 0.05 with t_{value} = 9.050 ($t_{value} > t_{table}$)
- H4: Information quality is suspected to have a significant effect on User satisfaction. Hypothesis accepted because the p-value < 0.05 with t_{value} = 14.992 ($t_{value} > t_{table}$)
- H5: Service quality is suspected to have a significant effect on Intention to use. Hypothesis accepted because the p-value < 0.05 with t_{value} = 8.403 ($t_{value} > t_{table}$)
- H6: Service quality is suspected to have a significant effect on User satisfaction. Hypothesis accepted because the p-value < 0.05 with t_{value} = 16.916 ($t_{value} > t_{table}$)
- H7: Intention to use is suspected to have a significant effect on User satisfaction. Hypothesis accepted because the p-value < 0.05 with t_{value} = 8.951 ($t_{value} > t_{table}$)
- H8: User satisfaction is suspected to have a significant effect on Intention to use. Hypothesis accepted because the p-value < 0.05 with t_{value} = 8.951 ($t_{value} > t_{table}$)
- H9: Intention to Use is suspected to have a significant effect on Net benefits. Hypothesis accepted because the p-value < 0.05 with t_{value} = 8.613 ($t_{value} > t_{table}$)
- H10: User satisfaction is suspected to have a significant effect on net benefits. Hypothesis accepted because the p-value < 0.05 with t_{value} = 17.179 ($t_{value} > t_{table}$)
- H11: Net Benefits is suspected to have a significant effect on Intention to use. Hypothesis accepted because the p-value < 0.05 with t_{value} = 8.613 ($t_{value} > t_{table}$)
- H12: Net Benefits are suspected to have a significant effect on User satisfaction. Hypothesis accepted because the p-value < 0.05 with t_{value} = 17.179 ($t_{value} > t_{table}$)

Table 2 Hypothesis Testing Result

Hypothesis		*p*-Value	β	t	Results
H1	System Quality => Intention to Use	0.000	0.429	11.708	Accepted
H2	System Quality => User Satisfaction	0.000	0.478	14.445	Accepted
H3	Information Quality => Intention to Use	0.000	0.346	9.050	Accepted
H4	Information Quality => User Satisfaction	0.000	0.455	14.992	Accepted
H5	Service Quality => Intention to Use	0.000	0.342	8.403	Accepted
H6	Service Quality => User Satisfaction	0.000	0.493	16.916	Accepted
H7	Intention to Use => User Satisfaction	0.000	0.598	8.951	Accepted
H8	User Satisfaction => Intention to Use	0.000	0.587	8.951	Accepted
H9	Intention to Use => Net Benefits	0.000	0.716	8.613	Accepted
H10	User Satisfaction => Net Benefits	0.000	1.002	17.179	Accepted
H11	Net Benefits => Intention to Use	0.000	0.466	8.613	Accepted
H12	Net Benefits => User Satisfaction	0.000	0.665	17.179	Accepted

Twelve hypotheses have been tested with the results that all hypotheses are accepted. The discussion of the results of hypothesis testing is described in the explanation below:

- System quality, information quality, and service quality have a positive influence on usage intentions. It can be concluded that information, services, and systems have been implemented properly in the SRIKANDI system to raise usage intentions from users.
- System quality, information quality, and service quality have a positive influence on user satisfaction so that it can be concluded that the information, services, and systems that are run on the SRIKANDI system have satisfied users.
- SRIKANDI system users are satisfied and want to use the system because they benefit from using it. One of these benefits is that users can easily manage their internal research results in the SRIKANDI system.

- The previously mentioned findings imply that institutions should encourage users to use the SRIKANDI system by implementing it to realize the desired results, in this case, namely internal research management [12].
- Information systems are considered successful based on various stakeholders' benefits and continued use [13]. The hypothesis testing results prove that the SRIKANDI system has been successfully implemented, but every stakeholder must use the system to strengthen the result.

CONCLUSION AND FURTHER RESEARCH

SRIKANDI is an information system that manages research and service operated by LPPM UPN "Veteran" Yogyakarta. The DeLone & McLean IS Success Model was used to evaluate SRIKANDI. The results of the evaluation state that the SRIKANDI system has been successfully implemented with a measuring component of six variables from the DeLone & McLean model. The success of the implementation of SRIKANDI cannot be separated from the quality of information, service quality and the quality of the system that has been running well so that users of this information system can feel satisfied and want to continue to use it. SRIKANDI also provides benefits to user personnel so that users are confident enough to return to using it.

Further research is recommended for respondents to be able to explore supervisors and research reviewers because the users of SRIKANDI are not only researchers who submit research or service through SRIKANDI. The DeLone & McLean model is a good model for assessing the success of an information system, but it is recommended for future research to adopt a model to measure the success of other information systems and compare it with the DeLone & McLean model.

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