Analysis the Impact of Management Information System Usage on the Performance of Business Company Using DeLone And McLean Model

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Abstract— **Due to globalization, many business companies have implemented management information systems in an effort to improve the performance of the company in order to achieve high competitiveness. The effectiveness of the MIS impact to the business company performance. The DeLone-McLean method is used as a model to measure the success of MIS usage in improving the performance of a business company. The DeLone-McLane model has six criteria which helps to understand the impact of MIS on both individual and company performance. This study is focused on review of DeLone-McLean IS success updated model, determine MIS usage adequately supports company goals, and evaluate MIS users quality of information, system and services. Based on the analysis of the Delone-Mclean model for IS success, this study shows that the users of business company agree to the success of MIS implementation. Among all construct in this study, information quality and system quality support well and meet the user's need. The user satisfaction greatly impact to the net benefit or performance of business company. Thus, the DeLone-McLane model helps to understand the impact of MIS on both individual and company performance. The limitation of this study is the findings could be just spesific only to spesific business company.**

Keywords—Management Information System; Performance of Business Company; DeLone-McLeon Model

I. INTRODUCTION

During the growth of business competition environment, most business companies increase the effectiveness of business processes. To improve their competitiveness, most businesses implement the automated process of decision-making capabilities. Therefore, there is an increasing Management Information Systems (MIS) implemetation in various business firms. MIS are reported to be beneficial for the operations of the company, particularly the contribution of MIS in decision-making processes to ensure the achievement of company goals.

MIS is a subset of the internal processes control of a business covering the application of people, documents, technologies, and procedures by management solving business problems such as production, services, and a business strategies [1]. MIS is distinct from regular information systems which is a critical component of the risk management strategy in the business company. According to [1], MIS should be used to recognise, measure, monitor, limit, and manage risks which involves four elements such as staff and management, practices or policies, operational processes, and feedback devices.

The effectiveness of the MIS impact to the company performance depends upon many factors in a business company. Many researchers have been evaluated information system (IS) success factors at various stages [2]. The role of MIS is to manage the data, organizing, retrieving of the information which help the company to provide services faster, more accurate and timeliness information, propriate decision making which impact to the level of company performance. The failure of MIS implementation can be caused by lacking of training and appreciation to users, lack of administrative discipline of standarised and procedure, or the MIS does not give proper information to the users in the company. Lyytinen and Hirschheim in [3] stated that a system that is abandoned by the users is considered having an interaction failure. Therefore the MIS implementation should be evaluated by the company.

For the evaluation of the impact of MIS usage, this study used the DeLone-McLean information systems success updated model. Some researchers have been introduced several IS success models and DeLone–McLean model is the most prominent [3]. According to [4], DeLone-McLean model proposed after a comprehensive survey on the effective criteria for evaluating the information systems. This model had six criteria and one comprehensive evaluation model of information systems. The model focused on six major issues involved the whole system.

The aims of this study are (1) To review the DeLone-McLean information system success updated model (2003). (2) To determine whether MIS usage adequately supports

company goals. (3) To evaluate whether MIS provides users with quality of information, system, and services.

II. LITERATURE REVIEW

A. Management Information Systems

A Management Information System (MIS) is a set of computer hardware and software, gathered, organized, summarized, and reported information for use by managers, customers and other users [1]. MIS is a model of the components of an information system: computer hardware, software, data, procedures and people [4]. MIS is a system approach to management that aims to continuously improve company process and system. [4] define MIS as the development and use of information system that help businesses achieve their goals and objective. Robert in [1] stated the objectives of MIS as the provision of information to all levels management at the appropriate time, accuration level and an economical cost. The information is used to decision making process for taking appropriate action in overcoming the problems that arise. Thus the implementation of MIS is a key system that could improve performance in the business company.

B. The DeLone-McLean Model for IS Success

One of the measurement models of the success of information systems developed by many researchers [9,10,12] is the DeLone-McLean model. The DeLone and McLean model is further refined to Delone-Mclean model for IS success which implies that information quality, system quality and service quality will have a positive impact on the use and user satisfaction and will continue to have a positive impact on net benefits [5,12].
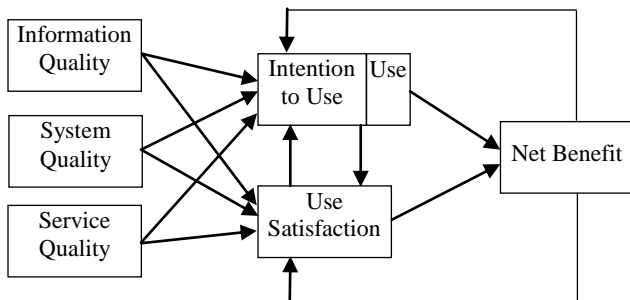

Fig. 1. The DeLone-McClean Model for Information System Success
Source: DeLone and McLean Model [5]

1. Information quality: Information quality is related to system output that is useful for business users. Information quality have measured by many researchers which have some dimension like timeliness, completeness, understandability, relevance, accuracy consistence, up to date, and usability. According to [4] information quality refers to the ability to acquire information that is sufficient, comprehensive in nature and fulfill end-user needs. There are six indicators of information quality as follows:

completeness, precision, reliability, data is always currency, and form of output [7].

2. System quality: System quality is an important factor for IS success. System quality means value, excellence, compliance with specification, and quality that meet customer expectations. The indicators used to in this study refer to [7] consist of six measurement scales of system quality as follows: system flexibility, system integration, response time, error recovery, convinience of access, and language.

3. Service quality: Service quality is an comparison between customer expectation with service received. This represents the quality of the support that users receive from the IS division. There are three components that interplay the quality of service in the company, namely the quality assurance of system, empathy from the system to the user, and the quality of the system response to the action by the user [5]

4. Intension to use/Use: - This represents the degree and manner in which this system is utilized by the user. For Example amount of use, frequency of use, nature of use, appropriateness of use, extent of use, and purpose of use

5. .Use: Use of information is closely related with recipient's consumption of the output of an information system [2]. [13] states that the success dimension use represents the degree and manner in which an IS is utilized by its users. Use is a very important factor in IS success. This measured in terms of amount of use, nature of use [11], appropriateness of use, extent of use, actual use [8], daily use time and frequency of use [7,13].

6. User Satisfaction: User satisfaction defined as the users response to the quality of the output of an information system [2]. User satisfaction related with user attitude [15,16], therefore, a studies which include user satisfaction should include user attitudes measurement [2]. According [17], user satisfaction can be measured indirectly through system quality, information quality, service quality, and other variables.

7. Net benefits: The effective use of information system result net benefits perceived by individuals, groups, or company performance. Business company performance means increased productivity and sales, cost reductions, improved profits, market efficiency, and enhanced decision-making. There are five items adapted from [3,18] i.e. speed of acomplishing task, job performance, effectiveness, ease of job, and usability in work.

C. Business Company Performanc

Performance is a formal effort undertaken by the company to evaluate the effectivity and efficiency of corporate activities that have been implemented for a certain period of time [19]. The company performance could be influenced by the implementation of MIS related to database management that will be used in enhancing company performance. The company performance is a description of the level of achievement of the implementation of both individual and team tasks within the company, in realizing

the target company within a certain period. In the present study it is assumed that the business company performance is a function of the individual and team performance that totally effect to the management performance

D. Previous Research

[20] study aimed to identify the impact of management information systems (MIS) on the performance of governmental organizations, case study at Jordanian Ministry of Planning. This research findings said that there is no impact of hardware and software equipment on the performance of governmental organizations, there is a significant impact of networks, individuals and procedures, and MIS as a whole on the performance of governmental organizations.

[21] study aimed to identify the impact of MIS to improve the efficiency and effectiveness of the Arab Bank from the perspective of both the staff and the Arab Bank management and dealing with customers. This research findings said that users of MIS have a level technicians, highly skilled, qualifications and experience to enable them to perform their work, and that an appropriate degree of information provided by the systems used very high and reflected thus on the effectiveness of decision-making that are meant to take.

[22] study indicated that measures of organizational traits, individual traits, information quality, system or service quality, industry traits and tasks performed using the system impact perceived performance of the marketing organization mediated individual performance impact, attitudes toward using the system, and system use.

E. Research Hypotheses and Testing

There are nine hypotheses in this research that shown in Figure 2. Hypothesis H1 and H2 assume that information quality is positively associated with use of MIS and user satisfaction. Hypothesis H3 and H4 assume that system quality is positively associated with use and user satisfaction. H5 and H6 assume that service quality is positively associated with use and user satisfaction. Hypothesis H7 and H8 assume that use variable is positively associated with user satisfaction and net benefit or. The last but not least, Hypothesis H9 assumes that use satisfaction is positively associated with net benefit or company impact.
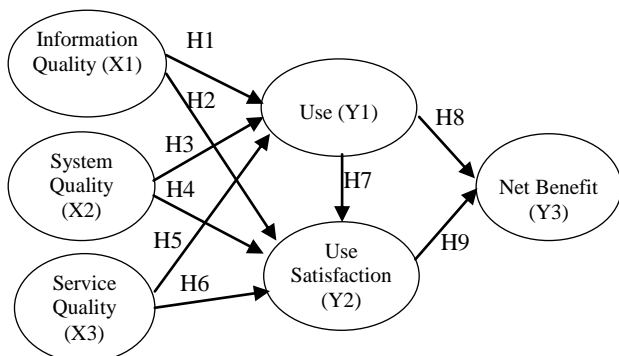

Fig. 2. Measuring Model and Hypotheses

H1: There is a positive and significant relationship between information quality with use variable.

H2: There is a positive and significant relationship between information quality with user satisfaction variable.

H3: There is a positive and significant relationship between system quality and use variable.

H4: There is a positive and significant relationship between system quality with user satisfaction variable.

H5: There is a positive and significant relationship between service quality variables with use variable.

H6: There is a positive and significant relationship between service quality and user satisfaction variable.

H7: There is a positive and significant relationship between use variable with user satisfaction

H8: There is a positive and significant relationship between use variable with net benefits.

H9: There is a positive and significant relationship between user satisfaction with net benefits variable.

III. RESEARCH METHODOLOGY

A. The Field Study

The population of this study is the employee of the business company that have worked more than 1 year. The total population in this study is 514. In the course of this study, the stages of the analysis will be compiled questionnaires, questionnaire distribution, validity and reliability analysis, and Structural Equation Modelling (SEM) analysis. Here is the analysis phase in more detail. Samples taken for this research use Stratified Random Sampling technique to know the number of samples in each division in the business company. Equation (1) is used to determine the sample of the respondents in this study.

$$n = \frac{N}{1+Ne^2} \quad n = \frac{514}{1+514*0,05^2} = 224,95$$

(1)

Data collection, based on questionnaires, was conducted during January-March 2017.

B. Measurement of the Variables

The questionnaire was based on standard measures and the questions being translated into Indonesian. Information quality was measured using five indicators adopted from [7]: completeness, precision, reability, currency, and format of output. Similarly, system quality adopted six indicators from [7]: system flexibility, system integration, time to respond, eror recovery, convinience of access, and language. Service quality was measured using three indicators adopted from [5]: assurance, empathy, and responsiveness. Use was measured using four indicators adopted from [10]: amount of use, nature of use [10] and [7,14]: daily used time and

frequency of use. User satisfaction was measured using two indicators adopted from [5]: repeat purchases and repeat visits. Net benefit as a performance of the business company was measured using five indicator adopted from [3]: speed of acomplishing task, job performance, effectiveness, ease of job, and usefullness in work

C. Research Instrument

In the course of this study, the primary instrument used for the collection of data is the questionnaire. In order to reduce the possibility of questionnaire getting lost in transit and return, the questionnaire was distributed direct to the respondences. A total of 250 questionnaire were distributed to employees in nine divisions in the business company in order to evaluate the impact of MIS usage on the performance of the company. There are 235 questionnaire were returned out of which 225 was found to be valid and useful for this study. Thus, the questionnaire has represented 90.00% then it is reliable.

IV. RESEARCH FINDING AND ANALYSIS

A. Data Analysis

SEM analysis will be tested using SPSS 22 and AMOS software. Before performing SEM analysis testing, firstly tested statistic that is assumption test of linearity, normality, outlier, and goodness of fit. Validity testing is conducted to test the validity of the questionnaire used using SPSS 22 which indicates that all tested instruments are valid. The reliability testing using SPSS 22 using Cronbach's Alpha method repeatedly states that the reliability of the data questionnaire. Index of the goodness of fit to determine whether the conceptual models developed base on the theory have been fully supported by facts. Thus this study obtains that the Delone-Mcleon models is the appropriate models to explain the relationship the success of MIS usage to the company performance.

TABLE I.   THE RESULT OF PATH COEFFICIENT TESTING

Variable	Coef.	C.R	P	Result
X1→Y1	0.57	3.62	0.00	Significant
X2→Y1	-0.36	-2.56	0.01	Significant
X3→Y1	0.24	2.30	0.00	Significant
X1→Y2	0.50	3.98	0.00	Significant
X2→Y2	0.24	2.28	0.02	Significant
X3→Y2	0.10	1.22	0.22	Not significant
Y1→Y2	0.21	3.33	0.00	Significant
Y1→Y3	0.07	1.02	0.31	Not significant
Y2→Y3	0.98	10.08	0.00	Significant

Hypothesis testing using causality testing is to know the accuracy of variable and reciprocal relationship between variables in the model. Table 1 is the results of path coefficient testing. It shows each value of the junction coefficient and the probability value obtained from the coefficient column and probability (P). For path coefficient with the probability value < α (0,05) hence relation between variable is significant, whereas if probability value > α (0,05) hence relation between variable is not significant.

Table 1 shows that service quality variables (X3) on customer satisfaction (Y1) and use variables (Y1) on net benefits (Y3) are not significant. Whereas information quality (X1), system quality (X2), and service quality (X3) on the use variable are significant. Furthermore, information quality (X1) and system quality (X2) on user satisfaction are significant but service quality (X3) on user satisfaction is not significant. The variable of use (Y1) has significant relationship to user satisfaction (Y2) but Y1 has not significant relationship to net benefit (Y3). And the last but not least, user satisfaction (Y2) has significant relationship to net benefit or company performance (Y3).

The hypothesized relationships among the study variables depicted in Figure 2 were tested by the Structural Equation Modelling (SEM) method, which is particularly well suited for predictive applications and theory building [23]. Two important dimensions of construct validity are (a) convergent validity, including reliability, and (b) discriminant validity. Together, the structural and measurement models form a network of constructs and measures. The item weights and loadings indicate the strengths of the measures, while the estimated path coefficients indicate the strengths and signs of the theoretical relationships. Validity test is conducted to test the validity of the questionnaire using SPSS 22 indicates that all tested instruments are valid. Reliability test using SPSS 22 software using Cronbach's Alpha method repeatedly from the results obtained states that the questionnaire used in this study is valid.

B. Results and Discussion

The hypotheses base on the DeLone-McLean model for IS success as shows on Figure 3 is described as follows.
The variable of information quality (X1) has a positive impact on user satisfaction variable (Y2) of 0.50. This means that the higher the information quality then the higher user satisfaction. The variable of information quality (X1) has positive impact on the use variable (Y1) of 0.57. This means that the higher the value of the information quality then the higher the use of users.

Variable of system quality (X2) have negative impact to usage variable (Y1) equal to -0,36, which means the higher system quality then the lower of use of users. The variable of system quality (X2) has a positive impact on user satisfaction variable (Y2) of 0.24, which means that the higher system quality then the higher user satisfaction.

Variable of service quality (X3) have positive impact to use variable (Y1) equal to 0,25. This means that the higher service quality then use of users. Service quality variable (X3) does not impact user satisfaction variable (Y2), so that the change of service quality variable will not impact user satisfaction.
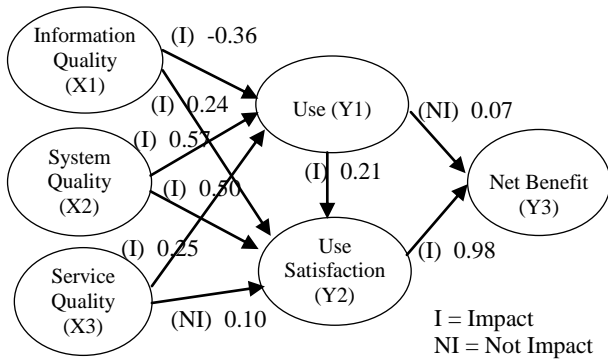
Fig. 3. The Result of Data Processing of DeLone-McLane Model

Variable of use (Y1) has a positive impact on user satisfaction variable (Y2) of 0.21. This means that the higher the use, the higher the user satisfaction variable (Y2). The use variable has no impact on net benefit variable (Y3), so that changes in use variable values (Y1) will not impact the value of net benefit variables (Y3).

The variable of user satisfaction (Y2) has a positive impact on the net benefit variable (Y3) of 0.98. This means that the higher the user satisfaction then the higher the net benefit.

The findings in this study shows that the user satisfaction (Y2) has the greatest influence on the net benefit (Y3) with a value of 0.983. Meanwhile the variables that makes the MIS usage has not been successful is on the service quality (X3). The problems that are still obstacles include the lack of clarity of the menus in the MIS application, the lack of online discussion facilities, and the frequent server down that hampers the process of data when important information is required from the MIS process.

C. Conclusions

In the course of this study shows that MIS is successful about system quality, information quality, and service quality based on the analysis result. The factors that greatly impact the success of MIS usage is user satisfaction, then the factor that greatly impact the user satisfaction is information quality. This means that MIS provides useful information for users that generate users satisfaction to MIS. Farther, the users satisfaction increase the net benefits of MIS. It means users satisfaction on MIS usage impact to the individual and company performance. The management should organize training or prove the menu instructions in the MIS applications. Besides that management should develop online discussion facilities and improve server performance to reduce server downtime to facilitate data processing in order to users can obtain important information needed. Based on the analysis of the Delone-Mclean model for IS success, the questionnaire data from 225 respondents shows that the users of business company agree to the success of MIS implementation. Among all construct in this study, information quality and system

quality support well and meet the user's need. The DeLone-McLane model helps to understand the impact of MIS on both individual and company performance.

The present study has its limitations. Since the results are only based on a field study of one mandatory management information system in one specific business company. The findings could be just spesific only to its business company. Empirical testing of the DeLone-McLean model for IS success should therefore be extended to cover a wider variety of other systems.

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