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The Analysis of Academic Information System Success: A Case Study at Instituto Profissional De Canossa (IPDC) Dili Timor-Leste

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***Abstract*—The development of information technology and modern communication era gets more progress. Therefore, every college institution or university is obligated to use the academic information system to process the academic data and to ease the user of academic administration activity as well as the students. The problem to be discussed is about how to find out the level of success of academic information system towards the users' intention at IPDC Dili Timor-Leste. The purpose of the research was to test the level of quality based on three variables; system quality, information quality, and service quality towards the intention of academic information system's users at IPDC Dili Timor-Leste, using DeLone & McLean model. A structured questionnnaire was distributed to the user of academic information system at IPDC, collected 106 valid questionnaires. The tools used were SPSS and AMOS. The result of the research was showed in *Structural* model from the hypotheses having significance towards the users' intention. The result of this study is recommended or suggested to the manager of IPDC to be used as the consideration from the analysis result with the information technology being adopted from DeLone & McLean Success Information model towards the users' intention.**

Keywords—Success of information system; academic information system; D&M IS success model

I. INTRODUCTION

Extension of college educational institutions is an important factor. Especially in the field of education, the application of information technology in education with academic information system is now applied to every college [1]. Supporting the operational process and meet the needs of college by using information technology will provide benefits for academic learning process in terms of effective productivity and efficiency in the college system [2]. Private and public college educations need to know the level of quality of each system to support the process of academic information systems with to be more innovative and well structured [1].

Therefore, this study was to analyze the impact of user intention on academic information systems, with successful information technology, with the interests of technology which can provide more effective and accurate information [2][3]. The use of information technology systems can be made as one main component to improve the quality of the academic system as a strategy to achieve the goal of competitive advantage in educational colleges [4][5].

Thus the achievement of the academic process of the academic system can also be involved from all relevant aspects of integration, with students, lecturers, administrative and financial staff, and support officers from the students to become the most accurate output of the system [6].

From this study, the Instituto Profissional de Canossa (IPDC) of Dili Timor-Leste has used an academic information system known as (SIA). SIA can be implemented to facilitate the academic civitas on the administration, to obtain so-well -structured learning process data well. The objective of the study was to test the success of the academic information system (SIA) on the users' intention, at Instituto Profissional de Canossa Dili Timor-Leste based on approach model of DeLone & McLean which is Information System Success Model [7]. Benefits that can be obtained from this research is to determine the success rate of academic information system by achieving knowledge and insight from the success of information systems [2]. The contribution of this research is using Informatin Systen Success (ISS) as the theoretical basis to test the factor of system quality, quality information, and service quality towards the intention of academic information system (SIA) user of Instituto Profissional de Canossa Dili Timor-Leste according to expectation and perception [3].

Based on the research adopted from DeLone and McLean model (2003) the focus was on the level of information system. This model usually is the dependence of six variables information system success measurement, such as System Quality, Information Quality, Service Quality, Intention to Use, Use Satisfaction and Net Benefit [7][4].

A. Academic Information System

Academic information system (SIA) is a set of kinds of data managed automatically with certain tools and methods. To facilitate academic data processing efficiently and effectively, information as a source of an organization is to provide academic information to users [5]. The success of

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the academic system is to determine the level of satisfaction with the users' intention of the academic system, with the development of academic technology and business communication [6]. In connection with theory, as well as the academic information system Instituto Profissional de Canossa (IPDC) Dili Timor-Leste is a medium of information and communication for the management of each stakeholder and academic activities as well as social works, and access from the public to know better with the circumstances of the academic system level.

B. Information System DeLone & McLean Success

The development of modern-day information technology has caused much influence on every organization, ensuring that investments in information systems (IS) is a success [8]. The success of the information system (IS) with keen's from the opinion of information systems evaluation, "effectiveness" or "success" is the interest of every field in practical research, to determine out of the success of IS by increasing it [9][4].

The DeLone and McLean model is a method of IS success in measuring information systems or important effectiveness to our understanding of accurate assessment and management action of information systems [10]. In the theoretical study of the success models of DeLone and McLean IS success systems, the results of previous research contributions were connected to the TAM model (1992). DeLone and McLean with practical research proposed the latest model (2003) based on literature review [4].

The models tested for the level of success are information quality, system quality, service quality, user intention, user satisfaction and net of organizational benefits, as important dimension [2]. This context can be combined to the individual towards the user's intention and impact of the organization to one dimension with net of benefits. To expand it, the impact of this information system can be grouped depending on each context [4][11][12], illustrated in the Fig. 1.

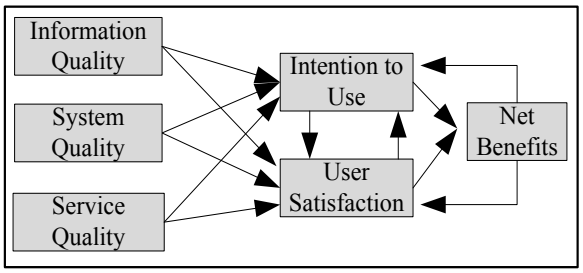


Figure 1. DeLone and McLean Model (2003)

Those six elements of factors or components in DeLone and McLean measuring model are:

- System quality is said to measure the characteristics of information system used for system reliability, access speed, system flexibility and security [13].
- Information quality measures the output quality from the information system. The information quality produced must be relevant, complete and easy to understand [11].
- Service quality initially was the support of quality system to be received from information system as the proponent of information technology as it is responsive, accurate and reliable in technical competition and empathy of information technology personnel staff [10].
- Users' intention includes the whole information systems as well as the interaction through navigation system, and connected to information system applied [13].
- User satisfaction involves finding information about the input of the system, information and service. Net Benefits is the combination of individual impact

II. LITERATURE REVIEW

The research is connected to previous studies as the comparison and review sources, like in Table I. The result of the research is used as the basic reference from the discussed topic.

TABLE I. PREVIOUS RESEARCH AND OBJECTIVE OF THE RESEARCH

Research	Objective
S. Singh and R. Aggarwal (2014)	To measure the ability level of personnel based on recruited performance to the level of managerial hierarchy using three attributes (AHP, DEA, DEA-AHP) [14].
S. Mohammed, A. Souares, J. L. Bermejo, R. Sauerborn, and H. Dong (2014)	This study is to assess the interest of scheme implementation of health insurance resource optimally and to analyze the factor influencing each scale; payment mechanism, benefit package, administrative efficiency and active monitoring mechanism [15].
I. Aouadni and A. Rebai (2016)	To ease the educational institutions by evaluation the satisfaction of personnel performance using the method of multi-criteria satisfaction analysis (MUSA) to obtain the performance quality with good solution from the combination of MUSA and genetic algorithm to ensure the efficiency level of MUSA [16].
H. Elkadi (2013)	To identify the main factors influencing the success and failure of the project which can recommend the action that needs to be avoided from the failure [17].
M. A. Anwer, V. Esichaikul, M. Rehman, and M. Anjum (2016)	The analysis of Afghanistan's e-government service status with the evaluation criteria to be identified based on the satisfaction of the citizen from e-government service using the evaluation model in quantitative data result supported from qualitative analysis [18].

The previous studies still have connection with the discussed topic. Therefore, the discussion of the researcher focused on the academic information system (SIA) towards the users' intention in Instituto Profissional de Canossa Dili Timor-Leste using DeLone and McLean ISS model [19].

III. METHODOLOGY

A. Research Subject

The core of this research is the users of academic information systems (SIA) at Instituto Proffissional de Canossa Dili Timor-Leste, using questionnaires distributed to the respondents. This sampling activity was held in January until February 2017. The questionnaires were distributed by researchers directly or offline. A total of 122 questionnaires were distributed and collected, with this response rate of 100%. Some invalid questionnaires are 16 (13,1%), valid ones were 106 out of the effective response rate (86,9%.).

B. Design of Research Scheme

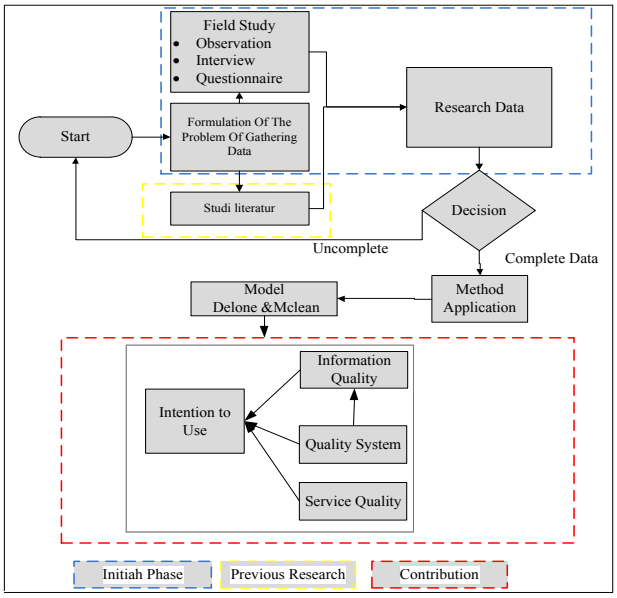


Figure 2. Design of Research Scheme

C. Research Model

The model of this research consists of several parts in Fig. 2. The first is a field study to collect all the information contained in the academic information system (SIA), as well as to analyze the problems of the academic system and literature studies that are relevant to the academic information system. So it is adapted to the success model of information systems using DeLone and McLean model (2003) developed by Suryanto [19]. Similarly, this model is supported by Likert whose scale turns into four points, such as; "Less", "sufficient", "good", "excellent", relating to each other's points [20].

D. Research Structure

In accordance with the objectives, this study can be presented with library study whose structure is illustrated in Fig. 3. For the Information System Success (ISS) knows the success rate of information quality, system quality, and service quality to the of intention of academic information system (SIA) users in Instituto Profissional de Canossa Dili Timor-Leste [19].

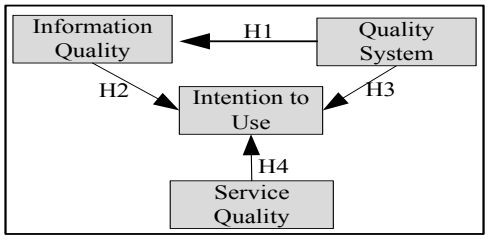


Figure 3. Research Structure

E. Hypothesis Model

With the existing reference, the research used the proposed ISS of the DeLone and McLean models as a theoretical basis [12]. This research was conducted from three factors in forming input intention to use system like information quality, system quality, and service quality. These three factors are one of the important factors to measure the success of the quality of academic information system (SIA) in Instituto Profissional de Canossa (IPDC) Dili Timor-Leste. A study found that the quality of information systems is a factor that supports the increase of quality level of information as an important influence in determining the availability to reuse the system, by giving satisfaction to the user's intentions [11]. The process of determining the information quality is to use the level of service quality of the system, towards the user's intention. Thus, this study will propose two problems as follows: the system quality has an influence on the quality of information to be able to support the information quality factor significantly that will influence the intention of the academic information system user (SIA) in Instituto Profissional de Canossa Dili Timor- Leste [19][21].

F. Data Analysis

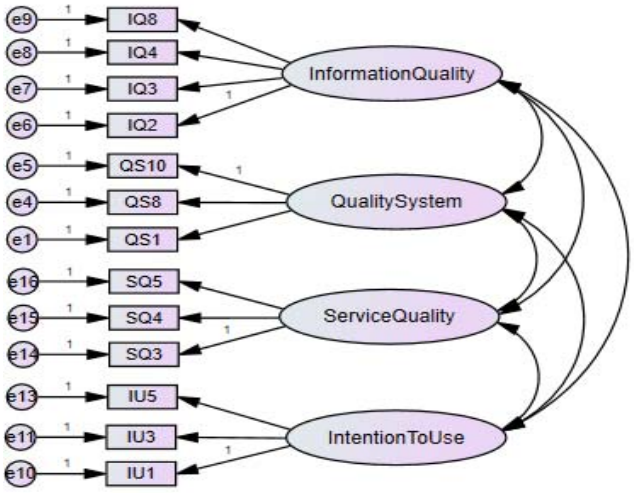
Tools used in research were SPSS 19 and AMOS 16.0 software with Windows 10 for data analysis needs. This statistical method can be adopted in the study conducted as shown in Fig. 3.

Using descriptive statistic as a result of data analysis supported the description of academic information systems, with data collected from users, to create demographic distribution results in Instituto Profissional de Canossa (IPDC) colleges that respond from users to this study. With the path of data analysis used to deliver results, it is related to the importance of relationships that influence the quality of information significantly and the effect of system quality, with the importance of the impact of significant service quality on user intentions to use Academic information system in Instituto Profissional de Canossa Dili Timor-Leste.

IV. RESULTS

Based on the study, this research used descriptive statistics as the analysis of the basic information distribution of sample measurements with valid effective data from 106 respondents. 106 respondents had 51 (48,1 %) men and 55 (51,9%) women. This study showed that most of the correspondents were from Instituto Profissional de Canossa

students in Dili Timor-Leste. With the number of respondents, at least the difference from the sexes made the comparison of men and women still remained the same based on student achievement from semester 1 to the end of the semester. Thus, from Instituto Profissional de Canossa Academic information system users of Dili Timor-Leste, competition can be applied in the hope that productive user levels are increasing. With the educational background of the Instituto Profissioal de Canossa (IPDC) Dili Timor-Leste, the total number of academic information systems was 22 and lecturers with different educational backgrounds were from 12 (54,54%) scholars, 8 (36,36%) masters and 2 (9,1%) doctors at Instituto Profissional de Canosa Dili Timor-Leste.



Note: the above data was analyzed by the writer in the paper.

Figure 4. Structure of the Confirmatory Factor Analysis

A. Convergent Validity Testing

With this study, the research can be done with Confirmatory Factor Analysis (CFA) in Fig. 4. It aims to test the validity, which contains convergent validity and discriminant validity. The validity of a convergent measures whether any of the validly proven item or instrument of validity can reflect the answer to each factor with the same concept. While discriminant validity measures two different statistical factors. Table II lists standardized estimate, with extracted average variance (AVE), composite reliability (CR). As shown in Table II, most of each standarized estimate item is greater than 0.7 which meets the determined standard [22]. Moreover, Gefen et al. [23] suggests that CR and AVE value are more than 0.7 and 0.5. Every CR and AVE value go through the blockage from 0.7 and 0.5. Thus, the scale can support well on the convergent validity.

B. Discriminant Validity Testing

This discriminant validity test is performed by comparing the root square of AVE and the factor correlation coefficients. Discriminant validity result was calculated using the Stats Tools Package developed by Gaskin [24]. In Table III, each square root factor of AVE is more significant than the correlation coefficient of each other factor, which indicates good discriminant validity.

TABLE II. STANDARDIZED ESTIMATES, CR AND AVE

Lat.Variable	Obs. Variable	Standardized Estimates	CR	AVE
Information Quality	IQ8	0.68	0.873	0.633
	IQ4	0.87		
	IQ3	0.84		
	IQ2	0.78		
Quality System	QS10	0.95	0.876	0.704
	QS8	0.76		
	QS1	0.79		
Service Quality	SQ5	0.67	0.871	0.695
	SQ4	0.89		
	SQ3	0.92		
Intention to Use	IU5	0.85	0.864	0.681
	IU3	0.71		
	IU1	0.90		

Note: the above data was analyzed by the writer in the paper.

TABLE III. THE SQUARE ROOT OF AVE AND FACTOR CORRELATION COEFFICIENTS

	Intention to Use	Quality System	Information Quality	Service Quality
IU	**0.825**			
QS	0.769	**0.839**		
IQ	0.769	0.710	**0.796**	
SQ	0.818	0.743	0.788	**0.834**

Note: the above data was analyzed by the writer in the paper.

C. Model Analysis Structure

This research study used six indices to measure the overall model matching. The Chi-Square ratio ($\chi 2/df$), RMSEA was for quantifying the root mean square error results from the approach, GFI was to conform to the goodness of the fit index, AGFI was to match the goodness of the fit index, CFI was for comparison according to Index, and PCFI was for the comparability and suitability of the expected index.

As shown in Table IV, The chi square ratio shows a good fit model, not exceeding the recommended maximum value [25]. Furthermore, MacCallum [26] reveals that to achieve a good fit model the RMSEA value is recommended to be no more than 0.08. In this research, 0,075 of RMSEA showed good fit. Other fit indications, GFI and AGFI were 0.90 and 0.85, respectively, exceeding the recommended value of 0.8, indicating a good fit model [27]. While CFI and NFI were greater than 0.9, corresponding to Bentler et al [28], indicated good fit. This study showing that CFI 0.96 and NFI 0.911, it indicated good fit. Thus, the overall model was acceptable.

TABLE IV. MODEL FIT INDICES

Fit Indices	Recommended Value	Actual Value	Model fit
χ2/df	≤ 3	1.589	Good
RMSEA	≤ 0.08	0.075	Good
GFI	≥ 0.8	0.900	Good
AGFI	≥ 0.8	0.850	Good
CFI	≥ 0.9	0.960	Good
NFI	≥ 0.9	0.911	Good

Note: the above data was analyzed by the writer in the paper.

D. Testing Result From Hypothesis Research

The result of SEM analysis can be seen in Table V and Fig. 5 shows relationship level among variables. The results of the structural model in Fig. 5 show that, except H3 is not supported, other than that, the hypothesis is significantly supported. As, in the first hypothesis H1 (β = 0.763, t-value = 7.462 ***) there is a supported relationship between system quality and information quality. The second hypothesis of H2 (β = 0.251, t-value = 2.092 **) can be seen from the quality of the information directly which may affect and support the intention of the user. The third hypothesis H3 (β = 0.485 t-value = 1.382 **) shows where the quality of the system is not supported to the intention of the user but from the hypothesis of four H4 (β = 0.233, t-value = 3.700 ***), the quality of service is significantly supported to the intention of users to reuse it. Furthermore, the results of Fig. 5 indicate that the quality of the system is able to explain the information quality of 58%. Then from system quality, information quality and service quality together explain the variance of 76% of the variance of user intention.

TABLE V. HYPOTHESES RESULT

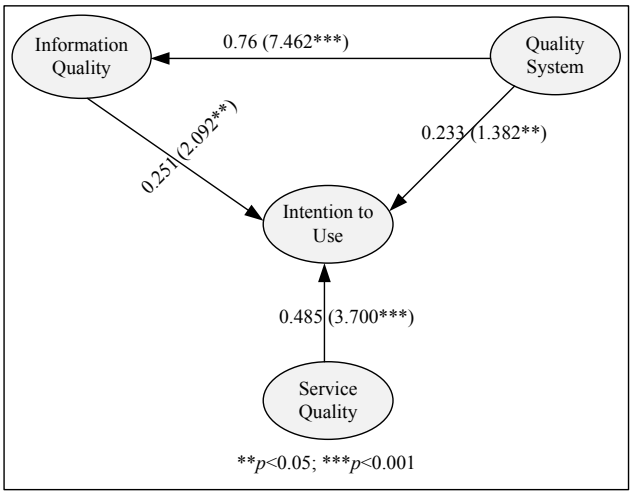
	Path	(β)	*t*-value	Remarks
H1	Quality System → Information Quality	0.763	7.462***	Supported
H2	Information Quality → Intention to Use	0.251	2.092**	Supported
H3	Quality System → Intention to Use	0.485	1.382**	Not Supported
H4	Service Quality → Intention to Use	0.233	3.700***	Supported

***p*<0.05; ****p*<0.001

Note: the above data was analyzed by the writer in the paper.

V. DISCUSSION AND CONCLUSIONS

Based on the results, this research can be used with Information System Success (ISS) as the basic theory, with the aim to correct the test results from three dimensional models such as; Information quality, system quality and service quality to the user's intention. The three independent variables serve to explain the intentions of the users of the academic information system (SIA) of Dili Timor-Leste. Model results of this study can be seen in Fig. 3 and Fig. 5.



Note: the above data was analyzed by the writer in the paper.

Figure 5. Struktural Equation Model

The results of this study show that the system quality significantly influences the information quality. This result is consistent with prior study by Suryanto [19]. The information quality significantly influences the users' intentions of academic information systems. These results are consistent with similar studies [19][29][30]. However, the result of this study rejects H3 hypothesis, system quality has no significant influence on intention to use. It is in contrary to previous studies [19][29][31].

Furthermore, the results of this study confirm that service quality significantly influences the user's intentions. Consistent with previous research by Qutaishat [30], service quality has a significant influence on user intention. This result, however, contradicts Suryanto et al [19] and Cho et al [29], saying that the service quality is insignificant to the users' intentions of information systems. The possibility in this case occurs because the display features and navigation information system is less understood user intentions when using the system.

Based on measurements using the D&M IS Success Model, the results support most of the hypotheses. Information Quality and Service Quality has an important role in predicting the intention to use SIA. Most respondents believe that using an SIA will improve their efficiency at work. To achieve SIA efficiency, organizations must provide complete and reliable information and support services for systems. In addition to achieving good system quality, organizations need to provide speed and ease of access for users. With easy and fast access it will support good information quality.

The final result of the D&M IS success model in Fig. 5 is that the model only discusses the system quality, information quality and service quality towards the users' intentions of academic information systems. It is therefore recommended that in the future, with further research it is necessary to develop models based on some researchers [13][29][31] with these models being more complex than the results of this study.

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