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The Effect of Academic Information Systems and Library Information Systems upon Quality Information Systems and Student Trust as an Intervening Variable

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Abstract: The purpose of this study is to examine and analyze empirically the influence of Academic information system, Library information system, and student trust, upon the quality of information system. Respondents in this study were students at private university in Bogor, Indonesia. The analysis used in this study using path analysis model, which is a method that uses exogenous and endogenous variables. The finding of this study sub-structural one that there is a direct influence and positive significant between academic information system on students and library information system. Meanwhile, the sub-structural two found that there is direct influence and positive significant between academic information system on the quality of information system and library information system to the quality of information system, as well as the indirect effect positive academic information system by considering students trust to the quality of information system, and as well as the indirect effect positive library information system by considering the students trust to the quality of information system.

Keywords: Academic Information Systems (AIS), Library Information Systems (LIS), Student Trust (ST), Quality Information Systems (QIS)

1. Introduction

Information technology is growing very rapidly in Indonesia and in the world. This technology is increasingly to communicate, access the internet, and get information in realtime. This also affects the development of information systems to various forms of business, both to service companies, trade and manufacturing, and others. It was found that the intention to use such services is high, in particular relative to services providing information based on localization and the personal schedule and interests of the student by Asif and Krogstie [1]. Information systems will be successful if supported by several supporting factors, such as user participation [13, 10].

Anyone who understand the information it will win the competition in the world of business. The Rapid development in the field of information technology requires all business organizations and competing to win business competition. One way for business organizations to compete with their competitors is a master the information system that supports the organization wheel, only few business organizations spend a lot of money for investment in information technology. Information technology is the fourth resource after the human resources, resources, resources and machine resources that managers use to establish and operate the company [7]. Speed of access was the most important feature of electronic information that would encourage its use over print sources, with 87 per cent of all respondents citing this as being very important to them in determining their use of electronic resources. This feature was closely followed by the ability to access information from the desktop - 84 per cent rated this as important - followed by 24/7 access facility, and the search and browse facilities provided by electronic resources - 57 per cent rated both of these later features as

very important [3].

Various types of information systems used by public and private universities sometimes can't be satisfy by users, students, lecturers, and other communities. Linkage with this information system of students becomes the main focus in the use of information systems that exist in the college. Based on the background of the problem, then the research problem can be formulated as follows: (1) is there any influence of academic information system on student's trust?, (2) is there any in academic towards student's trust?, (3) to test, analyze, and prove empirically the influence of library information systems on student trust, (4) to test, analyze, and prove empirically the influence of academic information systems on the quality of information systems, (5) to test, analyze, and prove empirically the influence of library information systems on the quality of information systems, (6) to test, analyze, and empirically prove the influence of students' trust on the quality of information systems, (7) to test, analyze, and prove empirically the influence of academic information system through students' trust on the quality of information systems, and (8) to test, analyze, and prove empirically the influence of academic information system through students' trust on the quality of information systems.

2. Literature Review

2.1. Quality, Academic, Library Information System and Student Trust

The term quality has been defined in many ways. Researcher Joyce Rowe from Virginia State University and Ralp Neal from Virginia Commonwealth earned various definitions from nine experts. One of the experts is: James Martin, a renowned computer consultant, who describes software quality as timely, within budget, and meets the needs of users of data processing mechanisms [2]. Academic Information System is a place for academicians, especially students and lecturers to access various academic data that can be done from anywhere and anytime, except scheduled services. Accessing data in the form of updating/updating biodata and filling/improving KRS and viewing various academic data such as KHS, Transcript, course test score, KRS filling schedule and course, academic requirements and calendars, and various academic information/ notifications. Management of academic administration. Library Information System (LIS) is a subsystem integrated with university information system to provide information related to libraries to support the operation of higher education, management, and decision making in the Library as well as at the college level.

The results of previous research is related to the research variables the basic model used in this research is a model developed by Gardiner, et al. [3]. The most important uses of information resources by academics in all disciplines in this study were to collect information for research (37 per cent cited this as most important), followed by accessing texts (30 per cent). CIS academics also tended to use them to keep up-to-date with their subject area 29 per cent cited this as the most important use of information collected. Digital libraries are conventional and important information sources and the primary cause of using digital libraries is just for the purpose of seeking information. Information seeking which was defined as the purposive seeking for information as a consequence of a need to satisfy some goal, seems to be difficult given the existence of information overload for users who generally have limited information processing capability [14, 6].

University libraries incessantly endeavor to offer better and more useful services to meet users' dynamic needs using the modern technologies [9, 8]. Whilst marketing techniques and methods are used in academic libraries worldwide, the spread of marketing in Greek academic libraries proved to be limited. Basic operational problems were identified as the main barrier to greater uptake. Nevertheless, the majority of Greek academic librarians realize the importance of marketing, but they still have a long way to go in terms of understanding and adopting marketing concepts in their provision of services [4]. As in American and UK academic libraries, technology will continue to change library services and required skills in Jamaica [5]. However, it is interesting to note that only 40 percent contend that technology continues to drive much of the futuristic thinking in their library, raising questions as to what else drives their futuristic thinking. Also, libraries will be monitoring the success of open source integrated library systems software. However, while social networking tools can help libraries go where their users are, some academic librarians see challenges in determining which tools to use, how much resources to devote to them and how to assess their effectiveness.

Revealed that gap analysis show user expectation on all attributes of the system quality, information quality, service quality dimensions is still bigger when compared to the performances and there is a variety of gap, which means the performance quality of academic information system in UPI with three quality dimensions have yet to fulfil user expectation standard [12]. Logically although the information system or technology is implemented in accordance with the characteristics of the task needs but if it is not fully utilized by the user then the performance is also not rust based on the characteristics of technology and individual performance in new information systems technology applied and used by users of the system.

Hypothesis is a temporary answer to the formulation of research problems that have been previously described, said temporarily because the answer given new based on relevant theory and not based on the facts obtained through data collection [11]. The hypothesis proposed in this study as follows:

H1: Academic information system and library information system have an effect on the quality of information systems.

H2: Academic information system and library information system have an effect on the quality of information systems through student trust.

2.2. Logical Framework

Based on the explanation of the theory of each of the variables used above, reflected the structure of the framework that describes the two sub-structures, namely the sub-structure of one px3, x1 & px3, x2 and sub-structure of two py, x1, py, x2 & py, x3 when Described research framework can be described as follows.

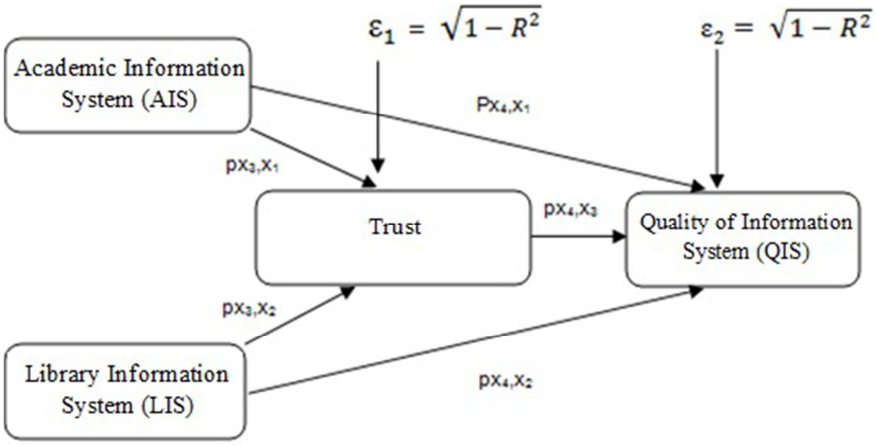

Figure 1. *Logical Framework.*

3. Research Methodology

Types of Research can be grouped by field, goal, method, level of explanation and time. Based on the type of research as mentioned above, the authors describe this type of research as follows. According to the purpose: this research includes applied research, on the quality of information systems, in three private universities, namely STIE Binaniaga, STIKOM Binaniaga, and AMIK Bogor. According to the method: Data obtained from a specific place. According to the level of expectation: This research is an associative research to the aim. According to the time: this research is conducted by cross sectional or empirical in which data and information are collected directly.

3.1. Objects, Populations, and Sample Research

This research was conducted in STIE Binaniaga, STIKOM Binaniaga, and AMIK Bogor. As respondents of the study were students who were recorded as students at STIE Binaniaga, STIKOM Binaniaga, and AMIK Bogor as many as 1,051 students as population, consisting of 589 students from STIE Binaniaga, 411 students from STIKOM Binaniaga, and 51 students from AMIK Bogor. Determination of the number of samples determined from the population is set by 70 respondents/students, due to time constraints, with details of 35 STIE Binaniaga, 25 STIKOM Binaniaga, and 10 AMIK Bogor.

3.2. Data Research and Data Collection

Furthermore, in this research data collection techniques are considered appropriate so that obtained complete data, objective, valid and reliable data collection techniques through a survey by using questionnaires. Operationalization and Measurement of research is anything in the form of what is determined by the researchers to be studied so that obtained information about it then drawn conclusions. The research variable is an attribute of a group of objects studied and shows a meaning that can distinguish between something with other. Measurement of research variables is done using dimensions and indicators of each variable described in the statement items presented in the questionnaire. Each respondent's answer is given a score with a likert scale of 1 - 5. Gradation of each answer for academic information system variable (5 = very satisfied, 4 = satisfied, 3 = satisfied enough, 2 = dissatisfied, and 1 = very dissatisfied), information system Libraries (5 = 5 = very satisfied, 4 = satisfied, 3 = reasonably satisfied, 2 = dissatisfied, and 1 = highly unsatisfied), student confidence (5 = strongly believed, 4 = trust, 3 = quite confident, 2 = Distrust, and 1 = very unbelieving), and the quality of the system Information (5 = very satisfied, 4 = satisfied, 3 = quite satisfied, 2 = not satisfied, and 1 = very dissatisfied).

3.3. Data Analysis

Data analysis of this research has applied path analysis refers to Statistical Product and Service Solutions ver.20. The path analysis equation for the Student Trust and Quality Information System are as follows:

$$\begin{cases} X_3 = \beta_1 X_1 + \beta_2 X_2 + \varepsilon_1 \\ or \\ ST = \beta_1 AIS + \beta_2 LIS + \varepsilon_1 \end{cases} \quad (1)$$

$$\begin{cases} X_4 = \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon_2 \\ or \\ QIS = \beta_1 AIS + \beta_2 LIS + \beta_3 AT + \varepsilon_2 \end{cases} \quad (2)$$

Where:

X_1 or AIS = Academic Information Systems
X_2 or LIS = Library Information Systems
X_3 or ST = Student Trust
X_4 or QIS = Quality Information System

4. Result

4.1. Descriptive Statistic

Based on 70 students who made the respondents to fill out the complete research questionnaire obtained the following results. (1) variable academic information systems (X1) obtained range (range) of 2; The lowest value (min) of 3; The highest value (max) of 5; Total sum (sum) of 301; The median value is 4; The value that often appears (mode) is 4; Average (mean) of 4.30 with standard deviation of 0.645; The level of data dissemination (variance) of 0.416; The skewness value of -0.374 and the peak size of the data distribution (kurtosis) of -0.668. (2) variable library information system (X2) obtained range (range) of 3; The lowest value (min) of 2; Median value of 4; The value that often appears (mode) of 4; The highest value (max) of 5; Total sum (sum) of 259; Average (mean) of 3.70 with standard deviation (standard deviation) of 0.729; The level of data distribution (variance) of 0,532; Value skewness of the data (skewness) of 0.305 and the peak size of the data distribution (kurtosis) of 0.305. (3) variable student trust (X3) obtained range (range) of 2; The lowest value (min) of 3; Median value of 4; The value that often appears (mode) of 3; The highest value (max) of 5; Total sum (sum) of 267; Average (mean) of 3.81 with standard deviation of 0.767; The level of data dissemination (variance) of 0.588; The skewness value of the data (skewness) of 0.333 and the peak size of the data distribution (kurtosis) of -1.216. (4) variable quality of information system (X4) obtained range (range) of 2; The lowest value (min) of 3; Median value of 4; The value that often appears (mode) of 4; The highest value (max) of 5; Total sum (sum) of 256; Average (mean) of 3.66 with standard deviation of 0.587; The level of data distribution (variance) of 0.345; The skewness value of the data (skewness) of 0.241 and the peak size of the data distribution (kurtosis) of -0.637.

4.2. Regression Test with Path Analysis Method

Based on the test results between the academic information system, library information system, the students' trust obtained results as equation: ST = 0.345AIS + 0,526LIS + ε1. Results of processing by using SPSS 20 and student trust as dependent variable (endogenous), then we get the multiple linear regression equation above which shows that: (1) the value of regression coefficient for academic information system variables showed a positive value of 0.345 and 0.000 significance means that if the academic information system increased by 0.345, then the level of student confidence will also increase by 0.345. (2) the value of regression coefficient for library information system variables shows a positive value of 0.526 and its significance 0.000 means that if the library information system increased 0.526, it will increase student confidence of 0.526. (3) based on the result of regression coefficient value, the most influential factor to the students trust is the Library Information System (LIS). The result of coefficients influence of academic information systems, liabrary systems to student shown on the Table 1 below:

Table 1. *Equation of Model Regression One.*

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.007	.498		.014	.989
	Academic Information System (AIS)	.410	.107	.345	3.817	.000
	Library Information System (LIS)	.553	.095	.526	5.824	.000

a. Dependent Variable: Student Trust (ST)

It is shown by the value of the largest regression coefficient when compared with other variables, which amounted to 0.526 with significance of 0.000 <0.05. Testing Hypotheses one based on hypothesis test result by using SPSS 20, to test hypothesis one got result are: (1) it proved that the value of t value 3.817 with a significance value of 0.000 <0.05, which means that the test rejected Ho and accept Ha, meaning that academic information system positive effect on student trust, that is if academic information system increases it will increase students trust, otherwise if the academic information system is less good then it will decrease the student trust. (2) it proved that the value of t value 5,824 with a significance value of 0.000 <0.05, which means that the test rejected Ho and accept Ha, meaning that the library information system positive effect on student trust, if the library information system improved better then will increase students trust, on the other hand if the library information system is not good then it will decrease the students trust.

Based on test result between academic information system, library information system, student trust, to the quality of information system obtained result the equation as: QIS = 0.144AIS + 0.197LIS + 0.692ST + ε_2. Results of processing using SPSS 20 and the quality of information systems as dependent variable (endogenous), then obtained the multiple linear regression equation above which indicates that: (1) the value of regression coefficient for academic information system variable showed a positive value, that is equal to 0,144 and its significance 0,018 mean that if academic information system increased by 0,144, hence level of quality of information system will also increase equal to 0,144. (2) the value of regression coefficient for library information system variables showed a positive value, that is 0.197 and significance 0.004 means that if the library information system decreased 0.197, it will improve the quality of information systems of 0.197. (3) the value of regression

coefficient for student confidence variables showed a positive value of 0.692 and significance 0.000 means that if the confidence of students increased 0.692, it will improve the quality of information systems of 0.692. Based on the results of regression coefficient value, the most influential factor on the quality of information systems is student trust. It is shown by the value of the largest regression coefficient when compared with other variables, that is equal to 0.692 with significance of 0.000 <0.05. (4) the results of hypothesis testing using SPSS 20, to test the hypothesis two are: (a) it proved that the value of t value 2,431 with a significance value of 0.018 <0.05, which means that the test rejected Ho and accept Ha, meaning that academic information system positively affect the quality of information systems, that is if the academic information system improved better It will improve the quality of information systems, otherwise if the academic information system is less good then it will decease the quality of information systems. (b) it proved that the value of t value 2,974 with a significance value of 0.004 <0.05, which means that the test rejected Ho and accept Ha, meaning that the library information system positively affect the quality of information systems, that is if the library information system improved better It will improve the quality of information systems, otherwise if the library information system is less good it will degrade the quality of information systems. (c) it is proved that the value of t value 9.502 with a significance value of 0.000 <0.05, which means that the test rejects Ho and accept Ha, meaning that the student's trust positively affect the quality of information systems, if the student's confidence increases then will improve the quality Information systems, on the contrary if the student's trust decreases it will degrade the quality of information system. (d) it is evident that in the equation of model one standardized coefficients beta value for academic information system is 0,345 with significance value 0,000 <0,05 and value 0,345 represent path value or path px3, x1. The result of coefficients influence of academic information systems, liabrary systems to student shown on the Table 2 below:

Table 2. *Equation of Model Regression Two.*

Coefficients[a]						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	.485	.227		2.135	.036
	Academic Information System (AIS)	.131	.054	.144	2.431	.018
	Library Information System (LIS)	.158	.053	.197	2.974	.004
	Student Trust (ST)	.530	.056	.692	9.502	.000

a. Dependent Variable: Quality Information System (QIS)

Meanwhile, the standardized coefficients beta value in the equation of model two for the academic information system is 0.144 with the significance value of 0.018 and the value of 0.144 is the path or path value px4, x1, and the standardized coefficients beta value for the student's trust is 0.692 with the significance value 0.000 and the value 0.692 is Path or path value px4, x3. Based on the calculation, it can be concluded that academic information system has an effect on the quality of information system by considering student's trust, and the total influence is direct influence plus indirect influence, that is 0,144 + (0,345 X 0,692) = 0,144 + 0,239 = 0,383. (5) it is evident that in the equation model one standardized coefficients beta value for library information system is 0,526 with significance value 0,000 <0,05 and value 0,526 is path value or path px3, x2. Meanwhile, the standardized coefficients beta value in the equation of model two for library information system is 0.197 with value significance of 0.004 and value 0.197 is the path or path value px4, x2, and the standardized coefficients beta value for student's trust is 0.692 with a significance value of 0.000 and value 0.692 is the path or path value px4, x3. Based on the calculation, it can be concluded that the information system of the library has an effect on the quality of information system by considering the student's trust, and the total influence is direct influence plus the indirect influence, that is 0,197 + (0,526 X 0,692) = 0,197 + 0,364 = 0,561,5. Calculating the residual coefficients of one structure equation (ε1 and ε2 values) To find out the magnitude of ε1 and ε2 (variables outside the model) can be calculated using Adjusted R Square values for one and two structures can be seen in table 1 and table 2, Residual values ε1 and ε2.

Based on the percentage of information system quality can be explained by student trust, library information system and academic information system equal to Adjusted R Square value, that is 0,816. Calculation of the value of ε1 and ε2 (variables outside the model) can be calculated as follows: A. Residual one (ε1)

5. Discussion

The result of one structure test which has been done by using path analysis confirm that there is positive influence between academic information systems to student's trust. The results of this test explain 0.345 academic information system directly positive effect on student confidence. So also the results of testing the hypothesis of library information system to the students' trust shows the results of 0,526 library information system positively affect student confidence.

The result of testing that has been done to test the hypothesis of academic information system on the quality of information system by using path analysis confirm that there is positive influence between academic information system on information system quality equal to 0,144 the rest influenced by other variable outside model equal to 0,856 or

85,60%. Testing of library information system to quality of information system by using path analysis confirm that there is positive influence between information system of library to information system quality equal to 0,197 or 19,70% the rest influenced by other variable outside model equal to 0,803 or 80,30%.

The results of testing the students 'trust on the quality of information systems by using path analysis confirm that there is a positive influence between students' trust on the quality of information systems by 0.692 or 69.20% the rest influenced by other variables outside the model of 0.308 or 30.80%. The result of the test that has been done to test the hypothesis of academic information system by considering the students 'trust toward the quality of information system by using path analysis confirming that there is a positive influence between the academic information system by considering the students' trust on the quality of information system. The results show that the total effect is direct influence coupled with the indirect effect, ie 0.144 + (0.345 X 0.692) = 0.144 + 0.239 = 0.383. This means that 38.30% of academic information systems influence by considering the students' trust on the quality of the remaining information systems as much as influenced by other variables beyond the model of 61.70%.

The result of testing that has been done to test the hypothesis of library information system by considering the students' trust toward the quality of information system by using path analysis confirm that there is positive influence between library information system by considering the student's trust toward the quality of information system. The results show that the total effect is direct influence coupled with the indirect effect, ie 0.197 + (0.526 X 0.692) = 0.197 + 0.364 = 0.561. This means that 56.10% of library information systems influence by considering the students' trust on the quality of the remaining information systems influenced by other variables outside the model of 0.439 or 43.90%.

6. Conclusion

Based on the results of hypothesis testing using SPSS 20, it can be concluded as follows: (a) there is a positive and significant influence between the influence of academic information systems on student trusts, meaning the better academic information system, it will result in increased student confidence. (b) there is a positive and significant influence between the influences of library information systems on student trusts, meaning the better the library information system, it will result in increased student confidence. (c) there is a positive and significant influence between the influences of academic information systems on the quality of information systems, meaning the better academic information system, it will result in increased quality of information systems. (d) there is a positive and significant influence between the library information systems on the quality of information systems, meaning the better the library information system, it will result in increased quality of information systems. (e) there is a positive and significant influence between the students' trust on the quality of information systems, which means the higher the student's confidence, it will result in increased quality of information systems. (f) there is a positive and significant influence between the academic information systems by considering the students' trust in the quality of information systems, meaning the better the academic information system by considering the student's trust, it will result in increased quality of information systems. (g) there is a positive and significant influence between the library information systems by considering the students' trust on the quality of information systems, meaning the better information system library organization taking into account student trust, it will lead to increased quality of information systems.

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