Information Technology Governance in E-Learning Application System of A Higher Education in Indonesia

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Abstract. Current information technology is not a difficult thing to do in the organization, especially within the scope of higher education. Learning process that is higher education also been able to leverage information technology, such as e-learning system. However, it was not easy to manage a college e-learning system, since many factors that affect the implementation of the system. This is a paper of the exposure evaluation of a college to see how far the governance of information technology has been carried out optimally.

Keywords: Information, technology, e-learning, evaluation, governance

1. Introduction

The involvement of information and communication technology (ICT) in education is no longer considered as an option but has become an absolute necessity that should be owned and utilized by the college, if it is concerned to improve the quality of education. Not many universities in Indonesia that have implemented this technology, not only for the purposes of the administration of educational management, but as the main media in the organization of teaching and learning activities; research and development; and services to the community. Therefore, it talks about management colleges can not escape the discussion of ICT and the role of ICT in higher education. In principle, there are 3 (three) core process of education or core processes that occur in college, respectively [2]: (1) teaching; (2) research; (3) services.

Seen from the perspective of management science, the third process is a core of products and services or products and services offered by the institution to its customers. College in order to effectively conduct all three processes, it needs to be supported by a number of supporting activities related to such things : academic administration; finance and accounting; human resources; campus infrastructure; and so forth.

One of the derivatives activities of teaching, which is related to the learning process. Currently teaching and learning process can be supported by information technology utilization, support is important because it can provide improved learning interactions, in particular the transfer of knowledge from teacher to learner. However, the condition of higher education in general in Indonesia are still not able to contribute optimally in the application of information technology because of various problems that arise in the internal environment of higher education concerned. Recognize the purpose and process problems and categories of activities in this college to assist management in allocating its resources, in order to support the vision and mission that have been implemented.

2. Information Technology In Higher Education

There are various types of concept of using ICT, which directly and indirectly impact the way of education that leads to improved quality, the following general grouping can be done by the college in its activities, namely [3] : (1) media simulation; (2) course management; (3) virtual class; (4) computer based training; (5) cyber community.

Based on the above grouping it would need a good governance in using information technology. Governance or so called corporate governance is a condition in running a system becomes more efficient and effective. As in, J. Wolfensohn, President of World Bank [8], "Corporate Governance is about promoting corporate fairness, transparency and accountability" from the definition, it can be concluded that the demands of transparency, accountability : accountability; clarity; and the like is a requirement of the community in nature of democracy, both for organizations and private property and more for state owned organizations. Because college is an entity that requires good management and public interest concerns, should also be properly for accounted.

Governance guidelines or audit referred to in this study, namely to provide a simple structure to audit and assess control, based on audit practices generally accepted in accordance with the scheme and COBIT. This audit guidelines provide instructions for setting up an audit plan that is integrated with COBIT framework. Purpose of governance (audit) are to : (1) provide reasonable assurance to management in which the control objectives are integrated; (2) give advice on the management for corrective action.

The most important thing in the audit of the use of information technology in higher education in Indonesia, the existing information technology environment of each university to support the objective of creating transparency for the realization of one of the basic principles of Good Corporate Governance. Any sophisticated technology that is applied if it does not support the goals of the organization's vision and mission will be in vain. Conversely, if it turns out the technology used tend to be "left behind" but was able to support the goals of the organization's vision and mission of the organization can be said to have been successful in the application of information technology.

Based on the above understanding, it is necessary standardization that can be used as a guide for the internal assessment of information technology in higher education in Indonesia, one in Information Systems Department at Widyatama University. The methodology or model that can be considered to be applied in the context of this evaluation is a model of IT Governance issued by ISACA (Information Systems Audit and Control Association). Model of IT Governance issued by ISACA COBIT framework is used.

3. Learning Strategies

Basically, the use of information technology in organizations, including universities can be divided into four phase, namely : (1) phase 1: As a Data Provider; (2) phase 2 : As an Information Provider; (3) phase 3 : As the Knowledge Provider; (4) phase 4 : As a Provider Policy. In phase 1 and 2, the decision is still mostly done by men, whereas in phase 3 and 4, the decision has been taken over by more machines. The following figure shows the phasing the following examples of its use in practice. In other words the use of existing information technology and the phasing and the hierarchy level of technology use that can be measured [7].

Measure that can be used for this purpose is the Capability Maturity Level of Information Systems Audit Model. Maturity Model is one of the products Governance, Control and Audit for Information and Related Technology (COBIT) developed by the IT Governance Institute an institution founded by the Information Systems Audit and Control Association (ISACA). Any individual or organization will have a pattern of maturation of its e-literacy in each of the utilization of information technology, including higher education as an entity in the service provider to students and lecturers. If can use the conceptual framework or theory Personal Capability Maturity Model (P-CMM) [9].

COBIT Maturity Model for maturity level is set as the profile of IT processes that can be understood by the Enterprise of the present and future conditions to be achieved. COBIT maturity model instead of threshold models, COBIT maturity level will not increase if the terms and conditions in the lower level is filled first. COBIT maturity model is used to examine exactly a level has been reached, but is intended as a reference to the relevant conditions of some level of maturity [4]. Maturity model for each COBIT process, is used to identify : (1) the actual performance of the Enterprise – Enterprise Today Where ?; (2) current status of the industry –The Comparison ?; (3) Target increase in Enterprise –Where Enteprise wants to be ?; (4) Growth path is needed – from a state of "as-is" to the "to-be".

Maturity Model is a method to measure the level of management development process, which means the capability to measure the extent to which such management. How good is the development or management capability depends on the achievement of the objectives of COBIT. For example, there is some critical processes and systems that require security management, which is more stringent than the process and other systems that are not so critical. On the other hand, the degree of control required and satisfaction, to be applied in a process is driven on Enterprise appetite for risk, and compliance requirements that apply.

4. Identification of Problem

One of the main focus for the analysis based on the Capability Maturity Model is information technology governance, which is related to the learning process using e-learning system that existed at a university in Indonesia. Therefore, very important set of instructional design of efficient and effective utilization of information technology within the framework. Instructional design is to organize the design of learning activities that will be a community, especially at universities need to be adjusted to the proper management of available resources. According to Dadang Supriatna and Mochamad Mulyadi [1] "... instructional design is the practice of the preparation of media and communication technologies to help fill that knowledge transfer can take place effectively between lecturers and students. This process contains the determination of the initial status of student understanding; formulation of learning objectives, and designing a 'treatment' based media to help the transition." Currently participants are learning (students) also become commonplace in the use of information technology, as described by Neil Howe, et al. and Lenhart, et al., ie according to Neil Howe and William Strauss [6], "shows the character of today's college students are interested in group activities; interested in new technologies; born after 1982; spend more time to homework than watching TV". While Lenhart, Simon, and Graziano [5], pointed out that "today's youth are : 94% use the internet to research school; 78% believe the Internet helps school work; 41% use email and instant messaging to communicate with teachers and friends about school work; the Internet is the main communication tool". This means that the challenges and opportunities of higher education is very great in accelerating knowledge transfer students in the learning process, one way to utilize information technology, namely e-Learning.

4.1. Analysis

Related analysis of the survey to be conducted, it is necessary to determine the list of needs analysis, which COBIT combines with some of the principles, known as the model : (1) quality; (2)Fiduciary; (3) security. Based on the 3 (three) model COBIT, there are 7 (seven) categories are interlinked with each other in meeting the information needs of the organization. COBIT workbased on the definition as follows : Effectiveness; Efficient: Confidentiality; Integrity; Availability; Fulfillment; Reliability; Information. Some of these categories are used as a model to analyze the survey results will be done.

The scheme of assessment of Information System Department at Widyatama University which will be analyzed as follows : Taking together that, Information System Department has been done the application of e-learning system over a span of 2 (two) years, so it needs to evaluate the extent to which application of management success can be measured, particularly with the fulfillment of the infrastructure and application development (e-learning system). However, very different from the preparation of human resources; preparation materials; and policies, which is lacking in support to the use of information technology. As reference material to assess how far the level of maturity ofthe evaluation conducted in technologies to manage information consistently can be seen in the following table.

Tab.I. The Maturity Value Process Maturity Model Based On Infomration Technology

Parameter	Description	Value
Ignore	Non-existant	0 − 0.50
Aware	Initial/Ad-Hoc	0.51 − 1.50
Plan	Repeatable But Intuitive	1.51 − 2.50
Established	Defined Process	2.51 − 3.50
Measure	Managed and Measurable	3.51 − 4.50
Optimizing	Optimized	4.51 − 5.00

4.2. Mapping Surveys

Understanding of learning for students. Channel this explanation, may include; descriptions of story can be linked to specific addresses; to explain in more detail; or in the form of interesting things that can motivate users of e-learning to follow it. In conclusion, the material in the form of text should be designed with various links or steps that provide more detailed understanding. Analogy, if students are not forced into a particular link, then the student will not understand the intent of the lecturer concerned.

These will be mapped survey results of the analysis of each object, to see how far the internal conditions in the management of information technology is consistently on the Information System Department. To map the object of the survey is based on the categories related to the topic of the interview, which consisted of several questions for each category of questions. The summary of the relevant assessment area covered Information System Department in managing e-learning system, which during the last 2 years this has been done. Here's the scope of questions that do :

1) Topics of discussion include infrastructure, the ability of e-learning system that is currently running, the availability of e-learning working paper; condition requiring the implementation of e-learning.
2) Topics include discussion about software, software that is easy to apply type; the system can run up to the moment; have the manual book, have a monitoring and evaluation system; support system administrator.
3) Topics of discussion include human resources, the ability of teachers to use ICT; know how to run an e-learning systems; follow the activities of e-learning workshop; have an electronic teaching materials; student involvement.
4) Preparation materials include discussion, the ability to make use of electronic teaching materials; difficulties in using e-learning.
5) Policy includes a clear instruction on the use of e-learning, or lead to the target to run it. Here's the interview that produces fulfillment index for each group category of questions, as shown in the table.

The survey was conducted by assessing four areas related objects e-learning system : (1) involves the lecturer to be consulted about efforts to use information technology; (2) view the role of faculty, students during the running of e-learning system; (3) assess the extent to which e-learning systems are developed in accordance with the requirements; (4) assess policies related to the leadership of the instructions for using information technology, especially e-learning system. Here's the interview that produces fulfillment index for each group category of questions, as shown in the table.

Tab.II. Implementation of Compliance Index E-Learning System in Information System Department
(Information Technology Audit Results)

Number	Category Question	Number of question	Compliance Index (CMM)
1	Infrastructure (supporting means)	6 type	2,5
2	Software (e-learning system)	5 type	5
3	Human Resources (initiatives)	7 type	2,14
4	Preparation of material	6 type	1,25
5	Policy (Institutional Order)	5 type	0

Note : CMM range 0 - 5

4.3. Evaluation

1) Regarding infrastructure have been available and supported by the climate on campus including students, and has prepared training for students and lecturers. However, there are many lecturer who do not care about the infrastructure, because infrastructure is less well optimized information technology (IT) and was limited to ad-hoc only.
2) On aspects of the development of e-learning system, Information System Department is supported because it has been prepared in a planned, including monitoring and evaluation.
3) Human resources are the most important thing to depart from the arrangement of information technology. Because of the ability of knowledge and skills in information technology owned by thelecturer, it can be planned activities related to the flow of information technology utilization. It is, lecturer still do not care / understand and have not made a plan, to implement the process of learning to use e-learning optimally.
4) Preparation of the material is still lacking when it is associated with the use of information technology, there are still many teachers who need to be directed to use information technology. Need a more serious effort to plan it.

5) Policy (instruction institutions), the role of institutions is crucial in moving the policy in order to utilize information technology. In this study there has been no instruction from the institution to take advantage of information technology, because it has not been reflected in a culture that is still the conventional learning process, so it should be made in the form of institutional policy.

Thoroughly if total value obtained by the Studies Information System Department is in the stage of managing e-learning systems that drift in the fulfillment of the index, which is **2.18**, if the reconciliation of the pattern of mean maturity level is at the planning level.

4.4. Recommendation

Based on the results of the evaluation was done with a level of maturity is in the planning, it is important to be able to further increase the role of institutional policy, to be able to participate in motivating faculty to take advantage of information technology. Furthermore, this will be a challenge for teachers to begin to prepare the optimal use of information technology. The other recommendations that need to be addressed :

1) There needs to be a pilot and socialization continuously on each lecturer, on the introduction of the type of infrastructure that can facilitate the process of completing the work, gradually and continuously at high education environment.
2) The need for organized planning and procurement in identifying an optimal use of infrastructure, with the thought of integrated programs.

5. Conclusions

Conclusions in this research, Application of information technology in higher education is not easy. This was shown by the results of the maturity model of the total evaluation of the infrastructure, human resources materials preparation of teaching materials, and policies, the average is still below the index 3 of the scale of 0-5 according to the scale of COBIT. There are several aspects that are hindrances to grow the development of information systems, among others :

1) Ownership of the importance of data and information has not been embedded in each of the leadership
2) The absence of policy support from party leaders about the direction of the utilization of information technology management firm, which resulted in lack of readiness to utilize information technology manager of information technology in an optimal
3) The process of changing the working culture of information technology is still not optimal, there is still resistance to change and lack of desire to try the technology faculty of information.
4) Scarcity of human resources in managing information technology
5) IT management is still largely done on an ad-hoc and not supported by standard procedures are accompanied by authority and clear responsibilities.

Therefore, the implementation strategy of information technology in higher education must begin to be considered from the planning phase, and coupled with the support of top management as an important factor to accelerate and ease the application of information technology.

6. References

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Some of the publications issued one year later, namely : 1) the title "Design Application Search Location on a building with Utilizing Geographic Information System (Case studies on buildings of Widyatama University)" held in October, 2011 with the theme "2011 World Congress on Engineering and Technology (ICET), October, 2011, Shanghai China; 2) the title "The development of learning process with using e-learning templates at universities", which was held in April, 2011 with the theme, "Improving business competitiveness through an integrated system", International seminars, Bandung, Indonesia; 3) the title "Optimizing the Implementation of E-Learning Strategies in Higher Education", which was held in April, 2012, IJEEEE, at Bangkok, Thailand.

Currently a lecturer in information systems courses, and is steeped study of e-learning, a position as head of information systems department. Recent awards achieved, was instrumental in the development of "empowerment model / optimization – internet service center (PLIK) in Indonesia" and "understanding the development of ICT in small medium micro enterprises (SMEs) in the City Bandung