TO GOVERN E-LEARNING SYSTEM: A PROPOSAL TO DEAL WITH REGULATION COMPLIANCE, INSTITUTION OBJECTIVE, AND USER NEED

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Abstract- Many studies and experiences shows the e-learning system provides various advantages and huge benefits to who can operate this system properly. But to get the optimum advantage and benefits, there are a lot of obstacles have to be overcome. Inherent in the system, e-learning also bring many risks come from its environment or embedded in the system. Although many studies have proposed the method or approach to tackle those obstacles and risks, but it's still limited study in handling those problems from IT Governance view. The study proposes the frameworks to govern e-learning system. By the IT Governance view, the implementation of an e - learning system is assured to be aligned with institutions goal and strategy, use and manage resources efficiently, provide expected value to the organization, manage its risk, and its performance can be measured. This study is conducted in one of private university in Indonesia as the case study.

Keywords- E-learning; IT-Governance; Regulation Compliance; Strategic Alignment; COBIT 5;

I. INTRODUCTION

In this knowledge era, it has been proven that an e - learning system is become the potential solution to overcome many obstacles in higher education educational process. The proper e-learning system operation solves the problem of physical infrastructure limitations, time and place constraints, and -for some big cities case-, the traffic problem. Not only as the problem solving, e-learning is also as an enabler for higher education to achieve many advantages such as: the opportunity for information to be presented in various forms (text, audio, video, images, etc.), the flexibility medium in which the learning material will be stored in, e-learning offer lower cost to both students and implementers, e-learning has a big potential to absorb the increasing number of students [1]. Implementation of e-learning also reduces the environmental impact through lower paper and energy consumption and provide higher retention [2]

As a product of the technology growth, inherence with the benefit we can get from e-learning, there are many challenges and risks. Many studies regarding the e-learning challenges and risks have been published. Nurul Islam et.al as presented in [3] summarized those challenges in five categories: learning style and cultures, pedagogical e-learning, technology training, and time management. The more technical challenges to implement e-learning also presented in [4] such as: inability to afford computers, internet connectivity, energy problem, and limited expertise. Meanwhile, some risks embedded in the e-learning such as: the reduction of social and cultural interaction, the learner may feel isolated and unsupported in the case when instructors are not always available[2]. The other risks are: security and authority issues.

Although many challenges have been assessed and various approaches and solutions have been proposed to address those challenges, there are still obstacles that have not been concerned. One of the obstacles is the regulatory compliance. In many cases the utilization of the fast growth technology, government regulation late to anticipate its impacts. Some protests and demonstrations held related Uber taxi operation in some countries, for example, shows the delay of government regulation anticipation. More and less situations also happen in the e-learning implementation. Especially in Indonesia, e-learning operation and its reporting has to follow the regulation which actually designed and applied to face-to-face (conventional) learning.

By definition, e-learning refers to the use of ICT (Information Communication Technology) to enhance and support the learning process [4]. As the ICT project, the implementation of an e - learning system in higher education institution has to be governed to assure that the operation of e-learning system: align with institutions goal and strategy, use and manage resources efficiently, provide expected value of the organization, manage its risk, and its performance can be measured[5]. Based on various studies, there are plenty ICT projects that fail to deliver the expected value. There are many reasons why the ICT Project fails, one of the most significant reasons is poor in project planning[5], [6]. Furthermore, ISACA survey shows that many enterprises still unsuccessful to demonstrate concrete, measurable business value from their IT-enabled investments. IT G is the mechanism to address this situation[7].

This paper presents the proposal to govern the e-learning system implementation in higher education, with the study case is The Higher Education

Institution in Indonesia. In this case the governance is crucial since e-learning system has to accommodate with many interest such as: government regulation, institution goal and strategy, and user (instructors, students) needs. We adapt the COBIT IT Governance framework in proposing the governance [8], [9].

II. RELATED STUDY

A. E-Learning

Due its big potential opportunities compared to face-to-face –conventional- learning, e-learning has attracted many researchers and practitioners to do research or practical implementation on this field. Inherent with its fast growth, there are also many challenge, problem and also risk appear. There are many research publications regarding the potentiality, opportunity, challenges and risks of e-learning. Some of the related studies are described in this section.

One of the early study related to e-learning challenges is presented in paper [10]. In the study, the author summarizes the e-learning implementation challenges which faced by the instructor of the National Research University. Their finding shows that there are various challenges ranging from pedagogical, personal and technology have to be faced by the instructors, with the majority of those instructors stated the time management (personal challenges) is the biggest barriers. The specific technical aspect challenges such as: laboratory computer problem, the limitation capabilities of networking infrastructure, and unavailability of the manual guide are also found in The Jordan University when they implement Moodle LMS platform as presented in [11]. The recent study which explores the literature review regarding the challenges of e-learning is presented in [3] which describes the five categories of e-learning challenges and the suggestion for a successful e-learning outcome. Of those five categories, there are none of them includes the regulatory compliance and constraints. The impact, problem, and success story regarding the implementation of e-learning in some developing countries has also been studied and reported as presented in [12]. The report presents that in the developing countries, there are still lots of technical problems such as: internet or telecommunications, electricity powers, and computer hardware.

B. IT-Governance

Currently Information Technology has become a critical backbone of any organization, including the higher education intuitions. But there are so many IT Projects fail because the lack of planning and organizing [6], [13], [14]. Effective IT-Governance is the most significant factors to avoid the failures. Many surveys related to the practicing of IT Governance in certain organization confirm that the effective IT Governance will provide many benefits to the organization. Based on their survey [15], IT Governance Institute (ITGI) summarize those beneficial such as: integrate business with IT, improve risk management, increase visibility of IT the boards, reduce the cost and increase customer satisfactions. IT Governance has also been implemented in many higher education institutions for many interest and purposes [16]–[18].

IT Governance by definition is a framework that supports the management of all information resources (human resources, costs, and infrastructure) in order to achieve the organization's objectives effectively and efficiently. Two major concerns of ITG are: how IT can provide sufficient value to the business and how the risks that exist and arise from the existence of IT can be managed[5], [19]. In line with the awareness of organization board and top management level in their IT operation values, the need for IT Governance implementation increases day by day. The IT Governance implementation is complex, multi dimension and wide coverage area. Fortunately, there are many standard and frameworks of IT Governance based on industry best practice. Some of them are: COBIT, ITIL, ASL, ISO38500 [5].

The majority of those e-learning studies presented in the previous subsection do not include the governance challenges in their study, especially in handling regulation compliance constraint, institution goal and strategy, and user needs as well in a single place. This study covers this lack by using COBIT as the IT Governance frameworks. The COBIT is selected since the university as the case study has already familiar with this framework as presented in [16], [20]

III. METHOD & TOOLS

The study is conducted based on COBIT 5 frameworks for the governance and management of Enterprise IT. The frameworks cover a very wide span of Governance of Enterprise IT (GEIT) which enables IT to be governed and managed in a holistic approach, taking in full end to end business and IT responsibility, considering the IT-related interests of external and internal organization. Of 5 COBIT 5 principles- 1. Meeting stakeholders needs, 2. Covering the enterprise end to end, 3. Applying a single integrated framework, 4. Enabling holistic approach, and 5. Separating governance from management [9]- the e-learning system governance study presents the first principle only due the space limitation.

To fulfill the first principle (meeting stakeholder needs) COBIT 5 provide COBIT 5 Goal Cascade as a step by step mechanism to translate the stakeholder needs into specific, actionable and customized enterprise goals, IT-related goals, and enabler goals.

COBIT Goals Cascade is depicted in fig. 1. For each of those steps, COBIT 5 defines generic goals and mapping template. The 17 generics enterprise goals is developed based on Balance Score Card (BSC) perspective and they represent a list of commonly used goals that an enterprise may define for itself. COBIT 5 also defines the 17 IT-related goals which also in BSC perspective as well. The mapping table templates are used to map Enterprise Goal – IT Related Goal and IT-related Goal – Enabler Goal.

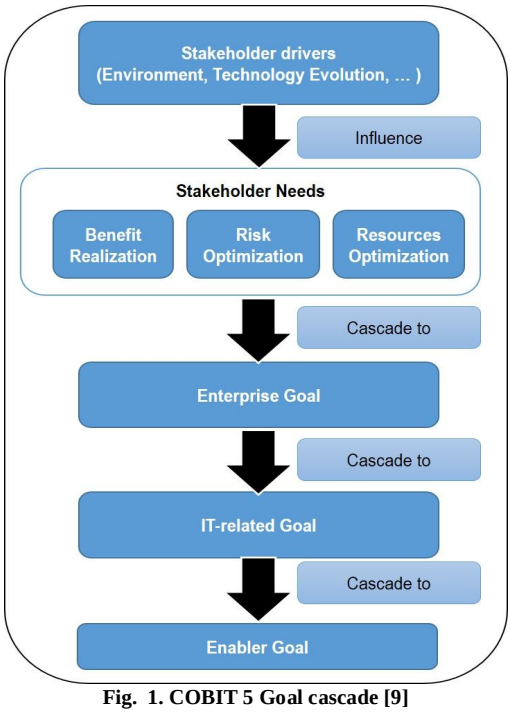

Fig. 1. COBIT 5 Goal cascade [9]

IV. GOVERNANCE PROPOSAL

A. Environment Scanning & Analisys

This activity is performed to give the understanding related the background, purposes, objective of e-learning system and also the environment in which e-learning will be operated.

1) University of Mercu Buana

The e-learning system governance program is proposed for University of Mercu Buana, a private university situated in Jakarta, Indonesia (www.mercubuana.ac.id). The university maintains 4 separated location campuses, serves six faculties which consist of one degree, 17 bachelor degrees, 7 postgraduate degrees, one special program and one doctoral program. Currently, the education processes serve more than 30 thousand students from all degree, and all of those educational services are served by around one thousand lectures and around 650 education staffs. As a private higher education institution in Indonesia, the university has its own autonomy in financial management, but the academic process has to follow the government regulation. The specific regulation related educational process has to be followed by university is that periodically the university has to submit reports of its educational process and results to ministry of research and higher education. One of the reporting contents is the detail presence of each student in the physical learning class.

University academic processes are supported by an integrated information system from admission, enrollment, to graduation. The university also has operated e-learning system based on Moodle, in planning to perform a cooperation with Really-English (http://www.reallyenglish.com/) in e-learning based English teaching. The planning, organizing and operating of information system and technology is managed by the university IT Directorate. Beside to serve the core university activities in education and researches, the information technology is also used to support the other various general purposes such: finance, human resources, and communication – collaboration as well. In serving of all of IT services, the management, operation, and support are handled by two subdivisions. The first subdivision is the center of information system development whose main responsibility is to develop and operational support of system, application, and the second one is the center of network and internet infrastructure whose the main responsibilities are any support related to network infrastructure, hardware and internet connection.

2) SWOT Analysis

We use the SWOT Analysis model to evaluate and formulate the university strategy regarding e-learning system. The summarization of the SWOT analysis is presented in the table 1 and table 2. Table 1 describes the strategy taken to utilize the university strength and to minimize the weaknesses impacts, while in the table 2 is presented the strategy to optimize opportunities benefits in facing the threats.

	Weaknesses
	1. It is hard to change the face-to-face teaching model into e-learning model, mainly for new instructors and new students 2. The majority of the instructor / lecture is illiterate of e-learning technology 3. The non-physical presence activities based on e-learning model as adapted by Moodle or ReallyEnglish doesn't comply with government regulation which requires periodic report of student physical presence in each predefined course week. 4. Un-integrated system (academic system and Moodle e-learning system) led to the lecturers have to do double entry, make the most of the lectures are reluctant to e-learning base courses
Strengths	**Strategies Proposed: Utilize Strengths to minimize the weaknesses**

1. The strong commitment of the board to pursue efficiency and effectiveness of the teaching process 2. The well foundation of IT infrastructure to support the e-learning process	a) To establish new business process environment (in organizational, personal, and skill perspectives) to accommodate the role and responsibility in managing the new e-learning system b) To assess any possibility mechanisms to translate on-line course features into the presence of a certain predefined course week c) To integrate all related educational information systems to achieve one single entry to a certain piece of data

Table I. Strength-Weakness Analysis & Strategies

	Threats
	1. Government regulation requires periodic reports of student physical presence in each predefined course week for all courses taken 2. Government regulations do not allow a course conducted fully online (e-learning based) 3. Some university competitors offer more advance e-learning system model
Opportunities	**Strategies Proposed: Facing the threat, maximizing opportunities**
1. Many e-learning platform available in the market 2. The possibility for cooperation with services and content provider of English course (i.e Really English) 3. E-learning system high potentiality to overcome many problems and challenges such as: The increase number of student body, the limitation of physical infrastructure, wasting time due to traffic jam, etc	a) To assess any possibility mechanisms to translate on-line course features into the presence of a certain predefined course week b) To assess the possibility to perform blended learning c) To assess the alternative solution in integrating the external content and services with internal system (i.e. Legacy academic information system and Moodle based e-learning system).

Table II. Opportunities-Threats Analysis & Strategies

B. University COBIT 5 Goal Cascade

1) Step 1. Stakeholder Drivers Influence Stakeholder Needs

This first step action is performed by to do a SWOT analysis as presented in the previous section. The development of the strategies conducted on the S-W analysis stage also considers the fulfillment of the stakeholder needs, as presented in the following table 3.

Stakeholder Needs	The Strategy to fulfill
Regulation Compliance: Physical -in a certain week-based presence activities report to governance	To assess any possibility mechanisms to translate on-line course features into the presence of a certain predefined course week
Institution Objective: Class based admission and enrollment as the base of tuition fee payment	To integrate all related educational information systems to achieve one single entry to a certain piece of data
User/Instructors Needs: A single data entry to provide their learning activities performance report	

Table III. Stakeholder Needs vs Strategies Taken

2) Step 2. Stakeholder Needs Cascade to Enterprise Goals

University board defined for itself a number of strategic goals, of which improving customer satisfaction and compliance with government regulation are the most important. Table 4 described the university's goal which adapted from 17 COBIT 5 generic enterprise goal.

BSC-Dimension	COBIT 5 Enterprise Goal (Number & Goal)	Specific University Objectives
Financial (of 5 COBIT Generic Goals)	2. Portfolio of competitive products and services 4. Compliance with external laws and regulations	• Be able to compete with higher education competitor in serving high quality e-learning services • To follow the ministry of research and higher education regulation in reporting of educational process activities
Customers (of 5 COBIT Generic Goals)	6. Customer-oriented service culture 8. Agile responses to a changing business environment	• Educate education process administrators, teacher/instructors, and student in facing the new technology and culture • Educate education process administrators, teacher/instructors, and student in facing the new technology and culture
Internal (of 5 COBIT Generic Goals)	13. Managed business change programs 15. Compliance with internal policies	- • Student payment policies require mid and final exam performed by face-to-face
Learning Growth (of 2 COBIT Generic Goals)	17. Product and business innovation culture	• The successful e-learning based educational process operation as one of enabler to support university image branding

Table IV. University Goals

3) Step 3. Enterprise Goals Cascade to IT-related Goals

To achieve a certain enterprise (university) goal, it is required a number of IT-related outcome represented as IT-related goals. IT-related consists of information and related technology. The detail mapping of Enterprise Goals - IT-related Goals can be referred to [9]. One of examples those university Goals and IT-related Goals is: University Goal *#4 Compliance with external laws and regulations* is primarily supported by IT-related Goals of #2 IT compliance and support for business compliance with external laws and regulations #10 Security of information, processing. The university Goal #4 is also depend on, but in

lesser degree, the IT-related Goals of #4 Managed IT-related business risk, #7 Delivery of IT services in line with business, #14 Availability of reliable and useful information for decision making, and #15 IT compliance with internal policies.

4) Step 4. IT-related Goals Cascade to Enabler Goals

The last step in this cascade process is the mapping of IT-related goals and IT-related processes. The mapping shows how the IT-related are supported by IT-related processes. Each IT-related component is supported by few IT-related process categorized as primary and secondary supporters. COBIT 5 process consists of 37 processes grouped into 4 domains. Of university IT-related Goals, the IT-related Goals. As an example IT-related #4 is secondary supported by process APO03 Manage Enterprise Architecture.

C. E-learning System Enterprise Architecture

To continue the goal cascade process, this section presents one of the IT-related process base on COBIT 5 i.e APO03 Manage Enterprise Architecture and in this case study context, the process is E-learning System Enterprise Architecture. The enterprise architecture is developed base in EA guidance released by National Institute Standards and Technology (NIST) as described in the special publication 500-167 [21]. The e-learning enterprise architecture is illustrated as fig 2 which consists of: business architecture, information architecture, information system (application) architecture, data architecture, and infrastructure architecture. Up to this proposal step, the completion of global concepts of the architecture is provided to the top of two layers while the rest of the three layers are still under assessment process.

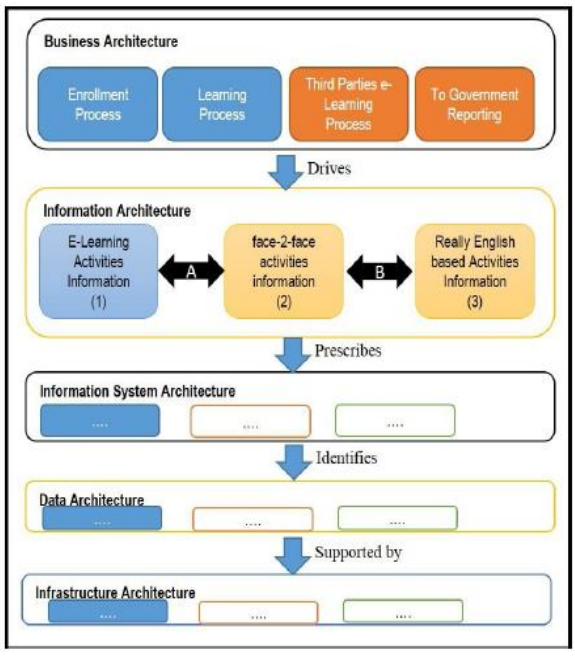

Fig. 2. Proposed E-learning enterprise architecture

The first layer, Business Architecture, consists of 4 main processes. The first and second processes are performed to accommodate internal university needs. The enrollment process serves the registration, admission, scheduling, class allocation etc. of learning attendance and instructors as well. The learning process will serve the learning activities such as: tuition fee recording, course material preparation, presence checking, grading, up to graduation and alumni recording. The third process, third parties learning process, is the e-learning based process provided by Really English (www.reallyenglish.com). The last process is the process highlighted in the study, which will serve the activities regarding the fulfillment of regulatory compliance. According to the government regulation number 4 year 2014, all higher education institution has to report its educational activities periodically. The reporting compliance will be measured by some parameters: the correctness of reporting content, the completeness of reporting, and the time committed.

The second layer of e-learning enterprise architecture depicts the information flow. The core of learning-related information provided to supply other information required by the human resources department, financial department, and external regulator as well is the face-to-face learning based information (2). The others main information components are: (1) internal e-learning activities information, and (3) external e-learning activities information performed by ReallyEnglish. The global information flows between those three components described in table 5.

flow ID	Information Content
A	• (2) to (1) class set up, lecturers, and student. • (1) to (2) the presence of students converted from their activity in doing quizzes, answering forum, and downloading module in a certain week. • (1) to (2) the grading result of assignment and quizzes
B	• (2) to (3) class set up, lecturers, and student. • (3) to (2) the presence of students converted from their grade in doing three assignments in a certain week

Table V. Information Flow Of Information Layer

CONCLUSION AND FUTURE STUDY

The study presents the proposal of e-learning system governance to overcome some obstacles of e-learning system operation in a higher education institution. As the implementation of IT Governance is the complex task with very wide span area, due the limitation of the space, the paper only presents some important and highlighted part of the overall proposal. The three main obstacles to the implementation of the e-learning system, the regulatory compliance, internal objective and user needs, are handled by enterprise strategies as the output of the SWOT analysis. In the more technical level, the Enterprise Architecture, it is presented the information flow and scenarios to deal with those challenges.

The IT Governance implementation is a life cycle process. There for the study relate to e-learning system, government will always continue. Current activities of the study are to define and to complete the enterprise architecture in order to be executed ready. In the next study, the related aspects of e-learning system governance will be assessed are: the resources management, benefits realization monitoring, risk management, and performance measurement.

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