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The Implementation of E-learning System Governance to Deal with User Need, Institution Objective, and Regulation Compliance

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Abstract

In this digital era, it has been proven that the proper of e-learning system implementation provides various advantages and huge benefits. But to achieve the proper implementation is not an easy way since there are many obstacles have to be addressed. Beside the benefits and advantages, such as the other IT based system, e-learning also bring many risks that come from its environment or embedded in. Although many methods or approaches proposed to tackle those obstacles and risks, but the study that tackle those problems from IT Governance view is still limited. The study presents the report of the IT Governance approach to address some of the risks of eLearning system implementation such as: miss alignment with the enterprise goal and strategies, uncomplianceness with the government regulation, and unmatched with the stakeholder needs. The governance of eLearning system proposed has been implemented in the private university situated in Jakarta, Indonesia for two semesters. Based on the general observation, the University can get some benefits such as their succeed in maintaining its institution as the university that comply with government regulatory.

Keywords*: e-learning; IT-governance; regulation compliance; strategic alignment; COBIT 5*

1. Introduction

In the digital era, information system plays very important role in each organization include in higher education. Higher education is a special type of organization which its core business is in education and researches. To support their activities a Higher Education institution manages and operate various systems, applications, and technology infrastructure [1]. One of the essential parts of that system is e-learning system. There is no doubt that an e-learning system is become the potential solution to overcome many obstacles in higher education educational activities [2]. There are many barriers in educational activities can be solved by implementing the proper e-learning system operation. Those barriers as: physical infrastructure limitations, time and place constraints, and -for some big city cases-, the traffic problem. Not only as the problem solving strategy, e-learning is also as an enabler for higher education to achieve many benefits such as: the opportunity for information to be presented through various forms (text, audio, video, images, etc.), as the flexible storage 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 [3]. By implementing the e-learning system, higher education institution also contributes in reducing the environmental impact since the usage of less paper and the consumption of less energy [4].

The rule of thumb on using the technology is not only the benefits we can get, but also the challenges and risks we must handle. Many publications from various countries in the globe present the e-learning challenges and risks. Based on the Middlesex University case, Nurul Islam et.al, as published in [5], concluded those challenges in five categories: learning style and cultures, pedagogical e-learning, technology training, and time management. The operation of e-learning system in developing country commonly has to deal with more technical challenges [6] such as: inability to afford computers, internet connectivity, energy problem, and limited expertise. There are also many embedded risks in the e-learning such as: the reduction of

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social and cultural interaction, the learner may feel isolated and unsupported in the case when instructors are not always available [4]. As the other technology that use the internet as its backbone, e-learning system is also disturbed by some security and authority issues.

Based on those various studies, at least it can be learned two things. The first one is that each country (location) has their own specific challenges and risk and the second thing is, even though various approaches and solutions have been proposed to address those challenges, there are still obstacles that have not been got enough attention. One of the obstacles that have not got enough attention is the regulatory compliance. There is a common condition where the regulation fails to anticipate the fast growth of the technology utilized. As an example, the conventional public transportation drivers that do rally against Uber taxi operation in some countries shows the late of government regulation anticipation. The delay of regulation anticipation, more and less, also happens in the e-learning implementation. Especially in Indonesia, e-learning operation and its reporting must follow the regulation which designed and applied to face-to-face (conventional) learning..

E-learning is the learning system which refers to the use of ICT (Information Communication Technology) to enhance and support the learning process [6]. Thus, for e-learning system ICT is the major part of the overall system. The common best practice in ICT management and operation is that all of ICT aspects have to be governed to assure its alignment with institutions goal and strategy, to use and to manage resources efficiently, to provide the expected value, to manage its risk properly, and to evaluate its performance fairly[7]. As the ICT project, e-learning system must be governed too. Various studies regarding ICT project present that there are many ICT projects fail to deliver the expected value. Many reasons can be highlighted as the cause of the failure of IT projects, but one of the most significant reasons is the weakness of project planning [7-8]. Information System Audit & Control Association (ISACA) has conducted the surveys regarding the operation of ICT in various enterprises. The survey results present that many enterprises still unsuccessful to demonstrate concrete, measurable business value from their IT-enabled investments. IT Governance is the mechanism to address this situation [9].

This paper presents some part of e-learning system governance implementation results in higher education; with the study case is The Higher Education Institution in Indonesia. In this case the governance is crucial for e-learning system because the e-learning system must accommodate with many interest such as: government regulation, institution goal and strategy, and user (instructors, students) needs. The initial proposal of the governance has been published in [2]. In the governance implementation, we adobt the COBIT IT Governance framework and modify it according local context needs [10-11]. The rest of this paper is organized as follows. Section two describes related work on e-learning and governance as well. The third section discusses the method and framework used in the study. The result of the implementation of e-Learning governance is presented in section four. In the last section, section five, it is discussed the conclusion of the implementation, the status of the implementation and the future enhancement.

2. Related Work

2.1. E-learning

Nowdays, e-learning system is the most attractive mechanism for higher education institutions to perform their activities in education and learning. E-learning system offers more advantages and opportunities compared to face-to-face conventional learning. Due its advantages, e-learning has attracted many experts and practitioners to do research or practical implementation on this field. The fast growth of e-learning system provides big opportunity, but on the other side, it also brings many challenge, problem and risk. Many publications discuss the potentiality, opportunity, challenges and risks of e-learning. This section discusses some of related works regarding the pro-cons of e-learning system.

The most recent study regarding the critical success of e-learning system adoption in developing country is presented in [12] which discussed the critical external factors in the technology acceptance models. The study presents some of external critical factors in individual practitioner that, as realized by the author, contains some limitations such as this study did not cover the regulation in where the e-learning system is operated. One of the early study result regarding e-learning challenges is published in [13]. The paper discusses the summary of e-

learning implementation challenges which faced by the instructor of the National Research University. The implementation of an e-learning system at this University has to deal with various challenges ranging from pedagogical, personnel, and technology must be faced by the instructors. Of those challenges, time management (personal challenges) is the biggest barriers. Almabarabeh et.al [14] present their study of the implementation Moodle LMS platform which elaborates the specific technical aspect challenges such as: laboratory computer problem, the limitation capabilities of networking infrastructure, unavailability of the manual guide, the difficulties to read the computer screen, and the lack of computer operation knowledge. One of the study which elaborates e-Learning system from user acceptance point of view is presented in [15]. This study of e-learning user acceptance confirms that the usefulness provides more positive influence compare to its easy of use. Another barrier to achieve the successful of e-learning system operation is the participant less motivation as studied byC. Juliane e.t. al [16]. In the study, the authors explore some factors that influence the learning motivation.

The earlier study performed by Olson et.al [17] elaborate the problem, impact, and success story regarding the implementation of e-learning in some developing countries. In this report, the authors describe many challenges have to be addressed to get optimum benefits and advantages of a successful e-learning implementation. The authors conclude that the education institution in the developing country still face lots of technical problems such as: internet or telecommunications, electricity powers, and computer hardware. The other challenges are: it is not easy for teachers to change the learning process practice from face-to-face to digital learning model, the over class capacity, and the gender gap of participant's distributions. Another literature review study results on the challenges of e-learning is described in [5]. According the study, there are five categories of e-learning challenges. The study does not only present those challenges, but also propose their suggestions for a successful e-learning outcome. Although the study is comprehensive enough, but it does not include the regulatory compliance and governance constraints.

Those all related works presented in this section discuss various barriers and challenges on e-learning planning, implementation, or evaluation as well. Most of those obstacles and challenges studied revolved around technology, personal, cultural, and infrastructure issues whereas the regulatory and governance related issues have not been studied yet. In this work we do the study of IT-governance related to e-Learning implementation which proposed to deal with government regulation constraint, to align with institution objective, and to accommodate the user needs.

2.2. IT-governance

Information Technology has become a critical backbone in supporting the growth and sustainability of any organization, including the higher education intuitions organization. But unfortunately, there are still too many IT Projects fail to deliver the expected values. According to The Standish Group Chaos Report, in the year of 2015 there were 71% IT project failed [18-19]. The failure of IT project can be caused by many factors such as: lack of top management support, organizational culture, business process reengineering, lack of training, the weakness of the project management officer, and the lack of planning and organizing as well [8],[20-22]. The dominant factors influence the failure of IT project is mostly the governance and or management aspects.

Many evidences show that effective IT-Governance can assist an organization to achieve its goal by aligning IT project with organization objective, allocating resources properly, and managing the project risk. An organization that adopts IT governance also harvest a good impact such as improvement of their performance and profit as presented in [23]. ITGI published their survey that summarizes the IT Governance beneficial such as: integrate business with IT, improve risk management, increase the boards visibility to IT , reduce the cost and increase customer satisfactions. As partial or overall entire organization for many interests and purposes, many higher institutions adopt the formal framework of IT Governance to support the achievement of their goal [24-29].

IT Governance is a framework utilized to support the management of all information resources (human resources, costs, and infrastructure) to achieve the organization's objectives effectively and efficiently. The two main concerns of ITG are: how IT can provide sufficient value to the business and how the risks arise from the existence of IT can be managed [7],[30]. 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 [7].

According to author knowledge, the governance challenge of e-learning system has gotten lack attention from most of e-learning studies, especially in handling regulation compliance constraint, institution goal and strategy, and user needs in single point of view as well. This study case tries to cover this lack by using COBIT as the IT Governance frameworks which has been applied in the organization [24],[31]

3. Method & Tools

The study case is performed based on COBIT 5 frameworks for the governance and management of Enterprise IT. The COBIT 5 frameworks cover a very wide span of Governance of Enterprise IT (GEIT) which enables Information Technology related 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 [11]. This e-learning system governance study case reports only the first principle due the space limitation.

To fulfill the first principle (meeting stakeholder needs) COBIT 5 provide COBIT 5 Goal Cascade as the guidance of a step by step mechanism to translate the stakeholder needs into specific, actionable and customized enterprise goals, IT-related goals, and enabler goals as depicted in Figure 1. For each of those steps, COBIT 5 defines generic goals and mapping template. The 17 generic enterprise goals are developed based on Balance Score Card (BSC) perspective as a representation of the goal lists commonly used by an enterprise. COBIT 5 also defines the 17 IT-related goals which also in BSC perspective. The mapping table templates are used to map Enterprise Goal-IT Related Goal and IT-related Goal-Enabler Goal. The COBIT 5 consists of seven enablers: principle, policies and framework; process; organizational structure; culture, ethic, behavior; information; services, infrastructure, and application; and people, skill and competencies.

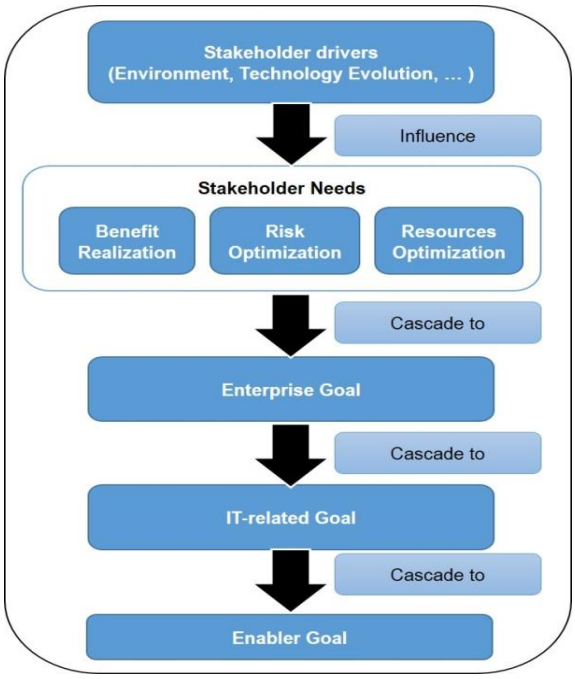

Figure 1. COBIT 5 Goal cascade [11]

4. Governance Implementation

4.1. Environment scanning & analisys

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

4.1.1. University and e-learning system

Universitas Mercu Buana (University of Mercu Buana), the campus where the e-Learning governance case study is implemented, is a private university situated in Jakarta, Indonesia (www.mercubuana.ac.id). The university serves six faculties which consist of 24 bachelor degrees, six 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 well. Those academic communities are distributed in four separate location situate in Jakarta Province.

As a private higher education institution in Indonesia, the university has to follow government regulation regarding the academic process and its reporting, although it has own autonomy in financial management. Indonesia Government through The Ministry of Research and Higher Education implements regulations requiring universities to submit the report of all educational and academic activities periodically. Included in the content of this required report is the detail presence of each student in the learning class.

The operation of university academic processes has been supported by an integrated information system for all learning related activities ranging from admission, enrollment, scheduling, to graduation. The university uses Moodle to support the implementation of e-learning activities for several years. For strategic and efficiency reasons, the board of the university decided a policy to establish a cooperation with Really-English (http://www.reallyenglish.com/) in performing e-learning based of English teaching. Really English (RE) is the UK based English Education Institution with global reputation. In the cooperation, RE will provide the learning system, learning content, and application infrastructure while the university has an obligation to provide the teachers.

The University IT related activities such as the planning, organizing and operating 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 the application system, and the second one is the center of operational and support of information system whose the main responsibilities are to support the user in operating and using the system.

4.1.2. SWOT analysis

The SWOT Analysis model is used to evaluate and formulate the university strategy in governing 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 impact of weaknesses, while in the Table 2 is presented the strategy to optimize opportunity benefits in facing the threats.

4.1.3. university COBIT 5 goal cascade

4.1.3.1. 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.

Table 1. Strength-Weakness Analysis & Strategies

	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 / lecturer 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 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	Strategies Proposed: Utilize Strengths to minimize the weaknesses 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 2. Opportunities-Threats 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 1. Many e-learning platforms 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	Strategies Proposed: Facing the threat, maximizing opportunities 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 3. Stakeholder Needs vs Strategies Taken

Stakeholder Needs	The Strategy to fulfill
Regulation Compliance: Physical -in a certain week- based presence activities report to governance Institution Objective: Class based admission and enrollment as the base of tuition fee payment User/Instructors Needs: A single data entry to provide their learning activities performance report User/Student Needs: A fair attendance recording for total attending calculation as pre-request of middle and final exam User/Instructors Needs: A fair attendance recording for teaching fee calculation User/Management Needs: A valid attendance record for reporting preparation and submission to the ministry	To assess any possibility mechanism to translate on-line course features into the presence of a certain predefined course week To integrate all related educational information systems to achieve one single entry to a certain piece of data. The related information system such as: Academic Information System, e-Learning System, Teaching Fee System, and Reporting to Ministry System

4.1.3.2. step 2. stakeholder needs cascade to enterprise goals

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

Table 4. University Goals

BSC-Dimension	COBIT 5 Enterprise Goal (Number & Goal)	Specific University Objectives
Financial (of 5 COBIT Generic Goals)	#2. Portfolio of competitive products and services	1. It is hard to change the face-to-face teaching model into e-learning model, mainly for new instructors and new students
	#4. Compliance with external laws and regulations	2. Be able to compete with the other higher education competitor in serving high quality e-learning services
		3. 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	4. Educate education process administrators, teacher/instructors, and student in facing the new technology and culture
	#8. Agile responses to a changing business environment	5. 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	6. Student payment policies require mid and final exam performed in the face-to-face model
	#15. Compliance with internal policies	
Learning Growth (of 2 COBIT Generic Goals)	#17. Product and business innovation culture	7. The successful e-learning based educational process operation as one of enabler to support university image branding

4.1.3.3. step 3. enterprise goals cascade to IT-related goals

To achieve a certain university goal, it is required some of IT-related outcomes 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 (11), while the specific mapping for the university is presented as Table 5.

One of examples those university Goals and IT-related Goals is: University Goal #*2 Portfolio competitive product and service* is primarily (P) supported by IT-related Goals of: #1 Alignment of IT and business strategy, #5 Realized benefits from IT-enabled investments and services portfolio, #7 Delivery of IT services in line with business requirements. The university Goal #2 also secondary (S) supported by the IT-related Goals of #3 Commitment of executive management for making IT-related decisions, #8 Adequate use of applications, information and technology solutions, #11 Optimization of IT assets, resources and capabilities, #13 Delivery of programs delivering benefits, on time, on budget, and meeting requirements and quality standards, and #14 Availability of reliable and useful information for decision making.

Table 5. Mapping Of University Goal Vs It Related Goal

			Enterprise/University Goal						
			2. Portfolio of competitive products and services	4. Compliance with external laws and regulations	6. Customer-oriented service culture	8. Agile responses to a changing business environment	13.Managed business change programs	15. Compliance with internal policies	17. Product and business innovation culture
IT - Related Goal									
Financial	1	Aligment of IT and Business Strategy	P		P	P	P		S
	2	IT compliance and support for business compliance with external laws and regulations		P			S	P	
	3	Commitment of executive management for making IT-related decisions	S			S	P		S
	4	Managed IT-related business risk		S		S	S	S	
	5	Realized benefits from IT-enabled investments and services portfolio	P		S	S			S
	6	Transparency of IT costs, benefits and risk							
Customer	7	Delivery of IT services in line with business requirements	P	S	P	P	S		S
	8	Adequate use of applications, information and technology solutions	S		S				S
Internal	9	IT agility	P		S	P	S		P
	10	Security of information, processing infrastructure and applications		P				P	
	11	Optimisation of IT assets, resources and capabilities	S		S	S	S		S
	12	Enablement and support of business processes by integrating applications and technology into business processes	P		S	S	S		S
	13	Delivery of programs delivering benefits, on time, on budget, and meeting requirements and quality standards	S		S		P		
	14	Availability of reliable and useful information for decision making	S	S					
	15	IT compliance with internal policies		S				P	
Learning & Growth	16	Competent and motivated business and IT personnel	S		S	S			S
	17	Knowledge, expertise and initiatives for business innovation	P		S	P	S		P

4.1.3.4. step 4. IT-related goals cascade to enabler goals

The last step in this cascade process is the mapping of IT-related goals into enabler goal. COBIT framework provides seven categories of enablers include: Principles, Policies and Frameworks; Process; Organizational Structures; Culture, ethics, and behaviors; Information; Services, Infrastructure and Applications; and People, Skills and Competencies. Some of the university e-Learning related enablers are presented in this section.

1) Principles, Policies & Procedures

The eLearning principles have to be followed by internal stakeholders are:

a. The e-Learning must support the university to maintain its reputation as a college that adheres to government regulation.
b. The e-Learning system has to accommodate all user needs regarding: its service availabilities, the completeness of its feature and function, and the consideration to the wide range IT literacy of the users.

To deal with the government regulations on learning activities reporting, the university's board and eLearning committee determine the policies and procedures summarized as follow:

a. To follow the government regulation, there are a certain time scheduled for all of courses that conducted by e-learning model
b. The Learning activities are done by blended learning model which few parts of its activities are done in the face to face form. In the face to face class meeting, the

presence of students is recorded and this record will become the input to government reporting

c. It is determined the procedures to convert certain activities in e-learning into student presence of face to face class, as described in Table 6.

Table 6. Presence Conversion Procedures

e-Learning System	Presence Conversion Procedure
Internal Moodle LMS	• The instructor will recorded as present in a certain week scheduled of face to face if he/she does all of the activities below: o To upload a lecturer note (courses module) o To provide quizzes o To post and reply forum as well • The student will recorded as present in a certain week if he/she does all of the activities: o To download a lecturer note (courses module) o To answer the quizzes provided by lecturer o To reply the forum
Really English System. The learning model is based on the module that has to be studied and the relevant exercise that has to be answered by students	• The student will be recorded as present in a certain week if he/she does at least three package quizzes

2) Structure

The governance of organizational structure is one of the mandatory component to assure the IT-related governance is implemented effectively. The COBIT 5 guidance on organizational structure provides a model that shows: stake holder, goal, and good practices. Adapted and customized from the COBIT guidance, the organizational structure of the e-Learning governance in this case is described in the Table 7.

Table 7. e-Learning Governance Organizational Structure

Role/Structure	Definition/Description
Board	The group of rector, 2 vice rector, resources director and IT director of the University who are accountable for the governance of the university and have overall control of its resources
Rector	The university PIC who has the total management of the university
Learning & Innovation Director	The university PIC who is accountable in the operation of learning & the innovation process entire university, includes e-Learning process and activities
Finance Director	The university PIC who is accountable for all aspects of financial management, including financial risk and controls and reliable and accurate accounts
IT Director	The university PIC who is responsible for aligning IT and business strategies and accountable for planning, resourcing and managing the delivery of IT services and solutions to support the university objectives, includes eLearning objectives
Head of The Center of Learning Material & e-Learning System (PBA-eL)	The head of the organizational division (i.e. PBA-eL) supervised by Learning & Innovation Director who is responsible to manage, operate, and control the process & activities of eLearning operation
Head of IS Support & Operation	The university senior management supervised by IT Director who is responsible in supporting the IS Operational Environment & Infrastructure Operation
Head of IS Development	The university senior management supervised by IT Director who is responsible in developing the entire University's Information System Solution
Head of Internal Quality Assurance	The university senior management who is responsible to assure the quality of all processes and activities entire the university

3) E-learning System Enterprise Architecture

One of IT enablers according COBIT 5 guidance is the processes categorized into 5 domain processes: EDM, APO, BAI, DSS, MEA [11]. Each domain process contains some generic processes and one of those processes is highlighted in this report. The process is

APO03 Manage Enterprise Architecture as the part of the APO domain process. This APO03 process secondary supports the IT-Related Goal #4. In formulating the E-Learning System Enterprise Architecture (EA), we use the EA guidance released by National Institute Standards and Technology (NIST) as described in the special publication 500-167. The e-learning EA is depicted as Figure 2 which consists of 5 components: business architecture, information architecture, information system (application) architecture, data architecture, and infrastructure architecture.

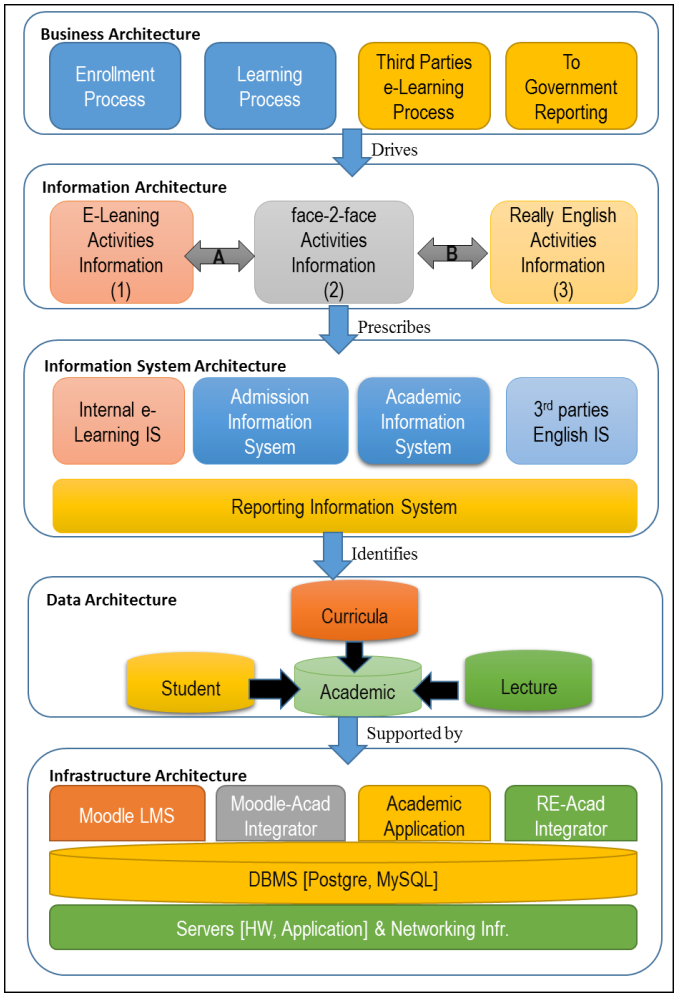

Figure 2. Proposed E-learning enterprise architecture [11]

Four main processes are presented in the first layer. The enrollment process and the learning process are conducted to fulfill the internal university needs. The enrollment process provides services for such purposes such as the registration, admission, scheduling, and class allocation of learning attendance and instructors as well. Whereas the learning process serves the learning activities such as: tuition fee recording, course material preparation, presence checking, grading, up to graduation and alumni recording. The third process is third parties learning process which is provided by Really English (www.reallyenglish.com).

The main process highlighted in this report study is the last one which performs any related activities to fulfill the regulatory compliance. The government regulation number 4 year 2014 state that all higher education institutions must report its educational activities periodically. The reporting compliance is measured by some criteria such as: the correctness of reporting content, the completeness of reporting, and the time committed. The main challenge of the reporting content compliance is that the report has to be contained the detail presences of

learning activities in every week in certain course time for every semester. This detail presence learning activities is contrary to the e-learning based course which is no limitation in time and place. To overcome this barrier the e-learning committee decided a mechanism to convert the student's and lecturer's activities in e-learning system into conventional learning presence. In certain week, a student will be recorded as presence if he/she does all three tasks: to download module, to answer quizzes, and to participate in online forums. The information flow of this mechanism is described as Table 8.

In the second layer of e-learning enterprise architecture, it 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 (1). The others main information components are: (1) internal e-learning activities information, and (b) external e-learning activities information which is performed by RE. The global information flows between those three components described in Table 8.

Table 8. Information Flow Of Information Layer

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

The information architecture in the second layer prescribes the information system architecture in the lower layer. Those information systems are: internal eLearning IS, Academic IS, Admission IS, and Really English IS as a third party system. On top of those four systems is the reporting information system which supports university to deliver the academic activities report to the government. In the Data Architecture layer there are three main data component i.e. student, lecturer, and curricula. The interaction between the three of main data will provide the academic activities data which contains some data items such as: presences, exam, grades, etc.

The lowest layer of eLearning EA is the infrastructure architecture that supports the data and information management. In the bottom part of the architecture and there is run some information system application such as: Moodle LMS to support eLearning process, Academic Information System Application (AIS) to support the main process of the university academic activities and the two integrator applications. The first integrator application is operated to accommodate data interchange between Moodle and AIS, while the second integrator application is operated to support the data integration between AIS and RE application that provided by third parties i.e English Online Learning provider. Those all applications run on top of the DBMS, Application Servers, and Operating System Software. The Infrastructure architecture also contains hardware and networking peripherals.

5. Conclusion and Future Study

This paper reports the implementation of e-learning system governance to deal with some obstacles of e-learning system operation in a higher education institution. Some aspects of IT-Governance implementation are presented in this report includes: the stepping of IT Governance implementation; the environment scanning and analysis; the university COBIT cascade goals; principle, policies, and procedure; and the enablers as well. The three main obstacles to the implementation of the e-learning system i.e the regulatory compliance, university objective, and user needs are handled by formulating e-learning governance strategies as the output of the SWOT analysis. The strategy is then cascaded into university goal, IT-Related goals, and the IT-enablers. Some of adaptations of these enablers into university context are as also discussed. In the technical level, the Enterprise Architecture, it is presented the information flow and scenarios to deal with those challenges.

The governance has been implementing for two semesters in the university and the objective to align the e-Learning system with the university objective in regulatory compliance is assured. We make a general observation of the eLearning system operation to get an initial picture of its governance effectiveness. Based on the observed results, there are some challenges appear such as: many instructors and students do not aware regarding the presence conversion mechanism and also technical problem related to the infrastructure capacity to support its operation mainly in peak time. Some of functional enhancements have already been implemented to accommodate the user needs or technology demands such as presented in [32] which to leverage the social media capability in facilitating of instructor-student interaction.

The IT Governance implementation is a life cycle process in a holistic approach. There is still some left IT-governance focuses have not been yet covered in the study such as: benefit realization, performance management, and risk optimization. In the future study, we will elaborate resources optimization aspects to handle to technical problem stated in the previous paragraph. We will also assess the benefit realization measurement to the value creation delivered by the e-eLearning governance implementation. The other focuses we must also asess are the risk optimzation and performance management.

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