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IT Governance Audit at Lampung University Using COBIT 5 Framework Focus on EDM Domain

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Abstract. The competitiveness of an organization depends on IT governance because it enables organizations to optimize the benefits of implementing IT. The process of IT governance in the university's answer to the needs of the organization which will guarantee the certainty of value creation of information technology as well as an assurance of the return of information technology investments that have been invested. Currently, IT governance and implementation at the University of Lampung has been run fairly well, but there are some steep obstacles in its business processes. COBIT 5 is a standard for IT governance processes that can help an organization to manage, develop, and retain its assets. In this study, an information technology governance audit was conducted based on the focal framework of COBIT 5 EDM domains with case studies at the University of Lampung. Data collection methods used are data analysis, interviews, and questionnaires. From the audit process, it was found that Lampung University's ability to manage information technology at EDM generally focuses on level 4, but the achievement in each process has not been fulfilled yet and has not achieved the expected results by University of Lampung.

1   Introduction

The competitiveness of an organization depends on IT governance because it enables organizations to optimize the benefits of implementing IT. The main goal of IT governance is to align IT strategy with organizational strategy. IT governance in universities is a concept that becomes the answer to the needs of the organization will guarantee the certainty of value creation of information technology as well as an assurance of the return of information technology investment that has been invested. One example of universities that implement IT governance is the first state university in Lampung, the University of Lampung (Unila).

Currently, the governance and IT implementation in Unila has been done well enough, but there are some troubling obstacles in its business processes. For example, in some work units at the University of Lampung, there is a lack of human resources to manage and develop IT systems at their work units. Furthermore, when there's a change of position in work units, causing empty of personnel who carry out the task of managing the work unit website, so they can't upload the latest information on the work unit's website.

COBIT (Control Objectives for Information and Related Technologies) is a framework published by ISACA (Information System Audit and Control Association) which is suitable to be used to manage IT governance. Governance processes deal with the stakeholder governance objectives such as value delivery, risk optimization, resource optimization, and including practices and activities aimed at

evaluating strategic options, providing direction to IT and monitoring the outcome (Evaluate, direct and monitor [EDM]). The evaluate, direct, and monitoring process can be found in the EDM domain of COBIT 5. COBIT 5 is the current edition of ISACA's COBIT Framework that provides end-to-end business deployment of corporate information technology governance.

There are some researches about IT governance using the COBIT 5 framework, such as [1] who discussed information technology governance with case studies in the Election Organizing Council (DKPP) using the COBIT 5 framework that focuses on the APO (Align, Plan, and Organize) domains that include APO02 (manage IT strategy), APO06 (manage budget and costs), and APO09 (manage services agreement). In another study, there's a research by [2] which focus on manage relationship (APO08) with a case study at PT OTO Multiartha. Moreover, there is a study of audit capability EAM using COBIT 5 and ISO 55002 on State Electricity Company focusing on EDM02, EDM05, and APO11 [3].

Based on previous researches, it can be concluded that COBIT 5 is the most used standard for information technology governance process that can help an organization to manage, develop, and maintain its assets and able to assist the process of audit, governance, and management of information technology.

1.1   Literature Review

IT Governance by [4] is a governance process for decision-making by ensuring the allocation of IT usage in the organization's strategies. IT governance reflects the application of organizational principles with a focus on management activities and the use of IT for enterprise achievement. According to [5], the primary purpose of IT governance is to harmonize every organization's business processes with existing information technology, meaning that with the structure and process required in information technology investment, management side can ensure that the applied information technology is aligned with current business strategies.

COBIT 5 is the latest edition of ISACA's COBIT Framework that provides end-to-end business deployment of corporate information technology governance to illustrate the key roles of information and technology in creating enterprise value. COBIT 5 is built on the development of COBIT 4.1 by integrating Val IT and Risk IT from ISACA, ITIL, and relevant standards from ISO [6].

ISACA on their book called "COBIT 5 Enabling Process" [7] explains that the EDM governance process deals with the objectives of stakeholders in assessing, optimizing risks and resources, including practices and activities for evaluating strategic options, providing direction to IT and monitoring results. The EDM domain processes are EDM01 Ensure Governance Framework Setting and Maintenance, EDM02 Ensure Benefits Delivery, EDM03 Ensure Risk Optimization, EDM04 Ensure Resource Optimization, and EDM05 Ensure Stakeholder Transparency.

In the COBIT 5 framework published by ISACA [7], it no longer uses the Maturity Level as in the previous COBIT 4.1 [8]. Maturity Level is changed to Process Capability Model adopted from ISO / IEC 15504-2, where the assessment process will be based on the level of an organization's ability to perform the processes defined in the assessment model. Here is the level of Process Capability Model owned by an organization:

   a. *Level 0 : Incomplete Process*
      The organization at this stage does not carry out the IT processes that should exist or have not achieved the objectives of the IT process.
   b. *Level 1 : Performed Process*
      The organization at this stage has succeeded in implementing the IT process and the IT process objectives are really achieved.
   c. *Level 2 : Managed Process*
      At this stage, Organizations in implementing the IT process and achieve their objectives has been well managed, so there is plus value in the assessment because the implementation and achievement is done with good management.
   d. *Level 3 : Established Process*

The organization at this stage has IT processes that have been standardized within the whole organization.
 e. *Level 4 : Predictable Process*
   The organization at this stage has been running the IT process within definite limits (eg time constraints).
 f. *Level 5 : Optimizing Process*
   At this stage, the organization has made innovations and made continuous improvements to improve its capabilities.

1.2   Previous Research

The research [3] focuses on EDM02 domain (ensuring benefits delivery), EDM05 (ensuring transparency of stakeholders), and APO11 (managing quality). From this research, there are gaps in the three domains that become the evaluation point. Domain EDM 02 is a domain that assesses the optimization of a business in a company mainly attained at Level 2, indicating that the EDM02 process achieves proper management such as planning, monitor activity, and more asset management performance adjustments but has not been able to achieve timeliness work that the company wants.
EDM 05 is a domain that assesses reporting activities within a company to obtain conditions attained mainly at Level 3, indicating that distribution asset management activities have been able to be implemented well in accordance with established standard procedures to achieve the expected results, but the implementation of the work process has not been able to consistently applied throughout the organization.
   APO 11 is a domain that assesses the quality of processes, company procedures, as well as work practices related to the distribution of the company's asset management to a condition largely attained at Level 3. It is indicating that the related asset management activities related to quality management have standardized procedures established to achieve expected results related to management Assets, but the quality management of work processes has not been able to be consistently applied throughout the organization.
   Based on [9], XYZ Cargo is a Freight Forwarder Service Company specialized in the logistic transportation located in Jakarta. XYZ Cargo has implemented Information Technology (IT) that covers all key aspects of the business processes of the enterprise. the IT governance at the XYZ Cargo has been done although still not run optimally because they have not reached what is expected later process capability within each IT process contained in the domain EDM01 to ensure the governance framework setting, and maintenance on average was at 2.7, EDM02 to ensure the benefits delivery on average is at 2.3 and EDM03 to ensure the risk optimization on average at 2.0. Performance levels of EDM01, EDM02, and EDM03 are still at level 2 (managed process). EDM04 domain to ensure the resource optimization on average is at level 1.7 while EDM05 domain to ensure the stakeholder transparency on average is at level 1.3. Performance levels of EDM04 and EDM 05 are still at level 1 (performed process). Therefore, the performance of IT governance processes in XYZ Cargo has a repeated pattern in conducting activities related to the management of information technology governance. It is not well defined and formalized; thus, it still happens inconsistently.

2   Materials and Methods

This research is conducted using the survey method. The stages performed in this study include the process of problem formulation, literature study, collecting secondary data (through documents analysis), mapping, collecting primary data (through interviews and questionnaires), IT governance audit of University of Lampung (consisting of 3 phases, include determining current capability level, gap analysis, and recommendation writing), and report writing based on IT governance audit results.
   The following is the elaboration of the formula for calculating the recapitulation of the questionnaire answers to obtain the current level of capability in the organization described in [1]:

1. Calculate Recapitulation of Respondent's Answers and Normalization of the Respondent's answers

   a. The average conversion formula

   $$\mathbf{R.K} = \frac{\mathbf{nK}}{\Sigma \mathbf{Pi}} \tag{1}$$

   Where:

   R.K: The average conversion of the respondent's answer, 1 for answer Yes and 0 for answer No

   nK: Conversion Value consists of 1 for answers Yes and 0 for answer No. nK is the conversion value for each question

   ΣPi: Number of questions for respondents. The number of questions is the number of questions per level (0-5)

   b. Normalization formula

   $$\mathbf{N} = \frac{\Sigma \mathbf{RKi}}{\Sigma \mathbf{RKa}} \tag{2}$$

   Where:

   N: Normalization

   ΣRKi: Average number of conversions per level (level 0 - level 5)

   ΣRKa: Average number of overall conversions

   c. Formula for level normalization

   $$\mathit{NL} = \mathbf{N} \times \mathbf{L} \tag{3}$$

   Where:

   NL: Level normalization

   N: Normalization of the average conversion result of respondents' answers

   L: Level on each domain process consisting of level 0-5

2. Calculating the Data Domain Capability Level

   a. Capability level formula for each respondent

   $$\mathit{CLi} = \mathbf{NL0} + \mathbf{NL1} + \mathbf{NL2} + \mathbf{NL3} + \mathbf{NL4} + \mathbf{NL5} \tag{4}$$

   Where:

   CLi: The capability level value of each respondent in each process on the domain.

   NL0: Normalized level values at level 0

   NL1: Normalized level values at level 1

   NL2: Normalized level values at level 2

   NL3: Normalized level values at level 3

   NL4: Normalized level values at level 4

   NL5: Normalized level values at level 5

  b.   The overall capability formula for each process

$$CLa = \frac{\Sigma CLi}{\Sigma R} \tag{5}$$

Where:

CLa: Value of capability level in each domain process
ΣCLi: The number of capability level values on each respondent in each domain process
ΣR: Number of respondents in each domain process

3. Calculating the Current Capability Level
    Here is the current Capability Level formula:

$$CC = \frac{\Sigma CLa}{\Sigma Po} \tag{6}$$

Where:

CC: Current capability value
ΣCLa: Total number of capability values in each domain process
ΣPo: Number of processes on each domain

3   Results and Discussions

3.1   Collecting the Secondary Data

The first step in conducting a governance audit of information technology at the University of Lampung is to collect secondary data from both written and digital document analysis to identify drivers in the organization. The drivers at Lampung University are described in the analysis of existing conditions and SWOT analysis. The purpose of this data collection is to gain an understanding of the University of Lampung in detail which includes the vision, mission, objectives, strategic goals, and existing conditions of the University of Lampung. In identifying organizational drivers, the data used are obtained from the official website of Lampung University, the strategic plan document of the University of Lampung, and the results of direct observation.

3.1.1   Vision and Missions

The University of Lampung (Unila) has established a determination to continue the dharma of building Unila and the nation together. The vision of Unila is defined in the 2005-2025 Unila Long Term Development Plan (RPJP), "In 2025 Unila Becomes the Ten Best College in Indonesia"[10].
   In line with the national education development mission and the policy of the Ministry of Education and Culture, Unila has also established a mission written in the Strategic Plan Document of University of Lampung [10], namely:
   1.   organizing qualified and relevant university's tridarma;
   2.   carrying out the good governance organization;
   3.   ensure accessibility and equity of higher education;
   4.   cooperate with various parties both within and outside the country.

3.1.2   Objectives

Here are the business objectives of Lampung University which is written in the Strategic Plan Document of University of Lampung [10]:

1. to produce qualified and highly competitive graduates who are rapidly absorbed by the labor market and able to create jobs for themselves and others;
2. produce superior / new intellectuals published in accredited journals at domestic and abroad and acquire intellectual property rights for the new science and technology;
3. improve the competitiveness and welfare of the community by performing dedication to quality and innovative society and based on superior / new science and technology;
4. improving the organization's management in academic, financial, and human resources towards good governance;
5. increase accessibility for all levels of society to obtain higher education services in Unila;
6. enhancing cooperation with central, provincial, district / city, business, non-governmental (NGO) and other stakeholders; Both within and outside the country.

3.1.3   Strategic Goals

The strategic goal of Unila in 2020 is a quantitative measurable condition to be achieved by 2020 as the impact of the outcomes of Lampung University's work programs and activities undertaken by Lampung University's work units. The indicators and targets for achievement of the strategic objectives are detailed in table 1.

Table 1. Name, performance indicators, and strategic target of Unila 2016-2020 [10]

Code	Strategic Goals	Strategic Goal Performance Indicators (Impact)	Condition at 2015	Strategic Goals Target, December Year				
				2016	2017	2018	2019	2020
A	Increased quality of learning and student affairs	Number of students entrepreneurship	48	25	50	75	100	125
		Percentage of Unila graduates who graduated in one standard competency test of graduates	No data	60%	65%	70%	75%	80%
		Accreditation of Unila	B	B	B	Superior	Superior	Superior
		Amount of national medals	22	40	60	80	90	100
		Amount of International medals	11	15	19	23	27	31
		Percentage of graduate waiting period <3 months	No data	40%	50%	60%	70%	80%
B	Increased relevance and research productivity	Number of Unila patents	24	35	50	75	100	150
		Number of cited articles	No data	25	50	75	100	125
		Number of research & development prototype of Technology Readiness Learning (TRL) level 6	No data	10	15	20	25	30
		Number of industry-worthy prototypes with Technology Readiness Learning (TRL) level 7	0	0	0	1	1	2
C	Increased the quality and quantity of community service	The number of community groups that apply science results of dedication continuously	10	15	30	50	75	100
D	Increased quality and quantity of Tri Dharma	Accreditation of Unila	B	B	B	Superior	Superior	Superior
		Science and technology parks built	Not available	Not available	Available	Available	Available	Available

Code	Strategic Goals	Strategic Goal Performance Indicators (Impact)	Condition at 2015	Strategic Goals Target, December Year				
				2016	2017	2018	2019	2020
	Universities	Science park and mature technology	Not available	Not available	Not available	Not available	Available	Available
		Center for Science and Technology	0	1	1	2	2	2
		Percentage of S-3 lecturers	26	35	40	45	50	55
		Percentage of professors	4,7	6,0	7,5	9,0	10,5	15,0
		Percentage of Unila certified lecturers	85%	90%	95%	95%	95%	95%
		Revitalization of infrastructure and facilities at Unila	Done	Done	Done	Done	Done	Done

3.1.4 Existing Conditions

Lampung University is one of the state universities in Lampung province that utilizes IT (information technology) to run business processes and achieve its business goals. The University of Lampung has about 21 units of work, and almost all work units at the University of Lampung rely on information technology to conduct their business processes. The University of Lampung has about 3,000 units of desktop computers distributed to all work units. The University of Lampung also has 32 server units operating in data centers with various specifications and functions. Almost all computers, laptops, handphones and tablets that are used for the business process in Lampung University work units both in faculty, institution, and UPT have been able to connect to Internet network using either WiFi or LAN cable. Work units at the University of Lampung already have a website for their work unit. There are even some work units that have utilized additional software to improve the effectiveness of business processes.

Table 2. Number of Staff/Employees at University of Lampung

No	Type of Education Personnel	Number of Education Personnel with Latest Education								Total
		S3	S2	S1	D4	D3	D2	D1	High School	
1	Librarian	0	1	10	0	1	2	0	2	16
2	Laboratory staff / Technician / Analyst / Operator / Programmer	0	0	62	0	25	0	0	51	138
3	Administration	1	18	127	0	39	4	1	397	587
4	Lecturer	348	839	67	0	0	0	0	0	1254
5	Others	0	0	153	0	1	0	0	97	251
	Total	349	858	419	0	66	6	1	547	2246

Table 3. Distribution of Education Personnel in 12 Unit Works at Unila (without lecturer)

No	Work Unit	Total (persons)
1	General and Financial Bureau	247
2	Bureau of Academic and Student Affairs	28
3	Bureau of Planning and Public Relations	25
4	FEB	77
5	FH	57
6	FKIP	98
7	FP	88
8	FT	79
9	FISIP	48
10	FMIPA	63
11	FK	40
12	UPT dan society	142
	Total	992

One of the work units at Lampung University whose business process focuses on the field of information technology is UPT TIK (Technical Implementation Unit of Information and Communication Technology). UPT TIK provides internet network in the form of wired network and WiFi network called WiFi @ UNILA for all work units, lecturers, and students at the University of Lampung. The internet network of the University of Lampung has been quite good, with accessibility speed reaching 200 Mbps. The internet accessibility ratio of the University of Lampung is 6.7 kbps per student. This ratio has exceeded the internet accessibility adequacy ratio set by Dikti that is 1 kbps per student.

The number of employees or staff and leaders in the work units at the University of Lampung both the civil servants and non-civil servants who can be utilizing the internet and ICT facilities such as applications/software and hardware is quite enough. However, the problem that often encountered from some work units is the lack number of employees/staff who serve as IT experts in the work unit. Table 2 shows the list of staff numbers at the University of Lampung and its distribution.

3.1.4.1 Main Business Processes

The University of Lampung has several business processes that been running regularly, but three business processes are considered as the primary business process to achieve the business goals of Lampung University. Three main business activities or activities at Lampung University, such as the business process of education (academic), research, and community service.

3.1.4.2 Stakeholders at University of Lampung

A stakeholder is a group, community or individual human being who has a relationship and interest to an organization or company. The University of Lampung has two types of stakeholders, namely internal stakeholders, and external stakeholders. Internal stakeholders are defined as stakeholders within the organization, while external stakeholders are stakeholders outside the organization's environment. Table 4 shows the list of stakeholders of Lampung University.

Table 4. Stakeholder at University of Lampung

No.	Stakeholder	Internal/External
1	Directorate General of Higher Education	Internal
2	The work units of University of Lampung (UPT, Institution, Bureau, Faculties)	Internal
3	Lecturers	Internal
4	Students	Internal
5	Staff / Employees	Internal
6	The university senate	Internal
7	Alumni	External
8	Student's parents	External
9	Communities	External
10	Other organizations / companies / colleges	External
11	Press	External
12	Other scholarship sponsoring agencies / suppliers	External

3.2   Mapping

Mapping focuses on EDM domain and uses data that has been obtained from the secondary data collection stage (vision, mission, objectives, and strategic goals of the University of Lampung) with business objectives and IT objectives.

Table 5. Frequency of occurrence of IT process (P), Frequency of IT process appearance in COBIT, and Probability of IT process

IT Process	Process Name	P	COBIT	Probability = (Frequency of occurrence of IT process (P) / Frequency of IT process appearance in COBIT)*100%
EDM01	Ensure governance framework setting and maintenance	63	3	21.00
EDM02	Ensure benefits delivery	46	5	9.20
EDM03	Ensure risk optimization	49	4	12.25
EDM04	Ensure resource optimization	50	3	16.67
EDM05	Ensure stakeholder transparency	35	3	11.67

Table 5 is a table describing the frequency of occurrence of the IT process on the mapping results, the frequency of occurrence of the IT process on COBIT, and the probability of the IT process. After the probability of IT process is obtained, each IT process is determined by its importance category according to the range level, with the rule of 0.0-10.00 marked in green (Low); 10.01-20.0 marked in yellow (Medium); 20.01-30.0 marked in red (High).

3.3   Phase 1 - Determining Current Capability Level of Lampung University

The current level of capability is determined through the capability level questionnaire given to the respondents in the work units at the University of Lampung. Of the 21 work units, only six were filled and returned the offered questionnaire. Table 6 shows the list of respondents who filled in the survey.

Table 6. List of Respondents who Answered the Questionnaire

No.	Code	Respondent
1	R1	Head of UPT ICT at University of Lampung
2	R2	Head of sub-division of Public Relations of BPHM at Lampung University
3	R3	Head of UPT PKLI at University of Lampung
4	R4	Head of sub-division of Business Administration at UPT Language University of Lampung
5	R5	Head of sub division of General section at LPPM Lampung University
6	R6	Vice dean of academic and cooperation in FMIPA University of Lampung

3.3.1   Overall Results Calculation of Capability Level

In this section, we will describe the acquisition of Lampung University's Current Capability Level in current technology governance in general based on the chosen domain, i.e., EDM01 Ensure Governance Framework Setting and Maintenance, EDM02 Ensure Benefits Delivery, EDM03 Ensure Risk Optimization, EDM04 Ensure Resource Optimization, and EDM05 Ensure Stakeholder Transparency. The calculation result of current capability level value in each chosen domain is obtained from the calculation of the overall capability level in each domain process obtained from previous data processing of respondents. Calculation of current capability level in the selected domain using the current capability level calculation formula described in subchapter 3.1. From the formula, we get the result described in table 7.

Table 7. Recapitulation of Current Capability Level Results of Lampung University

Domain	Process	Current Capability Level	Expected Capability Level	Maximum Level
EDM01	Ensure Governance Framework Setting and Maintenance	3.6	5	5
EDM02	Ensure Benefits Delivery	3.79	4	5
EDM03	Ensure Risk Optimization	3.63	3	5
EDM04	Ensure Resource Optimization	3.46	4	5
EDM05	Ensure Stakeholder Transparency	3.43	5	5

3.4   Phase 2 – *Gap Analysis*

Based on the calculation of capability level in the domain Evaluate, Direct, and Monitor (EDM), the current capability level at the University of Lampung is obtained. The result of the calculation shows that Lampung University's current ability is generally at level 3. Level 3 means that IT processes are standardized throughout the organization. At this level, there is clear evidence of any systematic achievement of process objectives. While the target capability is desirable at level 4, therefore it is necessary to make improvements and developments in managing information technology at the University of Lampung. Figure 2 shows an achievement radar graph of Capability Level on the Evaluate, Direct, and Monitor (EDM) domain.
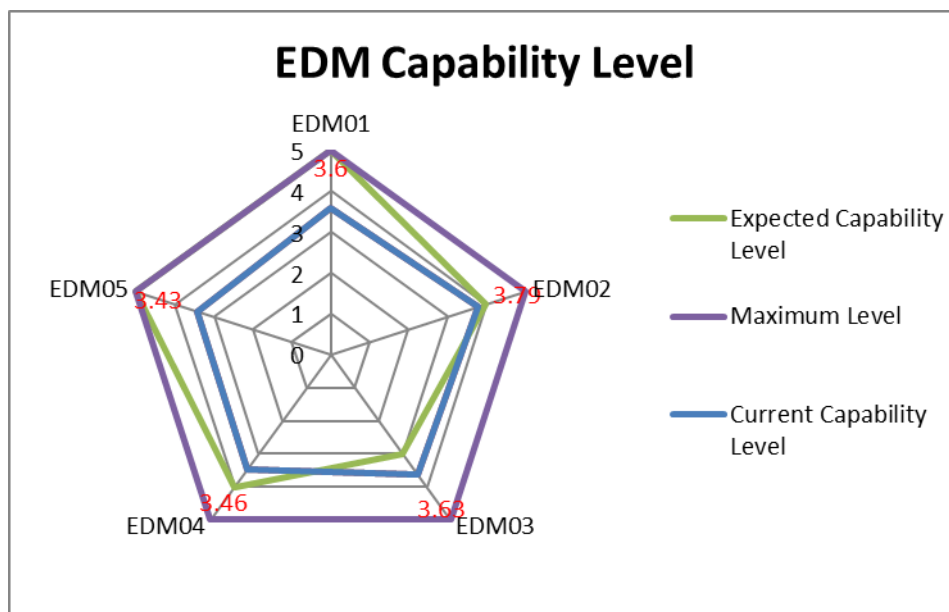

Figure 1. Graph of Achievement of Capability Level on Evaluate, Direct, and Monitor (EDM) Domain

Based on the results of further calculation capability level, Lampung University's current capability level in managing information technology has been obtained. From the results of these calculations, there is no capability value fit with the expected level of the University of Lampung. Among the capability level of as is and to be condition, there are some differences, from the data, it's obtained that there's gap between them. Here's an explanation of the gap on each domain process:

a. Gap Analysis on Ensure Governance Framework Setting and Maintenance (EDM01) Process

Here are some gap analysis on the EDM01 domain about the process of ensuring governance framework setting and maintenance:
1. All work units at the University of Lampung already have an organizational structure for each work unit, but not specific (except in UPT ICT) for IT-related duties.
2. Only on specific work units (such as in ICT Unit) that have Standard Operational Procedures on IT governance.
3. In some work units at the University of Lampung, the division of tasks that related to IT (e.g.: taking care of websites, taking care of certain applications to assist business processes) is still unclear.

b. Gap Analysis on Ensure Benefits Delivery (EDM02) Process

Here are some gap analysis on the EDM02 domain about the process of ensuring benefits delivery:

1. The use of existing IT to facilitate the main business processes (community service, research, and education) at the University of Lampung has not been maximized, for example in some work units at the University of Lampung already have their own website but the content of the website still does not contain the latest information from the work unit.
2. Evaluation activities on how effective organizational strategies and IT strategies have been integrated and aligned have not been done periodically.

c.   Gap Analysis on Ensure Risk Optimization (EDM03) Process

Here are some gap analysis on the EDM03 domain about the process of ensuring risk optimization:
1. Standard Operational Procedures about IT risk management is still not completed yet by UPT ICT University of Lampung.
2. There is no evaluation of risk management activities because the Standard Operational Procedures about risk management have not been completed.
3. There is no reporting of risk management issues to the board or executive committee.
4. Frequent of power outages that can cause hardware damage.

d.   Gap Analysis on Ensure Resource Optimization (EDM04) Process

Here are some gap analysis on the EDM04 domain about the process of ensuring resource optimization:
1. The number of human resources to manage and develop IT (IT Expert) in some work units of University of Lampung is still limited, so there are some employees/staff perform double duty or gets excessive duty.
2. Lacks the ability to manage excessive human resources but lacks IT skill in some work units at the University of Lampung.
3. Lack of access point and slow internet connection due to the number of users although the internet ratio at the University of Lampung has exceeded the internet accessibility sufficiency ratio established by Dikti.

e.   Gap Analysis on Ensure Stakeholder Transparency (EDM05) Process

Here are some gap analysis on the EDM05 domain about the process of ensuring stakeholders transparency:
1. There is no clear communication between internal stakeholders and external stakeholders or between internal stakeholders in Lampung University because of the lack of certain media (such as information system that is only intended for the community of Lampung University) to communicate between stakeholders.
2. Communication between stakeholders has not been well documented because it only uses social media.
3. The needs of different stakeholders have not been fully met, for example the needs of external stakeholders such as the needs of other organizations / companies about the media or sources of information about cooperation offered by the University of Lampung.

3.5   Phase 3 – Recommendation

Based on the findings and gap analysis, a plan and solution for improving information technology governance in Lampung University was developed. The plans and solutions are addressed for the selected domain in this study such as EDM01, EDM02, EDM03, EDM04, and EDM05. The repair solution plan is an improvement recommendation from each domain that has been audited to achieve the expected level (in general, at level 4). Here are some recommendations on each domain process:

a. Recommendation for EDM01 (*Ensure Governance Framework Setting and Maintenance*) Domain

The current capability level for the EDM01 domain in the University of Lampung is 3.6, while the expected capability level is level 5, the recommendation is to meet the gap capability level, such as creating a specific list of IT-related duties, creating Standard Operational Procedures about IT governance that can be applied to all work units at the University of Lampung, and creating a list of tasks related to IT and its division (e.g. taking care of website, taking care of specific application to assist business process) at each work unit at University of Lampung.

b. Recommendation for EDM02 (*Ensure Benefits Delivery*) Domain

The current capability level for the EDM02 domain in the University of Lampung is 3.79, while the expected capability level is level 4, the recommendation is to meet the gap capability level, i.e. maximizing the utilization of existing IT to facilitate the main business processes at the University of Lampung, conducting evaluation activities on how effective organizational strategies and IT strategies have been integrated and aligned to maximize the benefits that can be obtained by Lampung University, and allowing and considering stakeholder suggestions on IT usage innovations that let Lampung University to respond to new opportunities or challenges, do new business, and improve competitiveness.

c. Recommendation for EDM03 (*Ensure Risk Optimization*) Domain

The current capability value for the EDM03 domain at the University of Lampung is 3.63, while the expected capability level is level 3 but in fact it has not fulfilled some processes at level 3, so the given recommendation are giving time limits for completion of Standard Operational Procedures about IT risk management, conduct reporting of risk management issues to the board or executive committee, overcome the risk of power outages by providing backup power supply such as by using solar power, and performing back-up and recovery data on a regular basis.

d. Recommendation for EDM04 (*Ensure Resource Optimization*) Domain

The current capability level for the EDM04 domain in the University of Lampung is 3.46, while the expected capability level is at level 4, the recommendation is to meet the gap capability level, such as held the recruitment of human resources to manage information technology at Lampung University by following the needs and rules applicable at the University of Lampung, provide regular training to IT employees to improve their quality and ability, adding some access points in several locations at the University of Lampung, and increasing bandwidth to deal with slow connections.

e. Recommendation for EDM05 (*Ensure Stakeholder Transparency*) Domain

The current capability level for the EDM04 domain in the University of Lampung is 3.43, while the expected capability level is at level 5, the recommendation is to meet the gap capability level, i.e. developing communication media or information systems for internal and external stakeholders for communication between stakeholders (e.g. IS-parent, IS-internal, IS-cooperation, IS-alumni, and others); for communication between internal stakeholders, such as in the Faculty of Engineering, solutions for middle-to-bottom employees who do not understand faculty budget issues is SIMPAN (Budgetary Management Information System), then applications such as SIMPAN can be developed to be used by other work units; conduct the periodic monitoring of communications between internal stakeholders and external stakeholders; and trying to meet the needs of all stakeholders in Lampung University.

4   Conclusions

From the result and the discussion, it can be concluded that based on the capability level, Lampung University's capability in managing information technology on EDM (evaluate, direct, and monitor)

domains generally leads to level 4, but the achievement in each process has not been fulfilled yet Which is expected by the University of Lampung.

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