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# Information Technology Governance Audit In E-Learning using Cobit 2019 Framework (Case Study: Langlangbuana University Bandung)

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## Abstract

To control the level of successful implementation of software, a governance audit is carried out using audit tools that are applicable in the community so that the audit results become a barometer for management in decision-making. With the development of technology and the existence of regulations issued by the Ministry of Education, Culture, Research and Technology that require distance learning (PJJ), the University of Langlangbuana Bandung requires PJJ to use self-developed E-Learning. In the implementation of E-Learning that is already running, a measurement is needed to determine the level of success. The tool that is widely used to conduct Information Technology Audits is COBIT 2019, which is the background for choosing a governance audit using COBIT because the implementation of international standard IT frameworks can produce measurements and recommendations for good IT management. IT governance by implementing the IT Framework is necessary so that technology performance can still be relied upon and optimal good governance. The audit results are expected to describe governance regarding policy implementation, Information Technology infrastructure, and services in the use of E-Learning using APO02-Manage Strategy, BAI09-Manage Asset, and DSS01-Manage Operation with the 2019 COBIT Framework. So that it can calculate the gap between the current capability level with the target capability level in E-Learning. The final conclusion can provide recommendations to the management of Langlangbuana University in terms of managing strategy, managing assets, and managing operations as material for decision-making.

## Keywords:

E-Learning, COBIT 2019, Process Domain

## Introduction

Technology is currently growing rapidly, one of which is computers and information. In the midst of this pandemic outbreak, all tertiary institutions are using a computer-based learning system in the form of e-learning. Langlangbuana University (UNLA) is a tertiary institution in the field of education, so it is important to carry out a governance audit as a guarantee of independence and objectives and consultations designed to add value and improve organizational operations. The application of information technology (IT) in Indonesia is recommended by the Government of the Republic of Indonesia in government agencies to improve services to the community in accordance with the Regulation of the Minister of

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Communication and Informatics Number: 41/PER/KOMINFO/2007, which states that "to support the objectives of administering public service governance, planning good IT management and good communication (good governance)". The method used in assessing this is the COBIT 2019 Framework. The reason the author chose COBIT 2019 is because it has several advantages, namely being effective and efficient, related to relevant information, and related to the availability of information when needed by current and future business processes (Zuraidah, 2020).

UNLA Bandung is a tertiary institution in the field of education. The aims and objectives to be realized by management in providing efficient, advanced, and independent learning UNLA Bandung has the use of data innovation that can help the daily activities of organizations only in correspondence with the network. What is happening now is that evaluation is being used with human reasoning that is expert in the evaluation, which allows for misalignment between business goals and information technology goals. The application of information technology at UNLA in 2012 used information technology that was first developed, namely SIAK (Academic Information System), and in early 2019, Langlangbuana University developed e-learning for the teaching and learning process amid a pandemic outbreak. So that an e-learning governance audit is needed as a recommendation from P3TI (Management, Development, and Information Technology Services) of Langlangbuana University to find out whether the use of e-learning is in accordance with what is expected of Langlangbuana University.

The reason for choosing the object is to find out the optimization of the use of e-learning in the teaching and learning process at Langlangbuana University, Bandung. It is necessary to conduct a governance audit. The background to choosing a governance audit using COBIT is that the implementation of international standard IT frameworks such as Control Objectives for Information and Related Technology (COBIT) can produce measurements and recommendations for good IT management. IT governance by implementing the IT Framework is necessary so that technology performance can still be relied upon for optimal governance.

Rahmawati (2008) states that information technology is "any integrated method or tool used to collect data, process it, and send or present electronic information in various formats that are useful to users." Wardiningsih (2009) states that information technology is "a combination of computer technology (hardware and software) with communication technology (data, image, and voice networks)." Pratama (2013) states that information technology is "technology that assists in work related to information processing." From the three opinions above, it can be concluded that information technology is a set of computer technology tools and connected communication technology that has tasks such as creating, processing, manipulating, and disseminating data and information so that it is useful for users.

Information Technology Governance (IT Governance) Adityamarwan (2012) defines information technology governance as "a form of executive and board of directors responsibility that concerns leadership, organizational structure, and processes that ensure that corporate IT survives and expands corporate strategy and achieves corporate goals." Hanum (2011) states that information technology governance is "an integrated part of the successful management of the company with guaranteed efficiency and effectiveness of measurement improvements in relation to corporate processes. IT governance enables companies to gain full advantage over information, maximum profits, capital, opportunities, and competitive advantages when competing. Hilmawan et al. (2015) define information technology governance as "the activity of establishing the rights of decision makers and an

accountable framework (accountability framework). Information technology governance includes the cultures, organizations, arrangements, and practices that result in a system of oversight and transparency in the use of IT." From the three definitions above, it can be concluded that information technology governance is a policy structure that is implemented that contains control over the use of information technology to ensure support for achieving goals in organizations, agencies, and companies.

The Internet was first created by the Advanced Research Projects Agency (ARPA) in 1969. At that time, the Internet was still a computer network, which was later named the ARPANET. This term became the origin of the formation of the internet network that is popular today. Then, in the 1980s, the internet began to be used by a limited circle with the aim of connecting various popular campuses or universities in the United States. Understanding the concept of E-Learning or electronic learning, there are several expert opinions. According to Allan J. Henderson (2003), e-learning is defined as distance learning using computer technology, commonly called the internet. Jaya Kumar C. (2002) defines "e-learning as any learning using electronic circuits (LAN, WAN, or internet) to convey learning content, interaction, or guidance. Kamarga (2000) defines e-learning as teaching and learning activities that are delivered through electronic computer devices that obtain learning material according to needs. Harton (2003) defines e-learning as web-based learning that can be accessed via the internet. From the four definitions above, it can be concluded that e-learning is a teaching and learning process with the concept of the internet and a portal that contains information about learning.

COBIT (Control Objectives for Information and Related Technology) 2019 COBIT (Control Objectives for Information and Related Technology) is a framework created to make it easier for an organization to become a guideline and reference in carrying out IT governance processes. COBIT was developed by the IT Governance Institute (ITGI), which is part of the Information Systems Audit and Control Association (ISACA). ISACA is an international organization that develops information technology governance for organizations. One of them is COBIT (Control Objectives for Information and Related Technology), which is a collection of documentation and guidelines for implementing and managing good information technology governance within companies to assist management, references in conducting audits and helping users bridge the gap between business risks, control requirements, and other technical issues (ISACA). ISACA, 2012 The 2019 COBIT Framework consists of the Governance of the Enterprise IT domain, namely the EDM (Evaluate, Direct, and Monitor) domain, and the Management of the Enterprise IT domain, which consists of APO (Align, Plan, and Organize), BAI (Build, Acquire, and Implement), DSS (Deliver, Service, and Support), and MEA (Monitor, Evaluate, and Assess).

COBIT 2019 enables management in an organization to understand information technology governance systems, which are useful for increasing corporate value, COBIT can also assist management in making decisions and controlling processes so that they can protect company assets through the development of IT governance. The COBIT 2019 framework is the latest version updated after COBIT 5.0, which was developed by ISACA and contains guidance on IT governance and management in organizational business processes. Along with the times and information technology in a company, it is the main reason for supporting the growth of a company. In releasing COBIT 2019, ISACA not only added several new elements to the framework but also updated aspects of COBIT 5.0 to suit the needs of information technology governance in the modern era. Thus, COBIT 2019 can be a reference and guide for managing technology governance because it has been developed and integrated for more than

25 years. COBIT 2019 builds on new insights from science and operationalizes those insights in practice. (ITGI, 2020. COBIT 5 vs. COBIT 2019) Governance and management objectives within the 2019 COBIT framework consist of five domains, namely:

1. In EDM (Evaluate Direct Monitor), the governance area evaluates strategic options, then provides direction to senior management on the selected strategic options and monitors the achievements of the selected strategies. Consists of five processes.
2. APO (Build, Acquire, Implement) discusses the overall organization, strategy, and supporting activities for information technology. Consists of 14 processes.
3. BAI (Build Acquire Implement) discusses how to define, acquire, and implement information technology solutions and their integration into business processes. Consists of 11 processes.
4. DSS (Deliver Service Support) discusses six operational delivery processes and information technology service support.
5. MEA (Monitor Evaluate Assess) discusses four processes, namely monitoring the performance and suitability of information technology with internal performance targets, internal control objectives, and external requirements.

In Adhitya, Mulyana, and Mulyana's research (2019), the 2019 COBIT Framework has five domains, which are as follows:

1. Evaluate, Direct, and Monitor (EDM) This domain, the governance area, evaluates strategic options, directs senior management on selected strategic options, and monitors the achievement of strategies.
2. Align, Plan, and Organize (APO) addresses the overall organization, strategy, and support activities for IT.
3. Build, Acquire, and Implement (BAI): define, acquire, and implement information technology solutions and their integration into business processes.
4. Deliver, Service, and Support (DSS) discusses the operation and support of information technology services, including security.
5. Monitor, Evaluate, and Assess (MEA) discusses information technology performance monitoring and compliance with internal performance targets, internal control objectives, and external requirements.
6.

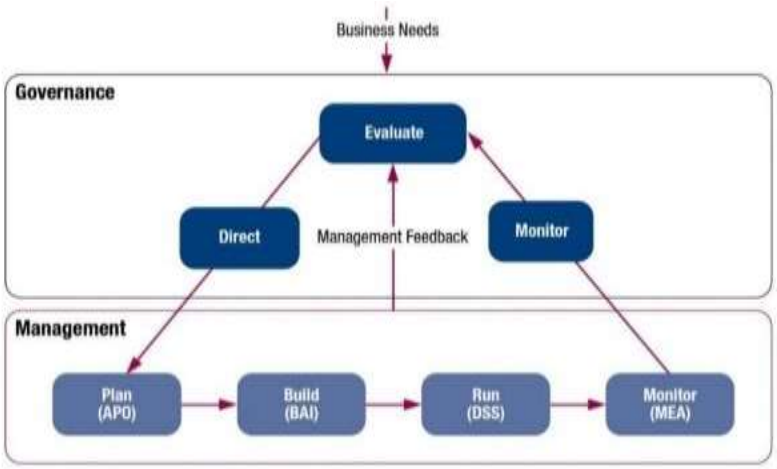



Figure 1. Scope of COBIT 2019 COBIT 2019 Framework: Introduction and Methodology, 2018

In Dasyolanda Manullang's research (2021), mapping the 2019 COBIT domain and selecting the domains to be analyzed using the 2019 COBIT Cascade goals as shown in Figure 2.

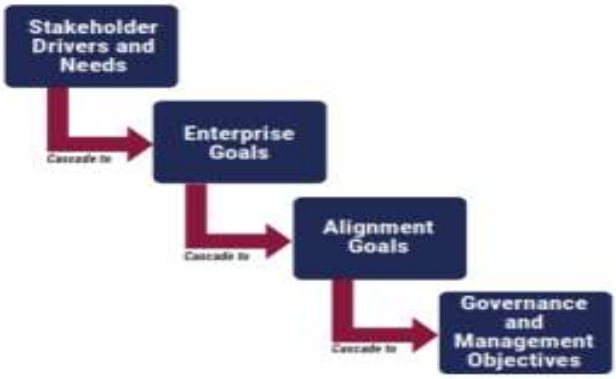



Figure 2. *Goals Cascade* COBIT 2019 Sumber: ISACA(2018)

The four stages in the COBIT 2019 Goals Cascade are as follows:

1. Determination of stakeholder drivers and needs Stakeholder needs must be transformed into company goals and strategies that can be followed up. In this case, the goal is the vision, and the target is the company's vision. Strategy is the set of steps taken to achieve a goal. The implemented strategy is mapped out based on a confidential progress report outline document provided by the company with read access.
2. Enterprise Goals Furthermore, various existing company goals are then confirmed, reduced, added, updated, and clarified to become company goals. COBIT 2019 utilizes the Balance Score Card (BSC) model in setting company goals. The BSC model states that company goals should pay attention to a balance between four things: the financial side, which is the main concern of investors and shareholders; the customer side, which is the party that will receive or buy the company's products or services; the internal side, which states the business processes that occur within the company; and the HR side, which is termed learning and growth.
3. Alignment Goals This stage is a stage with updated terms and improvements from COBIT 5, which aims to avoid the misunderstanding that often occurs when company goals that have been mapped previously only display the IT department purely. Alignment Goals aims to ensure that the IT goals in the IT department do not differ from those of the company. At this stage, alignment between company goals and IT goals is carried out. This stage is a stage with updated terms and improvements from COBIT 5, which aims to avoid misunderstandings that often occur where company goals that have been mapped previously only display the IT department purely. Alignment Goals aims to ensure that the IT goals in the IT department do not differ from those of the company. At this stage, alignment between company goals and IT goals is carried out.
4. Governance and management objectives The final stage maps the alignment goals into the 2019 COBIT governance and management objectives.

**Calculating Maturity Level Capability Maturity Model Integration (CMMI) Method**

In A.A. Mohamad's research, Mulyana Dicky R. Mulyawan Ali (2019), At COBIT 2019, the concept of measuring the implementation of governance and management of information technology used is COBIT performance management, which is in line with CMMI V2. The capability level applies to the achievement of information technology performance in institutions and process improvement in individual practice areas. Capability Maturity Model Integration (CMMI) is a continuation of the Capability Maturity Model (CMM), which was released in the late 1990s. CMMI is a framework that can be used to improve the performance of an organization or business processes within an organization. Initiate, manage, define, quantitatively manage, and optimize are CMMI framework levels. Figure 3 shows the Process Capability Level from COBIT 5 and COBIT 2019. Shown in Figure 3.

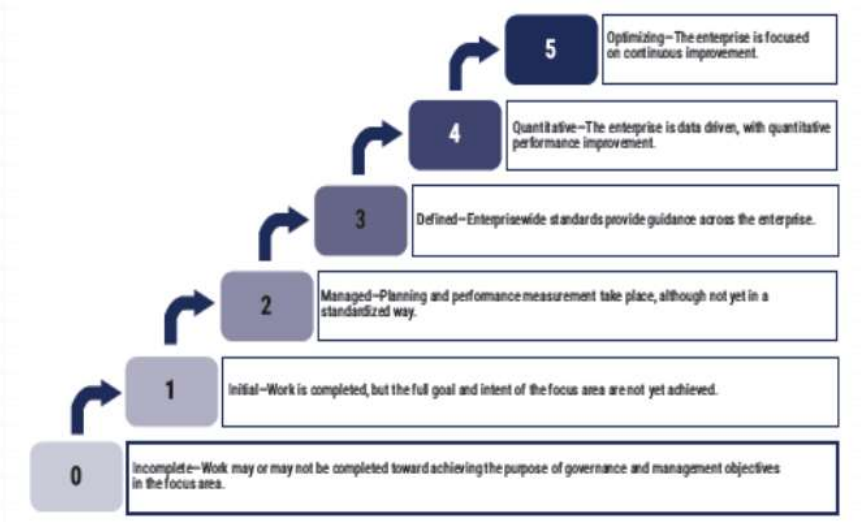



Figure 3. COBIT 2019 capability, Source ISACA

After determining which COBIT 2019 process domains will be analyzed to create a questionnaire according to the activities of each sub-domain, The answer choices on the questionnaire use the level of agreement, with a range of values from zero (0) to five (5). Questionnaires will be distributed to two respondents, namely the leaders and managers of the company's IS/IT, and five respondents as representatives of each of the selected company's three IS/IT users. The answers to the questionnaire results will be processed to obtain the capability level of IS/IT governance with Formula 1.

$$\text{Index Kapabilitas} = \frac{\text{Total Bobot Sub-Kontrol}}{\text{Total Aktivitas pada Sub-Kontrol}} \qquad (1)$$

**Gap Analysis**

Gap analysis, or gap analysis, is defined as a comparison of actual performance with potential or expected performance. Gap analysis is used to evaluate a business by comparing the company's current performance with previously targeted performance and determining what steps are needed to reduce the gap and achieve the desired conditions in the future. This analysis

model is based on consumer assumptions by comparing company performance with consumer expectations and standards. (Stolzer et al., 2011)

The method or steps of gap analysis are as follows:

1. Identify the current situation. Knowing and understanding the current situation or business process will make it easier to arrange and realize expectations. And can see all the developments that have been achieved, so that business goals will be easily achieved.
2. Identify the future situation. Knowing and understanding the target in the future is a good thing, and to achieve it, various efforts need to be made by setting targets and knowing where to go. When conducting a gap analysis to plan a future strategy, you must ensure details. The right place to see the future situation and the targets set can be in the short term or the long term.
3. Identification of gaps After knowing where to start and where to end, the distance between the two points is called a cedlah, or gap, and one can then dig deeper and determine the details of why the gap exists.
4. Identify the right solution. When finished, conclude the problems or gaps that occur. What can be done from these conclusions is to find solutions to the gaps that occur. These solutions must be formulated into a final plan that is clear, structured with a certain timeframe, and fast and precise.

After measuring and obtaining the IT governance capability level, the next step is to calculate the gap value, which is the difference between the expected capability level (a questionnaire filled out by leaders and IS/IT managers) and the current level of capability (a questionnaire filled out by users as representatives of IS/IT users), as shown in formula 2.

$$Gap = X - Y \qquad (2)$$

With X being the expected maturity level and Y being the current maturity level. This gap analysis was carried out to identify activities and provide suggestions in the form of recommendations for improving Langlangbuana University's IS/IT so that its governance can achieve the expected level of capability.

## Methodology

This stage describes a series of research stages or how to solve problems in this research process. The research methodology consists of planning stages, domain selection, data collection stages, analysis stages, and recommendations based on the results of the analysis. The research methodology used is illustrated in Figure 4.

### *Planning Stage*

The initial step in this research is to carry out the planning stage. The planning stage consists of two parts: formulating the problem and studying the literature.

1. Formulate the problem. In this stage, the formulation of problems related to governance audits in e-learning is carried out. With the formulation of the problem, it will become a guide for the writer to reach the final goal as expected. Technology governance audits on e-learning at Langlangbuana University have never been carried out, so the authors conducted a governance audit on e-learning to find out whether the use of e-learning has been running optimally and to find out whether

policies, strategies, and services are running according to the SOP (System Operational Procedure) that has been determined by Langlangbuana University management.

2. Literature Study In this stage, studies are carried out on various pieces of literature relevant to the thesis study. Literature study is carried out by:
   a. Read journals related to the research topic.
   b. Studying literature related to COBIT 2019, which is officially sourced from ISACA
   c. Data search related to internet research

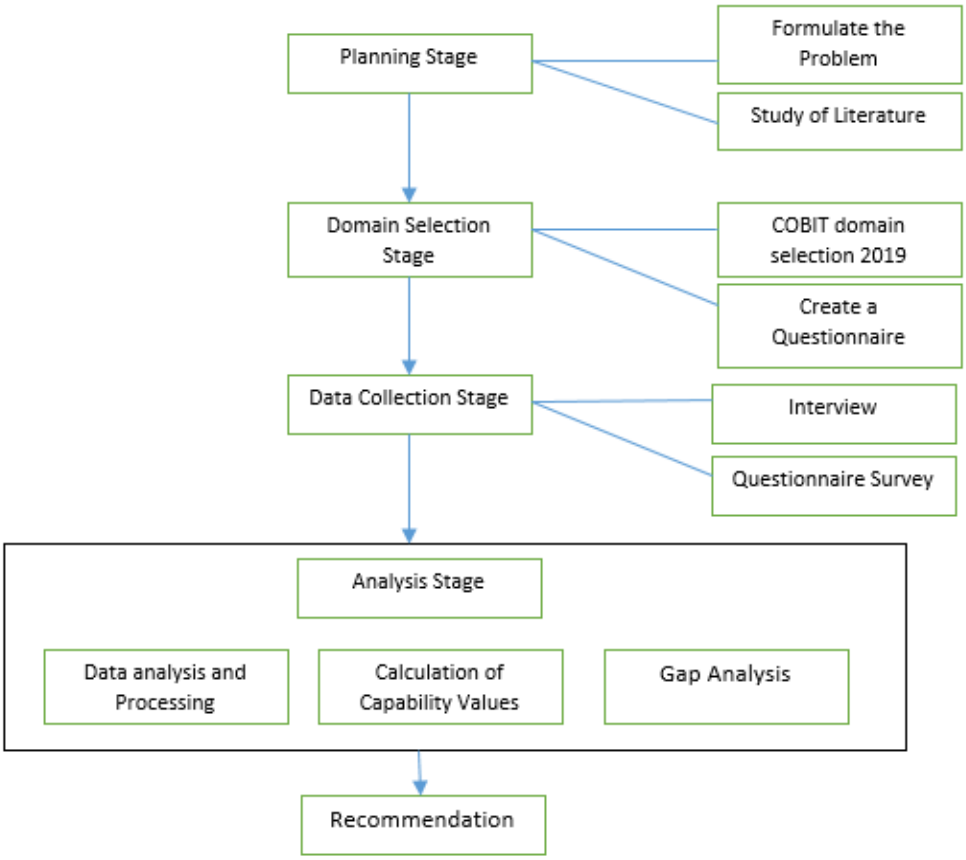



Figure 4. Research Stages

***Domain Selection Stage***

In the second stage, namely the 2019 COBIT domain selection stage, the reason for selecting the COBIT framework in conducting this research is that the implementation of international standard IT frameworks such as Control Objectives for Information and Related Technology (COBIT) can produce measurements and recommendations for good IT management. suitable for auditing governance, in the domain selection stage, there are two stages, namely:

1. COBIT 2019 domain selection In this stage, selecting the COBIT 2019 domain that is in accordance with the needs and constraints faced and determining the appropriate domain are determined together with the P3TI Chair. In this case, the chairman of P3TI and the management of Langlangbuana University chose the APO02 domain, Manage Strategy, to audit policies regarding the implementation of e-learning and determine whether they were in accordance with what management expected. Then, the management and chairman of P3TI chose the BAI09 domain, Manage Assets, to audit whether existing infrastructure at the University of Langlangbuana is being used or

according to what is needed for the implementation of online learning. Finally, the management and chairman of P3TI chose the DSS01 to find out whether the e-learning services held at Langlangbuana University were running well. The selection of the domain is in accordance with the enterprise goals that are adjusted to the strategic plan (Renstra) and information technology blueprint at Langlangbuana University.

2. Create a questionnaire according to the selected COBIT 2019 domain. In this stage, create a questionnaire according to the previously selected domain, namely the domains APO02 (manage strategy), BAI09 (manage assets), and DSS01 (manage operations), in accordance with the provisions of COBIT 2019, which are contained in the official ISACA book.

***Data Collection Stage***

In the third stage, there is a data collection stage consisting of:

1. Interview : Interviews with each leadership representative from the Langlangbuana University Information Technology Service Management Center who will be asked about the domain to be studied in accordance with the problem at hand For the APO02 domain, Manage Strategy, an interview was conducted with the Head of P3TI regarding policy, and for the BAI09 domain, Manage Assets, an interview was conducted with the Head of Section. Hardware and conducting interviews for the DSS01 domain: Manage Operations conducted interviews with the Head of Division. P3TI Software.
2. Questionnaire : Google Forms were used to disseminate open-ended questions to around 40 students regarding assessment services customized using the DSS01—Manage Operations subdomain, and to roughly 10 lecturers regarding DSS01—Manage Operations questionnaire to find out whether Langlangbuana University's e-learning services were running well. The lecturer then filled out a policy questionnaire using the APO02 sub-domain assessment, and finally lecturers were asked to fill out a questionnaire about infrastructure using the BAI09 sub-domain assessment. The reason for choosing student-representative respondents is that students are users, and lecturers are also users and know about the state of infrastructure and service policies regarding the implementation of e-learning. The determination of the number of respondents is representative of all users. To assess services using the DSS01 subdomain, 43 respondents consisted of ten (10) lecturers, three (3) SI/TI managers, and thirty (30) students. To assess the policy using the APO02 sub-domain, ten (10) lecturers and three (3) SI/TI managers were involved, and finally, the infrastructure assessment involved ten (10) lecturers and three (3) SI/TI managers. Because SI/TI lecturers and managers know about policies, infrastructure, and services at Langlangbuana University

***Analysis Stage***

In the analysis phase carried out, there are several steps carried out, namely as follows:

1. Data Analysis and Processing In this stage, the data that has been collected from the results of the questionnaires and interviews is processed by analyzing the data processing, which consists of several processes, namely changing the Google form to Excel so that it can be easily processed for calculating the results of the questionnaires and interviews.
2. Calculation of Capability Value In this stage, the data that has been processed is then used to calculate the achievement capability value at what level in each domain being audited.

3. Gap analysis In this stage, the capability level value that has been obtained at this time will be compared with the level value to be achieved. In this way, it will be possible to identify which processes need improvement and where gaps occur.

### *Making Recommendations*

After all stages have been completed, namely conducting an assessment, calculating capability, and conducting a gap analysis, it will proceed to the stage of making recommendations to achieve the expected level.

## Results and Discussion

In this stage, the researcher will discuss policies and strategies for e-learning implementation using the APO02 Manage Strategy subdomain, discuss information technology infrastructure using the BAI09 Managed Asset domain, and discuss services using DSS01 Managed Operations. Next, it will explain the results of data from questionnaires and interviews, calculating capability and analyzing gaps, along with their recommendations. And the stages will be explained as follows: In determining the governance audit domain for the use of e-learning at Langlangbuana University, especially the Information Technology Development and Service Center (P3TI), we refer to the UNLA Information Technology Development blueprint, which includes:

1. Policy aspects In early 2020, the Ministry of Education and Culture rolled out an independent campus policy that, among other things, relates to the higher education accreditation system. With the existence of an automatic re-accreditation program, it will be facilitated by the existence of an information system, both academic and non-academic. Through this information system, universities can monitor and evaluate each study program through quality assurance for the feasibility of re-accreditation, including institutional re-accreditation.
2. Technical Aspects The Revolutionary Era 4.0 requires every tertiary institution to apply and expand learning through e-learning without reducing its quality. Even though it is done online, the university continues to make various efforts to expand the application of e-learning in lectures. So far, e-learning still faces obstacles in terms of lecturer capability, both in quality and quantity, even though the university's academic system is capable of implementing it.

The results of compiling the capability level assessment questionnaire for the APO02, BAI09, and DSS01 subdomains can be seen in the appendix. This questionnaire was prepared in Microsoft Excel and Google Forms, which were then distributed and filled out by research respondents, namely management and SI/TI managers and student and lecturer representatives who used e-learning services, infrastructure, and policies at Langlangbuana University.

This capability assessment is the expectation of capability in e-learning at Langlangbuana University, which currently has only reached capability level three (3), namely established process. At this level, the process that has been implemented is able to achieve the expected process achievement. e-learning is in accordance with the wishes of management or P3TI (Development Center, Information Technology Services) of Langlangbuana University,

namely at capability level four (4) (predictable process), at this level the process that has been carried out above within the superiors is determined to achieve the desired achievement. because the rules of PJJ or distance learning require that every university not leave e-learning as teaching and learning materials so the use of e-learning must run optimally both from policies using Sub Domain APO02 (Manage Strategy), infrastructure using Sub Domain BAI09 (Manage Assets), and services using Sub Domain DSS01 (Manage Operation).

Table 1. Expected Capability in E-Learning at Langlangbuana University

| No | Sub domain | Name sub domain | Value capability |
|---|---|---|---|
| 1 | APO02 | *Align, Plain, and Organise* | 3,90 |
| 2 | BAI09 | *Build, Acquire, and Implement* | 4,30 |
| 3 | DSS01 | *Deliver, Service and Support* | 4,20 |
| **Capability Level Ekspected** | | | **4,13** |

Information System and Information Technology Manager There are three (3) management representatives of information systems and information technology to assess policies, infrastructure, and services at Langlangbuana University e-learning; this data collection is in the form of interviews. The recapitulation of all respondents involving lecturers, managers of information systems and information technology, and students were taken on average for each domain, as shown in Table 6 for the average capability assessment of subdomains.

Table 2. Recapitulation of Respondents and Current Capability

| No | Sub Domain | Respondents | Total Respondents | Current Capability Level | Summary |
|---|---|---|---|---|---|
| 1. | APO02 - Manage Strategi | Lecturer | 10 | 3,38 | 3,03 |
| | | SI/IT manager | 3 | 2,68 | |
| 2. | BAI09 - Manage Asset | Lecturer | 10 | 3,40 | 3,16 |
| | | SI/IT manager | 3 | 2,91 | |
| 3. | DSS01 - Manage Operation | Lecturer | 10 | 3,54 | 3,45 |
| | | SI/IT manager | 3 | 3,32 | |
| | | Student | 30 | 3,48 | |

The results of all respondents, both lecturers, managers of information systems and information technology, and students, obtained a capability value from each sub-domain, namely for policy assessment using the APO02, Manage Strategy sub-domain, obtaining a capability value of 3.03; for infrastructure assessment using the sub-domain BAI09, Manage Asset, obtaining a capability value of 3.16; and for service assessment using the DSS01 sub-domain, Manage Operation, obtaining a capability value of 3.45.

Table 3. Expected capability and current capability

| No | Sub Domain | Ekspected Capability Level | Current Capability Level |
|---|---|---|---|
| 1. | APO02 - Manage Strategi | 4,12 | 3,03 |
| 2. | BAI09 - Manage Asset | 4,09 | 3,16 |

| | | | |
|---|---|---|---|
| 3. | DSS01 - Manage Operation | 4,20 | 3,45 |

From the table above, it can be seen that the expectation of capability to be achieved by assessing the APO02: Manage Strategy subdomain is 4.12, BAI09: Manage Assets is 4.09, and DSS01: Manage Operations is 4.20.

After the results of the capability level assessment were obtained from processing the questionnaire data, the current capability level value indicated the attainment level at Langlangbuana University. To find out how many gaps (distances) exist between the measurement results of the predetermined capability level and the level that has been targeted by Langlangbuana University. The table below shows the gap between the current level and the target level for the APO02-Manage Strategy subdomain for assessing policies on e-learning at Langlangbuana University. Assessment of the gap with the results of a questionnaire from lecturers By means of calculations

$$Gap = X - Y \qquad (2)$$

With X being the expected maturity level and Y being the current maturity level. This gap analysis was carried out to identify activities and provide suggestions in the form of recommendations for improving Langlangbuana University's IS/IT so that its governance can achieve the expected level of capability.

Table 4. Summary of APO02 Subdomain Gaps

| **No** | **Sub aktifitas** | **Name kontrol** | ***Expected capability*** | ***Current capability*** | **Gap** |
|---|---|---|---|---|---|
| 1 | APO02.01 | Understand the context and direction of the company. | 4,25 | 3,31 | 0,94 |
| 2 | APO02.02 | Assess ability, performance, and maturity. | 4,50 | 3,27 | 1,23 |
| 3 | APO02.03 | Set digital capability targets. | 4,00 | 3,17 | 0,83 |
| 4 | APO02.04 | Do a gap analysis. | 4,20 | 3,17 | 1,03 |
| 5 | APO02.05 | Define a strategic plan and road map. | 4,00 | 3,22 | 0,78 |
| 6 | APO02.06 | Communicate I&T strategy and direction. | 3,75 | 3,12 | 0,63 |
| Capability Level Domain APO02 | | | 4,12 | 3,21 | 0,91 |

The results of the overall assessment of users consisting of lecturers, students, and managers of information systems and information technology for the assessment of the APO02 sub-domain, Manage Strategy to Assess Policies, with the expectation capability of Langlangbuana University management of 4.12 and ratings from lecturer users, students, and system managers of information systems and information technology at 3.21, show a gap of 0.91 to achieve the capability expected by management

For the infrastructure assessment of all users, lecturers, students, and managers of information systems and information technology, there is a gap between the capability expected by management and the capability value of the users, as shown in Table 5.

Table 5. Summary of Gaps in BAI09 Sub-Domains

| No | Sub activity | Name kontrol | Expected capability | Current capability | Gap |
|---|---|---|---|---|---|
| 1 | BAI09.01 | Mengidentifikasi dan mencatat asset | 4,17 | 3,30 | 0,87 |
| 2 | BAI09.02 | Mengelola Aset Penting | 4,13 | 3,27 | 0,86 |

| No | Sub activity | Name kontrol | Expected capability | Current capability | Gap |
|---|---|---|---|---|---|
| 3 | BAI09.03 | Mengelola Siklus Hidup Aset. | 4,00 | 3,24 | 0,76 |
| 4 | BAI09.04 | Mengoptimalkan Nilai Aset | 4,17 | 3,27 | 0,90 |
| 5 | BAI09.05 | Mengelola Lisensi | 4,00 | 3,34 | 0,66 |
| **Capability Level Domain BAI09** | | | **4,09** | **3,28** | 0,81 |

The results of the overall assessment of users consisting of lecturers, students, and managers of information systems and information technology for infrastructure assessment with the BAI09 - Manage Asset subdomain to assess infrastructure with the capability of Langlangbuana University management expectations of 4.09 and ratings from users of lecturers, students, and managers of information systems and information technology at 3.28 show a gap of 0.81 to achieve the capability expected by management. The last is the recapitulation of service assessments by all users, including lecturers, students, and managers of information systems and information technology, where there is a gap with the expectations desired by management, as shown in Table 6.

Table 6. Summary of Gap in DSS01

| **No** | **Sub activity** | **Name kontrol** | **Expected capability** | **Current capability** | **Gap** |
|---|---|---|---|---|---|
| 1 | DSS01.01 | Perform Operational Procedures | 4,40 | 3,61 | 0,79 |
| 2 | DSS01.02 | Manage outsourced I&T Services | 4,25 | 3,52 | 0,73 |
| 3 | DSS01.03 | Monitor I&T Infrastructure | 4,00 | 3,58 | 0,42 |
| 4 | DSS01.04 | Manage Environment | 4,33 | 3,55 | 0,78 |
| 5 | DSS01.05 | Manage Facilities | 4,00 | 3,55 | 0,45 |
| **Capability Level Domain DSS01** | | | **4,20** | **3,56** | **0,63** |

The results of the overall assessment of users consisting of lecturers, students, and managers of information systems and information technology, for infrastructure assessment with the DSS01 – Manage Operation subdomain to assess services with the expectation capability of Langlangbuana University management of 4.20 and ratings from users of lecturers, students, and managers of information systems and information technology at 3.56 there is a gap of 0.63 to achieve the capability expected by management.

Recapitulation of the three subdomains APO02 – Manage Strategy, BAI09 – Manage Assets, and DSS01 – Manage Operations to assess the level of capability of policies, infrastructure, and services that are expected by management and users to have gaps and the average of all subdomains as shown in Table 7.

Table 7. recapitulation of gaps in APO02, BAI09 and DSS01 sub domains

| No | Sub activity | Name control | Expected capability | Current capability | Gap |
|---|---|---|---|---|---|
| 1. | APO02 | Manage Strategy | 4,12 | 3,21 | 0,91 |
| 2. | BAI09 | Manage Asset | 4,09 | 3,28 | 0,81 |
| 3. | DSS01 | Manage Operation | 4,20 | 3,56 | 0,64 |
| Summary Gap | | | | | 0,79 |

From the recapitulation of all subdomains (APO01: Manage Strategy to assess policies, BAI09: Manage Assets to assess infrastructure, and DSS01: Manage Operations to assess

services), the average gap is taken at 0.79. As input to the management of Langlangbuana University, the authors provide recommendations for several points related to policies, infrastructure, and services described in several sub-domains in COBIT 2019. From the results of user capability currently, there is still a gap with the expected capability from management, so the authors make recommendations from the results of values that have not reached management's expected capability as shown in table 8.

Table 8. Recommended Sub Domains APO02, BAI09 and DSS01

| No | Sub Activity | Name kontrol | *Expected capability* | *Current capability* | Gap | Recommended |
|---|---|---|---|---|---|---|
| | **APO02 - Manage Strategy** | | | | | |
| 1 | APO02.01 | Understand the context and direction of the company. | 4,25 | 3,31 | 0,94 | We need to conduct more in-depth outreach to stakeholders who do not yet understand the vision, mission, and business processes of the company. |
| 2 | APO02.02 | Assessing ability, performance, and maturity | 4,50 | 3,27 | 1,23 | Need to socialize All stakeholders can maximize the IT facilities that have been installed. |
| 3 | APO02.03 | Setting digital capability targets | 4,00 | 3,17 | 0,83 | We need to convince stakeholders to implement the information technology blueprint that has been made by the company. |
| 4 | APO02.04 | Conduct gap analysis | 4,20 | 3,17 | 1,03 | It is necessary to carry out an internal assessment of IS/IT developments on a regular basis so as to obtain up-to-date recommendations. |
| 5 | APO02.05 | Determine strategic plans and roadmaps | 4,00 | 3,22 | 0,78 | They need to sharpen and evaluate blueprints regularly so that they can adjust IS/IT developments with technological developments. |
| 6 | APO02.06 | communicate the strategy and direction of I&T | 3,75 | 3,12 | 0,63 | They need to sharpen and evaluate blueprints regularly so that they can adjust IS/IT developments with technological developments. |
| | **BAI09 - Manage Asset** | | | | | |
| 7 | BAI09.01 | Identifying and recording assets | 4,17 | 3,30 | 0,87 | further improved the inventory of IS/IT equipment used by the company. |
| 8 | BAI09.02 | Managing Important Assets | 4,13 | 3,27 | 0,86 | Need to schedule maintenance of important assets such as servers, UPS, etc. related to full-time services |
| 9 | BAI09.03 | Managing the Asset Life Cycle | 4,00 | 3,24 | 0,76 | Requires planning in updating IS/IT so as to get low prices with high quality. |
| 10 | BAI09.04 | Optimizing asset value | 4,17 | 3,27 | 0,90 | Planning is needed in updating IS/IT so that you get low prices with high quality and according to needs. |
| 11 | BAI09.05 | Managing licenses | 4,00 | 3,34 | 0,66 | Further increasing the use of licensed software |
| | **DSS01 - Manage Operation** | | | | | |

| No | Sub Activity | Name kontrol | *Expected capability* | *Current capability* | Gap | Recommended |
|---|---|---|---|---|---|---|
| 12 | DSS01.01 | Performing Operational Procedures | 4,40 | 3,61 | 0,79 | Further improvement in terms of SOP implementation to maintain service improvement |
| 13 | DSS01.02 | Manage outsourced I&T Services | 4,25 | 3,52 | 0,73 | Not too much maintenance using outsourcing only with IT hardware supplier customers |
| 14 | DSS01.03 | Monitoring I&T Infrastructure | 4,00 | 3,58 | 0,42 | Log usage and data backup are more optimized |
| 15 | DSS01.04 | Manage the Environment | 4,33 | 3,55 | 0,78 | Further improve the security system for very important hardware locations |
| 16 | DSS01.05 | Manage Facilities | 4,00 | 3,55 | 0,45 | further improve governance related to electricity resources from installation and backup resources and carry out periodic inspections |

With reference to the recommendations above, the management of Langlangbuana University can make improvements as expected so that the use of e-learning, which includes policies, infrastructure, and services, goes well.

## Conclusion

The conclusions drawn from the results of this research are that the author can describe the governance audit regarding the implementation of policies, information technology infrastructure, and services in the use of e-learning using the APO02-Manage Strategy, BAI09-Manage Asset, and DSS01-Manage Operation with the 2019 COBIT Framework guidelines. can map user capabilities based on general analysis results at Langlangbuana University at the subdomain level APO02: Manage Strategy at level 3.03; BAI09: Manage Assets at level 3.16; and DSS01: Manage Operations at level 3.45. Calculate the gap between the current capability level and a target capability level of less than 1, or only 0.79. Find problems related to management and services that have an impact on E-Learning operations. The author can provide recommendations in the APO02-Manage Strategy, BAI09-Manage Asset, and DSS01-Manage Operation process domains that were agreed upon by UNLA management in order to achieve capability in using e-learning at Langlangbuana University.

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