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Evaluation of Computer Lab at XYZ Institution using BAI & DSS Domains of COBIT 2019

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Abstract : *This research aims to measure the IT governance implementation in the computer laboratory at XYZ Institution using COBIT 2019 framework. Based on the scope and the problems that were identified, BAI and DSS aspects are the domains chosen to measure the implementation of the IT governance. The methods for this research are focus group discussion and field assessment. The BAI and DSS domains consist of 16 objectives, which are then divided into 104 practices and then divided further into 535 activities. These 535 activities are the processes that we have to determine for each capability level. After determining the capability levels for each process, we summarized the values and then evaluated the average values for each objective. These average values are the values that we used to determine the capability levels for each objective. We presented the result of our self-assessment using a radar diagram. XYZ Institution is still in the starting phase of having good IT governance. This condition is reflected by the achievement of each objective's capability levels ranging from 1 to 2. In addition to this condition, there is only one objective that meets the Institution's capability level target of 3.*

Keywords: *bai domain, cobit 2019, computer lab, dss domain, it governance.*

Abstrak : *Institusi XYZ belum pernah melakukan penilaian terhadap implementasi tata kelola TI menggunakan kerangka kerja COBIT 2019 di laboratorium komputer miliknya. Oleh karena itu, penelitian ini bertujuan untuk mengukur tingkat kapabilitas dari pengimplementasian tata kelola TI pada laboratorium komputer milik institusi XYZ menggunakan kerangka kerja COBIT 2019. Berdasarkan ruang lingkup dan permasalahan yang kami identifikasi, domain BAI dan DSS merupakan domain yang dipilih diukur tingkat implementasinya. Metodologi dalam melakukan penelitian ini adalah dengan melakukan focus group discussion dan penilaian lapangan. Domain BAI dan DSS memiliki 16 obyektif, yang terdiri dari 104 praktek yang mana dapat dipecah lagi menjadi 535 aktivitas. Keseluruhan 535 aktivitas ini merupakan proses-proses yang harus ditentukan tingkat kapabilitasnya. Setelah tingkat kapabilitas dari masing-masing proses ini ditentukan, kemudian kami jumlahkan dan dihitung nilai rata-ratanya berdasarkan objektifnya masing-masing. Hasil dari penilaian ini kami presentasikan dalam bentuk diagram radar. Institusi XYZ masih berada dalam tahap awal dalam memiliki tata kelola TI yang baik. Hal ini terefleksi dari pencapaian tingkat kapabilitas dari setiap obyektif yang berada pada rentang nilai 1 hingga 2. Sebagai tambahan, hanya ada 1 objektif yang memenuhi target dari institusi, yaitu memiliki tingkat kapabilitas dengan nilai 3.*

Kata kunci*: cobit 2019, domain bai, domain dss, laboratorium komputer, tata kelola ti.*

1. INTRODUCTION

In this technological era, universities are thriving to increase their quality and performance using information technology (IT). Whether IT implementation can bring benefit to universities or not, it will depend on how well universities are managing and monitoring their IT [12]. As a higher education institution, XYZ Institution would need to ensure that its IT

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implementation has been aligned with its institutional goals. Therefore, XYZ Institution will apply the IT governance framework in order to optimize its IT usage and measure the effectiveness and efficiency of its IT [12].

Information Technology (IT) governance is a structure of procedures and policies designed to ensure that every process within a company aligns with its business objectives by managing existing risks and IT resources [15]. "Productivity paradox" is a term used to indicate when an IT investment is unable to create any business value for the organization. Therefore, a good IT governance is required to ensure that the IT being implemented in the organization is able to add value in business and mitigates any IT risks [5]. This literature review aims to provide an in-depth exploration of the evolving landscape of IT governance, examining current perspectives, seminal works, and emerging trends in the field.

The emergence of IT governance has rapidly become a significant concern within the realm of information technology [1]. Therefore, an IT governance framework is required to provide structured guidance for higher education institutions so they can manage their IT effectively. This framework assists in establishing the necessary policies, processes, and controls to ensure that IT supports the strategic and operational goals of the institution [7]. By using the governance framework, higher education institutions can ensure that IT is used efficiently, IT risks are managed well, and the value of IT is optimized. This includes defining responsibilities, monitoring performance, and adjusting IT strategies in response to changing needs and technologies.

There are a lot of IT governance frameworks that can be used as a reference, such as COBIT, COSO, ITIL, CMMI and FAIR. The COBIT framework is crafted for overseeing and managing information and technology within a business, covering the entire organization, it includes documentation and guidelines to implement IT governance [12],[7]. As a framework, it provides a differentiation between governance and management objectives where each objective will have its own distinct activities, structures, and purposes [7]. Before the emergence of COBIT 2019, COBIT 5 can be used to measure the quality of IT services in educational institutions [8],[12]. As an example, COBIT 5 has been used to measure the maturity level and the performance of Sistem Informasi Akademik (SIAKAD) implementation in Universitas Pembangunan Nasional Veteran Jakarta (UPNVJ) [10].

The year 2018 marked a significant milestone in the COBIT framework's journey, which is the release of COBIT 2019. This update, building upon the success of its predecessor COBIT 5, represents a quantum leap in addressing the contemporary challenges faced by organizations in managing and governing their IT environments. COBIT 2019 is not merely a set of guidelines; it is a strategic tool that assists enterprises in optimizing their information and technology investments, ensuring they align with business goals and effectively manage associated risks. COBIT 2019 can also be used to measure the

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effectiveness of IT controls and IT governance to support business objectives [3]. Therefore, in this research we are using COBIT 2019 because it is the newest COBIT framework from ISACA, and also because COBIT 2019 responded to the newest IT changes and has shown a deep understanding towards good IT governance [13]. As we embark on this exploration of COBIT 2019, it becomes imperative to understand the fundamental principles that underpin its design and how it positions itself as a framework for governance, risk management, and compliance.

Every institution that is being assessed using the COBIT framework will need to provide the necessary information to achieve its goals through the implementation of processes defined in the framework. In order to measure the contributions of IT to an institution, there are a number of COBIT governance and management objectives that have to be achieved [7]. COBIT 2019 divide these objectives into five domains, which are evaluate, direct and monitor (EDM), align, plan and organize (APO), build, acquire and implement (BAI), deliver, service and support (DSS), and monitor, evaluate and assess (MEA) domains. The scope of this research is to measure the IT governance implementation by evaluating on how IT solutions are acquired and implemented in the computer laboratory at XYZ Institution using the BAI domain. In addition, we also measure the level of service and support provided by the computer laboratory using the DSS domain.

XYZ Institution is a higher education institution located in Jakarta, Indonesia. XYZ Institution has chosen COBIT 2019 as its IT governance framework because COBIT 2019 is particularly relevant for implementation in the education sector, where effective IT governance is essential [9]. The scope for this research is limited to the computer laboratory located inside the information technology faculty building and being used by the school of IT. The computer laboratory is headed by the head of the computer lab and assisted by a lab assistant where both of them will be involved in this research.

The computer laboratory was chosen because it is an essential part of the IT school and the XYZ institution has never performed any IT governance self-assessment even though it has invested a significant amount of money for the computer laboratory. Being able to meet the required quality and compliance standards from COBIT 2019 is important because it will indicate that the computer laboratory has managed to align its processes with institutional goals [6]. Therefore this study will help the institution to determine the capability level, which is the level used to rate the COBIT 2019 compliance score, for the computer laboratory.

The COBIT 2019 domains to be scored are limited to BAI and DSS domains only because these two domains are crucial to measure the quality of the IT solutions and IT services provided. Having the knowledge of BAI and DSS domains' capability levels will help the XYZ institution to assess the successfulness of its past investments in its computer laboratory.

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2. METHODS

This research is a descriptive quantitative study utilizing selected instruments and primary data. Primary data is data collected directly by the researcher from the research subject using interviews, questionnaires or Focus Group Discussions (FGD) [14]. In this research, we will be doing FGD with stakeholders from the computer laboratory that includes the computer laboratory assistants and the Head of the computer laboratory. The stages of the research can be observed in the following flowchart.

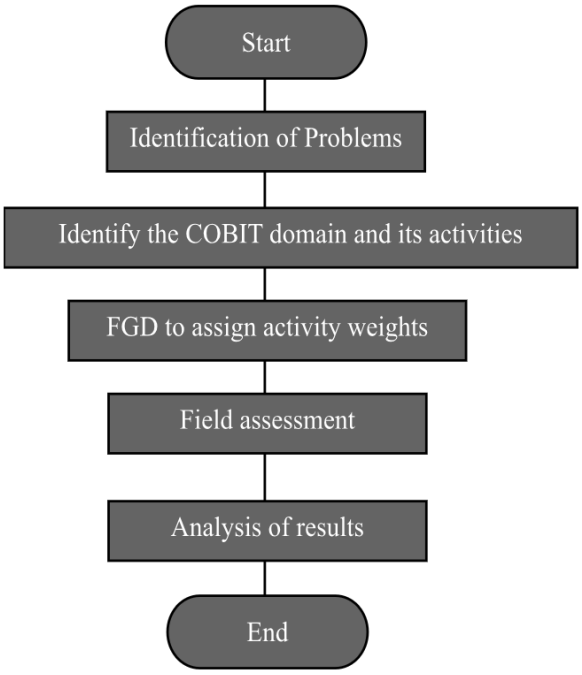

Figure 1. Research Methodologies

2.1 Identification of Problems

At this stage, problem identification is conducted in the computer laboratory of the XYZ institution. Problem identification involves observing the activities carried out in the laboratory and identifying the stakeholders involved.

2.2 Identify The COBIT Domain and Its Activities

The objectives of governance and management in COBIT are grouped into five domains. The governance objectives are grouped within the Evaluate, Direct, and Monitor (EDM) domain. Meanwhile, the management objectives are categorized into four domains: Align, Plan, and Organize (APO), Build, Acquire, and Implement (BAI), Deliver, Service, and Support (DSS), and Monitor, Evaluate, and Assess (MEA). COBIT 2019 offers a methodical approach to identify governance processes within a university and then recommendations for action can be derived [4].

An agreement between the research team and the stakeholders from the XYZ institution has been reached that for this research, the COBIT domains chosen are only the BAI (Build, Acquire, and Implement) domain, which is used to measure how IT solutions are acquired and implemented, and the DSS (Deliver, Service, and Support) domain, which is used to measure the level of service and support provided by the computer laboratory staffs. In this stage, the activities of each domain are collectively determined with stakeholders and aligned with the existing business processes in the computer laboratory of the XYZ Institution.

2.3 FGD to Assign Activity Weights

In this stage, FGD (Focus Group Discussion) is conducted in the form of interviews to assign weights to each activity within the respective domains, involving laboratory stakeholders, namely laboratory

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assistants, and lab heads. Weight assignment is carried out using the level table provided below:

Table 1. Capability Levels for Processes

Level	Description
Level 0	Absence of fundamental capability. An insufficient strategy to fulfill the governance and management objectives. Potentially not aligning with the intentions of any process practices.
Level 1	The objective is somewhat accomplished by employing an incomplete set of activities that can be described as preliminary or intuitive, lacking a high level of organization.
Level 2	The purpose is accomplished by implementing a fundamental, yet comprehensive, set of activities that can be described as executed.
Level 3	The purpose is achieved in a highly organized manner, utilizing organizational assets. The processes are generally well-established.
Level 4	The purpose is successfully attained, the process is clearly outlined, and its performance is quantitatively assessed.
Level 5	The purpose is accomplished, the process is clearly defined, performance is evaluated for enhancement, and there is a commitment to ongoing improvement.

Source : Dikutip dari [7].

2.4 Field Assessment

After the weighting process is completed, the data is processed to assess the effectiveness of IT governance in the computer laboratory.

2.5 Analysis of Results

The final step is the analysis of results which includes the capability level calculation, gap analysis and providing recommendations to XYZ Institution regarding IT governance. Capability level is the level used to measure the current BAI and DSS domain levels that have been achieved by XYZ Institution's computer laboratory [11]. While gap analysis is the difference between the current capability level that has been achieved and the capability level expected by the institution which then will generate a recommendation [11].

3. RESULTS AND DISCUSSIONS

3.1. Self Assessment Scope

The scope for this assessment is the Build, Acquire and Implement (BAI) domain and the Deliver, Service and Support (DSS) domain of COBIT 2019, and the object for the assessment is the computer laboratory at XYZ Institution. The BAI and DSS domains consist of 16 objectives, which are then divided into 104 practices and then divided further into 535 activities. These 535 activities are the processes that we have to determine for each capability level. The Table 2 below describes the objectives of the assessment based on BAI and DSS domains of COBIT 2019.

Table 2. Self Assessment Scope

Domain	Objectives
Build, Acquire and Implement (BAI)	BAI01 Managed Programs BAI02 Managed Requirements Definition BAI03 Managed Solutions Identification and Build BAI04 Managed Availability and Capacity BAI05 Managed Organizational Change BAI06 Managed IT Changes BAI07 Managed IT Change Acceptance and Transitioning BAI08 Managed Knowledge BAI09 Managed Assets BAI10 Managed Configuration BAI11 Managed Projects
Deliver, Service and Support (DSS)	DSS01 Managed Operations DSS02 Managed Services Requests and Incidents DSS03 Managed Problems DSS04 Managed Continuity DSS05 Managed Security Services

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3.2 Capability Levels for Each Objective

The assessment for determining the capability levels for each objective was performed through utilizing selected instruments and conducting Focus Group Discussions (FGD) with stakeholders. The instruments that were verified are standard operating procedure documents (SOPs) for the computer laboratory. While the personnels that were interviewed are the head of the computer laboratory and the computer laboratory assistant.

After determining the capability levels for each process, we summarized the values and then evaluated the average values for each objective. These average values are the values that we used to determine the capability levels for each objective. We present the result of our self-assessment on table 3 below.

Table 3. Self Assessment Result

Objectives	Level Reached	Level Target
BAI01	2	3
BAI02	3	3
BAI03	1.2	3
BAI04	0.2	3
BAI05	0.7	3
BAI06	0.3	3
BAI07	0	3
BAI08	0.5	3
BAI09	1.6	3
BAI10	0	3
BAI11	0	2
DSS01	1.5	3
DSS02	1.2	3
DSS03	1.2	3
DSS04	1.3	3
DSS05	0.6	2

Based on the discussion that we had with the stakeholders, it was agreed that the target for the capability level is 3 except for objective BAI11 and DSS05 that has the target capability level of 2. This is because the objective "BAI11 - Managed Project" is still a new objective that didn't exist in COBIT 5 but existed in COBIT 2019. While for objective "DSS05 - Managed Security Service", XYZ Institution understands that it is still lacking in terms of security and didn't want to set a very high capability level target.

Based on the results shown in table 3 above we can incur that XYZ Institution is still in the starting phase of having good IT governance. This condition is reflected by the achievement of each objective's capability levels ranging from 1 to 2. In addition to this condition, there is only one objective that meets the Institution's capability level target of 3. The self-assessment result is then converted to a radar diagram as shown in figure 1 below for better understanding of the gap analysis result between the current level of achievement against the expected level of achievement.

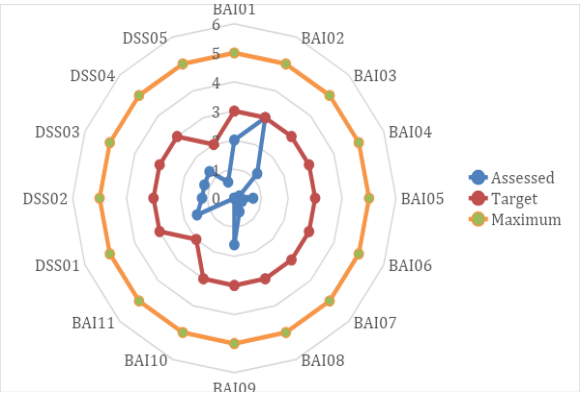

Figure 2. The radar diagram of our COBIT 2019's self assessment result

4. CONCLUSION

There are 8 objectives that have the score between 0 and 1, which are BAI04, BAI05, BAI06, BAI07, BAI08, BAI10, BAI11, DSS05.

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This indicates that the computer laboratory is still lacking a high level of organization in many of its processes, especially in the BAI domains. While 7 other objectives that have the score between 1 and 2 are BAI01, BAI03, BAI09, DSS01, DSS02, DSS03, DSS04. This indicates that the computer laboratory has accomplished a fundamental capability in most of the objectives in the DSS domain. Even though only 3 objectives in the BAI domain have already accomplished this fundamental capability. In addition, there is 1 objective that has met the Institution's capability level target of 3, which is BAI02. This indicates that the computer laboratory is highly organized in managing its requirements definitions.

Based on this assessment, we recommend the XYZ Institution to improve its COBIT 2019 score by revising and updating the policy and procedure documents for the computer laboratory so that those documents will be aligned with the institution's newest business and IT goals. In addition, XYZ Institution needs to establish a document management software, so that all policies and procedures can be easily managed and searched if necessary. Our final recommendation is for XYZ Institution to conduct COBIT 2019 training for the computer laboratory personnels and all relevant stakeholders to help them better understand IT governance.

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