

Information Technology Governance Capability at PT XYZ using COBIT 2019

Jesslyn Kurniawan¹, Wella²

^{1,2}Information System Department, Faculty of Engineering and Informatics, Universitas Multimedia Nusantara, Indonesia

jesslyn.kurniawan@student.umn.ac.id

wella@umn.ac.id

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Abstract— This paper introduces PT XYZ, a management consultancy company located in Jakarta. The company offers a diverse range of information technology products. Hence, an assessment was conducted to evaluate the effectiveness of information technology governance at PT XYZ. The assessment of information technology governance competency is predicated around the challenges frequently encountered by organisations, namely in the domains of project management, IT budget allocation, and the availability of proficient human resources in the field of information technology. The assessment of capability is conducted utilising the COBIT 2019 framework, employing a qualitative methodology. The utilisation of data collection techniques involving interviews and literature review is being employed. The findings from the data collection revealed that three COBIT 2019 domain processes, specifically APO06 - Managed Budget and Costs, APO07 - Managed Human Resources, and BAI11 - Managed Projects, aligned with the issues faced by the organisation. The findings of the capability assessment indicated that the three chosen domain processes, specifically APO06, APO07, and BAI11, were successfully accomplished at level 2, signifying a full achievement. Consequently, the companies received several recommendations for enhancing their information technology governance and attaining a higher level of quality.

Index Terms—Information Technology, IT Governance Capability, COBIT 2019, Recommendations

I. INTRODUCTION

Seeing the changes in this era, the rapid development of existing technology, besides relying only on it, society is also required to develop in a way that makes changes in all aspects of daily activities. That is no exception in organizations. An organization must be able to adapt with this rapidly developing information technology, it can be measured by the success of the organization in utilizing information technology as a tool to support the operational activities of the organization [1]. to support the company's goals to deal with rapid technological advances, companies must be able to utilize the use of information technology effectively and efficiently [2].

Reality the importance of information for an organization can be seen from the amount use of information systems in organizations as tools company operational support. Therefore, one of the supporters running the company's operations is IT governance.

Currently IT or information technology has a significant role in terms operation of an organization due to shifts of roles and relevance information technology in organizations that require more understanding clearly related to information technology governance [3]. As for the cause of ineffectiveness information technology governance in the organization is the occurrence of business losses such as unexpected costs, the quality of the use of information technology, to failure of information technology in providing value to organizations [4]. Therefore, organizations need to conduct remedial audits for technology governance information. Audit itself is an activity to collect data and evaluate data related information to establish and report levels conformity between existing information data with existing audit criteria its provisions [5]. Information technology governance audit essentially is a form of operational auditing, but nowadays information technology auditing is better known as a separate type of audit unit that has a purpose for improving information technology governance [6]. In its implementation, this information technology governance audit can be carried out using existing frameworks. There are many types of frameworks work that can be used to help humans conduct governance audits information technology, one of which is the COBIT framework.

COBIT stands for Control Objectives for Information and Related Technology developed by ISACA (Information Systems Audit and Control Association), which is an international professional membership association for individual interested in or working in the areas of IT audit, IT risk, and IT governance [7], [8]. The latest COBIT framework update, namely COBIT 2019, is intended to facilitate a flexible framework and its design and implementation adjusted [9]. COBIT 2019 itself has 11 design factors

and quite a lot processes, namely there are 40 processes. The many processes make COBIT 2019 to be more flexible than other versions.

Use of COBIT 2019 analysis in information technology governance has the objective of assisting organizational governance, information technology management, to risk optimization [10]. In its application, technology governance information can be put on COBIT 2019 framework which will have effect in supporting or supporting the goals of an organization. Later, the result of this information technology governance audit is in the form of recommendations of IcoreI models or processes with different priority levels and capability levels must be applied or implemented [11]. Various fields of the company can use this COBIT 2019 framework. One company that can conduct an audit with the 2019 COBIT framework on IT governance is a management consulting company located in Jakarta.

The management consulting company has been established since 2015. Until now, the company has not only provided consulting services management and information technology, but also produce products applications that heavily involve their information technology governance team. The number of products they produce cannot be separated from frequent problems times encountered such a fickle resource that causes impact on the execution of targeted projects. Problems that often occur in the company, namely the first problem faced by the company related to the budget of each project to be carried out. Sometimes teams the project developer experiences a lack of budget in the process. Second, sources Human resources owned by the company often change so that workmanship a project gets a little bogged down. Finally, regarding resources people who continue to be replaced cause an influence also on handling project because a project is not done completely on resources previous human resources and must be continued with existing human resources new. Because of these problems, can be done measuring IT governance using the 2019 COBIT framework as an evaluation company.

COBIT 2019 itself has as many as 40 processes that cover a lot of aspects of a company. In the audit conducted will be used processes that have compatibility with existing problems through stages factor design until 3 process domains are found that have compatibility with problems faced by the company. These 3 processes consist of APO06 – Managed Budget and Costs, APO07 – Managed Human Resources, BAI11 – Managed Projects

Limitations of the problems that exist in this study are measurement of information technology governance in a company management consulting using the COBIT 2019 framework and the 2019 COBIT process used in this study is APO06 –

Managed Budget and Costs, APO07 – Managed Human Resources, BAI11 – Managed Projects.

II. THEORY

A. Information System

Governance is a series of relationships with processes to direct and control an organization to achieve a desired goal, Information Technology is a process where monitoring and controlling capability decisions are carried out information technology (IT) in determining a value delivery (deliver value) to key stakeholders in an organization or company [12]. In the information technology governance process, there are several data management which is an important asset for a company or organization. Technology governance Information carried out a company affects quality services on the information technology. If information technology services in a company that does not have good management, then it can impact and create problems such as operational costs that are too high so that they are not in accordance with the budget, use of assets that are less than optimal, decision making that is not appropriate, uncontrolled service, and problems others that can be detrimental to a company or organization.

Implementation of information technology governance can make the company becomes superior to the resources it has so, the company can take advantage of opportunities, product innovation, information, and have competitive advantage in the business environment. One factor that can be a sign of the progress of a company is the implementation of governance manage information technology well because it increases the value of the stakeholders' interests and produces quality performance [9]. Assessing quality information technology governance can use a variety of frameworks designed to design information technology governance and assess its maturity [13]. Each framework has a different development focus.

B. Information System Audit

Information system audit is a step-by-step process of collecting and evaluating data that becomes evidence of performance of an organization. Achievement of organizational goals is assessed from the extent organizational systems can perform data integrity and push on achieving organizational goals effectively and using resources efficiently [13]. To measure and evaluate a system information that has been designed and implemented effectively, efficient, economical, has an asset security mechanism, and establishes data integrity requires an information system audit that can measure and evaluate the degree of equivalence between business procedures and requirements users [14].

According to Gallegos, the stages and audit procedures stages are [15]. The first stage is planning which includes the main activities, namely setting the objectives and scope of the audit, understand the client's business processes, organize audit groups, review the results of previous audit findings, and prepare an audit program. This early stage involves a lot of communication with people who are concerned with the object to be audited and carry out the process analysis of the objectives, vision, mission, policies, and objectives of the audit object.

The second stage is the fieldwork or field inspection stage. In this stage, field inspection is very helpful for the auditors to carry out the analysis because at this stage the auditor works to collect information from related parties by using methods such as interviews, observation to conduct a survey to the audit object.

The third stage is reporting. At this stage the auditor will analyze and conclude the results obtained. Auditors usually provide an evaluation in the form of recommendations for improvement to the management. The stage of reporting or writing the results of these findings will clearly state the findings and their impact.

The fourth stage is follow-up. At this stage is the final stage, namely providing audit results that have been summed up and analyzed. The form of the results given is in the form recommendations for improvement from the findings found in the audit process and determining whether the audit results are reference only or directly implemented by the organization.

C. COBIT

Control Objective for Information and Related Technology or COBIT for the first time published in 1996 namely COBIT 1.0 which focus only on auditing. In 1998 COBIT published reverted to COBIT 2.0 which contains the audit and evaluation fields on the control stage, then 2 years later in 2000 COBIT to be precise re-published a new version, namely COBIT 3.0 which has orientation towards management. 5 years later in December to be exact In 2005, COBIT re-published a new version, namely COBIT 4.0 which followed by an update in May 2007, namely COBIT 4.1. Both versions are oriented towards information technology governance. Long after that, precisely in June 2012, COBIT made updates again by issuing COBIT 5.0 which is oriented towards technology governance company information [16], [17]. Finally, COBIT made a major update from previous versions in 2018, namely COBIT 2019 which published effective and efficient ways to carry out the process performance monitoring to process oriented implementation on information technology governance and technology management information.

Contains how to optimize the repairs that can be done organization [18]

D. COBIT 2019

COBIT 2019 or Control Objectives for Information and Related Technologies 2019 has been published by ISACA or Information System Audit and Control Association which is the latest update from the COBIT framework type suite. COBIT 2019 which was released on November 2018 and is an update of COBIT 5 [19]. COBIT 2019 has provided an acceptable analysis model openly make combinations of organizational governance and management by providing indicators, processes, levels, to 11 Measurement of Administrative Capability Measurement is a collection of the best practices with the goal of increasing value and trust in information systems so that the organization will be helped in optimizing and improving management governance their information technology [19]. In addition, this framework also introduces the concept of a focus area, which is intended to provide focus on a particular problem-solving situation by sticking to it COBIT 2019 core model with its governance and management objectives. Measurement of organizational maturity using COBIT 2019 consists of 5 main domains which are divided into one governance destination domain management and the four domains of management objectives, namely EDM or Evaluate, Direct, and Monitor, BAI or Build, Acquire, and Implement, APO or Align, Plan, and Organize, and MEA or Monitor, Evaluate, and Assess, and DSS or Deliver, Service, and Support) [11]

E. RACI Chart

RACI or Responsible Accountable Consulted Informed is diagram used for the parties involved with the process the company's business so that it can become a resource person in a study. Each indicator on the RACI diagram has its own meaning which is described as follows [20].

1. Responsible (R)
Responsible or responsibility means the party that has responsibility responsible for carrying out the activities be his area of work.
2. Accountable (A)
Accountable means the party in charge of giving directions from carrying out activities. This party has the authority to decide a problem. Simply put they have a standing as the person in charge and decision maker.
3. Consulted (C)
Consulted means the person in charge of providing criticism and suggestions or consultation on the implementation of activities. Usually, they are called advisors.

4. Informed (I)

Informed party who obtains information related to the activity ongoing, results, and decisions taken.

III. METHOD

The method used in this study is to use a framework COBIT work 2019 which is the most recent version of the framework COBIT which has been updated by ISACA. This type of research is research qualitative which uses literature and interview methods for collecting the necessary data.

This study uses a framework in the form of an overview of the process flow of research conducted using the audit stages described by Gallegos.

1. Planning

The first step in this research is planning by first determining the object of research, namely at PT XYZ. When the research object has been determined, a pre-interview is conducted to ask for permission while simultaneously identifying the outline of areas that are a problem in the company, as well as determining the 2019 COBIT domain will be used as a focus in this study based on the results of interviews with the company.

2. Field Work

The second stage is the stage of collecting the necessary data. Researchers conduct a literature study to understand more deeply the topics and objects of this research and conduct research directly to PT XYZ to see real problems to be faced. At this stage also carried out follow-up interviews.

3. Reporting

This third stage is the stage of writing a report from the data that has been collected. Analyzing these data to get conclusions and evaluation results in the form of recommendations on the problem faced by PT XYZ.

4. Follow Up

The final stage is to report to PT XYZ so that you can use it as a reference or recommendation for improvements necessary and can be used as a reference for further audits.

This study conducted a literature study using references the 2019 COBIT book provided by ISACA (Information Systems Audit and Control Association) entitled "COBIT Framework 2019 Governance and Management Objectives" and using research journals before as a reference.

This study also requires an interview stage to collect the data needed in the research. The interview stage involves representatives of divisions in PT XYZ. Self-interview will be conducted several times both online and offline. If done by online via video conferencing via zoom meeting or google meet.

However, if the interview is conducted offline the researcher will meet directly with representatives of related divisions from PT XYZ. Data collected from stage This interview will be used as a tool to measure the maturity level of governance information technology in PT XYZ.

The data analysis method used in this study is to use a measurement scale (ISO/IEC 33004) for the results of the interviews as follows.

- N – Not Achieved (0% to 15%)
Companies have little or no evidence of achieving the attributes assessed in the defined process.
- P – Partially Achieved (>15% to 50%)
The company has some evidence of the approach and some evidence of the achievement of the attributes assessed in the process which is defined by the aspect of achievement of the attributes being unpredictable.
- L – Largely Achieved (>50% to 85%)
The company has evidence of a systematic approach for significant achievement of the attributes assessed in the defined process but still has some weaknesses in the assessment process.
- F – Fully Achieved (>85% to 100%)
The company has completed and systematic evidence for the full achievement of the assessed attributes in the defined process and has no significant weaknesses in these attributes in the assessment process.

IV. RESULT AND DISCUSSION

Data collection was carried out by interviewing related parties. The earliest stage carried out in research is to decide with XYZ company to do research on the company. After that, determine the focus of the research area in the company. The areas in this research are covers IT governance in XYZ company to determine the process domains in COBIT 2019. This research was conducted to measure the capability Maturity level of PT XYZ's IT governance using the framework COBIT 2019.

The COBIT 2019 process domain was selected based on identified issues conducted at PT XYZ. The problems found are related to problems with work on several company projects that often experience delays until the workflow changes. This problem arose because of a change in human resources that often changes every several time periods. The company gives responsibility for working on several projects to their human resources are usually only apprentices stayed for 1 semester in the company. This human resource problem has sufficient impact on project completion due to the capabilities of each resource humans are very diverse. Some are very good at the language programming used and some do not

understand the language at all programming used. This causes the work process to run slow depending heavily on the ability of each individual resource the human.

Project handlers for project workflow details are also managed by interns where every change of team, of course, has a slightly different way of handling projects. The company provides a work timeline but only broadly speaking. In this case, company employees do play a role as the person in charge and mentor for the apprentices, but the limited number of employees causes one employee to handle many projects at once so you can't focus on just one project. Not to mention, the person in charge and the mentor still has to teach every apprentice who doesn't understand yet language used. Broadly speaking this problem is influenced by the way companies and resources handle the project.

In addition, there are budget and cost factors that are often needed in the process of working on projects for developer purposes such as buying domains and so on sometimes inadequate in terms of funds. Therefore, selected domains related to the problem.

Based on interviews with several IT governance parties in the company XYZ, it is found that there are 3 domains that are quite relevant to the problem that happened, namely APO06 –Managed Budget and Costs, APO07 – Managed Human Resources, BAI11 – Managed Projects.

A. RACI

The RACI in Table 1 shows the divisions involved in the 3 domains selected, namely APO06 – Managed Budget and Costs, APO07 – Managed Human Resources, and BAI11 – Managed Projects. Each division has a different role for each domain which will be described in the following tables.

TABLE I. RACI CHART

Domain	CEO	BD	HR	PM
APO06 – Managed Budget and Costs	A	R	C	I
APO07 – Managed Human Resources	A	C	R	I
BAI11 – Managed Projects	A	C	I	R

In the APO06 domain, the business development team plays an active role in preparing the company's IT budget. They design and build methods to make planning related to the required IT budget. Collaborate with the IT human resource division to assess employee and IT needs, but if you want to plan the

usual allocation of funds involve the project manager as well.

In the APO07 domain, the team responsible for implementation is human resources. They work inside Recruitment of employees needed according to IT needs company. In addition, the human resource division also deals with work contracts to employee administration.

In this BAI11 domain, the person in charge is the manager project. A project manager usually plays an active role in planning and directing project execution. Project planning also involves several related parties such as: finance and human resources. A project manager oversees Monitor project implementation and be responsible for the process the process.

B. Result

The results of measuring the capability of information technology governance at PT XYZ are simplified as follows.

TABLE II. RESULT

Process Domain	Achieved Capability Level				
	1	2	3	4	5
APO06 – Managed Budget and Costs					
APO07 – Managed Human Resources					
BAI11 – Managed Projects					

Based on Table 2, the results of measuring the level of capability at PT XYZ company which were obtained from the results through interviews concluded that in the domains APO06, APO07, and BAI11 reached the same level, namely level 2 or it can be said (Fully Achieved)

C. Analysis Results

The interview results will be measured based on the rating scale from Table 1. The answers of each informant are categorized based on the criteria listed in the description column. The answers in each subdomain will be averaged and the value of the average is the final value obtained from each domain. A domain can be said to be successful or continue to the next level if the sub-domain of the previous level gets an average value of greater than 85% but if the domain does not reach or is less than 85% then it is declared to stop at that level and cannot continue. Assessment of the domain and its sub-domains will be described as follows.

1. APO06 – Managed Budget and Costs

TABLE III. APO06 LEVEL 2 ASSESSMENT

APO06 – Level 2	
Sub-Domain	Score
APO06.01	77.5
APO06.02	80
APO06.03	79.25
APO06.05	85.7
Total	322.45
Average	$322.45/4 = 80.6\%$

Table 3 shows the results of calculations from the APO06 domain regarding how companies manage IT budgets in companies. Sub-domains are at level 2 with APO06.01 having an average value of 77.5, APO06.02 having an average value of 80, APO06.03 having an average value of 79.35, and APO06.05 having an average value of 85.7. So, the overall average for the APO06 level 2 domain is 80.6%, which means that the audit stops at level 2 and cannot continue to level 3 because the average domain has a value of less than 85%. The results of the interviews in this domain show quite good results because almost all activities in managing the IT project budget recommended by the 2019 COBIT framework are carried out by the company, but some things are still lacking and have some weaknesses.

2. APO07 – Managed Human Resources

TABLE IV. APO07 LEVEL 2 ASSESSMENT

APO07 – Level 2	
Sub-Domain	Score
APO07.01	76.7
APO07.02	84.3
APO07.03	77.5
APO07.04	86.75
APO07.05	85
APO07.06	86
Total	496.25
Average	$496.25/6 = 82.7\%$

Table 4 shows the results of calculations from the APO07 domain related to human resource management in companies. Sub-domains are at level 2 with APO07.01 having an average of 76.7, APO07.02 having an average of 84.3, APO07.03 having an average of 77.5, and APO07.04 having an average of 86.75, APO07.05 has an average of 85, and APO07.06 has an average of 86. So, the average in the APO07 level 2 domain is 82.7%, which means that the audit stops at level 2 and cannot continue to level 3 because the average domain has a value of less than 85%. The results of the interviews in this domain show good results because almost all the

activities recommended by the 2019 COBIT framework related to human resources for IT have been carried out by the company, but there are still deficiencies in outsourcing arrangements and gaps in some individuals between the capabilities needed and the talent required. owned. These problems cause a lack of percentage obtained.

3. BAI11 – Managed Projects

TABLE V. BAI11 LEVEL 2 ASSESSMENT

BAI11 – Level 2	
Sub-Domain	Score
BAI11.01	72.5
BAI11.02	87
BAI11.04	83.2
BAI11.05	90
BAI11.06	85
BAI11.07	87
BAI11.08	86
BAI11.09	85
Total	675.7
Average	$675.7/8 = 84.5\%$

Table 5 shows the results of calculations from the BAI11 domain related to project management in companies. The sub-domains are at level 2 with BAI11.01 having an average of 72.5, BAI11.02 having an average of 87, BAI11.04 having an average of 83.2, BAI11.05 having an average of 90, BAI11.06 has an average of 85, BAI11.07 has an average of 87, BAI11.08 has an average of 86, and BAI11.09 has an average of 85. So, the average in the BAI11 level 2 domain is 84.5% which is classified as a high average value because it is close to 85%, but still cannot continue to level 3 because the average domain still has a value of less than 85%. The interview results in this domain show good results because almost all the activities recommended by the 2019 COBIT framework related to managing IT projects have been carried out by the company, but there are still deficiencies in the lack of training carried out and project planning which sometimes tends to be too flexible.

D. Findings and Impacts

Identify the findings and impacts based on the results of the interviews that have been conducted. These findings and impacts outline the constraints in the company. The following are the findings and impacts found.

1. APO06 – Managed Budget and Costs (Level 2)

- a. Finding: The company does not have a fixed scheme to identify all IT-related elements. Budgets tend to be flexible.
Impact: IT needs sometimes experience delays, especially for several small matters

related to costs because the scheme changes and is not fixed, which makes it difficult for third-order funds to be needed for small needs.

- b. Finding: The company does not have a specific procedure for communicating budget decisions and reviewing them with business unit budget holders.

Impact: The need for funds becomes irregular. Can cause miscommunication to the business unit.

- c. Finding: The company does not maintain a formal IT budget, including all expected IT costs of IT-enabled programs, services, and assets.

Impact: Budgets become too flexible and unpredictable when companies have to issue budgets. As a result, when needed, disbursing funds is quite time consuming.

2. APO07 – Managed Human Resources (Level 2)

- a. Finding: The company does not set rules for using external contract employees, third party services, and using transfers to support business needs.

Impact: One employee can sometimes work on many projects at once. Sometimes there is still dependence on one individual.

- b. Finding: The company pays little attention to the gap between the required skills and the available human resources. Rarely do individual placements repeatedly.

Impact: Project work can be hampered due to a lack of skills needed to work on a project because you still have to learn it first.

3. BAI11 – Managed Projects (Level 2)

- a. Finding: Companies do not provide project management training. But still considering certification for project managers.

Impact: Some of the company's goals can be hampered due to the lack of training provided by the company.

- b. Finding: In maintaining the project plan along with the risk assessment, the company carries out direct follow-up with stakeholders.

Impact: Several changes to the plan could be forgotten to be conveyed to stakeholders because there was only verbal follow-up.

E. Recommendations

Provision of recommendations is made after obtaining the findings and the impact of the problems

that exist in the company which is carried out through a series of interviews with the PT XYZ company and conducting a review of some data related to the selected domain. Some recommendations for improvements that can be made by the company are as follows.

1. APO06 – Managed Budget and Costs (Level 2)

- a. Companies must have a fixed scheme to identify all IT related cost elements such as operational costs, hardware costs, software costs, personnel, and others. Must have clear details and calculations.

- b. Companies should have a fixed procedure for communicating budget decisions and reviewing them with the company's business units and carried out regularly.

- c. Companies need to have a formal IT budget or some sort of record keeping for the expected formal IT budget estimates of the programs, services, and assets that support IT.

2. APO07 – Managed Human Resources (Level 2)

- a. Companies need to maximize the provision of flexible resource arrangements, such as the use of transfers, external contracting personnel, and third-party service arrangements to support changing business needs.

- b. Companies need to identify the gaps between the skills needed and those available on a regular basis. Especially if the employee is an apprentice. This can be done by developing a few things, such as providing training for both technical and behavioral skills, re-deployment or rotation, and making changes to the procurement strategy. These things are to overcome the gap individually and collectively.

3. BAI11 – Managed Projects (Level 2)

- a. Companies need to provide project management training as well though are considering certification for project managers. Certification should be accompanied by the provision of project management training for project managers.

Companies need to improve how to maintain project plans and dependent plans such as risk plans, quality plans and benefits realization plans. Ensure that the plan is always updated and reflects actual progress and approved material changes. Apart from carrying out direct follow-up with stakeholders, you can also always document changes in detail for every aspect of the project work process to serve as a reference document for the next team change and

ensure that communication between team members runs well to avoid miscommunication.

V. CONCLUSION

After measuring the level of information technology governance in a management consulting company using the 2019 COBIT framework, it was concluded based on interview results that the problem with PT XYZ was in handling the projects they had and influenced the way the company handled IT budgets and resources. possessed human resources. There are 3 domains chosen based on these problems, namely APO06 – Managed Budget and Costs, APO07 – Managed Human Resources, and BAI11 – Managed Projects. Apart from the existing problems, the domain selection is also adjusted to the RACI table which contains the parties involved in the running of a project.

In the APO06 – Managed Budget and Costs and APO07 – Managed Human Resources domain processes, the average yield is 80.6% and 82.7%. The results of these two domains are in accordance with company targets that are at level 2 in the Fully Achieved category, so there is no GAP in this process domain and in the process domain BAI11 – Managed projects get an average yield of 84.5% which is at level 2 which the company's target is level 3 so as to create a GAP in the analysis of 1.

The measurement results are obtained from the findings and impacts to obtain recommendations for the company to improve or maximize it in accordance with the recommendations given by COBIT 2019 so that the value achieved by the company can increase the level obtained by the company.

For further research, it can measure the capability again and measure the level increase made by the company.

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