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Risk Assessment and Recommendation Strategy Based on COBIT 5 For Risk - A Case Study of an Internet Service Provider Company

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Abstract

Information technology governance is part of organizational management that includes leadership and ensuring that information technology has a broad scope to meet needs. The concept of IT Governance is a method of managing technology users in. The company, in this case, provides IT needs and solutions to customers ranging from hardware, software, and services. A good business case will include the problem in information technology governance, especially when it comes to maintenance related to POP or Post Office Protocol which is the internet protocol used on TCP/IP networks such as the internet. In this study, the framework used as a reference in IT development is COBIT 5. The domain processes studied are EDM02 – Ensure Benefits Delivery, APO07 – Manage Human Resources, and APO10 – Manage Suppliers, who can evaluate IT governance at this Company. The research method used is Gallego's Theory starting from planning, field inspection, reporting, and follow-up. The results of this study were obtained from the evaluation of information technology governance in the Company got to level 1 capability with fully achieved achievement but could not move up to the next stage, that is, level 2, resulting in a gap analysis of 1 level from the target level expected by the Company.

Keywords: Capability Level, COBIT 5, Gap Analysis, IT Governance

1. INTRODUCTION

The rapid development of technology makes the need to get accurate, reliable, and complete information increases the more tools that can help solve a problem [1], especially for holding information technology's significant role in a company. Information Technology not only serves as a supporter but also becomes one determinant of success in good IT management, resources IT and information about the organization's strategy and goals [2]. Organizations can implement the application of information technology that is considered very important in the implementation of a framework or framework that will be used as a reference by the company from the stage planning through to the evaluation of information technology that can contribute to the achievement of organizational strategy and

goals [3]. In the research, technology Information is essential to achieve business goals and create a competitive advantage in the target market. Alignment between IT and business strategies can offer added value in a competitive environment. Therefore, IT management is required to maximize information technology performance, starting with the rapid development of technology information in various fields. Information technology should be more sensitive to Current conditions of human life that require speed and efficiency in facilitating work, so technology management is needed [4].

Information technology governance is part of a management organization that covers leadership, structure, and process within an organization and ensures the reach of information technology that is broad and focused on the efficiency and transformation of information technology to meet future needs. There are five focus areas in IT governance: IT Strategic Alignment, Value Delivery, resources management, risk management, and performance measurement. The company can implement the focus area to meet the needs, responsibility, and proper risk management. Draft information technology governance (IT Governance) is an organization's management method of information technology users. Governance IT incorporates best practices from organizational design, development and implementation, delivery support, and performance monitoring information systems to ensure that information and technology are linked and have a framework to support company goals [5].

Every company that carries out activities or programs that are owned indeed will require good governance or management to achieve desired goals. Usually, problems arise when using technology information (IT) as management to maximize IT/investment with metrics that signal a hazard when a risk occurs or failure of business requirements. This usually results due to a mismatch of IT governance provided. These conditions require a holistic approach to the business or organization to be successfully designed to meet a need. We need a framework that can minimize risk by controlling the needs of companies that focus on measurement and improvement in governance, for example, the COBIT framework. It can also reduce presence gaps between parties that play a significant role in governance evaluation management and business processes of an enterprise to support a system.

The international community has widely recognized COBIT Framework (Control Objective for information and related technology) as an IT management best practice that can help auditors, management, and users integrate business aspects, control requirements, and aspects of IT business. COBIT provides business-oriented guidance and can be used by owners and management, such as auditors and users. For many companies, the most important yet often overlooked asset is the technology and knowledge that supports it. The reason for selecting the first COBIT 5 framework is to fulfill the required standards. Besides that, this

framework applies directly to the business and enables a business or agency to use a framework to manage management and administration efficiently, comprehensively, and integrated. The second reason is that the COBIT 5 framework is very comprehensive and provides a foundation for framework integration, standards, and other effective practices that cover all aspects of the company [6]. The last reason for choosing the framework COBIT 5 is to provide solutions (recommendations and improvements) related to the process domains and goals for information technology governance [7].

The case study company is a tier two company in the internet business service provider/internet technology service provider that focuses on service for residential and corporate customers. This company was just established in 2016. It delivers IT needs and solutions to customers starting from hardware, software, and services. This company engaged in information technology, fulfilling the provision of information technology services that must be developed to meet the needs of companies or consumers. As for that problem that occurs in information technology governance at a company, which becomes the focus area in this research, is Resource Management, which relates to the management of information technology resources and human resources. This problem occurs primarily in the maintenance section related to POP or Post Office Protocol which is the internet protocol used on TCP /IP networks such as the internet. According to sources, this is because human resources are less responsible for conducting elections and maintenance, so the device becomes frequently damaged due to overheating.

Another problem is that no framework is yet referenced in information technology governance. Implementation the standardization of IT governance has yet to be implemented within the framework work or framework. This research can provide recommendations for improvements to information technology governance in a company in order to meet the needs and goals of the company. Here are table 1. describing the problem, impact, focus area, and frequency and table 2. Problem Frequency Rate.

Table 1. Problems, Impacts and Focus Areas

No.	Problem	Impact	Focus Areas	Frequency
1	Lack of leadership in information technology in decision making, responsibilities and tasks carried out in each division	Work productivity time and employee communicatio n become hampered	*Risk Management*	*Medium*
2	The quality of understanding related to	The delay in the work	*Resource Management*	*High*

	information technology SOPs is still lacking, so it needs to be developed	process in the company's productivity		
3	The quality of the application data system is still not well optimized		*Resource Management*	*Medium*
4	Electric issues sometimes make devices often experience errors		*Resource Management*	*Medium*

Table 2. Problem Frequency Rate

Problem Frequency Rate	
Information	**Meaning**
Very High	The problem occurs at least once a week.
High	The problem occurs on average 1 time per month.
Medium	The problem occurs 1-6 times a year.
Low	The problem occurs once between 1 – 5 years.
Very Low	The problem occurs once every 5 years or more.

The problems in the first point are related to the absence of Leadership in information technology due to a lack of retrieval. The right decisions and responsibilities given are not appropriate to impact work productivity time, and communication between divisions becomes obstructed. According to information from sources, this incident can frequently occur and cannot be predicted due to the level of awareness in human resources. The second point related to a Quality understanding of SOPs related to information technology still needs to be improved, so it has barriers to productivity in IT Project work, such as the operation of devices, applications, and networks.

According to sources, this incident can still be said to be a frequent occurrence because the company is still relatively new in information technology, so it needs to be developed. The third point concerns the Quality of the application data system needs to be optimized better. According to the source, this happens quite often because the data system needs to be redesigned to be optimized so that the impact is hindering the productivity of in company. The last one, related to the electric issue, makes the device an error, thereby hampering work products such as blackouts, other devices getting errors, etc. According to sources, this incident can happen often, and a lack of preparation causes this problem.

Based on the problems that occur, which made in a company needs to be audited in order to evaluate governance information technology with the framework from COBIT 5 by doing measurement and provision of recommendations and improvements so that it can help in dealing with existing problems and preparing the process of the company's business strategy path for the future. In this study,

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the framework used as a reference in IT development is COBIT 5. It can evaluate governance IT based on the company related to the problem faced so that IT improvements and recommendations can support the company's needs in doing business well. Therefore, this research was undertaken to ensure that implementing and using government information technology in a company, which is already operating, can provide business value, risk management, and human resources to meet all business needs—the need for an IT governance assessment process.

2. METHODS

The research method for implementing Information Technology Governance or IT Governance uses the COBIT 5 framework in the company uses a qualitative approach method, namely collecting data related to the conditions and needs of IT in the company and conducting literature studies by studying topics and subjects related to research, specifically the COBIT 5 framework. The process of carrying out research with the information system audit stages using the Gallegos method starts with Planning, Field Work, Reporting, and Follow-up. Can see the figure 1 of the research framework as follows:

2.1. Research Workflow

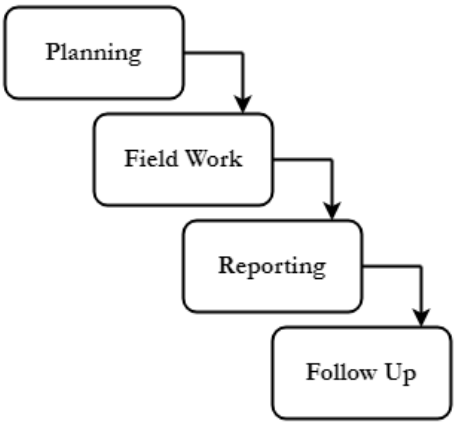

Figure 1. Research Workflow

Figure 1. is a framework used to research measuring the capability of governance a case studies based on the company.

1. Planning
   In the first stage, determine the object to be researched. After that, a pre-interview was conducted regarding the problems faced by the resource person, as follows the Human Resources division, and determined the scope and

selected the COBIT 5 process according to the vision and mission of the company. After that, create an audit document according to the COBIT 5 framework standard [8].

2. Field Work
   In the second stage, we collect information containing data from related parties. From the application of data collection methods, among others, conducting observations, interviews, and literature studies [9].
3. Reporting
   The third stage is collecting data. The collected data will be processed from the maturity level and calculated by gap analysis with the company's current state. Measurement of maturity level and gap analysis is carried out using interviews following the standardization of the COBIT 5 framework. After obtaining this value, recommendations for improvement are given to increase expectations based on the company's case study [10].
4. Follow Up
   In the fourth stage, providing the results of the audit report as a recommendation of corrective action for the management of the company object under study, then assisting with improvements that will be the responsibility of the management of the object to serve as a reference if there is an audit in the future [11].

2.2. COBIT 5 System Method

This system method uses the COBIT 5 framework because it is a reference in IT development that can evaluate IT governance based on company-related problems faced so that IT improvements and recommendations can be made to support the company's needs in running its business properly. This method is carried out with the stages of process determination from COBIT 5 [12]:

a) Stakeholder drivers influence stakeholder needs.
b) Stakeholder needs cascade to enterprise goals.
c) Enterprise goals cascade to IT related goals.
d) IT-related goals cascade to enabler goals.

2.3. Data Sampling Technique

The population is the completeness of the research subjects, and the sample used in this study are company employees who are part of the Human Resources division and other divisions. Employees who are actively working and registered in a company in June 2022, male and female gender, aged between 25 and 40 years. The sampling method used in this study is used to determine the RACI Chart and has the following provisions.

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2.4. Data Analysis Technique

There are 2 data analysis techniques used:

1. Maturity Level Analysis

The analysis of the maturity level or level of maturity in this study was based on the results of the interviewees' answers regarding the evaluation given to informants during interviews for all selected COBIT 5 functions. This assessment will be based on consideration of the scale used to determine whether the COBIT 5 process stops or continues to the next level [13].

A scale is used to assess each process attribute to move up to the next stage. The following is the scale used [14]:

1) N: Not Achieved (0 to 15%)
   We found little or no evidence-gaining scale related to the computed process attributes.
2) P: Partially Achieved (> 15% to 50%)
   There is some evidence of the scale of the estimated process attribute gain. Some attribute gains may be unpredictable.
3) L: Largely Achieved (> 50% to 85%)
   There was evidence of a systematic approach to scale and significant achievement of the calculated process attributes. Some of the weaknesses related to this attribute are that it is contained in the calculated process.
4) F: Fully Achieved (> 85% to 100%)
   Found complete evidence of a systematic approach scale and full achievement of the calculated process attributes.

2. Gap Analysis

In this study, a gap analysis or gap analysis was carried out by comparing the ability level scores expected by the company based on the ability calculations that have been carried out. Based on the results of this gap analysis, it is recommended that the company can make improvements to reach the desired level or level, and also the company hopes that the system owned by the company can always maintain the security of its information and reduce risks that can be borne by the company that will arise in the future [15].

3. RESULTS AND DISCUSSION

In this result and discussion, the determination of the scope is the complexity of the research object to be studied. This method is carried out by processing data regarding selected information from pre-interviews conducted with informants through Google Meet.

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3.1. Planning

In determining the object of this research is the company's internal part. The internal section is the head of the Human Capital division, who knows all relevant information from problems to research needs from the company. This company was only established in 2016, and IT needs, and solutions to customers range from hardware, software, and services. The problems faced by this company are the focus area of Resource Management, which has yet to maximize device maintenance so that overheating often occurs. Other things occur in frameworks that still need to be used as a reference in information technology governance.

Pre-interview is a data collection method for determining the object to be studied in the company. The pre-interview with the head of the Human Resources division was conducted online via Google Meet. The pre-interview was conducted by discussing a detailed description of the company's profile, vision, mission, and problems over the past five years. The results of this processing based on the guidelines provided in the COBIT 5 framework are as follows:

1. Determining Enterprise Goals

The Enterprise Goals' determination is carried out when the Pre-Interviews have been carried out before taking into account the company's problems, goals, vision, and mission. After that, select the 17 Enterprise Goals in the COBIT 5 framework, then discuss them with sources according to the needs and desires of the company. The results of the discussion obtained are as follows:

Table 3. Mapping Vision and problems to Enterprise Goals

Vision and Problems Experienced	BSC Dimension	Enterprise Goals	Relation of Governance Objectives		
			BR	RO	ROp
Vision: "To become a leading and trusted provider of internet and information technology services, capable of providing the right solutions to information technology needs to help people get a better life. So that it can play an active role in advancing and developing the future of the nation,	Financial	1. Stakeholder value of business investments	**P**		**S**
		2. Portfolio of competitive products and services	**P**	**P**	**S**
		3. Managed business risk (safeguarding of assets)		**P**	**S**
		4. Compliance with external laws and regulations		**P**	
		5. Financial transparency	**P**	**S**	**S**

especially in the Karawang region.					
Lack of leadership in information technology in decision making, responsibilities and tasks carried out in each division.	Customer	6. Customer-oriented service culture	**P**		**S**
		7. Business service continuity and availability		**P**	
		8. Agile responses to a changing business environment	**P**		**S**
		9. Information-based strategic decision making	**P**	**P**	**P**
		10. Optimisation of service delivery costs	**P**		**P**
The quality of understanding related to information technology SOPs is still lacking, so it needs to be developed.	Internal	11. Optimisation of business process functionality	**P**		**P**
		12. Optimisation of business process costs	**P**		**P**
		13. Managed business change programmes	**P**	**P**	**P**
		14. Operational and staff productivity			**P**
		15. Compliance with internal policies		**P**	
The quality of the application data system is still not well optimized.	Learn and Growth	16. Skilled and motivated people	**S**	**P**	**P**
Electrical issues sometimes make devices often experience errors.		17. Product and business innovation culture	**P**		

BR = Benefits Realisation
RO = Risk Optimisation
ROp = Risk Optimisation

As can be seen in Table 3, 10 Enterprise Goals are obtained from 17 Enterprise Goals.

2. Mapping Enterprise Goals to IT-Related Goals

In Mapping Enterprise Goals selected from discussions with resource persons, the mapping will be carried out again into IT-Related Goals. Table 4, the mapping results obtained from Mapping Enterprise Goals to IT-related Goals are as follows:

Table 4. Selected IT – related Goals

Code	IT-related Goals
1	Alignment of IT and business strategy
2	IT compliance and support for business compliance with external laws and regulations
4	Managed IT-related business risk
5	Realised benefits from IT-enabled investments and services portfolio
6	Transparency of IT costs, benefits and risk
7	Delivery of IT services in line with business requirements
8	Adequate use of applications, information, and technology solutions
9	IT agility
10	Security of information, processing infrastructure and applications
11	Optimisation of IT assets, resources and capabilities
12	Enablement and support of business processes by integrating applications and technology into business processes
14	Availability of reliable and useful information for decision making
15	IT compliance with internal policies
16	Competent and motivated business and IT personnel
17	Knowledge, expertise, and initiatives for business innovation

3. Mapping IT-Related Goals to Enabler Goals

In Mapping IT-related goals obtained, the final mapping will be carried out to get Enabler Goals or the domain process from COBIT 5. Table 4, the mapping results obtained from Mapping IT-related Goals to Enabler Goals are as follows:

Table 5. Mapping IT-Related Goals to Enabler Goals

IT Related Goals	COBIT5 Process
IT Related Goals 1	EDM01, EDM02, APO01, APO02, APO03, APO05, APO07, APO08, BAI01, BAI02
IT Related Goals 2	APO01, APO12, APO13, BAI10, DSS05, MEA02, MEA03
IT Related Goals 4	EDM03, APO10, APO12, APO13, BAI01, BAI06, DSS01, DSS02, DSS03, DSS04, DSS05, DSS06, MEA01, MEA02, MEA03
IT Related Goals 5	EDM02, APO04, APO05, APO06, APO11, BAI01

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IT Related Goals	COBIT5 Process
IT Related Goals 6	EDM02, EDM03, EDM05, APO06, APO12, APO13, BAI09
IT Related Goals 7	EDM01, EDM02, EDM05, APO02, APO08, APO09, APO10, APO11, BAI02, BAI03, BAI04, BAI06, DSS01, DSS02, DSS03, DSS04, DSS06, MEA01
IT Related Goals 8	APO04, BAI05, BAI07,
IT Related Goals 9	EDM04, APO01, APO03, APO04, APO10, BAI08
IT Related Goals 10	EDM03, APO12, APO13, BAI06, DSS05
IT Related Goals 11	EDM04, APO01, APO03, APO04, APO07, BAI04, BAI09, BAI10, DSS01, DSS03, MEA01
IT Related Goals 12	APO08, BAI02, BAI07
IT Related Goals 14	APO09, APO13, BAI04, BAI10, DSS03, DSS04
IT Related Goals 15	EDM03, APO01, MEA01, MEA02
IT Related Goals 16	EDM04, APO01, APO07
IT Related Goals 17	EDM02, APO01, APO02, APO04, APO07, APO08, BAI05, BAI08

It can be seen in table 5 that 37 COBIT 5 Enabler Goals were selected, which means that all of the COBIT 5 Enabler processes are based on the existing primary. The following are selected processes from COBIT 5.

4. COBIT 5 Process Selection

In selecting the COBIT 5 process, held a joint discussion with the resource head of the division head from Human Resources, which was conducted online using Google Meet, 37 COBIT 5 processes have been selected, and there will only be three processes that will be taken for an audit. These three processes cover the vision and problems of the company. Here are three processes that have been discussed for the audit:

1) EDM02 – Ensure Benefits Delivery
   Maximize the value of the contribution to the business from business processes, IT services, and IT assets paid for by IT at an acceptable cost.
2) APO07 – Manage Human Resources
   Provides a systematic approach that ensures optimal organization, placement, rights, and skills for people. This involves communicating roles and responsibilities, developing and implementing growth plans, and setting performance-related expectations, all supported by competent and dedicated employees.
3) APO10 – Manage Suppliers
   Manage IT-related services from multiple vendors to meet business requirements, including vendor selection, relationship management, and contract management, and review and monitor vendor performance for effectiveness and compliance.

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3.2. Field Work

In data collection in data collection there are literature studies, observations, and interviews as follows:

1. Literature Studies

At the Literature Study stage, appropriate information was collected on the company faced it by studying scientific journals and research books on evaluating IT governance using the COBIT 5 framework.

2. Observations

At the observation stage, it is done offline by observing the field. The results of the field observations that have been carried out are to obtain information in the form of daily company activities, starting from active employees. More than 50 active employees work in the company, and the company's working hours are from 08.00 am to 5.00 pm. The working time is still being determined because each stakeholder has their role. It can continue from 17.00 - 02.00 so that each employee has a shift time. Then the products and services offered to companies that are IT Solutions (software & hardware) for the community. Other information is contained in regulations and SOPs to company contracts but needs to be explained due to confidentiality from the company.

3. Interviews

At the interview stage, research was carried out after selecting the COBIT 5 process by interviewing two informants, as follows the heads of Human Capital and Business Strategic related to the RACI Chart, to determine the responsibility of each stakeholder for the given domain process and the resulting value from the chosen process domain.

3.3. Reporting

The results of the data collection that has been collected will be processed from the maturity level and calculated gap analysis with the current state of the company. Figure 2, measurement of maturity level and gap analysis is carried out using interviews following the standard COBIT 5 framework as follows:

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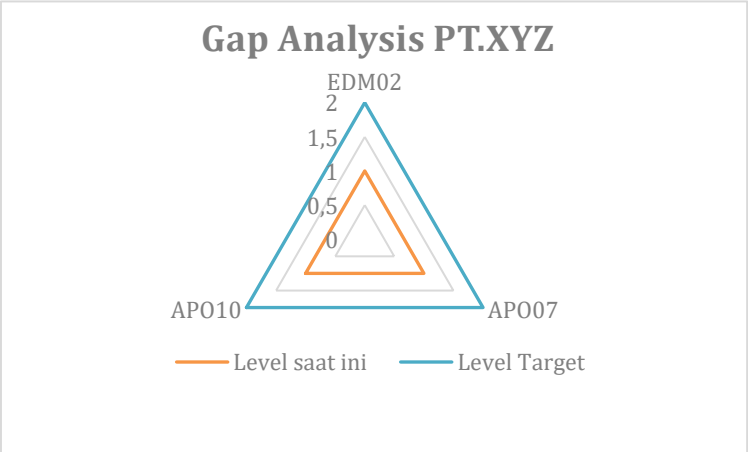
Figure 2. Radar Graph Gap Analysis



1. Performing Capability Level Measurements

In measuring the level of capability of the COBIT 5 process, calculations are carried out by calculating the average of each process that has been obtained. The average of each domain process from EDM02 is 73.56%, APO07 is 74.19%, and APO10 process is 72.80%.

2. Performing Gap Analysis Calculations

The gap analysis calculation is used to determine the condition of using the results to support the measurement of the company's product quality in the planning and evaluation stages. These results will be used to recommend that the company can improve to achieve the desired level. In addition, the company also hopes that the systems and data stored by the company can always be protected and can reduce the risks that arise. The following is a table of gap analysis:

Table 6. Gap Analysis Result

Process	Current Level	Target Level	Gap Analysis
EDM02	1	2	1
APO07	1	2	1
APO10	1	2	1

Table 6 shows the results of the Gap Analysis that occurs in company processes. The following Figure is a Radar Chart from the company:

Each process faces a gap analysis that must meet the company's expectations. The current condition is at level 1, and the target expectation level is at level 2, so each

process has a comparison gap. From the results of the gap analysis, of course, some findings emerge so that improvements and recommendations are needed.

3. Preparation of Audit Report Results

The Audit Report Results were done using the template base on COBIT 5 to get the final result from capability level and gap company analysis. However, from these results, findings and impacts can be used as recommendations and improvements for a company evaluation.

3.4. Follow Up

In providing audit results reports submitted by the auditors to parties from the company. Based on the problems that occur in the focus area of Resource Management related to maintenance which is not carried out routinely, so errors often occur in the equipment, and no framework is used as a reference in this research, the audit report will provide a solution that contains capability level, gap analysis, as well as recommendations for company improvement as a solution to IT governance in the future.

4. CONCLUSION

Based on the objectives of measuring and evaluating information technology governance at this company using the COBIT 5 framework, the results that have been carried out at this company cannot go up to the next stage, namely level 2, so there is a gap analysis of 1 level from the target level expected by the company because problems are still found in each process, so recommendations for improvement are needed so that the target level to be achieved by the company is achieved. The capability level results in nine problem findings in each process selected in the COBIT 5 framework. Recommendations that are the main priority for improvement and improvement are in APO07 - Human Resource because many problems occur in the process domain, so recommendations for improvements are made to prevent the impact that occurred on the company by conducting discussions to resolve the root of the problem. The company accepts and approves the recommendations for improvements provided by the auditors to be used as IT governance solutions in the future.

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