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DESIGN OF INFORMATION TECHNOLOGY GOVERNANCE IN THE INFORMATION TECHNOLOGY DIVISION OF PT PLN USING THE FRAMEWORK COBIT 2019

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ABSTRACT

In order to support the company's main business objectives, PLN UP3 Manokwari has implemented information technology which is structurally managed and implemented by the information technology division. However, the management of information technology currently has not implemented information technology governance with a specific framework. To support the ongoing management of information technology, the information technology division of PLN UP3 Manokwari still uses the system manually. Manual management of information technology has many risks, this causes the company's main business objectives to not be achieved optimally. The method used in this study is based on the 2019 COBIT framework. The purpose of this research is to design information technology governance in the information technology division of PLN UP3 Manokwari.

Keywords: *design, Information Technology Governance, COBIT 2019, Divisi Information Technology PLN UP3*

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1. INTRODUCTION

Information technology plays a very important role. Currently, systems and information technology support almost all areas of business, both directly and indirectly [1]. The development of information technology is growing from year to year. Information technology is needed to support the company's production flow and business processes. a company that implements information technology requires very high costs and significant risks. However, the use of information technology offers opportunities to increase productivity and improve business processes. Information technology has an impact on fast and accurate business processes. It is too become one of the supporting factors incorporate decision making.

Application technology information requires governance which is often referred to as information technology governance (Governance Information Technology). The

application of information technology must be planned systematically due to limited resources and the need for quality information, therefore governance is needed that can be used as a guide in the application of information technology in companies. In managing data processes, information technology governance is an important asset management for companies [2].

IT services with good governance tend to significantly affect business performance overall [3]. IT Governance plays a role in identifying differences in management and optimizing company performance [2]. When a company's IT services are not managed properly, it creates problems such as unplanned operating costs, suboptimal use of funds, poor decision making, poor service management and can pose risks that can harm the company [4].

Information technology governance is currently a major concern in the development of IT-based services. The need to provide credible and transparent high-quality IT services drives every

company, whether in the private or public sector. The success of technology implementation is influenced by company performance. The main problem that causes the failure of ITG (Information Technology Governance) implementation is IT operations [5]. Based on this understanding, it can be seen to what extent these visions and objectives can be translated into actions and governance in each existing unit or department. Especially if you see that investing in IT implementation is not cheap. In the private sector, IT management is used to carry out operational activities, whereas in the public sector it is still used in a limited way as a tool to support company management [6].

Information technology governance is the process of controlling information technology assets based on a framework for achieving the company's vision and mission [7]. Effective information technology governance provides a framework that enables companies to leverage information technology capabilities and manage innovative practices [8]. Companies belonging to industries whose strategic role of IT is to transform business processes are more aware of the COBIT framework for governing and managing IT, enabling a better IT performance [9]. Information technology governance is a system designed to direct the management of the company in a professional manner based on the principles of transparency, accountability, responsibility, independence, fairness and equality. Information technology governance is part of corporate governance that focuses on information systems and technology as well as performance and risk management. Corporate information technology governance is useful for directing and controlling companies so that they comply with laws and regulations, comply with stakeholder expectations, and comply with applicable business norms and ethics.

One of the frameworks that can be used in the evaluation of information technology management is Information and Related Technology Control Objectives or commonly known as COBIT. COBIT is a standard framework that is considered complete and comprehensive when evaluating governance management IT organization. COBIT is known as a framework with a wide range of topics, especially when combined with the latest 2019 version of COBIT, which offers flexibility of use [10]. COBIT 2019 is the latest version and gets a major update from the previous version, namely COBIT 5 [11]. COBIT 2019 is the latest version of COBIT and a refinement of COBIT 5 [12]. Based on the 2019 COBIT framework, improving the scope from 5 to 11 can be used to improve the scope of management and governance of an enterprise, namely the enterprise IT threat landscape, compliance requirements, the role of IT for the company,

enterprise IT resource model, IT implementation methods, strategy companies in adopting IT and companies [13].

Over the years, framework best practice has been developed to help organizations understand, plan, and implement information technology governance. COBIT is one best practices for the management and governance of corporate information technology. COBIT continues to evolve into a broader and more comprehensive information technology governance and management framework. One of the COBIT development products released in 2018, which was created by integrating more than 25 years of development, is COBIT 2019 [10]. COBIT 2019 development is based on two main classification systems, classifying the five COBIT 5 development principles and one new additional principle categorized into governance systems and another three new additional principles categorized into governance framework.

The State Electricity Company (PLN) UP3 Manokwari is one of the Implementing Units of the State Electricity Company Limited Liability Company. PLN UP3 Manokwari is one of the State Owned Enterprises (BUMN) in Manokwari, West Papua Province, as a provider of electricity. In order to support the company's main business objectives, PLN UP3 Manokwari has implemented Information Technology (IT) which is structurally managed and implemented by the Information Technology Division (ITD). However, information technology management at PLN UP3 Manokwari currently has not implemented information technology governance with a specific framework. To support the ongoing management of information technology, the Information Technology Division of PLN UP3 Manokwari still uses its tools in certain sections such as in the application development section using laravel framework with the development model use System Development Life Cycle (SDLC), then in section Cyber Security they are studying Perdue Model as a reference, while in some parts still use the system manually. Management of data that is still manual has many risks, including systems that are not integrated, overwhelmed in handling risks, maintenance of uncontrolled information technology assets, and other risks. This causes the company's main business objectives have not been achieved optimally. In addition, the obstacles faced in the information technology section are such as the Information Technology Division which was only formed in 2019 so that in the management of information technology at PLN UP3 they are still trying to make improvements, then there is no technician section available in the field so they have trouble when there is damage require technicians and a lack of Human Resources in the information technology section which causes them to be

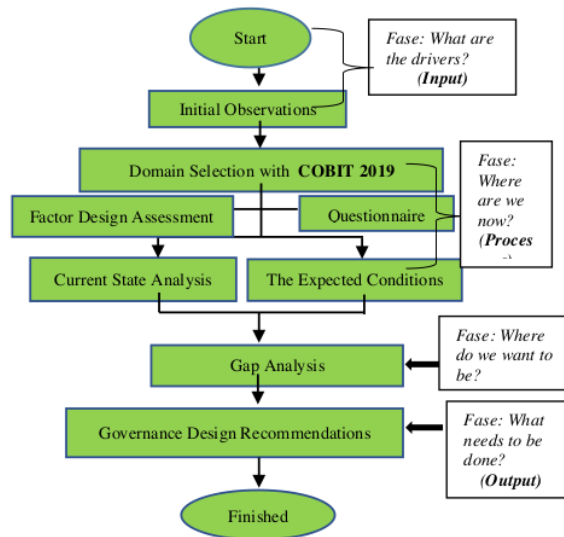
overwhelmed in handling information technology management at PLN UP3 Manokwari.

Based on the problems above, the researcher offers the design of information technology governance in the division information technology PT PLN UP3 Manokwari uses Frameworks COBIT 2019. COBIT 2019 was chosen as the framework to be used in this study because it is more flexible and has a wider scope. Data collection will be carried out using interview techniques with assistance toolkit COBIT 2019 and a questionnaire made based on the selected domain in the assessment factor designat COBIT 2019. The questionnaire will be distributed to PT PLN UP3 Manokwari parties who are directly responsible for a job, who are selected based on the RACI Chart. For the stages or phases that will be carried out follow the approach implementation roadmap COBIT 2019. The purpose of this research is to design Information Technology governance in the Division Information Technology PLN UP3 Manokwari. Output of this research is in the form of an information technology governance plan that contains recommendations for improvements that can be used by the Division Information Technology at PLN UP3 Manokwari to support the achievement of the company's main business objectives.

2. RESEARCH METHOD

The methodology that will be used in this study is to adopt the approach implementation roadmap COBIT 2019 but not all phases are used because they are limited at the design stage. The phases used are phases 1-4 ie:

- What are the drivers?
- Where are we now?
- Where do we want to be?
- What needs to be done?



Gambar 1. Research Flowchart

The description of the Research Flow

Stage 1: What are the drivers?

This stage is carried out in two ways:

- a. Literature review
Literature review was conducted to dig up information related to the problems and objects studied, such as the theoretical foundations and models of information technology governance
- a. Business Process Studies
Business process studies are conducted by interviewing and studying company documents to collect company data through company profiles which include company details, basic company information, company achievements and other information.

Stage 2 :Where are we now?

The selection of the COBIT domain was carried out by measuring 10 design factor use help toolkit COBIT 2019 and held discussions with the PLN UP3 Manokwari Manager. After the factor design assessment is carried out, then proceed to the next stage assessment which is done in 2 ways, namely through data collection questionnaire and assessment design factor.

a. Evaluation Design Factor Factor

Design is the phase where the corporate governance design process is formed and ensures the success of companies in the field of I&T [14]. Evaluation design factor conducted by conducting interviews with the Manager and IT Division of PLN UP3 Manokwari. The questions given refer to the 10 design factors contained in toolkit COBIT 2019 but in this

study only used a few factor design tailored to the needs of the company.

b. Questionnaire

Data collection was carried out using a questionnaire. Questionnaires are arranged based on the selected domain on framework COBIT 2019. The questionnaire will be distributed to respondents who are parties to PLN UP3 Manokwari who are directly responsible for a job selected based on the RACI Chart. Questionnaire data processing analysis was carried out by calculating scores on the assessment of each process where there was an achievement value per activity. The rating for the breakdown of achievement is the percentage of the average value of the total activity value per IT process formulated in the company [15].

$$Ratings = \frac{\text{total activity value per process}}{\text{number of respondents}} \times 100\%$$

From the average value, it is converted into a rating scale, including N, P, L, and F.

- N (*not achieved*) scale 0 – 14%. This category has no or little evidence of achievement in information technology processes.
 - P (*partially achieved*) scale 15 – 50%. In this category there is some evidence regarding the achievement of information technology processes.
 - L (*achieved*) scale 50 – 84%. This category includes evidence of a systematic approach, and significant achievement of certain processes, although there may still be insignificant weaknesses.
 - F (*fully achieved*) scale 85 – 100%. In this category there is evidence of systematic and complete, and full achievement of the process attributes.
- c. Analysis of Current Conditions
Questionnaire results data is processed to analyze the current condition of implementing corporate information technology governance
- d. The expected conditions
Based on the assessment results data design factor then it can be seen the conditions of implementation of information technology processes that are expected through tools COBIT 2019.

Stage 3 :Where do we want it?

In the gap analysis process, a comparison will be made between the current condition of information technology and the condition of information technology expected by the company. From this comparison is used to analyze the extent to which the current IT process is in accordance with the conditions expected by PLN UP3 Manokwari.

Stage 4 :What needs to be done?

At this stage an improvement plan is made based on the gap analysis obtained in the previous stage. Maintenance plan contains recommendations that

can be used by the Division Information Technology PT PLN UP3 Manokwari to achieve the expected level of implementation of Information technology processes. Furthermore, the preparation of the design of Information Technology governance in the Division is carried out Information Technology PT PLN UP3 Manokwari.

3. RESULT AND DISCUSSION

3.1 Results of Factor Design Assessment

Factor design assessments for all governance processes totaling 40 processes were carried out using toolkit COBIT 2019 which has been provided by ISACA 2019 [10] [16] [17] [18]. Based on the factor design assessment shown in table 1, the objective of the selected process is each process that is marked in green.

Table1. Target Capability Level per IT Governance Process

Process	The Capability Level at Expected
EDM01	4
EDM02	4
EDM03	4
EDM04	4
EDM05	4
APO01	4
APO02	4
APO03	4
APO04	4
APO05	4
APO06	4
APO07	4
APO08	4
APO09	3
APO10	4
APO11	4
APO12	4
APO13	4
APO14	4
BAI01	4
BAI02	4
BAI03	4
BAI04	4
BAI05	4
BAI06	4
BAI07	4
BAI08	3
BAI09	3
BAI10	4
BAI11	4
DSS01	4
DSS02	4
DSS03	4

DSS04	Managed Continuity	4
DSS05	Managed Security Services	4
DSS06	Managed Business Process Controls	4
MEA01	Managed Performance and Conformance Monitoring	4
MEA02	Managed System of Internal Control	4
MEA03	Managed Compliance with External Requirements	4
MEA04	Managed Assurance	4

3.2 COBIT Domain Selection Results

Out of a total of 40 information technology governance processes, the Information Technology Division of PLN UP3 Manokwari said that almost all information technology governance processes are important to the company, so that the level of capability expected in each high value process can be seen in table 1. However, in this study only take the information technology governance process that is most prioritized by the company. From the results of the discussion, the selected COBIT domains were EDM03, APO03, APO12, APO13, BAI01, BAI03, BAI06, BAI06, BAI07, BAI11, DSS05. This is because they still have difficulties in handling risk and the need for a managed enterprise architecture.

3.3. Results of Data Processing

Questionnaires that have been collected processed using descriptive statistical techniques. The results of processing the questionnaire data from the selected COBIT domains are shown in the following table.

1. EDM03 Process Assessment (Risk Optimization Management)
 The capability level of the EDM03 process is still at level 1 with a rating scale of 36% or category P (partially achieved).

Table 2. Result of the EDM03 Process Assessment

Activity	Result
Activity 1	45%
Activity 2	37%
Activity 3	25%
Total	107%
Ratings	36%

2. APO03 Process Assessment (Managed Enterprise Architecture Management)
 The APO03 process has a capability level at level 2 with a rating scale of 67% or category L (largely achieved).

Table 3. Result of the APO03 Process Assessment

Activity	Result
Activity 1	67%
Activity 2	72%
Activity 3	59%
Activity 4	66%
Activity 5	69%
Total	332%
Ratings	67%

3. Assessment of APO12 Process (Managed Risk Management)

The capability level of the APO12 process is still at level 1 with a rating scale of 45% or category P (partially achieved).

Table 4. Result of the APO12 Process Assessment

Activity	Result
Activity 1	47%
Activity 2	33%
Activity 3	37%
Activity 4	45%
Activity 5	54%
Activity 6	53%
Total	269%
Ratings	45%

4. APO13 Process Assessment (Managed Security Management)

The APO13 process capability level is still in place at level 1 with a rating scale of 39% or category P (partially achieved).

Table 5. Result of the APO13 Process Assessment

Activity	Result
Activity 1	37%
Activity 2	42%
Activity 3	39%
Total	118%
Ratings	39%

5. BAI01 Process Assessment (Managed Program Management)

The BAI01 process has a capability level at level 2 with a rating scale of 70% or category L (largely achieved).

Table 6. BAI01 Process Assessment Result

Activity	Result
Activity 1	77%
Activity 2	62%
Activity 3	65%
Activity 4	79%
Activity 5	70%
Activity 6	72%
Activity 7	64%
Activity 8	70%
Activity 9	68%
Total	627%
Ratings	70%

6. Process Assessment BAI03 (Management of Managed Solution Identification and Manufacturing)

The BAI03 process has a capability level at level 2 with a rating scale of 67% or category L (largely achieved).

Table 7. BAI03 Process Assessment Result

Activity	Result
Activity 1	72%
Activity 2	66%
Activity 3	69%
Activity 4	70%

Activity 5	65%
Activity 6	76%
Activity 7	63%
Activity 8	71%
Activity 9	64%
Activity 10	65%
Activity 11	60%
Activity 12	67%
Total	808%
Ratings	67%

7. BAI06 Process Assessment (Managed IT Change Management)

The BAI06 process has a capability level at level 2 with a rating scale of 73% or category L (largely achieved).

Table 8. BAI06 Process Assessment Result

Activity	Result
Activity 1	75%
Activity 2	74%
Activity 3	67%
Activity 4	76%
Total	292%
Ratings	73%

8. Process Assessment BAI07 (Managed IT Change Acceptance and Transition Management)

The BAI07 process has a capability level at level 2 with a rating scale of 71% or category L (largely achieved).

Table 9. BAI07 Process Assessment Result

Activity	Result
Activity 1	77%
Activity 2	72%
Activity 3	65%
Activity 4	72%
Activity 5	67%
Activity 6	63%
Activity 7	76%
Activity 8	78%
Total	570%
Ratings	71%

9. BI11 Process Assessment (Managed Project Management)

The BAI11 process has a capability level at level 3 with a rating scale of 74% or category L (largely achieved).

Table 10. BAI11 Process Assessment Result

Activity	Result
Activity 1	69%
Activity 2	75%
Activity 3	75%
Activity 4	79%
Activity 5	77%
Activity 6	66%
Activity 7	72%
Activity 8	78%
Activity 9	76%
Total	667%
Ratings	74%

10. DSS05 Process Assessment (Managed Service Management)

The capability level of the DSS05 process is still at level 1 with a rating scale of 39% or the P category (partially achieved).

Table 11. DSS05 Process Assessment Result

Activity	Result
Activity 1	49%
Activity 2	35%
Activity 3	45%
Activity 4	29%
Activity 5	37%
Activity 6	36%
Activity 7	42%
Total	273%
Ratings	39%

3.4 Gap Analysis Results

The results of the gap analysis between the current level of IT process capability and the level of capability expected by the IT Division of PT PLN UP3 Manokwari are shown in table 12.

Table 12. Gap Analysis of Process Capability Levels

No	Process	Current capability level	The capability level at expect	GAP
1	EDM03	1	4	3
2	APO03	2	4	2
3	APO12	1	4	3
4	APO13	1	4	3
5	BAI01	2	4	2
6	BAI03	2	4	2
7	BAI06	2	4	2
8	BAI07	2	4	2
9	BAI11	2	4	2
10	DSS05	1	4	3

3.5 Recommendations for Improvement

Based on the results of the assessment of each IT governance process in the IT Division of PT PLN UP3 Manokwari, in order to achieve the expected level of capability, it is recommended that companies take corrective actions in IT management of each selected process domain with reference to the IT governance design that has been designed by researchers. The IT governance model was created by considering the current implementation of IT in the IT Division of PT PLN UP3 Manokwari. Based on the indicators of the company's goals, it is necessary to have policies in managing IT processes so that they can support the achievement of the company's main business goals.

This IT governance design recommendation is prepared based on the governance design referring to COBIT 2019 Governance and Management Objectives (ISACA, 2019).

3.6 Design of Information Technology

The IT management model is realized in the form of an information technology governance design based on the ISACA guidelines 2019, which was compiled as a guide line for the IT Division of PT PLN UP3 Manokwari in managing IT. This design is structured for the entire selected COBIT domain process, namely:

1. EDM03 Risk Optimization Management
2. APO03 Managed Enterprise Architecture Management
3. APO12 Managed Risk Management
4. APO13 Managed Security Administration
5. BAI01 Managed Program Management
6. BAI03 Management of Managed Solution Identification and Creation
7. BAI06 Managed IT Change Management
8. BAI07 Managed IT Change Acceptance and Transition Management
9. BAI11 Managed Project Management
10. DSS05 Managed Security Services Management

The IT governance design is designed based on the 2019 COBIT framework. The scale of each indicator is in the form of a percentage, where each indicator is expected to reach an F rating scale (fully achieved) namely the scale of 85 – 100% and the maximum target is 100% meaning that in this category the company already has systematic and complete evidence, and full achievement of the process attributes.

4. CONCLUSION

Based on the results of research on the Division Information Technology PT PLN UP3 Manokwari, the following conclusions are obtained:

1. The results of selecting the COBIT domain resulted in 10 (ten) process mains, namely: EDM03, APO03, APO12, APO13, BAI01, BAI03, BAI06, BAI07, BAI11, and DSS05
2. The level of IT process capability in the IT Division of PT PLN UP3 Manokwari is still on average at level 2, meaning that the company has achieved its goals through the implementation of basic, complete, and a series of activities that can be characterized as performance.
3. The IT Division of PLN UP3 Manokwari has not yet implemented an information technology governance system.
4. The level of capability expected by the

IT Division of PT PLN UP3 Manokwari is on average at level 4, where the company has achieved its goals and well defined its performance which can be measured quantitatively.

5. The IT governance plan is prepared as a guide for the IT Division of PT PLN UP3 Manokwari in managing IT and refers to the 2019 COBIT framework Governance and Management Objectives.

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