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Assessment of Information Technology Governance Implementation Based on COBIT Framework 5 Focus on APO 04 Subdomain (Align, Plan and Organise)

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Abstract—

Most of companies and organizations have used information technology to improve the effectiveness and efficiency of business performance. In order for the effectiveness and efficiency of information technology to be achieved, it is necessary to have good information technology governance so that the desired goals are achieved. Bank XXX Branch X always strives to provide the best, provide excellent service and work optimally. Despite using reliable information technology, when the implementation there are still some obstacles that cannot be avoided. In the IT division, there are still obstacles that is technical problems related to IT equipment, *Branch Delivery System (BDS)* applications, transaction service products, additional services and *e-channels*. In this study, an assessment of information technology governance was carried out based on the COBIT 5 *framework* focusing on *APO04* subdomain. The purpose of this study was to determine the level of capability model and risk value also provide recommendations for improving information technology governance at PT. Bank XXX Branch X. The methodology used is the method of data collection and data analysis. Data collection methods consist of problem formulation, literature study, observation, interviews and questionnaires. The data analysis method is carried out by calculating the results of the questionnaire answers using a Likert measurement scale to get the current capability model level, expected capability model level and risk value, calculate the gap and provide recommendations for improvement. The results of this study show that the value of the current capability model in *APO04* sub domain is 3.77, the expected capability model is 4.1 and 12 recommendations for improvement are obtained.

Keywords— COBIT 5, IT Governance Assessment, Capability Model, Current Capability Model, Expected Capability Model.

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I. INTRODUCTION

1 At this time, the use of information technology is one of the important factors to increase the effectiveness and efficiency of business performance. To support the success of an organization or company according to its objectives, it depends on how far information technology governance is being carried out. Information technology governance is able to realize the benefits of information technology to meet the needs of a company or organization and is able to control information technology resources through a structured process with the

aim of creating information technology processes needed by a company [1].

1 information technology governance focuses on determining the desired decision making in the use of information technology in an organization or company. The majority of public and private organizations or companies have used the information technology governance framework as a reference for assessing and improving information technology governance in an organization or company in order to achieve maximum effectiveness [2].

Despite having reliable and superior information technology, in the implementation in



1 In the field there are still obstacles that cannot be avoided. IT Division at PT. Bank XXX Branch X focuses on implementing the role, namely evaluating technology and openly accepting innovation ideas related to the environment for business interests and ensuring success. In its implementation, always maintain the work system, one of which is by conducting a rotation system in accordance with the applicable SOP (Standard Operating Procedure) and documenting the work carried out. As well as dealing with technical problems related to information technology facilities that occur in the field. PT. Bank XXX Branch X has 7 unit offices under it. The main cause in handling technical problems is the lack of HR (Human Resources) in the IT division at PT. Bank XXX Branch X.

COBIT (Control Objectives for Information and Related Technologies) is an internationally recognized standard framework created by ISACA (Information Systems Audit and Control Association) to manage IT Governance with the aim of developing an information technology policy that will maintain data integrity, safeguard assets, enable organizational goals to be achieved effectively and use resources efficiently [3].

Therefore, the author will conduct research on the evaluation of information technology governance using the COBIT 5 (Control Objectives for Information and Related Technologies) framework with a case study at PT. . Bank XXX Branch X with a focus on using the APO04 (Manage Innovation) sub domain. The purpose of this research is to provide recommendations on the results of the evaluation of information technology governance to banking companies to optimize the use of information technology governance in the future in accordance with the company's business processes.

II. LITERATURE REVIEW

Audit is a process carried out by an auditor to obtain accurate sources of information and data about a company or organization to ensure that systems, processes, or products are running properly. The purpose of the audit is to provide evaluation results on a system or process that is currently running in an organization or company that allows the auditor to evaluate the system by checking the quality of the system and testing the system. Audits are able to rank weaknesses and

strengths in the management of ongoing systems and are also able to provide process improvement information on a system or process that is less than optimal [4].

Information technology has a very important role in aspects of people's lives. Information technology is a technology for storing data, processing data, compiling data and manipulating data in various ways to obtain accurate and quality information. The information is usually used for personal interest, the government of a company or organization in making decisions. The purpose of information technology is to solve a problem, develop creativity, increase effectiveness and provide time efficiency to make it easier for humans to manage information. Information technology must be carefully planned because information technology is the main driver of a process of changing a system that provides important feedback for strategic objectives [5].

Governance is a series of processes related to policies, rules, management, management and control of a company. Governance includes stakeholder relations and organizational management objectives. This is to ensure that information technology in the organization or company can be applied to maintain and expand strategies to achieve information technology goals [6].

The main objective of information technology governance is to balance each existing business process in the organization or company with the current state of information technology, to maximize the use of information technology to optimize the application of information technology and to measure the performance of information technology. This means that information technology governance is part of an organization's information technology governance process related to stakeholders, organizational business structures and processes that ensure that human resources related to information technology are implemented in line with the strategies and goals to be achieved by an organization to obtain results. which is expected.

COBIT 5 is the latest generation of ISACA (Information Systems Audit and Control Association) guidelines based on the development of COBIT 4.1 which discusses information technology management and information technology governance. COBIT 5

provides the best framework for managing, measuring and monitoring IT performance, explaining and providing all the information technology management model processes in detail [7].

1 The APO (Align, Plan and Organise) domain describes the processes required for effective planning and organization of internal and external IT resources, including innovation planning, risk management and IT quality management. The APO domain focuses on activities that include policies, corporate architecture, innovation, financial management and portfolio management in the IT sector in order to contribute to the achievement of business goals, the APO domain consists of 13 control objectives :

1. APO01 Manage The IT Management Framework
2. APO02 Manage Strategy
3. APO03 Manage Enterprise Architecture
4. APO04 Manage Innovation
5. APO05 Manage Portfolio
6. APO06 Manage Budget and Costs
7. APO07 Manage Human Resources
8. APO08 Manage Relationships
9. APO09 Manage Service Agreements
10. APO10 Manage Suppliers
11. APO11 Quality
12. APO12 Manage Risk
13. APO13 Manage Security

RACI Chart is a matrix that maps the level of assignment and responsibility for a decision making role in the organization[8]. In the RACI chart there are four levels of responsibility, namely Responsible, Accountable, Confirmed and Informed.

In the COBIT 5 framework the Capability Model process is adapted from the software engineering process evaluation standard ISO/IEC 15504. This model will help to get a common objective view in carrying out the assessment process. In addition, this model also provides a way of measuring the performance of governance processes and management processes where the process will be based on the organization's ability to carry out the specified process [7].

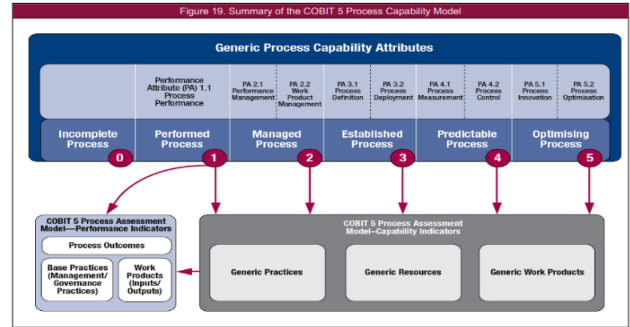


Figure 1. Process Capability Model COBIT 5 [9]

Likert scale is a scale used to measure perceptions or opinions. The Likert scale is considered easier to make and apply to respondents in order to provide opinions and assessments with appropriate choices so that the answers given are varied. The Likert scale is commonly used in questionnaires to calculate the level of each question in the COBIT 5 process [10].

III. METHODOLOGY

The following research stages determine the steps of the research carried out, for more details can be seen in Figure 2.

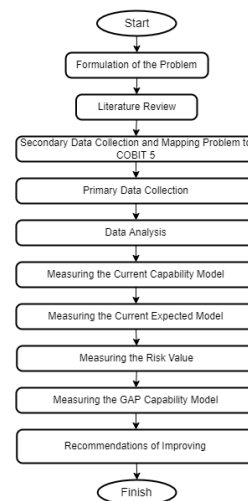


Figure 2. Research Framework

Secondary data collected in the form of information about the general description of the organization (organizational structure, vision, mission of PT. Bank XXX Branch X). The mapping process is carried out using the mapping process contained in the COBIT 5 document. The mapping process begins by mapping the vision, mission into enterprise goals, IT related goals and the focus of sub-domains in COBIT 5.

2 TABLE I. MAPPING VISION AND MISSION IN TO COBIT 5

Enterprise Goals	IT Related Goal	COBIT 5 Process
Product and business innovation culture	Knowledge, expertise and initiatives for business innovation	EDM02
		APO01, APO02, APO04, APO7, APO08
		BAI05, BAI08

From the results of the mapping process in Table 1. it is more focused on the sub domain that focuses on the management of the constraints being faced by the IT division. The following is the mapping process in Table 2.

5 TABLE II. MAPPING SUB DOMAIN APO04

Enterprise Goals	IT Related Goal	COBIT 5 Process	IT Process APO 04
Product and business innovation culture	Knowledge, expertise and initiatives for business innovation	APO04 Manage Innovation	APO04.01
			APO04.02
			APO04.03
			APO04.04
			APO04.05
			APO04.06

Primary data collection was done by using interview, observation and questionnaire methods [11]. In the method of observation and interviews, conducted by direct observation to PT. Bank XXX Branch X and interviewed resource persons related to the implementation and governance of information technology. The list of questions in the questionnaire was selected based on the activities domain in the COBIT 5 document. Primary data were analyzed using a Likert measurement scale with a capability model. From the measurement results using a Likert scale, it will then be converted into a capability model using the following equation [12].

$$\text{Capability Level} = \frac{(0 \times y_0) + (1 \times y_1) + \dots + (5 \times y_5)}{z} \quad (1)$$

Where $Y_n(y_0 \dots y_5)$ is number of processes at level n and z is number of evaluated process.

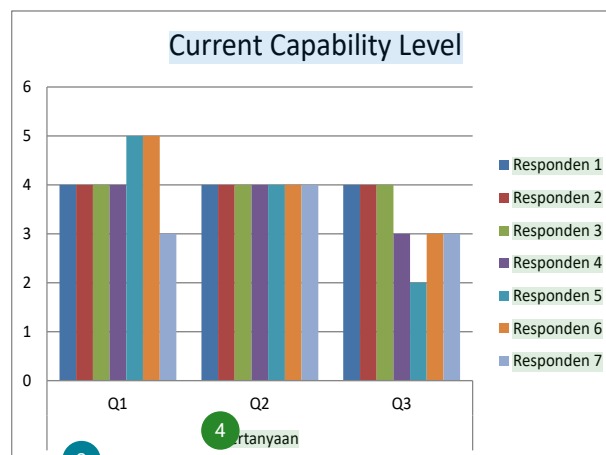
Some other research related to implementing information technology approach for solving the problem inspired from paper [13].

IV. RESULT AND DISCUSSION

The questionnaire contains 25 questions selected based on the APO04 activities domain to determine the value of the current capability model, expected capability and risk value. Questionnaires were distributed to seven respondents. Respondents were determined based on the RACI chart APO04 which was adjusted to the existing positions at PT. Bank XXX Branch X, here is a list of respondents:

1 TABLE III. RESPONDENTS LIST

No	Kode	Respondent
1	R1	Head of Branch
2	R2	Transaction Process Head
3	R3	General Affair
4	R4	IT officer
5	R5	IT officer
6	R6	IT officer
7	R7	IT officer



2 Figure 3 Recapitulation of Questionnaire Answers on APO 04.02

Each respondent's answer in Fig. 3 will be calculated using equation (1) as follows.

$$\text{Capability Level R1} = \frac{(4 \times 3)}{3}$$

$$\text{Capability Level R1} = 4$$

After calculating each respondent's answer, it is continued by calculating the average value of the respondent's capability to get the current capability value at APO04.01. Likewise, in



1 calculating the expected capability value and risk value, the following are:

TABLE IV. COMPARISON CURRENT CAPABILITY WITH EXPECTED CAPABILITY

IT Proses	Current Capability Model	Expected Capability Model	Gap	Risk Value
APO04.01	3,71	4,21	0,5	3,96
APO04.02	3,8	3,99	0,19	3,8
APO04.03	3,78	4,02	0,24	4,2
APO04.04	3,82	4,21	0,39	3,99
APO04.05	3,64	4,06	0,42	4,09
APO04.06	3,82	4,13	0,25	4,02
Average	3,77	4,1	0,33	4,01

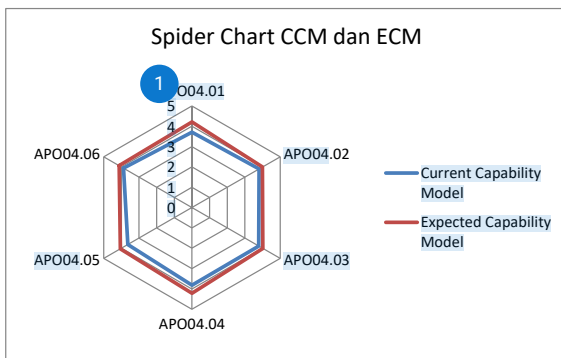


Figure 4 Gap between CCM and ECM

In Table 4 it is known that the current capability of the APO04 model is at the level of the established process, which is 3.77 and the expected capability of the APO04 model is at the level of the established process, which is 4.1.

On Fig. 4, there is still a difference between the value of the current capability model and the expected capability model. So it is necessary to improve the IT process in order to achieve the desired expected capability model value. In addition, recommendations for improvement can be in the form of corrective corrections for the implementation of existing responsibilities in the organizational structure with the RACI COBIT 5 diagram to emphasize the roles that have been determined. The following are recommendations for improvement to overcome the difference in the capability value:

1. Things that can be made to improve the suitability between the results of the questionnaires from parties R (Responsible) and A (Accountable), as well as the RACI chart on IT activities APO04.01 is to make improvements by appointing the Branch Manager as accountable party and IT officers and Transaction Process Head and General Affairs as the Responsible.
2. Appoint the Transaction Process Head and IT Officers as responsible on IT activities APO04.02.
3. Appoint the Transaction Process Head and IT Officers as Responsible on IT activities APO04.03.
4. Appoint the Transaction Process Head and IT Officers as Responsible on IT activities APO04.04.
5. Appoint the Transaction Process Head as the responsible and accountable and IT officers as responsible and accountable on IT activities APO04.05.
6. Appoint the IT Officers as responsible and accountable parties and the Transaction Process Head as an accountable on IT activities APO04.06.
7. To improve the APO04.01 process, increase relevant human resources such as the introduction of innovation, provide infrastructure that can be a driver of innovation such as IT tools to encourage innovation ideas that are currently running as well as innovation ideas in future.
8. To improve the APO04.02 process, hold regular meetings with business units or other stakeholder entities and understand the parameters of product innovation, services and transaction services, additional services and e-channels so that appropriate strategies can be developed..
9. To improve the APO04.03 process, conduct training or communicate information related to product innovation, services and transaction services, additional services and e-channels to employees and users.
10. To improve the APO04.04 process, evaluate the Branch Delivery System

1 (BDS) application trial, transaction service products, additional services and e-channels to find out any problems and consider if the implementation is appropriate and feasible as well as documenting properly routinely every alternative solution that can support efficient handling of product innovation services and transaction services, additional services and e-channels.

11. To improve the APO04.05 process, communicate and coordinate directly with the head office as well as conduct a more in-depth analysis of the pattern of problems and handling of any opportunities for product innovation, transaction services, additional services and existing e-channels.
12. To improve the APO04.06 process are monitoring if there are new innovations in the Branch Delivery System (BDS) application, transaction service products, additional services and e-channels and assessing implementation based on strategies and innovation plans to be realized as well as reviewing plans the innovation during management to improve the quality of the use of the innovation and adjust the innovation plan if necessary.

V. CONCLUSION

Based on the research, the current capability model of Bank XXX Branch X in the APO04 sub domain is at the established process level which has an average value of 3.77 with the lowest current capability model value being in the IT process APO04.05 which is 3.64. The highest current capability model is in the IT process APO04.06, which is 3.88. To solve this problem, the recommendations in point 11.

The expected capability model of Bank XXX Branch X in the APO04 sub domain is at the established process level which has an average value of 4.1 with the lowest expected capability model value being in the IT process APO04.02 which is 3.99 and the highest expected capability model value is on the IT process APO04.01 which is 4.21. To solve this problem, recommendations in points 8 and 9 can be made.

The level of risk owned by Bank XXX Branch X in the APO04 sub domain has an average value of 4.01 with the lowest risk value being in the IT process APO04.02 which is 3.8 and the highest risk value being in the IT process APO04.05 which is 4.09. To solve this problem, recommendations in points 7 and 8 can be made.

Based on the results of questionnaires, interviews and observations, 12 recommendations were obtained from the assessment of information technology governance at Bank XXX Branch X.

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