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COBIT 5 Capability Level of Information Technology Governance at PT ABC

Kevin Martin[1], Wella[2]
Information System, Universitas Multimedia Nusantara, Tangerang, Indonesia
kevin32@student.umn.ac.id
wella@umn.ac.id

***Abstract*— In Indonesia, PT ABC is an ICT business that specializes in network services, IT management, and system integrators. The company's IT governance mechanisms are still not working to their full potential. This is demonstrated by the inability of PT ABC to achieve its business objectives due to poor management of its IT resources, difficulties in addressing issues, and a failure to comply with external obligations. Utilizing the COBIT 5 framework and an IS audit phase, the capability level measurement and gap analysis for IT governance at PT ABC were conducted to address all of these issues. Purposive sampling and a qualitative research methodology were both used in this study. Interviews and observations served as the major and secondary data sources. As a result, capability level measurement and gap analysis at PT ABC stop at level 1 for the EDM04 process and have a gap value of 1, whereas they stop at level 3 for the DSS03 and MEA03 processes and have no gap value. Therefore, in order for the IT application to be more optimal and to prevent or reduce the recurrence of the same issues in the future, PT ABC needs to implement and follow up on the advice made.**

***Index Terms*— Capability Level, COBIT 5, Gap Analysis, IS Audit, IT Governance**

I. INTRODUCTION

Along with the development of information and communication technology (ICT), most companies are currently starting to apply information technology (IT) to achieve planned goals and support the company's business processes [1]. Those make IT have a significant role and become an added value and competitive advantage for companies to survive and compete to beat their competitors. Thus, investment in IT is needed, both in terms of cost and time, to apply IT-based services optimally to the company's business functions so that the investment made will lead the company in a better direction [2].

IT governance is needed to align the IT department related to investment returns and the implementation of IT-based services to the goals and business activities of the company's management [2]. IT governance is a term that refers to a commitment, awareness, and implementation of the company's management control process related to IT resources or information systems (IS) that have been invested in being implemented, with the aim that the operation of the IT can support and in line with the company's business strategy. This makes a company that has applied IT services or IS inseparable from the IT governance to measure the capability level of their IT or IS implementation [3].

In measuring the capability level of the application of IT services, a framework is needed to assist or serve as a guideline for auditors in making valid and reliable measurements. One of the frameworks applied to perform capability level measurements is Control Objectives for Information and Related Technologies (COBIT), which is the most commonly applied today in COBIT 5 framework [4]. The COBIT 5 framework can be used to assist companies in carrying out IT governance evaluations to achieve optimal values because there is a calculation of the capability level value, which represents the level of alignment between IT and business processes [5].

One company that has used IT to help run its business processes is PT ABC. PT ABC is a company engaged in the ICT field, focusing on IT management, network services, and system integrators. In this case, PT ABC is always agile to compete with its competitors and answer every market demand in the various industries, especially in IT, which is now widely implemented by different corporate sectors [6]. Moreover, PT ABC is noted already to have multiple clients or customers from various industrial segments in Indonesia, which have entrusted solutions for applying IT offered by PT ABC. That way, the company's business processes cannot be separated from IT in providing complete services to their clients or customers.

The business processes carried out so far with the application of IT, especially for the solution operations department at PT ABC, are still not running well. This can be seen from the IT governance processes that are still less than optimal, as evidenced by the lack of transparent management related to the IT resources and the limitations in implementing problem-solving because there are no clear and systematic standard operating procedure documents for the department, which make the work processes hampered when a problem arises, and for the last is the company's lack of compliance with external requirements set by client or customer who uses the services of PT ABC. Those problems are significant obstacles for PT ABC in achieving its vision and mission to become the leading

ICT company in Indonesia by providing ICT-based solution services. In this case, the problems encountered can be identified thoroughly and resolved properly by giving some recommendations for the measurement results of the capability level and gap analysis for the IT governance processes at PT ABC using the COBIT 5 framework, where aspects of IT are vital for companies today to be aligned with their business processes [7].

Based on the problems faced by PT ABC, this research is needed to help the company, especially the solution operations department, in solving the problem by measuring the capability level and also gap analysis of IT governance using the COBIT 5 framework, which where the results in the measurements obtained will later become a factual basis in providing some recommendations for improvements to the application of IT carried out, so that its implementation will be supporting the goals or business processes of PT ABC more optimally and as an expected.

II. Literature Review

A. *Previous Studies*

Research on COBIT 5 can be done by directly specifying the domain, such as the DSS (Deliver Support System) domain [8]. In addition, the selection of the COBIT 5 process is most often carried out based on the results of the cascading framework [9]-[11]. Evaluation using COBIT 5 often uses observation and questionnaire methods [8]-[9]. However, some studies use the interview method to improve accuracy [10]-[11]. After an evaluation, research is always continued by conducting a gap analysis [8]-[11]. Companies conducting COBIT 5 evaluations are usually legal entities [8]-[11]. The evaluation results vary widely, but it is rare for companies to get level 5 (Optimize). In evaluating the IS implemented by PT Sinar Sentosa Primatama Jambi [8], it is known how much benefit the company gets from implementing it. Then in the analysis of the IS implemented at PT Batu Karang [9], it can be seen the performance of the governance processes is still not fully implemented.

Furthermore, in measuring the capability level of the IT governance and management processes at PT Wellcomm Ritelindo Pratama [10], the results can be obtained regarding the extent of the IT governance and management processes' capability level. The last is in the capability level measurement processes from the implementation of IT at PT Supra Boga Lestari [11]. It can be obtained values of the capability level for providing recommendations for improvement in that company.

B. *IT Governance and COBIT 5*

IT governance is an action carried out in a structured and systematic way to align and optimize the application of IT with the company's business processes, as well as to ensure optimal allocations of IT implementation in the company's strategy. On the other hand, IT governance will reflect an application of corporate principles that focus on management and the use of IT to achieve the company's goals [12]. There are 4 (four) main objectives of conducting IT governance in the company, which include aligning IT with company strategy, helping the company to take every opportunity from the implementation of IT, there is a form of accountability for the use and management of appropriate IT resources, and also controlling any existing risk related to the application of IT in the company [13].

COBIT 5 is a framework developed by ISACA (Information Systems Audit and Control Association), which was first launched in 2012. COBIT 5 is the result of the development of the previous version, namely COBIT 4 or COBIT 4.1 [14]. The COBIT 5 is currently oriented to the governance of enterprise IT, emphasizing enablers in its implementation, defining a new process reference model with additions to the governance domain, as well as the existence of adding new processes that were not previously available in COBIT 4 and COBIT 4.1 [15]. The COBIT 5 also has 5 (five) domains, including EDM (Evaluate, Direct, Monitoring), APO (Align, Plan, Organize), BAI (Build, Acquire, Implement), DSS (Deliver, Support, Service), and MEA (Monitor, Evaluate, Assess). Thus, COBIT 5 becomes a framework with broad scope to support the alignment between IT implementation and the company's goals [15].

C. *Capability Level*

The levels of competence for the Process Assessment Model are separated into several dimensions, which range from 1 to 5 [11].

a. Level 1 Performed process, An implemented process achieves its purpose.

b. Level 2 Managed process, The processes performed as described above are implemented in a controlled manner and are set, controlled and maintained accordingly.

c. Level 3 Established process, The managed process described above is implemented using a defined achievable process.

d. Level 4 Predictable process, The above established process works within defined limits to achieve the process result.

e. Level 5 Optimizing process, The above predictable processes are continuously improved to meet relevant current and projected business objectives.

III. RESEARCH METHODOLOGIES

A. Research Object

The object of this research is PT ABC, especially in the solution operations department. PT ABC is a company engaged in ICT that focuses on network services, IT management, and system integrators. In this case, PT ABC is noted to already have various clients or customers from multiple industrial segments in Indonesia, which have entrusted IT solutions to the services offered by PT ABC. In addition, as a company engaged in the IT field, PT ABC also cooperates with many technology companies and participates in implementing IT to support the company's business processes.

B. Research Methods

This research uses qualitative methods to obtain and produce descriptive data, either verbally or in writing, based on observations and interviews. In this case, the qualitative method can be interpreted as an orderly way that can be used to conduct descriptive research and requires analysis, emphasizing the perspective and subject by the facts that occur in the field. The application of the qualitative method in this research is based on consideration of the data obtained from the audit processes, which is in the form of facts from a statement and the explanation was given, so that it can support this research process in measuring capability level and gap analysis of IT governance at PT ABC optimally.

The data collection techniques in this research used a qualitative approach with observation and interview methods. The method of collecting data through the interviews will be the primary data sources carried out in a structure with the auditees from the solution operations department at PT ABC, whose responsible for the implementation and execution of each activity for the selected COBIT 5 processes and also the entire interviews processes will be conducted using a video conference application, namely Zoom. In contrast, the method of collecting data through the observations will be the secondary data sources carried out by making indirect to identify company documents in the form of soft copies relevant to the problems and the scopes of activities for each selected process in the COBIT 5 framework.

There are 4 (four) stages of this research based on the IS audit phases [10], which include planning, fieldwork, reporting, and follow-up. In the planning, a pre-interview will be conducted to obtain information regarding the problem currently faced by PT ABC, determine the COBIT 5 processes through mapping, and create audit working papers to be used in the next phase for collecting data. Data collection will be carried out in the fieldwork phase using observation and interview techniques. Observations and interviews were conducted through forum group discussion (FGD) consisting of 3 IT department auditees responsible for the selected process. The results of the FGDs will be published in reporting phase. In the reporting phase, all data obtained will be analyzed to get the capability level and gap values, and all the results will be presented in an audit report. In the last phase, namely follow-up, the development of the audit report that has been previously created for PT ABC will be provided, including the gap values, findings, impacts, and recommendations for improvement.

IV. RESULTS AND DISCUSSIONS

A. Planning

The pre-interview activity was carried out together with the IT director from the solution operations department. The results were information related to the urgency of the problems faced by PT ABC at this time, which include the lack of precise management of the IT resources and limitations in implementing problem-solving because there are no systematic and explicit standard operating procedure documents for the department. The last is the company's lack of compliance with external requirements set by client or customer who uses the services of PT ABC.

There are 4 (four) main stages in determining the COBIT 5 processes. Starting from deciding PT ABC's enterprise goals, mapping the selected enterprise goals to the IT-related goals, and mapping established IT-related goals to the operations. Lastly, the COBIT 5 processes were determined based on the problems currently faced by PT ABC.

COBIT 5 Enterprise Goals				
		Relation to Governance Objectives		
BSC Dimension	Enterprise Goal	Benefits Realisation	Risk Optimisation	Resource Optimisation
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
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
Internal	11. Optimisation of business process functionality	P		P
	12. Optimisation of business process costs	P		P
	13. Managed business change programmes	P	P	S
	14. Operational and staff productivity	P		P
	15. Compliance with internal policies		P	
Learning and Growth	16. Skilled and motivated people	S	P	P
	17. Product and business innovation culture	P		

Figure 1. Selected Enterprise Goals

Figure 1 shows 3 (three) enterprise goals selected from 17 enterprise goals provided by the COBIT 5 framework. In this case, those enterprise goals are appropriate and represent PT ABC's goals, including customer-oriented service culture, business service continuity and availability, and also optimization of business process functionality.

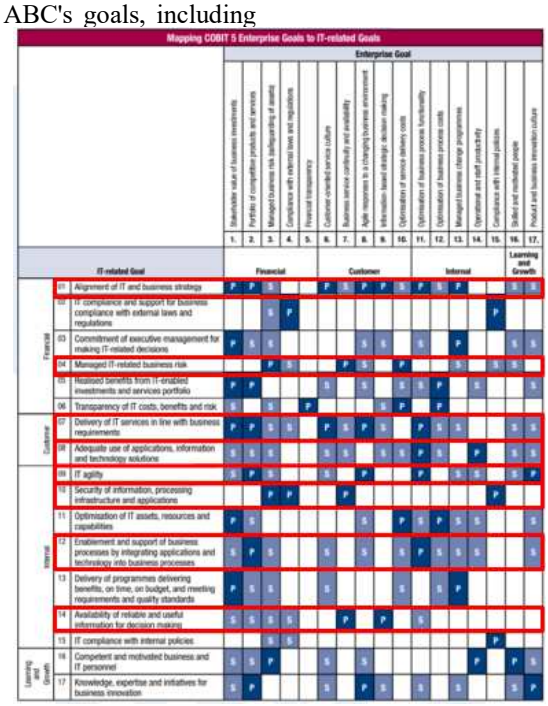

Figure 2. Results of Mapping Enterprise Goals to IT-related Goals

Figure 2 shows that 8 (eight) IT-related goals were selected for the mapping results, which shows how PT ABC's plans are supported by purposes related to their IT.

Table 1. Results of Mapping IT-related Goals to Processes.

IT-related Goals	Processes
ITG01	APO01, APO02, APO03, APO05, APO07, APO08, EDM01, EDM02, BAI01, & BAI02
ITG04	DSS01, DSS02, DSS03, DSS04, DSS05, EDM03, APO10, APO12, APO13, BAI01, BAI06, DSS06, MEA01, MEA02, & MEA03
ITG07	DSS01, DSS02, DSS03, DSS04, DSS06, EDM01, EDM02, EDM05, APO02, APO08, APO09, APO10, APO11, BAI02, BAI03,BAI04, BAI06, & MEA01
ITG08	APO04, BAI05 & BAI07
ITG09	EDM04, APO01, APO03, APO04, APO10, & BAI08
ITG10	EDM03, APO12, APO13, BAI06, & DSS05
ITG12	APO08, BAI02 & BAI07
ITG14	APO09, APO13, BAI04, BAI10, DSS03, & DSS04

Table 1 shows 35 processes of COBIT 5 that were selected as a whole for the results of the mapping, which, as a form, shows how goals related to their IT are supported by processes regarding IT in the COBIT 5 framework. On the other hand, Figure 4 shows 3 (three) COBIT 5 methods selected from 3 (three) different domains, including DSS03 Manage Problems, MEA03 Monitor, Evaluate and Assess Compliance with External Requirements, and EDM04 Ensure Resource Optimisation.

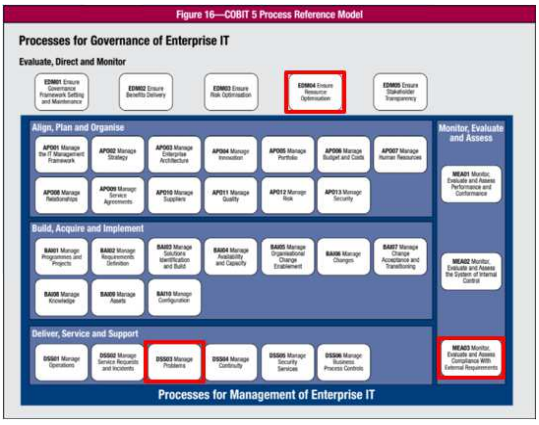

Figure 3. Selected Processes

The activities of making audit working papers are based on the 3 (three) COBIT 5 processes that were previously selected. The audit working papers contain the scopes, the purpose, and a list of questions compiled according to the activities in those processes to be asked to the auditees responsible for executing each activity.

B. *Fieldwork*

There are 2 (two) main activities for the fieldwork phase, including observations and interviews. Based on the results of the statements, information is obtained regarding the availability of the company's document in the form of soft copies relevant to each selected COBIT 5 process for PT ABC. In contrast, the results of the interviews are based on answers to questions asked to the auditees from PT ABC, whose responsible for carrying out each activity of the EDM04, DSS03, and MEA03 processes.

Table 2. Observation Results

Process	Document Guide	Document Availability
EDM04	11 Documents	10 Documents
DSS03	16 Documents	16 Documents
MEA03	15 Documents	12 Documents

The results of document observations in Table 2 show that for the EDM04 process, there are 10 (ten) documents available from 11 papers that serve as guidelines, then, for the DSS03 process, there are 16 documents available from 16 reports that serve as guidelines, and for the MEA03 process, there are 12 documents available from 15 papers that serve as guidelines. In this case, all the documents already available at PT ABC have differences in document naming but similarities in the documents that serve as guidelines from the COBIT 5 framework.

Table 3. Interview Assessment Calculation Results

Process	Total	Status	Explanation
EDM04	80,44%	Largely Achieved	Stopped at level 1
DSS03	80,33%	Largely Achieved	Stopped at level 3
MEA03	81,75%	Largely Achieved	Stopped at level 3

The interview assessment calculations in Table 3 show that the EDM04 process has stopped at level 1 with an average value of 80,44% and is included in the primarily achieved category. The DSS03 process has stopped at level 3 with an average value of 80,33% and is included in the primarily achieved category. Lastly, the MEA03 process has stopped at level 3 with an average value of 81,75% and is also included in the primarily achieved category.

C. *Reporting*

All data obtained in the previous phase will be analyzed to get the capability level value in each process. After the calculation results are received, the gap analysis is carried out by comparing the results of the capability level value at this time with the expected capability values by PT ABC for those processes.

Table 4. Capability Level Measurement Results

Process	Capability Level				
	1	2	3	4	5
EDM04	L	N	N	N	N
DSS03	F	F	L	N	N
MEA03	F	F	L	N	N

The capability level measurement results in Table 4 show 3 (three) selected processes for PT ABC, including the EDM04 process. The capability level is currently still at level 1, called the performed process. In contrast, the DSS03 and MEA03 processes have reached level 3 at their current capability level, known as the established process. For the lowest process, the main essence that can be done to improve this process is to conduct a review related to specific resources that may incur additional costs so that they do not exceed the budget limit. Furthermore, try and study particular metrics or frameworks, such as the COBIT 5 framework, to measure the process of managing these resources.

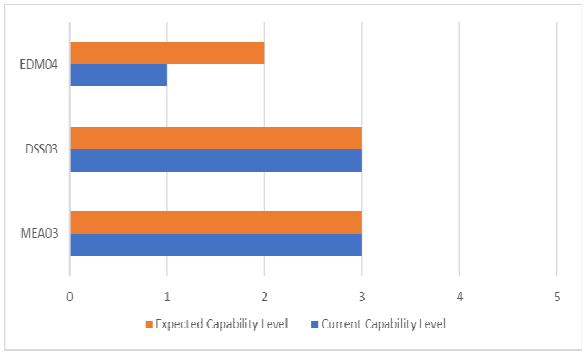

Figure 4. Gap Analysis Results

Gap analysis results from Figure 4, the EDM04 process shows a gap value of 1 level, which means that the expected capability level value for that process is higher than the current capability level value, so recommendations are needed to make improvements. In contrast, the gap analysis results for the DSS03 and MEA03 processes show no gap value, which means the expected capability level values of both approaches are the same as the current capability level values so that the methods are in line with the company's expectations. Lastly, an audit report is created after the gap analysis, including findings, impacts, and improvement recommendations.

D. *Follow-Up*

The final phase of the audit process in this research will be following up on the recommendations given in the previous stage. The results are that all of those recommendations have been approved by PT ABC to be implemented later by the PIC until the specified due date so that the IT governance processes at PT ABC become more optimal and as expected.

V. CONCLUSIONS

Based on the results of this research that have been carried out for the measurement capability level and gap analysis of IT governance at PT ABC using the COBIT 5 framework, the following conclusions can be drawn:

1. The processes that are suitable for the problems faced by PT ABC at this time are EDM04, then DSS03, and MEA03. In this case, the measurement and analysis results from the EDM04 show that the process of optimizing PT ABC's IT resources still lacks and is below the expectations of the company, so it has a significant impact on the problems, while the results of the measurement and analysis of DSS03 and MEA03 show process of problem management and monitoring, evaluating and assessing compliance with external requirements at PT ABC have gone well and also following what is expected by the company for their IT governance processes.
2. The recommendations for improvement given to PT ABC are based on the audit findings for the EDM04, DSS03, and MEA03 processes and all activities at the target level for the EDM04 process. All those recommendations have been received and approved to be fully implemented. Then the implementation of the IT at PT ABC will become more optimal and as expected in the future.

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