COBIT 5.0: Capability Level of Information Technology Directorate General of Treasury

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Abstract—**Information system is one of the most important things that can help every companies to improve the performance of their company. The Directorate Generate of the Treasury is one of the government agencies that already use information systems to support their performance to handle the entire transaction of state budgeting and also they provides information systems to serve their users. That system must have a priority of the security and reliability. To ensure that the system has both of the priority, it is necessary to holding of the information systems auditing to ensure that capability level of their governance. This research using framework of COBIT 5.0 and doing measurements with Capability Level. EDM 01 (Ensure Governance Framework Setting and Maintenance) and EDM 02 (Ensure Benefits Delivery) are the two main processes of that government needs to do an audit, because they want to make sure that the system can running well and can deliver every benefits to their users. Based on the measurements that have been done using a capability level, both of the main processes are stalled on level 4 and could not reach the level of target on level 5 because there are some activities that cannot going well and can be inhibit the others process to reach their goals.**

Index Terms— **Capability Level, COBIT 5.0, Information Systems, Information Systems Auditing, IT Governance.**

I. INTRODUCTION

In modern era, there are several progress at the development of the information technology that have some function or feature that getting better. There are several companies use information systems to assist the company in achieving their goals, and helps to improve the performance of the processes that exists at the company [1]. Therefore, the information system have a priority of the security and reliability. To ensure that the system has both of the priority, it is necessary to holding of the information systems auditing to ensure that capability level of their government. This research used framework of COBIT 5.0 and doing measurements with the Capability Level of their governance, that framework issued by ISACA in 2012 is COBIT 5.0. The framework is appropriate to be able to ensure the IT governance of information technology at the Directorate Generate of the Treasury.

Directorate of Treasury is one of the government agencies that deal with the every activities and transactions carried out by the State. The Directorate using information systems to support their performance. Information systems are handled by the IT section that called with the Directorate of Information Systems and Treasury Technology, where the directorate ensure the system that always running well and always available when their users want to use, and also to manage the entire State Treasury activities. Based on the importance of the information system, then the government want to do the auditing of the information systems to take the measurement of the information technology governance to ensure that their systems can running well without inhibit the performance of some of the business processes at their government.

The main purpose the problems in this study:

1. How capability level of information and technology governance on the Directorate General of the Treasury using framework of the COBIT5.0?

2. How does the recommendation over the results of the measurement capability level has been done of the technology and information Directorate General of the Treasury?

II. LITERATURE REVIEW

A. IT Governance

IT Governance under the Information Technology Governance Institute (ITGI) is part of corporate governance and comprises of leadership, organizational structure and IT governance processes and IT objectives. IT governance is the responsibility of the board of directors (BOD) and executive management [2].

In other words, we can say that IT Governance is an interrelated organizational structure and process for

managing and controlling the company by adding value to the use of technology in it [2].

B. Audit

Audit is a systematic and objective process to ensure the level of submission between the assignment and predefined criteria, the results of the assignment will be communicated to the interested parties [3].

C. Information System Auditing

Information System Auditing is an an evaluation of how the suitably level of between information systems that has been designed and implemented effectively, efficiently, and economically, as well as adequate assets of security mechanisms, and ensuring adequate integrity [4].

D. COBIT 5.0

COBIT or known Control Objective for Information and RelatedTechnology is one of the frameworks that can run an audit information system in detail and depth, an information systems auditor requires a framework that is used to perform an audit on a company with a complex data[5].

COBIT is a framework that used for the audit of information technology created by ISACA (Information Systems Audit and Control Association) and published in 1996 which emphasizes the areas of audit, then in 1998 are published COBIT version 2 that highlight the phase control. In 2000 released COBIT 3.0-oriented management, and in 2005 released COBIT 4.0 which led to IT Governance.

In 2007 COBIT released version 4.1, and in 2012 the most released version COBIT new IE version 5.0 more leads to governance and management for the company's IT assets.

5   five principles that belonging to COBIT 5.0, are:

1. Meeting Stakeholder Needs—It is critical to define and link enterprise goals and IT-related goals to best support stakeholder needs.

2. Covering the Enterprise End to End—Companies must shift from managing IT as a cost to managing IT as an asset, and business managers must take on the accountability for governing and managing IT-related assets within their own functions.

3. Applying a Single Integrated Framework—Using a single, integrated governance framework can help organizations deliver optimum value from their IT assets and resources.

4. Enabling a Holistic Approach—Governance of enterprise IT (GEIT) requires a holistic approach that takes into account many components, also known as enablers. Enablers influence whether something will work.

COBIT 5 features seven enablers for improving GEIT, including principles, policies and frameworks; processes; culture; information and people.

5. Separating Governance From Management—Governance processes ensure goals are achieved by evaluating stakeholder needs, setting direction through prioritization and decision making; and monitoring performance, compliance and progress. Based on the results from governance activities, business and IT management then plan, build, run and monitor activities to ensure alignment with the direction that was set.
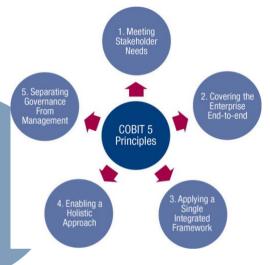

Fig 1. COBIT 5.0 Principles

E. Capability Model

On the COBIT 5.0 is no longer using the Maturity Level as on the COBIT 4. But updated into Capability Model that is based on the ISO/IEC 15504. ISO 15504-2 that describes a measurement to be able to do an assessment of the ability of the processes of COBIT framework that defined into six levels that start from a scale of 0 – 5 [6].

III. RESEARCH METHODOLOGY

To conduct this study, this research used multiple research methods to help resolve some of the problems that exist, such methods-are:

A. COBIT 5.0

The first method is the COBIT 5.0 framework. COBIT 5.0 is a framework used to make measurements of management and governance of information technology management in the company to achieve its objectives. This research uses this framework as it provides a complete framework and can help companies achieve their desired target, benefits and provide an assessment through good corporate governance and management in information technology.

The stages of information system auditing performed, are:

1. Determine the purposes and problems of the company.

2. Conduct analysis on some of the existing problems with the guidelines provided by COBIT 5.0.

3. Determination of priorities against 37 kinds of processes that exist on COBIT 5.0.

4. Collecting some data of some processes that have become priorities to be auditing.

5. Perform a measurement or assessment of the level of capability against the results obtained from the data collection.

6. Specify the target against the level of capability is desired by the company.

7. Provide recommendations over the results have been found in research and data collection that already done.

B. The Stages of Information System Auditing

The next method are using stages of the Information System Auditing according to Hermawan [7], there are four stages in the stage of the Information System Auditing, are:

1. The Stages of Planning. The first stage is the planning stages, at this stage this research determines the objects that will be do the information system auditing, determine the purpose of the audit process of information system, and perform the identification and analysis of the process – the process in accordance with the vision - mission of that company's.

2. The Stages of Preparation. The second stage is the preparation stages, at this stage this research do the collection of information to be processed and analyzed. The first step is provide Enterprise Goals to be sorted based on interests and vision – mission owned by the company. The next step is doing mapping against the results of Enterprise Goals to IT Related Goals. The last step is doing the mapping of the process that contained in COBIT 5.0 required by the company to do an audit.

3. The Stages of Implementation. The third stage is the implementation stages. Data collecting technique is done by using qualitative data method where this research did environmental observation and observation document that owned by company and adjusted with document which have become standard or provision from COBIT 5.0, then using interview and giving questionnaire to IT division in that company. By doing data collection techniques, this research analyzed

the level of information technology governance capabilities in that company.

4. The Stages of Reporting. The last stage is the reporting stages, at this stage this research evaluate the data that have been obtained from the previous stage. The results will be show with the form of a report containing the findings of the audit activities of the information system that have been conducted and contains recommendations on the results. The document will be given to related parties that can be given as a review and references so that IT governance of that company can improve better.

IV. RESULTS AND DISCUSSIONS

The result of the analysis and discussion against the four stages of information system auditing performed, are:

A. The Stages of Planning

The object on this research is the Director General of Treasury is engaged in public service. This research conducted an audit of the IT Division in the Directorate that called Directorate of information systems and technology of Treasury. Directorate of information systems and technology of Treasury became one of Directorate General of Treasury subdirektorat since 2015. Directorate General of Treasury itself has been established since 2004 where that directorate is engaged in the implementation every activities of the State from that budget, the management of State Treasury, the management of state property, provides a useful system to help serve its users, and so on.

That government provide huge influence against the State Treasury transactions and also to provide services to their users. Therefore it is very important the IT Division in a company to help ensure the system they have in order to be able to walk to the maximum without any obstacles that can interfere with the process of the performance of that company. Based on the importance of the system, certainly the role of the security and reliability of the information system needs to be able to preventing the occurrence of gaps or issues on performance at the company.

Based on the importance of the role of the second well against information systems or information technology governance exists, then this research wanted to do the measurement capabilities of information technology governance in the Directorate General of the Treasury so that audit of information systems can help to find the possibility of gaps in the system or that governance, and also can fix it if found some gap or obstacle which resulted will be inhibit processes or business process in the company.

In this study used of COBIT framework 5.0 and have one domain became the main focus of the existing COBIT 5.0 i.e. Evaluate, Direct, and Monitor

(EDM) 01 and 02 is about Setting and Maintenance as well as the delivery of the benefits of the business.

B. The Stages of Preparation

To measure the level of capability of the IT management and governance, and needs for data collections to be processed into a source of information. The following is the steps undertaken to get a data that want to be processed, are:

1. Determine the purpose of the Directorate General of Treasury.

2. Analyze of IT Related Goals based on COBIT 5.0 are in accordance with the vision and mission of the company.

3. Choose the main process that is needed by the company in order to did audit of information system for it governance at the company and can evolve to be better.

The 37 kinds of processes that exist in the COBIT framework 5.0, are:

Table 1. Processes of COBIT 5.0

No	Process	Description
1	EDM01	*Ensure Governance Framework Setting and Maintenance*
2	EDM02	*Ensure Benefits Delivery*
3	EDM03	*Ensure Risk Optimisation*
4	EDM04	*Ensure Resource Optimisation*
5	EDM05	*Ensure Stakeholder Transparency*
6	APO01	*Manage the IT Management Framework*
7	APO02	*Manage Strategy*
8	APO03	*Manage Enterprise Architecture*
9	APO04	*Manage Innovation*
10	APO05	*Manage Portfolio*
11	APO06	*Manage Budget and Costs*
12	APO07	*Manage Human Resources*
13	APO08	*Manage Relationships*
14	APO09	*Manage Service Agreements*
15	APO10	*Manage Suppliers*
16	APO11	*Manage Quality*
17	APO12	*Manage Risk*
18	APO13	*Manage Security*
19	BAI01	*Manage Programs and Projects*
20	BAI02	*Manage Requirements Definition*
21	BAI03	*Manage Solutions Identification and Build*
22	BAI04	*Manage Availability and Capacity*
23	BAI05	*Manage Organizational*

No	Process	Description
		Change Enablement
24	BAI06	*Manage Changes*
25	BAI07	*Manage Change Acceptance and Transitioning*
26	BAI08	*Manage Knowledge*
27	BAI09	*Manage Assets*
28	BAI10	*Manage Configuration*
29	DSS01	*Manage Operations*
30	DSS02	*Manage Service Request and Incidents*
31	DSS03	*Manage Problems*
32	DSS04	*Manage Continuity*
33	DSS05	*Manage Security Services*
34	DSS06	*Manage Business Process Controls*
35	MEA01	*Monitor, Evaluate, and Assess Performance and Conformance*
36	MEA02	*Monitor, Evaluate, and Assess the System of Internal Control*
37	MEA03	*Monitor, Evaluate, and Assess Compliance With External Requirements*

Based on 37 kinds of process that given to the IT Division to be determined that will be the main focus to did the audit of information systems, so the head of the Sub Directorate choose two main process, EDM01 (Ensure Governance Framework Setting and Maintenance) and EDM02 (Ensure Benefits Delivery) because the company provides an information systems major that can be influential of Treasury transactions against the country and they giving service to the community and the users that access it, then these companies would like to audit of the two main process that already choosen with the head of the Sub Directorat IT. After getting two main processes, this research did interviews and giving the questionnaire that refers of the two main processes that already chosen before.

C. The Stages of Implementation

On the stage of implementation requires the evaluation of evidence of data originating from three different kinds of data collection i.e. observation, interviews, and questionnaires. The explanation of the three kinds of the data collection that have been performed, are:

1. Observation

This research did the two stages of observation. The first stage is the observation of the environment, in which visit and conduct the observation of the situation and working space of the IT Division. The workspace of IT Division can be said very comfortable, nice, orderly, and has highly security. At the workspace, there are six main monitor in the front

that is used to monitor the operations of the system they have. The IT Directorate has a very highly security where the employees working there had to go through two stages. First stages, they using fingerprints and the second stages, they did the tapping using employees card, so the others will not be able to enter to the working space if they do not have the employees card.

The second stage is document observations, where this research do some adjustment the documents that government have with that have become standards refers to document the Process Assessment Model (PAM) on COBIT 5.0 are as follows:

Table 2. Observation Documents

No	Guidelines of Document COBIT 5.0
EDM01 *Ensure Governance Framework Setting and Maintenance*	
1	*Constitution/bylaws/statues of organization*
2	*Governance/decision-making model*
3	*Regulations*
4	*Business Environment Trends*
5	*Communications of changed compliance requirements*
6	*Obligations*
7	*Audit Reports*
8	*Performance Reports*
9	*Status and results of actions*
10	*Results of internal control monitoring and reviews*
11	*Results of benchmarking and other evaluations*
12	*Results of reviews of self-assessments*
13	*Assurance review scope*
14	*Compliance confirmations*
15	*Compliance assurance reports*
16	*Reports of non-compliance issues and root causes*
17	*Enterprise governance guiding principles*
18	*Decision-making model*
19	*Authority Levels*
20	*Enterprise governance communications*
21	*Reward System Approach*
22	*Feedback on governance effectiveness and performance*
EDM02 *Ensure Benefits Delivery*	
1	*Strategic road map*
2	*Investment return expectations*
3	*Selected programs with return on investment (ROI) milestones.*
4	*Benefit results and related communications*
5	*State-gate review results*
6	*Investment portfolio performance reports*
7	*Evaluation of strategic alignment*
8	*Evaluation of investment and services portfolio*
9	*Investment types and criteria*

No	Guidelines of Document COBIT 5.0
10	*Requirements for stage-gate reviews*
11	*Feedback on portfolio and programmed performance*
12	*Actions to improve value delivery*

Based on the list of the documents on the table 2, Directorate General of the Treasury have all documents that comply with the standard of COBIT 5.0. Documents – documents for the main process EDM01 and EDM02 are a document about the valid work contracts and documents made by PPK (The Makers of Commitment Officials that signed by the Centre, document Standard Operating Procedures that are used as a guide to do the whole existing activities, the document that describes the requirements that are set up when there is a change of regulatory or compliance with the both of internal and external, the document that contains all about reports of information systems auditing that have been conducted before, the document that contains about Performance Report their of employees in which the results of review against self-assessments and made every 3 months and adjusted with Major of Performance Indicators document (IKU) to do the assessment, document about non-disclosure agreement to be used when a company wants to do cooperation with vendors or third parties in accordance with the standards provided in the Assessment Process (PAM) in COBIT 5.0.

2. Interview

The interview that have been done located at the Directorate of Information Systems and Technology of Treasury, Central Jakarta. This research do an interview with Mr. M. Ali Hanafiah, as the head of Sub Directorate of Information Systems and Technology of Treasury. That interview was talking about Setting and Maintenance and how to perform the delivery of benefits to the user. There is some topic of discussion is obtained from the results of this interview, are:

a. Directorate of Information System and Technology of Treasury making the accuracy of content and timing to carried out their task.

b. Directorate of Information System and Technology of Treasury Always did a satisfaction survey to their stakeholders, the survey is doing yearly.

c. Directorate of Information System and Technology of Treasury did some training for their new employees who will work in their company.

d. When the want to create a project, the IT division has some kind of initiative, because they want to see if there is a potential for their

business process. But on the other hand they also receive input, if there is a command from the owner or stakeholders. But before the owner requested or the bet of a program or system, the IT may be modified by the initiative and may some process may be appropriate with the others process. And if there is a redundancy process, the IT will do a process that is done only once.

e. They have Service Level Agreement document that they will used to fix it the errors or bug.

f. If they are going to make a project, they have lacking of the human resources, not about the capacity but because the system or project that will be created is too large enough so that will takes a specific skill. Therefore they did with involving the third parties by hire the consultants.

3. Questionnaire

This research using the guidelines of COBIT 5.0 to create a questionnaire that will be given to the company. This research gave that questionnaire with the question or statement in accordance with two main processes that have been selected before. The questionnaire consists of 5 levels, which is at level 1 contains a more specific question about while at level 2 to 5 contain a more general question. The questionnaire can be rise to the next level if they get the median value $\geq$ 85%. But if $\leq$ 85% the questionnaire just stop on that level. So it can be said that the last level is the level of capability level of it governance against both of the two main processes that they selected earlier with the IT Division of the company.
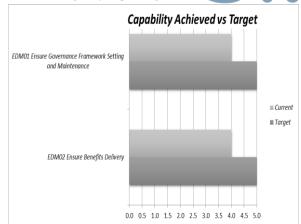
D. The Stages of Reporting

Fig 2. Capability Achieved vs Target

Figure 2 showing about the graph of against the achievement of the it governance capability level obtained with the target that was made by the Directorate. In Figure 2 it can be said that it

governance that available on the Directorate of information systems and technology, Treasury, Ministry of Finance has not yet been able to reach the desired target i.e. level 5. The final value achieved by these companies reached only at level 4 for the both of two main processes i.e., Evaluate, Direct, and Monitor (EDM01 and EDM02) with the results against each process i.e. 84.88% and 84.69%, where those results prove that there is still some gap of the activity on the both of the processes that have not been run with maximum. Some of the activities that becomes a barrier so that can be inhibit the performance of the both of these processes, are:

a. Lack of the information processing that is required to support the operations of the process of Setting and Maintenance and delivery of benefits.

b. Lack of a the timetable unmeasured determination process for Setting and Maintenance.

c. Lack of the supervisory restriction on performance Settings and Maintenance.

d. Lack of the identification and determination against the procedure and frequency of assessment in accordance with the assessment process and the purpose of the process of delivering the benefits of the business.

e. Lack of doing a reset when there are many things that are not desired in the process of Setting and Maintenance.

V. CONCLUSIONS

Based on the results of the evaluation of the measured level of capability of human resources governance and TI on the Directorate of Information Systems and Technology of Treasury, Ministry of Finance of Jakarta using framework of COBIT 5.0 and using two main processes are EDM01 (Ensure Governance Framework Setting and Maintenance) and EDM02 (Ensure Benefits Delivery), then that has been generated is the process of EDM01 stopped at level 04 with the value is in 84.88% and the process of EDM02 stopped at level 04 with the value is in 84.69%. EDM01 and EDM02 is in the Largely Achieved on level 4 and called the Predictabel Process. Based on the information, the company is running a process that is always done with monitoring, measured, and predicted to reach a desired goals.

Based on the results of the data collection can be said that EDM01 (Ensure Governance Framework Setting and Maintenance) and EDM02 (Ensure Benefits Delivery) can not be reached at level 5 because the company lack of setting the information needed to support the process of Setting and Maintenance, lack of supervisory restriction on performance processes of Setting and Maintenance, and companies less to identified against the procedure

and frequency of assessment in accordance with the assessment process and the goal of delivering the benefits of the business. Recommendations for the some gap are it will be better if the company set the informations that they need before doing the process of Setting and Maintenance because if the information needed is less, it will be inhibited in achieving the desired goals, the company should set limits of the supervision to oversee the performance of the Setting and Maintenance, and the company should to do the identification of procedures as well as the frequency of the assessment process delivery of the benefits.

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