IT GOVERNANCE: MEASURE CAPABILITY LEVEL USING COBIT 5 FRAMEWORK

[1]Noor Mutia, [2]Renny Nur'ainy
[1,2]Universitas Gunadarma
Jl. Margonda Raya 100 Pondok Cina Depok Jawa Barat Indonesia
[1]mutianoor24@gmail.com, [2]renny@staff.gunadarma.ac.id

Abstract

The measurement of IT Governance capability level becomes useful for companies in order to reduce and avoid the mistake and losses in IT management. This research aims to measure the capability level of IT Governance in Oil & Gas Company listed in Indonesia, in occasion at PT Energi Mega Persada Tbk (EMP), and support the IT governance that has not reached the EMP's target. The data engaged directly from respondents achieved from the results of questionnaires, interviews and observations. COBIT 5 Framework developed to measure the capability level of process by using Process Assessment Model (PAM). The result found that the capability level of IT Governance measurement of 37 IT processes for all domains in EMP presently at level 3,3 or established level. It means that IT Governance based on COBIT 5 in EMP has been commonly documented, communicated and implemented by default and has standardized. This research is likely to assist company in realize the capability level of IT Governance presently matched to the target that the company wants to reach. In order to the enhancements can conduct to make IT Governance more effective, efficient, and able to support the achievement of company goals.

Keyword: *Capability Level COBIT 5 Framework, IT Governance*

INTRODUCTION

The part of information technology (IT) in management of information is to create information more efficient and effective for decision-making. Consequently, the decision-making process can be more effective (Romney, Steinbart & John, 2012). At the while of the business conversion process, significant IT investment reaching 1-8% of gross revenue is typically necessary (dependent on the industry and other factors) (ISACA, 2012). High requirement of IT, large extents of investment on IT and IT-related risks, this necessity the good IT Governance to accomplish company goals. IT Governance helps companies to make sure that investments made on IT make value for the company and diminish IT-related risks. Furthermore, the presence of IT Governance can rise profitability for the company and added provide return on investment better than its competitors (Shivashankarappa, Smalov, Dharmalingam & Anbazhagan, 2012). Nevertheless, when companies do not have the decent IT Governance, there may be possibilities of technology investment, failure to deliver services to the consumers and obedience of regulatory (Wibowo, 2011).

COBIT framework provides best practices that help companies enhance the use of technology for their business processes, guide management in controlling the IT governance, and achieve their goals (ISACA, 2012). COBIT 5 advanced to measure the capability level of process by using Process Assessment Model (PAM). PAM is a framework for

measurement that offers a basis for decisive the capability level of a process in COBIT 5. The persistence of capability level assessment is to apprise executive level management, Board of Directors and stakeholder management of the capabilities of existing IT processes in organization in addition to board improvements based on the needs of organization.

Prior research conduct by Wibisono (2014) which aims to measure the level of information technology maturity through the COBIT 5 framework to realize what should be the consideration of management to refining the quality of information systems in PT Agranet Multicitra Siberkom. The research shows that the level of information technology capabilities of PT AMS amounted level 1 (Performed). In order to increase its capability level PT AMS needs to make improvements by focusing on initiation to process that does not exist and improve documentation and procedures for the process already running. Furthermore, research from Tristiadi (2015) aims to measure the level of IT Governance capability as well as provide suggestions for increasing the role of IT Governance in National Library of Indonesia. The results show that the level of information technology capabilities of National Library of Indonesia amounted 2.13 (Managed). Improvements have made on a sustainable basis within a period of two years with the priority of governance and risk management being the most important.

This research measuring the capability level of IT Governance currently by using assessment tools COBIT 5 framework. Moreover, to knowing whether Oil & Gas Company in Indonesia already achieve their goals of IT Governance, and also measuring the target of capability level of IT Governance. These results will provide an overview of the implementation of IT Governance Oil & Gas Company in Indonesia, especially PT EMP, Tbk, and will then be analyzed and expected to provide recommendations. In accordance to background above, the research problem are at which the capability level of IT Governance Oil & Gas Company in Indonesia currently? Does the capability level of IT Governance currently meet to the target capability level of information technology governance in Oil & Gas Company in Indonesia?, What the recommendation to improve the IT Governance capability level in Oil & Gas Company in Indonesia?

LITERATURE REVIEW

IT Governance and COBIT 5 Framework

According to IT Governance Institute (ITGI, 2007), IT Governance is the responsibility of executives and the board of directors. In addition consists of leadership, organizational structures and processes that ensure that the enterprise's IT sustains and extends the organization's strategies and objectives.

COBIT (Control Objective for Information and Related Technology) is a framework and tool that can bridge the gap between control needs, technical issues and business risks, and communicate that level of control to stakeholders. While, Inline with ISACA (2012), COBIT is a set of documentation and guidelines for implementing IT Governance, a framework that helps auditors, management, and users to bridge the gap between business risk, control needs and technical issues. COBIT 5 developed to measure the capability level of process by using Process Assessment Model (PAM).

Process Assessment Model (PAM)

PAM is a framework for measurement that provides a basis for determining the capability level of a process in COBIT 5 as seen in Figure 1. PAM adapts ISO/IEC 15504-

2. Software Engineering Standard that describes the requirements for the assessment implementation and measurement scale to assess the capability of a process. The purpose of process capability assessment is to inform executive level management, board of directors and stakeholder management of the capabilities of existing IT processes in organization as well as target improvements based on the needs of organization.

Capability Dimension COBIT 5

The level of capability of COBIT 5 starts from level 0 (incomplete) up to 5 (optimizing). Each capability level adjusted to the conditions of organization. The dimension of capability there is also a set of attribute processes. The attribute process provides characteristics for measurement of a process capability. Each capability level has a different attribute process.

Figure 2 shows that the six levels of COBIT 5 capability which have processes attribute will be the basis of measurement of each process contained in COBIT 5 namely amounting to 9 (nine) process attributes will be measured using ISO/IEC 15504 to obtain the process capability level.
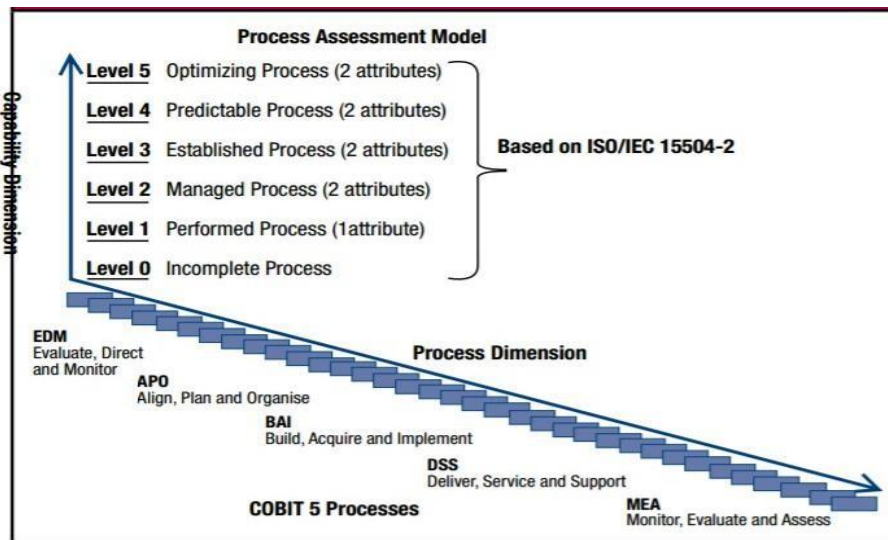

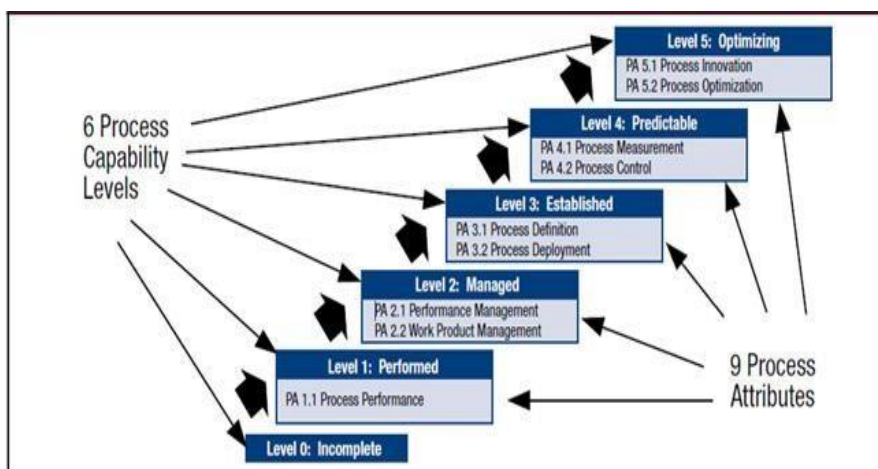**Figure 1. Process Assessment Model**
Source: ISACA (2012)

Figure 2. Capability Levels and Process Attributes
Source: ISACA (2012)

Based on Figure 2, Level 1 (Performed) is the process was implemented according to ad hoc (in outline, it depends on the individual). Level 2 (Managed) is the process was implemented and managed well plan and monitored. Level 3 (Established) is the process was implemented in standard procedure. Level 4 (Predictable) is the process was implemented on standard procedure with some restrictions in order to be consistent and achieve the good results. Level 5 (Optimizing) is the process was evaluated and fixed continuously.

Previous Research

Research from Wibisono (2014) entitled Measurement of Capability of Information Technology at PT Agranet Multicitra Siberkom (Information System Analysis Using COBIT 5 Framework). This research aims to determine the level of process capability related to information technology PT AMS uses COBIT 5 framework so that improvements proposed to increase the quality of PT AMS's information system. This research uses a qualitative method, namely by conducting a case study at PT AMS to determine the current condition of the PT AMS information system using the COBIT 5 framework. The following stages Determining the scope of assessment by mapping enterprise goals to IT related goals; Capability assessment is using the self-assessment format provided by COBIT (ISACA: Self Assessment Guide, 2012) and conducting interviews based on an self assessment guide provide from ISACA format to ascertain the current state of IT. The results showed that the measurement of PT AMS's IT capability level were at level 1 (Performed), which means the information technology process at PT AMS has been running and achieving the desired goals but PT AMS does not have a standard process required documentation.

Research from Tristiadi (2015) entitled Measurement of Capability Level of Information Technology Governance Using COBIT 5 Assessment Tools (Case Study at Perpustakaan Nasional Republik Indonesia). The results show that, the IT capability level in Perpustakaan Nasional Republik Indonesia at level 2 (Managed). The suggested enhancements are assessing policies that are not prime, mainly the policy of division of tasks between work units and supervision of coordination between work units, coordinating and make regulations with the Partner Library (Province and City) regarding the integration of digital libraries and supervision of collaboration between libraries in Indonesia.

Research from Yudithiarini (2015) aims to provide an assessment of the application of information technology governance at PT XYZ using COBIT 5 Framework and provide corrective actions that can take in order to improve achievement of process capability levels. The results showed that the IT capability level of PT XYZ at level 2 (managed) which means that in general from each process has been well documented and controlled, a review of each process has also been carried out. While, the recommendation is the provision of adequate IT human resources for operational activities and initiatives that can be carried out by others from the center.

Research from Renata (2015) show that the level of IT governance capability in Indocement uses the COBIT 5 framework at 2.05 (managed), which means that the implementation of the IT process carried out by the Management Information System of Indocement has generally been carried out with planning, monitoring and adjustment. Work products have compiled, controlled and managed appropriately. The recommended recommendations are to emphasize the application of policies and procedures in each activity carried out. The existing policies and procedures are complete, but have not

implemented properly and evaluations regarding existing applications are already running effectively by minimizing errors.

Research from De Haes, Grembergen, Debreceny (2013) is a study literature, which explores the use of COBIT in future research activities. The research revealed that Investigates COBIT as an artifact, sees the framework within an ecosystem of competing and complementary frameworks and standard. Uses it as a common measurement foundation for investigation of some particular aspect of EGIT or cognate areas of enquiry such IT audit and assurance. These research questions can be a source of inspiration for researchers in this field. There are many research opportunities on EGIT and aligned research domains.

Research from Junita (2012) aims to obtain the maturity level of the Company's information and communication technology governance currently compared to the target to achieved with COBIT maturity models 4.1. The results show that the maturity level of the Company's IT process is currently at levels between 2 (Repeatable but Intuitive) and 3 (Defined Process), there are relatively few gaps with the short-term maturity target set by the Company, namely 3 (Defined Process) . The fundamental improvements that needed are the establishment of a work unit that is responsible for the internal implementation of IT controls and documentation of general policies and governance processes of information and communication technology, so that supervision of the implementation of policies carried out effectively and ensure the implementation of IT Governance.

Research from Nugraha (2012) aims to determine the maturity level of PT XYZ information technology development using COBIT 4.1 framework so that improvements done to improve the level of IT governance maturity. The results shows that the current maturity IT level of PT XYZ is at level 2 (Repeatable but Intuitive) which means that IT of PT XYZ has standard procedures for most of its IT processes accompanied by documentation, and communicated through training, but not yet adequate and unable to detect the deviation that occurs. The recommendations suggested that the level of maturity can increase simultaneously is a gradual improvement of all business processes including improvement of the completeness of procedures and documentation, improvement of HR competencies, the establishment and optimization of supporting organs and the conduct of IT audits.

Research from Wolden, Valverde, and Talla (2015) which investigates the effectiveness of the implementation of the COBIT 5 Information Security Framework in the reduction of risk of Cyber Attacks on The Supply Chain Management System (SCMS). The results indicated that COBIT 5 added a new dimension for IS security governance via strict policies and rule set that further strengthened enterprise applications security and that organization benefit from implementing the COBIT 5 framework security measures in SCMS and ERP system.

Research from Adhayanti and Karmilasari (2012) which purpose to assess the performance of the SPRI (Surat Perjalanan Republik Indonesia) system in terms of information technology aspects to achieve good government governance at Bogor Immigration Office using COBIT 4.1 Framework. The results showed the performance evaluation of the SPRI system at the Bogor immigration office had a maturity manage on level 4.1, which means that the entire process carried out according to standards and the results can measured. The recommendation are the management of human resources by intensifying information technology training, determining clear job descriptions and evaluating personnel performance, increasing the identification of automated solutions

and the availability of information technology services.

Research from Maskur, Djunaedi, Adhipta, and Sumirah (2016) aims to determine the maturity level of information technology governance using COBIT 5 framework at Jeneponto Regency Government, which can help organizations to achieve IT goals and deliver value through effective governance and management. The results show that there are eight COBIT processes that are not yet complete implemented or applied so that it has not yet reached the purpose of the process which on level 0 Incomplete Process. The recommendation are political will is needed to support the application of IT in realize good governance and make improvements to leadership. In addition, organizational structure as follows necessary to establish a Chief Information Officer (CIO), establish an IT Strategy Committee to ensure harmony between the objectives of the Jeneponto Regency Government and any ongoing IT initiatives, establish an IT steering committee responsible for monitoring IT investment and Structure of the work unit of the Jeneponto Regency IT management.

Research from Utomo and Mariana (2011) which aims to Measuring IT Governance through Deliver and Support (DS), Monitor and Evaluate (ME) on Cobit 4.1 Framework and Provide recommendations related to IT management in accordance with the business strategy and objectives of Stikubank Semarang University based on Key Goal Indicator and Key Performance Indicator. The results show that the level of IT Governance at level 3, which means the process, documented and communicated. The recommendation are rearrangement of data management between BAAK and academic services in the Study Program at Stikubank Semarang University integrated in one network, where data surveillance centralized at the data center, namely the server at P2ICT. Educating and training users, managing data and monitoring and evaluating IT performance are made interrelated with each other, so that can improve the efficiency and effectiveness of IT performance.

RESEARCH METHOD

This research is qualitative with using case study of EMP to recognize the implementation of IT governance in EMP. Hence, the data collects by direct and cooperating with people at the research site (McMillan & Schumacher, 2003).

The data collection carried out by field studies out to get primary data by taken directly from respondents obtained from the results of questionnaires, interviews and observations. Furthermore, the secondary data composed from several public reports internally, and other institutions that can be confidential namely company profile, company policy, standard operational procedure, and governance guidelines. Moreover, as a reference for more comprehending about this research, the secondary data was collected from literature review of national and international books, journals, thesis about evaluating the IT governance based on COBIT 5 Framework.

Research Phase

In order to identify the implementation of IT governance by using COBIT 5 framework with several phase, **Phase 1** is identification enterprise goals. To identify the goals of the EMP's company from EMP documentation, the researcher would do mapping with the enterprise goals based on COBIT 5. **Phase 2** is identification IT-related goals. On this phase, identify COBIT 5 enterprise goals identified with IT related goals COBIT 5 formed by using IT dimension balance scorecard. **Phase 3** is identification IT process.

In this phase to arranged the mapping of IT related goals COBIT 5 had been identified in the previous phase with IT process of COBIT 5 based on 5 domain or process such as EDM, APO, BAI, DSS, MEA. The result of identification is the IT process had function as processes in assessing capability level of IT governance for the future need of company. **Phase 4** is assessment capability levels. Finally, **Phase 5** is Arrangement of Recommendation. This final phase was the arrangement of recommendation in IT governance improvement based on the current capability level matched with the capability target level by the guide on COBIT 5.

In accordance with measuring of process capability, level in agreement to the Self Assessment Guide: Using COBIT 5 (ISACA, 2012) with several level. Level 0 is incomplete process. On the first level, the process not be practical or means unsuccessful on the process. It is only a little or no attest in each systematic attainment on the goals from the processes. Level 1 is performed process (Informed). On this level, the process has applied and reached the goals of the process. Moreover, this level has one attribute process which PA.1.1 process performance. This attribute has a function to measure how far the goals have achieved of this process. Level 2 is managed process (planned & monitored). This level an applied process managed and the outcome applied and controlled containing planning and controlling. This level has two attributes are PA 2.1 performance management and PA 2.2 work product management. PA 2.1 has a function to measure how far the process has applied. Through PA 2.2 work product management has a function to measure how far the result achieved from the process.

Furthermore, Level 3 is established process (well defined). The process has been made is formerly applied using a defined process capable of achieving the result of the process. This level has two attributes are PA 3.1 process definition and PA 3.2 process deployment. PA 3.1 process definition has a function to extent how far standard process applied in order to support the definite processes. PA 3.2 process assignment has a function to measure how far standard process worked effectively on the explained process to achieve the results.

Level 4 is predictable process (quantitatively achieved). This level constructed process operated on the certain restrictions in order to achieve the results of the process. This level has two attributes are PA 4.1 process measurement and PA 4.2 process control. PA 4.1 process measurement has a function to identify and measure how far the results of the measurements could use to ensure and support on achieving the goals of the processes and the company. The measurement could done by measuring the process, the product and both of them. PA 4.2 process control has a function to identify how far one process in quantitative process could give the stable results, competent and measured in certain restriction. Level 5 is optimizing process (continuous improvement). On this level, the process predicted to do enhancement in order to fulfill the relevant business goals with project goals. This level has two attributes are PA 5.1 process innovation and PA 5.2 process optimization. On PA 5.1 process innovation the measurement from the variations of one process known over general cause analysis built on differences performances and investigations with innovative approach in explanation and applying the process. On PA 5.2 process optimization clarified the measurement based on definitions, managements and working processes in order to provision attaining the process goals with optimum and effective.

RESULT AND DISCUSSION

PT. EMP is a fabricator, developer and explorer company in the oil and gas sector. As an oil and gas company, the business activities take on EMP namely exploration,

Table 1. Average of Capability Level Per Domain

Domain	Average of Capability Level (Current)
Evaluate, Direct and Monitor (EDM)	3.2
Align, Plan and Organize (APO)	2.8
Build, Acquire and Implement (BAI)	3.4
Deliver, Service and Support (DSS)	3.7
Monitor, Evaluate and Assess (MEA)	3.7
Average of All Domain	3.3

development and exploitation of crude oil and natural gas. EMP business aims will charted against COBIT 5 enterprise goals. The following is Table 1 about the performed average measurement of the capability level of 37 IT processes from 5 domains.

Table 1 shows that Evaluate, Direct and Monitor (EDM), Build, Acquire and Implement (BAI), Deliver, Service and Support (DSS), Monitor, Evaluate and Assess (MEA) achieve to level 3 or established level. Whereas, only Align, Plan and Organize (APO) achieved to level 2 or managed. Level 3 is the greatest extensively achieved level of each domain. This specify that generally of every IT process there are standards in the practice of policies, company procedures and other guidance such as Working Guideline No. 53 of 2013 concerning information and communication technology on Contractor Cooperation Contract (PTK-053/SKO0000/2013/SO-Teknologi Informasi dan Komunikasi pada KKKS). The guidelines goal to enhance ICT resources used or owned by KKKS in upstream oil and gas business activities related to the confidentiality of integrity, and the availability of data or information. So overall the capability level of IT governance results in EMP amounting to 3.3 or established, which means that IT governance process based on COBIT 5 framework in EMP has been commonly was documented, communicated and implemented by evasion and has been standardized.

Later on the measurement of capability level IT process currently, then compare between the results of capability level IT process currently with the results of capability level IT process target. The targets are jointly by ICT Department management led by ICT Department Manager taking into account the availability of resources. The result of the comparison between the capability level IT process currently and the target seen in the figure 3 as below.
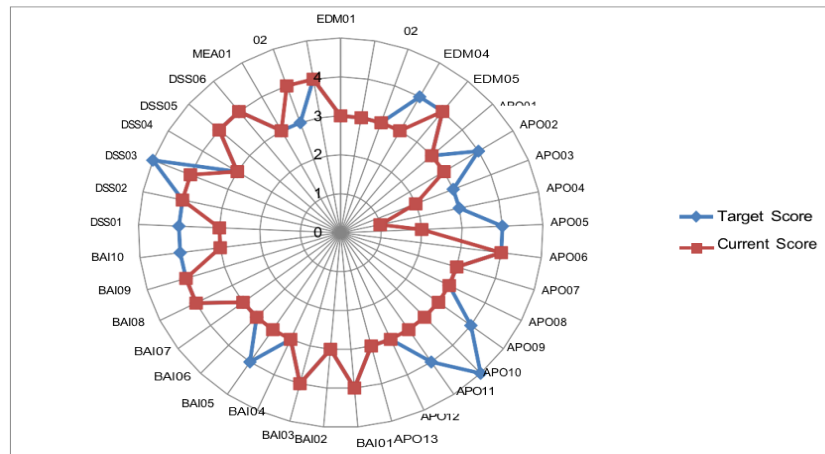
Figure 3. Diagram of Current and Target IT Process Capability level

Table 2. List of Unreached IT Process Currently to Target

IT Process ID	IT Process Name	Target Score	Current Score	Gap
EDM04	Ensure resource optimization	4	3	1
APO02	Manage strategy	4	3	1
APO03	Manage enterprise architecture	3	2	1
APO04	Manage innovation	3	1	2
APO05	Manage portfolio	4	2	2
APO09	Manage service management	4	3	1
APO10	Manage suppliers	5	3	2
APO11	Manage quality	4	3	1
BAI05	Manage organizational change enablement	4	3	1
BAI10	Manage configuration	4	3	1
DSS01	Manage operations	4	3	1
DSS03	Manage problems	5	4	1

Based on diagram it have identified that there are 25 IT processes feast across in all domains have reached the targets among others. They are EDM 01, EDM 02, EDM 03, EDM 05, APO 01, APO 06, APO 07, APO 08, APO 12, APO 13, BAI 01, BAI 02, BAI 03, BAI 04, BAI 06, BAI 07, BAI 08, BAI 09, DSS 02, DSS 04, DSS 05, DSS 06, MEA 01, MEA 02, and MEA 03. Moreover, there are 12 IT processes feast across in four domains that have not reached the target among others that is EDM 04, APO 02, APO 03, APO 04, APO 05, APO 09, APO 10, APO 11, BAI 05, BAI 10, DSS 01 and DSS 03. The gaps between the capability level of IT process currently with the target capability level IT process by EMP used as the basis for researcher in focusing IT process that has not reached the target, which will be prepared recommendations.

Discussion

Table 2 indicated the matching between capability levels IT processes currently that have not reached the target with the target that created the gap between them. After knowing the level of gaps that arise in these IT process, then decided references to attain targets that meet the prospects of EMP.

Based on the table IT process EDM 04 is ensuring resource optimization. The optimization of resources not only connected to human resources, but also the resources of assets (hardware and software) with a cost effective. Now, general EMP has optimized the use of resources. However, the optimization of asset resources that surpasses its

economic lifetime was impact the performance poverty of those resources. To advance the accomplishment of the capability level these process are scheming the decline of cost through the utilization of resource, enhanced direction of maintenance with Department of Budgeting and Finance. In order to prevailing asset resources can track optimally, checking the management of IT asset resources particularly maintenance by finding problems that happen, reporting, and then performed corrective action.

IT process APO 02 is managing strategy. ICT department has short and long-term goals that provision the company's strategy. Yet, these long-term goals have not obviously definite. To increase the attainment of the capability level these process are describe forthcoming business targets based on an understanding of EMP business environment and requirements. Formerly, analyses the hole between current and future IT capability circumstances. Additionally, creating strategic plans and information technology roadmap for the long term and containing into short-term information technology strategy. The strategic plan defines how information technology objectives will give to the company's strategic objectives and chance of current needs. These long-term and short-term strategies has accepted and communicated to stakeholders and those involved directly elaborate in the objectives. This is to ensure that future of IT strategic plans and roadmaps assumed by all stakeholders. Finally, implement the strategic plan and assess the application of the strategic plan.

Furthermore, IT process APO 03 is manage enterprise architecture. ICT Department EMP has ICT blueprint, but it is not accomplished until be fulfilled. To expand the reaching of the capability level these process are constructing an initiative architecture vision by detecting stakeholder requirements, EMP's strategic goals and plans, aligning architecture with strategic program significances, EMP's capabilities and needs, evaluating EMP readiness for change, defining architectural scope, describing architectural principles, constructing architectural visualization, explain architectural value proposition, objectives, and benchmarks, identify architectural risks. Selecting, maintaining, and verifying the architecture model, then documenting the architecture. Identification opportunities and solutions, improve implementation and movement strategies through gap analysis between current and targeted environments in the architecture. Building an implementation and migration plan that line up with the program and project portfolio. Provide and manage service in accordance with enterprise architecture.

IT process APO 04 is manage innovation. The EMP ICT Department does not yet have rules and procedures that explicitly regulate innovation management. To expand the attainment of the capability level these process the improvement have to complete by establish policies and procedures regarding innovation intend to analysis of rejected initiatives which covering the causes of the initiative being rejected, corrective action and the requirements for the proposed initiative to be accepted.

Next IT process APO 05 is manage portfolio. ICT Department of EMP has been undertaking a portfolio of IT investments, however not yet measured the success of the portfolio. Whether the IT investment have to done aligned with the strategy of the EMP itself. To improve the achievement of the capability level these process, evaluate and selective to the programs to be funded by assessing those programs. It also by measuring the percentage of IT investments that match the company's strategy and management's satisfaction with the IT contribution to the success of the IT strategy through calculates the Net Present Value (NPV) and Internal Rate Return (IRR). In addition, monitoring, optimizing and reporting on investment portfolio performance. Measuring the ratio

between the funds allocated to the funds used and the funds available with funds allocated for IT investments through one of Return of Investment (ROI). For the portfolio of programs, projects, services and IT assets deemed by ICT EMPs to be non-beneficial and not used, then they should documented into retired services. This documentation is required if one day the replacement service does not meet the specifications. The old service can reused or when defining a new service, the old service used as a reference in defining its functionality. The retired services documentation may also use as an archive of data whose information can be used in the future.

IT process APO 09 is managing service agreement. In managing service agreements, ICT Departments have contracts with suppliers. The contracts there are rights and obligations of each party, the validity period of the agreement, force majeure and dispute settlement. In addition, there is also a service level agreement (SLA). However, the requirements for quality management listed in the SLA, for acceptance criteria not yet available. To improve the achievement of the capability level these process are developing frameworks and procedures in the management of service level especially acceptance criteria. Developing and implementing monitoring procedures, logging, complaints handling, management of disturbances, and solving problems related to IT services. Then, monitoring and measuring SLA achievements against targeted ones. Finally, conducting service reviews and identify improvement opportunities.

Moreover, IT process APO 10 is Manage suppliers. In managing relationships with suppliers, ICT Department has used a tender mechanism in accordance with PTK-007 year 2015 on supply chain management of cooperative contracting contractors (KKKS), in addition there are several supplier catalog indicators established but no risk assessment has been undertaken on the supplier. To improve the achievement of the capability level these processes are EMP identify and evaluate supplier relationships and existing contracts with categorized into their type, significance level and critical level. In addition, evaluate the supplier and contract criteria to find out the available supplier portfolio and supplier alternatives. EMP can also identify and manage risks associated with the supplier's ability continually in deliver services safely, efficiently and effectively. This risk assessment is documented and available when needed for decision making with regard to suppliers. Furthermore, EMP routinely review the overall performance of supplier based on the contractual requirements, the value obtained compared to the costs incurred and other issues of concern. This review is documented and available when needed for supplier selection in the future.

IT process APO 11 is manage quality. In managing the quality, ICT Department has conducted periodic monitoring of the services provided, but sometimes there are recurring problems. To improve the achievement of the capability level these process are establish and maintain a Quality Management System (QMS). QMS provides a standard, formal and sustainable approach to quality management of information, application of technology and business processes according to business needs. Initial stages in the implementation of this QMS focus on important processes related to business continuity. For EMP related to the quality of internet access speed so that data exchange, business transactions can run smoothly. Furthermore, establish and manage quality for standards, practices and procedures in accordance with QMS that have approved by management. Then, analysis the comparative costs incurred with the profit earned. This quality standard should also be in line with the information technology control needs. Finally, focusing on quality management to stakeholders, shareholders by determining needs tailored to quality management practices. In case the speed of access to the latest news on the official

website of www.emp.id and the issuance of financial statements in a timely manner.

On IT process BAI 05 is manage organizational change enablement. In adjusting the dynamics of the oil and gas business that has decreased over the past four years, structural changes have occurred in ICT Department. There are communications conducted to those who have affected by the changes but no follow-up has taken to ensure that the changes are sustainable. To improve the achievement of the capability level these process are preparing qualified human resources for changes in structure and function and responsibility with the first training and evaluate the implementation.

IT process BAI 10 is manage configuration. Configuration updates performed as needed not periodically. To improve the achievement of the capability level these process EMP setting and manage configuration storage on a regular basis with current configuration by populating the changes made. This should arranged in detail for any project of any priority at EMP without exception. Documentation for this activity is an updated storage with the latest configuration items and approved base values. Furthermore, reporting related to status and configuration periodically that record when changes occur. This report does not distinguish between projects with top priority with low priorities project. All project have to fully documented and reported. The documentation for this activity is a configuration status report.

Then IT process DSS 01 is managing operations. ICT Department has been running in accordance with Standard Operational Procedure related, but the target of this process is the process implemented according to certain standards and constraints to be consistent in achieving the results set. To improve the achievement of the capability level these process are design and development of interference/event detection system, first level filtering of the event/interruption occurs to determine whether the event needs further handling or neglected bias. If the event would to ignored, the event have to documented into the log file even though no further handling is necessary. In addition, if the event caused by a service or device that exceeds the threshold, it must checked. If the event caused by components/devices that are not functioning normally, then investigation and further handling that must done. Furthermore, conducting a review of the disruption/event that occurred along with the handling that has done. Finally, monitoring, logging, interference detection, solving problems related to IT infrastructure in accordance with established procedures.

Finally, IT process DSS 03 is managing problems. ICT Department has applied in accordance with SOP no. EMP-ICT-SOP-00.018. Target of this process is that the process evaluated and improved a continuing basis. To improve the achievement of the capability level these process are elevate known errors by identifying the cause of the problem, making notes on known errors and appropriate solutions, and identifying other potential solutions. Documentation for this activity is a known and ever-known record of errors and ongoing solutions to known errors. Furthermore, proactively management the problem by analyzing operational data (especially incident and change records) to identify emerging trends that may be indicative of the problem. Documentation for this activity is an observation report for problem resolve, and identification against sustainable solutions.

CONCLUSION

Based on the measurement capability level of IT governance using COBIT 5 Framework at PT. EMP Tbk, it can be concluded that the capability level of IT Governance capability currently at level 3,3. The 37 IT processes in all domains, such as

Evaluate, Direct and Monitor (EDM), Align, Plan and Organize (APO), Build, Acquire and Implement (BAI), Deliver, Service and Support (DSS), Monitor, Evaluate and Assess (MEA) are established level. It means that IT governance by using COBIT 5 in EMP has been generally documented, communicated and implemented by default and has standardized.

If it compares with the target of company, capability level of IT governance predicted by EMP amounting to 25 IT processes currently have reached to the target company. However, there are still amounting to 12 IT processes on EDM, APO, BAI and DSS domains that have not reached the target. Thus, there are recommendations of activities that performed by EMP in order to increase the capability level. Furthermore, EMP have to implementation of good IT governance with improvement of EDM can be done by focusing on improving maintenance coordination and monitoring. APO, the improvement can focus on making Standard Operational Procedure especially for manage innovation by considering the working guidance on information and communication technology on Contractor Cooperation Contract (PTK-053/SKO0000/2013/SO-Information Technology and Communication on KKKS) as the basic preparation. Moreover, BAI improvements can focus on documenting, improving supervision and training submissions when organizational structure changes. Moreover, DSS improvements can focus on the development of interference or event detection systems and increased supervision.

EMP needs to make improvements in order to increase the capability level of IT governance as targeted by EMP. The improvement have to done gradually within two years by completing activity recommendations on IT processes that have not reached the target namely EDM 04, APO 02, APO 03, APO 04, APO 05, APO 09, APO 10, APO 11, BAI 05, BAI 10, DSS 01 and DSS 03. The company emphasize that the implementation of policies and procedures in each activity related to information technology have to communicate to all interested parties. In addition, the company review existing procedures to determine their eligibility with the latest conditions. Finally, the company ensure that every activity and process is appropriates documented for control and recommendation needs. For regulators, the results of this research have to use as input and suggestion especially for SKK MIGAS in making a regulation that in the future can cover all IT operational activities on contractor cooperation contract.

REFERENCES

Adhayanti, N. & Karmilasari. (2012). *Audit TIK pada sistem penerbitan surat perjalanan Republik Indonesia (SPRI) di Kantor Imigrasi Bogor*. Prosiding Seminar Ilmiah Nasional Komputer dan Sistem Intelejen, *7*(44), 323-330.

De Haes, S., Grembergen W.V., & Debreceny, R.S. (2013). COBIT 5 and enterprise governance of information technology: Building blocks and research opportunities. *Journal of Information System*, *27*(1), 307-324.

ISACA. (2012). *COBIT 5-self assessment guide*: *Using COBIT 5*. Retrieved from https://www.isaca.org/2018/01/01

ISACA. (2012). *Implementation COBIT 5*. Retrieved from https://www.isaca.org/2018/01/01

ISACA. (2012). *Process assessment model (PAM): Using COBIT 5*. Retrieved from https://www.isaca.org/2018/01/01

IT Governance Institute. (2007). *COBIT 5: Framework, objective controls*, management

guidelines. Retrieved from https://www.itgi.org/2018/01/01

Junita, E. (2012). *Audit tata kelola teknologi informasi dan komunikasi melalui pendekatan maturity assessment tools COBIT 4.1: Studi kasus pada PT. Semen Gresik Persero, Tbk* (Master's thesis). Jakarta: Universitas Indonesia.

Maskur, Djunaedi, A., Adhipta, D., & Sumirah. (2016). Perancangan tata kelola TI dengan menggunakan framework Cobit 5 (studi kasus: Pemerintah Kab. Jeneponto). *Jurnal Teknologi Informasi dan Komputer*, *1*(1), 10-15.

McMillan, J. H & Schumacher, S. (2003). *Research in education*. New Jersey: Pearson Press.

Mutia, N. (2018). *The Measurement of Information Technology Governance Capability Level Using COBIT 5 Framework (Case Study of PT Energi Mega Persada, Tbk)* (Master's Thesis). Jakarta: Universitas Gunadarma.

Nugraha, R. (2012). *Pengukuran tingkat kematangan teknologi informasi dengan menggunakan kerangka kerja COBIT 4.1 studi kasus pada PT. XYZ* (Master's thesis). Jakarta: Universitas Indonesia

Renata, T. (2015). *Analisis tata kelola teknologi informasi berdasarkan COBIT 5 framework: Studi kasus pada PT Indocement Tunggal Perkasa* (Undergraduate's thesis). Jakarta: Universitas Indonesia.

Romney, M. B., & Steinbart, P. J. (2012). *Accounting information system*. 12th edition. London: Pearson Press.

Shivashankarappa, A.N, Smalov, L., Dharmalingam, R., & Anbazhagan, N. (2012). *Implementing IT Governance Using COBIT: A case study focusing on critical success factors*. Internet Security (World CIS), 2012 World Congress on, pp, 144-149, IEEE.

Tristiadi, B. (2015). *Pengukuran tingkat kapabilitas tata kelola teknologi informasi dengan menggunakan assesment tools COBIT 5 (Studi kasus pada Perpustakaan Nasional Republik Indonesia)* (Master's thesis). Jakarta: Universitas Indonesia.

Utomo, A. P., & Mariana, N. (2011). Analisis tata kelola teknologi informasi (IT Governance) pada bidang akademik dengan COBIT framework studi kasus pada Universitas Stikubank Semarang. *Dinamik*, *16*(2), 139-149.

Wibisono, L. (2014). *Pengukuran tingkat kapabilitas teknologi informasi pada PT Agranet Multicitra Siberkom (analisis sistem informasi menggunakan kerangka kerja COBIT 5)* (Master's thesis). Jakarta: Universitas Indonesia.

Wibowo. A. M. (2011). *IT Governance Maturity at Indonesian State Owned Enterprises: Contingent Factors and Impacts* (Master's thesis). Jakarta: Universitas Indonesia.

Wolden, M., Valverde, R., & Talla, M. (2015). The effectiveness of COBIT 5 information security framework, for reducing cyber attacks on supply chain management system. *IFAC-PapersOnLine*, *48*(3), 1846-1852.

Yudithiarini, A. (2015). Analisis tata kelola teknologi informasi berdasarkan COBIT 5 framework pada kontraktor kontrak kerja sama (KKKS) minyak & gas bumi (studi kasus pada PT XYZ) (Master's thesis). Jakarta: Universitas Indonesia.