IT GOVERNANCE AUDIT AT PT PERUSAHAAN GAS NEGARA USING COBIT FRAMEWORK

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Abstract

The use of information and communication technology in a company gives an important contribution for the achievement of business objectives. PT Perusahaan Gas Negara, especially in the Business Solutions and Services Operations (BSSO), plays a significant role in the utilization of information and communication technology assets to PT Perusahaan Gas Negara. It takes a good IT governance for BSSO to improve the efficiency and effectiveness of IT usage. Audit of IT governance maturity using COBIT 4.1. Maturity model level used to determine the maturity level of IT usage in the enterprise with a scale of 0 (non-existent) to 5 (optimized). This study focused on two domains namely Plan and Organise (PO) and Monitor and Evaluate (ME) model to measure the maturity level of IT maturity levels in PT Perusahaan Gas Negara. From this study, the results of the maturity level domain PO is 3.13 and ME is 2.98, it can be given the conclusion that the maturity level of IT governance at PT PGN is in level 3 (defined). At this level means that all the procedures in the company are standardized and documented, but the company is still not able to detect the deviations that have occurred.

Keywords*: communication, information, IT Audit, IT Governance, maturity model.*

INTRODUCTION

Information and communication technology nowadays have become a very important requirement for most enterprise organizations, because it is believed to help to improve the effectiveness and efficiency of business processes. Application of information technology in business processes in a company is seen as one of the solutions which will be able to increase the competition level of the company. Information technology in the narrow view explaining the technology side of an information technology, such as hardware, software, databases, networks, and other equipment. In a wider concept, information technology describes a collection of information technology, user, and management for the entire organization [1].

The company as an organization has a tendency-oriented towards profit, which requires a system that can collect, store, and process data to produce information that can assist in running the company's strategy to achieve corporate objectives with the efficient and effective way by utilizing information and communication technology. A successful company or organization is a company or organization that is able to understand and manage and implement the technology in their business activities [2]. To put and apply ICT to the company, they make an investment

in the form of systems and policies to ensure that the use of ICT can provide added value to the company's business [3]. Investments issued by companies are often in large numbers, so the company expects the major changes in the conditions also, of course, moving towards a better organizational structure.

But not all companies get a good result from their investments, the failure to achieve maximum return on investment is often due to lack of control on the level of IT management. To achieve the successful IT investment, the company must have good IT management where IT is able to support the organization's in achieving their objectives [4]. Application of information technology in the enterprise will be able to do well if it is supported by an information technology management from planning to implementtation, and management should be based on standards that have received very wide recognition in the world [5].

PT Perusahaan Gas Negara (PGN) was founded on May 13, 1965 which focused on natural gas business. PGN flow natural gas to the household, industrial, and commercial. PGN use of information and communication technology in running their business processes to improve the efficiency and effectiveness of the company in the areas of operational and strategic planning. Business Solutions and Services Operations (BSSO) in PGN are in the Directorate of Information Communication Technology and is under the division Business Solutions Development. BSSO utilize information and communication technologies which have responsibilities to control the gas delivery process and billing to customers. This study focuses on the domain of the Plan and Organize (PO) and Monitoring and Evaluation (ME) using Maturity Model to assess IT governance in BSSO at Perusahaan Gas Negara. IT governance is a part of the management of the organization that includes leadership, data structures, and process organization. This is to ensure that the organization's information technology can be used to maintain and expand the organization's strategies and objectives. IT governance includes information systems, technology and communications, business and law as well as other issues involving almost all stakeholders [6]. PO domain focuses on the identification of tactics, strategy, management, and risk management companies to ensure that the use of the IT infrastructure has been right on target, whereas ME domain focuses on IT perform-ance management monitoring and internal control monitoring in the company. Author choose PO and ME domains for BSSO is under the Information Communication Technology (ICT) division is one of the main activities are to plan, manage, and operate ICT in the company and evaluate the performance of ICT.

In the end we will get the value according to the Maturity Model in Control Objectives For Information And Related

Technology (COBIT) and associated with the Standard Operation Procedure (SOP) that is owned by the company which can be used to evaluate the use of information and communication technologies in BSSO at Perusahaan Gas Negara. COBIT provides the best reference business practices that include the entire business process of the organization and expose the logical structure of activities that can be managed and effectively controlled. The main objective of COBIT is provide clear policy and great practice for IT governance for organizations around the world to help senior management to understand and regulate IT-related risks. COBIT does so by providing IT governance framework and guidance detailed control objective for management, business process owners, users and auditors [4].

RESEARCH METHODOLOGY

The object of research was selected in this study is a company which focused in oil and gas sector, PT Perusahaan Gas Negara located at Jl. K.H. Zainul Arifin 2, Central Jakarta. The company will be audited regarding the use and utilization of information and communication technology used in the company in order to support all activities in the company so that the company's main objectives will be achieved.

This study focuses on the BSSO in a division of ICT which is the core of technology development at the company. Audit assessment using maturity level models to determine the maturity level of the use of information technology in the enterprise, especially in the BSSO in supporting the company in achieving its goals.

Data collection methods in this research using two types of data sources: primary data and secondary data**.**

1. Primary Data

The primary data obtained directly in the field when researcher conducted observations and giving questionnaires to PT Perusahaan Gas Negara. The following is an explanation of the primary data collection:

A. Observation

Observations carried out in the Business Solutions and Services Operations PT Perusahaan Gas Negara. Observations carried out to see the course of the use of information technology systems in that division.

B. Questionnaire

The questionnaire contains a written statement given to the respondents in the Business Solutions and Services Operations at PT Perusahaan Gas Negara. The questionnaire is taken from the earlier thesis and from the statements which provided by COBIT in every subdomains. The statement made reference to COBIT 4.1 framework with domain PO and ME. Questionnaires were distributed to four of the respondents to obtain research data to be processed. The respondents is a manager and staff in BSSO.

2. Secondary Data

Secondary data is data obtained and collected from various sources that already exist. Data collection is done by studying the relevant literature on information technology governance using the COBIT 4.1 framework. Theories studied include a basic understanding of information technology, the basics of audit and information technology audit, IT governance, IT governance framework ratio, and the fundamentals of COBIT 4.1. The reference obtained from textbooks, research theses and journals.

Data obtained from questionnaires distributed to respondents is then processed and analyzed in order to get an idea about the real condition of the company. To perform data processing following the method proposed by [7]. First of all ranges of answers in the questionnaire was made into 4 scales and each scale has its own value, can be seen in Table 1.

Then every numbers on the level of compliance maturity value (C) divided by the total maturity level compliance value thus obtained normalized level of compliance maturity value (D) (Table 3*)*

Each maturity level (0, 1, 2, 3, 4, 5) (M) multiplied by a normalized level of compliance maturity value (D) so that later it will eventually get the value contribution for each maturity level (Table 3).

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Table 1. Compliance Level Numeric Values

Agreement with Statement	Compliance Value
Not at All	0
A Little	0.33
Quite a Lot	0.66
Completely	1

Table 2. Maturity Level Compliance Values Calculation

Maturity Level	Sum of Statements Compliance Values (A)	Number of Maturity Level Statements (B)	Maturity Level Compliance Value (A/B)=C
0	0	2	0
1	0	9	0
2	3	6	0.50
3	8.63	11	0.78
4	6.97	9	0.77
5	6.31	8	0.79

Table 3. Normalized Compliance Calculation

Level	Not Normalized Compliance Values (C)	Normalized Compliance Values D (C/Sum(C))
0	0	0
1	0	0
2	0.5	0.176
3	0.78	0.275
4	0.77	0.275
5	0.79	0.277
Total	**2.84**	**1**

Table 4. Maturity Level Calculation

Level	Nomralized Compliance Values D	Contribution (D*Level)
0	0	0
1	0	0
2	0.176	0.35
3	0.275	0.83
4	0.275	1.09
5	0.277	1.38
	Total Maturity Level	**3.65**

Gap Analysis

The calculations results were done describes the level of maturity in terms of the management of information and communication technology in that company. Each company must have a target to be achieved in the management of information technology in his company as one of the factors supporting the company in achieving its goals. The desired target with the value obtained to create a gap between reality and the desired target. It can provide a motivation for the company to make improvements in the management of information and communication technology in order to better, efficient, and well targeted.

RESULTS AND DISCUSSION

This research focuses on assessing the performance of the use of information and communication technology in the BSSO in PGN are in the Directorate of Information Communication Technology and is under the division Business Solutions Development.

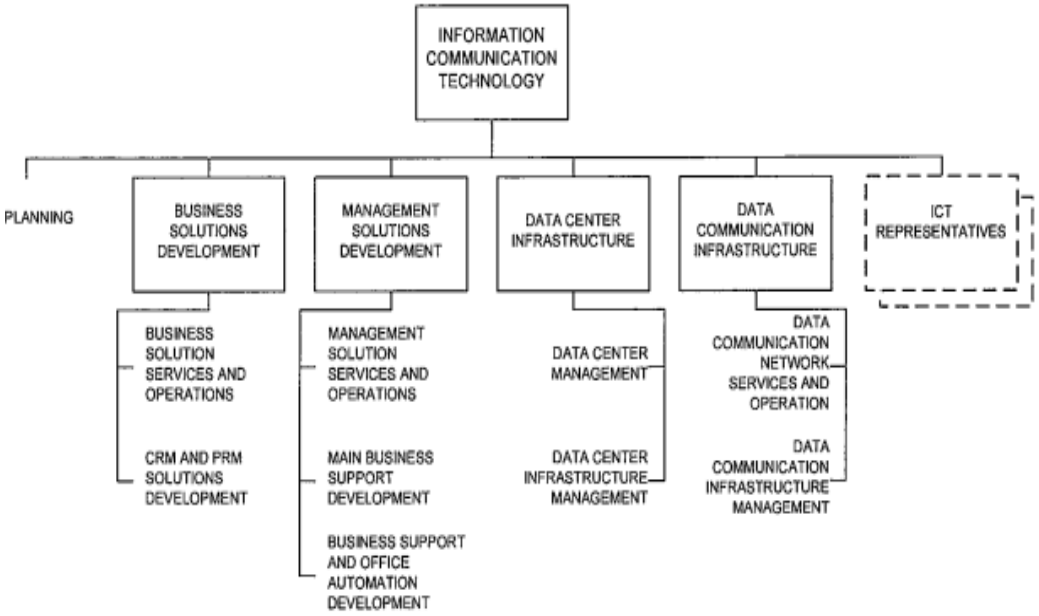

Figure 1. Information Communication Technology Management Structure

The task of the Business Solutions and Services Operations are monitored and do:

1. The development of ICT solutions for services and operations
2. Further refinement of ICT services
3. The operational activities of ICT business solutions and supporting facilities incident management and ICT issues

Standard Operation Procedure (SOP) of the Company

PT Perusahaan Gas Negara has a Standard Operation Procedure (SOP) in particular ICT division that oversees the Business Solution Services and Operations in handling various problems that arise every time. Because of company confidential, author cannot access the SOP and only given the list of SOP that they owned. The SOP is owned as follows:

1. Operating procedures of performance management service provider of information and communication technology
2. Operating procedures of risk management information and communication technology services
3. Operating procedures of permissions management
4. Operating procedures of reporting and handling of information security incidents
5. Operating procedures of monitoring the use of information systems
6. Operating procedures of control effectiveity monitoring
7. Operating procedures of information exchange
8. Operating procedures change management
9. Operating procedures disaster recovery

plans information technology services
10. Operating procedures of security of information systems standard
11. Operating procedures development or operating system changes and hardware
12. Operating procedures of internal and external communication

Organization Goals Mapping to IT Process of COBIT 4.1

Next step is mapping of organizational goals for BSSO to COBIT 4.1 business goals (Table 6).

Based on the mapping result can be seen the corresponding COBIT IT goals with organizational objectives of BSSO can be seen in the Table 7. The table also depicted the mapping process of IT Goals towards COBIT 4.1 IT Process. Mapping limited to the IT Process domain PO and ME.

IT Process which gained from the mapping process are PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8, PO9, PO10, ME1, ME2, and ME4. After getting IT Process, next step is creating and distributing of the questionnaire based on the domain of IT Process mapping obtained from the process above (Table 8).

Table 6. COBIT 4.1 Business Goals

Financial Perspective	1. Provide a good return on investment of IT-enabled business investments 2. Manage IT-related business risk 3. Improve cor-porate governance and transparency
Customer Perspective	4. Improve customer orientation and service 5. Offer competitive products and services 6. Establish service continuity and availability 7. Create agility and responding to changing business requirements 8. Achieve cost optimization of service delivery 9. Obtain reliable and useful information for strategic decision making
Internal Perspective	10. Improve and maintain business process functionality 11. Lower process costs 12. Provide compliance with external laws, regulations and contracts 13. Provide compliance with internal policies 14. Manage business change 15. Improve and maintain operational and staff productivity
Learn-ing and Growth Pers-pective	16. Manage product and business innovation 17. Acquire and maintain skilled and motivated people.

Table 7. Organizational Mapping with Business Goals and IT Goals

Business Goals COBIT 4.1	Organization Goals	Business Goals Perspective COBIT 4.1	IT Goals COBIT 4.1
Managed IT-related business risk	The operational activities of ICT business solutions and supporting facilities	Financial Perspective	14
	Incident management and ICT issues		21
Establish service continuity and availability	The development of ICT solutions for services and operations	Customer Perspective	16
Create agility in responding to changing business requirements	Further refinement of ICT services		1
Provide compliance with external laws, regulations, and contracts	Incident management and ICT issues	Internal Perspective	21
Lower process cost	The operational activities of ICT business solutions and supporting facilities		15
Manage product and business innovation	Further refinement of ICT services	Learning and Growth Perspective	28 and 9
Acquire and maintain skilled and motivated people			

Table 8. Identified IT Process

Number	IT Goals	IT Process
1	Respond to business requirements in alignment with the business strategy	PO1, PO2, PO4, PO10, and MEI
9	Acquire and maintain IT skills that respond to the IT strategy	PO7
14	Account for and protect all IT assets	PO9 and ME2
15	Optimize the IT infrastructure, resources and capabilities	PO3
16	Reduce solution and service delivery defects and rework	PO8
21	Ensure that IT services and infrastructure can work properly resist and recover from failures due to error, deliberate attack or disaster	PO6 and ME2
28	Ensure that IT demonstrates cost-efficient service quality, continuous improvement and readiness for future change	PO5 and ME4

Data Collection Result Total

When viewed from Table 9, domain PO overall based on data obtained from PT Perusahaan Gas Negara at the Business Solutions and Services Operations is 3.13 which exceeds the international standard which is 2.75. The score exceeded the level 3 of the model is defined process maturity level which mean the procedures have been standardized and documented and communicated through training, however, it is unlikely that deviations will be detected. The procedures themselves are not sophisticated but are the formalisation of existing practices.

Table 9. PO Result From All Respondents

Sub Domains	1	2	3	4	Average
P01	2.88	2.74	2.96	3.04	2.91
P02	3.17	3.18	3.09	3.10	3.14
P03	3.13	3.13	2.90	3.17	3.08
P04	3.49	3.59	2.97	3.40	3.36
P05	3.48	3.41	3.06	3.45	3.35
P06	2.87	2.87	3.00	3.45	3.05
P07	3.11	3.07	2.85	3.20	3.06
P08	2.96	2.96	2.69	3.02	2.91
P09	3.37	3.83	2.60	2.64	3.11
P10	3.54	3.54	2.92	3.20	3.30
Total					**3.13**

When viewed from Table 10 domain ME overall had a score of 2.98 is already slightly above the international standard level 2.75. The score approached level 3 of mature-ty model (defined level). The procedures are already almost standardized and documented through training. But implementation still depends on the individual whether to follow it or not (Table 11). Figure 2 explained the position of maturity level PT Perusahaan Gas Negara compared to the maturity level of international standards and their industry targets to be achieved by the company. If seen, PT Perusahaan Gas Negara's PO domain is still above the international industry standards average. But still have a fairly large gap between the positions of the current levels with the company's target to be achieved (Table 12).

Table 10. ME Result from All Respondents

Sub Domains	1	2	3	4	Average
ME1	3.24	3.24	2.86	3.00	3.09
ME2	3.39	3.46	2.74	2.98	3.14
ME4	3.17	3.09	3.17	3.17	2.70
Total					**2.98**

Table 11. SOP Association with Subdomains

Sub Domains	SOP
PO2	Standard operating procedures of permissions management
PO3	Standard operating procedures development or operating system changes and hardware
PO6	Standard operating procedures of reporting and handling of information security incidents
	Standard operating procedures of security of information systems standard
PO9	Standard operating procedures disaster recovery plans information technology services
	Standard operating procedures of risk management information and communication technology services
ME1	Standard operating procedures of performance management service provider of information and communication technology
ME2	Standard operating procedures of control effectivity monitoring

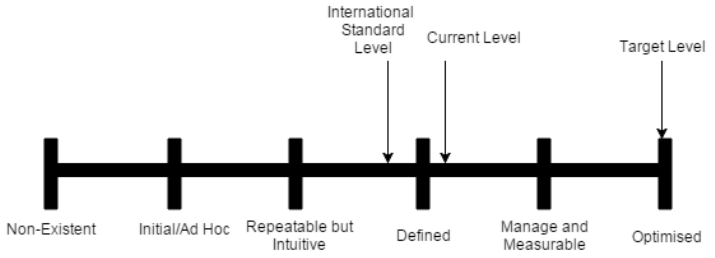

Figure 2. Comparison Conditions Maturity Level of PO

Table 12. Comparison Conditions Maturity Level of PO Domains

Sub Domain	Maturity level		
	Current Level	Target	Gap
PO1	2.91	5	2.09
PO2	3.14	5	1.86
PO3	3.08	5	1.92
PO4	3.36	5	1.64
PO5	3.35	5	1.65
PO6	3.05	5	1.95
PO7	3.06	5	1.94
PO8	2.91	5	2.09
PO9	3.11	5	1.89
PO10	3.30	5	1.70
Total		**5**	**1.87**

Figure 3 explains the position maturity level PT Perusahaan Gas Negara compared to the maturity level of international standards and their industry targets to be achieved by the company. If seen, PT Perusahaan Gas Negara for ME domain is already a little past the international industry standards. But still have a fairly large gap between the current level positions with the company's target to be achieved (Table 13).

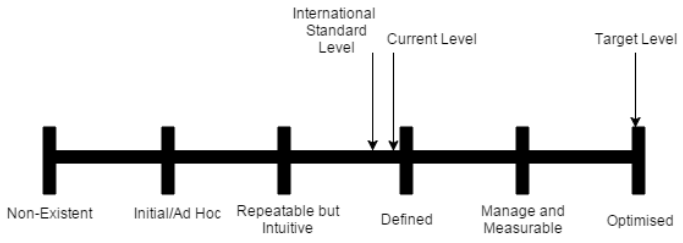

Figure 3. Comparison Conditions Maturity Level of ME

Table 13. Comparison Conditions Maturity Level of ME

Sub Domain	Maturity Level		
	Current Level	Target	Gap
ME1	3.09	5	1.92
ME2	3.14	5	1.86
ME4	2.70	5	2.30
Average	**2.98**	**5**	**2.02**

CONCLUSION AND SUGGESTION

Based on data processing and evaluation of the observed data obtained from respondents using the maturity model level in PO and ME domain using the COBIT 4.1 framework, it can be concluded as follows:

PT Perusahaan Gas Negara until now quite well in managing IT governance over IT investments and assets he already owns. It is characterized by a score in the two domains, namely PO have score 3.13 and ME domain score is 2.98. The second domain is already touching the third level of maturity level models, namely at the defined level, which means that all processes and IT issues within the company has been successfully identified. Procedures that are used and documented to run all of the company's IT processes are already available, but it also had no training for staff IT to improve its ability to resolve IT problems.

Scores obtained from both domains according to [10] has passed above the international standards level. But still adrift far enough to score targeted by a company which is a level 5 (optimized).

The domains in this research are PO (10 subdomains) and ME (3 subdomains) while the subdomain that has the lowest score in the domain PO are PO1 and PO8 which have a score of 2.91. PO1 discuss the company's IT strategy, and PO8 discusses IT quality management of the company. For ME domain, subdomain that has the lowest score of 2.70 is ME4, this subdomain described the provision of IT governance. The company is expected to provide back pressure in an attempt to fix IT problems, especially in the planning phase and quality settings and the application of IT governance that companies benefit from IT investments and use IT assets in line with company objectives.

There are four sub domains in PO and two sub domains in ME already have the SOP (PO2, PO3, PO6, PO9, ME1, and ME2). Another sub domain does not have the SOP.

From the research that has been done, the writer has suggestions that later can be used by companies to improve the performance of IT governance at this time to make it better in the future based from the conclusion. The company must concern to improve define IT strategy of the company (PO1), managing IT risk (PO9), and provide IT governance (ME4). This statement based from the lowest

score of every domain. Company must create an IT strategy document which complete and clear to be followed by all managers and create a variety of training about IT risk should be followed by all employees. Company must integrate IT governance with corporate governance means that all aspects of the company assisted by IT to solve every problem. Also creates the SOP for every sub domain.

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