Information Technology Governance Using COBIT 4.1 Framework for Supporting Service of Information Technology (Case Study: PT. Pupuk Sriwidjaja Palembang)

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ABSTRACT

After the spin-off as a Holding Company of Indonesian fertilizer company which is currently held by PT. Pusri Holding, PT. Pupuk Sriwidjaja Palembang had problems in the ERP application related with data integrity service. PT. Pupuk Sriwidjaja Palembang need to upgrade its IFS and also need to implement Information Technology Governance (ITG) using COBIT 4.1 as a fulfillment of directives from the Ministry of State-Owned Enterprises.

By knowing the maturity level of company through the audit process using COBIT 4.1, the company can deliver solutions based on OFI (Opportunities For Improvement). This method is done by getting the IT Process that grouped into 4 domains from the company's business goals. The solutions can eliminate all problems according to the data integrity service for the ERP application, and the implementation of ITG can be monitored and evaluated well. Furthermore, the company can improve the IT contribution by alignment of IT and business strategy on ensuring the linkage between short-term or long-term business and IT plan.

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1. INTRODUCTION

Nowadays, information technology (IT) is developed very rapidly and it has penetrated into various fields. The application of IT has been widely implemented through the company to support or even as a primary key support of any business process that is integrated as a basis for decision-making that determine the achievement of corporate objectives.

In 2011, PT. Pupuk Sriwidjaja Palembang transforms as Holding Company Indonesian Fertilizer Company, and now held by PT. Pupuk Indonesia. Following the spin-off, the Company experiencing data integrity problems in the application of Enterprise Resource Planning (ERP), namely Industrial and Financial Systems (IFS), especially on the financial side. On the other hand, the company is expected to increase its production capacity, so it need to use IT as a Center of Excellence to achieve the business goals. State-Owned Enterprises Ministry has also provide guidance to all Indonesian fertilizer company to immediately implement IT governance based on COBIT 4.1, but has not been implemented thoroughly by PT. Pupuk Sriwidjaja Palembang.

Therefore, PT. Pupuk Sriwidjaja Palembang needs an IT governance mechanism that includes technical and operational side as well as the executive management to meet business needs through IT GOVERNANCE (ITG). ITG in this study is defined using the COBIT 4.1 framework which has been used extensively and also have a wider scope of the process to ensure the vision and mission of the company and the achievement of the objectives. COBIT 4.1 Framework has 4 (four) domains, namely, Planning and Organization (PO), Acquisition and Implementation (AI), Delivery and Support (DS), and Monitoring and Evaluating (ME).

PT. Pupuk Sriwidjaja Palembang was a State-Owned Enterprises (SOEs) in charge of 6 (six) subsidiaries including subsidiaries in the various areas that requires a mandatory application of IT

Governance mechanisms to maximize the contribution of IT to ensure the achievement of long-term business objectives align with Company's Long-Term Plan (RJPP) or short-term plans that fit Budget Plan Company (RKAP) for every year.

According to these premise, the authors want to assess the governance of IT at PT. Pupuk Sriwidjaja Palembang using COBIT 4.1 Framework and provide useful recommendations for the improvement of the company to implement comprehensive integration in its Enterprise Resource Planning (ERP).

2. PREVIOUS STUDY

2.1 COBIT 4.1 Overview

COBIT Framework consists of 34 high-level control objectives. Each IT process is grouped into four main domains:

1. Planning and Organization (PO, 10 IT Processes)
   Identifying how IT can best contribute to the achievement of the organization's business goals, forming a good organization with a good technological infrastructure as well.
2. Acquisition and Implementation (AI, 7 IT Processes)
   Identify IT solutions and then implemented and integrated in the business processes to realize the IT strategy.
3. Delivery and Support (DS, 13 IT Processes)
   Domain associated with the delivery of the desired service, which consists of operations on system security and business continuity aspects to training provision.
4. Monitor and Evaluate (ME, 4 IT Processes)
   All IT processes need to be assessed regularly and periodically how quality and compliance with control requirements

3. RESEARCH METHOD

3.1 Problem-Solving Framework

In this research, there are 4 major stages and 1 final stage to be done, as illustrated in Figure 1.

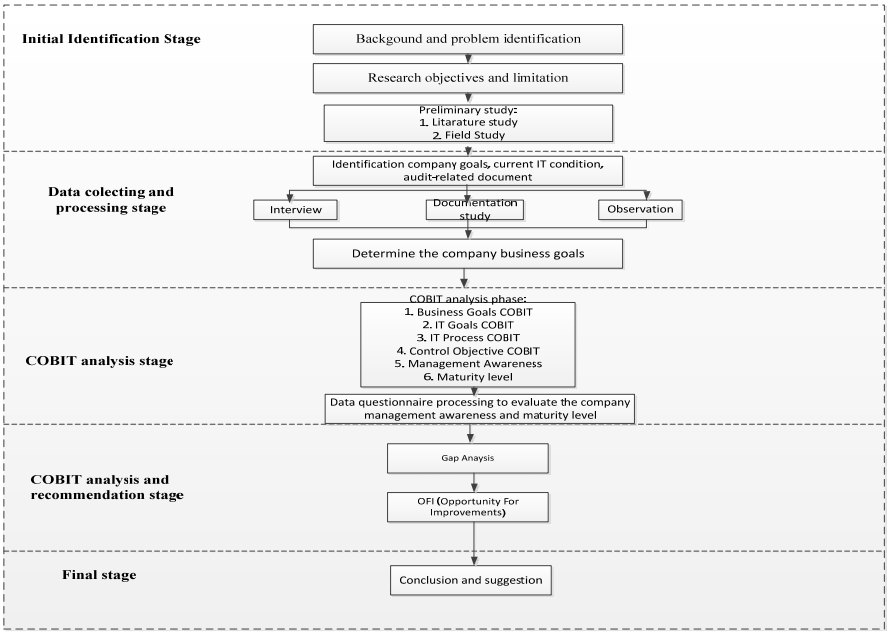

Figure1. Problem-Solving Framework

In this research, data was collected from the company by examining: Vision, Mission, Goals and Objectives of the company's business, the Company Long Term Plan (RJPP), Long Term Plan - Information Technology (RJP-TI) Policy, Work Plan and Budget of company (RKAP), RUPS documents, Standard Operating Procedure, the IT company's existing condition, all business processes are exist in the activities of the IT department in managing IT related companies and the IT Department users based on Committee on Information Technology Development (KPTI) of PT. Pupuk Sriwidjaja Palembang. After analyzing based on

COBIT documents, we can find number of detail control objectives to be translated into questionnaire of management awareness and maturity level.

3.2 Sampling Technique

Sample collection technique is purposive sampling, which requires some criteria to choose the sample objects. This study have choose 31 respondents as considered [1] to represent the variations that exist in the organization and sought to reflect the role of the existing RACI (Responsible, Accountable, Consulted, Informed) chart for each IT process.

3.3 Research Respondents

Respondents that selected in this study were employees of PT. Pupuk Sriwidjaja Palembang that use IT in the working process according KPTI documents (Committee on Information Technology Development) of company. In this study, the authors use a number of studies as many as 31 samples of respondents to the questionnaire data collection on Management Awareness and Maturity Level of PT. Pupuk Sriwidjaja Palembang according to the COBIT 4.1 framework. The respondent of questionnaire can be found in Table 1.

Tabel 1. The respondent of questionnaire Management Awareness and Maturity Level

No.	Type of Respondent	Department	Population	Sample
1.	Supervisor	Department of Company Planning/ KPI and Risk Management	10	1
2.	Supervisor	Department of Financial Supervisory	14	1
3.	Supervisor	Department of Finance	26	1
4.	Planner	Department of Customer Relationship Management and Marketing Development	10	1
5.	Planner	Department of Accounting	40	1
6.	Planner	Department of Planning and Control of Maintenance	51	1
7.	Planner	Department of Material Planning and Warehousing	51	1
8.	Planner	Department of Procurement	29	1
9.	Planner	Department Human resource development and organization	20	1
10.	Planner	Department of Labor	30	1
11.	Users	Department of Information Technology	22	21
Total			303	31

2.4 Validity and Reliability Testing

Validity testing of this study is calculated using Pearson Product Moment Correlation by correlating the item score on the questionnaire with a total score. Terms if the data used is valid if the Pearson Correlation values greater than 0.3 R critical, if less than 0.3 then the point R correlation instruments of less than 0.3 is considered autumn/ not used. Test the validity of this study using SPSS 20[2].

In this research, reliability testing is done using Cronbach's Alpha method. Cronbach's Alpha calculates the correlation among items in the questionnaire statements. Kaplan and Saccuzo (1993) stated that a measuring instrument said to be reliable if it has a value of Cronbach's alpha coefficient ≥ 0.7[3].

4. RESULTS AND ANALYSIS

COBIT analysis stage is started by processing and evaluating the audit-related documents: Vision, Mission, Company business goals, Company IT Goals, RJPP, RJP-TI Policy, RKAP, RUPS documents, and POB.

4.1 Mapping Business Goals with the COBIT 4.1 (Balanced Score Card perspective)

The process of translating company business goals into balance scorecard perspective can be found in table 2:

Table 2. Mapping Business Goals PT. Pupuk Sriwidjaja Palembang with the COBIT 4.1

No	Business Goals PT. PUPUK SRIWIDJAJA PALEMBANG	Perspective			
		Financial	Customer	Internal	Learning &Growth
1	Achievement of the Company's profits before tax of USD 1, 82 Trillion and healthy corporate performance "AAA".	V			
2	Achievement of production target of 1.345 million tons of ammonia and urea production target of 2.04 million tons and 1,500 tons of organic fertilizer production.			V	
3	Implementation of the distribution of subsidized Urea for Agricultural Sector as 1.2935 million tons and 10,000 tons of organic fertilizer and urea Commercial sales (farm and industrial) as much as 660,000 tons, exports 140,000 tons of Urea and Ammonia 100,000 tons.			V	
4	Implementation of development projects and investments		V	V	
5	The availability of a qualified workforce and in accordance with their competence at the end of 2013 as many as 2,607 people.				V
6	K3 and LH: Zero Accident and Proper Green.			V	
7	Improve efficiency and productivity and optimal working capital management	V		V	
8	Improve the reliability level of the factory so that the factory can operate On Stream Days and a high level of efficiency.	V		V	
9	Doing fertilizer distribution by the principle of "6 RIGHT" for Fertilizer PSO.		V		
10	Coordinate with the local department of agriculture in order to PSO fertilizer distribution according to government regulations.			V	
11	Increase market opportunities for non PSO fertilizer and non-fertilizer products sold.			V	V
12	Cooperation with raw material suppliers, strategic partners, process owners, investors, and other relevant agencies in terms of business development.		V	V	

No	Business Goals PT. PUPUK SRIWIDJAJA PALEMBANG	Perspective			
		Financial	Customer	Internal	Learning &Growth
13	Seek funds from third parties from both the financial and banking organization with competitive interest rates.	V			
14	Doing early retirement program.				V
15	Hiring employees and provide education and training as well as implementing knowledge management systems and post-program evaluation.				V
16	Minimize negative impacts on the environment.			V	
17	Improving behavior-based safety.			V	
18	Efforts to encourage self-sufficiency in energy supply				V
19	Support measures development center of excellence fertilizer manufacturing industry and encourage PT. Pupuk Sriwidjaja Palembang can take on the role of innovation in the development with PT. Pupuk Indonesia (Persero).		V	V	V
20	Promote the development and packaging engineering services in the fertilizer industry PT Pupuk Sriwidjaja Palembang valuable high-tech and commercial.		V	V	V
21	Encourage and support efforts by the completeness of seed processing technology for farmers, so the absorption of fertilizer goes according to plan farmers planting calendar and plan distribution by PT. Pupuk Sriwidjaja Palembang.		V	V	V
22	Improve the performance of Good Corporate Governance (GCG / GCG).	V			
23	Identification and control, as well as internal risk assessment and monitoring of all areas and functions related to the achievement of targets and goals set out in the company RJPP and CBP in 2013, good for business risk and investment risk (routine and development).	V			

3.2 Mapping Business Goals to IT Goals in the PT. Pupuk Sriwidjaja Palembang

The next process of mapping company business goals into IT goals can be found in Table 3.

Tabel 3. Mapping Business Goals to IT Goals in the PT. Pupuk Sriwidjaja Palembang

Business Goals			***IT Goals***							
Financial Perspective	1	*Provide a good return on investment of IT-enabled business investment*	24							
	2	*Manage IT-related business risk.*	2	14	17	18	19	20	21	22
	3	*Improve corporate governance and transparency*	2	18						
Customer Perspective	4.	Improve customer orientation and service	3	23						
	5.	Offer competitive products and services	5	24						
	6.	Establish service continuity and availability	10	16	22	23				
	7.	Create agility in responding to changing business requirements	1	5	25					
	8.	Achieve cost optimization of service delivery	7	8	10	24				
	9.	Obtain reliable and useful information for strategic decision making	2	4	12	20	26			
Internal Perspective	10.	Improve and maintain business process functionality	6	7	11					
	11.	Lower process cost	7	8	13	15	24			
	12.	Provide compliance with external laws, regulations, and contracts	2	19	20	21	22	26	27	
	13.	Provide compliance with internal policies	2	13						
	14.	Manage business change	1	5	6	11	28			
	15.	Improve and maintain operational and staff productivity	7	8	11	13				
Learning and Growth Perspective	16.	Manage product and business innovation	5	25	28					
	17.	Acquire and maintain skilled and motivated people	9							

3.3 Mapping the IT Goals to IT Process PT. Pupuk Sriwidjaja Palembang

The next process of translating IT goals into IT process can be found in table 4:

Tabel 4. Mapping the IT Goals to IT Process PT. Pupuk Sriwidjaja Palembang

1.	Respond to business requirements in alignment with the business strategy	PO1	PO2	PO4	PO 10	AI1	AI6	AI7	DS1	DS3	ME1
2.	Respond to governance requirements in line with board direction	PO1	PO4	PO 10	ME1	ME3					
3.	Ensure satisfaction of end users with service offerings and service levels	PO8	AI4	DS1	DS2	DS7	DS8	DS10	DS13		
4.	Optimise the use of information	PO2	DS 11								
5.	Create IT agility	PO2	PO4	PO7	AI3						
6.	Define how business functional and requirements are translated in effective and efficient solutions	AI1	AI2	AI6							
7.	Acquire and maintain integrated and standardised applications systems	PO3	AI2	AI5							
8.	Acquire and maintain an integrated and standardised IT infrastructure	AI3	AI5								
9.	Acquire and maintain IT skills that respond to the IT strategy	PO7	AI5								
10.	Ensure satisfaction third-party relation	DS2									
11.	Ensure seamless integration of applications into business processes	PO2	AI4	AI7							
12.	Ensure transparency and understanding of IT cost, benefits, strategy, policies, and service levels	PO5	PO6	DS1	DS2	DS6	ME1	ME4			
13.	Ensure proper use and performance of the applications and technology solutions	PO6	AI1	AI7	DS7	DS8					
14.	Account for and protect all IT assets.	PO9	DS5	DS9	DS 1 2	ME2					
15.	Optimize the IT infrastructure, resources and capabilities	PO3	AI3	DS3	DS7	DS9					
16.	Reduce solution and service delivery defects and rework	PO8	AI4	AI6	AI7	DS10					
17.	Protect the achievement of IT objectives.	PO9	DS 10	ME2							
18.	Establish clarity of business impact of risks to IT object	PO9									
19.	Ensure that critical and confidential information is withheld from those who should not have access to IT	PO6	DS5	DS11	DS 12						
20.	Ensure that automated business transactions and information exchanges can be trusted	PO6	AI7	DS5							
21.	Ensure that IT services and infrastructure can properly resist and recover from failures due to error, deliberate attack or disaster	PO6	AI7	DS4	DS5	DS12	DS 13	ME2			
22.	Ensure minimum business impact in the event of an IT service disruption or change	PO6	AI6	DS4	DS 12						
23.	Make IT services are available required	DS3	DS4	DS8	DS 13						
24	Improve IT's cost-efficiency and its contribution to business profitability	PO5	DS6								
25.	Deliver projects on time and on budget, meeting quality standards	PO8	PO 10								
26.	Maintain the integrity of information and processing infrastructure	AI6	DS5								
27.	Ensure IT compliance with laws, regulations and contracts	DS 11	ME2	ME3	ME4						
28.	Ensure that IT demonstrate cost-efficient service quality, continuous improvement and readiness for future change	PO5	DS6	ME1	ME4						

3.4 Linking IT Process PT. Pupuk Sriwidjaja Palembang

The final process of mapping to get the IT process can be found in Table 5.

Tabel 5. IT Process PT. Pupuk Sriwidjaja Palembang

IT Process	Domain
PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8, PO9, PO10	Plan and Organize
AI1, AI2, AI3, AI4, AI5, AI6, AI7	Acquire and Implementation
DS1, DS2, DS3, DS4, DS5, DS6, DS7, DS8, DS9, DS10, DS11, DS12, DS13	Deliver and Support
ME1, ME2, ME3, ME4	Monitoring and Evaluation

3.5 Management Awareness

There are 3 levels of management awareness of the respondents [4]:

1. H (High) to be considered a good performance
2. M (Medium) for performance that are considered moderate or fairly
3. L (Low) for performance that are considered lacking or poorly

Tabel 6. Questionnaire results of Management Awareness

NO	Process	Answers			NO	Process	Answers			NO	Process	Answers		
		Low	Med	High			Low	Med	High			Low	Med	High
1	PO1	19%	52%	29%	13	AI3	13%	72%	15%	25	DS8	22%	63%	15%
2	PO2	19%	61%	20%	14	AI4	31%	51%	18%	26	DS9	19%	72%	9%
3	PO3	12%	49%	39%	15	AI5	4%	62%	34%	27	DS10	15%	65%	20%
4	PO4	23%	60%	17%	16	AI6	20%	58%	22%	28	DS11	12%	58%	30%
5	PO5	36%	51%	13%	17	AI7	13%	68%	19%	29	DS12	6%	80%	14%
6	PO6	14%	66%	20%	18	DS1	19%	58%	23%	30	DS13	9%	74%	17%
7	PO7	20%	59%	21%	19	DS2	16%	57%	27%	31	ME1	12%	66%	22%
8	PO8	17%	55%	28%	20	DS3	3%	74%	23%	32	ME2	13%	72%	15%
9	PO9	15%	66%	19%	21	DS4	11%	70%	19%	33	ME3	14%	72%	14%
10	PO10	16%	60%	24%	22	DS5	15%	62%	23%	34	ME4	12%	78%	10%
11	AI1	14%	65%	21%	23	DS6	19%	65%	16%					
12	AI2	13%	70%	17%	24	DS7	17%	53%	30%					

3.6 Maturity Level

The questionnaire results are then being analyzed based on 6 maturity attributes, which are: (1) AC/ awareness and communication, (2) PSP/ Policies, Plans and Procedures, (3) TA/ Tools and Automation, (4) SE/ Skills and Expertise, (5) RA/ Responsibilities and Accountabilities, and (6) GSM/ Goal Setting and Measurements. The result based on maturity attributes is presented on Table 7.

Tabel 7. Questionnaire Result based on Maturity Attributes

Attribute	As-is	To-be
AC	2.805	4.176470588
PSP	2.76	4.145
TA	2.710588235	4.130294118
SE	2.753823529	4.105882353
RA	2.715294118	4.101470588
GSM	2.576176471	4.078235294

3.7 Opportunities for improvement (OFI)

Based on the analysis outlined above, the recommendations for the IT strategic plan are:

1. Awareness and Communication (AC)

Raise awareness and delivery of the CSF, KGI, KPI that can be understood and implemented optimaly by all stakeholders and always deliver any new changes in the IT process.

2. Policies, Plans, and Procedures (PPP)

Create a number of rules, policies, and or SOP for multiple IT processes, namely: IT strategic planning, information architecture, technology direction of IT, managing IT investments, IT human resource management, quality management of IT, IT risk assessment, management projects, IT change management, IT service level management, IT service management by third parties, measurement of IT performance and capacity, business continuity planning, business impact analysis, incident management, the provision of IT governance.

3. Tools and Automation (TA)

Three most important recommendations are:

a) Implement the use of tools for defining the IT strategic plan, information architecture, direction of technology, quality management of IT, IT automation solution identification, change management, incident management and IT service levels.
b) Keep a thorough implementation of the ERP system integration company.
c) Improvement of operational information systems, in particular the budget SI, SI Marketing, Shipping, maintenance SI, SI KPIs, financial SI, SI HR, Logistics SI, SI Security.

4. Skills and Expertise (SE)

a) Conduct employee training and education planning
b) Conduct training on IT processes: management of IT security systems

5. Responsibility and Accountability (RA)

Determine the role and responsibilities of IT related processes: defining the IT strategic plan, defining the information architecture, defining the direction of IT technology, the identification of IT automation solutions.

6. Goal Setting and Measurement (GSM)

Conduct monitoring and measurement of IT processes: defining the IT strategic plan, defining the information architecture, defining the direction of technology, IT human resource management, quality management of IT, IT risk management, identification of IT automation solutions, IT service level management, IT systems security, identification and allocation of IT budgets, training and education of staff, service desk and incident management, IT configuration management, problem management, and data management

5. CONCLUSION

PT. Pupuk Sriwidjaja Palembang needs to upgrade or replace the ERP application to ensure the data integrity and to cover all of the newest business goals. The implementation of IT governance at PT. Pupuk Sriwidjaja Palembang is suitable on IT use to support its business activities (Key Operational) for achieve its business goals by making IT as a center of excellence. After the mapping process based on the COBIT 4.1 framework, it's known that PT. Pupuk Sriwidjaja Palembang have 34 IT processes and 210 detailed control objectives. IT governance performance at PT. Pupuk Sriwidjaja Palembang in enough good value in terms of the actual maturity is 3 (Defined Process) and expect the future condition of the IT companies are at level 4 (Managed and measureable). Its illustrates the existing IT processes at the company has defined and documented through policies, procedures, but the lack of measurement, and the overall supervision of the periodic development of policies and procedures.

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