221

Business Process Assessment with Balanced Scorecard and Framework COBIT

Harryston Nagata*[1], Johanes Fernandes Andry[2]
[1,2]Universitas Bunda Mulia Jakarta Utara
harrystonnagata08@gmail.com[*1], jandry@bundamulia.ac.id[2]

Abstract

Manufacturing company is the company that produces household appliances based on plastic/plastic houseware, this company has applied information system but there is often problem in sales department that is when processing of data discount, data obtained wrong and not according to which have been determined. Therefore, the author is given the task to audit the information system on the company. The author uses the COBIT and Balance Scorecard framework, the COBIT domain used is the Plan and Organize (PO) and Acquire and Implement (AI), in the PO Domain the author uses PO4 sub-domains (Define the IT Processes, Organization and Relationships) Communications management aims and direction) and PO 9 (Assess and Manage IT risks) whereas in AI Domain used is AI4 (Enable Operation and Use), Balanced Scorecard Perspective used in this research is Internal Business Process, which focuses on business process assessment company and business goals have been in line with IT goals. The results from this research is still many deficiencies that exist in company especially at risk management of IT proven and IT risk management that have not managed maximally so that can be developed in the future.

Keywords: Business Process, Assessment, COBIT, Balanced Scorecard

1. Introduction

Information technology is very important for all organizations because the company is proven to help in improving the effectiveness and efficiency of business enterprises, in achieving the effectiveness and efficiency required technology used to support the success of the organization in achieving its goals. The triumph of information technology related on how far IT governance is done by the company [1] [2]. To find problems and provide solutions in IT that runs in a company, can be done with audit information system.

Audit information system required a standard, then the standard used is COBIT. COBIT is an information technology governance framework standard that provides obvious policy and great practice by assisting management in understanding and managing issues in IT governance [3]. COBIT is also a best practice-based framework, focusing on IT organizational processes and how their achievement can be appraised and observed [4]. COBIT basically is developed to meet the several requirements of management by confront the information gap among business risks, control, and technical problems. COBIT supports IT governance by serving a framework to define the alignment of IT with the business [5]. The BSC covers an amount of assess that enable the managers to have a fast and complete enterprise view [6]. Balanced Scorecard (BSC) is an evaluation of an organization that is not only limited to traditional financial evaluation, but also with steps on customer satisfaction, inside processes and the capability to improve [7]. The BSC is a management system designed to connect and align the firm with its strategy business at all stage. After the balanced scorecard is stated at the corporate standard, it is cascaded to strategic business units and support departments. In this case the authors focus on the internal business process in PT Nagata Indonesia Permai.

PT. Nagata Indonesia Permai is a plastic manufacturing industries that produces household appliances made of plastic / plastic houseware. Company has applied information system as supporting work process. Company problem is in discount data processing, because often mistake in data processing which is not right or not as according to that should at the marketing division. Therefore, it is necessary to measure business process alignment with the usage of company's information system, to ensure alignment between information systems and business processes of the company, it is necessary to audit the information system to reduce errors in data

processing. Based on these problems, this study aims to provide recommendations for the management of appropriate information technology, so that it can be used as a reference and can improve data processing optimally. The authors conducted this study based on existing research.

The authors listed two previous studies relevant to the theme of the study that the authors took to clarify the theory used in reviewing research conducted. Michele Rubino and Filippo Vitolla in 2014, in the journal "Internal control over financial reporting: opportunities using the COBIT framework", Explain the analysis indicates that the execution of the COBIT structure, or mostly the adoption of potent IT controls, serves necessary advantage to the whole company. IT control objectives have a direct impact on the IT control weaknesses and indirectly on the other categories of material weaknesses [8]. James Kamwachale Khomba in 2015, in the journal "Conceptualisation of the Balanced Scorecard (BSC) model: A critical review on its validity in Africa", Explain it is established that the BSC design to do a crucial task in helping business implementer in forming holistic long period management resolutions. However, this model gives inappropriate strain on the maximization of stockholder fortune on the forfeit of other jointly necessary stakeholders. This model does not emphasize or completely disregard stakeholders such as competitors, suppliers, creditors, governments, local communities and the natural environment. The model is full of many unrealistic conceptuality opinions in the modern sphere [9].

Based on those problems, this study are use the combination of COBIT 4.1 framework and Balanced Scorecard standard methods with BSC's business process perspectives and COBIT's domain. Then, those indicators will measure all of working areas, so that the scores of performance will represent business goals and objectives.The purpose of measuring business processes with information systems used is to evaluate and make the results as input to improve the management of running systems, in order to solve problems faced by the company.

2. Research Method

This research consists of three phases, which are research, interview and questionnaire. The detail is show in Figure 1.
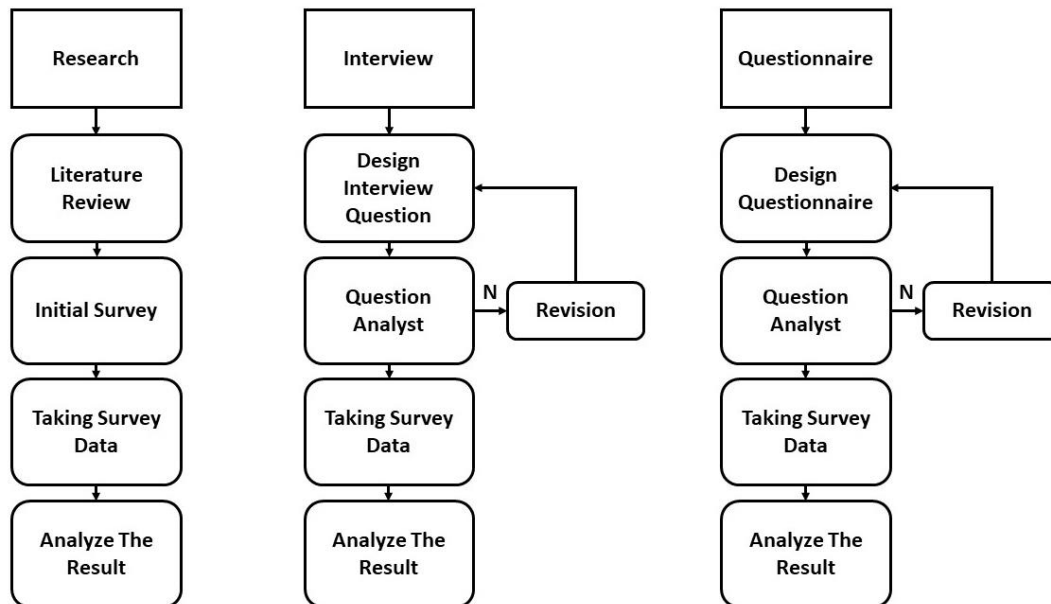

Figure 1. Research Design [10]

This are the explanation about the research design:
1. Research

In this stage, first process is literature review. Literature review is explanation of theory that used in this research. After that, the next process is initial survey, where survey has conducted at the beginning of the research process. Then, obtain survey data from survey that has been done. At the end of this stage is process of analyze the result, where the result of survey data is being analyze and get the conclusions from the results during the research phase.

2. Interview

In this stage, the authors are designing interview questions. Then, the question is analyzed to ensure that accordance with the research topic. If the question is not appropriate, then re-designing the questions that have been made. After that process, authors are obtaining the survey data from survey that has been done. Eventually, authors are analyzing the result of the interview to take a conclusion from the interview process.

3. Questionnaire

In this stage, the authors are designing the questionnaire, where the questionnaire will be filled to the company. Then, the statement is analyzed to ensure that accordance with the research topic. If the statement is not appropriate, then re-designing the statement that have been made. After that process, authors are obtaining the survey data from survey that has been done. Eventually, authors are analyzing the result of the questionnaire to take a conclusion from of all statements that have been filled by the company.

3. Result and Discussion

In this stage the authors explain the results of the study, authors are analyzing the result of the interview to take a conclusion from the research. The author uses the domain Plan and Organize (PO) and Acquire and Implement (AI). PO domain involve strategy and tactics, and concerns the identification of the way IT can best provide to the achievement of the business goals. The realization of the strategic vision needs to be planned, communicated and managed for dissimilar perspectives. A proper organization as well as technological infrastructure should be put in place.AI domain is used to realize the IT strategy, identify the IT solution need, and developed or acquired, as well as implemented and integrated into the business process. In addition, changes in and maintenance of existing systems are covered by this domain to make sure the solutions continue to meet business objectives [11].

3.1 Plan and Organize (PO)

This domain includes strategies and tactics, and involves identifying how IT can best contribute to the achievement of business objectives. The realization of strategic vision needs to be planned, communicated and managed for different perspectives. The right organization and technology infrastructure should be prepared. For the PO domain, the authors use PO4, PO6 and PO9. The author uses the PO4 sub-domain to define the IT processes, organization and relationships and focus on effective and efficient IT investment and portfolio decisions, and by setting and tracking IT budgets in line with IT strategy and investment decisions and then PO6 is to communicate management aims and direction that satisfies the business requirement for IT of provide accurate and timely information on current and future IT service and related risks and responsibilities, focus on providing accurate, understandable and approved policies, procedures, guidelines and other documentation to stakeholders, embedded in an IT control framework and directives and PO9 in order to assess and manage IT risks within the company that satisfies the business requirement for IT of analyzing and communicating IT risks and their potential impact on business processes and goals by focusing on development of a risk management framework that is integrated in business and operational risk management frameworks, risk assessment, risk mitigation and communication of residual risk. Here is the result of maturity level calculation on PO domain.

PO4 has not reached the expected maturity level because the implementation of supervision is not yet sufficient in the IT function to ensure the roles and responsibilities are implemented correctly so that in the future there needs to be further development in accordance with the provisions of IT standards, In addition, the company has not placed IT functionality in the overall organizational structure, internal and external IT organizational structures that reflect the business needs, nor have the process of periodically reviewing the IT organizational structure to adapt the source strategy to meet the expected business objectives. Then, the placement of the organization, responsibilities and size of the QA group that meets the organization's requirements. And Implementation of adequate oversight of the IT function to ensure that roles and responsibilities are carried out correctly also do not exist within the company. Therefore the average maturity level value at PO4 only reaches 1.47.

Recommendation for PO 4 is Companies need to put IT functionality in the overall organizational structure, internal and external IT organizational structures that reflect business needs, and also implement processes to periodically review IT organizational structures to adapt

source strategies to meet expected business objectives. Then, organizational placements, responsibilities and the size of the QA group that meets the requirements of the organization and implementation of adequate oversight of IT functions to ensure that roles and responsibilities are carried out correctly are also recommended within the company.

PO6 also have not reached the expected maturity level because the supervision of the IT environment has not been aligned with the company's management and will be planned applied in the future. In addition, there is no oversight of the IT environment that is aligned with the company's management, nor has there been any continuous improvement of the process as well as references to procedures, standards and guidelines for IT policy and IT policy enforcement for all staff, so that the average maturity level value obtained only 1.4. Recommendation for PO 6 is it is necessary to monitor the IT environment in harmony with the company's management, and also need to implement a continuous process improvement as well as reference to procedures, standards and guidelines for IT policy as well as enforcement of IT policy for all staff.

PO9 has not reached the expected level because there is no informal assessment of the project risk. In addition, in the absence of specially-considered IT risks, risk assessments are identified in the planning of a project but are rarely assigned to a particular manager. Because of the underdeveloped and immature risk assessment approach applied to the project manager policy, risk is always at a low level and applied only in response to problems that occur. In the company to date there is no risk management policy that determines when and how to conduct risk assessment. For more details can be seen in Table 1. Recommendation for PO9 is companies need to consider the risks of IT in a specific way. Risk assessments identified in the planning of a project need to be assigned to a particular manager, so that the existing risk assessment approach can thrive and mature so that it can be applied to project manager policies and risk management always at a high level and can be applied in response to problems that occur, companies need to establish a risk management policy when and how to conduct a risk assessment

Table 1. Average Maturity Level Domain Plan and Organize (PO)

Process	Control Objective	Current Level	Expected Level
PO4	Define the IT Processes, Organization and Relationships	1.47	3
PO6	Communicate management aims and direction	1.4	3
PO9	Assess and Manage IT risks	1	3

3.2 Acquire and Implement (AI)

Control over the IT process of Enable operation and use that satisfies the business requirement for IT of ensuring satisfaction of end users with service offerings and service levels and seamlessly integrating applications and technology solutions into business processes by focusing on providing effective user and operational manuals and training materials to transfer the knowledge necessary for successful system operation and use. Management of the process allow operation and use that fulfill the business provision for IT ensuring satisfaction of end users with service offerings and service levels and seamlessly integrating applications and technology solutions into business processes.

In AI4 the value obtained only 1.62 because there is no further plan to identify all technical aspects of the system, system operational aspects, aspects of system usage, therefore AI4 has not reached the expected maturity. Recommendation for AI4 is the future there is need further plan to identify all technical aspects of the system, system operational aspects, aspects of system usage, so as to correct errors in data processing that occurs within the company. To see the maturity level calculation results can be seen on Table 2.

Table 2. Average Maturity Level Domain Acquire and Implement (AI)

Process	Control Objective	Current Level	Expected Level
AI 4	Enable Operation and Use	1.62	3

3.3 Balance Scorecard

The Balanced Scorecard (BSC) is measurement tool in order to measure an organization's performance in public and private sectors. Balanced scorecard is a customer-based planning and process improvement system, with its primary focus on encourage an organization change process by identifying and evaluating pertinent performance measures. It is an integral part of the mission identification, strategy formulation and process implementation, with an emphasis on translating strategy into a linked set of financial and non-financial measures [12]. The author uses the Balanced Scorecard to measure the performance of business processes in the company, Perspective used is the internal process of business in order to align business goals with IT goals. The author link IT Goals with IT processes and criteria of the COBIT information where the criteria are determined based on the process used. Which is the IT goal is based, in which there are IT goals, processes taken from the COBIT domain used in this study, and the COBIT information criteria consisting of effectiveness, efficiency, confidentiality, integrity, availability, compliance, and reliability obtained from sub domains in COBIT 4.1. See Table 3 Linking IT Goals to IT Process.

The IT Goal number one is Respond to business requirements in alignment with the business strategy are linked to PO 4 (Define the IT Processes, Organization and Relationships) and on the COBIT information criteria there is a primary in effectiveness and efficiency. The IT Goals number two is Ensure seamless integration of applications into business processes are linked to AI 4 (Enable Operation and Use) and on the COBIT information criteria there is a primary in effectiveness and efficiency and secondary on integrity, availability, compliance, and reliability.IT Goals number three is Ensure proper use and performance of the applications and technology solutions are linked to PO 6 (Communicate management aims and direction) and AI4 (Enable Operation and Use) the COBIT information criteria there is a primary in effectiveness and efficiency and secondary on integrity, availability, compliance, and reliability.

IT Goals number four is Ensure that critical and confidential information is withheld from those who should not have access to it are linked to PO 6 (Communicate management aims and direction) process and on the COBIT information criteria there is a primary in effectiveness and secondary in compliance. IT Goals number five is Ensure that automated business transactions and information exchanges can be trusted to it are linked to PO 6 (Communicate management aims and direction) process and on the COBIT information criteria there is a primary in effectiveness and secondary in compliance. IT Goal number six is Ensure proper use and performance of the applications and technology solutions.

Table 3. Linking IT Goals to IT Process

#	IT Goals	Processes		COBIT Information Criteria						
				Effectiveness	Efficiency	Confidentiality	Integrity	Availability	Compliance	Reliability
1	Respond to business requirements in alignment with the business strategy	PO4		P	P					
2	Ensure seamless of applications into business processes	AI4		P	P		S	S	S	S
3	Ensure proper use and performance of the applications and technology solutions	PO6	AI4	P	P		S	S	S	S
4	Ensure that critical and confidential information is withheld from those who should not have access to it	PO6		P					S	
5	Ensure that automated business transactions and information exchanges can be trusted	PO6		P					S	
6	Ensure proper use and performance of the applications and technology solutions	PO6	AI4	P	P		S	S	S	S

The next, the authors will link business goals and IT goals. Business goals describe what a company expects to accomplish over a specific period of time. Businesses usually outline their goals and objectives in their business plans. Goals may pertain to the company as a whole, departments, employees, customers, or any other area of the business, whereas IT goal is what the company expects for IT running in the company. The following is an internal balanced scorecard perspective that is related to the business goals and IT goals that can be seen in Table 4, the author link the business goals with the IT goals and criteria of COBIT information where the criteria are determined based on the process used.

At this stage, author mapping the business goals which managed according to a balanced scorecard, where the IT goals and COBIT information criteria, Indicate a given common business goal, the IT goals that support for business goal and the COBIT information criteria that associated to the business goal. There is six business goals should not be assume as all probable business goals; it is an option of relevant business goals that can have a clear impact on IT, in which there are BSC perspectives used, business goals, IT goals, and COBIT information criteria consisting of effectiveness, efficiency, confidentiality, integrity, availability, compliance , and reliability. Seen Table 4.

Table 4. Linking Business Goals to IT Goals

BSC Perspective		Busniess Goals	IT Goals		Effectiveness	Efficiency	Confidentiality	Integrity	Availability	Compliance	Reliability
					COBIT Information Criteria						
Internal Perspective	1	Improve and maintain business process functionality	2		✓	✓					
	2	Lower process costs	3			✓					
	3	Provide compliance with external laws. Regulation and contracts	4	5			✓			✓	
	4	Provide compliance with internal policies	6				✓			✓	
	5	Manage business change	1		✓	✓					
	6	Improve and maintain operational and staff productivity	2	6	✓	✓					

The business goal number 1 is improve and maintain business process functionality are associated to IT goal number 2 (Ensure seamless integration of applications into business processes) and there is effectiveness and efficiency in the COBIT information criteria. The business goal number 2 is lower process costs are associated to IT goal number 3 (Ensure proper use and performance of the applications and technology solutions) and there is efficiency in the COBIT information criteria. The business goal number 3 is Provide compliance with external laws, regulations and contracts are associated to IT goal number 4 (Ensure that critical and confidential information is withheld from those who should not have access to it) and 5 (Ensure that automated business transactions and information exchanges can be trusted) and there is confidentiality and compliance in the COBIT information criteria.

The business goal number 4 is Provide compliance with internal policies are associated to IT goal number 6 (Ensure proper use and performance of the applications and technology solutions) and there is confidentiality and compliance in the COBIT information criteria. The business goal number 5 is manage business change are associated to IT goal number 1 (Respond to business requirements in alignment with the business strategy) and there is effectiveness and efficiency in the COBIT information criteria. The business goal number 6 is

Improve and maintain operational and staff productivity are associated to IT goal number 2 (Ensure seamless integration of applications into business processes) and 6 (Ensure proper use and performance of the applications and technology solutions) and there is effectiveness and efficiency in the COBIT information criteria.

4. Conclusion

Conclusion that can be taken from this research is still many deficiencies that exist in company especially at risk management of IT proven by level maturity at domain PO 9 only level 1 where maturity level expectation is 3, so need to be raise again IT risk management that have not managed maximally so that can be developed in the future and the AI domain only reaches the maturity level of 1.62 where the expectation of maturity level is 3, because there is no further plan to identify all technical aspects of the system, but in the future the company needs to identify all the aspects needed in the development of future system, so can be minimize error on data processing.

Recommendation for PO Domain in the future there needed to implement oversight function of IT to ensure the roles and responsibilities are implemented correctly in accordance the provisions of IT standards with the supervision of the IT environment has need to been aligned with the company management and assessment of the project risk IT. Recommendation for AI Domain in the future there is need further plan to identify all technical aspects of the system, so as to correct errors in data processing that occurs within the company.

References

[1] S. Erniwati and N. K. Hikmawati, *"An Analysis of Information Technology on Data Processing by using Cobit Framework,"* International Journal of Advanced Computer Science and Application, Vol. 6, No. 9, 2015.

[2] A. P. Utomo and N. Mariana, *"Analisis Tata Kelola Teknologi Informasi (It Governance) pada Bidang Akademik dengan Cobit Frame Work Studi Kasus pada Universitas Stikubank Semarang,"* Jurnal Teknologi Informasi Dinamik, Vol. 16, No. 2, Pp. 139–149, 2011.

[3] I. D. P. and M. I. R. Alit, *"Tingkat Kematangan Infrastruktur Teknologi Informasi Pada Domain Acquire and Implement Menggunakan COBIT 4.1 (Studi Kasus: UPT Perpustakaan Universitas,"* KINETIK, Vol. 2, No. 3, Pp. 227–234, 2017.

[4] J. Fernandes Andry, *"Process Capability Model Based on COBIT 5 Assessments (Case Study),"* JATISI, Vol. 3, No. 1, Pp. 23–33, 2016.

[5] J. F. Andry and H. Hartono, *"Performance Measurement of IT Based on COBIT Assessment: A Case Study,"* Association for Information Systems, Vol. 2, No. 1, 2017.

[6] E. K. and S. C. G. Giannopoulos, A. Holt, *"The Use of the Balanced Scorecard in Small Companies,"* International Journal of Business and Management, Vol. 8, No. 14, 2013.

[7] O. Zizlavsky, *"The Balanced Scorecard: Innovative Performance Measurement and Management Control System,"* Journal of Technology Management & Innovation, Vol. 9, No. 3, 2014.

[8] M. Rubino and F. Vitolla, *"Internal Control Over Financial Reporting: Opportunities Using the COBIT Framework,"* Managerial Auditing Journal, Vol. 29, No. 8, Pp. 736–771, 2014.

[9] J. K. Khomba, *"Conceptualisation of the Balanced Scorecard (BSC) Model,"* International Journal of Commerce and Management, Vol. 25, No. 4, Pp. 424–441, 2015.

[10] J. F. Andry, *"Audit Tata Kelola TI Menggunakan Kerangka Kerja COBIT Pada Domain DS dan ME Di Perusahaan Kreavi Informatika Solusindo,"* in *Seminar Nasional Teknologi Informasi dan Komunikasi 2016*, 2016.

[11] IT Governance Institute Team, *"COBIT 4.1.,"* USA: IT Governance Institute, 2007.

[12] P. Řehoř and D. Holátová, *"Application of Balanced Scorecard Method as a Tool for Strategic Management of Chosen Municipality,"* in International Conference, 2013, Pp. 333–340, 2013.