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Evaluation of Maturity Level of Information and Communication Technology (ICT) Governance with CobIT 5.0 Case Study: STMIK Pelita Nusantara Medan

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Abstract. In entering competition the quality and predicate best the national and the quality of graduates, college trying to use information technology as an instrument for might win this competition. That IT can be used to fulfill and support the system in college, it needs assessment from information technology regularly. One method of conducting evaluation of the performance of the department of information technology is to use the framework Cobit 5 as yardstick efficiency in the use of information technology currently consisting of 5 (five) domain namely: EDM, APO, DSS, MEA A measuring instrument his as. With this method, researchers trying to make it a blueprint as the end result of utilization of information technology in college , so the management can plan exactly how of development of information technologies company to the next few years .An evaluation, known level capabilities inside the area mea and APO is entirely located at the level of 1 (performed) with the level of the target to be achieved is the level of 3 (established). Weakness governance information technology in STMIK Pelita Nusantara Medan is the lack of formalization rules and procedures management information technology. To reduce the gap between capability the current level was level and capability to be achieved, so STMIK Pelita Nusantara Medan must meet PA2.1, PA2.2, PA3.1 and PA3.2, that capability the current level was that is at the level of 1 could rise to the level of 3. Along with that, STMIK Pelita Nusantara Medan moved closer to the purpose..

1. Introduction

Information technology has given effect significantly and changed business environment which has been managed and supervised until now. Implementation of information technology on business process of a company is one way to provide the solution that will improve the company competition level. In this case, the framework is very significant to make sure that information technology enables to business, increase advantage, information technology risk must be managed precisely and information technology resources can be applied responsibly. In order to reach the target, it required planning, implementation, supporting and evaluating in mature and optimal. It is caused by the high cost of investment which is incurred in increasing the role of technology information. If financial losses happened it could be avoided. It means that financial losses will be occur because of data loss, data misuse, computer misuse and non- accurate information because of data processing error so integrity data will be doubtful, procurement of hardware and software investment is very high but it is not followed by reverse value, management of information technology staff is undirected. All the



problems above could occur in all companies; therefore evaluation of information technology is needed to investigate which parts should be recovered so it can reach the business objective.

In addition to companies, universities are an example of an education institution that needs supports of information technology and communication. Technology information development demands college to control resource potential effectively and efficiently to face competition. The usage of Information Technology (IT) in university governance, especially in STMIK Pelita Nusantara, it has been following development of IT and has aligned with the needs of existing business processes and every single IT service that is provided by STMIK Pelita Nusantara always does changing periodically based on the service user needs, it proves that STMIK Pelita Nusantara has been making supervision and management. However, in the usage and governance, whether it is suitable with IT standards, it needs to be verified through the audit process of information technology governance, which refers to a framework. This performance measurement will be petrified evaluation process implementation of information technology in STMIK Pelita Nusantara and help in making the decision to strike a balance between the risks and benefits of information technology in building and developing the services and information technology functions that suit their needs and expectations.

It is necessary to have governance planning in order that provided services could be improved appropriate with instance strategic objectives. Therefore, a number of controlling designs have been proposed and developed to help companies and also instances in creating a good controlling system, such as COBIT and Information Technology Governance. IT governance is a structure and process that are interconnected as well as direct and control agencies in achieving corporate goals through value-added and balancing the risks and benefits of information technology and processes.

The usage of COBIT framework towards Information Technology governance providing structures that provide IT processes, IT resources and information for STMIK Pelita Nusantara. Information Technology governance can also monitor the performance of IT to ensure information and technology which is interconnected can support instance support based on COBIT framework which has five high-level controlling objectives, namely; (1) Evaluate, Direct and Organize (EDM); (2). Align, Plan and Organize (APO); (3). Build, Acquire and Implement (BAI); (4). Deliver, Service and Support; (5). Monitor, Evaluate and Assess . With COBIT, hopefully the usage and IT governance can produce efficient and effective work and make its governance usage consider where the integration of hardware, software and human devices build integration.

2. Methodology

IT governance is the responsibility of top management and executive management of a company. Also explained that IT governance is part of the overall management of the company consisting of leadership and organizational structures and processes is to ensure the continuation of the IT organization and the development of strategies and goals of the organization. One key focus is information technology governance to align information technology with business objectives. As an explanation it can be said that the information technology governance is the combination of corporate governance and management of information technology

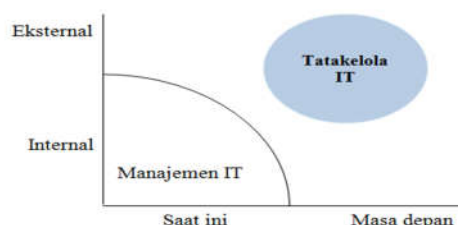


Figure 1. Information Technology Governance and IT Management

COBIT is issued and prepared by IT Governance Institute, which was one part of the ISACA, in 1996. COBIT is an IT governance framework or can also be called a supporting tool that can be used to separate the gap between needs and how the implementation technique of filling needs in an organization. COBIT enables clear policy development and it is much better used for IT control

throughout organizations, helping to improve the quality and value and also simplifying the implementation of process plot of an organization in terms of IT implementation. As for the one issued by ISACA is COBIT 5.

2.1. Process of Capability Model

ISO/IEC 15505 defines measurement for process capability assessment of COBIT framework. Capability process is defined on 6 level starts from point 0 to 5, which represents the capability improvement of implementation process. Here is explanation of level capability process:

Table 1. Capability Level

Level	Value	Description
0	Incomplete	Not implemented
1	Performed	Has reached the goal of the process
2	Managed	Level 1 has been implemented with the right product performance established, controlled and maintained.
3	Established	Level 2 has been implemented that is able to achieve the results of the process
4	Predictable	The process which established in Level 3 it's operating based on determined limitation.
5	Optimized	The process which is predictable on level 5 improved to meet business purpose today which is relevant and directed.

3. Results And Discussion

After doing analysis of questioner result, so it is achieved the result of values on every activity in domains *Align, Plan and Organise* (APO) and *Monitor, Evaluate and Assess* (MEA) then put into the auditor framework. Further action which is taken is finding the value average on each process to determine how the condition of existing process.

$$\text{Maturity Index} = \frac{\text{Sum of Right Answer}}{\text{Sum of Control Questions}} \quad (1)$$

Here is the recapitulation result of the process value on domain A.P.O and Monitor, Evaluate and Assess (MEA)

Table 2. Recapitulation of Calculation Result of Maturity Level IT STMIK Pelita Nusantara Medan Domain Align, Plan and Organize (APO)

Domain	Process	Result
APO 01	Managed the IT Management	1,81
APO 02	Managed Strategy	1,89
APO 03	Managed Enterprise Architectur	1,98
APO 04	Managed Innovation	1,43
APO 05	Managed Portfolio	1,84
APO 06	Managed Budget and Costs	1,89
APO 07	Managed Human Resources	1,85
APO 08	Managed Relationships	1,85
APO 09	Managed Service Agreements	1,83
APO 11	Managed Quality	1,87
APO 12	Managed Risk	1,8
APO 13	Managed Security	1,95

Table 3. Recapitulation of Calculation Result of Maturity Level IT STMIK Pelita Nusantara Medan Domain M E A

Domain	Process	Result
MEA 1	Performance and Conformance	1,91
MEA 2	System of Internal Control	1,78

Domain	Process	Result
MEA 3	Evaluate and Assess Compliance with External Requirements	1,46

From Table 3 can be created its representation in a radar graphic, as shown in Figure 2.

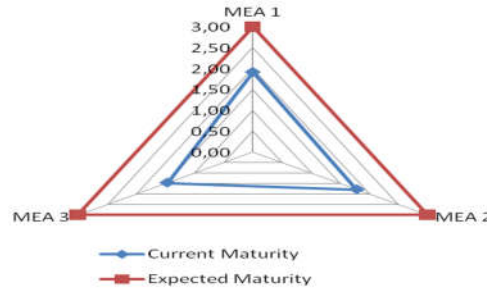


Figure 2. Graphic of *Current maturity* level vs *Expected maturity* level on domain *Monitor, Evaluate and Assess* (MEA)

Table 4. Result of Research Implication

Domain	Process	Current Maturity	Expected Maturity	Gap	Status	Repairing
APO 1	Manage the IT Management	1,814	3	1,186	Superpriority	Being repaired
APO 2	Manage Strategy	1,886	3	1,114	Superpriority	Being repaired
APO 3	Manage Enterprise Architecture	1,985	3	1,015	Superpriority	Being repaired
APO 4	Manage Innovation	1,433	3	1,567	Superpriority	Being repaired
APO 5	Manage Portfolio	1,838	3	1,163	Superpriority	Being repaired
APO 6	Manage Budget and Costs	1,888	3	1,112	Superpriority	Being repaired
APO 7	Manage Human Resources	1,846	3	1,154	Superpriority	Being repaired
APO 8	Manage Relationships	1,85	3	1,15	Superpriority	Being repaired
APO 9	Manage Service Agreements	1,833	3	1,167	Superpriority	Being repaired
APO 11	Manage Quality	1,869	3	1,131	Superpriority	Being repaired
APO 12	Manage Risk	1,8	3	1,2	Superpriority	Being repaired
APO 13	Manage Security	1,95	3	1,05	Superpriority	Being repaired
MEA 1	Performance and Conformance	1,907	3	1,093	Superpriority	Being repaired
MEA 2	System of Internal Control	1,78	3	1,22	Superpriority	Being repaired
MEA 3	External Requirements	1,46	3	1,54	Superpriority	Being repaired

Explanation of Table 5 and Figure 4: that the best architectural model of the 5 models used is 8-5-1 which produces 75% accuracy and MSE 0.0445464533.

Table 5. GAP between Current Maturity and Expected Maturity on Application of Information System Stmik Pelita Nusantara with domain APO and MEA

Domain	Process	Current Maturity	Expected Maturity	Gap
APO 1	Manage the IT Management	1,814	3	1,186
APO 2	Manage Strategy	1,886	3	1,114
APO 3	Manage Enterprise Architecture	1,985	3	1,015
APO 4	Manage Innovation	1,433	3	1,567
APO 5	Manage Portfolio	1,838	3	1,163
APO 6	Manage Budget and Costs	1,888	3	1,112
APO 7	Manage Human Resources	1,846	3	1,154
APO 8	Manage Relationships	1,85	3	1,15
APO 9	Manage Service Agreements	1,833	3	1,167
APO 11	Manage Quality	1,869	3	1,131
APO 12	Manage Risk	1,8	3	1,2
APO 13	Manage Security	1,95	3	1,05

Domain	Process	Current Maturity	Expected Maturity	Gap
MEA 1	Performance and Conformance	1,907	3	1,093
MEA 2	The System of Internal Control	1,78	3	1,22
MEA 3	Evaluate and Assess Compliance with External Requirements	1,46	3	1,54

From table 5 domain maturity level can be created its representation in a radar graphic, as shown in Figure 3.

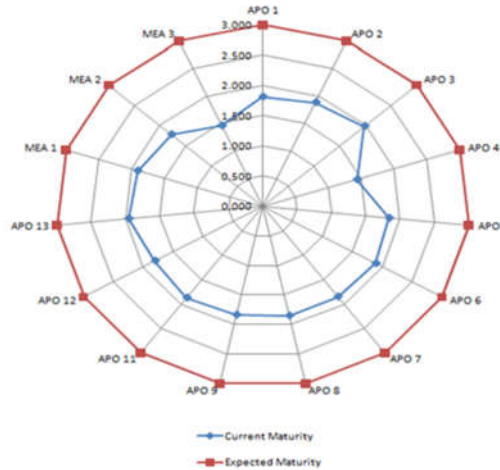


Figure 3. Graphic resume Current maturity level vs Expected maturity level on domain MEA dan APO

Table 6. Resume Current Maturity and Expected Maturity on Implementation of Information System STMIK Pelita Nusantara Medan Domain APO Dan MEA

Maturity Level	Domain		
	APO	MEA	APO, MEA
Expected	3	3	3
Average	1.83	1.75	1.80
Minimum	1.43	1.46	1.50
Maximum	1.96	1.90	1.95

From Table 6 maturity level domain can be created its representation in a radar graphic, as shown in Figure 4:

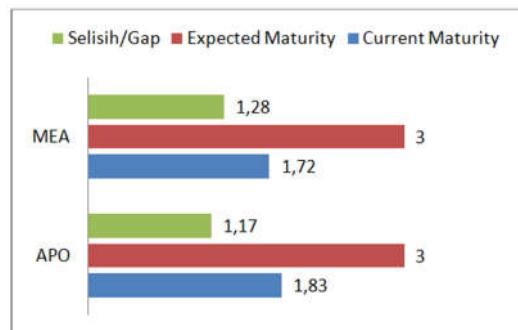


Figure 4. Graphic Resume Current maturity level vs Expected maturity level on domain MEA dan APO

From the audit result which has been conducted, the measurement of capability level process within area APO and MEA STMIK Pelita Nusantara, capability level result is 1.83 on domain APO, 1.75 on

domain MEA, the average level is 1.80, it means that MEA and APO is in the stage towards capability level 2 and still achieve 0,20 above level 1. Rounding up is selected in accordance with the concept of determining the specific process capability level. Therefore to APO and MEA capability level has already been considered as level 2, so that the target of capability level which is desired is level 3

4. Conclusion

The conclusions that can be drawn from this research are:

- a. Based on the measurement result of IT maturity level at STMIK Medan Pelita Nusantara by using COBIT 5 framework, it obtained maturity level remains below a predetermined standard that is still at the level of less than 3. It means that the maturity of IT governance at STMIK Medan Pelita Nusantara still much need of repair.
- b. From the evaluation capability MEA level on the domain area and APO, STMIK Pelita Nusantara is at level 1 (performed) of the whole process APO and domain Monitor, Evaluate and Assess (MEA).
- c. From audit result which has been conducted, the measurement of process capability level in area APO and MEA at Medan Pelita Nusantara, it achieved the result of capability level 1, the average level of 1.80, it means that APO11 is going to reach capability level 2 and it still reaches 0, 80 above level 1. Rounding up is selected in accordance with the concept of determining the specific process capability level. Thus for APO and MEA capability level is still considered to be one, so that the desired capability level target is a destination target level that is level 3.
- d. Based on gap analysis result which has been gained, the gap is gained on the level above 1, this case means that there are many things which must be repaired by STMIK Pelita Nusantara and it must take repaired actions as soon as possible.
- e. Pelita Nusantara Medan, therefore the established process is level 3 for each process of MEA and APO.
- f. To reduce gap between capability level nowadays and the capability level which must be gained.

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