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Measuring the capability level of IT governance: a research study of COBIT 5 at Universitas Negeri Gorontalo

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Abstract. Nowadays, Information Technology Governance (ITG) has been massively performed in various organizations. ITG itself reflects the existence of management and utilization of the IT activities to the achievement of the goals of the organization. Nevertheless, the evaluation of ITG at the Universitas Negeri Gorontalo (UNG) has still not been carried out systematically. To resolve the issue of evaluation efforts required to use the COBIT 5. The purpose of this research is to find out IT governance at UNG and to measure the extent of the capability of ITG at UNG. The approach of this research is descriptive by using quantitative and qualitative data. The results of this study indicate that the level of IT management capabilities at UNG is level 3 (Established Process), which means that the IT management process has been carried out following a defined standard process and enabling the achievement of process results. Based on the results obtained, recommended corrective steps can be taken by the organization management so that the level of capability of the DSS and MEA processes can be increased so that IT utilization in UNG becomes more optimal to avoid the risk of failure from IT implementation.

1. Introduction

Currently, Universitas Negeri Gorontalo (UNG) has been using various IT applications in the implementation of activities to achieve its vision and mission as an organization. Several IT applications (information system) used in UNG are SIAT, SITU, SIRBA, etc [1]. Nevertheless, to ensure the synchronization between IT strategy and organization strategy, it is known that IT governance, as stipulated by the current regulation, is yet to be applied as stipulated in government regulation. For instance, implementation of IT operations at UNG is yet to have an SOP in its development, maintenance, and impact. This has made it difficult to measure service performance as an implication of the IT application. In addition, implementation of IT needs large investment and therefore, needs an appropriate IT governance (ITG) mechanism for its utilization to support the attainment of the organizational strategic plan, to achieve the vision, mission, and objectives of the organization [2-5].

Measuring capability level of ITG is intended to provide information related to the capability of the IT process as well as target to carry out improvement based on the needs of the organization. Assessment or measurement of processes is stated in the level of capability to increase rigor and reliability in conducting review toward the IT processes. Performance of processes related to the management can be measured. Thus, it can be known whether those processes are within the correct path to achieve objectives. To find out the extent of IT processes management and to increase the quality of information system implementation at UNG, it is considered as important to carry out a study to measure the IT governance capability level at UNG. In this study, the capability level of IT is carried out by using the COBIT 5 (Control Objectives for Information and Related Technology) framework [6] and is focused on the domain of DSS (Deliver, Service, and Support) namely: the processes of



DSS01, DSS02, and DSS03 and MEA (Monitor, Evaluate, and Assess) domain, that is on the processes of MEA01, MEA02, and MEA03.

2. Literature review

2.1. IT governance

IT Governance is the organizational capacity exercised by the board, executive management and IT management to control the formulation and implementation of IT strategy and in this way ensure the fusion of business and IT [2]. Meanwhile, according to [6], IT governance is specifying the decision rights and accountability framework to encourage desirable behavior in the use of IT.

The importance of IT governance [6] is:

- IT governance can increase the effectiveness of management activities in various areas.
- Focusing IT on supporting organization strategy.
- Proper IT governance can become accountable in each produced decision in all aspects related to IT activities.
- IT can encourage the emergence of new business opportunities for the organization.
- Effective IT governance can create a mechanism to find out the value of IT.
- IT governance can create a clear and transparent decision-making process related to IT.

2.2. COBIT 5 and capability dimension

COBIT 5 is the newest generation, which combines ISACA related to IT governance and management. COBIT 5 is a general and applicable protocol for all types of the organization regardless of its size. The framework of COBIT 5 has five principles [7] as follow:

- Meeting stakeholder needs
- Covering the enterprise end-to-end
- Applying a single integrated framework
- Enabling a holistic approach
- Separating governance from management

Capability model within COBIT 5 is based on ISO/IEC 15504, the standard on Software Engineering and Process Assessment Model. The capability level itself is a model that describes how a core process in an organization is implemented. In addition, it also provides measurement on the performance of processes within the governance or management area. Within COBIT 5, there are six levels of capability [7] as listed below:

1. Level 0 (Incomplete Process). This process is not implemented or fail to achieve the process objectives.
2. Level 1 (Performed Process). The process is implemented and achieves the process objectives.
3. Level 2 (Managed Process). The currently implemented process managed, monitored, and adjusted. The appropriate products are maintained and controlled.
4. Level 3 (Established Process). The previously managed process is now implemented using the process that is able to achieve its objectives.
5. Level 4 (Predictable Process). The currently implemented and established process is now operable in defining the limit to achieve the process result.
6. Level 5 (Optimizing Process). The process predicted and described before is continuously improved to fulfill the currently relevant business objectives.

2.3. Deliver, Service, and Support (DSS)

DSS domain is one of the domains in COBIT 5 that includes management of IT enterprise. DSS domain focuses on data delivery, service, and support provided for effective and efficient information system [7]. Processes within DSS domain itself consist of six processes namely: DSS01 (Manage Operation), DSS02 (Manage Service Request and Incidents), DSS03 (Manage Problem), DSS04 (Manage Continuity), DSS05 (Manage Security Services), and DSS06 (Manage Business Process

Control). In this study, three domain processes are selected as its focus namely: DSS01, DSS02, and DSS03.

2.4. Monitor, Evaluate, and Assess (MEA)

MEA domain focuses on monitoring the IT governance process, planning and implementation of IT. This domain refers to performance management, internal monitoring and controlling, of **g** **o** **d** **i** **e** **n** **c** **e** **n** **c** **e** **s** toward governance and regulation [7]. MEA domain consists of three processes namely: MEA01 (Monitor, Evaluate and Assess Performance and Conformance), MEA02 (Monitor, Evaluate and Assess the System of Internal Control), and MEA03 (Monitor, Evaluate and Assess Compliance with External Requirements).

3. Research Method

This study uses the descriptive quantitative-qualitative method [8]. This study is carried out through stages as shown in Figure 1. The respondents in this study are the personnel who meet the RACI criteria [9]. RACI stands for responsible, accountable, consult, and inform. The total number of respondents in this study is 57 people.

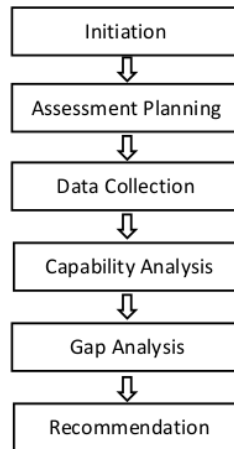


Figure 1. Research Stage Scheme

4. Findings and discussion

4.1. Capability Level Analysis

Capability level analysis is used to measure the capability level of the process in DSS and MEA domains at UNG based on the data obtained from the respondents. In the measurement of the capability level of IT governance in UNG, the questionnaire was used as the data collection method with the index value for each measured criteria. The measurement to determine the index of each process domain governed is presented in table 1.

Table 1. Capability level of DSS and MEA domains

DSS	Index	MEA	Index
DSS01	3.53	MEA01	3.35
DSS02	3.19	MEA02	3.37
DSS03	3.39	MEA03	3.37
Total	10.4	Total	10.9
Index average	3.47	Index average	3.63

Based on the data recapitulation in Table 1, the capability level in DSS domain is concluded as follow:

1. Capability level value in DSS01 process is in level 4 with the maturity value of 3.53.
2. Capability level value in DSS02 process is in level 1 with the maturity value of 3.19.
3. Current Capability level value in DSS03 process is within level 3 with the maturity index of 3.39.

Meanwhile, the capability level for MEA domain is concluded as follow:

1. Current capability level value in MEA01 process, the current maturity level is in level three which repeated but intuitively with the maturity index of 3.35.
2. In an internal control system (MEA02) the current maturity level is in level 3 but repeated intuitively with the maturity index of 3.37.
3. The current maturity level for compliance with the external requirement (MEA03) tends to points out to level 3 with intuitive reptition and the maturity index of 3.37.

4.2. Gap Analysis

Current Capability is an average value of as is maturity level whereas expected capability is an average value from the expected maturity (to be). The gap analysis in DSS and MEA domains are presented in table 2.

Table 2. Gap analysis in DSS and MEA domains

Domain	Process	Current Capability	Expected Level	Gap
DSS01	Manage operation	3,53	5	1,47
DSS02	Manage service, request, and incidents	3,19	4	0,81
DSS03	Manage problem	3,39	4	0,61
MEA01	Performance and conformance	3.35	4	0.65
MEA02	System of internal control	3.37	4	0.63
MEA03	Compliance with external requirements	3.37	4	0.63

From Table 2 it is evident that current capability level for each process in DSS and MEA domains overall is within level 3 (repeatable). This can be said that the IT governance in UNG has been carried out but yet optimized. IT governance has a repetitive pattern in the management of activities related to IT governance. However, the existence has not been properly and formally defined, thus inconsistency often happens.

Based on the measurement of maturity level, it is obtained that the gap lies within the IT application maturity, which has been implemented. The largest gap lies in the process of Manage Operation in DSS domain, whereas, the smallest gap lays in Manage Problem in DSS domain. This large gap in the process of Manage Operation shows that IT applications implemented in UNG are not flexible to the demand for changes and dynamics that happens in the institution. In addition, the lack of IT operator capability in managing the problems influences the lack of IT operators' capability in identifying and anticipating changes that might happen. Representation of maturity level mapping in DSS domain (figure 2a) and MEA (figure 2b) is shown in figure 2.

Above all, the measurement on the maturity level of information system in this study shows that the maturity level of IT in UNG on the processes within DSS and MEA are far below the expected level, the 5.0 or the 4.0.

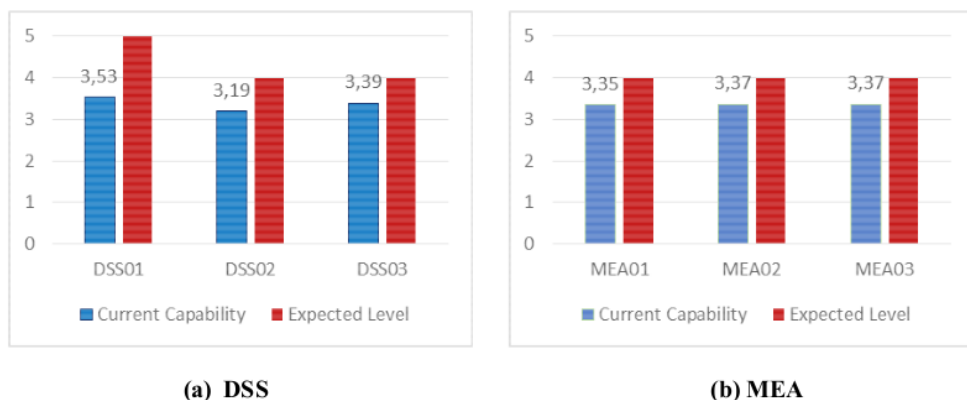


Figure 2. Representation diagram of capability level mapping

5. Conclusion

This study on the measurement of capability level in current IT Governance (as is) is within the Established Process and is far below the expected maturity level (to be). The gap lays on the ability of the operators in managing the operation and managing the problems. Therefore, personnel and users' knowledge and skill in IT application need to be improved through routinely scheduled training. In addition, the UNG management commitment toward utilization of IT needs to be improved to pay more attention to the utilization of IT in this institution.

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