Assessment of ripeness analysis of information technology supervision on DS and ME domains using COBIT 4.1 in the information engineering department of Musamus Merauke

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Abstract. Information technology plays an essential role in the business world because it may affect the operations of the organization within the organization that also uses information technology to provide information. One of the departments that use information technology is the Information Engineering Department of Musamus Merauke University, which is used to provide information related to the Department of Information Engineering. But in the use of information technology is still flawed. Therefore, it is necessary to have a standard in information technology management to measure overall standards and governance in information technology management, ie using COBIT. Based on this study, we will design an information technology management model for the Department of Information Engineering. Control objectives for information and related technologies (COBIT) are four (4) primary domains, including domains, planning, and organization (PO), acquisition and implementation (AI), transmission and support (DS) and tracking. And evaluating (ME) in research. This will use two domains, namely the delivery domain and support (DS) and monitoring and evaluation (ME) by adjusting the problems and requirements of the information engineering department in the arrangement. Information technology support for information technology service processes and support for monitoring and evaluation of information technology, the results showed that the level of maturity of information technology supervision in the information engineering department is at level 2. Therefore, information technology in the engineering department Information must be updated to the expected level.

1. Introduction
Ministry of Communications and Information of the Republic of Indonesia issued regulations No. 4 of the year 2016 regarding the information security management system (ISMS) for all government agencies. One of the public institutions that have to comply with ISO 27001: 2003 in improving information security systems, namely public universities because Information and Communication Technology (ICT) has become a part of public services at public universities. The government has prepared tools for implementing information security management by measuring the level of errors in order to improve service quality [1].

The information security management system (ISMS) has been well implemented in providing solutions for service use because the scope of standards is not too wide in terms of fulfilling all data management needs. Therefore, there are still problems. To find that [2].

Information Engineering Department is an agency that uses information systems as a tool to support information. The information system is intended to provide information about activities that usually occur in the Information Department so that students can search for information through
information systems found in the Department of Information Engineering. But there are obstacles in the information system that have not yet received actual data due to data There are not many updates, so many students use information systems to receive information [3].

In order to improve the management of information technology in the Department of Information, it is necessary to have a model that refers to the standard of practice in order to be consistent with the strategy and objectives of the agency in order to resolve problems that occur frequently. One form that is often used in agencies or companies in the control objectives for information technology and related (COBIT), which is a form of appropriate and comprehensive regulatory standards under the scope of planning, implementation, and governance. Supervise all information technology processes [4].

COBIT has 4 main domains: planning and organization domain (PO), acquisition and execution (AI), shipping and support (DS) and auditing and evaluation (ME). PO domain involves strategy, strategy and Pay attention to how to use information technology to provide the best support in order to achieve business objectives. AI domains relate to the use and strategy of using information technology in the process. The DS business domain associated with the submitted information technology and support services using the ME domain associated with the regulation of all controls on the use of information technology [5].

Modeling the COBIT framework for information technology management in the information engineering department using DS and ME domains to solve problems and fulfill the needs of the delivery and support of information technology services, including controlling all controls in providing support In order to be able to solve problems and meet the needs of document analysis results. Information Technology Master Plan [6].

The results from the application of information technology will be improved if using the information technology management model by measuring performance and success according to the objectives of the agency and the model can also refer to the suitability of information technology management in the management standard. General information technology around the world.

2. Methods
The research methodology is one of the processes of finding problems through studying and analyzing the factors used in conducting research. Must follow the rules set so that research can be used in science [7].

The research will be conducted by using a questionnaire to collect data from the respondents and design and develop causal relationships, as in the methods that researchers use as examples to enable researchers to obtain the information necessary to support research conducted [8].

2.1. Data collection
Collecting literature studies that support research that will be conducted on the maturity level analysis with COBIT frameworks in DS and ME domains so that they can measure achievement and readiness in the assessment index to help organizations know safety management. Of services

2.2. Interview
Interview with the head of the department, the secretary of the department and the lab leader to receive information about information technology used in the information engineering department.

2.3. Data analysis
After receiving the information collected during the interview and from the subsequent data collection, the data will be analyzed according to the level of security of information technology services in the information engineering department.

2.4. Concepts / Processes
The concept of research is to obtain information about information technology in the Department of Information in sampling. There are three objects that become research populations among others. Head of Department Secretary of the Department of Laboratory Head can be viewed in the table. from now on:
This research study uses tools in the form of questionnaires. The query statement was developed based on the number of statements in each maturity level in the delivery and support domain (DS) and the domain of verification and evaluation (ME). The total number in the DS domain is the 291 statement. The list and the total number of statements in the ME domain is the 196 statement. Therefore, the total number in the questionnaire is equal to 487. The number of orders in the domain can be seen in Table 2 and Table 3 below:

Table 1. Respondents

| No | Respondents            | Total |
|----|------------------------|-------|
| 1  | Head of Department     | 1     |
| 2  | Secretaries            | 1     |
| 3  | lab heads              | 1     |
|    | Total                  | 3     |

Table 2. Number of messages in Domain Delivery and Support (DS)

| Domain                                      | Level Maturity | Total Statement |
|---------------------------------------------|----------------|-----------------|
| DS1 – Define and manage service levels      | 2 3 4 5 6 7 8 | 18              |
| DS2 – Manage third party services           | 1 4 4 5 5 7 8 | 23              |
| DS3 – Manage performance and capacity       | 2 3 4 6 6 6 7 | 27              |
| DS4 – Ensure continuous service             | 2 2 2 6 7 5 6 | 24              |
| DS5 – Ensure system security                | 1 4 3 5 5 7 8 | 23              |
| DS6 – Identify and allocate cost            | 2 2 3 4 3 3 4 | 17              |
| DS7 – Educate and train users               | 2 3 3 4 5 6 7 | 23              |
| DS8 – Manages service desk and incidents    | 2 2 2 3 7 4 5 | 20              |
| DS9 – Manage the configuration              | 2 3 4 6 6 7 8 | 28              |
| DS10 – Manage problems                      | 1 7 4 6 7 4 5 | 29              |
| DS11 – Manage data                         | 1 3 3 4 4 4 5 | 19              |
| DS12 – Manage the physical environment      | 2 3 3 4 4 4 5 | 20              |
| DS13 – Manage operations                    | 2 3 3 4 4 4 5 | 20              |
| Total                                      | 22 42 40 59 67 61 291 |

Table 3. Number of messages in Domain Monitoring and Evaluate (ME)

| Domain                                      | Level Maturity | Total Statement |
|---------------------------------------------|----------------|-----------------|
| ME1 – Monitor and evaluate information technology | 4 8 7 6 6 6 5 | 37              |
| ME2 – Monitor and evaluate internal control  | 4 8 8 6 7 6 5 | 39              |
| ME3 – Monitor and evaluate ensure regulatory compliance | 4 7 7 5 6 5 37 |
| ME4 – Monitor and evaluate provide information technology Governance | 2 8 8 7 6 5 | 26              |
| Total                                      | 14 31 30 27 25 22 149 |

This study uses a quantitative and descriptive analysis model. Descriptive analysis is used to find that information technology supervision in the current information department and problem solving methods can improve information technology governance operations in the information engineering department [9].
Quantitative analysis model Use Microsoft Excel spreadsheet to process all the answers and explain the problem determination of the maturity level of information technology governance conducted in the information engineering department. The data obtained from the respondents are processed using the average calculation so that the average level of maturity and radar charts from the results of the radar chat can see the level of maturity of the institution at a high or low level and level. Maturity The information engineering department is still at a very low level, which is at level 2, so it does not match the expected maturity level [10].

3. Results and discussion
The COBIT maturity level questionnaire distributed to respondents is used to calculate the maturity level of information technology supervision in the information engineering department. This questionnaire uses the maturity criteria set in the COBIT 4.1 framework for DS domains and the scale ME used in this query. Use the Guttman scale. In the query, there are two answer options, Y (yes) and T (no). Calculate the answer Y (yes) will be converted to the value 1 and the answer T (no) is converted to 0. The software used to calculate the maturity level is Microsoft Excel. After all the results of the query are included in the eye. Then the maturity level of each process in the delivery domain name support (13 procedures) and monitoring and evaluation (process 4) In the questionnaire distributed to respondents for each was calculated. The results of the maturity level of each process from 3 (three) respondents. Then, find the mean and average results will be the value of the maturity level of each process of information technology. The result of summarizing the maturity level for DS domain and ME with a predefined process. Table 4 and Table 5.

| Table 4. Recapitulation of Maturity Levels in Domain Delivery and Support (DS) |
|---|
| Domain | Proses | Current Maturity | Expected Maturity | Maturity Level |
| DS1 – Define and manage service levels | 1,655 | 3 | 2 |
| DS2 – Manage third party services | 2,053 | 3 | 2 |
| DS3 – Manage performance and capacity | 2,207 | 3 | 2 |
| DS4 – Ensure continuous service | 2,158 | 3 | 2 |
| DS5 – Ensure system security | 2,026 | 3 | 2 |
| DS6 – Identify and allocate cost | 1,636 | 3 | 2 |
| DS7 – Educate and train users | 1,688 | 3 | 2 |
| DS8 – Manages service desk and incidents | 2,685 | 3 | 2 |
| DS9 – Manage the configuration | 1,556 | 3 | 2 |
| DS10 – Manage problems | 2,076 | 3 | 2 |
| DS11 – Manage data | 1,688 | 3 | 2 |
| DS12 – Manage the physical environment | 1,688 | 3 | 2 |
| DS13 – Manage operations | 1,688 | 3 | 2 |

| Table 5. Recapitulation of Maturity Levels Domain Monitoring and Evaluate (ME) |
|---|
| Domain | Proses | Current Maturity | Expected Maturity | Maturity Level |
| ME1 - Monitor and evaluate information technology | 1,725 | 3 | 2 |
| ME2 - Monitor and evaluate internal control | 1,735 | 3 | 2 |
| ME3 - Monitor and evaluate ensure regulatory compliance | 1,688 | 3 | 2 |
| ME4 - Monitor and evaluate provide information technology Governance | 1,881 | 3 | 2 |

The maturity level referred to in this study is level 3 (three). As a result of the calculations performed, it can be accepted that the maturity level of information technology available in the Department of Information Engineering for DS Domain is at an average level. 2 and ME Domain at level 2 means that current information technology supervision The information engineering department must be developed again because the level of maturity is still lower than level 3.
Assessment of the maturity level of each information technology process in the domain DS and ME means the COBIT maturity model model 4.1, along with the evaluation index criteria, can be viewed in the following table 6:

**Table 6.** Criteria for the index for COBIT. Maturity level version 4.1.

| Criteria                          | Maturity Level          |
|----------------------------------|-------------------------|
| 0 - 0.55                         | Non-Existent            |
| 0.51 - 1.50                      | Initial/Ad Hoc          |
| 1.51 - 2.50                      | Repeatable But Invinitve|
| 2.51 - 3.50                      | Defined Process         |
| 3.51 - 4.50                      | Managed and Measurable  |
| 4.51 - 5.00                      | Optimized               |

Based on the research conducted in the DS domain, there are 13 processes that show the mean level 2 (two), referring to the desired maturity level, which is at level 3 (3). Then, information technology in the information engineering department is still low. Over the level Expected maturity can be seen at

**Figure 1.** Current maturity level with expected maturity level in Domain Delivery and Support (DS)

**Figure 2.** Current maturity level with expected maturity level in Domain Monitoring and Evaluate (ME)
the highest level of value in the DS. Manage service areas and events that occur while the smallest level of DS1 is to define and manage service levels. At this level, it is known that service management is not periodic according to the rules specified.

The results of the research are conducted in the ME domain. There are 4 processes that show the mean at level 2 (two), referring to the desired maturity level which is at level 3 (three). Then, information technology in the information engineering department is still below the level. Defined The expected value can be seen at the highest level in ME 4, providing information technology supervision while ME's smallest level is ME3 ensuring that it meets the external needs. At this level, it is well known that external needs meetings do not have an exact schedule.

4. Conclusion

Based on research conducted in the Information Engineering Department with the COBIT 4.1 Framework on Domain DS, which has 13 processes and ME Domain, which has 4 processes in research. The level of information technology integrity can be seen in the Domain DS at Level 2, where the process can be Developed At this level, it is known to manage services that are not periodic, as defined by the rules, while the Domain ME is at level 2, which is known that meeting the external needs is not an exact time limit.

The improvement of information technology supervision in the Department of Information for DS and ME is to increase the level of maturity in the level 3 according to the mission, vision, goals and direction of the development of the information engineering department with standards and documents and communications. Trained

In creating the right suggestions, it requires deep understanding and knowledge. The questionnaire does not provide 100% of the information technology supervision in the organization because everyone can understand the statement about the questionnaire. In making recommendations, there must be good coordination to ensure that the short, medium and long term goals are truly

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