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Application of the COBIT 5 Framework in the Information Technology Governance Audit at Public Regional Hospital S.K. Lerik

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Abstract

Information technology (IT) management in hospitals is very important. Most hospitals in Indonesia still experience difficulties in managing information technology (IT) effectively. This was also experienced by Public Regional Hospital S.K. Lerik, this is caused by a lack of understanding of good information technology governance, as well as a lack of human resources trained in the field of information technology. Human resources in the field of information technology, including experts, technicians and information technology managers, are an important component in information technology operations. The COBIT 5 framework was chosen because it is able to provide a structured approach to managing information technology strategy, risk and performance that supports organizational goals. This research aims to analyze the application of the COBIT 5 framework to information technology (IT) governance at Public Regional Hospital S.K. Lerik. The method used, namely COBIT 5, is focused on the EDM04 (Ensure Resource Optimization) and APO01 (Manage the IT Management Framework) subdomains. The results of this study are increased operational efficiency of information technology, more effective investment management, and better quality of health services at Public Regional Hospital S.K. Lerik.

Keywords: *COBIT 5, Domain (EDM04 and APO01), Information Technology Governance, Increasing IT Efficiency, Public Regional Hospital S.K. Lerik, Process Capability Model.*

1. Introduction

Information technology (IT) plays an important role in supporting health services, one of which is through the implementation of the Hospital Management Information System (SIMRS). The implementation of SIMRS is required by the Regulation of the Minister of Health of the Republic of Indonesia in 2013 and aims to improve the efficiency and quality of hospital services [1]. However, a survey shows that around 60% of hospitals in Indonesia still face challenges in IT management due to limited human resources and a lack of understanding of good IT governance. RSUD S.K. Lerik as a class C hospital owned by the Kupang City Government also faces similar obstacles, especially in terms of system maintenance, data integration, and information security. To answer this challenge, an evaluation of IT governance with a structured approach is needed. COBIT 5 is a framework that can be used to assess and improve IT governance comprehensively [3]. This study aims to evaluate IT governance at RSUD S.K. Lerik with a focus on the EDM04 (Ensure Resource Optimization) and APO01 (Manage the IT Management Framework) domains to support improving the quality of health services through optimization of IT management.

2. Literature Review

2.1. Governance

Governance as a company's internal control system has the main objective of managing significant risks in order to meet its business objectives [4].

2.2. Information technology governance

Information technology governance ensures that information technology processes or activities are carried out systematically, in a controlled and efficient manner, thereby creating efficiency, reducing operational costs and increasing competitiveness.

2.3. COBIT 5

(Control Objectives for Information and Related Technology) COBIT 5.0 is a business framework for the governance and management of enterprise IT. This evolutionary version incorporates the latest thinking in enterprise governance and management techniques, and provides globally accepted principles, practices, analytical tools and models to help enhance the trust and value of information systems. COBIT 5 builds on and extends COBIT 4.1 by integrating other major frameworks, standards and resources, including ISACA Val-IT and Information Technology Risk, Technology Infrastructure Library (ITIL) and related standards from the International Organization for Standardization (ISO) [3].

2.4. COBIT Principles

COBIT 5 (Control Objectivies Information and Related Technology) generally has 5 basic principles [5], namely:

1. Meeting stakeholder needs
   This principle emphasizes that all IT decisions must be based on the values and needs of stakeholders. COBIT 5 introduces the "Goals Cascade" mechanism that helps link strategic business objectives with IT objectives. Through this, organizations can determine IT priorities based on value to stakeholders, ensuring that all processes, resources, and risks are managed to provide maximum benefits. Goals Cascade helps break down business objectives into more specific IT objectives, so that each IT activity has a direct contribution to achieving the organization's strategic goals.
2. Covering the enterprise end-to-end
   COBIT 5 is designed to integrate all organizational processes involving IT, not just the IT department. This principle ensures that every part of the company, including business processes and resources, is integrated into IT governance. That way, IT is not seen as a separate function but as a key component that supports the entire business operation. COBIT 5 helps overcome silos, so that IT governance and risk management can be applied across the organization to improve efficiency and strategic alignment.
3. Applying a single integrated framework
   COBIT 5 integrates several governance and management standards, such as ITIL, ISO 27001, and PMBOK, into a single integrated framework. This makes it easier for organizations to implement internationally recognized best practices without having to use different frameworks separately. With this integrated approach, organizations can follow uniform guidelines for managing information technology, reducing complexity, and reducing redundancy in processes. The application of this integrated framework facilitates consistency and compatibility across processes and facilitates compliance with regulatory standards and required controls.
4. Enabling a holistic approach
   COBIT 5 uses seven "enablers" as key components that work holistically to achieve organizational goals. These seven enablers include: processes, information, policies, culture, organizational structure, infrastructure, and human resources. Each enabler plays a critical role in aligning IT processes with business needs. This holistic approach ensures that all aspects, from policies to HR skills, collectively support the goals of effective IT governance. These enablers are interrelated, and improvements in one enabler will impact the quality of other enablers in supporting the overall governance system.
5. Separating governance from management
   This principle emphasizes the separation of governance and management functions to achieve clear accountability. In COBIT 5, governance focuses on policy-making, monitoring, and evaluating IT performance against organizational goals, while management is more concerned with the day-to-day operations and execution of meeting those goals. With this separation, the responsibility for setting the strategic direction and goals of the organization (governance) is separate from the responsibility for implementing and managing day-to-day operations (management). This helps ensure tight oversight, control, and transparent reporting between parts of the organization.

Fig. 1: COBIT 5 Principles [3]

2.5. COBIT Domains

The COBIT 5 work domain focuses on two main areas, namely the governance area and the second area on management or business. In the governance area, there is only one domain, namely EDM, while in the management area there are four domains, namely APO, DSS, BAI and MEA. In addition, in each domain there are subdomains, for the governance area there are 5 subdomains while management has 37 subdomains [3]

2.6. Process Assessment Model

The Process Capability Model itself is defined by ISACA as a Process Assessment Standard based on ISO/IEC 15504 Software Engineering which is recognized [3]. This model provides a method for measuring the performance of IT governance processes or management processes and identifying process improvements. Process capability is a characterization of the ability of a process to meet

current or projected business objectives. PAM COBIT 5 classifies the processes resulting from the process attribute assessment into six levels of process capability as follows:

1. Level 0 Incomplete process. The process is not implemented or fails to achieve its process objectives.
2. Level 1 Process performed. The implemented process achieves its process objectives. The process is managed.
3. Level 2 The process is now implemented in a managed manner, and its work products are appropriately defined, controlled, and maintained.
4. Level 3 Established process. The process is now implemented using an established process that is capable of achieving its process outcomes.
5. Level 4 Predictable process. The process now operates within the defined boundaries to achieve its process outcomes.
6. Level 5 Optimizing the process. Processes are continuously improved to meet current and relevant needs.

2.7. Index Creation Scale

Before determining the maturity level of each EDM04 and APO01 subdomain, the maturity index of each EDM04 and APO01 subdomain process must first be determined. The maturity index is obtained from the calculation of the questionnaire answers and is not always in the form of an integer, therefore to facilitate the calculation process and determination of the maturity level, the index rounding scale is as in table 1 below:

Table 1: Maturity level

Index Creation Scale	*Maturity level*
5,51 – 5	5
3,51 – 4,5	4
2,51 – 3,5	3
1,51 – 2,5	2
0,51 – 1,5	1
0 – 0,5	0

3. Methodology v

3.1 Method of collecting data

Primary data were obtained through interviews, questionnaires, and direct observation. Meanwhile, secondary data were collected through literature studies including books, scientific journals, e-books, and other sources relevant to this study, as well as SIMRS (Hospital Management Information System) work program documents at RSUD S.K. Lerik, Kupang City. The research flow that will be implemented in measuring the performance of information technology human resources at RSUD S.K. Lerik, Kupang City is as shown in Fig 2

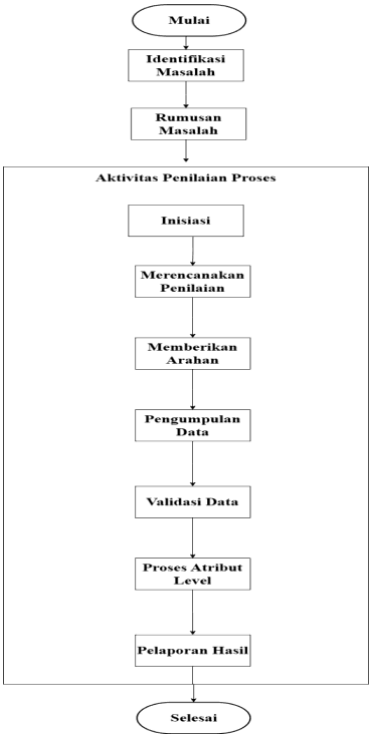

Fig. 2: Research Flowchart

The following is an explanation of the research flowchart:

1. Problem identification

This is the initial stage of data collection in this study conducted through interviews, observations, and distributing questionnaires using a Likert scale to respondents who are related and relevant to measuring the performance of information technology human resources at RSUD S.K. Lerik, Kupang City. This process aims to obtain accurate information to identify relevant Information Technology (IT) processes, especially those covering the EDM04 and APO01 subdomains.

2. Problem formulation
   In this process, the determination of problems obtained from direct observation results is carried out.
3. Initiation
   The first stage in the Assessment Process Activities is Initiation. At this stage, identification is carried out at RSUD S.K. Lerik which aims to understand the actual conditions and collect primary data such as an overview of the agency and so on. In addition to primary data, supporting data is also collected to assist in the process of determining the domain in COBIT 5 for evaluation. All data taken is data needed for the evaluation of information technology governance in this study.
4. Planning the assessment
   At this stage, the researcher carries out an assessment plan with the aim of obtaining evaluation results that are in accordance with the Capability Level
5. Briefing
   At this stage, the researcher provides an explanation of the evaluation research to respondents at S.K. Lerik Hospital so that they can understand the input, process and output in the agency and the process to be assessed, the documents needed, the schedule and results of the interview recapitulation that have been answered by the respondents up to the reporting stage or reporting and the results of the information technology governance evaluation.
6. Data collection
   At this stage, the researcher collects data from the findings at S.K. Lerik Hospital with the aim of obtaining evidence of the evaluation assessment on the process activists that have been carried out.
7. Data validation
   At this stage, the researcher carries out a data validation process that aims to find out the results of calculations from the questionnaire in order to obtain evaluation results and assessments of the Capability Level.
8. Process attribute level
   At this stage, the researcher carries out a process of assigning levels to the attributes in each indicator, which aims to show a Capability Level result from the calculation of the questionnaire at each previous stage and the gap analysis at the next stage.
9. Reporting the result
   At this last stage, the researcher reports the results of the evaluation which aims to provide recommendations to RSUD S.K. Lerik with COBIT 5. In the practice of information technology governance in COBIT 5, there are several provisions that must be met.

4. Results And Discussion

4.1 Questionnaire Research Results

The questionnaire was distributed to 1 person, namely the head of the planning, evaluation and reporting sub-section of S.K. Lerik Hospital, Kupang City.

4.2 Questionnaire Recapitulation

After the questionnaire is weighted, an index value will be obtained for each domain from each process. Furthermore, a recapitulation of all the data that has been obtained is carried out. From the results of the recapitulation, a gap can be identified between the maturity level in the current condition (existing) and the maturity level that is the target (expected). To calculate the gap value, the following formula is used:

$$GAP = X - Y \quad (1)$$

Description:
X = Expected maturity level (to be)
Y = Current maturity level (as is)

The recapitulation of overall data from the EDM04 subdomain questionnaire results is shown in Table 2.

Table 2: EDM04 Subdomain Questionnaire Recapitulation

Process	*As is*	*To be*	GAP
EDM04.01	3.8	5	1.2
EDM04.02	3.6	5	1.4
EDM04.03	3.4	5	1.6

Based on Table 2, a radar graph is obtained as shown in Fig 3.

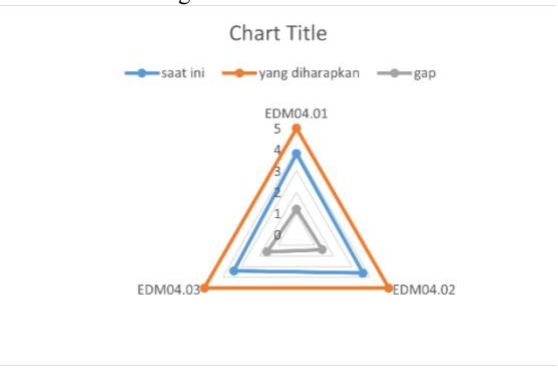

Fig. 3: EDM04 subdomain GAP analysis radar diagram

The recapitulation of overall data from the APO01 subdomain questionnaire results is shown in Table 3.

Table 3: EDM04 Subdomain Questionnaire Recapitulation

Process	*As is*	*To be*	GAP
APO01.01	3	5	3
APO01.02	3.4	5	1.6
APO01.03	4	5	1
APO01.04	3.8	5	1.2
APO01.05	3	5	2

Based on Table 3, a radar graph is obtained as shown in Fig 4.

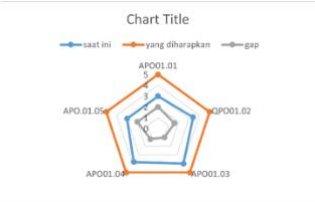

Fig. 1: Radar diagram of APO01 subdomain GAP analysis

Based on the questionnaire recapitulation table data, the following is a discussion of each domain process, namely:

4.2.1. EDM04 Subdomains

1. Subdomain EDM04.01
   In the EDM04.01 subdomain process, the current maturity index (as is) is 3.8 (predictable process) and the expected maturity index (to be) is 5 (optimizing the process) then the GAP value is obtained from the expected maturity index minus the current maturity index, then 5 - 3.8 = 1.2 is obtained, to achieve the expected maturity index of 5 (optimizing the process) there needs to be an increase in the evaluation and monitoring of human resources more systematically to ensure alignment with strategic objectives and provide periodic training programs to improve the competence of human resources in accordance with the latest technological developments.

2. Subdomain EDM04.02
   In the EDM04.02 subdomain process, the current maturity index (as is) is 3.6 (predictable process) and the expected maturity index (to be) is 5 (optimizing the process). Then the GAP value is obtained from the expected maturity index minus the current maturity index, then 5 - 3.6 = 1.4 is obtained. To achieve the expected maturity index of 5 (optimizing the process), there needs to be an increase in developing more detailed policies related to human resource management, including recruitment planning and career development programs.

3. Subdomain EDM04.03
   In the EDM04.03 subdomain process, the current maturity index (as is) is 3.4 (implemented process) and the expected maturity index (to be) is 5 (optimizing the process) then the GAP value is obtained from the expected maturity index minus the current maturity index, then 5 - 3.4 = 1.6 is obtained, to achieve the expected maturity index of 5 (optimizing the process) there needs to be an increase in improving the human resource performance monitoring mechanism with clearer indicators to measure the effectiveness of the policies implemented and conduct periodic evaluations of resource use to identify areas that still need to be improved.

4.2.2. APO01 Subdomains

1. Subdomain APO01 01
   In the APO01.01 subdomain process, the current maturity index (as is) is 3 (implemented process) and the expected maturity index (to be) is 5 (optimizing the process) then the GAP value is obtained from the expected maturity index minus the current maturity index, then 5 - 3 = 2 is obtained, to achieve the expected maturity index of 5 (optimizing the process) there needs to be an increase in

terms of coordination between the information technology team and hospital management to ensure that information technology policies support organizational strategies.

2. Subdomain APO01 02
   In the APO01.02 subdomain process, the current maturity index (as is) is 3.4 (implemented process) and the expected maturity index (to be) is 5 (optimizing the process) then the GAP value is obtained from the expected maturity index minus the current maturity index, then 5 - 3.4 = 1.6 is obtained, to achieve the expected maturity index of 5 (optimizing the process) there needs to be an increase in adjusting the information technology organizational structure to the strategic needs of the hospital, ensuring that each role in the information technology team supports hospital operations and conducting regular training for IT staff, especially in aspects of information security and the latest technology, so that their competence is always maintained.
3. Subdomain APO01 03
   In the APO01.03 subdomain process, the current maturity index (as is) is 4 (predictable process) and the expected maturity index (to be) is 5 (optimizing the process) then the GAP value is obtained from the expected maturity index minus the current maturity index, then 5 - 4 = 1 is obtained, to achieve the expected maturity index of 5 (optimizing the process) there needs to be an increase in determining the main responsibilities for each position in the IT team, ensuring their roles support business needs and information security and conducting structured routine training to improve IT staff skills in handling emerging problems.
4. Subdomain APO01 04
   In the APO01.04 subdomain process, the current maturity index (as is) is 3.8 (predictable process) and the expected maturity index (to be) is 5 (optimizing the process) then the GAP value is obtained from the expected maturity index minus the current maturity index, then 5 - 3.8 = 1.2 is obtained, to achieve the expected maturity index of 5 (optimizing the process) there needs to be an increase in the comparison of the information technology human resource performance monitoring system to evaluate the effectiveness of information technology management policies and procedures and prepare improvement plans based on the evaluation results so that the effectiveness of information technology management continues to increase.
5. Subdomain APO01 05
   In the APO01.05 subdomain process, the current maturity index (as is) is 3 (established process) and the expected maturity index (to be) is 5 (optimizing the process) then the GAP value is obtained from the expected maturity index minus the current maturity index, then 5 - 3 = 2 is obtained, to achieve the expected maturity index of 5 (optimizing the process) then there needs to be an increase in developing a stricter internal audit mechanism to ensure that information technology policies are implemented properly and according to standards.

5. Conclusion

After conducting research to measure the performance of information technology human resources at RSUD S.K. Lerik, Kupang City, the following conclusions can be drawn:

EDM04 subdomain process

1. EDM04.01 Ensure resource optimization process
   In this process, the current maturity index (as is) is 3.8 (predictable process). This can be interpreted that currently the EDM04.01 process which includes evaluation of human resource management is currently at level 4 (predictable process). While the expected state (to be) obtained a maturity index of 5. This shows that RSUD S.K. Lerik expects that the existing process will continue to be improved to meet the goals that are continuously projected. The GAP between the current maturity index (as is) and the expected maturity index (to be) is 1.2.
2. EDM04.02 Direct resource management process
   In this process, the current maturity index (as is) is 3.6 (predictable process). This can be interpreted that currently the EDM04.02 process which includes direction in human resource management is currently at 4 (predictable process). Meanwhile, the expected condition (to be) obtained a maturity index of 5. This shows that RSUD S.K. Lerik expects that the existing process will continue to be improved to meet the goals that continue to be projected. The GAP between the current maturity index (as is) and the expected maturity index (to be) is 1.4.
3. EDM04.03 Monitor resource management process
   In this process, the current maturity index (as is) is 3.4 (established process). This can be interpreted that currently the EDM04.03 process which includes monitoring of human resource management is currently at level 3 (established process). While the expected state (to be) obtained a maturity index of 5. This shows that RSUD S.K. Lerik expects that the existing process will continue to be improved to meet the goals that continue to be projected. The GAP between the current maturity index (as is) and the expected maturity index (to be) is 1.6.

APO01 subdomain process

1. APO01.01 Process Alignment of information technology human resource strategy with the organization.
   In this process, the current maturity index (as is) is 3 (established process). This can be interpreted that currently the APO01.01 process which includes the alignment of information technology human resource strategy with the organization is currently at level 3 (established process). While the expected state (to be) obtained a maturity index of 5. This shows that RSUD S.K. Lerik expects that the existing process will continue to be improved to meet the goals that are continuously projected. The GAP between the current maturity index (as is) and the expected maturity index (to be) is 2.
2. APO01.02 Process Planning of information technology human resource capacity and competence.
   In this process, the current maturity index (as is) was 3.4 (established process). This can be interpreted that currently the APO01.02 process which includes planning the capacity and competency of information technology human resources is currently at level 3 (established process). While the expected state (to be) obtained a maturity index of 5. This shows that RSUD S.K. Lerik expects that the existing process will continue to be improved to meet the goals that continue to be projected. The GAP between the current maturity index (as is) and the expected maturity index (to be) is 1.6.
3. Process APO01.03 Management of competency and training of information technology human resources.
   In this process, the current maturity index (as is) is 4 (predictable process). This can be interpreted that currently the APO01.03 process which includes competency management and training of information technology human resources is currently at level 4 (predictable process). While the expected state (to be) obtained a maturity index of 5. This shows that RSUD S.K. Lerik expects that

the existing process will continue to be improved to meet the goals that are continuously projected. The GAP between the current maturity index (as is) and the expected maturity index (to be) is 1.

4. Process APO01.04 Measurement of information technology human resource performance.
   In this process, the current maturity index (as is) was 3.8 (predictable process). This can be interpreted that currently the APO01.04 process which includes measuring the performance of information technology human resources is currently at level 4 (predictable process). While the expected state (to be) obtained a maturity index of 5. This shows that RSUD S.K. Lerik expects that the existing process will continue to be improved to meet the goals that continue to be projected. The GAP between the current maturity index (as is) and the expected maturity index (to be) is 1.2
5. Process APO01.05 Management of information technology human resource risk and compliance.
   In this process, the current maturity index (as is) is 3 (established process). This can be interpreted that currently the APO01.04 process which includes management of information technology human resource risk and compliance is currently at level 3 (established process). While the expected state (to be) obtained a maturity index of 5. This shows that RSUD S.K. Lerik expects that the existing process will continue to be improved to meet the goals that continue to be projected. The GAP between the current maturity index (as is) and the expected maturity index (to be) is 2.

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