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Analysis of Information System Governance Using the EDM Domain of the COBIT 5 Framework: A Case Study of Sendang Agung Electric

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Abstract

Information Technology (IT) governance is a part of an organization that is the responsibility of IT management, executive management, and the board of directors in planning and implementing IT strategies to align IT resources with the business within the organization. The importance of IT governance today is not limited to private companies or government agencies. With proper IT governance, information within an organization can be optimized to achieve the company's objectives. Therefore, IT governance can also be applied and developed in private companies. This study uses COBIT 5 because it is believed to provide a clear distinction between processes within the scope of management and governance. In COBIT 5 itself, there are various domains with capability levels as a reference for measurement. The research area to be conducted focuses on the IT department of Sendang Agung Electric Company, referring to the COBIT 5 domains APO01, APO02, BAI01, BAI03, EDM01, EDMO2, EDM03, and DSS01. Recommendations are focused on the BAI03, EDM01, and EDM02 domain processes because these three domains have significantly higher gap values compared to the other domains.

Keywords– – *Information System Governance, COBIT 5, EDM*

1. Introduction

The development of information technology (IT) has become an inevitable aspect of modern life, permeating nearly every sector and significantly transforming how individuals and organizations operate. As technological innovation accelerates, it fosters a shift from manual processes to automated systems, thereby increasing efficiency, accuracy, and productivity (Permata Hakim & Darwis, 2016). This transformation is not only driven by the intrinsic capabilities of technology itself but also by the creativity and innovation of those who seek to harness it to solve emerging problems and create strategic advantages. Organizations that fail to adapt to these technological changes risk being left behind in increasingly competitive markets, while those who embrace IT stand to gain improved operational agility, better decision-making tools, and enhanced stakeholder engagement.

Information Technology governance, as a strategic component of organizational management, plays a pivotal role in ensuring that IT resources and systems are effectively aligned with overall business goals. According to Devanti et al. (2019), IT governance refers to a set of responsibilities and practices carried out by executives and IT leaders to ensure that IT supports and extends an organization's strategies and objectives. It includes the formulation of IT strategies, policies, and performance monitoring systems that guide the development and use of IT. Effective IT governance not only helps to optimize IT investments but also ensures compliance with regulations, reduces risks, and enhances value delivery from IT assets. Among the numerous frameworks available to implement IT governance, COBIT (Control Objectives for Information and Related Technologies) has gained prominence for its structured, standardized approach to assessing governance maturity and capability levels (Hakim et al., 2015).

The relevance and application of IT governance are no longer limited to large corporations or governmental institutions. In fact, small and medium-sized enterprises (SMEs) have begun to recognize the necessity of governing their IT

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systems to remain competitive and sustainable. Proper IT governance in private sector firms enables streamlined communication, improved service delivery, and better alignment between operational technology and business strategies. It also enhances data integrity and information flow, supporting better strategic decision-making. According to Darwis & Yulianti Solehah (2021), implementing IT governance in private organizations ensures that technology investments align with organizational priorities, thereby helping institutions achieve their goals in a systematic and accountable manner.

Sendang Agung Electric, a company specializing in ship engine and electrical services, provides a relevant case for evaluating the implementation of IT governance in a private sector context. The company utilizes various forms of information technology to support its operational processes and service delivery. However, preliminary observations suggest that IT utilization at Sendang Agung Electric is not yet fully optimized. There appears to be a lack of formal evaluation of how IT processes align with broader business objectives, and no structured mechanism is in place to ensure that IT-based decisions reflect the preferences and expectations of internal and external stakeholders (Permata Hakim & Darwis, 2016; Darwis & Yulianti Solehah, 2021). This gap poses a risk to operational efficiency and strategic coherence, highlighting the need for a governance model that can systematically assess and direct IT practices toward business value creation.

To address these issues, the present study employs the COBIT 5 framework, which provides a comprehensive model for IT governance and management. COBIT 5 distinguishes clearly between governance and management activities, offering a systematic way to evaluate performance and capabilities. Its domain structure and maturity model enable organizations to assess their current state and plan improvements based on defined levels of capability. Specifically, this research focuses on the Evaluate, Direct, and Monitor (EDM) domain, which is central to the governance aspects of COBIT 5. This domain includes processes that are critical for establishing governance

frameworks, delivering business benefits, and managing IT-related risks (Nugraha et al., 2021a). By focusing on the EDM domain, the study aligns with its goal of assessing governance maturity at a strategic level.

The EDM domain consists of three primary processes: EDM01 (Ensure Governance Framework Setting and Maintenance), EDM02 (Ensure Benefits Delivery), and EDM03 (Ensure Risk Optimization). These processes collectively form the foundation for evaluating the effectiveness of governance in aligning IT initiatives with enterprise goals. EDM01 ensures that a formal governance framework is established and continuously improved. EDM02 focuses on value realization from IT-enabled investments, while EDM03 addresses risk oversight and optimization in the IT context (Nugraha et al., 2021b). Through the application of these processes, organizations can measure and enhance their ability to make informed governance decisions, maintain control over strategic IT initiatives, and ensure accountability across all levels of operation.

Based on the rationale above, the purpose of this study is to conduct a governance capability analysis at Sendang Agung Electric by using the EDM domain within the COBIT 5 framework. The study aims to identify shortcomings and gaps in the current implementation of IT governance, particularly in the areas of strategic alignment, value delivery, and risk management. By evaluating each EDM process against defined COBIT criteria, the research provides an evidence-based foundation for recommending improvements in IT governance practices. The results are expected to help Sendang Agung Electric enhance its decision-making processes, align IT initiatives with stakeholder needs, and ultimately improve overall organizational performance.

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2. Method

Literature Study

The initial step in this research involves conducting a comprehensive literature study to establish a solid theoretical foundation and identify relevant methodologies that align with the research objectives. This process includes a structured review of various scholarly sources such as textbooks, peer-reviewed journal articles, conference proceedings, and previous research that have discussed the governance of information technology, especially within the COBIT 5 framework. According to Devanti et al. (2019), a literature review plays a pivotal role in enabling researchers to understand key concepts, recognize theoretical gaps, and assess the strengths and weaknesses of earlier studies. Through this approach, researchers can develop a conceptual framework that guides the direction of the study and ensures the research is grounded in validated knowledge. Additionally, this stage helps in refining the research questions and selecting appropriate analytical tools.

The literature study focuses primarily on the governance of information systems and the utilization of the COBIT 5 framework, particularly the EDM (Evaluate, Direct, and Monitor) domain, which provides a governance perspective as opposed to a management focus. Key concepts explored include IT governance, strategic alignment, value delivery, risk optimization, and performance measurement within IT systems. Several studies have emphasized the effectiveness of COBIT 5 in evaluating IT governance maturity due to its comprehensive structure and clearly defined capability levels. The research also references models and methodologies from previous case studies that applied COBIT 5 in private sector organizations, thereby drawing parallels and identifying best practices. By reviewing these resources, this research ensures methodological rigor and contextual relevance in assessing Sendang Agung Electric's governance maturity.

Research Design

The research design used in this study is a descriptive qualitative approach with an embedded quantitative element, which aims to evaluate the maturity level of IT governance practices at Sendang Agung Electric. The central focus is the

application of the COBIT 5 framework, particularly its EDM domain, to assess the current state of IT governance implementation. The design enables the researcher to collect data systematically, interpret governance processes, and assess the extent to which these processes meet stakeholder needs and align with the organization's strategic objectives. According to Gantino Mufti and Tyroni Mursityo (2017), the measurement of maturity levels across COBIT 5 domains provides a structured method to analyze both strengths and areas for improvement within IT governance practices.

To ensure a comprehensive analysis, this study employs a set of evaluation instruments based on COBIT 5's capability level model, which ranges from level 0 (incomplete process) to level 5 (optimized process). The research involves identifying key stakeholders, conducting interviews or surveys, and mapping existing processes against COBIT 5's defined criteria. This is followed by a scoring process to determine the current maturity level for each sub-domain under EDM: EDM01 (Ensure Governance Framework Setting and Maintenance), EDM02 (Ensure Benefits Delivery), and EDM03 (Ensure Risk Optimization). These assessments help identify gaps between current practices and expected governance standards, and inform recommendations for improvement.

Ultimately, the research design is structured to not only measure current capability but also to provide strategic insights that could guide future IT governance improvements at Sendang Agung Electric. By adopting the COBIT 5 framework, the study aims to enhance transparency, accountability, and alignment between IT and business processes, thereby increasing the overall organizational effectiveness. The combination of literature synthesis and structured governance assessment ensures the study's contribution to both academic inquiry and practical IT governance development.

Table 1. Focus of Information Technology Governance Evaluation Domains

No.	Domain COBIT 5	COBIT 5 Process
1.	APO01	Define The Management Framework for IT
2.	APO02	Define Strategy
3.	BAI01	Manage Programmes and Project
4.	BAI03	Identify and Build Solutions

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5.	EDM01	Ensure Governance Framework Setting and Maintenance
6.	EDM02	Ensure Value Optimisation
7.	EDM03	Ensure Risk Optimisation
8.	DSS01	Manage Operations

Data and Evidence Collection

The data and evidence collection stage uses direct interviews with relevant officials at Sendang Agung Electric in accordance with the processes in domains APO01, APO02, BAI01, BAI03, EDM01, EDM02, EDMO3, and DSS01. However, if direct interviews cannot be conducted due to the busy schedules of certain parties, interviews may be conducted through an online application. Evidence and facts are also collected through direct observation at Sendang Agung Electric (Nugraha et al., 2021a).

Conducting a Fitness Test

A fitness test is conducted to align the company's current state with the IT process standards in COBIT 5. The collected data and facts undergo an analysis process involving weighting to measure the maturity level based on working papers aligned with COBIT 5 standards, particularly in the domains APO01, APO02, BAI01, BAI03, EDM01, EDM02, EDMO3, and DSS01 (Permata Hakim & Darwis, 2016).

Maturity Level Measurement (Capability Level)

Maturity level is a measurement tool to determine the current state of information technology processes. The purpose of the maturity level measurement stage is to generate a weighting value for each perspective. Maturity levels range from level 0 (non-existence) to level 5 (optimized). At each maturity level, there are statements used as benchmarks to measure the extent to which the processes are currently being implemented at Sendang Agung Electric. The following formula is used to calculate the capability level value:

$$NC = \frac{(NkxLp0)+(NkxLp1)+(NkxLp2)+(NkxLp3)+(NkxLp4)+(NkxLp5)}{100}$$

Notes:
NC: Capability Level Value
Nk: Maturity value indicated in the respondent's results
Lp: Level percentage (questionnaire response percentage)

Recommendation Development

The next step is to develop and generate recommendations that are useful for Sendang Agung Electric based on the findings and maturity levels obtained from the measurement in the form of a system improvement design.

3. Result and Discussion

Identification of Problems and Opportunities

At this stage, we will identify the problems that hinder the implementation of information technology at Sendang Agung Electric using capability level analysis to determine the company's level of capability in implementing and managing information technology governance, referring to an assessment process consisting of levels 0 to 5 and calculating the gap value.

Capability Level Analysis

Capability Level Analysis, or the maturity level of the implementation and management of information technology governance, is conducted by conducting direct interviews and surveys at the company to observe and also through interviews with previously determined sources as the basis for data collection, which is then compiled into the Capability Level Analysis table prepared based on the COBIT 5 guidelines as a reference.

Table 2. Capability Level Analysis Results

No	Domain Process	Capability Value		*Capability Level*	
		As is	*To be*	*As is*	*To be*
1.	APO01	1,5	3	2	3
2.	APO02	0,35	1,75	1	2
3.	BAI01	0,17	1,91	1	2
4.	BAI03	0,38	2,62	1	3

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5.	EDM01	0,3	2,6	1	3
6.	EDM02	1	3	1	3
7.	EDM03	0,5	2,38	1	2
8.	DSS01	0,25	2,12	1	2
	average	0,56	2,42	1	3

Table 2 explains that the eight domains used as a reference in conducting IT governance audits at Sendang Agung Electric have currently reached a value of 0.56, which means that Sendang Agung Electric is at maturity level 1. Click or tap here to enter text. At level 1, the implementation of IT governance management within the company is still in its early stages, relying on existing performance processes and unable to effectively manage, monitor, and measureClick or tap here to enter text..

This contrasts with the condition of IT governance management at Sendang Agung Electric, which is expected to achieve a score of 2.42 or reach maturity level 3. Therefore, improvement recommendations are needed as a basis for the company to make improvements and achieve the desired targets. Click or tap here to enter text.

Figure 2. Capability Level Value Diagram

Gap Analysis

Table 3. Gap Analysis Results

No.	**Process Domain**	***Capability Level***		***Gap***
		As is	***To be***	
1.	APO01	2	3	1
2.	APO02	1	2	1
3.	BAI01	1	2	1
4.	BAI03	1	3	2
5.	EDM01	1	3	2

6.	EDM02	1	3	2
7.	EDM03	1	2	1
8.	DSS01	1	2	1
	Range	**1**	**3**	**2**

Based on the table above, it shows that the governance at Sendang Agung Electric has a gap of 2, a gap of 1 in APO01, 1 in APO02, 1 in BAI01, 2 in BAI03, 2 in EDM01, 3 in EDM02, and 1 in DSS01. With an average gap of 2, it can be said that the implementation of IT governance at Sendang Agung Electric has been managed well and further recommendations are needed to develop it to level 3, which involves further design.

Figure 3. Gap Value Diagram

Recommendations

At this stage, recommendations will be made based on the questionnaire results and findings obtained from the interviews. The recommendations are based on the base practices contained in the COBIT 5 guide, focusing on the BAI03, EDM01, and EDM02 process domains. This is because these three domains have a very high gap value compared to other domains, so they are considered to have a sufficiently high urgency to warrant immediate improvement recommendations. The improvement recommendations provided are based on the achievement results and activities in each domain with a very high gap value that have not been implemented properly at Sendang Agung Electric.

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Table 4. Recommendations for Improvement

No.	Findings	Recommendations for Improvement
1.	There is no assessment of the importance of IT maintenance activities proposed in the current solution design, functions, and business processes	Create standard procedures for assessing IT maintenance in determining solutions to problems based on existing functions and business processes
2.	There are no rules and procedures for considering user risks and impacts	Develop a standard risk assessment framework with risk and impact classification levels for users.
3.	The proposed requirements and solutions do not meet the business case objectives	Develop policies related to criteria, requirements, and decision-making steps for proposing solutions in line with business objectives

Table 5. Implementation of EDM01 Recommendations

No.	Findings	Recommendations for Improvement
1.	No reward system to encourage the desired cultural change	Create a specific policy related to rewarding employees with high performance results every few months to increase employee morale
2.	Maintenance in the use of IT has not been implemented properly	Establish a routine inspection schedule for the maintenance of IT assets owned by Sendang Agung Elektric
3.	No procedures for evaluating the use of IT services	Establish standard procedures for evaluating or reporting on the use of IT services

Table 6. Implementation of EDM02 Recommendations

No.	Findings	Recommendations for Improvement
1.	Current IT usage is not yet able to provide effectiveness and efficiency in business processes	There is a need for a system design that supports the company's business processes so that performance results can be managed properly through the maximum utilization of IT
2.	There is no procedure for evaluating performance optimization results	Create standard performance evaluation procedures that are discussed in detail at regular meetings

Recommendation Implementation

The proposed system design will be related to the recommendation design in the BAI03, EDM1, and EDM02 domains, where all three domains require a system that includes maintenance activities.

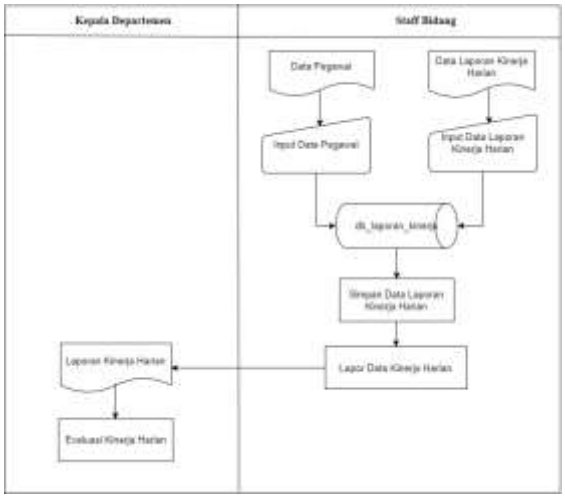

Figure 4. Three domains require a system that includes maintenance activities

IT maintenance along with risks and proposed solutions, performance reporting, and effective and efficient use of IT in applicable business processes. The following is the implementation of the proposed system design in the form of a flowchart, which will be explained in detail in the following:

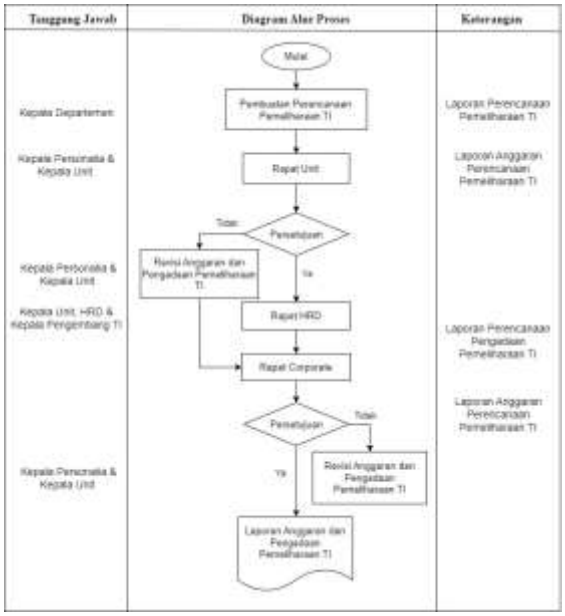

Figure 5. Recommended IT Maintenance Planning Procedures

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The next stage after the system design is approved is the system development process. In ongoing business processes, the IT maintenance system will be closely linked to the performance of the staff responsible for the areas they handle. Thus, the IT maintenance system can also serve as a daily staff performance reporting system to generate IT maintenance reports and daily staff performance reports. This impacts the effectiveness and efficiency of the system's performance in line with the gaps identified at Sendang Agung Elektric. The flow of the performance reporting and IT maintenance system will be explained in detail.

4. Conclusion

The current state of information technology governance at Sendang Agung Electric cannot yet be considered effective or optimal. This is because business processes still rely heavily on human labor and have not yet incorporated information technology into every aspect of their operations. Furthermore, the average implementation of information technology governance is still at an early stage or at level 1. Sendang Agung Electric should conduct regular evaluations of information technology maintenance and management, as well as establish a specific policy regarding this matter, which is formalized in applicable rules or procedures, to achieve the desired level of information technology governance.

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