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PENGUKURAN TINGKAT KEMATANGAN TATA KELOLA TEKNOLOGI INFORMASI BERDASARKAN COBIT 2019 STUDI KASUS DI PT ENERGI NUSANTARA

MEASUREMENT OF IT GOVERNANCE MATURITY LEVEL BASED ON COBIT 2019 CASE STUDY AT PT ENERGI NUSANTARA

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ABSTRACT

The rapid development of information technology (IT) requires organizations to have effective IT governance to ensure alignment between IT strategy and business objectives, optimize resources, and manage risks. PT Energi Nusantara, as one of the largest mining companies in Indonesia, faces complex challenges in IT governance, including alignment of IT strategy, risk management, and resource management. This study aims to measure the level of maturity of the company's IT governance using the COBIT 2019 framework and provide strategic recommendations for improvement. This study uses a mixed method approach, namely a combination of quantitative and qualitative methods. Quantitative data was collected through questionnaires designed based on COBIT 2019 domains and processes, while qualitative data was obtained through in-depth interviews with stakeholders and internal document analysis. Data analysis was carried out using descriptive statistics to measure maturity levels, gap analysis to identify gaps, and content analysis to analyze qualitative data. This research enriches the literature on the application of COBIT 2019 in the context of IT governance in the mining sector. The results of this research can be a reference for academics, researchers and IT practitioners who want to develop more effective and efficient IT governance strategies. In addition, the resulting strategic recommendations can be adopted by other companies in similar industries to improve their IT governance.

***Keyword**: IT Governance, COBIT 2019, Maturity Level, Gap Analysis*

ABSTRAK

Perkembangan teknologi informasi (TI) yang pesat menuntut organisasi untuk memiliki tata kelola TI yang efektif guna memastikan keselarasan antara strategi TI dengan tujuan bisnis, mengoptimalkan sumber daya, dan mengelola risiko. PT Energi Nusantara, sebagai salah satu perusahaan pertambangan terbesar di Indonesia, menghadapi tantangan kompleks dalam tata kelola TI, termasuk keselarasan strategi TI, manajemen risiko, dan pengelolaan sumber daya. Penelitian ini bertujuan untuk mengukur tingkat kematangan tata kelola TI perusahaan menggunakan framework COBIT 2019 dan memberikan rekomendasi strategis untuk perbaikan. Penelitian ini menggunakan pendekatan mixed method, yaitu kombinasi metode kuantitatif dan kualitatif. Data kuantitatif dikumpulkan melalui kuesioner yang dirancang berdasarkan domain dan proses COBIT 2019, sementara data kualitatif diperoleh melalui wawancara mendalam dengan pemangku kepentingan dan analisis dokumen internal. Analisis data dilakukan dengan menggunakan statistik deskriptif untuk mengukur tingkat kematangan, gap analysis untuk mengidentifikasi kesenjangan, dan content analysis untuk menganalisis data kualitatif. Hasil penelitian menunjukkan bahwa tingkat kematangan tata kelola TI PT Energi Nusantara telah tercapai dengan nilai sebesar 4,21 dari nilai maksimal 4,65. Dari 40 objektif yang dinilai, terdapat 8 objektif yang telah mencapai tingkat kapabilitas sempurna, 21 objektif yang telah mencapai tingkat kapabilitas maksimal, dan 11 objektif yang belum mencapai tingkat kapabilitas maksimal. Penelitian ini memperkaya literatur tentang penerapan COBIT 2019 dalam konteks tata kelola TI di sektor pertambangan. Hasil penelitian ini dapat menjadi referensi bagi akademisi, peneliti, dan praktisi TI yang ingin mengembangkan strategi tata kelola TI yang lebih efektif dan efisien. Selain itu, rekomendasi strategis yang dihasilkan dapat diadopsi oleh perusahaan lain di industri sejenis untuk meningkatkan tata kelola TI mereka.

Kata Kunci: Tata Kelola TI, COBIT 2019, Tingkat Kematangan, Analisis Kesenjangan

INTRODUCTION

The rapid development of information technology (IT) in the last few decades has changed the business paradigm globally. IT is no longer only seen as an operational support tool but has become a strategic element capable of creating competitive advantages for organizations.

In this context, IT governance is a critical aspect that ensures that IT investments can provide added value to the organization, both in terms of operational efficiency, regulatory compliance and business innovation. A firm's ability to innovate is heavily dependent on its absorptive capacity and resource availability, including knowledge, technologies, and infrastructure (Dhewanto et al., 2012). Effective IT governance enables organizations to manage risk, optimize resources, and ensure alignment between IT strategy and business objectives.

However, the increasingly dynamic complexity of the business environment, accompanied by increasingly stringent regulatory demands, requires organizations to have mature IT governance. Without good governance, organizations risk facing various problems, such as misalignment between IT and business strategies, inefficiencies in managing IT resources, and vulnerability to cyber security risks and operational disruptions. Therefore, measuring the level of IT governance maturity is an important step for identifying strengths and weaknesses in IT management, as well as formulating appropriate improvement strategies.

PT Energi Nusantara, as one of the largest coal mining companies in Indonesia, is an example of an organization that relies heavily on IT to support its operations and business strategy. As a company operating in the natural resources sector, PT Energi Nusantara faces unique challenges, such as supply chain complexity, environmental sustainability demands, and strict government regulations. In facing this challenge, the role of IT is becoming increasingly central, starting from supply chain management systems, enterprise resource planning (ERP) systems, to environmental monitoring systems.

However, with increasing dependence on IT, PT Energi Nusantara needs to ensure that the IT governance implemented has reached an adequate level of maturity. The COBIT 2019 (Control Objectives for Information and Related Technologies) framework was chosen as a tool to measure the level of IT governance maturity because this framework is globally recognized and provides a comprehensive approach to evaluating and improving IT governance. COBIT 2019 does not only focus on technical aspects, but also emphasizes alignment between IT and business goals, risk management and regulatory compliance.

This research aims to measure the maturity level of IT governance at PT Energi Nusantara using the COBIT 2019 framework. By understanding the current maturity level, companies can identify areas that need to be improved and formulate strategies to achieve the expected maturity level. Apart from that, it is hoped that this research can provide a practical contribution to PT Energi Nusantara in increasing the effectiveness of IT governance, as well as an academic contribution in enriching literature related to the implementation of COBIT 2019 in the mining sector.

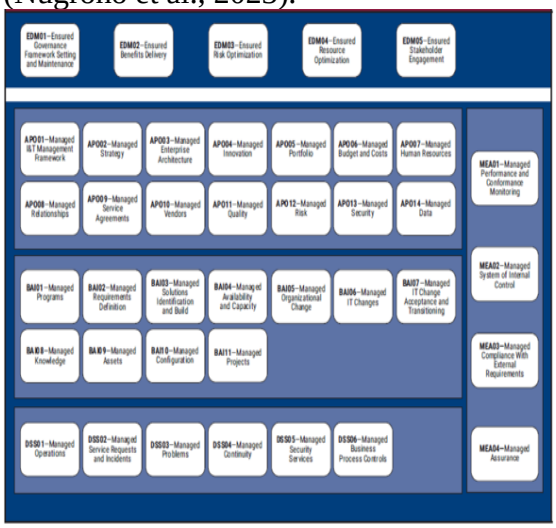
IT Governance is the structures, processes, and relational mechanisms that ensure that IT supports and extends an organization's strategy and goals. It includes how IT decisions are made, who is responsible, and how IT performance is measured and managed. IT Governance also relates to strategic alignment between IT and business, IT resource management, risk management, and performance measurement (Board Briefing on IT Governance Introduction, 2005).

According to the IT Governance Institute, basically IT governance focuses on two main things: delivering IT value to the business and mitigating IT risks. Delivering this value is driven by strategic alignment between IT and business, while risk mitigation is driven by implementing accountability within the company. These two aspects need to be measured well. This leads to five key focus areas in IT governance, all of which are driven by value for stakeholders (Wiley, n.d.):

1. Value Delivery. Ensure that IT investments provide the expected business value.
2. Strategic Alignment. Ensure that IT strategy is aligned with business strategy.
3. Resource Management. Manage IT resources effectively and efficiently.
4. Risk Management. Identify and manage IT-related risks.
5. Performance Measurement. Measure and monitor IT performance to ensure goals are achieved.

Picture 1. Focus areas of IT governance

There are several widely accepted IT governance standard models that determine how well IT is managed. Some of these are the Information Technology Infrastructure Library (ITIL), Control Objectives for Information and Related Technologies (COBIT), and ISO/IEC 27001 (FASIHUDDIN et al., 2022). The purpose of using these standards is so that the purpose of implementing information technology in an organization meets the expected goals and avoids the risk of losses from unknown risks (Rian Hidayat & Jatikusumo, 2024). Of the three standard models for Information Technology Governance, the COBIT framework is considered complete in terms of governance because of its comprehensive coverage, namely defining components to build and support governance systems, processes, organizational structures, policies and procedures, information flows, culture and behavior, skills and infrastructure and defining that design factors are things that must be considered by the Company to build the most appropriate and effective governance system. In 2018, ISACA released the latest version of COBIT, namely COBIT 2019 (Nugroho et al., 2023).



Picture 2. COBIT Core Model

Source: ISACA

The governance and management objectives in COBIT are grouped into five domains. The domains have names with verbs that express the key purpose and areas of activity of the objectives contained in them: (*COBIT® 2019 Implementation Guide : Implementing and Optimizing an Information and Technology Governance Solution*, 2012; *COBIT 2019 Framework Governance and Management Objectives*, 2019; De Haes et al., 2020)

1. The Evaluate, Direct, and Monitor (EDM) domain is where governance goals are gathered. The governing body in this area assesses strategic possibilities, advises top management on the selected options, and keeps track of the strategy's progress.
2. Four domains comprise management objectives.
   a. Align, Plan, and Organize (APO) deals with I&T's overarching structure, strategy, and auxiliary operations.
   b. The term "Build, Acquire, and Implement" (BAI) refers to the process of defining, acquiring, and

integrating I&T solutions into business processes.

c. The operational delivery and support of I&T services, including security, are covered by Deliverer, Service, and Support (DSS).
d. Monitoring, Evaluating, and Assessing (MEA) deals with I&T performance monitoring and compliance with external requirements, internal performance targets, and internal control objectives.

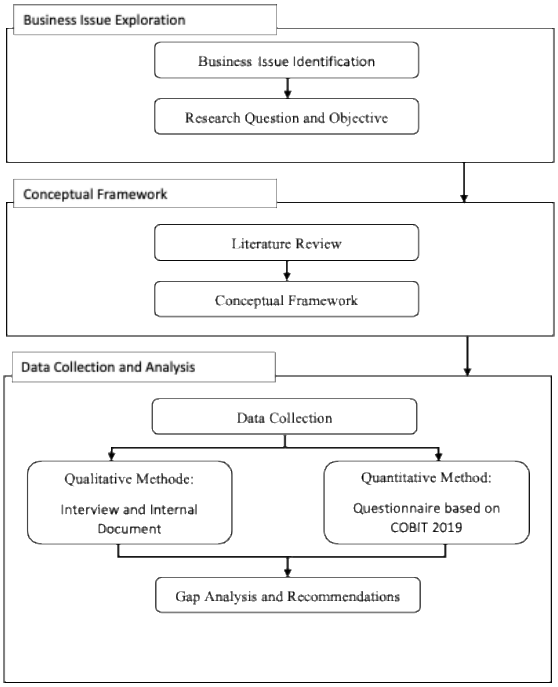
There are four levels of rating scales, or rating scales, that can be used to calculate the level of capability (Nurtjahjo et al., 2025). Not Achieved (N) indicates that there is no evidence of achievement that defines the activity being assessed, Partially Achieved (P) indicates that there is some evidence of achievement and a defined approach to the activity being assessed, and Largely Achieved (L) indicates that there is evidence of a systematic approach and achievement that is defined in the activity being assessed. Fully Achieved (F).

Table 1. Rating Scale Values

Abbreviation	Description	Percentage
N	Not Achieved	0% to 15%
P	Partially Achieved	>15% to 50%
L	Largely Achieved	>50% to 85%
F	Fully Achieved	>85% to 100%

RESEARCH METHOD

This research uses a descriptive approach with a case study method. A descriptive approach was chosen because this research aims to describe the level of IT governance maturity at PT Energi Nusantara in detail. The case study was chosen because this research focuses on one research object, namely PT Energi Nusantara, to gain an in-depth understanding of the condition of IT governance in that company.



Picture 3. Research Design

This research uses three main stages, namely exploration of business issues, preparation of a conceptual framework, and data collection and analysis to formulate a strategy for improving IT governance at PT Energi Nusantara. The first stage begins by identifying business issues related to IT governance faced by the company. These issues include operational complexity, regulatory demands, IT risk management, alignment of IT strategy with business goals, and digital transformation challenges. Identification of this business issue was carried out through literature study, initial interviews with stakeholders, and analysis of internal company documents. The results of identifying business issues are then used as a basis for formulating research questions and research objectives.

The second stage focuses on developing a conceptual framework for the research. This conceptual framework was developed based on a literature review and the COBIT 2019 framework. The COBIT 2019 framework was chosen for its ability to provide a comprehensive approach to evaluating IT governance, covering domains such as Evaluate, Direct, and Monitor (EDM); Align, Plan, and Organize (APO); Build, Acquire, and Implement

(BAI); Deliver, Service, and Support (DSS); and Monitor, Evaluate, and Assess (MEA). This conceptual framework is used as a basis for conducting gap analysis, which aims to identify differences between the current IT governance conditions and ideal conditions based on the 2019 COBIT standard.

The third stage includes the process of collecting and analyzing data using the Mixed Method, namely a combination of qualitative and quantitative approaches. In the qualitative aspect, data was collected through in-depth interviews with key stakeholders, such as CIOs, IT managers and related staff. In addition, an analysis of the company's internal documents, such as IT policies, IT audit reports and IT strategic plans, was carried out. In the quantitative aspect, data was collected through distributing questionnaires designed based on indicators in the COBIT 2019 framework. This questionnaire was aimed at management and IT staff to assess the maturity level of IT governance.

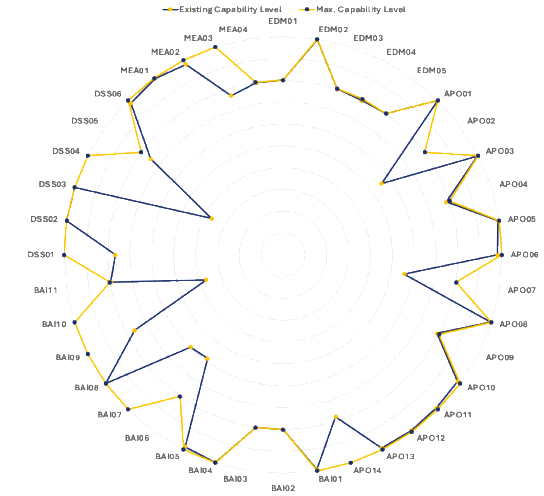
In data analysis, the method used is adjusted to the type of data obtained. On qualitative data, content analysis was carried out to identify the main themes that emerged from interviews and company documents. Meanwhile, quantitative data was analyzed using descriptive statistics to calculate the maturity level of IT governance based on a scale of 0-5 in COBIT 2019. In addition, gap analysis was carried out to identify areas that needed improvement.

Based on the results of the analysis, strategic recommendations were formulated to improve IT governance at PT Energi Nusantara. These recommendations are prepared by considering the results of gap analysis, industry best practices, and the company's business context.

RESULT AND DISCUSSION

Data Description

Based on quantitative data analysis using a questionnaire, the level of IT governance maturity at PT Energi Nusantara was measured for each COBIT 2019 domain.



Picture 4. The gap between the current assessment results and expectations

Discussion

Based on the assessment results of all evaluated objectives, it can be concluded that the maturity level at PT Energi Nusantara has been achieved with a score of 4.21 out of a maximum possible value of 4.65.

Furthermore, based on the analysis of the five attached figures, it is observed that out of the 40 objectives assessed for capability level, eight objectives have attained the highest capability level, namely:

Picture 5. Perfect Capability Level

Then, there are 11 (eleven) objectives that have not yet reached the maximum capability level, including:

Picture 6. Capability Level Not Maximum

Gap Analysis

This gap indicates that the company needs to improve the implementation of IT solutions, IT performance monitoring, and

alignment between IT strategy and business objectives. The following are the gap analysis conclusions for each domain:

1. Evaluate, Direct, Monitor

This domain includes the process of evaluating, directing and monitoring IT governance.

Picture 7. EDM Domain Gap Analysis

2. Align, Plan, Organize

This domain focuses on aligning IT strategy with business objectives, planning IT resources, and managing relationships with stakeholders.

Picture 8. APO Domain Gap Analysis

3. Build, Acquire, Implement

This domain includes the processes of developing, acquiring, and implementing IT solutions.

Picture 9. BAI Domain Gap Analysis

4. Deliver, Service, Support

This domain includes the processes of providing IT services, operational support, and IT. security management.

Picture 10. DSS Domain Gap Analysis

5. Monitor, Evaluate, Assess

This domain includes the process of monitoring, evaluating and assessing IT performance.

Picture 11. MEA Domain Gap Analysis

CONCLUSION

Based on the research results, it can be concluded that the maturity level of Information Technology Governance at PT Energi Nusantara has reached level 4.21 on the COBIT 2019 scale, which is in the Managed and Measurable category. This shows that IT processes in the company have been well managed, clearly documented, and performance measurements are carried out consistently for continuous improvement. This achievement reflects the company's seriousness in ensuring alignment between business and IT strategies, risk management, and optimization of IT resources.

However, even though it has reached a relatively high level of maturity, there is still room for improvement towards the maximum level. Therefore, a strategy for strengthening sustainable governance is needed, including improvements in areas that have not been fully achieved according to expectations, strengthening organizational culture based on data and technology, and developing digital capabilities holistically. Thus, PT Energi Nusantara can further strengthen its strategic position in the mining industry through adaptive, innovative, and highly competitive IT governance.

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