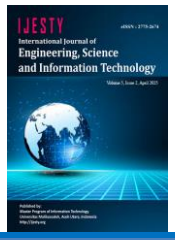
International Journal of Engineering, Science and Information Technology
Volume 5 No. 2 (2025) pp. 195-203
ISSN 2775-2674 (online)
Website: http://ijesty.org/index.php/ijesty
DOI: https://doi.org/10.52088/ijesty.v5i2.811
Research Paper, Short Communication, Review, Technical Paper



IT Governance Maturity Assessment at PT PLN Suluttengo Using COBIT 2019

George Morris William Tangka[1]*, Cherry Lumingkewas[2], Erienika Lompoliu[2]

[1]Faculty of Computer Science, Universitas Klabat, Indonesia
[2]Faculty of Economy and Business, Universitas Klabat, Indonesia

**Corresponding author Email: gtangka@unklab.ac.id*

The manuscript was received on 20 June 2024, revised on 10 October 2024, and accepted on 12 February 2025, date of publication 4 April 2025

Abstract

The rapid development of Information Technology (IT) has made IT governance essential for organizations to align business objectives, manage risks, and optimize resources. PT PLN (Persero) Unit Induk Wilayah Suluttenggo, a key player in electricity distribution in North Sulawesi, Gorontalo, and Central Sulawesi, requires a structured IT governance framework to ensure operational efficiency and compliance. This study evaluates the organization's IT governance maturity using the COBIT 2019 framework, focusing on its Design Factors and Governance Objectives. The research employs a structured methodology, starting with problem identification, a literature review, and the selection of relevant COBIT 2019 domains. Data collection is conducted through structured interviews using the COBIT 2019 Design Toolkit, analyzing ten key Design Factors, including Enterprise Strategy, Risk Profile, IT-related issues, and Compliance Requirements. The findings indicate that PT PLN prioritizes customer service, digital transformation, and regulatory compliance while facing challenges in IT risk management, project execution, and IT investment optimization. Through a detailed assessment of IT governance maturity, this study identifies key gaps and provides recommendations for improvement. Strengthening IT governance practices will enable PT PLN to enhance operational efficiency, mitigate IT-related risks, and align IT initiatives with corporate strategy. The study contributes to both academic research and practical applications by demonstrating the effectiveness of COBIT 2019 in IT governance evaluation.

Keywords: *IT Governance, COBIT 2019, PT PLN, Design Factors, IT Risk Management, Digital Transformation.*

1. Introduction

Information Technology (IT) has developed very rapidly, playing a crucial role in companies. The presence of IT helps enhance the effectiveness and efficiency of business operations. One of the key pieces of evidence demonstrating the importance of IT in a company is the implementation of IT governance. IT governance is a structure of procedures and policies designed to ensure that every process within a company aligns with its business objectives by managing existing risks and IT resources [1] [2] [3].

IT governance is the responsibility of a company's or institution's management and leadership, who do not necessarily need to be IT experts. However, these leaders and managers must be aware of the role and responsibility of IT implementation within the organization to maintain alignment with corporate strategy [4] [5]. The existence of IT governance facilitates the monitoring and evaluation of the performance of IT systems implemented by the company.

One way to implement IT governance is through auditing. An audit is a systematic process of obtaining and evaluating evidence related to actions or processes within a company. It involves assessing this evidence to make appropriate recommendations and determine the necessary corrective actions [5] [6] [7]. Conducting an IT governance audit helps a company evaluate the extent of IT implementation and identify misalignments with the organization's objectives. One approach to conducting such an audit is using the Control Objectives for Information and Related Technology (COBIT) framework [1].

COBIT is a set of guidelines that assist auditors in directing IT governance. The use of COBIT within a company helps in achieving business objectives. The latest version available is COBIT 2019, which replaced COBIT 5 and was developed by the Information System Audit and Control Association (ISACA) [8]. COBIT 2019 helps optimize IT governance by managing risks, maximizing resource

Copyright © Authors. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

utilization, and realizing the benefits of IT implementation. The primary goal of COBIT 2019 is to manage IT within an organization more quickly and efficiently while supporting innovation [9] [10].
PT PLN (Persero) Unit Induk Wilayah Suluttenggo is a division of the state-owned electricity company (PLN) responsible for electricity distribution in North Sulawesi, Gorontalo, and Central Sulawesi [11] [12] [13] [14]. This study aims to assess the IT governance of PT PLN (Persero) Unit Induk using COBIT 2019 as a framework to guide the evaluation process, focusing on identifying the factors affecting the governance design through graphical design factors. This research helps the company evaluate the performance of its IT governance implementation, identify areas requiring improvement, and enhance its IT systems to achieve its business goals.

2. Research Method

Fig 1. Research Design

The research methodology employed in this study follows a systematic flow to comprehensively address the challenges faced by PT. PLN UNIT INDUK in implementing COBIT 2019 for effective IT governance [15] [16] [17]. The research process begins with problem identification, recognizing existing issues in IT management and governance within the organization. Following this, the study proceeds with a literature review, examining previous research and frameworks related to COBIT 2019 implementation. The next step involves determining the relevant COBIT 2019 domains, particularly utilizing the Design Factor 1-10 from the COBIT 2019 Design Toolkit. This step is crucial as it provides a structured approach to assessing the organization's IT governance landscape [1] [18].

1. Enterprise Strategy (Design Factor 1) – This factor emphasizes the importance of key principles such as Growth/Acquisition, Innovation/Differentiation, Cost Leadership, and Client Service/Stability in IT management. Applying these principles can enhance banking services, improve IT efficiency and effectiveness, and contribute to overall corporate stability.
2. Enterprise Goals (Design Factor 2) – In COBIT 2019, this factor addresses the organization's objectives, with 13 key considerations. These include competitive product and service offerings, business risk management, regulatory compliance, financial information quality, customer service culture, business continuity, effective information management, cost optimization, workforce productivity, internal policy adherence, digital transformation initiatives, and innovation in products and business models.
3. IT Risk Profile (Design Factor 3) – COBIT 2019 defines 19 criteria to assess an organization's IT risk profile. These include IT investment decisions, project lifecycle management, IT cost control, IT expertise and behaviour, regulatory compliance, and data and information governance.
4. IT-Related Issues (Design Factor 4) – This factor involves identifying and analyzing IT-related challenges and risks the organization faces. IT issues are assessed based on their severity, and categorized into three levels: 1 (No Issues), 2 (Issues), and 3 (Serious Issues). Identifying these problems using COBIT 2019 criteria enables more effective resolution and future risk mitigation.
5. Threat Landscape (Design Factor 5) – The organization’s exposure to threats is classified into two categories: standard (normal threat levels) and high (elevated threat levels).
6. Compliance Requirements (Design Factor 6) – Regulatory compliance is a key consideration, categorized into three levels: low, regular, and high.
7. Role of IT (Design Factor 7) – This factor determines IT’s function within the organization, classifying it into one of four roles: Support, Factory, Improvement, or Strategic.
8. IT Sourcing Model (Design Factor 8) – The organization’s IT service delivery model can take different forms, including Outsourcing, Cloud services, or a combination of outsourced solutions.
9. IT Implementation Methods (Design Factor 9) – Various IT implementation methodologies are available, such as Agile, DevOps, Traditional, and Hybrid approaches.
10. Technology Adoption Strategy (Design Factor 10) – Companies adopt new technology at different paces. Some are first movers, implementing innovations immediately, while followers wait for broader adoption before proceeding. Slow adopters, on the other hand, take a cautious approach and adopt technology at a much slower pace.

Subsequently, data collection is carried out through structured interviews using the COBIT 2019 Design Toolkit, where key stakeholders respond to questions based on the 10 Design Factors. The results from this step help uncover the organization's current COBIT 2019 implementation status, identify potential gaps, and explore areas for improvement [19] [20]. Once the data is collected, the research advances to the analysis phase, where insights from the interviews are systematically examined. At this stage, the study determines objective priorities, focusing on governance objectives that score above 75% in relevance. To further refine the findings, an additional round of interviews is conducted using COBIT 2019 Governance Objectives, ensuring deeper insights into specific governance aspects crucial for PT. PLN UNIT INDUK [1] [11].
Finally, the research concludes with drawing key insights and recommendations, summarizing findings, and proposing actionable improvements to enhance COBIT 2019 implementation. This structured research flow ensures a holistic understanding of IT governance at PT. PLN UNIT INDUK provides valuable contributions to both academic discourse and practical IT governance strategies.

3. Results and Discussion

3.1. Enterprise Strategy

Table 1 Enterprise Strategy

Value	Importance (1-5)	Baseline
Growth/Acquisition	**1**	**3**
Innovation/Differentiation	**4**	**3**
Cost Leadership	**1**	**3**
Client Service/Stability	**5**	**3**

There are four strategies established by COBIT 2019, which consist of Growth/Acquisition, Innovation/Differentiation, Cost Leadership, and Client Service/Stability. Client Service/Stability and Innovation/Differentiation are the main focus of PT. PLN UNIT INDUK because they consistently prioritize customer satisfaction in every action they take. Additionally, they continuously innovate, especially in the IT sector, as the company's primary focus is its customers.

3.2. Enterprise Goals

Table 2 Enterprise Goals

Value	Importance (1-5)
EG01— Portfolio of competitive products and services	4
EG02—Managed business risk	4
EG03—Compliance with external laws and regulations	5
EG04—Quality of financial information	3
EG05—Customer-oriented service culture	5
EG06—Business-service continuity and availability	5
EG07—Quality of management information	4
EG08—Optimization of internal business process functionality	5
EG09—Optimization of business process costs	5
EG10—Staff skills, motivation and productivity	4
EG11—Compliance with internal policies	4
EG12—Managed digital transformation programs	5
EG13—Product and business innovation	5

PT. PLN UNIT INDUK demonstrates a strong commitment to IT governance and business optimization through various strategic focus areas. The company prioritizes customer-oriented service culture, business continuity, digital transformation, and process optimization, all rated highly due to their critical role in sustaining operational efficiency and competitive advantage. Compliance with external regulations and internal policies is well-managed, ensuring data security and regulatory adherence. Additionally, risk management, staff development, and financial information quality are key considerations, though some areas require further enhancement. With ongoing business and product innovation, PLN continues to strengthen its position in the energy sector, particularly in electrification, internet services, and digital transformation, securing its future competitiveness and sustainability.

3.3. Risk Profile

Table 3 Risk Profile

Risk Scenario Category	Impact (1-5)	Likelihood (1-5)	Risk Rating	Baseline
IT investment decision-making, portfolio definition & maintenance	5	3	15	9
Program & project life cycle management	4	3	12	9
IT cost & oversight	3	4	12	9
IT expertise, skills & behaviour	3	2	6	9
Enterprise/IT architecture	4	3	12	9
IT operational infrastructure incidents	4	4	16	9
Unauthorized actions	4	4	16	9
Software adoption/usage problems	4	4	16	9
Hardware incidents	4	3	12	9
Software failures	5	3	15	9
Logical attacks (hacking, malware, etc.)	4	3	12	9
Third-party/supplier incidents	3	3	9	9
Noncompliance	4	4	16	9
Geopolitical Issues	5	4	20	9
Industrial action	4	2	8	9
Acts of nature	5	3	15	9
Technology-based innovation	4	3	12	9

Environmental	4	2	8	9
Data & information management	4	2	8	9

PT. PLN UNIT INDUK places significant emphasis on IT investment decisions, risk management, and digital transformation to ensure operational efficiency and security. Investment decisions and IT architecture play a crucial role, with thorough assessments conducted before implementation. Risk management strategies are in place to mitigate hardware incidents, software failures, cybersecurity threats, and noncompliance issues, ensuring business continuity. Geopolitical factors, environmental considerations, and industrial actions are also key challenges, given PLN's status as a state-owned enterprise. Technology-based innovation and data management are carefully handled to balance cost, efficiency, and security. While software adoption, vendor management, and regulatory compliance pose challenges, PLN actively implements change management and training programs. Overall, PLN's IT governance framework aims to enhance digital transformation, secure data, and optimize business processes while adapting to regulatory, environmental, and geopolitical shifts.

3.4. I & T Related Issues

Table 4 I & T Related Issues

IT-Related Issue	Importance (1-3)	Baseline
Frustration between different IT entities across the organization because of a perception of low contribution to business value	2	2
Frustration between business departments (i.e., the IT customer) and the IT department because of failed initiatives or a perception of low contribution to business value	2	2
Significant IT-related incidents, such as data loss, security breaches, project failure and application errors, linked to IT	2	2
Service delivery problems by the IT outsourcer(s)	2	2
Failures to meet IT-related regulatory or contractual requirements	1	2
Regular audit findings or other assessment reports about poor IT performance or reported IT quality or service problems	1	2
Substantial hidden and rogue IT spending, that is, IT spending by user departments outside the control of the normal IT investment decision mechanisms and approved budgets	1	2
Duplications or overlaps between various initiatives, or other forms of wasted resources	1	2
Insufficient IT resources, staff with inadequate skills or staff burnout/dissatisfaction	3	2
IT-enabled changes or projects frequently failing to meet business needs and delivered late or over budget	1	2
Reluctance by board members, executives or senior management to engage with IT, or a lack of committed business sponsorship for IT	1	2
Complex IT operating model and/or unclear decision mechanisms for IT-related decisions	1	2
Excessively high cost of IT	1	2
Obstructed or failed implementation of new initiatives or innovations caused by the current IT architecture and systems	1	2
Gap between business and technical knowledge, which leads to business users and information and/or technology specialists speaking different languages	1	2
Regular issues with data quality and integration of data across various sources	1	2
High level of end-user computing, creating (among other problems) a lack of oversight and quality control over the applications that are being developed and put in operation	1	2
Business departments implementing their own information solutions with little or no involvement of the enterprise IT department (related to end-user computing, which often stems from dissatisfaction with IT solutions and services)	1	2
Ignorance of and/or noncompliance with privacy regulations	1	2
Inability to exploit new technologies or innovate using I&T	1	2

PT. PLN UNIT INDUK faces IT-related challenges, including delays in incident handling in remote areas due to infrastructure limitations and frustration between IT and business departments over failed initiatives and unmet expectations. Significant IT incidents, such as security breaches and data loss, can disrupt operations, though service delivery remains within SLA targets. Resource constraints and heavy workloads pose serious concerns, but regulatory compliance, financial oversight, and IT governance are well-maintained, with no major issues in audit findings, budget control, or IT decision-making. While historical concerns about IT's role in decision-making have been resolved, business-IT alignment is strong, and innovation is systematically implemented through research and benchmarking. Additionally, data quality, security, compliance, and business-technical collaboration are effectively managed, ensuring IT-driven transformation without major operational disruptions.

3.5. Threat Landscape

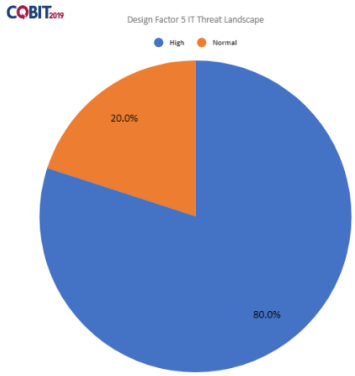


Fig 3. Threat Landscape

In Design Factor 5, there are two value categories: High and Normal. Based on interviews with respondents, 80% of threats at PT. PLN UNIT INDUK are classified as High, indicating that the company operates under a very high level of threat, while 20% fall under the Normal threat level due to its status as a government-regulated industry. The company relies on Operational Technology (OT), which serves as the core system operating within PT. PLN. This IT infrastructure is a critical asset for the company's operations.

3.6 Compliance Requirement

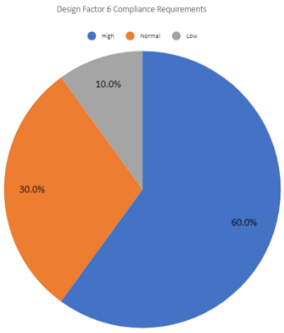


Fig 4. Compliance Requirements

Design Factor 6 has three value categories: High, Normal, and Low. Based on interviews with respondents, the compliance level at PT. PLN UNIT INDUK is 10% Low, 30% Normal, and 60% High. The company's compliance level is relatively high because PT. PLN operates under government supervision.

3.7 Role of IT

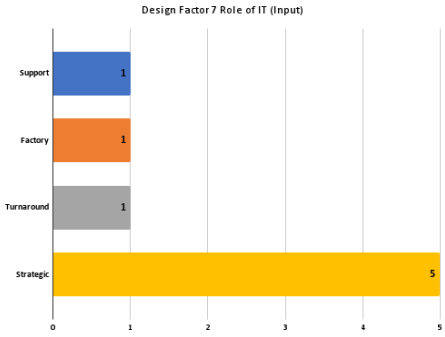


Fig 5. Role of IT

The role of IT in PT. PLN is strategic, as the company operates in networking and technology. Based on interviews with PT. PLN, it was explained that the company heavily relies on IT for innovation, and development—both in software and other technical aspects—and as a crucial support system in business processes. Almost 80% of PT. PLN's planning and work programs are linked to IT. Therefore, a strategic value scale of 5 was assigned.

3.8 Sourcing Model of IT

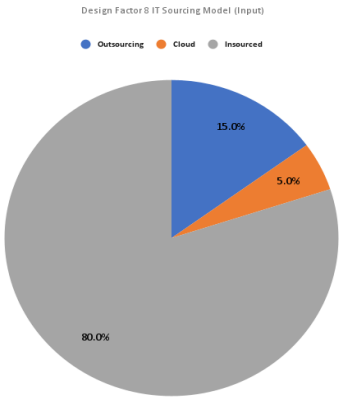


Fig 6. Sourcing Model of IT

In Design Factor 8, the results from interviews with PT. PLN indicate that 80% of resources come from internal sources (insourced) within the company. The outsourced resources account for only 15%, provided by PT. PLN's subsidiary, ICON+. Additionally, cloud services, such as Office 365, make up just 5% of the total resources used.

3.9 IT Implementation Method

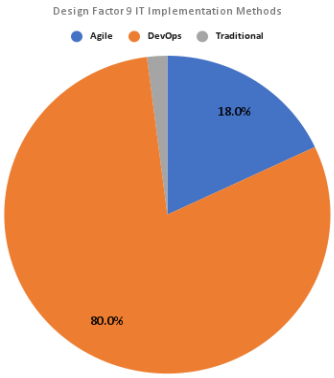


Fig 7. Implementation Method

In Design Factor 9, the results show that PT. PLN implements IT methodologies with DevOps at 80%, Agile at 18%, and Traditional methods at only 2%. DevOps has the highest percentage because it enables more efficient and effective software development and network operations.

3.10 Technology Adaption Strategy

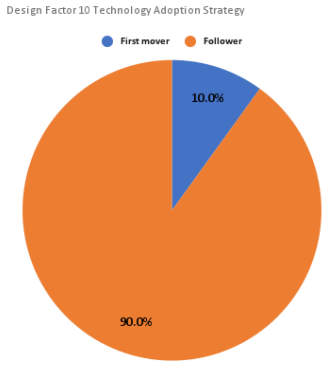
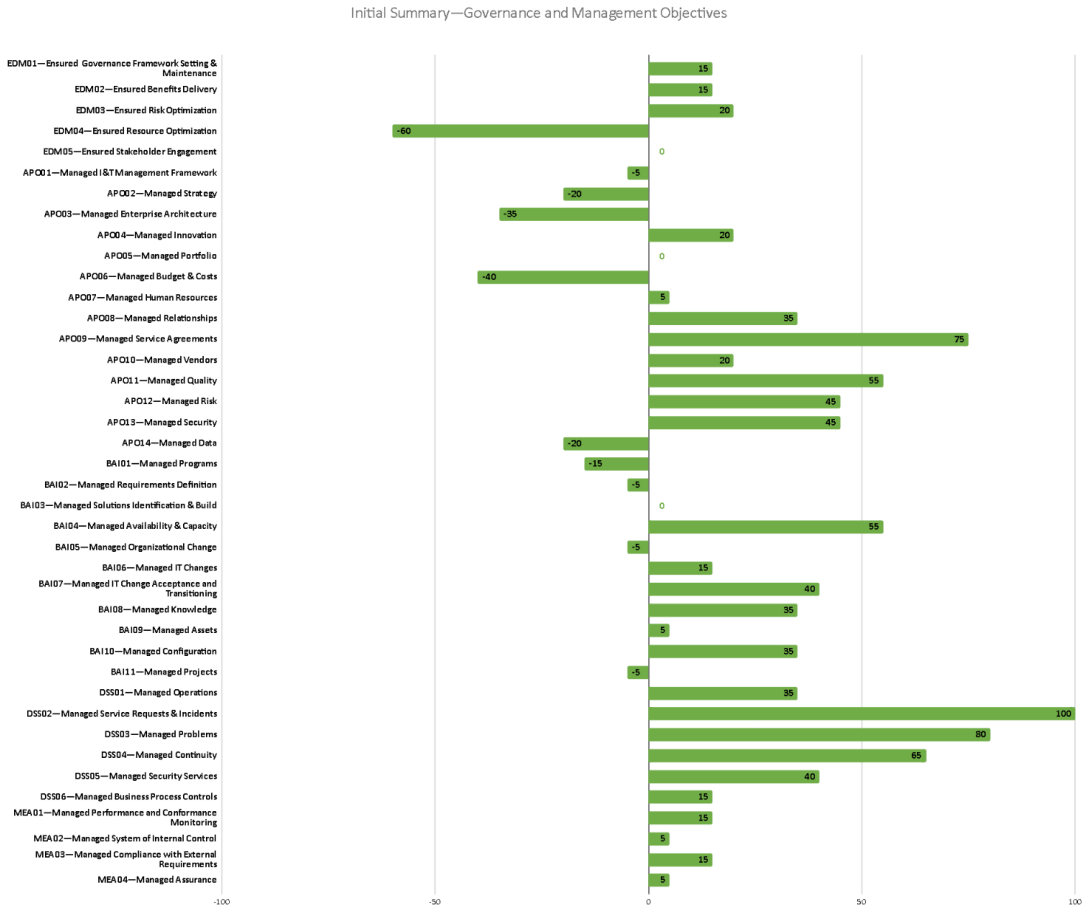


Fig 8. Technology Adaption Strategy

In Design Factor 10, based on the interview results, PT. PLN is classified as a follower, with 90% of its approach reflecting this strategy. Before adopting new technology, PT. PLN observes the success of other companies, particularly in Indonesia, that have already implemented it. Only after evaluating the effectiveness of the technology does PT. PLN proceed with adoption. As for the first mover category, it accounts for 10%, as there are instances where PT. PLN adopts new technology from abroad—only after it has already proven successful—making PT. PLN is the first in Indonesia to implement it.



After conducting the analysis, the expected capability levels for the Governance and Management Objectives in the organization have been determined based on COBIT 2019. Five core models are expected to have a capability level of 1, including APO01, APO14, BAI02, MEA03, and MEA04, indicating foundational processes that require further structuring. Six core models, such as APO04, BAI05, BAI09, DSS06, MEA02, and DSS04, are projected at capability level 2, representing developing processes that need further refinement. Meanwhile, eight models, including APO02, APO06, BAI07, DSS05, MEA01, APO05, BAI08, and APO09, are anticipated at capability level 3, suggesting well-established but not yet optimized processes. Additionally, APO12, APO13, BAI03, BAI04, DSS02, BAI11, and APO10 are expected to reach capability level 4, indicating structured and well-controlled processes. Finally, DSS01, DSS03, and APO08 are projected to attain capability level 5, reflecting continuous improvement and optimization. These high-expectation areas highlight the organization's focus on strengthening operations, problem management, and IT-business alignment to support strategic objectives.

Among these objectives, DSS01, DSS03, and APO08 stand out as critical components for ensuring reliable IT governance and operational excellence. DSS01 – Managed Operations focuses on the structured and efficient delivery of IT operational services, including system monitoring, job scheduling, data backup and restoration, and routine maintenance to ensure service availability and reliability. Meanwhile, DSS03 – Managed Problems emphasizes identifying and resolving the root causes of recurring incidents, reducing system disruptions, and improving overall service stability through systematic problem analysis and permanent corrective actions. Additionally, APO08 – Managed Relationships plays a vital role in fostering transparent communication and collaboration between IT and business units, ensuring that IT services align with business objectives and add value to the organization. The high expected capability levels for these objectives suggest that the organization prioritizes efficient IT operations, proactive problem resolution, and strong IT-business integration. By effectively implementing these objectives, the organization can enhance IT governance, minimize disruptions, optimize resource utilization, and strengthen IT's strategic role in achieving business success.

4. Conclusion

The findings of this study reveal that PT PLN has structured its IT governance framework based on COBIT 2019 to support operational efficiency, risk management, and IT-business alignment. The assessment identifies varying levels of expected capability across Governance and Management Objectives, with APO01, APO14, BAI02, MEA03, and MEA04 at Capability Level 1, indicating foundational processes that require further structuring. APO04, BAI05, BAI09, DSS06, MEA02, and DSS04 are projected at Capability Level 2, representing developing processes that need further refinement, while APO02, APO06, BAI07, DSS05, MEA01, APO05,

BAI08, and APO09 are expected at Capability Level 3, suggesting well-established but not yet fully optimized governance practices. Furthermore, APO12, APO13, BAI03, BAI04, DSS02, BAI11, and APO10 are anticipated to operate at Capability Level 4, indicating structured and well-controlled processes. The highest expectations are assigned to DSS01, DSS03, and APO08, projected at Capability Level 5, reflecting continuous improvement and optimization. PT PLN demonstrates strengths in operational reliability, proactive problem management, and IT-business integration, particularly in DSS01, DSS03, and APO08, which are critical for ensuring efficient IT service delivery, minimizing disruptions, and fostering collaboration between IT and business units. However, challenges remain in areas with lower expected capability levels, particularly in standardizing IT governance processes, improving resource allocation, and enhancing compliance measures. Opportunities for improvement include strengthening IT-business collaboration, refining IT risk management, and optimizing IT resource distribution to ensure a more resilient and adaptive governance framework. By leveraging COBIT 2019's governance design factors and capability model, PT PLN can systematically enhance IT governance maturity, support digital transformation efforts, and strengthen its role in achieving strategic business objectives. Implementing these improvements will align IT governance with PT PLN's long-term goals, ensuring sustainability, innovation, and operational excellence.

References

[1] ISACA, *COBIT® 2019 FRAMEWORK: GOVERNANCE AND MANAGEMENT OBJECTIVES*. ISACA, 2018.

[2] "Systematic Literature Review on Corporate Information Technology Governance in Indonesia using Cobit 2019 | Ikhsan | Prisma Sains : Jurnal Pengkajian Ilmu dan Pembelajaran Matematika dan IPA IKIP Mataram." Accessed: Feb. 17, 2025. [Online]. Available: https://e-journal.undikma.ac.id/index.php/prismasains/article/view/4370

[3] S. De Haes, W. Van Grembergen, A. Joshi, and T. Huygh, "COBIT as a Framework for Enterprise Governance of IT," in *Enterprise Governance of Information Technology: Achieving Alignment and Value in Digital Organizations*, S. De Haes, W. Van Grembergen, A. Joshi, and T. Huygh, Eds., Cham: Springer International Publishing, 2020, pp. 125–162. doi: 10.1007/978-3-030-25918-1_5.

[4] S. F. Bayastura, S. Krisdina, and A. P. Widodo, "Analysis and Design of Information Technology Governance Using the Cobit 2019 Jiko," vol. 4, no. 1. pp. 68-75, 2021. doi: 10.33387/jiko.

[5] P. A. Adawiyah and L. H. Atrinawati, "Perancangan Tata Kelola Teknologi Informasi Menggunakan Framework Cobit 2019," *J. Teknol. dan Sist. Inf*, vol. 1, no. 2, pp. 1-9, 2020, doi: 10.33365/jtsi.v1i2.301.

[6] P. Anastasia and L. Atrinawati, "PERANCANGAN TATA KELOLA TEKNOLOGI INFORMASI MENGGUNAKAN FRAMEWORK COBIT 2019 PADA HOTEL XYZ," *JSI: Jurnal Sistem Informasi (E-Journal)*, vol. 12, Oct. 2020, doi: 10.36706/jsi.v12i2.12329.

[7] M. F. A. Faraby, "Audit Tata Kelola Teknologi Informasi Pada Dinas Komunikasi dan Informatika Kabupaten Agam Menggunakan Framework Cobit 2019," bachelorThesis, Fakultas Sains dan Teknologi UIN Syarif Hidayatullah Jakarta, 2023. Accessed: Jul. 25, 2024. [Online]. Available: https://repository.uinjkt.ac.id/dspace/handle/123456789/71422

[8] ISACA, *COBIT 5: A Business Framework for the Governance and Management of Enterprise IT*. ISACA, 2012.

[9] E. Lompoliu and G. M. W. Tangka, "Information Technology Governance Using the COBIT 2019 Framework at PT Bank Pembangunan Daerah Papua," *International Journal of Engineering, Science and Information Technology*, vol. 4, no. 4, Art. no. 4, Nov. 2024, doi: 10.52088/ijesty.v4i4.609.

[10] G. M. W. Tangka and E. Lompoliu, "Information Technology Governance Using the COBIT 2019 Framework at PT. Pelindo TPK Bitung," *CogITo Smart Journal*, vol. 9, no. 2, Art. no. 2, Dec. 2023, doi: 10.31154/cogito.v9i2.577.355-367.

[11] "Listrik untuk Kehidupan yang Lebih Baik - PT PLN (Persero)." Accessed: Feb. 17, 2025. [Online]. Available: https://web.pln.co.id/

[12] M. R. Pribadi and H. Irsyad, "Model Konseptual Penerapan Tata Kelola TI PLN Pembangkitan Sumbagsel Berdasarkan COBIT 5," *Jurnal Ilmiah Informatika Global*, vol. 9, no. 1, Art. no. 1, Aug. 2018, doi: 10.36982/jiig.v9i1.440.

[13] A. F. Baharuddin, S. Suprapto, and A. R. Perdanakusuma, "Evaluasi Tata Kelola Teknologi Informasi Menggunakan Framework COBIT 5 Domain DSS (Deliver, Service, Support) (Studi Kasus : PT. PLN (Persero) Kantor Pusat)," *Jurnal Pengembangan Teknologi Informasi dan Ilmu Komputer*, vol. 3, no. 9, Art. no. 9, Sep. 2019.

[14] S. R. Widayanto, S. Suprapto, and A. Rachmadi, "Evaluasi Manajemen Teknologi Informasi Menggunakan Framework COBIT 5 Domain Monitoring, Evaluate, and Assess pada PT. PLN (Persero) Kantor Pusat," *Jurnal Pengembangan Teknologi Informasi dan Ilmu Komputer*, vol. 3, no. 7, Art. no. 7, Aug. 2019.

[15] I. W. Budiana, K. Y. E. Aryanto, and I. M. G. Sunarya, "Penilaian Tata Kelola dan Manajemen Infrastruktur TI Bank BPD XYZ Menggunakan COBIT 2019: Assessment of IT Infrastructure Governance and Management Bank BPD XYZ Using the COBIT 2019," *MALCOM: Indonesian Journal of Machine Learning and Computer Science*, vol. 4, no. 1, Art. no. 1, Jan. 2024, doi: 10.57152/malcom.v4i1.1043.

[16] L. H. A. G. I. Belo and Y. T. Wiranti, "Perancangan Tata Kelola Teknologi Informasi Menggunakan COBIT 2019 Pada PT Telekomunikasi Indonesia Regional VI Kalimantan," *Junal Sist. Inf. Ilmu Komput. Prima*, vol. 4, pp. 26-27, 2020.

[17] A. Safitri, I. Syafii, and K. Adi, "Identifikasi Level Pengelolaan Tata Kelola SIPERUMKIM Kota Salatiga berdasarkan COBIT 2019," Jurnal RESTI (Rekayasa Sistem dan Teknologi Informasi), vol. 5, no. 3, pp. 545–552, Jun. 2021, [Online]. Available: https://jurnal.iaii.or.id/index.php/RESTI/article/view/3060

[18] J. Souza Neto, F. Cavalcante, and R. Almeida, *Lessons Learned in Designing a COBIT 2019 Framework for a Brazilian Financial Organization*. 2019. doi: 10.13140/RG.2.2.36820.45440.

[19] M. Solehuddin, Z. Hulwani, and A. P. Widodo, “Perencanaan Tata Kelola Teknologi Informasi Menggunakan Framework Cobit 2019 pada DPMPTSP,” *Jurnal Ilmiah Komputasi*, vol. 20, no. 2, Art. no. 2, Jun. 2021.

[20] G. M. W. Tangka and E. Lompoliu, “Enchancing IT Governance at BPS Manado: A COBIT 2019 Framework Implementation Study,” *TeIKa*, vol. 14, no. 1, Art. no. 1, Jun. 2024, doi: 10.36342/teika.v14i1.3325.