MEASURING INFORMATION TECHNOLOGY GOVERNANCE USING COBIT 2019 FRAMEWORK AT TOURISM INDUSTRY

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Abstract—Although PT XYZ has adopted information technology, it has not formally assessed its governance, leading to persistent issues in IT management, human resource capabilities, and alignment with business processes. This study evaluates IT governance at PT XYZ, a company in the travel and tourism industry, where rapid technological advancements have impacted operations. Using the COBIT 2019 framework, the study assessed IT governance through interviews and literature review, focusing on the domains APO04 – Managed Innovation, BAI02 – Managed Requirements Definition, BAI03 – Managed Solution Identification & Build, and BAI05 – Managed Organizational Change. The results indicate that these domains are at level 2, "Largely Achieved," highlighting areas of improvement. This benchmark provides practical recommendations to enhance IT governance and improve integration between IT and business functions. The findings offer PT XYZ actionable steps to strengthen governance practices, improve organizational performance, and better align technology with strategic business goals.

Keywords: COBIT 2019, corporate governance, integration, IT governance.

Abstrak—Meskipun PT XYZ telah mengadopsi teknologi informasi, perusahaan tersebut belum menilai tata kelolanya secara formal, yang menyebabkan masalah yang terus-menerus dalam manajemen TI, kemampuan sumber daya manusia, dan keselarasan dengan proses bisnis. Studi ini mengevaluasi tata kelola TI di PT XYZ, sebuah perusahaan di industri perjalanan dan pariwisata, yang mengalami kemajuan teknologi yang pesat dan berdampak pada operasional. Dengan menggunakan kerangka kerja COBIT 2019, studi ini menilai tata kelola TI melalui wawancara dan tinjauan pustaka, dengan fokus pada domain APO04 – Managed Innovation, BAI02 – Managed Requirements Definition, BAI03 – Managed Solution Identification & Build, dan BAI05 – Managed Organizational Change. Hasilnya menunjukkan bahwa domain-domain ini berada pada level 2, "Tercapai Secara Luas," yang menyoroti area-area yang perlu ditingkatkan. Tolok ukur ini memberikan rekomendasi praktis untuk meningkatkan tata kelola TI dan meningkatkan integrasi antara TI dan fungsi bisnis. Temuan ini menawarkan langkah-langkah yang dapat ditindaklanjuti bagi PT XYZ untuk memperkuat praktik tata kelola, meningkatkan kinerja organisasi, dan menyelaraskan teknologi dengan tujuan bisnis strategis.

Kata Kunci: COBIT 2019, tata kelola perusahaan, integrasi, tata kelola TI.

INTRODUCTION

Indonesia's tourism industry is experiencing rapid technological advancements, transforming how companies operate and engage with customers (Siregar & Nasution, 2020). In tourism, where customer experience and operational efficiency are paramount, information technology (IT) plays a crucial role in enabling real-time data access, automating booking systems, and personalizing customer interactions (Kraus et al., 2021). Effective IT governance in this sector ensures that technology investments align with business goals, enhance service quality, and meet regulatory requirements, which are critical for maintaining competitiveness (Wang & Guo, 2024). Without proper governance, tourism businesses may face challenges in managing IT performance, ensuring data security, and responding to rapid market changes (Ha & Kumar, 2021). With information technology intricately linked to the internet, fundamental changes have occurred in communication, work

dynamics, and information accessibility. In the business realm, the integration of information technology is pivotal for enhancing operational efficiency, automating tasks, reducing errors, and bolstering productivity (Huda & Sri Pudjiarti, 2024).

COBIT 2019, a framework derived from COBIT 5, emerges as a crucial tool for governing information technology effectively (Ariffin & Ahmad, 2021). This framework, widely used in auditing, aids in evaluating and achieving IT governance goals (Rizki & Bahtiar, 2020). The COBIT 2019 framework, focusing on Capability levels, provides a holistic approach to evaluating information technology governance. Given the imperative of information technology governance for Good Corporate Governance (GCG). COBIT 2019, ITIL, and ISO 38500 are widely used frameworks for governing and managing Information Technology (IT) within organizations. COBIT 2019 is designed to offer a holistic approach to IT governance and management. It emphasizes aligning IT processes with business objectives to maximize value (Rizki & Bahtiar, 2020).

In contrast, ITIL (Information Technology Infrastructure Library) focuses primarily on IT Service Management (ITSM). ITIL offers best practices for delivering high-quality IT services by managing the IT service lifecycle. It emphasizes processes such as incident management, change management, and problem management. However, ITIL does not provide comprehensive guidance on IT governance or strategic alignment as COBIT 2019 does. It is more suitable for organizations aiming to improve operational efficiency in IT service delivery rather than establishing a full-scale governance framework (Ilori et al., 2024).

On the other hand, ISO 38500 is an international standard that provides high-level principles for corporate IT governance. It is aimed at senior executives and decision-makers, focusing on accountability, strategic direction, and IT resource management. Unlike COBIT 2019, ISO 38500 remains conceptual and does not offer actionable steps for operationalizing IT governance (Abdelilah et al., 2024).

COBIT 2019 not only addresses strategic alignment but also provides detailed guidance on processes, controls, and performance metrics that can be audited and measured. Moreover, COBIT 2019 can be integrated with other frameworks like ITIL and ISO 38500 to create a robust ecosystem for IT governance and management. This integration capability allows organizations to optimize IT investments, effectively manage risks, and ensure alignment with business goals (Nachrowi et al., 2020; Visitsilp & Bhumpenpein, 2021).

This study specifically applies the COBIT 2019 framework to assess IT governance maturity at PT XYZ, a tourism company, focusing on key domains: APO (Align, Plan, and Organize), BAI (Build, Acquire, and Implement), DSS (Deliver, Service, and Support), MEA (Monitor, Evaluate, and Assess), and EDM (Evaluate, Direct, and Monitor). Unlike previous research, which often uses COBIT solely for IT control and risk prediction (Sardjono et al., 2021), this study evaluates capability levels through gap analysis to identify areas for improvement and guide targeted recommendations. The findings offer PT XYZ actionable insights to enhance IT alignment with business objectives, mitigate risks, and support sustainable growth in the dynamic tourism sector.

MATERIAL AND METHODS

Previous Studies

The previous study that similar with the ongoing research can be found in previous studies within a TI consulting company. In this company's research, COBIT 2019 domains were utilized, and after evaluation, it was found that APO07 is at level 2 (partially achieved) (Fianty & Brian, 2023). To enhance the capability level of the APO07 domain, it is recommended that the company periodically review training materials and programs, develop tailored training initiatives aligned with the company's requirements and processes, identify, and address skill gaps, and establish Standard Operating Procedures (SOPs) in accordance with COBIT-2019 guidelines. The study by (Hiererra et al., 2022) proposed an IT governance model for smart tourism destinations based on the COBIT 2019 framework. This research employed a qualitative approach, including interviews and case studies, to identify key governance challenges such as aligning IT processes with tourism objectives, optimizing resources, and managing risks effectively. The model emphasized critical governance components like strategic alignment, performance measurement, and continuous improvement, which are essential for the evolving needs of smart tourism environments. Complementing this, the study by (Juan Luis et al., 2022) introduced a strategic approach to managing IT practices in tourism through a multi-criteria decision-making (MCDM) method. This quantitative study focused on determining the optimal sequence of IT processes to enhance operational efficiency and service delivery. The results indicated that structured IT governance practices, including performance monitoring and service optimization, play a pivotal role in improving decision-making and resource allocation in tourism organizations.

Identical with above research, the utilization of COBIT 2019 has been conducted at a university in Indonesia. The objective of the study is to create a

guide for implementing the information technology governance framework. The method employed involves sampling with multiple respondents as data sources, which is different from the previous study. The results of this research indicate that the capability level scores of the university are still low, and there are existing gaps. As a result, several recommendations for improvement have been provided to the university (Priyono & Wella, 2022). A study was also conducted at a library and archives in Indonesia, utilizing COBIT 2019 as the framework. This research differentiates itself by incorporating SWOT analysis and the Balanced Scorecard method. The study's findings resulted in recommendations and suggestions that can be implemented by the library and archives as steps for improvement in organizational change and information technology aspects (Pradipta & Manuputty, 2022).

There is also a similar study conducted on a startup during the pandemic, utilizing COBIT 2019 domain DSS04 – Manage Continuity. The research methodology involves conducting interviews, observations, and ultimately managing the data collected from observations and interviews. The measurement results indicate that the process activities within the DSS04 domain are not fully mature, suggesting there is room for improvement (Tanjung et al., 2021). An evaluation conducted at the National Institution aims to create a self-assessment tool for assessing the maturity level of Business Continuity Management (BCM) using the capability model method. The framework used in this evaluation is COBIT 2019, with a focus on the DSS domain. The main objective is to ensure the continuity of crucial business operations and maintain the availability of information at an acceptable level during significant disruptions (Dionisius & Utama, 2023).

In light of these gaps, the current study expands upon prior research by applying the COBIT 2019 framework comprehensively within the tourism industry. Unlike previous studies with narrower objectives or tools, this study uses COBIT 2019 to assess multiple domains—APO, BAI, DSS, MEA, and EDM—to evaluate overall IT governance maturity at PT XYZ. By employing capability-level measurement and gap analysis, it provides specific, actionable recommendations to enhance IT-business alignment and sector-specific governance practices, addressing a critical need for targeted IT governance in tourism. This approach fills a notable gap in the literature by offering a holistic and industry-tailored IT governance evaluation in a sector where customer experience, data security, and operational agility are pivotal.

Capability Level

Capability level serves as a measure of the current state of the organization and the business process objectives to be achieved (Simatupang et al., 2022). COBIT 2019 employs a capability scheme based on the Capability Maturity Model Integration (CMMI) levels. Each governance process and management objective are assigned a capability level ranging from 0 to 5 (Hardjadinata & Wiratama, 2023; Sudarnoto et al., 2022). Each explanation of the capability level can be seen as follows:

1. Level 0: Basic capabilities lacking, indicating an incomplete approach to governance and management goals.
2. Level 1: Goals achieved somewhat through incomplete activities; potential lack of organization and suboptimal structure.
3. Level 2: Goals achieved through completed basic activities; organized but room for improvement in effectiveness and efficiency.
4. Level 3: Some processes achieve goals in a well-organized manner, relying on organizational assets effectively.
5. Level 4: Well-achieved goals with clear definitions and quantitative performance measurement; well-organized and structured.
6. Level 5: Exceptional goal achievement, highest maturity level, implements continuous improvement cycle systematically for enhanced efficiency and effectiveness.

The Measurement Category explains that capability level measurements can be assessed on a scale from 0% to 100%. Within this range, 0% to 15% is termed as N (Not), 15% to 50% is labeled as P (Partially), 50% to 85% is referred to as L (Largely), and if the scale exceeds 85%, it is denoted as F (Fully), indicating full achievement.
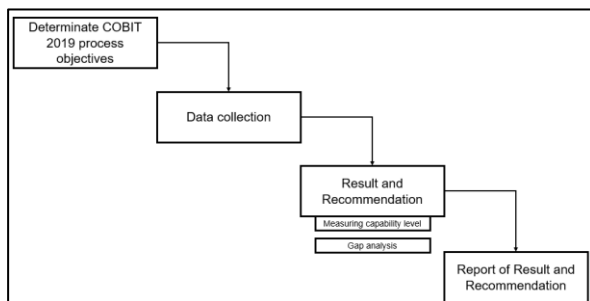
Gap Analysis

RACI Chart, or Responsibility Assignment Matrix, is a tool for defining team roles in tasks or projects (Sori & Utamajaya, 2023). RACI stands for Responsible (directly involved in the work), Accountable (oversees task completion), Consulted (reviews and approves), and Informed (kept in the loop about progress). Additional explanations such as the following.

1. Responsible: This party has a single Responsible role for each task and is directly accountable for it, making it clear who to contact or ask for updates from.
2. Accountable: Even though they are not the ones doing the work themselves, the Accountable party supervises the completion of tasks and bears accountability for the final result.

3. Consulted: This party examines and authorizes the work prior to delivery; there may be more than one role involved for every task, project milestone, or outcome.
4. Informed: This party or group does not directly participate in other aspects of the final product; instead, they are informed about progress and completion.

This research assesses the governance of information technology in companies by utilizing the COBIT-2019 framework. The methodology employed outlines the connections between stages, ensuring a focused and systematic progression of the study. The subsequent section presents the framework adopted for this investigation.

Source: (Research Results, 2024)
Figure 1. Research Workflow

Figure 1, above, represents the methodology employed for researching and measuring the IT governance capability based on previous research (Hardjadinata & Wiratama, 2023).
1. Determinate COBIT 2019. This phase involves interviewing the company owner to complete design factors 1-10 utilizing an ISACA-provided toolkit. Following the completion of this process, the outcome yield the recommended domain based on the filled design factors.
2. The interview process in this study involved key participants in IT management at PT XYZ, such as the IT manager and department heads. Semi-structured interviews were conducted to gather insights into the company's IT governance practices. Additional data were collected through direct observation of the company's IT infrastructure and a review of internal documents. This approach provided a comprehensive understanding of the challenges, existing practices, and maturity level of the company's IT governance.
3. Measuring Capability Level. The capability measurement was performed on the toolkit's recommended domain and resulted in a capability level. The level of capabilities varies from level 1 to level 5. The Level 1 to level 5

scale is determined based on the guidance of the capability level range.
4. Gap Analysis. Gap analysis was conducted by comparing the target capability level with the current capability level of the company. This gap analysis showed the extent of the difference between the company's current capability level and the targeted capability level between the current level of the company's capabilities with targeted capability level.
5. Result and Recommendation. This stage provide the overall results of the research carried out and provide recommendations for improvements that can be made to the company.

RESULTS AND DISCUSSION

Determinate COBIT 2019 Process Objectives

Design factor is divided into 2, namely the scope of governance (DF1-DF4) and governance system (DF5-DF11). In filling design factor 1-10 the company wants to focus on improving service to customers, Compliance (Compliance) and employee productivity as well as the alignment of information technology with business processes that are currently running. This step is also the first step so that companies can know the maturity level of corporate information technology governance today. By using the COBIT Design Toolkit, it is expected to determine the recommended domain for recommendations more accurately. The result of design factor toolkit can be seen in the table below (Table 1).

Table 1. Recommended Domain

Core Model	Priority	Capability Level Target
APO04 – Managed Innovation	75	3
BAI02 – Managed Requirements Definition	85	4
BAI03 – Managed Solution Identification & Build	95	4
BAI05 – Managed Organizational Change	100	4

Source: (Research Results, 2024)

Measuring Capability Level

After determining the domain and auditee using the RACI chart, capability calculation can be conducted to assess the company's capability level. If the average score is equal to or exceeds 85%, the company can proceed to the next capability level. Conversely, if the average score is less than 85%, it is considered not achieved, and the company cannot progress to the next level. The Capability Measurement Table indicates that Fully Achieved, with scores between 85% and 100%, represents the highest mastery of capabilities and serves as a

prerequisite for advancing to the next level. These assessment results are obtained from interviews with respondents at PT. XYZ. The result of capability level measurement can be seen on the Table 2.

Table 2. Capability level measurement result

Domain	Value
APO04 – Managed Innovation	49%
BAI02 – Managed Requirements Definition	71%
BAI03 – Managed Solution Identification & Build	82%
BAI05 – Managed Organizational Change	80%

Source: (Research Results, 2024)

The data in Table 2, derived from interviews between auditors and auditees, with auditees identified through RACI chart mapping. In these interviews, auditors evaluate the subprocess activities within the designated domain, followed by calculating the total value of the activities and dividing it by the total number of assessed subprocesses.

Gap Analysis

Based on the results of the capability level measurement in Table 2, a gap analysis was conducted to determine the disparity between the company's current capability level and the targeted capability level. This analysis aims to identify the extent of improvement required for each domain and prioritize areas that need immediate attention. By understanding these gaps, PT XYZ can develop a more structured approach to IT governance enhancement. The results of this analysis are presented in Table 3, which compares the current and target levels for each domain.

Table 3. Gap Analysis Result

Domain	Current Level	Target Level	Gap
APO04 – Managed Innovation	2	3	1
BAI02 – Managed Requirements Definition	2	4	2
BAI03 – Managed Solution Identification & Build	2	4	2
BAI05 – Managed Organizational Change	2	4	2

Source: (Research Results, 2024)

According to Table 2 the results of the Capability Level Measurement show that PT. XYZ received scores ranging from 49% to 82% for various domains. The Fully Achieved category indicates that none of the domains met the necessary 85% threshold to proceed to the next capability level. Following that, the Gap Analysis, as shown in Table 3 and Figure 2, reveals the disparity between current capability levels and the predetermined targets set during the COBIT 2019 domain determination process. The analysis

indicates areas that need improvement and attention by highlighting the gaps in each domain.
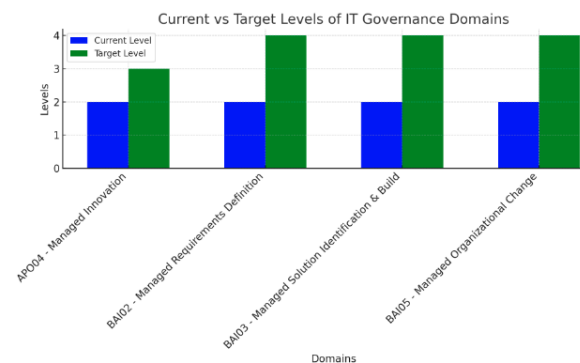
Source: (Research Results, 2024)
Figure 2. Gap Analysis

The results indicate that the most significant gaps exist in BAI02, BAI03, and BAI05, which are all two levels below the target. This suggests that the organization lacks structured processes for managing requirements, identifying solutions, and handling organizational change, potentially hindering effective IT governance implementation. The inability to reach the targeted capability level in these domains implies that PT XYZ may face challenges in ensuring a seamless transition in IT-related business processes, affecting overall efficiency and innovation. Addressing these gaps should be a strategic priority to enhance IT governance maturity.

Result Report and Recommendation

PT. XYZ received audit recommendations derived from the findings of a previously conducted capability assessment. These audit recommendations aim to assist PT. XYZ in reaching its desired goals and expanding its targets, fostering company growth. To facilitate understanding, a comprehensive gap analysis was presented in tables and charts, providing PT. XYZ with a clear visual representation of the disparities between their current level and the intended targets. The subsequent section outlines the suggested improvements for implementation by PT. XYZ.

The recommendations provided in Table 4 are categorized based on priority levels. The most critical improvements should focus on organizational change management (BAI05) and solution identification (BAI03), as these have the highest capability gaps. Addressing these areas first will help in achieving structured IT governance before progressing to other domains.

Table 4. Improvement recommendation

Process Domain	Activity	Recommendation
APO04.01	1	Evaluate the company's capabilities and resources (employee expertise, technology infrastructure, and budget). Form an innovation team with representation from various company departments, identify innovation risks, and create a management strategy.
APO04.01	2	Select and implement a data storage system that aligns with company security needs (consider private cloud storage).
APO04.02	1	Provide training for employees on information technology and collaborate with IT experts for suitable solutions.
APO04.03	1	Define clear, measurable goals for technology innovation aligned with the company's vision and mission.
BAI02.01	2	Evaluate and adopt technology to achieve desired business capabilities. Implement changes gradually and systematically to avoid risks.
BAI03.01	3	Review and update policies and procedures according to applicable regulations and contracts. Ensure the company's structure supports contract obligations and compliance with regulations.
BAI03.02	5	Implement a storage system (local, cloud computing, or hybrid storage). Evaluate service providers for security and compliance.
BAI05.01	4	Enhance communication between senior management, business owners, and the entire organization. Conduct leadership training for seniors.
BAI05.04	1	Develop a training plan for employees, involve them in planning to understand relevant training needs better.

Source: (Research Results, 2024)

Discussion

The results of this study indicate that PT XYZ's IT governance maturity is still at level 2, which means that while basic processes are in place, significant improvements are needed to enhance efficiency and effectiveness. The recommendations provided are expected to serve as a structured guide for the company to achieve its targeted capability level. Addressing the identified gaps, particularly in innovation management and organizational change, is crucial for ensuring sustainable IT governance. However, in implementing these improvements, certain challenges and limitations must be considered.

The limitations encountered during this research highlight important considerations for both practical application and theoretical advancement. Practically, the absence of on-site observations due to the company's location outside Java underscores the challenges faced when implementing IT governance frameworks in geographically dispersed organizations. This limitation emphasizes the need for developing remote monitoring tools and mechanisms to ensure effective oversight of IT governance practices. Furthermore, the lack of direct observation impacts the ability to assess the real-world feasibility and effectiveness of the given recommendations, which could influence the long-term success of governance improvement initiatives.

The diversity in methods employed when using the same framework, such as COBIT 2019, presents both challenges and opportunities for practitioners. It illustrates that while the framework provides a standardized structure, the flexibility in its application can lead to varying outcomes depending on the methodologies chosen. This highlights the importance of tailoring governance frameworks to the specific needs and contexts of organizations, while also establishing best practices to enhance consistency and comparability across implementations.

Theoretically, the use of the COBIT 2019 framework in this research contributes to the growing body of knowledge on IT governance and risk management. By focusing on domains such as APO04, BAI02, BAI03, and BAI05, and incorporating tools like the COBIT 2019 Design Factor Toolkit, this study provides a more structured approach to domain selection and governance evaluation. The application of gap analysis and the calculation of domain averages further enriches the methodological toolkit available for researchers and practitioners. Additionally, the use of RACI mapping for identifying key interview respondents ensures a systematic approach to data collection, enhancing the reliability of the findings.

This study also distinguishes itself from prior research by applying COBIT 2019, rather than older frameworks or alternative methodologies like linear regression, SWOT analysis, or balanced scorecards. This distinction underscores the evolving nature of IT governance research and its adaptation to contemporary challenges. By aligning with COBIT 2019, the research provides insights that are directly applicable to modern organizations, particularly those in the travel and tourism sector like PT. XYZ.

The focus on IT governance and risk management within the context of a travel and tourism company also adds to the theoretical discourse by addressing sector-specific challenges. As organizations in this industry face unique risks and operational demands, the findings of this study can guide other companies in adopting and tailoring IT governance practices to meet their needs.

CONCLUSION

Based on COBIT 2019 framework assessments, PT. XYZ should focus on enhancing capability in the domains APO04 – Managed Innovation, BAI02 – Managed Requirements Definition, BAI03 – Managed Solution Identification & Build, and BAI05 – Managed Organizational Change. Currently at the "L" (Largely Achieved) level, which indicates implemented activities with identified shortcomings, PT. XYZ is advised to follow the given improvement recommendations. Implementing these recommendations is expected to elevate the company's capabilities to the targeted level 3.

The recommendations provided aim to bridge these gaps and elevate the company's capabilities to the targeted maturity level of 3 (Established Process). Achieving this level would signify a more structured, standardized, and consistently applied governance framework across the organization. For PT. XYZ, a company operating in the travel and tourism sector, these improvements are expected to enhance innovation, streamline solution delivery, and manage organizational changes more effectively, ultimately supporting its strategic goals and operational resilience.

These findings have both practical and theoretical implications. Practically, they offer actionable insights into how PT. XYZ can optimize its IT governance practices to address current deficiencies. The recommendations also serve as a roadmap for other organizations facing similar challenges, particularly those in industries characterized by dynamic operational demands. Theoretically, this study reinforces the value of COBIT 2019 as a robust framework for evaluating and improving IT governance capabilities, contributing to the broader discourse on its application in various sectors.

This study is subject to several limitations. First, the assessment relies on available internal data and the current organizational structure, which may not fully capture future changes in business objectives or IT governance needs. Additionally, the assessment's focus on specific COBIT domains might overlook other areas requiring improvement, particularly as the company's priorities evolve. Finally, the successful implementation of recommendations depends on optimal resource allocation and management support, which may vary based on organizational constraints.

Future studies should expand the scope by examining additional COBIT domains to capture a more comprehensive view of IT governance maturity across PT. XYZ. Moreover, further analysis could incorporate a comparative study over multiple assessment periods to measure the effectiveness of implemented recommendations and track improvements over time. Investigating the impact of emerging technologies on these COBIT domains could also enhance the adaptability of recommendations, ensuring long-term relevance.

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