SAP ASSESSMENT USING COBIT 2019 AND ITIL FOR SYSTEM IMPROVEMENT AND STRATEGIC DECISION SUPPORT

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Abstract— *The increasing reliance on Information Technology (IT) for enhancing business performance has led organizations to adopt structured governance and service management frameworks. This study evaluates the IT governance implementation at PT. Natural Indococonut Organik—an organic coconut enterprise that relies on SAP as its core enterprise system. Using the COBIT 2019 and ITIL V.3 frameworks, the study assesses IT process capability, service management maturity, and alignment with best practices. A qualitative descriptive approach was applied through three structured interviews with IT personnel. The first interview used COBIT 2019 Design Factors to identify priority processes: APO12 (Managed Risk), DSS01 (Managed Operations), and MEA03 (Managed Compliance). The second assessed these processes' capability levels, revealing gaps below the target level (Level 4): APO12 at 33%, DSS01 at 75%, and MEA03 at 12.5%. The third interview applied the ITIL Self-Assessment to evaluate the service desk, with results indicating partial achievement and an overall maturity near Level 2. Key deficiencies were found in risk management, compliance oversight, operational consistency, and user feedback mechanisms—areas critical to supporting SAP effectively. Findings are categorized into design, evaluation, and improvement domains, demonstrating how governance analysis contributes to enhancing enterprise information systems. Strengthening SAP-related risk controls, service procedures, and user engagement processes is essential to elevate governance maturity and system performance.*

Keywords: COBIT 2019, ITIL V3, IT Governance, IT Service Management.

Intisari— *Ketergantungan yang semakin meningkat terhadap Teknologi Informasi (TI) untuk meningkatkan kinerja bisnis telah mendorong organisasi untuk mengadopsi kerangka kerja tata kelola dan manajemen layanan yang terstruktur. Studi ini mengevaluasi implementasi tata kelola TI di PT. Natural Indococonut Organik—perusahaan kelapa organik yang mengandalkan SAP sebagai sistem inti perusahaannya. Dengan menggunakan kerangka kerja COBIT 2019 dan ITIL V.3, penelitian ini menilai kapabilitas proses TI, tingkat kematangan manajemen layanan, serta kesesuaiannya dengan praktik terbaik. Pendekatan deskriptif kualitatif digunakan melalui tiga wawancara terstruktur dengan personel TI. Wawancara pertama menggunakan COBIT 2019 Design Factors untuk mengidentifikasi proses prioritas: APO12 (Manajemen Risiko), DSS01 (Manajemen Operasi), dan MEA03 (Manajemen Kepatuhan). Wawancara kedua menilai tingkat kapabilitas proses tersebut dan menunjukkan bahwa semuanya berada di bawah tingkat kapabilitas target (Level 4): APO12 sebesar 33%, DSS01 75%, dan MEA03 12,5%. Wawancara ketiga menggunakan ITIL Self-Assessment untuk mengevaluasi meja layanan, dengan hasil yang menunjukkan pencapaian parsial dan tingkat kematangan keseluruhan mendekati Level 2. Kelemahan utama ditemukan pada manajemen risiko, pengawasan kepatuhan, konsistensi operasional, dan mekanisme umpan balik pengguna—yang semuanya sangat penting untuk mendukung SAP secara efektif. Temuan dikategorikan ke dalam domain desain, evaluasi, dan perbaikan, yang menunjukkan bagaimana analisis tata kelola dapat berkontribusi terhadap peningkatan*

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sistem informasi perusahaan. Penguatan pengendalian risiko terkait SAP, prosedur layanan, dan keterlibatan pengguna sangat penting untuk meningkatkan kematangan tata kelola dan kinerja sistem.

__Kata Kunci__: COBIT 2019, ITIL V3, Tata Kelola IT, Manajemen Layanan IT.

INTRODUCTION

The rapid advancement of information technology (IT) has significantly reshaped organizational practices, driving changes across operations, structure, and service delivery. In particular, IT has enabled organizations to enhance operational efficiency by automating business processes, reducing human error, and improving decision-making speed [1], [2]. These improvements have also contributed to cost savings and faster problem resolution [3]. Digital transformation is now a critical aspect of organizational strategy. According to Verma and Sybol [4], technology plays a pivotal role in facilitating structural change, enabling enterprises to remain competitive and adaptive in dynamic business environments. Additionally, the integration of technologies such as IoT, Big Data, and AI has further enhanced the alignment between IT capabilities and business innovation strategies [5].

On the service side, organizations are using IT to deliver personalized and responsive services. The ability to collect and analyze customer data allows businesses to tailor experiences, improving engagement and satisfaction[1], [6]. Castillo et al. [7] emphasize that IT also plays a central role in driving open innovation, empowering firms to create novel products and services. Furthermore, IT supports the achievement of sustainability goals by enabling environmentally conscious practices and green technology adoption [8]. Through improved eco-efficiency and support for environmental, social, and governance (ESG) goals, IT is increasingly contributing to broader organizational responsibility and value creation.

However, the increasing reliance on digital systems also requires strong adaptability and continual upgrades to mitigate operational and security risks [1], [3]. To respond effectively, many organizations implement standardized frameworks for IT governance and service management. COBIT 2019, developed by ISACA, offers a structured governance model encompassing five key domains—EDM, APO, BAI, DSS, and MEA—and integrates 11 Design Factors to ensure strategic alignment between IT initiatives and enterprise objectives [9], [10]. As highlighted by Rozehnal and Novák [11], the framework also emphasizes process information flows as critical design components in

governance architecture. Complementing COBIT, ITIL V.3 provides a flexible set of best practices for managing IT services, with emphasis on improving service quality, operational efficiency, and business-IT alignment needs [12] . Research by Serrano et al. [13] suggests that ITIL has been widely adopted for its ability to optimize service delivery and support ongoing digital transformation efforts.

In the context of PT. Natural Indococonut Organik—an organic coconut manufacturing company relying on SAP as its core ERP system—an initial observation with the IT team revealed critical governance and service management weaknesses. These included reactive rather than proactive risk management, absence of documented mitigation plans, incomplete compliance monitoring, and infrastructure vulnerabilities such as untested UPS systems and unprotected cabling.

An early capability snapshot from the first stage of this study indicated that key SAP-related governance processes and service management functions were performing below the company's target maturity. Preliminary measurements showed that Managed Risk (APO12) achieved approximately 33% of the expected criteria, Managed Operations (DSS01) about 75%, and Managed Compliance (MEA03) just over 12%. The ITIL V.3 Service Desk maturity was also estimated near Level 2, indicating only partial alignment with best practices. These initial figures — later confirmed and analyzed in detail in the Results section — pointed to a substantial gap between SAP's intended role in ensuring uninterrupted operations, compliance readiness, and risk resilience, and its actual capability in practice. This gap highlighted the urgency for a structured governance and service management evaluation.

At the operational level, IT Service Management (ITSM) offers systematic approaches to managing IT infrastructure and applications. These practices are vital for maintaining service reliability, minimizing downtime, and ensuring that IT services consistently meet organizational performance expectations [14], [15]. Various studies have applied COBIT and ITIL frameworks to assess IT governance and service maturity across sectors. Unlike these studies, this research offers a distinct contribution by integrating both frameworks within a manufacturing company's ERP (SAP) context, highlighting practical governance

and service alignment. Table 1 summarizes the related works and this study's unique focus.

Table 1. Related Studies

No	Sector	Framework(s)	Distinct Contribution of This Study
1	Higher Education Institution [16]	COBIT 2019, ITIL 4	Offers an integrated COBIT–ITIL evaluation within the context of a specific ERP system (SAP) in a manufacturing company
2	Cross-sector [17]	COBIT & ITIL	Provides a field-based assessment and empirical validation through interviews and document triangulation in a real-world company
3	Similar field: Manufacturing. [18], [19]	COBIT 2019	Combines IT governance analysis with IT service management maturity using ITIL V.3, covering both structural and execution layers

Source : (Research Results, 2025)

While COBIT and ITIL are widely implemented independently, empirical studies that explore their combined application, particularly within a single organization, remain limited. This is evident from the implementation challenges and future research calls highlighted in [20], who note the complexity and resource demands of integrating both frameworks effectively within financial institutions.

This study aims to evaluate the IT governance and service management capabilities at PT. Natural Indococonut Organik, a company in the organic coconut industry that utilizes SAP as its core enterprise information system. Although SAP plays a central role in supporting business operations, the organization has experienced operational inefficiencies, limited governance visibility, and user-related service challenges. These issues suggest underlying gaps in IT governance structures and service management practices, particularly in areas critical to system reliability, compliance, and user satisfaction :

1. Identify priority governance processes using COBIT 2019 Design Factors,
2. Evaluate the capability levels of key COBIT processes related to SAP,
3. Assess the maturity of IT service management through an ITIL-based self-assessment, and
4. Analyze how governance gaps affect the design, evaluation, and improvement of SAP-based systems and provide actionable recommendations for enhancement.

This final objective is addressed by categorizing the identified governance gaps according to their operational impact on SAP-based systems and linking them to specific, targeted solutions. By extending the assessment into a structured roadmap for improvement, the study demonstrates how IT governance analysis can support system reliability, compliance, user satisfaction, and more informed decision-making—reinforcing its strategic role in enhancing enterprise information systems.

MATERIALS AND METHODS

As shown in Figure 1, this study adopts a qualitative descriptive approach to evaluate the implementation of IT governance at PT. Natural Indococonut Organik. Specifically, it applies the COBIT 2019 and ITIL V.3 frameworks to assess system control, service performance, and governance capabilities related to the SAP system. Purposive sampling was used to select key IT personnel directly involved in SAP operations, IT risk management, and compliance activities.
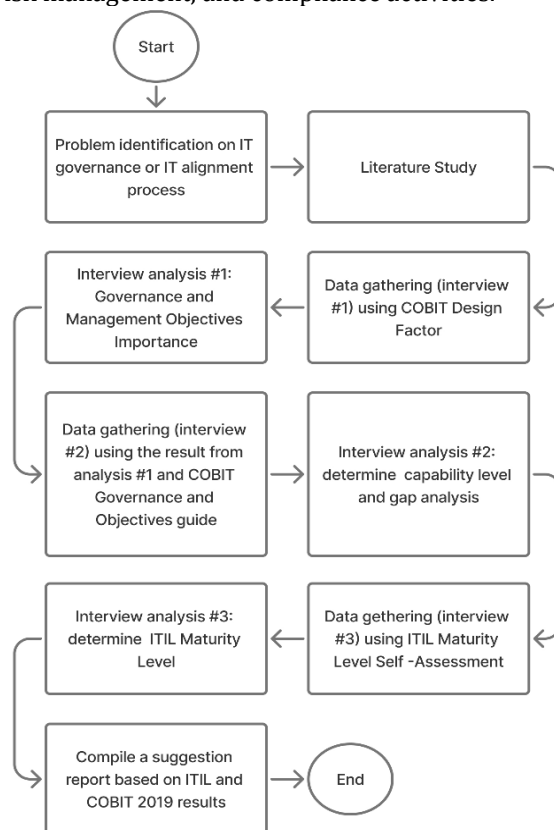
Source : (Research Results, 2025)
Figure 1. Research Flow Diagram

The selection of three respondents was based on the organization's RACI (Responsible, Accountable, Consulted, Informed) chart for SAP governance and service management processes. In this chart, the Head of IT, Systems Administrator, and Risk & Compliance Officer are designated as

Responsible (R) for the operational, risk, and compliance activities under evaluation.

These positions collectively cover strategic decision-making, daily operational management, and regulatory compliance oversight, providing a holistic perspective on SAP governance despite the small sample size. As supported by Vasileiou et al. [21], adequacy in qualitative sampling is determined by data richness and relevance rather than the number of participants, particularly when purposive selection is employed. The RACI model, as outlined by the Project Management Institute [22] is widely recognized for clarifying roles and responsibilities in organizational processes, making it an appropriate tool for identifying key informants in governance studies.

Data collection was conducted through three structured interview sessions. The first interview (Interview #1) utilized COBIT 2019 Design Factors [23], [24] to gather contextual data on the company's strategic goals, risk profile, IT-related issues, and threat landscape. These inputs were analyzed in Interview Analysis #1 to identify the most relevant Governance and Management Objectives for further assessment. The second interview (Interview #2) evaluated the organization's achievement of these objectives, enabling capability level assessments and gap analysis based on COBIT 2019 Governance and Management Objectives [25]. The third interview (Interview #3) employed the ITIL Maturity Level Self-Assessment [26] to measure the maturity of the organization's IT service management, with results analyzed in Interview Analysis #3.

Qualitative data analysis followed the thematic analysis approach [27], involving systematic coding of interview transcripts to identify recurring governance and operational patterns. Codes were grouped into broader themes corresponding to risk management, operational consistency, compliance assurance, and service quality. To enhance credibility and reduce subjectivity, methodological triangulation [28] was applied by cross-verifying interview findings with internal documentation (e.g., SAP operational logs, compliance audit records) and secondary sources. This combination of thematic coding and triangulation provided structured, validated insights into the organization's governance capability and service maturity.

The interviews involved three IT professionals: the Head of IT, and in the second interview, two additional IT staff. Their roles aligned with the targeted governance and management objectives identified after the first interview—specifically COBIT processes APO12

(Managed Risk), DSS01 (Managed Operations), and MEA03 (Managed Compliance with External Requirements)—as well as the ITIL assessment in the final interview.

RESULTS AND DISCUSSION

The research interviews in this study began with an analysis of the 10 Design Factors, which served as the basis for determining the priority processes for IT governance at PT. Natural Indococonut Organik. Based on the findings, using the COBIT 2019 Design Factor Toolkit, it was identified that the key priority processes requiring focused attention are APO12 (Risk Management), DSS01 (Operations Management), and MEA03 (Compliance Management with External Requirements). These three processes were selected due to their significant impact on risk management, operational effectiveness, and compliance with external regulations.

Further assessment was conducted to evaluate the capability level of each process based on the COBIT 2019 framework. The interview results provided insights into the extent to which the company meets the expected capability targets for each priority process. The following interview findings offer a more detailed explanation of the framework's implementation from the company's perspective, along with the data that has been collected. We will now discuss the results of all the design factors from the first interview.

Design Factor Analysis (First Interview)
1. Design Factor 1 : Enterprise Strategy

Based on interviews with the IT staff, PT. Natural Indococonut Organik is currently focusing its strategy on business growth and product development, with support from the SAP system in managing production and inventory. Because innovation is considered crucial in achieving these goals, it was given a score of 3. Cost efficiency is acknowledged, and the SAP system is used to help monitor expenses; however, because it is not the primary concern, cost leadership was given a score of 2. Customer service, on the other hand, is not yet a strategic focus, and due to the limited use of SAP's CRM features, it was given the lowest score of 1.

2. Design Factor 2: Enterprise Goals

The interview results for Design Factor 2 indicate that the organization places strong emphasis on developing a competitive portfolio of products and services, as well as complying with laws and external regulations—both receiving the highest score of 5. This reflects the critical role of the

SAP system in supporting integrated product management and compliance tracking. Internal business process functions, on the other hand, received a low score of 2, suggesting that process optimization through SAP—especially cross-departmental integration—still requires improvement. Additionally, financial information quality and digital transformation scored high (4 and 5 respectively), showing that SAP is being effectively utilized to generate reliable financial reports and support digital initiatives. Customer-oriented service culture and business service communities received scores of 3 and 4, indicating that SAP features such as CRM have not yet been fully leveraged to enhance customer experience. Overall, the results show that SAP plays a key role in the organization's strategic priorities, but there is still room for improvement in maximizing its potential, particularly in internal process efficiency and customer service. This is illustrated in the diagram below.

3.   Design Factor 3: Risk Profile

The interview results for Design Factor 3 highlight several risk categories that directly or indirectly affect the stability and effectiveness of the SAP system. Because IT expertise and behavior are essential for operating and maintaining SAP modules correctly, and data and information management ensures the accuracy of input across departments, both were given an impact score of 5 and a probability score of 4. These risks are considered critical due to frequent errors in data entry and limited understanding of SAP functionalities among some users. Additionally, because IT infrastructure incidents—such as unstable networks, slow system performance, or power outages—can cause downtime or delays in SAP access, and logical attacks (e.g., malware or unauthorized access) can compromise system integrity, these categories were each given an impact score of 5 and probability scores between 3 and 4.

On the other hand, technology-driven innovation and environmental risks were not seen as urgent threats to SAP usage, since innovation is not the primary focus and environmental disruptions (like floods or earthquakes) have not occurred frequently; therefore, both were assigned an impact score of 1 and a probability score of 2. These scores suggest that the organization should prioritize risk management efforts in areas that directly impact SAP performance and security. The complete assessment is presented in the Table 2 below.

Table 2. Result of Design Factor 3

No	Risk Scenario Category	Impact (1-5)	Likelihood (1-5)
1	IT investment decision making, portfolio definition & maintenance	4	3
2	Program & projects life cycle management	2	2
3	IT cost & oversight	4	3
4	IT expertise, skills & behavior	5	4
5	Enterprise/IT architecture	3	2
6	IT operational infrastructure incidents	5	3
7	Unauthorized actions	4	3
8	Software adoption/usage problems	3	3
9	Hardware incidents	4	4
10	Software failures	3	3
11	Logical attacks (hacking, malware, etc.)	5	3
12	Third-party/supplier incidents	4	4
13	Noncompliance	4	3
14	Geopolitical Issues	3	3
15	Industrial action	2	3
16	Acts of nature	5	2
17	Technology-based innovation	1	2
18	Environmental	1	2
19	Data & information management	5	4

Source : (Research Results, 2025)

4.   Design Factor 4 and 5: IT Related Issues and Threat Landscape

The interview results for Design Factor 4 highlight various issues related to information and technology that directly or indirectly impact the SAP system. The most critical issue involves data quality and integration from multiple sources, which is essential for ensuring accurate reporting across SAP modules such as finance, inventory, and production. Because inconsistencies in data input and lack of integration between systems often disrupt SAP workflows and decision-making processes, this issue was considered highly important and thus given a score of 3. Other issues—such as frustration between business and IT departments due to failed initiatives, significant IT incidents like data loss and security breaches, duplication of initiatives, and shortages in IT resources and skills—have caused delays in SAP-related projects and reduced user satisfaction. As a result, these issues were given a score of 2. Meanwhile, issues like very high IT costs, complex IT operating models, and failures in executing IT-supported projects were seen as having minimal direct impact on SAP operations, so they were given a score of 1. This can be seen on Table 3.

The interview results for Design Factor 5 show that the company generally operates in a stable environment with manageable external risks. Because most SAP operations, including data storage and access, have not experienced significant

disruptions due to external threats, the company is considered to operate in a normal threat environment (70%), while only 30% of the company is exposed to high-level threats, such as cybersecurity risks that could affect SAP performance.

Table 3. Result of Design Factor 4

No	I&T-Related Issue	Estimated Score
1	Frustration between different IT entities across the organization	2
2	Frustration between business departments and IT due to failed initiatives	2
3	Significant I&T-related incidents (data loss, breaches, failures)	2
4	Service delivery problems by IT outsourcers	1
5	Failures to meet IT-related regulatory or contractual requirements	2
6	Regular audit findings or poor IT performance	2
7	Hidden or rogue IT spending	1
8	Duplicated initiatives or wasted resources	2
9	Insufficient IT resources or staff burnout	2
10	Frequent failure of IT-enabled projects	1
11	Lack of executive support or sponsorship	1
12	Complex IT models or unclear decision-making	1
13	Excessively high IT costs	1
14	Failed initiatives due to IT architecture	1
15	Knowledge gap between business and IT	1
16	Data quality issues and poor integration	3
17	End-user computing problems	1
18	Departments implement IT without IT's involvement	1
19	Noncompliance with privacy regulations	2
20	Inability to innovate with new technologies	1

Source : (Research Results, 2025)

5. *Design Factor 6 and 7 : Compliance Requirements and Role of IT*

For Design Factor 6, the company has shown strong adherence to regulatory compliance, which is crucial for modules within SAP that handle tax reporting, audit trails, and financial documentation. Because SAP is configured to meet these regulatory standards and is used consistently to ensure compliance, 90% of the company's compliance level was categorized as High, while 10% was considered Normal, and none was classified as Low.

Regarding Design Factor 7, IT plays a supportive role in enabling the use of SAP across various departments for daily operations and reporting. Because SAP is essential in supporting business processes and maintaining operational continuity, the supportive role of IT was rated with a score of 5. In addition, because any system failure or downtime—such as issues with SAP server access—would directly disrupt business operations, the factory role of IT was rated 4.

However, SAP has not yet been positioned as a core enabler of strategic innovation in the company, so the strategic role was given a score of 3, and the turnaround role, which reflects IT's ability to lead innovation or transformation, was rated lower at 2.

6. *Design Factor 8, 9 and 10 : Sourcing Model of IT , IT Implementation Method and Technology Adoption Strategy*

The interview results for Design Factor 8 indicate that the company relies heavily on cloud-based services to support its IT operations, including hosting and accessing the SAP system. Because most SAP functions are integrated with or supported by cloud infrastructure, Particularly for data storage and remote access, the use of cloud services was reported as the primary IT resource model, accounting for 70%. In contrast, outsourcing and insourcing were each reported at 15%, showing that while third-party services and internal IT support are present, the company's main focus remains on cloud-based solutions.

For Design Factor 9, the company still predominantly uses traditional methods for software development, implementation, and operation, including in the context of SAP system management. Because change management, configuration, and support processes for SAP follow structured and sequential procedures, the traditional approach was reported as the most widely used, at 100%.

Meanwhile, Design Factor 10, the company tends to wait until a new technology is proven and widely adopted before integrating it into operations, including those related to SAP enhancements or module upgrades. Because of this cautious approach, the company is categorized as a follower in technology adoption, with a percentage of 80%. The remaining 20% are considered late adopters, and there is no indication that the company acts as an innovator or early adopter (0%).

7. *Priority Process Determination*

As explained earlier, information gathered from the first interview was analyzed and measured using the COBIT 2019 Design Toolkit to determine the scores or percentages for each of the 10 Design Factors. This toolkit also generates the Governance and Management Objectives Importance, which highlights the objectives that are considered important or recommended to be prioritized.

Based on the results of the 10 Design Factors, it was found that there are three objectives with a percentage above 75% based on the interview results. The priority processes with percentages

above 75% are APO12 Managed Risk, DSS01 Managed Operation, and MEA03 Managed Compliance with External Requirements.

These priority processes, identified using the COBIT 2019 Design Toolkit, were followed by a second interview with the IT staff at No. Natural Indococonut Organik to evaluate the IT capability levels within the company. The full results can be seen in Figure 2 below.

Second Interview: Determining Capability Levels and Gap Analysis

COBIT2019

Governance and Management Objectives Importance (All Design Factors)
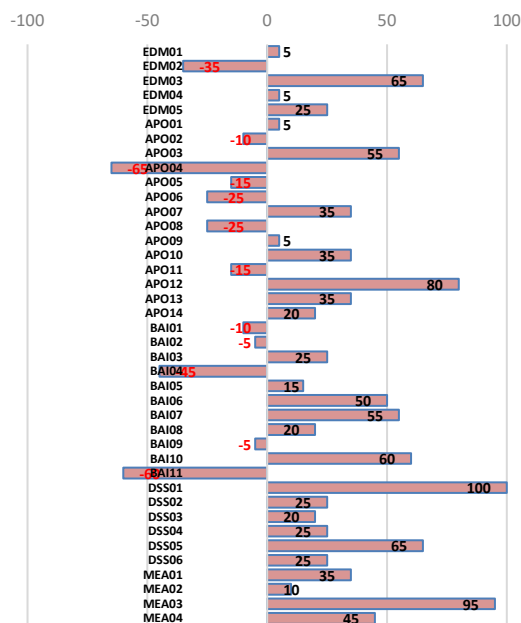
Source : (Research Results, 2025)
Figure 2. Governance and Management Objectives Importance

As introduced in the preliminary overview in the Introduction, early observations suggested that key governance processes were under their target maturity. The second interview at PT. Natural Indococonut Organik provided the detailed COBIT 2019 capability assessment to confirm and quantify these initial findings. This stage focused on evaluating three key governance and management processes: APO12 (Managed Risk), DSS01 (Managed Operations), and MEA03 (Managed Compliance with External Requirements).

To evaluate these processes, the research team referred to Level 2 activities defined in the COBIT 2019 model. The assessment involved determining whether each required activity had

been implemented or not, based on interviews with key IT personnel.

Table 4. Processes Interview Results

Process	No.	Activities	Applied?
APO12 (Managed Risk) Level 2	1	Method for collecting, classifying, and analyzing IT risk data	No
	2	Recording significant IT risk data (internal and external)	Yes
	3	Documenting business processes and IT dependencies	Yes
	4	Identifying critical IT services and infrastructure	No
	5	Grouping risk scenarios by category, business line, or function	No
	6	Inventorying risk mitigation activities	No
DSS01 (Managed Operations) Level 2	1	Developing and maintaining operational procedures	Yes
	2	Scheduling operational activities and ensuring compliance	No
	3	Recording incidents and determining information levels	Yes
	4	Identifying natural and man-made disaster risks	Yes
	5	Protecting IT equipment from environmental threats	Yes
	6	Keeping IT facilities clean and secure	Yes
	7	Evaluating UPS and backup equipment requirements	Yes
	8	Regularly testing UPS and ensuring smooth operation	No
	9	Ensuring multiple utility sources for IT facilities	Yes
	10	Properly protecting external and internal cables	No
	11	Organizing and documenting cabling (blueprints/diagrams)	Yes
	12	Conducting regular health, safety, and emergency training for staff	Yes
MEA03 (Managed Compliance) Level 2	1	Assigning responsibility for monitoring compliance changes	No
	2	Identifying and assessing the impact of compliance requirements	Yes
	3	Assessing the regulatory impact on third-party contracts	No
	4	Determining consequences of non-compliance	No
	5	Obtaining compliance confirmation from business/IT owners	No
	6	Conducting regular external/internal compliance reviews	No

JITK (JURNAL ILMU PENGETAHUAN DAN TEKNOLOGI KOMPUTER)

Process	No.	Activities	Applied?
	7	Obtaining compliance declarations from IT service providers	No
	8	Obtaining compliance confirmation from business partners	No

Source : (Research Results, 2025)

As shown in Table 4, the results revealed that some activities within each process had been implemented; however, significant gaps remain—particularly in APO12 and MEA03. For example, only 2 out of 6 activities were implemented for APO12, 9 out of 12 for DSS01, and just 1 out of 8 for MEA03. These results highlight weak areas in risk management, operational consistency, and compliance assurance, especially concerning SAP-related processes.

While some foundational practices are in place—such as maintaining operational procedures and recording incidents—critical aspects like formal risk analysis, structured compliance reviews, and infrastructure testing are lacking. The results suggest that improvements are necessary before these processes can be evaluated at a higher capability level. This assessment was conducted at sub-process level 2, and as none of the processes surpassed the 85% threshold required to advance, they cannot yet proceed to activity level 3. The score percentages and overall evaluation results are detailed in Table 5 below.

Table 5. Processes Interview Results

Priority Process	Target Minimum Capability Level	Achieved Capability Level	Percentage on Level 1	Descriptions
APO12	Level 4	Level 2	33%	Only 2 out of 6 activities were achieved. Improvements in risk management are needed.
DSS01	Level 4	Level 2	75%	Out of 12 activities, 9 have been successfully implemented. Capability is not yet fully achieved.
MEA03	Level 4	Level 2	12,5%	Only 1 out of 8 activities was achieved. Compliance with external requirements is low.

Source : (Research Results, 2025)

Table 5 also summarizes the target vs. Achieved capability levels, alongside the percentage of activities completed for each process. All three processes were expected to meet a minimum capability target of Level 4 as defined by the COBIT 2019 Design Toolkit. However, the results show that all three are still at Level 2. APO12 scored 33%, reflecting critical gaps in structured risk management for SAP, such as the absence of risk identification procedures, lack of service dependency documentation, and missing mitigation activity records. These risk management gaps—such as lack of institutionalized procedures and absence of a risk officer—mirror patterns found in other COBIT 2019 studies. For example, in a governance assessment at Telkom University, capability limitations stemmed from underdeveloped procedures and inadequate standard alignment, suggesting that formalizing risk protocols can substantially uplift performance[29].

Meanwhile DSS01, with a score of 75%, shows that while most operational activities are functional, formal scheduling, UPS testing, and infrastructure resilience (e.g., cable protection) still need improvement to support uninterrupted SAP operations. Operational deficiencies like missing maintenance scheduling and infrastructure protections reflect emerging weaknesses noted in COBIT DSS01 evaluations, which highlight the importance of defined operational procedures to ensure service reliability [30]. A structured study of IT operations in a higher education institute further confirms that systematic governance and monitoring boost operational maturity [31].

Lastly MEA03 received the lowest score at 12.5%, indicating that compliance mechanisms are largely absent, including missing roles for compliance monitoring, lack of regular audits, and No. confirmations from external IT or business partners. The absence of formal compliance roles and oversight reflects core issues in early-stage MEA03 scenarios, where organizations often rely on reactive metrics rather than structured compliance assurance mechanisms [32]. Capability studies within logistics firms similarly underscore the need for proactive compliance processes to close significant maturity gaps [33].

These scores confirm that although some progress has been made, none of the three priority processes currently meets the capability standard expected for high-priority governance objectives. To provide a clearer view of where the specific gaps lie, Table 6 outlines the key missing elements for each process and the broader implications.

Table 6. Processess Identified Key Gaps

COBIT2019 Process	Key Gaps Identified	Conclusion
APO12 (Managed Risk)	1. No formal risk identification and analysis for SAP 2. No identification of critical SAP services 3. No documentation of risk mitigation activities	SAP risk management is reactive and lacks a structured process, requiring significant improvement.
DSS01 (Managed Operations)	1. No scheduling of SAP operational tasks 2. No routine UPS testing 3. Incomplete cable and infrastructure protection	SAP operations are largely implemented, but preventive measures and consistency need enhancement.
MEA03 (Managed Compliance)	1. No assigned roles for monitoring SAP compliance 2. No compliance reviews or third-party confirmations 3. No evidence of regulatory tracking	Compliance mechanisms for SAP are underdeveloped, posing regulatory and audit risks.

Source : (Research Results, 2025)

As shown in Table 6, the evaluation highlights concrete and process-specific weaknesses as follow. For APO12, the absence of formal SAP risk identification and mitigation documentation means the current approach is reactive and lacks structure. On the other hand, for DSS01, while operational procedures are present, the absence of routine scheduling and preventive measures like UPS testing reveals vulnerabilities in operational stability. Lastly, for MEA03, compliance functions are significantly underdeveloped, with No. designated accountability or ongoing review, putting the company at risk of regulatory non-conformance.

To complement this COBIT-based evaluation, a third assessment was conducted to review service management maturity using the ITIL framework, focusing specifically on the performance of the Service Desk function. APO12 (Managed Risk) is addressed first as the highest priority, with a front-loaded approach to strengthen the organization's risk posture early. During the first three months, a dedicated risk officer is appointed, a centralized risk register is established, and service dependency mapping is completed to pinpoint critical SAP services and interdependencies. In months 4–6, risk procedures are formalized and approved, and quarterly risk review meetings begin ahead of the other processes. By months 7–9, integrated risk metrics are embedded into performance dashboards and aligned with operational KPIs,

while the final quarter (months 10–12) focuses on conducting a full-cycle risk evaluation and refining controls based on dashboard insights.

Efforts to improve DSS01 (Managed Operations) follow a steady, evenly paced sequence to balance infrastructure stability with operational continuity. The first two months concentrate on developing a preventive SAP maintenance schedule. In months 3–5, UPS testing procedures are introduced and infrastructure audits are carried out in parallel to detect vulnerabilities sooner. The mid-phase (months 6–8) implements automated monitoring tools and provides staff training on their use. Months 9–12 are dedicated to continuity readiness tests and fine-tuning standard operating procedures to ensure sustainable stability.

Meanwhile, MEA03 (Managed Compliance) is intentionally back-loaded to allow for careful preparation and integration with vendor management processes. Initial steps in months 1–2 involve assigning a compliance coordinator. The next phase, months 3–6, focuses on developing a compliance audit checklist and embedding compliance clauses into vendor contracts, with extra time allocated for legal and contractual reviews. From months 7–10, internal compliance audits are performed and any gaps are addressed. The final two months (11–12) institutionalize an annual compliance review cycle and produce a compliance summary report for management oversight.

This sequencing ensures that role formalization, procedural standardization, and quantitative performance monitoring are embedded progressively, thereby reducing change resistance and ensuring sustainable adoption [34], [35]. Such a structured approach aligns with governance capability improvement literature, which emphasizes the integration of process enhancement initiatives with operational realities to ensure both maturity advancement and business alignment [36].

Third Interview: Determining ITIL Maturity Level

Following the COBIT-based governance evaluation, the third interview shifted focus to IT service management maturity, specifically examining the SAP-related Service Desk using the ITIL V.3 framework. While the Introduction already indicated a lower maturity level, this stage provided a complete self-assessment across 59 criteria to pinpoint specific operational and user engagement gaps. This assessment, covering maturity levels from 1.0 to 5.0, revealed a high number of "No" responses, particularly in managerial intent,

process capability, internal integration, and customer interface. Key gaps included the absence of formal procedures for collecting user feedback, no satisfaction surveys, unstructured reporting, and limited involvement in change management or strategic planning.

Table 7 summarizes these unmet criteria by maturity level, showing that many of the deficiencies—particularly at Levels 2.0, 4.5, and 5.0—are directly linked to SAP operational challenges. For example, the absence of user satisfaction surveys (Level 2.0, 5.0) and closure updates (Level 2.0) corresponds with reduced transparency in SAP incident handling, while unstructured reporting (Level 3.0) aligns with delays in detecting systemic SAP issues. These specific gaps, as detailed in Table 7, form the root causes behind extended resolution times, increased SLA breach risk, and diminished user trust.

From a service delivery perspective, the lack of structured user feedback and satisfaction surveys prevents the identification of recurring SAP issues, resulting in repeated incidents without targeted resolution. The absence of closure updates increases follow-up requests and prolongs incident resolution time, raising the likelihood of breaching internal SLAs. Unstructured reporting and the absence of trend analysis mean systemic SAP issues remain undetected until they cause significant disruptions, increasing the mean time to resolution (MTTR). Furthermore, limited integration with change management (Level 4.5) risks deploying SAP updates without adequate user preparation, increasing the probability of post-release errors and unplanned downtime.

From a risk perspective, failing to meet ITIL Level 2.0 and above introduces operational and compliance vulnerabilities. SLA non-compliance can lead to contractual penalties, reputational damage, and a decline in stakeholder confidence. The lack of structured communication and monitoring may also lead to "shadow IT" behaviors—such as departments bypassing SAP for alternative tools—causing data fragmentation and governance lapses. Additionally, insufficient user involvement in change management may result in poor adoption of new SAP features, undermining the intended benefits of system upgrades.

A reactive, helpdesk-style Service Desk aligns with early-stage ITSM maturity structures lacking in proactive feedback loops or SLA alignment—an issue well-documented in ITIL-based case organizations. For instance, case studies show that integrating service management processes to reduce incidents and outages significantly enhances system stability [37].

Table 7. ITIL V.3 Service Desk Maturity Assessment: Unmet Criteria by Maturity Level

Maturity Level	Assessment Focus	Unmet Criteria
Level 1.5	Management Intent	1. Service desk is not considered strategic 2. Objectives are not communicated to stakeholders
Level 2.0	Process Capability	1. No procedures for collecting user information 2. No initial assessment of requests 3. No closure updates provided to users 4. No service improvement data 5. No user satisfaction surveys 6. Not informed about new or changed services
Level 2.5	Internal Integration	1. No access to product database 2. No weekly reviews 3. No monitoring of user satisfaction 4. No involvement from second-line support
Level 3.0	Products	1. No routine service reports 2. No staff analysis 3. No weekly service reviews 4. No review of improvement suggestions
Level 4.0	Management Information	1. No reportable training activities
Level 4.5	External Integration	1. No stakeholder meetings 2. No change management updates 3. No exchange with SLA team
Level 5.0	Customer Interface	1. No user satisfaction surveys 2. No active monitoring 3. No use of data for improvements 4. No monitoring of perceived value

Source : (Research Results, 2025)

To complement these findings, Table 8 summarizes the ITIL maturity evaluation results, comparing minimum passing thresholds with actual achievements at each level. PT. Natural Indococonut Organik successfully passed several maturity levels, including Level 1 (Pre-requisites) and Level 1.5 (Managerial Intent), both exceeding minimum requirements and receiving a "PASS" status. However, Level 2 (Process Capability) was marked "FAIL" due to key deficiencies such as the absence of procedures for user data collection, closure updates, and satisfaction surveys—all essential for user-centric SAP support. In contrast, Levels 2.5 (Internal Integration) and 3 (Products) met required standards and were marked "PASS," indicating that

internal collaboration and product-related service desk functions are working adequately.

Higher levels such as Level 3.5 (Quality Control) and Level 4 (Management Information) also received "PASS" ratings, reflecting some structured service reporting. However, Levels 4.5 (External Integration) and 5 (User Interface) did not meet expectations, exposing continued gaps in stakeholder communication, SLA coordination, and user experience monitoring—factors critical for optimizing SAP-related services.

Table 8. ITIL V.3 Service Desk Maturity Assessment Results

Level	Minimum pass	Achievement	Status
Level 1- Pre-requisites	M+1	M+2	PASS
Level 1.5 Management Intent	2M+1	2M+3	PASS
Level 2 Proses Capability	4M+2	4M+6	FAIL
Level 2.5 Internal Integration	M+2	M+2	PASS
Level 3 Products	3M+1	3M+4	PASS
Level 3.5 Quality Control	3M+1	3M+2	PASS
Level 4 Management Information	2M+1	2M+2	PASS
Level 4.5 External Integration	2M+1	2M+2	FAIL
Level 5 User Interface	5M	4M	FAIL

Source : (Research Results, 2025)

Taken together, the COBIT 2019 capability assessments and the ITIL V.3 Service Desk maturity evaluation reveal a consistent set of weaknesses: reactive risk management, incomplete operational safeguards, underdeveloped compliance mechanisms, and limited user feedback loops. Addressing these issues requires an integrated approach that targets both governance structure and service delivery processes. The combined insights directly inform the gap analysis summarized in Table 9, ensuring that improvement actions are prioritized based on their operational impact and resource requirements.

Table 9 presents a structured overview of gaps in SAP-based IS governance and operations, linking each issue to its impact, recommended solution, potential improvement, and corresponding priority type. The analysis spans DSS01 – Managed Operations, MEA03 – Managed Compliance, and ITIL – Service Desk Maturity, covering both technical and procedural weaknesses revealed by the maturity assessment. Key issues include the absence of scheduled maintenance, missing UPS testing procedures, incomplete infrastructure protection, lack of compliance tracking roles, absence of internal/external audits, no third-party compliance confirmations, missing user satisfaction surveys, no closure updates for users, lack of structured performance reporting, and minimal stakeholder engagement in SLA coordination.

Table 9. Outcomes Analysis Supporting the Design, Evaluation, and Improvement of SAP Systems

Category	Process Area	Identified Gap	Impact on SAP-Based IS	Recommended Solution	Potential Improvement	Priority Type
Design	DSS01 – Managed Operations	No scheduled maintenance for SAP operations	Increases risk of unplanned outages and service delays during business operations	Establish a weekly and monthly SAP operation schedule with logs and automated alerts	Reduced risk of unplanned SAP outages and smoother operational continuity	Priority 2 – Strategic Investment
Design	DSS01 – Managed Operations	Missing UPS testing procedures	Reduces resilience during power interruptions, risking SAP data loss or downtime	Implement routine UPS testing procedures and integrate results into IT documentation	Improved system resilience during power failures, avoiding SAP downtime	Priority 1 – Quick Win
Design	DSS01 – Managed Operations	Incomplete cable and infrastructure protection	Physical infrastructure vulnerabilities may lead to hardware failure affecting SAP access	Upgrade and regularly audit cabling and hardware safety in SAP server environments	Minimized risk of hardware failure affecting SAP uptime and data safety	Priority 4 – Low-Value Challenge
Evaluation	MEA03 – Managed Compliance	No compliance tracking roles assigned	SAP compliance features underutilized, risking audit failure or regulatory non-compliance	Assign compliance officers to monitor SAP usage policies and updates	Improved regulatory readiness and audit performance	Priority 1 – Quick Win

Category	Process Area	Identified Gap	Impact on SAP-Based IS	Recommended Solution	Potential Improvement	Priority Type
Evaluation	MEA03 – Managed Compliance	Lack of internal/external compliance reviews	No assurance mechanisms to ensure SAP operations follow legal or policy requirements	Schedule quarterly compliance audits for SAP modules linked to finance and reporting	Clear compliance tracking and reduced risk of legal penalties	Priority 2 – Strategic Investment
Evaluation	MEA03 – Managed Compliance	No confirmations from third-party providers or business partners	Undermines trust in SAP operations and opens gaps in governance accountability	Create a policy requiring partner/vendor compliance acknowledgment for SAP data	Better accountability and trust in SAP third-party data handling	Priority 4 – Low-Value Challenge
Improvement	ITIL – Service Desk Maturity	No user satisfaction surveys conducted	Lack of insight into SAP service effectiveness from user perspective	Deploy regular SAP user satisfaction surveys with trend analysis	Higher user satisfaction and more actionable service feedback	Priority 1 – Quick Win
Improvement	ITIL – Service Desk Maturity	No closure updates provided to SAP users	Users feel disconnected from support process, decreasing satisfaction and trust	Ensure helpdesk provides case closure summaries for each SAP-related ticket	Increased transparency and user trust in SAP issue handling	Priority 3 – Low-Effort Tuning
Improvement	ITIL – Service Desk Maturity	No structured reporting or performance review	Inability to track or improve SAP service performance systematically	Develop monthly performance reports on SAP issues and resolutions using service metrics	Improved visibility into service quality and problem trends	Priority 2 – Strategic Investment
Improvement	ITIL – Service Desk Maturity	No stakeholder involvement or SLA coordination	Limits governance transparency and degrades responsiveness to user issues	Host biannual stakeholder meetings and align SAP SLAs with feedback outcomes	Faster resolution and more aligned service performance with business needs	Priority 4 – Low-Value Challenge

Source : (Research Results, 2025)

Taken together, the COBIT 2019 capability assessments and the ITIL V.3 Service Desk maturity evaluation reveal a consistent set of weaknesses: reactive risk management, incomplete operational safeguards, underdeveloped compliance mechanisms, and limited user feedback loops. Addressing these issues requires an integrated approach that targets both governance structure and service delivery processes. The combined insights directly inform the gap analysis summarized in Table 9, ensuring that improvement actions are prioritized based on their operational impact and resource requirements.

This structure enables the organization to address high-impact, low-effort improvements immediately, while planning resource-intensive initiatives and lower-priority adjustments for later phases. By doing so, PT. Natural Indococonut Organik can tackle critical vulnerabilities, strengthen compliance, and enhance service quality, all while following best practices in continuous service improvement where early wins are leveraged to sustain momentum [38].

Implications for SAP-Based Information System Improvement

The evaluation results obtained through COBIT 2019 and ITIL V.3 not only identify governance process gaps but also present structured opportunities to enhance SAP-based enterprise information systems. To address the journal's emphasis on system design, evaluation, and improvement, the table below categorizes each finding accordingly. Each entry links a specific process gap to its operational impact on SAP, followed by practical recommendations, relevant responsible teams, and the potential improvements that may result. This categorization demonstrates how IT governance analysis can directly support the strategic development, assessment, and optimization of enterprise systems in real organizational settings.

CONCLUSION

Building on these integrated findings, the conclusion distills the study's contributions to both theory and practice, showing how a dual-framework evaluation can serve as a blueprint for

improving ERP governance and service maturity. This study provides both theoretical and practical contributions to the field of IT governance and service management in SAP-based manufacturing environments. Theoretically, it advances the understanding of how COBIT 2019 and ITIL V.3 can be systematically integrated to identify and address governance and service maturity gaps. Unlike prior studies that focus on a single framework, this research demonstrates a replicable evaluation model that captures interconnected weaknesses affecting risk management, operational continuity, compliance assurance, and user experience in ERP contexts.

Practically, the findings have been transformed into a prioritized improvement roadmap that categorizes actions into quick wins, strategic investments, low-effort tuning, and low-value challenges. Immediate measures—such as introducing routine UPS testing, assigning compliance tracking roles, and conducting user satisfaction surveys—offer rapid impact with minimal resources. Longer-term actions, including formalizing SAP risk management procedures and implementing structured reporting, aim to strengthen resilience, compliance readiness, and service quality. From the capability assessments, all three priority COBIT processes—APO12 (Managed Risk), DSS01 (Managed Operations), and MEA03 (Managed Compliance)—were confirmed at Level 2, below the target Level 4. The ITIL V.3 Service Desk maturity results echoed these gaps, showing weaknesses in user engagement, SLA coordination, and structured performance monitoring. These combined insights reinforce the importance of aligning governance frameworks with operational service maturity to optimize SAP system performance.

Future research should build upon this work by developing and testing a prototype SAP risk monitoring dashboard that integrates COBIT-defined risk indicators with ITIL-based service metrics, enabling real-time governance oversight. Additionally, implementing ITIL v4 practices—including value stream mapping and continual improvement—could be explored to determine whether they provide measurable benefits over ITIL v3 in manufacturing ERP contexts. Longitudinal studies are also recommended to evaluate the impact of these interventions on capability maturity progression and business outcomes over time.

REFERENCES

[1]   D. Kim, M. Alavi, and Y. Yoo, "Use Advanced Information Technology to Transform Organizations," *Principles of Organizational Behavior: The Handbook of Evidence-Based Management, Third Edition*. 2024. doi: 10.1002/9781394320769.ch27.

[2]   V. Prajová, F. Praj, P. Košťál, and M. Homokyová, "E-learning Platform for Information Technology in Business Management," *Mechanisms and Machine Science*, vol. 174 MMS. pp. 949–958, 2025. doi: 10.1007/978-3-031-80512-7_93.

[3]   N. Durão, C. S. Pereira, M. J. Ferreira, and F. Moreira, "Enablers for the Success for Competitive Stance in Portuguese Companies Due to Digital Transformation During Covid-19," *Studies in Systems, Decision and Control*, vol. 497. pp. 245–266, 2023. doi: 10.1007/978-3-031-40710-9_14.

[4]   A. Verma and S. S. Sybol, "The role of technology in facilitating organizational transformation," *Innovative Approaches to Managing Conflict and Change in Diverse Work Environments*. 2025. doi: 10.4018/979-8-3693-9556-1.ch014.

[5]   J. Lin and M. Mao, "How does digital transformation affect sustainable innovation performance? The pivotal roles of digital technology-business alignment and environmental uncertainty," *Sustainable Development*, vol. 32, no. 4. pp. 3163–3181, 2024. doi: 10.1002/sd.2830.

[6]   A. Alkaf, M. Y. Yusliza, J. Saputra, Z. Muhammad, and A. T. Bon, "A review of work effectiveness and efficiency, service quality and organisational performance literature: A mini-review approach," *Proceedings of the International Conference on Industrial Engineering and Operations Management*. pp. 5127–5141, 2021. [Online]. Available: https://www.scopus.com/inward/record.uri?eid=2-s2.0-85114234700&partnerID=40&md5=fd40a376b9b8e45f4d9851bac3cf8c33

[7]   A. Castillo, L. Ruiz, J. Benitez, F. Schuberth, and R. Reina, "IT impact on open innovation performance: Insights from a large-scale empirical investigation," *Decision Support Systems*, vol. 175. 2023. doi: 10.1016/j.dss.2023.114025.

[8]   X. Zhang, "Influence mechanism of digital technology on environmental, social, and governance (ESG) responsibility fulfilment of construction enterprises from the perspective of sustainability," *Journal of Asian Architecture and Building Engineering*. 2025. doi: 10.1080/13467581.2025.2506465.

[9] G. Toaza, C. Montenegro, and C. Salazar, "Designing an I&T Governance System in the Context of Strategic Public Sector Based on COBIT 2019 Framework. Case Study in a Developing Country," in *Proceedings of the 5th International Conference on Information Management and Management Science*, in IMMS '22. New York, NY, USA: Association for Computing Machinery, Dec. 2022, pp. 401–406. doi: 10.1145/3564858.3564920.

[10] F. S. Lubis, V. S. Praditha, M. Lubis, H. Fakhrurroja, M. F. Safitra, and A. R. Lubis, "Corporate ICT Governance of Indonesian State-Owned Companies: Governance Structure and Decision Making Archetype," in *2023 IEEE International Conference on Computing (ICOCO)*, Oct. 2023, pp. 277–282. doi: 10.1109/ICOCO59262.2023.10397787.

[11] P. Rozehnal and V. Novák, "Analysis of Processes Information Flows and Items as Additional Design Factor in COBIT Framework," *Central European Business Review*, vol. 10, no. 4, pp. 63–82, Sep. 2021, doi: 10.18267/j.cebr.264.

[12] L. Moudoubah, A. E. Yamami, K. Mansouri, and M. Qbadou, "From IT service management to IT service governance: An ontological approach for integrated use of ITIL and COBIT frameworks," *International Journal of Electrical and Computer Engineering (IJECE)*, vol. 11, no. 6, Art. no. 6, Dec. 2021, doi: 10.11591/ijece.v11i6.pp5292-5300.

[13] Y. Al-Ashmoery, H. Haider, A. Haider, N. Nasser, and M. Al-Sarem, "Impact of IT Service Management and ITIL Framework on the Businesses," in *2021 International Conference of Modern Trends in Information and Communication Technology Industry (MTICTI)*, Dec. 2021, pp. 1–5. doi: 10.1109/MTICTI53925.2021.9664763.

[14] J. Serrano, J. Faustino, D. Adriano, R. Pereira, and M. M. da Silva, "An it service management literature review: Challenges, benefits, opportunities and implementation practices," *Information*, vol. 12, no. 3, p. 111, 2021.

[15] W. Sardjono, N. Legowo, and A. Fairuszabadi, "Leveraging IT service management to enhance helpdesk service quality in handling consumer complaints," *Journal of Logistics, Informatics and Service Science*, vol. 11, no. 4, pp. 299–312, 2024.

[16] R. Y. Pratama and S. Umaroh, "An IT Asset Governance Model Design Using COBIT 2019 And ITIL V4 Framework at BKU Itenas," *E3S Web Conf.*, vol. 484, p. 02006, 2024, doi: 10.1051/e3sconf/202448402006.

[17] A. Rusman, R. Nadlifatin, and A. P. Subriadi, "Information System Audit Using COBIT and ITIL Framework: Literature Review," *Sinkron : jurnal dan penelitian teknik informatika*, vol. 6, no. 3, Art. no. 3, Jul. 2022, doi: 10.33395/sinkron.v7i3.11476.

[18] T. Dharmada, J. Wiratama, and A. Faza, "Leveraging COBIT 2019 Framework for Recommending ERP System Module Development at Cardboard Manufacturing Industry," *Journal of Information Systems and Informatics*, vol. 6, no. 2, Art. no. 2, Jun. 2024, doi: 10.51519/journalisi.v6i2.764.

[19] P. Kwak and R. I. Desanti, "IT Governance Evaluation Using COBIT 2019 Framework in A Manufacturing Company," in *2023 7th International Conference on New Media Studies (CONMEDIA)*, Dec. 2023, pp. 62–67. doi: 10.1109/CONMEDIA60526.2023.10428517.

[20] O. Ilori, N. T. Nwosu, and H. N. N. Naiho, "A comprehensive review of it governance: effective implementation of COBIT and ITIL frameworks in financial institutions," *Computer Science & IT Research Journal*, vol. 5, no. 6, Art. no. 6, Jun. 2024, doi: 10.51594/csitrj.v5i6.1224.

[21] S. L. Thomas, H. Pitt, S. McCarthy, G. Arnot, and M. Hennessy, "Methodological and practical guidance for designing and conducting online qualitative surveys in public health," *Health Promotion International*, vol. 39, no. 3, p. daae061, Jun. 2024, doi: 10.1093/heapro/daae061.

[22] R. Morisson, "RACI vs RASIC or RAPID for Decision-Making: throw out the complexity," *Orgvue Blog*, Sep. 19, 2023. [Online]. Available: https://www.orgvue.com/resources/raci-vs-rasic-or-rapid-for-decision-making

[23] A. R. Indrawati, I. S. Rozas, and N. Wahyudi, "Penyusunan Instrumen Maturity Assessment Design Toolkit Berbasis COBIT 2019," *Edu Komputika Journal*, vol. 10, no. 1, pp. 64–71, 2023.

[24] E. Amore, T. Dilger, C. Ploder, R. Bernsteiner, and M. Mezzenzana, "Leverage the COBIT 2019 Design Toolkit in an SME Context: A Multiple Case Study," *KnE Social Sciences*, pp. 73-101-73–101, 2023.

[25] Information Systems Audit and Control Association, *COBIT 2019 Framework: Governance and Management Objectives*. Schaumburg, IL: ISACA, 2018.

[26] A. Kempter, "ITIL Implementation - ITIL Assessment," IT Process Wiki. Accessed: Jun.

18, 2025. [Online]. Available: https://wiki.en.it-processmaps.com/index.php/ITIL_Implementation_-_ITIL_Assessment

[27] C. H. Saunders, A. Sierpe, C. von Plessen, A. M. Kennedy, L. C. Leviton, S. L. Bernstein, *et al.*, "Practical thematic analysis: a guide for multidisciplinary health services research teams engaging in qualitative analysis," *BMJ*, vol. 381, p. e074256, 2023, doi: 10.1136/bmj-2022-074256.

[28] M. M. Arias Valencia, "Principles, scope, and limitations of the methodological triangulation," *Investigación y Educación en Enfermería*, vol. 40, no. 2, p. e03, 2022.

[29] A. L. Ayu, M. Lubis, L. Abdurrahman, I. F. Zamzami, R. A. Alqahtani, and R. Ramadhani, "Assessment of IT Risk Management at the Faculty of Industrial Engineering, Telkom University, Utilizing the COBIT 2019 Framework's APO12 Domain with LAM INFOKOM Standards Mapping," *Electronic Integrated Computer Algorithm Journal*, vol. 1, no. 2, pp. 50–56, Apr. 2024, doi: 10.62123/enigma.v1i2.21.

[30] R. Kumar, "COBIT DSS01.01 – Perform Operational Procedures." Jun. 07, 2024. [Online]. Available: https://www.itsm-docs.com/blogs/cobit-framework/cobit-dss01-01-perform-operational-procedures

[31] B. Y. Fitriyani and A. H. Muhammad, "COBIT 2019 for Enhanced ICT Governance: A Case Study at a Higher Education Institution," *Journal of Information Systems and Informatics*, vol. 7, no. 1, pp. 45–62, Mar. 2025, doi: 10.51519/journalisi.v7i1.972.

[32] A. Kempwad, "COBIT MEA03.03 - Confirm External Compliance," *ITSM Documents & Templates*, June. 2024. [Online]. Available: https://www.itsm-docs.com/blogs/cobit-framework/cobit-mea03-03-confirm-external-compliance

[33] A. Yusuf, W. A. Saputra, and J. Jamilah, "Capability Gap Analysis in IT Governance for a Logistics Company Using COBIT 2019," *Journal of Information Systems and Informatics*, vol. 6, no. 3, pp. 1804–1821, Sep. 2024, doi: 10.51519/journalisi.v6i3.832.

[34] D. P. Siagian, B. Purwandari, and N. W. Trisnawaty, "Enhancing Information Technology Maturity with the COBIT 2019 Framework: A Case Study of ABC Univeristy," *The Indonesian Journal of Computer Science*, vol. 14, no. 1, 2025.

[35] M. Ria and R. D. P. Pasaribu, *Strategy to Improve IT Maturity Level Using COBIT 2019 Framework to Improve Service Quality at PT XYZ*. International Journal of Scientific Research and Management (IJSRM), 2025.

[36] K. Teitler-Santullo, "Case Study Driving Digital Transformation Through COBIT," ISACA. Accessed: Aug. 11, 2025. [Online]. Available: https://www.isaca.org/resources/isaca-journal/issues/2022/volume-6/case-study-driving-digital-transformation-through-cobit

[37] M. Chen, "The Impact of Changes in IT Service and Operations Management," *BMC Blogs*, May 2024. [Online]. Available: https://www.bmc.com/blogs/the-impact-of-changes-in-service-and-operations/

[38] K. W. Donovan, "Cut the noise, keep the impact: Prioritize with matrices." MGMA, Jun. 21, 2025. [Online]. Available: https://www.mgma.com/articles/cut-the-noise-prioritize-with-matrices