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# Alternative ITIL in the Integration and Optimization of IT Technology Management Process

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**Abstract.** The paper explores the scope of ITIL (Information Technology Infrastructure Library) best practices as an efficient alternative for integrating and optimizing information technology (IT) management processes in organisations. A comprehensive examination of the ITIL service lifecycle illustrates how this framework optimizes service quality, operational efficiency, and the strategic alignment of IT capabilities with overarching corporate objectives. The ITIL service's core life cycle architecture consists of five interconnected phases: strategy, design, transition, operation, and continual service improvement, each with distinct functions to deliver value and secure service sustainability over time. The article emphasizes a systemic approach and feedback as key elements in monitoring, evaluating, and implementing continuous process improvement. It also indicates that ITIL is not a prescriptive model but a flexible set of best practices that enables service providers to develop and offer technologies that meet customers' needs, thereby improving satisfaction while reducing risk and cutting costs. It was concluded that adopting ITIL facilitates IT governance and promotes standardization.

**Keywords:** ITIL; Integration; Optimization; Processes; Information Technologies; IT Governance.

## 1. Introduction

For an organisation to integrate and expedite IT-related processes, it is important to manage resources, monitor activities, and provide accountability to interested parties. Each process aims to deliver efficient dual-function solutions that support corporate objectives from the IT domain (Ordoñez et al., 2021). The increasing dependency of contemporary enterprises on software-driven environments necessitates organizational structures that transcend traditional operational silos, bridging the gap between engineering frameworks and executive decision-making.

To achieve this, establishing effective IT governance is critical. Governance must guide, prescribe, evaluate, and monitor strategies, policies, and plans to secure processes and steps (Martínez, 2022). This framework defines roles, responsibilities, metrics, and reports. It also guides decision-making and technological solutions to solve complex operational challenges (Calvo-Manzano et al., 2015). Without an explicitly defined governance paradigm, organizational assets risk misalignment, resulting in redundant technical tasks, uncontrolled operational expenditures, and fragmented performance metrics.

To manage IT governance, various models and references help improve processes in this area, such as ITIL (Information Technology Infrastructure Library), COBIT (Control Objectives for Information and Related Technology), and CMMI (Capability Maturity Model Integration) (Calvo-Manzano et al., 2015).

This paper analyzes ITIL's implementation for the integration and optimization of processes at the core of a service's lifecycle and in its management, with an emphasis on best practices. The ultimate goal is to demonstrate how a non-prescriptive adaptation of ITIL serves as a catalyst for systemic cohesion, transforming disparate IT operations into a synchronized and value-generating ecosystem.

## 2. Methodology

This study adopts a qualitative, documentary, and analytical approach to explore ITIL as a framework for integrating and optimizing service management processes. The research relies on a systematic review of specialized literature, including official ITIL publications, academic articles, and technical papers that underpin the implementation of best practices in IT governance.

The structural design of this study is organized into three critical phases to guarantee methodological rigor:

1. Identification and Exhaustive Literature Retrieval: Categorizing official document source materials, standard manuals, and peer-reviewed articles focusing on information technology service management (ITSM) and governance frameworks.
2. Deconstruction and Taxonomy Realization: Systematically categorizing the operational definitions, processes, and core functions established within the ITIL service lifecycle.
3. Comparative Evaluation and Synthesis: Juxtaposing the foundational attributes of ITIL against COBIT and CMMI parameters to isolate specific variables related to organizational flexibility and value delivery.

Rather than collecting empirical data, this study focuses on the interpretive analysis of secondary sources to establish theoretical correlations between ITIL and its impact on value generation, risk reduction, service continuity, and strategic

alignment. The analytical scope is bounded by two operational variables: the degree of process integration within corporate systems and the efficiency level of technology process optimization. This qualitative approach provides an integrated understanding of how ITIL enhances service quality and organizational performance through feedback-based process management. Consequently, the findings and conclusions are derived from the synthesis of reference materials and theoretical perspectives, aiming to offer a structured vision of ITIL's applicability and relevance in modern IT environments.

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### **3. Theoretical Framework**

#### **3.1. Evolution and Foundations of ITIL as an IT Governance Mechanism**

In the late 1980s, ITIL emerged as a structured solution developed by the Central Computing and Telecommunications Agency (CCTA) to address the systemic poor quality of IT services within British government public agencies. Early computational environments suffered from severe fragmentation, where hardware architecture and software development operated without standardized management protocols. Since its inception, the framework has undergone several significant revisions, culminating in the 2011 edition published by the UK Cabinet Office. This historical evolution reflects a fundamental paradigm shift from a reactive, purely infrastructure-centric approach to a proactive, service-driven management philosophy centered on organizational maturity.

According to Cartlidge et al. (2012), ITIL defines a system as "a combination of interrelated elements that work together to achieve a particular goal" (p. 6). Consequently, the ITIL framework aims to facilitate IT governance while nurturing monitoring practices associated with IT service management. Within this governance architecture, an IT service is conceptualized as a product resulting from a business process; as such, services must be continuously measured, evaluated, and improved to ensure alignment with organizational strategies.

ITIL accordingly provides comprehensive guidelines for service providers to ensure quality assurance in IT service delivery, specifically regarding the processes, functions, and capabilities required to support service development. As a non-prescriptive framework, ITIL provides service providers with a structured approach to creating value for customers. It does not impose rigid checklists; instead, it

establishes an adaptable philosophy that allows corporate entities to adjust the guidelines to fit their specific size, industry, and technological maturity level.

### 3.2. The Dynamics of Value Creation: Utility and Warranty

Specifically, the framework states that the fundamental purpose of a service is to deliver value to clients by facilitating their desired outcomes without requiring them to manage specific costs and risks (Hanna, 2011). Value in ITIL is not treated as an abstract or purely financial metric; it is quantified and realized through two distinct yet complementary dimensions: Utility (fitness for purpose) and Warranty (fitness for use). Customers, in turn, expect to derive value from these services through functional capabilities that address their needs, alongside an assurance of compliance with agreed mandates (Pedrosa et al., 2020). Consequently, clients utilize services because they anticipate specific results that satisfy their business requirements.

According to ITIL, service management is defined as a set of specialized organizational capabilities for enabling value to customers in the form of services (Scheffel & Strassner, 2008; Setyadi & Priyatiningih, 2021). Within the ITIL model, integrating processes and their interactions is essential to deliver value derived from both core components:

- **Utility:** Represents the positive effect of the service on the performance of the customer's activities. It refers to what the service does, removing operational constraints or enhancing the customer's capabilities to achieve specific outcomes. It represents the functional fitness of the service to fulfill a business need.
- **Warranty:** Represents the assurance that the service will meet its operational requirements. It refers to how the service is delivered and must guarantee availability, capacity, continuity, and security within a controlled environment. It represents the operational fitness of the service to remain stable under live execution conditions.

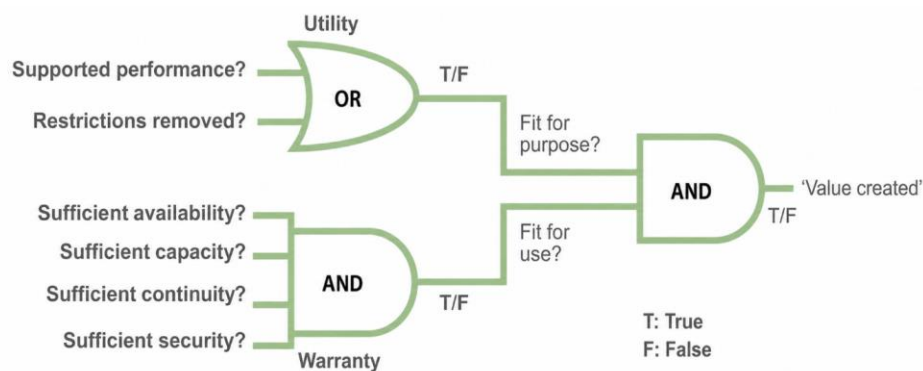


Figure 1. Value generation of a service as a result of usefulness and warranty (Cannon, 2011)

The optimization of ITIL processes ensures that services consistently generate value for customers, meaning that performance must actively support service delivery rather than being hindered by operational constraints. This approach ensures tight alignment with business goals, ultimately generating a sustainable competitive advantage in the service market. If either utility or warranty fails, the overall value chain degrades, rendering the entire technological solution ineffective for organizational growth.

### 3.3. Systemic Architecture of the Service Lifecycle and Feedback Loops

Within the ITIL framework, the service lifecycle is a synergistic and dynamic model that outlines how a service should be structured, details its interrelation with various processes, and enables a rigorous assessment of how changes impact specific components. This core structure is organized, first, around processes—defined as sets of activities with specific goals—and second, around functions, which comprise groups of people, tools, and other resources designated to execute one or more processes or activities (Cidav et al., 2020).

From a systemic perspective, these processes can be conceptualized as feedback systems (Hurtado Carmona, 2011, p. 17) through which the outcomes delivered to the client are constantly evaluated. This evaluation is achieved by measuring customer satisfaction against business objectives, value, service delivery quality, efficiency, and cost. Consequently, processes must be measurable, delivering defined results to specific customers in response to particular trigger events (Ramos Silvestre & Peredos Claros, 2023).

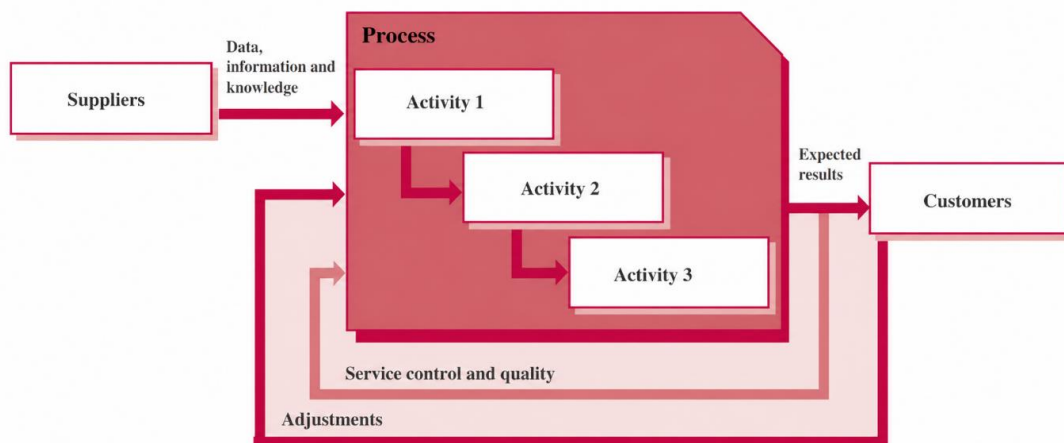


Figure 2. Process architecture. (Stewart, 2007)

Note. Adapted from *The Official Introduction to the ITIL Service Lifecycle* (Stewart, 2007).

This systemic process architecture enables the use of feedback data, which is analyzed to identify value gaps, underperformance against established targets, and opportunities for improvement. Accordingly, necessary modifications can be

applied to both processes and their specific activities. Furthermore, this feedback loop supports quality monitoring of the services provided, helping to prevent non-compliance with Service Level Agreements (SLAs) and safeguarding the stability of the live environment.

Within an enterprise's organizational structure, each component or business unit operates as a function performing specific tasks aligned with an outcome-oriented logic. Effectively, these functions are autonomous, requiring distinct skills and resources for their execution. According to Stewart (2007), such capabilities include internal work methodologies, institutional knowledge, and expertise necessary to maintain a robust system of monitoring and stability throughout the organizational lifecycle (p. 20). Functions prevent organizational amnesia by anchoring technical knowledge within stable teams, while processes ensure that this knowledge flows dynamically across the lifecycle stages.

### 3.4. Deconstruction of the Core Lifecycle Phases

The core of the ITIL service lifecycle consists of five (5) distinct phases interconnected by specific deliverables and feedback mechanisms, as illustrated in figure 3:

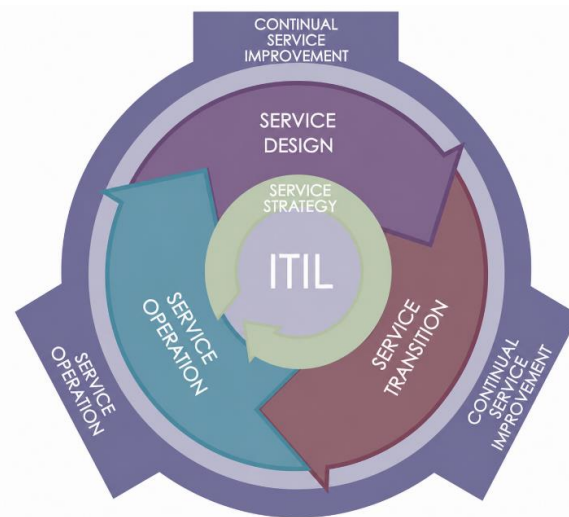


Figure 3. Representation Synergics of the core of the service life cycle (Cannon, 2011).

#### 3.4.1. Service Strategy

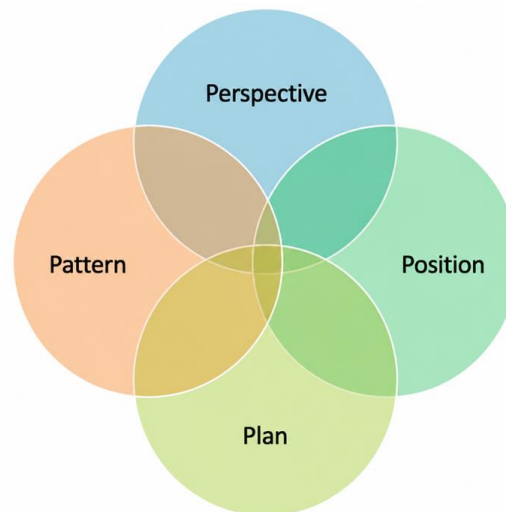
Like any other corporate discipline, strategic management defines an organization's plan to address specific market challenges. This strategic approach seeks to achieve competitive advantages by creating value for the client, focusing on identifying services as strategic assets (Harmon, 2019). Specifically, service strategy defines the perspective, position, plans, and patterns that a service provider must adopt to achieve the organization's business outcomes (Cannon, 2011, p. 4).

To transform service management into a strategic asset, organizations must clearly identify and define what services will be delivered from both a customer and

market perspective (Mandal, 2020). This approach provides service providers with a comprehensive guide on how to design, develop, and implement service management strategically.

The primary objective of the Service Strategy phase is to establish policies and targets that integrate the Information Technology (IT) department into the core business goals, transforming it into a strategic unit (Shrestha et al., 2020). The scope and boundaries of this phase are governed by the four (4) Ps of strategy (Cartlidge et al., 2012, p. 13):

- Perspective: Defines the overarching vision, direction, and distinctive philosophy of the organization.
- Position: Establishes the competitive basis on which the service provider will operate in the market.
- Plan: Outlines how the service provider will execute actions to achieve its strategic vision.
- Pattern: Captures the fundamental way of doing things – distinctive, consistent patterns in decisions and actions over time.



**Figure 4. The four P's of the strategy.**

*Note.* Adapted from *An Introductory Overview of ITIL - 2011* (Cartlidge et al., 2012).

The Service Strategy phase serves as the core of the ITIL lifecycle, providing a structured approach to developing a service strategy that addresses critical architectural questions: What services should be offered? To whom should they be offered? How can services generate value for customers? How will services be monitored? How will services be measured?

### 3.4.2. Service Design

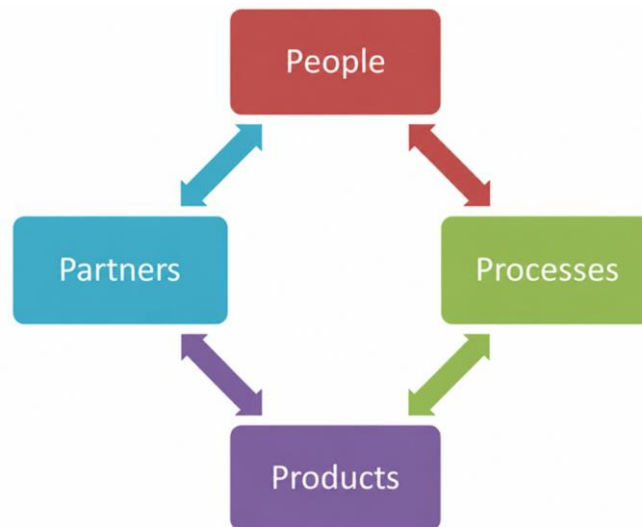
At this stage, new or modified services are planned to meet the evolving needs of both the business and its customers. The Service Design phase takes new requirements from the service strategy and translates them into blueprints aimed at achieving organizational goals (Cartlidge et al., 2012). From another perspective, service design facilitates the integration of new or altered services into production environments, ensuring quality delivery, customer satisfaction, and optimal performance (Hunnebeck, 2011). This highlights that service design seeks to maximize efficiency, thereby minimizing the need for subsequent reactive improvements throughout the service lifecycle.

Consequently, effective design must support easy development and maintenance while building the necessary methodologies and metrics to monitor and measure service performance. This phase focuses on creating services that can be developed, maintained, and improved both efficiently and effectively. It also aims to design robust processes while identifying and mitigating risks associated with service delivery. Within this framework, organizations develop strategic design capabilities alongside the methodologies and metrics required for rigorous quality monitoring and management.

This strengthens the principle of upfront design, which is driven by functional requirements, Service Level Agreement (SLA) mandates, business cases, and structural constraints (Hunnebeck, 2011, p. 4). Furthermore, the Service Design phase leverages the collective expertise and best practices of industry professionals, providing a standardized and controlled approach to service management. To achieve this, service design adopts a holistic approach structured around five core aspects (Hunnebeck, 2011, p. 36; Cartlidge et al., 2012, p. 21):

1. Service Solutions: Structural design blueprints for new or modified services.
2. Management Information Systems and Tools: Particularly the service portfolio and service catalogue to manage operational visibility.
3. Technology and Management Architectures: Infrastructure configurations required to support the services.
4. Processes: Core activities necessary to design, transition, operate, and improve services across the enterprise.
5. Measurement Methods and Metrics: Mechanisms for ongoing quality evaluation.

Finally, the 4 P's of Service Design—People, Processes, Products, and Partners—must be thoroughly integrated to ensure operational balance within the live environment.



**Figure 5. 4 P's for effective service design.**

*Note.* Adapted from *ITIL Service Design 2011 Edition* (Hunnebeck, 2011).

### 3.4.3. Service Transition

Service Transition focuses on the implementation of all service components to ensure that new or modified services meet customer expectations and can be effectively managed by the service provider. The ultimate goal of this phase is to ensure that new, changed, or retired services fulfil organizational expectations as documented in the service strategy and preceding lifecycle phases (Rance, 2011, p. 4; Carlidge et al., 2012, p. 31).

The core objectives of Service Transition are to plan and manage service changes efficiently, mitigate risks related to new, altered, or withdrawn services, and deploy service releases successfully into production environments. Additionally, this phase aims to set accurate expectations regarding service performance, ensure that service modifications deliver the intended business value, and provide clear, actionable knowledge concerning service assets.

To achieve this, the phase encompasses activities such as transition planning, change and release management, risk mitigation, and knowledge transfer. According to Rance (2011, p. 21), executing these activities effectively requires:

- Identifying all stakeholders: Mapping out interested parties, including suppliers, clients, and internal organizational areas.
- Adapting and deploying service designs: Implementing the service blueprints while establishing mechanisms to modify the design if issues are detected during transition.

### 3.4.4. Service Operation

Service Operation is the stage where agreed service levels are delivered to users and customers, and where the applications, technologies, and infrastructure supporting

service delivery are continuously monitored (Cartlidge et al., 2012, p. 40). This phase coordinates and implements the day-to-day activities and processes required to deliver and manage services at their agreed-upon levels. Additionally, it is responsible for the ongoing management of the underlying information technology infrastructure (Steinberg, 2011, p. 4).

Ultimately, Service Operation represents a critical stage in the service lifecycle; no well-planned or flawlessly transitioned process delivers actual value if its daily operational execution is flawed. It is the specific juncture where utility and warranty manifest as real metrics, where incidents are resolved via the Service Desk, and where the user experiences the actual value promised by the strategy.

#### **3.4.5. Continual Service Improvement (CSI)**

Continual Service Improvement (CSI) aims to sustain value for customers by preserving and elevating service quality and maturity throughout the lifecycle and its underlying processes via constant evaluation (Cartlidge et al., 2012, p. 50). Consequently, this stage aligns IT services with evolving business needs by identifying and implementing enhancements that enable business processes to better serve clients and deliver value (Lloyd, 2011, p. 4).

These ongoing optimizations typically materialize through Service Improvement Plans (SIPs). These activities reinforce a holistic lifecycle approach, driving optimizations across service strategy, service design, service transition, and service operation. CSI constantly seeks methodologies to enhance service delivery, process efficiency, and overall operational performance. To identify potential areas for optimization, measuring current performance is critical. This principle is underpinned by a fundamental axiom of service management: you cannot manage what you cannot control; you cannot control what you cannot measure; and you cannot measure what you cannot define (Lloyd, 2011, p. 4).

### **3.5. Advanced Conceptual Expansion of Alternative Frameworks (COBIT and CMMI)**

To establish a complete theoretical foundation for optimization, ITIL's operational model must be contextualized alongside the macro-governance criteria of COBIT and the quantitative process capability tracking of CMMI.

#### **3.5.1. COBIT Structural Metatheory (Control Objectives for Information and Related Technology)**

Developed by ISACA, COBIT operates as an overarching Enterprise Governance of IT (EGIT) framework. Unlike ITIL, which focuses on the lifecycle management of specific service pipelines, COBIT establishes a top-down architectural structure that separates Governance from Management:

- Governance: Driven by the Board of Directors under the leadership of executive officers. Its mandatory functions are to evaluate stakeholder

needs, Direct strategy through clear prioritization, and monitor compliance and corporate performance (EDM Domain).

- Management: Executed by executive management (CEO/CIO) to Plan, Build, Run, and Monitor activities (PBRM) in strict alignment with the governance trajectory.

COBIT organizes these requirements across structured process domains: Align, Plan and Organize (APO); Build, Acquire and Implement (BAI); Deliver, Service and Support (DSS); and Monitor, Evaluate and Assess (MEA). This structure relies on a systemic Goals Cascade mechanism, which dynamically maps high-level stakeholder needs into specific IT alignment goals, ensuring that technology investments directly generate business value, optimize structural risks, and preserve resource transparency.

### **3.5.2. CMMI Architectural Maturity Paradigms (Capability Maturity Model Integration)**

In sharp contrast to both service delivery frameworks and corporate governance models, CMMI represents a process capability and maturity reference model designed to evaluate and enhance process predictability across engineering lines. Rooted in statistical process control, CMMI reduces internal variance to guarantee predictable project cycles. In its staged representation, organizations are evaluated across five distinct Maturity Levels, where each level forms a predictable foundation for systemic continuous optimization:

- Level 1 (Initial): Processes are characteristically chaotic, undocumented, and reactive, relying heavily on individual heroism.
- Level 2 (Managed): Processes are formally planned, monitored, and controlled at the individual project level, ensuring activities are repeatable under similar conditions.
- Level 3 (Defined): Processes are thoroughly standardized, documented, and integrated into a corporate-wide library of best practices, transforming management into a proactive corporate strategy.
- Level 4 (Quantitatively Managed): Process performance is tracked via rigorous statistical metrics and quantitative quality models, enabling data-driven predictability.
- Level 5 (Optimizing): The enterprise focuses on continuous systemic innovation, leveraging quantitative historical data to implement preventive technical adjustments and drive agile operational enhancements.

## **4. Framework Comparison**

The following section provides a systematic evaluation of various international models that support the optimization and governance of IT processes. To establish a clear distinction between the most widely utilized systems in the industry, a comparative analysis is performed among ITIL, COBIT, and CMMI.

The following table (Table 1) provides a schematic comparison of the ITIL, COBIT, and CMMI frameworks for IT process management and optimization. It highlights key structural and operational aspects, including their core purpose, focus areas, governance scopes, methodological approaches, and degrees of flexibility.

**Table 1: Comparison of ITIL, COBIT, and CMMI frameworks for IT process management and optimization**

ASPECT	ITIL	COBIT	CMMI
Purpose	Optimize IT service management and value delivery	Align IT process governance and monitoring with business objectives	Improve organizational processes and mature software/systems development
Area of approach	Service lifecycle management	Strategic alignment, risk management, and performance measurement	Process maturity, engineering, and development practices
Structure	Five core phases: Strategy, Design, Transition, Operation, Continual Improvement	Domains and processes categorized into governance and management	Maturity levels (0-5) structured across multiple process areas
Scope	IT service providers and operational teams	Corporate IT governance at the organizational level	Software development, systems engineering, and product organizations
Methodological Approach	Non-prescriptive framework based on industry best practice	Governance-oriented framework focused on monitoring and control	Prescriptive and structured assessment reference model
Flexibility	High - highly adaptable to organizations of any type or size	Moderate - requires formal alignment with corporate goals	Moderate - demands rigorous, structured compliance evaluations
Standardization	Promotes standardization through repeatable service processes	Emphasizes compliance, audits, and control standards	Drives standardized development and engineering processes
Adoption	Widely adopted across public and private IT organizations	Predominant in highly regulated, audited, and compliant sectors	Common in aerospace, defense, engineering, and large-scale software projects
Guidance a results	Customer satisfaction and IT service value	Business value generation through IT	Predictable project performance and continuous quality

	realization	alignment and monitoring	improvement
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*Note.* Adapted from ITIL (Cartlidge et al., 2012), COBIT (Calvo-Manzano et al., 2015), and CMMI (Shrestha et al., 2020).

The comparative matrix highlights the structural divergence in how IT management is treated across frameworks. COBIT operates primarily as a top-down corporate governance blueprint, offering executive boards a rigorous methodology to monitor risk and audit performance indicators against overarching corporate goals. CMMI, on the other hand, provides a highly prescriptive engineering evaluation framework that measures the capability and capability maturity levels of systems development teams.

In sharp contrast, ITIL functions as a bottom-up, non-prescriptive, service-centric ecosystem. Its non-prescriptive nature allows organizations to bypass the rigid, compliance-heavy restrictions inherent to CMMI while avoiding the extensive governance overhead associated with COBIT. By focusing on the direct correlation between utility and warranty, ITIL optimizes day-to-day operations through repeatable service cycles, making it a highly flexible alternative for organizations aiming to integrate disparate operational tasks into a unified, value-driven architecture.

## 5. Conclusions

The integrated process approach explains ITIL's global success, driving its widespread adoption and the primary benefits realized by organizations that embed these methodologies and processes within their structures. Under ITIL, process optimization and service improvement are anchored in customer value creation. This value is generated, first, by enhancing service performance and eliminating operational constraints. Concurrently, service delivery must meet rigorous baseline requirements regarding availability, capacity, continuity, and security to satisfy client needs.

At the core of the service lifecycle lies a systemic architecture that integrates interactive, self-similar phases embedded with continuous feedback loops. This system validates operational performance against the strategic goals of both the business and the client, implementing adjustments that optimize the entire value chain. Consequently, this mechanism ensures that customers derive sustainable value from these services.

Ultimately, ITIL provides a comprehensive framework to implement a structured service lifecycle, enabling rigorous control over IT service management processes. Through this model, strategy, design, transition, operation, and continual improvement operate as an integrated ecosystem to optimize organizational best practices.

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