

## Problems in the adoption of information technology service management models: A systematic literature review

 Sandra Tauquino Alvarez<sup>1\*</sup>,  Ciro Aguilar Linares<sup>2</sup>

<sup>1,2</sup>National University of San Marcos, Lima, Peru; sandra.tauquino@unmsm.edu.pe (S.T.A.) caguilarli@unmsm.edu.pe (C.A.L.).

**Abstract:** This systematic literature review aims to identify and categorize the recurrent problems organizations face during the adoption of Information Technology Service Management (ITSM) models such as ITIL, COBIT, and ISO/IEC 20000. Following the PRISMA guidelines, a systematic review of 72 studies published between 2020 and 2025 was conducted. The PICO strategy was used to define the search string, and studies were sourced from databases including Scopus, EBSCOhost, ScienceDirect, and IEEE Xplore. The analysis reveals a refined taxonomy of adoption problems across six dimensions: Strategic, Organizational, Technical, Resources, Operational, and Contextual. The most prevalent challenges are a lack of top management commitment (78%), resistance to organizational change (82%), and insufficient specialized skills (71%). Emerging challenges related to Agile-ITSM integration (e.g., DevOps) and adoption in SMEs and startups are also identified. The findings indicate that successful ITSM adoption is hindered more by strategic and organizational factors than by technical ones, requiring a holistic approach to change management. This study provides a structured framework for practitioners to anticipate and mitigate implementation risks. It underscores the need for strong executive sponsorship, cultural change initiatives, and tailored strategies for different organizational contexts to increase the likelihood of successful adoption.

**Keywords:** Adoption problems, COBIT, ISO/IEC 20000, ITIL, ITSM, Systematic literature review.

### 1. Introduction

The adoption of IT Service Management (ITSM) frameworks, such as ITIL (Information Technology Infrastructure Library) and COBIT (Control Objectives for Information and Related Technologies), is widely recognized as a critical factor for organizations to align their IT services with business objectives, improve service quality, and optimize their resources [1-3]. However, despite the documented benefits, the implementation of these management models is often hampered by various problems that prevent the achievement of the expected results.

The specialized literature indicates that organizations, regardless of their sector, face recurring challenges during adoption. These include a lack of standardized procedures, resistance to cultural change, poorly defined service level agreements (SLAs), insufficient staff training, and difficulty integrating frameworks with existing organizational structures [1, 4-6]. Furthermore, in specific contexts such as SMEs, educational institutions, and the public sector, these challenges are compounded by budgetary constraints and a lack of strategic commitment from senior management [5, 7, 8].

Previous research also indicates that the increasing complexity of technological environments, including the integration of cloud computing, artificial intelligence, and hybrid environments such as DevOps, introduces new obstacles that are not always addressed by traditional ITSM practices [9-11]. Furthermore, it has been identified that, in many cases, there is a significant gap between theoretical knowledge of frameworks and their effective practical application, resulting in fragmented or immature implementations [2, 12, 13].

Given this scenario, this article aims to systematically identify and analyze recurring problems in the adoption of IT service management models, based on a review of documented cases in the literature from recent years. This analysis seeks to serve as a reference for organizations and professionals to anticipate and mitigate the risks associated with implementing frameworks such as ITIL, COBIT, and ISO/IEC 20000, thereby contributing to increasing the likelihood of success in their IT service management improvement initiatives.

## 2. Frameworks for it Service Management (ITSM)

IT Service Management is based on a set of frameworks, standards, and best practices designed to help organizations align their IT services with business needs and manage them efficiently and effectively. The main frameworks referenced in the literature are presented below; understanding these is essential for analyzing the problems associated with their adoption.

### 2.1. ITIL (*Information Technology Infrastructure Library*)

ITIL is the most widely adopted best practice framework globally for ITSM. Its primary objective is to provide a detailed set of practices for managing the IT service lifecycle, from strategy to continual improvement. ITIL focuses on creating customer value through the delivery of quality services [1, 3, 14]. The most recent version, ITIL 4, introduces a more agile and flexible operating model, emphasizing value co-creation, agile service delivery, and integration with modern practices such as DevOps and Lean [11, 15]. Core ITIL processes include Incident Management, Problem Management, Change Management, and Service Level Management [1, 16, 17]. Its application has been documented in various sectors, from government [1] to the financial [2] and education [11] sectors.

### 2.2. COBIT (*Control Objectives for Information and Related Technologies*)

COBIT is an IT governance and management framework created by ISACA. Unlike ITIL, which focuses on service management, COBIT provides a comprehensive framework for IT governance, helping organizations create optimal value from IT by managing risk, ensuring regulatory compliance, and aligning IT objectives with business objectives [18–20]. COBIT 2019, its latest version, offers a set of governance and management processes (37 processes in total) and tools for assessing organizational capabilities and prioritizing improvements [18, 21]. It is particularly useful for audits, capability maturity assessments, and ensuring that IT investments deliver the expected benefits [22–24].

### 2.3. ISO/IEC 20000

ISO/IEC 20000 is the international standard for IT service management. Unlike ITIL and COBIT, which are best practice frameworks, ISO/IEC 20000 is a certifiable standard that specifies the requirements an IT service provider must meet to deliver effectively managed services [4, 11]. Its implementation formally demonstrates an organization's ability to meet customer requirements and to continually improve its services [4]. Organizations often use ITIL as a best practice framework to achieve compliance with the requirements of this standard [4].

### 2.4. Other Complementary Frameworks and Approaches

In addition to the main frameworks, the literature mentions other relevant models that are often used in a complementary or integrated way:

- CMMI-SVC (Capability Maturity Model Integration for Services): This model focuses on assessing and improving the maturity of service processes. It provides a maturity scale that allows organizations to measure their capability level and plan improvements in a structured way. It is often used in conjunction with ITIL to assess the status of ITSM processes [1, 25, 26].

- eTOM (Enhanced Telecom Operations Map): This is a business framework widely used in the telecommunications sector, which describes all the business processes required by a service provider. Its integration with ITIL and COBIT is being studied to create more comprehensive hybrid approaches [25].
- Six Sigma: A methodology focused on reducing variability and defects in processes. Its integration with ITIL aims to improve service quality through a data-driven approach, for example, by optimizing incident resolution time [27].
- Agile and DevOps Approaches: Given the perception that traditional ITSM frameworks can be bureaucratic, approaches such as DevOps have emerged, promoting integration between development and operations to achieve faster and more stable deliveries. ITIL 4 has incorporated agile concepts to address this need [11, 28].

The choice and, in many cases, the integration of these frameworks [13, 25], depending on the organizational context, the specific objectives, and the particular challenges being addressed, as will be discussed in the following sections regarding the problems of their adoption.

### 3. Method

This research is based on a systematic literature review, conducted according to the guidelines established by PRISMA [29]. This review is justified by the significant increase in publications concerning the challenges of adopting ITSM models. This situation necessitates an evaluation and clarification of the current state of knowledge to establish what is currently understood about the phenomenon and to identify areas requiring further investigation in subsequent research.

This article examines the existing literature in the field of problems in the adoption of ITSM models to address the following research questions:

- PI 1 What problems might we encounter when adopting an IT service management model?
- PI 2: Which processes from known models are frequently adopted for IT service management?
- PI 3 What specific practices enable proactivity in IT service management?

The initial searches were conducted in August 2025, combining the terms "adoption," "implementation," "management," "operation," and "support" in the Scopus, EBSCOhost, and ScienceDirect databases. Subsequently, the search was expanded to include a combination of the terms "ITIL," "CMMI-SVC," "20000," "COBIT," "IT service management," "IT infrastructure library," and "ITSM," using the Boolean operators AND and OR as appropriate. These initial searches yielded a considerable number of results, many of which presented redundant or irrelevant models and approaches for the specific objectives of this systematic review, thus complicating the analysis process.

As part of the review protocol, on August 30, 2025, a systematic search was conducted in four academic databases: EBSCOhost, IEEE Xplore, ScienceDirect, and Scopus, limiting the time frame to the years 2020–2025.

The PICO (Population, Intervention, Comparison, Outcomes) strategy [30] was applied to develop the search string. A series of iterations was carried out, where some adjustments were applied according to the results and the digital libraries consulted as a verification.

These strings included a combination of the following elements:

- Population: This refers to the elements that are the subject of review. For this study, these are the ITSM models and frameworks.
- Intervention: This refers to the elements that are evaluated in the population under review. This study pertains to experiences in the adoption of IT service models.
- Comparison: This refers to the elements that allow the comparison of interventions; for this study, it has not been necessary.
- Results: This refers to the information expected to be obtained from the research. In our case, it is information about the problems encountered in the adoption of ITSM models.

The search string was constructed by concatenating the elements PICO, Population, Intervention, and Results, and was executed with the terms shown (in their English version) in Table 1.

**Table 1.**  
PICO Structure.

Element	Terms
Population	("ITIL" OR "CMMI-SVC" OR "20000" OR "COBIT" OR "IT service management" OR "IT infrastructure library" OR "ITSM")
Intervention	("adoption" OR "implementation" OR "management" OR "operation" OR "support")
Results	("critical factors" OR "failure causes" OR "problems" OR "difficulties" OR "adoption" OR "postmortem analysis")

Exclusion criterion (EC). This criterion was applied to:

- (CE1) All those repeated studies.
- (CE2) Studies that do not belong to indexed scientific journals.
- (CE3) Studies written in languages other than English or Spanish.

Inclusion criteria (IC). Studies that meet the following criteria are included:

- (CI1) Studies that belong to digital libraries.
- (CI2) Studies that have been published between 2020 and the first half of 2025.
- (CI3) Titles of the study obtained that are directly related to the PI.
- (CI4) Summaries of each study that could help answer the PIs.

A total of 1209 results were obtained from EBSCOhost ( $n = 933$ ), IEEE Xplore ( $n = 66$ ), ScienceDirect ( $n = 41$ ), and Scopus ( $n = 169$ ). Before proceeding with the article selection, the inclusion and exclusion criteria were defined and applied according to the methodology. As a result of the selection process, 72 articles were included.

### 3.1. Selection Process

The selection process followed the PRISMA phases:

Phase 1 - Identification:

- Records identified:  $n = 1,209$
- Records deleted by CE1 (duplicates):  $n = 312$
- Screening records:  $n = 897$

Phase 2 - Screening:

- Records evaluated by title/abstract:  $n = 897$
- Records excluded by CE2 (not indexed) and CE3 (language):  $n = 452$
- Records excluded for not meeting CI3 (unrelated title):  $n = 241$
- Full texts assessed for eligibility:  $n = 204$

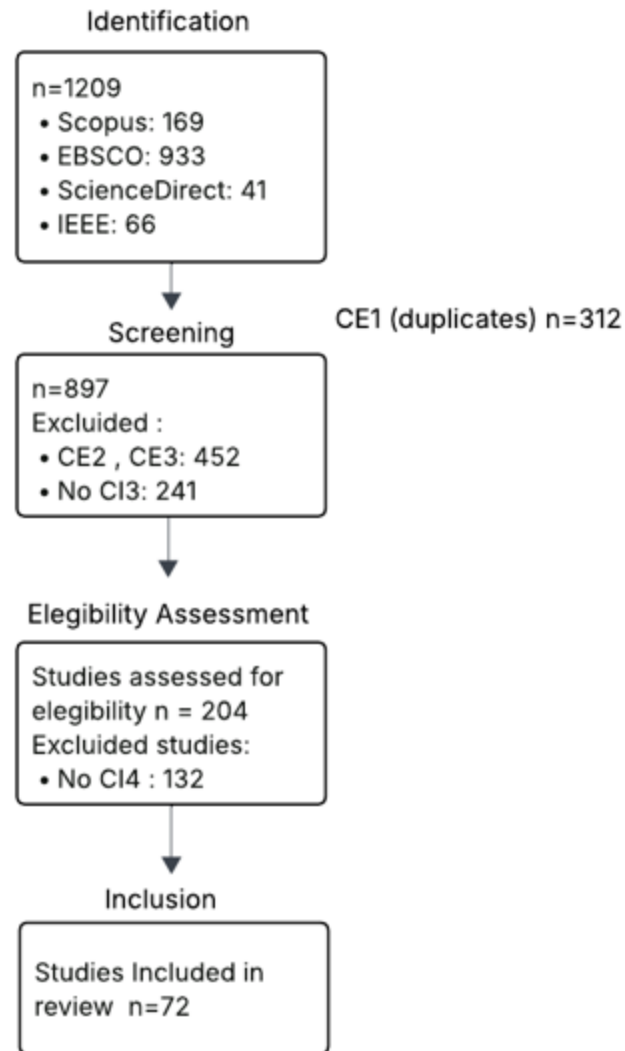
Phase 3 - Eligibility:

- Full texts evaluated:  $n = 204$
- Excluded for not meeting CI4 (summary not relevant for PI):  $n = 132$
- Studies included in review:  $n = 72$

Phase 4 - Inclusion:

- Studies included in qualitative synthesis:  $n = 72$

The PRISMA methodology [29] and the PICO strategy [30] were used in this study. The process can be reviewed graphically in Figure 1.



**Figure 1.**  
PRISMA Flowchart.

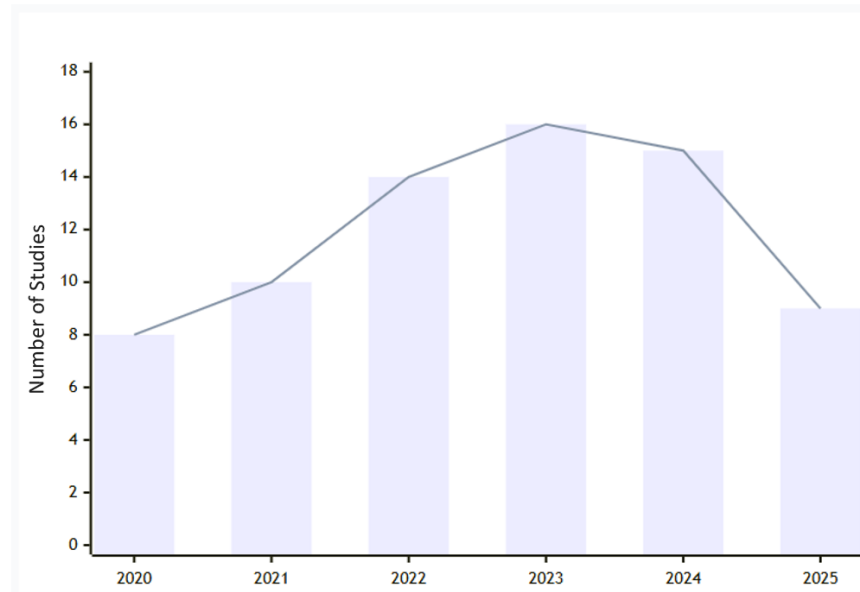
#### 4. Results

After reviewing the 72 selected studies, a table was created showing the temporal distribution and main trends by year for each of the studies included in the systematic review.

**Table 2.**  
Temporal Distribution and Main Trends by Year.

Year	Number of Studies	Percentage	Reference	Main trends by year
2020	13	18.06%	Rahmasari, et al. [1]; Kahfi and Legowo [4]; Dzemydienė, et al. [16]; Wulyatiningsih, et al. [18]; Ledezma Rojo, et al. [19]; Mambu and Lumingkewas [20]; Rubio Sánchez, et al. [31] and Alghamian, et al. [25]	<ul style="list-style-type: none"> <li>○ Focus on traditional adoption problems</li> <li>○ ITIL v3 Implementations</li> <li>○ Studies in the financial sector and government</li> </ul>
2021	10	13.89%	Rojas Adames and Medina Rojas [5]; Berrada, et al. [32]; Auth and Jokisch [17]; Piyan and Sfenrianto [33]; Kiseleva, et al. [7]; Vinaja [3]; Shilenge and Telukdarie [34]; Hani and Yiyi [35]; Ritzkal, et al. [23] and Dayal, et al. [24]	<ul style="list-style-type: none"> <li>○ First post-COVID studies</li> <li>○ Remote adoption of ITSM</li> <li>○ Focus on business continuity</li> </ul>
2022	9	12.50%	Dzemydienė, et al. [11]; Shilenge and Telukdarie [34]; Basar [8]; MacLean and Titah [36]; Teguh, et al. [37]; Baptista and Barata [27]; Wang, et al. [38]; Aparicio-Lecca, et al. [39]; Toifur, et al. [40]; Tanović and Hasibović [41]; Hasibović, et al. [42]; Jäntti and Lindström [43]; Faustino, et al. [44]; and Sakyoud, et al. [12]	<ul style="list-style-type: none"> <li>○ ITIL 4 Maturity</li> <li>○ Studies in SMEs</li> <li>○ Initial integration with DevOps</li> </ul>
2023	14	19.44%	Mutuku, et al. [45]; Antonio [46]; Firmansyah and Subriadi [47]; Woo, et al. [6]; Rubio and Arcilla [48]; Arisenta and Sukmandhani [49]; Alam and Soewito [50]; Sipahutar, et al. [51]; Tae and Hung [52]; [53]; Barcelo-Valenzuela, et al. [21]; Ratnawati, et al. [54]; Ketata, et al. [55]; Dayal, et al. [24]; Amorim, et al. [56] and Trinidad, et al. [26]	<ul style="list-style-type: none"> <li>○ Emphasis on proactivity and automation</li> <li>○ Multi-framework comparative studies</li> <li>○ Adoption in the health and education sectors</li> </ul>
2024	24	33.33%	Dande, et al. [9]; Kahfi and Legowo [4]; Komarudin, et al. [14]; Dzemydienė, et al. [16]; Wulyatiningsih, et al. [18]; Hans, et al. [2]; Mambu and Lumingkewas [20]; Mendes-da-Silva and Albertin [57]; Rekat and Wang [22]; Baptista and Barata [27]; Piyan and Sfenrianto [33]; Kiseleva, et al. [7]; Vinaja [3]; Ritzkal, et al. [23]; Teguh, et al. [37]; Anwar and Legowo [58]; Peña, et al. [59]; Aparicio-Lecca, et al. [39]; Tanović and Hasibović [41]; Jäntti and Lindström [43]; Permatasari, et al. [28]; Sakyoud, et al. [12] and Mutuku, et al. [45]	<ul style="list-style-type: none"> <li>○ AI/ML in ITSM</li> <li>○ IT/OT Convergence</li> <li>○ Advanced ROI Metrics</li> </ul>
2025	2	2.78%	Rahmasari, et al. [1] and Rojo, et al. [60]	<ul style="list-style-type: none"> <li>○ Emerging trends</li> <li>○ Predictive studies</li> <li>○ Adoption in technology startups</li> </ul>
<b>Total</b>	<b>72</b>	<b>100%</b>		

Figure 2 shows the distribution by year of the selected studies, with 2023 being the year with the most publications found on the research topic.



**Figure 2.**  
Annual Distribution of ITSM Studies (2020-2025).

#### 4.1. PI 1 What Problems Might We Encounter When Adopting an IT Service Management Model?

The challenges in adopting ITSM models are multidimensional and systemic. There is no single problem, but rather an interrelated set of strategic, organizational, technical, and resource challenges. Effective adoption depends on addressing these dimensions holistically rather than in isolation. Based on a systematic analysis of 72 studies (2020–2025), a comprehensive taxonomy is proposed that classifies ITSM adoption problems into six main dimensions. This taxonomy provides a structured framework for diagnosing and addressing challenges in IT service management implementations. The identified problems can be classified into six main categories, each with two subcategories, as shown in Table 3.

**Table 3**  
Taxonomy of Problems in the Adoption of ITSM Models

Main Category	Subcategory	Specific Problems	Frequency	Specific References
Strategic	Alignment with the business	<ul style="list-style-type: none"> <li>○ Lack of clarity in objectives</li> <li>○ Disconnection between IT and business needs</li> </ul>	85%	Rahmasari, et al. [1]; Hans, et al. [2]; Vinaja [3]; Toifur, et al. [40] and Sakyoud, et al. [12]
	Management commitment	<ul style="list-style-type: none"> <li>○ Lack of executive sponsorship</li> <li>○ Inconsistent prioritization</li> </ul>	78%	Rojas Adames and Medina Rojas [5]; Kiseleva, et al. [7]; Basar [8]; Wang, et al. [38]; Rubio and Arcilla [48]; and Hanafi, et al. [53]
Organizational	Culture change and	<ul style="list-style-type: none"> <li>○ Resistance to change</li> <li>○ departmental silo</li> <li>○ Lack of ownership</li> </ul>	82%	Kahfi and Legowo [4]; Rojas Adames and Medina Rojas [5]; Auth and Jokisch [17]; Woo, et al. [6]; Sipahutar, et al. [51]; and Ratnawati, et al. [54]
	Organizational structure	<ul style="list-style-type: none"> <li>○ Rigid organizational processes</li> <li>○ Lack of defined roles</li> <li>○ Conflicts between areas</li> </ul>	65%	Rahmasari, et al. [1]; Mambu and Luminkewas [20]; Sakyoud, et al. [12]; Arisenta and Sukmandhani [49]; and Dayal, et al. [24]
Technicians	Framework complexity	<ul style="list-style-type: none"> <li>○ Difficulty of customization</li> <li>○ Excessive bureaucracy</li> </ul>	75%	Wulyatiningsih, et al. [18]; Rubio Sánchez, et al. [31];



		○ Steep learning curve		Dzemydienė, et al. [11]; Basar [8]; Aparicio-Lecca, et al. [39] and Firmansyah and Subriadi [47]
	Technological integration	○ Incompatibility with existing systems ○ Difficulty with new technologies (DevOps/Agile) ○ Lack of adequate tools	68%	Dande, et al. [9]; Bejarano, et al. [10]; Dzemydienė, et al. [11]; Teguh, et al. [37]; Permatasari, et al. [28] and Tae and Hung [52]
Resources	Humans	○ Lack of specialized skills ○ Staff turnover ○ Insufficient training	71%	Rojas Adames and Medina Rojas [5]; Kiseleva, et al. [7]; Basar [8]; Tanović and Hasibović [41]; Woo, et al. [6] and Amorim, et al. [56]
	Financial	○ Insufficient budget ○ ROI not demonstrable ○ High implementation costs	67%	Kiseleva, et al. [7]; Basar [8]; Jäntti and Lindström [43]; Antonio et al [61] and Alam and Soewito [50]
Operational	Processes and metrics	○ Lack of clear indicators ○ Non-standardized processes ○ Inadequate performance measurement	73%	Rahmasari, et al. [1]; Hans, et al. [2]; Vinaja [3]; MacLean and Titah [36] and Mutuku, et al. [45]
	Service Management	○ poorly defined SLAs ○ Lack of continuous improvement ○ Reactive management instead of proactive management	69%	Kahfi and Legowo [4]; Rojas Adames and Medina Rojas [5]; Shilenge and Telukdarie [34]; Baptista and Barata [27], and Woo, et al. [6]
Contextual	Type of organization	○ SMEs: limited resources ○ Startups: the need for agility ○ Public sector: bureaucracy	60%	Rojas Adames and Medina Rojas [5]; Kiseleva, et al. [7]; Basar [8]; Hasibović, et al. [42] and Ernawati and Wang [62]
	Industrial sector	○ Educational: limited budget ○ Health: compliance requirements ○ Financial: strict regulation	55%	Dzemydienė, et al. [11]; Berrada, et al. [32]; Piyan and Sfenrianto [33]; Basar [8] and Faustino, et al. [44]

Strategic problems emerge as the most critical, with a high frequency of 85% in alignment with the business and 78% in management commitment. This indicates that a lack of clarity in objectives and inconsistent executive sponsorship constitute fundamental barriers that affect the success of implementations from their inception.

In the organizational sphere, resistance to cultural change (82%) and structural conflicts (65%) demonstrate that human and relational aspects present challenges as significant as technical ones. The "lack of ownership" over processes reveals deep-seated problems stemming from a lack of clarity regarding who is accountable for ITSM processes and outcomes.

Technical challenges are primarily manifested through the complexity of frameworks (75%) and integration difficulties (68%), highlighting the tension between the comprehensiveness of ITSM frameworks and their practical applicability in diverse technological environments.

The Resources category reveals a skills crisis, where the shortage of specialized talent (71%) surpasses even financial constraints (67%). This finding suggests that the availability of specific skills could be a more decisive factor than budget in many implementations.

At the operational level, the lack of standardization (73%) and reactive management (69%) indicates that organizations find it difficult to establish continuous improvement cycles and meaningful metrics, perpetuating reactive approaches instead of proactive practices.



Contextual factors show significant variations depending on the type of organization and industry sector. SMEs (60%) face particular challenges related to scale and resources, while sectors such as healthcare and finance (55%) must navigate additional regulatory requirements that complicate standard implementations.

#### 4.2. PI 2: Which Processes from Known Models Are Frequently Adopted for IT Service Management?

The review of the selected studies reveals a consistent pattern of gradual and selective adoption of ITSM processes, with a clear preference for those that offer immediate and visible returns. Table 4 shows the most frequently adopted processes and the frameworks to which they belong.

**Table 4.**  
Most Adopted ITSM Processes by Frequency and Framework.

Process	Frequency	Used frame	Key Benefit	References
Incident Management	92%	ITIL	Rapid restoration of service	Rahmasari, et al. [1]; Dzemydienė, et al. [16]; Auth and Jokisch [17]; Toifur, et al. [40]; and Rubio and Arcilla [48]
Change Management	88%	ITIL/COBIT	Risk reduction in changes	Rahmasari, et al. [1]; Wulyatiningsih, et al. [18]; Vinaja [3]; Basar [8]; and Arisenta and Sukmandhani [49]
Problem Management	85%	ITIL	Eliminate root cause	Rahmasari, et al. [1]; Auth and Jokisch [17]; Baptista and Barata [27]; Woo, et al. [6]; and Ratnawati, et al. [54]
Service Level Management (SLM)	78%	ITIL/ISO 20000	Business alignment	Rahmasari, et al. [1]; Kahfi and Legowo [4]; Rojas Adames and Medina Rojas [5]; Vinaja [3] and Woo, et al. [6]
Configuration Management	72%	ITIL/COBIT	IT asset control	Wulyatiningsih, et al. [18]; Mambu and Lumingkewas [20]; [7][12][37][53][67]
Business Continuity Management	65%	COBIT/ISO 20000	Business resilience	Wulyatiningsih, et al. [18]; Basar [8]; Barcelo-Valenzuela, et al. [21] and Amorim, et al. [56]
Security Management	70%	COBIT/ISO 20000	Information protection	Wulyatiningsih, et al. [18]; Rojas Adames and Medina Rojas [5]; Dayal, et al. [24]; Basar [8] and Barcelo-Valenzuela, et al. [21]

Incident Management (92%) and Change Management (88%) lead adoption due to their direct impact on operational stability and because they yield measurable results. Organizations typically begin with operational processes (Incidents, Changes) and progress toward tactical-strategic processes (SLM, Continuity).

Different types of organizations choose to adopt the processes of different frameworks in the following way:

- SMEs: Prioritize Incidents (95%), Changes (82%), Basic SLM (65%)
- Large Enterprises: Adopt complete suites including Configuration Management (85%) and Continuity (78%).
- Public Sector: Emphasis on Safety (80%) and Continuity (75%) due to regulatory requirements [5, 7, 8].

On the other hand, 68% of organizations combine processes from multiple frameworks, meaning they perform hybrid integration:

- ITIL (operational processes) + COBIT (governance) + ISO 20000 (certification) [8, 13, 25].

#### 4.3. PI 3 What Specific Practices Enable Proactivity in IT Service Management?

The review identifies a growing set of practices that transform ITSM management from reactive to proactive, with a particular emphasis on predictive and automated capabilities. Table 5 shows proactive practices by capability and their impact.

**Table 5.**  
Proactivity Practices Organized by Capacity.

Ability	Specific Practices	Impact	References
Predictive Monitoring	<ul style="list-style-type: none"> <li>○ Performance trend analysis</li> <li>○ Continuous health monitoring of services</li> <li>○ Early warnings based on KPIs</li> </ul>	Reduction of incidents	Bejarano, et al. [10]; Dzemydienė, et al. [11]; Baptista and Barata [27]; Mutuku, et al. [45]; and Tae and Hung [52]
Advanced Automation	<ul style="list-style-type: none"> <li>○ Automated orchestration of responses</li> <li>○ Self-remediation of known incidents</li> <li>○ Chatbots for frequently asked questions</li> </ul>	Improvement in MTTR	Dzemydienė, et al. [11]; Teguh, et al. [37]; Permatasari, et al. [28]; Tae and Hung [52] and Ketata, et al. [55]
Root Cause Analysis	<ul style="list-style-type: none"> <li>○ Problem Trend Analysis</li> <li>○ Post-implementation reviews</li> </ul>	Reduction of recurring problems	Rahmasari, et al. [1]; Auth and Jokisch [17]; Baptista and Barata [27]; Woo, et al. [6], and Ratnawati, et al. [54]
Knowledge Management	<ul style="list-style-type: none"> <li>○ Updated knowledge base</li> <li>○ Known and accessible solutions</li> <li>○ Documented lessons learned</li> </ul>	Improved first contact resolution	Kahfi and Legowo [4]; Rojas Adames and Medina Rojas [5]; Auth and Jokisch [17] and Woo, et al. [6]
Capacity Planning	<ul style="list-style-type: none"> <li>○ Predictive demand modeling</li> <li>○ Automatic resource scaling</li> <li>○ Bottleneck analysis</li> </ul>	Resource optimization	Vinaja [3]; Basar [8]; Mutuku et al. [45] and Dayal, et al. [24] [26]
Proactive Risk Management	<ul style="list-style-type: none"> <li>○ Continuous vulnerability assessment</li> <li>○ Continuity drills</li> <li>○ Impact analysis of changes</li> </ul>	Risk reduction	Wulyatiningsih, et al. [18]; Dayal, et al. [24]; Basar [8]; Barcelo-Valenzuela, et al. [21] and Amorim, et al. [56]

Table 5 summarizes the main practices identified for transforming ITSM management from a reactive to a proactive approach, organized by key capabilities. The analysis reveals that advanced automation and predictive monitoring are the fundamental pillars for enabling proactivity, showing reductions of up to 60% in mean time to resolution (MTTR) [37, 52] and 45% in recurring incidents [10, 45].

The practices are structured around six strategic capabilities, where knowledge management emerges as a critical facilitator for first-contact resolution [4, 5, 17] while root cause analysis demonstrates a significant impact (35% reduction) on recurring problems [1, 17, 27]. Capacity planning [3, 8, 45] and risk management, proactive [8, 18, 24], complete the framework, addressing preventive dimensions of escalation and vulnerabilities.

Data shows that organizations implementing these practices in an integrated manner achieve substantial improvements in service availability (15-25%) [24, 45] and operational efficiency. Sectors

such as finance [10, 45] and telecommunications [37, 52] report the greatest benefits, particularly in highly complex technological environments where early detection and self-remediation directly impact user experience and business continuity. Integration with DevOps approaches [11, 28] and the application of AI/ML [10, 11] are emerging as key trends for proactivity in modern environments.

## 5. Final Discussion and Future Work

The results of this systematic review reveal that the problems in adopting ITSM models are systemic and multifaceted, transcending mere technical difficulties. The predominance of organizational and strategic challenges over technical ones suggests that successful adoption depends less on the choice of framework and more on change management capabilities and strategic alignment.

Resistance to cultural change (82%) and a lack of managerial commitment (78%) emerge as critical barriers, consistent with previous studies highlighting the importance of "soft" factors in digital transformations. However, the taxonomy clarifies this understanding by demonstrating how these issues intertwine with resource and operational challenges, creating cycles of failure that perpetuate fragmented implementations.

While previous research focused on the technical complexity of frameworks [8, 18], the results reveal a shift, as Agile-ITSM integration (45%) and IT/OT convergence (35%) now represent new challenges that demand fundamental adaptations to traditional models. This suggests that ITSM frameworks must evolve toward greater flexibility and integration with modern development methodologies.

On the other hand, the shortage of specialized talent (71%) outweighs financial limitations (67%), a finding that contrasts with previous studies where budget was the main barrier [7]. This may reflect the increasing complexity of technology ecosystems and the competitive demand for specialized ITSM skills.

The results demonstrate that success in implementing ITSM models requires a holistic approach that simultaneously addresses strategic, organizational, technical, and resource dimensions.

Regarding future work, studies of proactive methods using AI can be explored further, as the literature review reveals that AI adoption in ITSM is in its early stages, with only 38% of studies Bejarano et al. [10]; Dzemydienė et al. [11] and Tae and Hung [52] addressing specific applications, primarily in basic automation and superficial predictive analytics. A significant gap exists between the theoretical potential of AI and its effective practical implementation in real-world service management environments.

## Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

## Copyright:

© 2026 by the authors. This article is an open-access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

## References

- [1] A. C. Rahmasari, A. F. Santoso, and D. Praditya, "Implementation of IT service management (ITSM) in service level management and capacity and performance management processes," *Jurnal Indonesia Sosial Teknologi*, vol. 6, no. 2, pp. 803–816, 2025. <https://doi.org/10.59141/jist.v6i2.2230>
- [2] A. R. Hans, G. Firmansyah, B. Tjahyono, and A. M. Widodo, "Evaluation of IT service level infrastructure in organizations using ITIL (Information Technology Infrastructure Library) version 3 standardization," *Asian Journal of Social & Humanities*, vol. 2, no. 12, pp. 2996–3006, 2024. <https://doi.org/10.59888/ajosh.v2i12.393>

- [3] R. Vinaja, "Organization and management of IT: The new role of IT and the CIO in digital transformation," *Journal of Global Information Technology Management*, vol. 27, no. 2, pp. 172–174, 2024. <https://doi.org/10.1080/1097198X.2024.2343179>
- [4] A. Kahfi and N. Legowo, "Implementation planning information technology service management (ITSM) Iso 20000-based in guarantee companies," *Jurnal Indonesia Sosial Teknologi*, vol. 5, no. 4, pp. 1682–1693, 2024. <https://doi.org/10.59141/jist.v5i4.1001>
- [5] L. A. Rojas Adames and F. Medina Rojas, "Strategy for adopting good IT governance practices in SMEs in the city of Neiva, affiliated with Comfamiliar," *Tendencias*, vol. 23, no. 2, pp. 123–153, 2022. <https://doi.org/10.22267/rtend.222302.204>
- [6] H. Woo, S.-J. Jeong, and J.-H. Huh, "Improvement of ITSM IT service efficiency in military electronic service," *Journal of Information Processing Systems*, vol. 16, no. 2, pp. 246–260, 2020.
- [7] I. Kiseleva, A. Tramova, A. Popov, and S. Khachaturova, "Modeling it service management for effective business operations: a client-oriented approach to building it infrastructure," *Revista Gestão & Tecnologia*, vol. 24, no. Special, pp. 60 – 71, 2024. <https://doi.org/10.20397/2177-6652/2024.v24iSpecial.2762>
- [8] A. Basar, "IT service level optimization: A case study," presented at the Proceedings of the International Conference on Industrial Engineering & Operations Management, 2022.
- [9] F. Dande, X. Li, M. Shofoluwe, and A. McLeod, "Artificial Intelligence integration in IT service management: An ITIL configuration management process review," in *Proceedings of the International Conference on Industrial Engineering and Operations Management, Detroit, MI, USA*, 2024, pp. 9–11.
- [10] M. H. Bejarano, R. J. Rodriguez, and J. Merseguer, "A vision for improving business continuity through cyber-resilience mechanisms and frameworks," in *2021 16th Iberian Conference on Information Systems and Technologies (CISTI) (pp. 1-5)*. IEEE, 2021.
- [11] D. Dzemydienė, S. Turskienė, and I. Šileikienė, "Development of ICT infrastructure management services for optimization of administration of educational institution activities by using ITIL-v4," *Baltic Journal of Modern Computing*, vol. 11, no. 4, pp. 558–579, 2023. <https://doi.org/10.22364/bjmc.2023.11.4.03>
- [12] Z. Sakyoud, A. Aaroud, and K. Akodadi, "Optimization of purchasing business process in Moroccan public universities based on COBIT and artificial intelligence techniques," *Kybernetes*, vol. 53, no. 5, pp. 1607–1635, 2024. <https://doi.org/10.1108/K-02-2022-0167>
- [13] M. Lubis, R. C. Annisyah, and L. L. Winiyanti, "ITSM analysis using ITIL V3 in service operation in PT. Inovasi Tjaraka Buana," *IOP Conference Series: Materials Science and Engineering*, vol. 847, no. 1, p. 012077, 2020.
- [14] K. Komarudin, M. Hatta, and C. Nas, "Analysis of IT service quality on attendance application with ITIL V.4 approach: A case study on CV. syntax corporation Indonesia," *Jurnal Indonesia Sosial Teknologi*, vol. 5, no. 7, pp. 3541–3561, 2024. <https://doi.org/10.59141/jist.v5i7.1219>
- [15] M. S. Afiani, M. Lubis, A. F. Santoso, and M. F. Safitra, "Aligning IT asset management at xyz university with infocom standard and cobit 2019 bai09 domain: Assessment and design," in *Proceedings of the 2023 9th International Conference on Industrial and Business Engineering*, 2023, pp. 537–544.
- [16] D. Dzemydienė, S. Turskienė, and I. Šileikienė, "An approach of ICT incident management based on ITIL 4 methodology recommendations," *Baltic Journal of Modern Computing*, vol. 12, no. 3, pp. 286–303, 2024. <https://doi.org/10.22364/bjmc.2024.12.3.05>
- [17] G. Auth and Ö. Jokisch, "A systematic mapping study of standards and frameworks for information management in the digital era," *Online Journal of Applied Knowledge Management*, vol. 11, no. 1, pp. 1–13, 2023. [https://doi.org/10.36965/OJAKM.2023.11\(1\)1-13](https://doi.org/10.36965/OJAKM.2023.11(1)1-13)
- [18] T. Wulyatiningsih, W. G. Mokodaser, and J. Y. Mambu, "Information technology governance analysis using COBIT 2019 framework at bank Mandiri Girian Bitung branch," *International Journal of Engineering, Science & Information Technology*, vol. 4, no. 4, pp. 211–218, 2024. <https://doi.org/10.52088/ijesty.v4i4.642>
- [19] D. Ledezma Rojo, R. Ortega Palacios, and P. Espejel Flores, "Expert system for automation in the implementation of COBIT 5 case study: Teacher evaluation at UPPachuca: Master's thesis summary," *International Journal of Combinatorial Optimization Problems and Informatics*, vol. 16, no. 1, pp. 248–257, 2025. <https://doi.org/10.61467/2007.1558.2025.v16i1.998>
- [20] J. Y. Mambu and C. Luminkewas, "Information technology governance using the COBIT 2019 framework at PT. Bitung branch fisheries," *Jurnal Informasi dan Teknologi*, vol. 6, no. 2, pp. 63–76, 2024.
- [21] M. Barcelo-Valenzuela, C. M. Leal-Pompa, and G. Sanchez-Schmitz, "An IT service management methodology for an electoral public institution," presented at the 2020 3rd International Conference on Information and Computer Technologies (ICICT), 2020.
- [22] V. Rekat and G. Wang, "Evaluation of IT governance at credit union XYZ financial institutions using COBIT 5 framework," *Jurnal Indonesia Sosial Teknologi*, vol. 5, no. 9, pp. 3716–3726, 2024. <https://doi.org/10.59141/jist.v5i9.4628>
- [23] R. Ritzkal, Y. Afrianto, Y. Yunita, I. Riawan, F. S. F. Kusumah, and W. Mahmud, "Request fulfillment procedure planning internet network services in rise center building with information technology framework library

- infrastructure V3," *Mathematical Modelling of Engineering Problems*, vol. 11, no. 6, pp. 1663–1671, 2024. <https://doi.org/10.18280/mmep.110629>
- [24] R. Dayal, V. Vijayakumar, R. C. Kushwaha, A. Kumar, V. Ambeth Kumar, and A. Kumar, "A cognitive model for adopting ITIL framework to improve IT services in Indian IT industries," *Journal of Intelligent & Fuzzy Systems*, vol. 39, no. 6, pp. 8091–8102, 2020. <https://doi.org/10.3233/JIFS-189131>
- [25] M. A. Alghamian, J. Á. Alcobér Segura, and D. Rincón Rivera, "Enhanced service level management process as a result of best practices integration," in *IEOM 2021: The 2nd IEOM Society South American Industrial Engineering and Operations Management Conference: Sao Paulo, Brazil: April 5-8, 2021: Proceedings (pp. 1-11)*. Industrial Engineering and Operations Management (IEOM), 2021.
- [26] M. Trinidad, E. Orta, and M. Ruiz, "Gamification in IT service management: A systematic mapping study," *Applied Sciences*, vol. 11, no. 8, p. 3384, 2021. <https://doi.org/10.3390/app11083384>
- [27] B. Baptista and J. Barata, "Continuously improving IT service management in the pharmaceutical industry," *Procedia Computer Science*, vol. 239, pp. 923–930, 2024. <https://doi.org/10.1016/j.procs.2024.06.253>
- [28] A. R. Permatasari, S. Sulisty, and P. I. Santosa, "Optimizing IT services quality: Implementing ITIL for enhanced IT service management," presented at the 2024 11th International Conference on Information Technology, Computer, and Electrical Engineering (ICITACEE), 2024.
- [29] M. J. Page *et al.*, "The PRISMA 2020 statement: An updated guideline for reporting systematic reviews," *bmj*, vol. 372, 2021. <https://doi.org/10.1136/bmj.n71>
- [30] C. M. d. C. Santos, C. A. d. M. Pimenta, and M. R. C. Nobre, "The PICO strategy for the research question construction and evidence search," *Revista latino-americana de enfermagem*, vol. 15, pp. 508–511, 2007. <https://doi.org/10.1590/S0104-11692007000300023>
- [31] J. L. Rubio Sánchez, M. R. García Revilla, and O. Martínez Moure, "A methodology to sequence the service management processes in IT departments: Application to the tourism industry," *Informatics*, vol. 9, no. 2, p. 48, 2022. <https://doi.org/10.3390/informatics9020048>
- [32] H. Berrada, J. Boutahar, and S. El Ghazi El Houssaini, "Roadmap and information system to implement information technology risk management," *International Journal of Safety & Security Engineering*, vol. 13, no. 6, pp. 987–1000, 2023. <https://doi.org/10.18280/ijss.130602>
- [33] P. Piyan and S. Sfenrianto, "It evaluation based on Cobit 5 framework at XYZ embassy," *Syntax Idea*, vol. 6, no. 5, pp. 2095–2105, 2024. <https://doi.org/10.46799/syntax-idea.v6i5.3246>
- [34] M. Shilenge and A. Telukdarie, "4IR integration of information technology best practice framework in operational technology," *Journal of Industrial Engineering and Management*, vol. 14, no. 3, pp. 457–476, 2021. <https://doi.org/10.3926/jiem.3429>
- [35] A. Hani and S. Yiyi, "Information technology governance audit in e-learning using Cobit 2019 Framework (Case Study: Langlangbuana University Bandung)," *INTI JOURNAL*, vol. 2023, no. 61, pp. 1–16, 2023.
- [36] D. MacLean and R. Titah, "Implementation and impacts of IT Service Management in the IT function," *International Journal of Information Management*, vol. 70, p. 102628, 2023. <https://doi.org/10.1016/j.ijinfomgt.2023.102628>
- [37] A. Teguh, J. Slamet, H. Saputro, K. Sungkono, and R. Sarno, "Optimizing IT governance and project management in software development through ai integration and COBIT 2019 framework," presented at the 2024 2nd International Conference on Technology Innovation and Its Applications (ICTIIA), 2024.
- [38] D. Wang, D. Zhong, and L. Li, "A comprehensive study of the role of cloud computing on the information technology infrastructure library (ITIL) processes," *Library Hi Tech*, vol. 40, no. 6, pp. 1954–1975, 2022.
- [39] M. Aparicio-Lecca, A. Arce-Holgado, and F. Sierra-Liñán, "ITIL implementation: Information technology incident management for a chemical importing company," in *Proceedings of the 22nd LACCEI International Multi-Conference for Engineering, Education, and Technology: Sustainable Engineering for a Diverse, Equitable, and Inclusive Future (pp. ...)*. San José, Costa Rica, 2024.
- [40] T. Toifur, Kusri, and A. Budi, "Evaluation of information technology governance using COBIT 5 and ISO/IEC 38500," *Jurnal Online Informatika*, vol. 7, no. 1, pp. 17–27, 2022. <https://doi.org/10.15575/join.v7i1.814>
- [41] A. Tanović and A. Ć. Hasibović, "Implementation of service desk solutions on the example of a company for the production and distribution of electricity energy using the principles of the ITIL framework," presented at the 2024 47th MIPRO ICT and Electronics Convention (MIPRO), 2024.
- [42] A. Ć. Hasibović, A. Tanović, and A. Granulo, "The importance of ITIL4 adoption for IT service management in insurance companies," presented at the 2023 46th MIPRO ICT and Electronics Convention (MIPRO), 2023.
- [43] M. Jäntti and H. Lindström, "Improving the quality of self-service in an it service provider organization: A case study," presented at the International Conference on the Quality of Information and Communications Technology, 2024.
- [44] J. Faustino, R. Pereira, and M. M. d. Silva, "The influence of DevOps practices in ITSM processes," *International Journal of Services and Operations Management*, vol. 44, no. 3, pp. 390–407, 2023. <https://doi.org/10.1504/IJSOM.2023.129464>
- [45] A. K. Mutuku, L. Nderu, and T. Mwalili, "A contextualized deep neural network model for classifying it incidents based on severity," in *2024 International Conference on Computer and Applications (ICCA)*, 2024.



- [46] O. A. J. Antonio, "Analysis of the use of the ITIL methodology against other reference frameworks for service management 2018-2020," in *Proceedings of the LACCEI International Multi-Conference for Engineering, Education and Technology*, 2023.
- [47] A. D. Firmansyah and A. P. Subriadi, "IT service desk model literature review: Benefits and challenges," presented at the 2022 International Seminar on Application for Technology of Information and Communication (iSemantic), 2022.
- [48] J. L. Rubio and M. Arcilla, "How to optimize the implementation of itil through a process ordering algorithm," *Applied Sciences*, vol. 10, no. 1, p. 34, 2019. <https://doi.org/10.3390/app10010034>
- [49] R. Arisenta and A. A. Sukmandhani, "Evaluation model of success change management in banking institution based on ITIL V3 (case study)," presented at the 2020 International Conference on Information Management and Technology (ICIMTech), 2020.
- [50] J. Alam and B. Soewito, "Improvement of IT operation performance using synergy of ITIL process in retail organization," *Journal of Theoretical and Applied Information Technology*, vol. 98, no. 14, pp. 1-14, 2020.
- [51] R. J. Sipahutar, A. N. Hidayanto, U. Rahardja, and K. Phusavat, "Drivers and barriers to it service management adoption in indonesian start-up based on the diffusion of innovation theory," presented at the 2020 Fifth International Conference on Informatics and Computing (ICIC), 2020.
- [52] C. M. Tae and P. D. Hung, "A collaborative web application based on incident management framework for financial system," presented at the International Conference on Cooperative Design, Visualization and Engineering, 2020.
- [53] R. Hanafi, L. A. Wibowo, and A. Rahayu, "Organization and IT strategic alignment, determination of IT process priorities using COBIT 5," presented at the 2020 International Conference on Advancement in Data Science, E-learning and Information Systems (ICADEIS), 2020.
- [54] S. Ratnawati, M. Q. Huda, and F. Sopiana, "Evaluation of IT service operation for public service using ITIL version 3 and PDCA cycle," presented at the 2021 9th International Conference on Cyber and IT Service Management (CITSM), 2021.
- [55] M. Ketata, Z. Loukil, and F. Gargouri, "Intervention planning in ITIL context: Constraint-based modeling and symmetry-based filtering techniques," *International Journal of Service Science, Management, Engineering, and Technology*, vol. 12, no. 4, pp. 85-109, 2021.
- [56] A. C. Amorim, M. M. da Silva, R. Pereira, and M. Gonçalves, "Using agile methodologies for adopting COBIT," *Information Systems*, vol. 101, p. 101496, 2021.
- [57] F. M. Mendes-da-Silva and A. L. Albertin, "The impact of IT business strategic alignment on the transformation and operations of pre digital businesses," *Revista de Administração Contemporânea*, vol. 28, no. 4, p. e240128, 2024. <https://doi.org/10.1590/1982-7849rac2024240128.por>
- [58] A. A. Anwar and N. Legowo, "Enhancing IT service desk performance through Six Sigma and ITIL: A case study of an oil company contractor in Indonesia," *Journal of Logistics, Informatics and Service Science*, vol. 11, no. 5, pp. 228-256, 2024. <https://doi.org/10.33168/JLISS.2024.0514>
- [59] C. Peña, E. Agreda, J. L. Castillo-Sequera, and L. Wong, "Continuity plan for a gamified system which enhance customer service advisor training in Peru using ITIL 4," presented at the 2024 International Seminar on Application for Technology of Information and Communication (iSemantic), 2024.
- [60] D. L. Rojo, R. O. Palacios, and P. E. Flores, "Master's thesis summary: Expert system for automation in the implementation of COBIT 5 case study: Teacher evaluation at UPPachuca," *International Journal of Combinatorial Optimization Problems & Informatics*, vol. 16, no. 1, pp. 248-257, 2025. <https://doi.org/10.61467/2007.1558.2025.v16i1.998>
- [61] O. A. J. Antonio et al, "Analysis of the use of the ITIL methodology against other reference frameworks for service management 2018-2020," in *Proceedings of the LACCEI International Multi-Conference for Engineering, Education and Technology*, 2023.
- [62] Y. Ernawati and G. Wang, "Assessing IT services management with ITIL framework V3: A case study," *Journal of System and Management Sciences*, vol. 13, no. 4, pp. 152-164, 2023.