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Implementation of IT Governance Using ITIL Service Operation Domain in Indonesian Universities: A Comparative Analysis

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ABSTRACT

This paper explores the implementation of IT governance in Indonesian universities, with a specific focus on the ITIL Service Operation domain. The research aims to assess the maturity levels of IT service management across various institutions and to identify areas for improvement. The study employs a comparative analysis approach, examining several research papers to understand the evolution of ITIL's benefits and challenges in the academic environment. Key findings indicate that while some universities exhibit advanced maturity levels in their IT governance, others are still in the early stages of development. Areas highlighted for improvement include comprehensive documentation, continuous improvement, technology integration, user satisfaction, and staff training. The study emphasizes the importance of adopting a systematic approach and leveraging best practices from the ITIL framework to optimize IT services, thereby enhancing operational efficiency and supporting educational objectives. The findings provide valuable insights into the strategic application of IT governance in enhancing the educational landscape through effective service management.

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1. INTRODUCTION

In 1980, Rockart[1] identified "service" as the primary critical success factor of Information Systems. During the late 1980s, many organizations' IT departments shifted from software development to a service-oriented approach. This change emphasized IT Service Management, which prioritizes managing IT services over developing IT applications. Information Technology Service Management, commonly known as ITSM, plays a crucial role in organizations by ensuring seamless IT service delivery, which is essential for smooth operations. As customer expectations rise, IT services are increasingly focusing on becoming more service-oriented to meet these demands.[2] Several studies have examined the adoption of ITSM frameworks and specific service-oriented IT frameworks[3]. The IT Governance Institute [4] suggests that the most widely adopted IT operational framework is IT Infrastructure Library at 24%, followed by Control Objectives for Information and related Technology at 14%. This research centers on ITIL as the most widely used ITSM framework. The study aims to explore how the benefits of ITIL evolve as universities increasingly adhere to its guidelines. Additionally, it seeks to understand the challenges of implementing ITIL and how these challenges change as universities become more committed to the model.

ITSM belongs to the field of Service Sciences, focusing on IT Operations[5][6]. It involves a series of processes working together to maintain the quality of IT services as per the agreed-upon service levels with the customer[7]. ITSM is about defining, managing, and delivering IT services to meet business goals and customer needs, typically within IT Operations. Service-oriented IT Management is viewed as a philosophy guiding an organization's orientation towards markets, services, lifecycles, and processes[8]. The latest version of ITIL, known as Version 3, was released in May 2007. It comprises 26 sections organized into five lifecycle phases: Service Strategy, Service Design, Service Transition, Service Operation, and Continual Service Improvement. The previous version, Version 2, includes a total of ten processes within two primary domains: Service Support and Service Delivery[9].

In the educational context, ITSM enables institutions to deliver valuable services to users through effective service management practices. ITIL serves as a comprehensive framework, offering best practices and guidelines in ITSM. This framework aids service providers in the universities in delivering high-quality services to users[10], which is crucial for enhancing the educational experience within an institution. Customer relationship management and service management hold significant importance in the digital era, influencing how businesses engage and retain customers[11][12][13]. Implementing ITIL in universities brings various benefits, including enhanced service availability, improved user satisfaction with IT services, efficiency gains through reduced redundant work and costs, faster integration of educational technology into learning environments, and reduced decision-making risks[14][15][16].

Service Operation is a crucial aspect of ITIL, focusing on managing and supporting the continuous operation of IT services within organizations to ensure their smooth functioning and ongoing enhancement. Positioned as the final stage in the ITIL life cycle, its significance lies in its direct impact on user perceptions of the services provided[17][18]. Service Operation encompasses various processes, including Event Management, Incident Management, Problem Management, Request Fulfillment, and Access Management[19][20].

Maturity models in IT management have been under discussion since at least 1973[21], with over a hundred different models proposed[22]. However, many of these models are too broad and lack clear definition and documentation[23]. When assessing the maturity levels of service qualities in universities, scholarly articles have introduced frameworks and insights aimed at evaluating and enhancing these services. For example, the Quality Maturity Model offers a structured approach for academic libraries to gauge their progress towards cultivating a culture of quality by identifying distinct levels of maturity across different aspects of service quality[24][25][26].

The Prince 2 Maturity Model underscores the challenges and potential for development in achieving higher maturity levels, indicating a broad awareness among library staff of quality management principles but a need for further enhancement and application of these principles[27]. Understanding maturity models through structured content analysis provides insights into the applicability of such models in educational services [28][29]. Maturity is categorized into five levels, ranging from initiated to completely mature, providing a framework that could be adapted to assess and enhance the maturity of university services. This model highlights the application of maturity assessments across different organizational contexts, underscoring the versatility and adaptability of maturity models[30].

The significance of IT governance has been acknowledged, but challenges persist in implementing the ITIL framework[31], especially within the higher education environment in Indonesia. Achieving high maturity levels in ITSM requires a commitment to continuous improvement, posing one of the problems that Indonesian universities are currently facing.

Related previous research, titled 'An Analysis of IT Assessment Security Maturity in Higher Education Institutions' [32] reveals that one university in Jakarta has implemented a unified technical function in the field of data processing. The organization subsequently distributed a detailed questionnaire to collect data aimed at understanding existing conditions comprehensively. The results of the data collection indicate that the organization lacks standardized security management or satisfactory service quality. This is evidenced by the incompleteness of Standard Operating Procedures and organization compliance.

Another related previous research, titled 'Maturity Levels of Academic Information Services of Higher Education Using IT Governance' [33], demonstrates that although the current maturity levels suggest that the utilization of IT application portfolios in providing academic information services in private higher education is adequate, the existing conditions have not met the expected performance indicator objectives. The results suggest that the average maturity level of IT governance is at Level 3 (defined process).

The success of this research will significantly contribute to understanding the implementation of IT governance in Indonesian higher education institutions. The primary innovation of this research lies in its comprehensive approach to implementing the ITIL Domain Service Operation framework, which has proven effective in various organizations. Additionally, this research will offer new insights into how higher education

institutions can enhance their IT services through the proposed implementation. Therefore, this article will be a valuable contribution to IT service users, researchers, and decision-makers in higher education and other organizations interested in improving their IT governance and service quality.

2. METHOD

Literature reviews play a crucial role in advancing scientific understanding by summarizing current knowledge, identifying areas needing further exploration, and guiding future research efforts. Through systematic literature reviews, researchers methodically search, assess, and integrate research findings[34]. The approach employed in this study is a literature review, which involves examining various sources like books, journals, papers, and more to form the foundation for conducting research. After collecting various journal studies, the journals are analyzed by identifying, understanding, and comparing each method and result presented in the collected journals[35]. Research involving literature reviews is also a form of investigation and can be considered scientific inquiry since data collection is achieved through a structured research methodology. A thorough and well-executed review, as a research method, lays a strong groundwork for advancing knowledge and bolstering theory development[36]. Unsystematic reviews are often subjective, lack justification for the selection of literature, and typically involve only a partial examination of available resources, leading to potentially inaccurate or false findings[37].

The first step is the systematic identification of articles to be involved in the review. The following step is dedicated to the preparation of the analysis. The next step involves the analysis of the content. Finally, the last step contributes to the overall writing and reporting of the findings[13][38]. For example, beginning with the identification of key articles on the topic, it is suggested to review the citations within those articles and proceed to review articles that cite the identified key articles[15][39]. A critical initial steps in conducting a literature review involves selecting a suitable sample of literature through a systematic search step. Neglecting this step can result in an outdated, fragmented, and irrelevant sample, which cannot be rectified in later steps of the review[37]. The primary emphasis of Systematic Literature Reviews in Information Systems, for instance, lies in the search process, its precision, and replicability, ensuring the reproducibility of document collections evaluated as part of the literature review[40]. Subjects selected from each literature are relevant to the topic of higher education institutions in Indonesia using the ITIL framework. Then, an analysis, description, comparison of strengths and weaknesses, lessons learned, and several conclusions are drawn from the research findings[41]. The implementation of this method when analyzing the content can compare multiple journals. Mulitiple journals were compared to identify similar objects, methodologies, and problem-solving approaches[42]The approach involves examining research papers published between 2014 and 2024.

A well-executed literature review informs readers about what has been discovered and aids other researchers in understanding the accumulated knowledge on a subject. We believe that this understanding is improved when a review is logically organized around the main ideas of the topic and utilizes tables and figures effectively to convey the key findings and relationships[43].

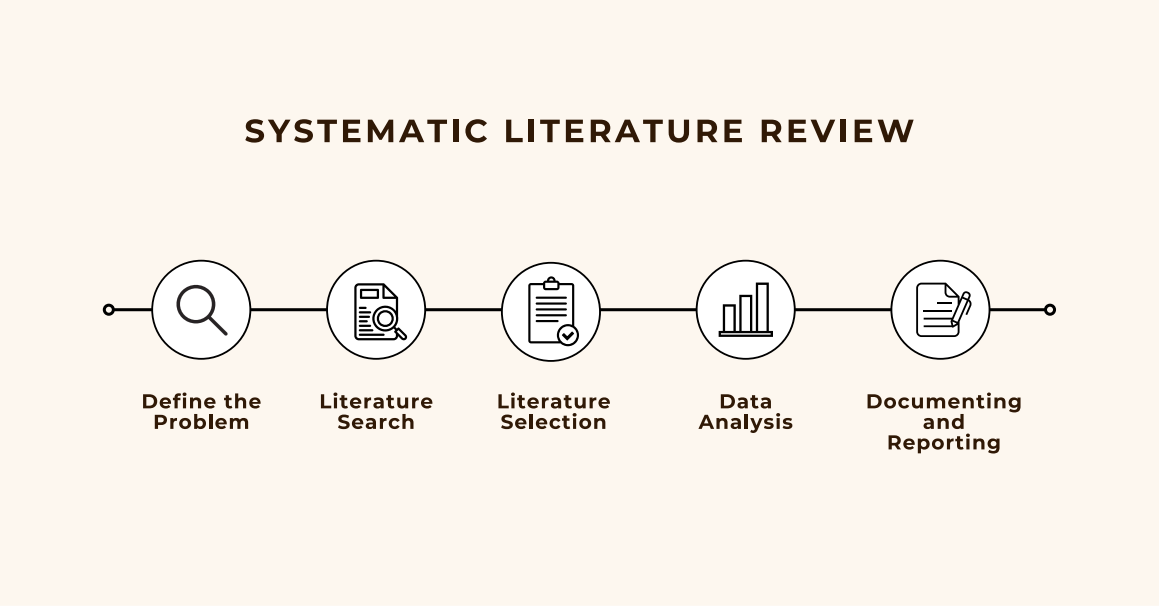

Figure 1 Systematic Literature Review Method

3. RESULTS AND DISCUSSION

3.1. RESEARCH ANALYSIS

3.1.1. Paper A: Analysis of Maturity Level of IT Governance Using ITIL V3 Domain Service Operation Framework at Palembang Open University[44]

The research conducted at the Palembang branch of the Open University analyzed the maturity level of IT governance using the ITIL V3 framework, focusing on the service operation domain. The study utilized literature reviews and a questionnaire distributed via Google Forms to the staff at the university. The results from this assessment were very encouraging, with the overall IT governance across all services, including academic and learning systems, achieving a high maturity level. Specifically, the overall services reached a maturity level of 5, which corresponds to an "Optimized process" classification, indicating highly effective and optimized IT management practices with a score of 4.57. However, the sub-domain of Technology Considerations achieved a maturity level of 4, classified as a "Managed process" with a score of 4.33. This sub-domain has not yet met the university's target maturity level. The study concluded that while the IT governance at the university is exceptionally well-implemented for most services, there remains room for improvement in the Technology Considerations area.

3.1.2. Paper B: Perancangan Manajemen Layanan Teknologi Informasi Menggunakan Framework Information Technology Infrastructure Library (ITIL) Versi 3 Domain Service Operation Studi Kasus Di SMK Negeri 3 Bandung[45]

The journal explores the application of the ITIL version 3 framework to enhance IT service management within SMK Negeri 3 Bandung, focusing on the Service Operation domain. It identifies the essential need for robust IT governance to maximize the utility of IT investments in academic services. The results reveal a predominance of initial and repeatable stages in the maturity assessment across various IT service management areas, indicating that many processes still require significant improvements. The overall maturity level falls within the lower spectrum, specifically between the "repeatable" and "defined" stages, indicating a foundational yet inconsistent application of IT service management practices. The paper details strategic steps and SOPs for enhancing IT service operations, such as event management, incident management, and problem management protocols. The conclusion emphasizes that despite some progress in ITIL adoption, a more systematic approach is necessary to fully leverage ITIL for effective IT service management in the educational sector.

3.1.3. Paper C: Framework ITIL V3 Domain Service Operation dalam Analisis Pengelolaan Teknologi Blended Learning[46]

The journal examines the application of the ITIL V3 framework. Key findings suggest that while the overall IT service operations align with the "Defined" to "Managed" stages of ITIL maturity, indicating a systematic and effective management, there are notable challenges in incident and problem management that need addressing to enhance service reliability and efficiency.

3.1.4. Paper D: Analysis and Design ITSM Service Operation Domain on Academic Services of Institute Pemerintahan Dalam Negeri (IPDN) Using ITIL Version 3 Framework[47]

The study discusses about IPDN's IT service management was at a maturity level of 1-initial, indicating a mostly reactive and unstructured approach to IT service management. Through the research, the authors designed and proposed Standard Operating Procedures (SOPs) for incident management and problem management.

3.1.5. Paper E: ITIL 2011: The Maturity of IT Service Operation in Universitas Multimedia Nusantara, Indonesia[48]

The evaluation focused on five key areas: Incident Management, Problem Management, Access Management, Event Management, and Request Fulfillment. The results indicated that four of the indicators—Incident Management, Problem Management, Event Management, and Request Fulfillment—remained at a basic maturity level (Level 1), suggesting that these areas have foundational processes in place but lack fully managed or optimized approaches. In contrast, Access Management achieved a higher maturity (Level 2), showing a more structured and managed approach.

3.1.6. Paper F: Analisis Layanan Teknologi Informasi Menggunakan Framework ITIL V.3 (Studi Kasus: Perpustakaan UKDW)[49]

The IT service maturity assessment at the UKDW library, using the ITIL V3 framework, evaluated the service operation domain along with its five sub-domains: problem management, event management, incident management, access management, and request fulfillment. The overall maturity level achieved by the

IT services at the UKDW library was Level 4, categorized as "Managed" with a final score 3.37. This indicates that the IT services at the library are well-organized, routinely executed, and have established standards for documentation and performance measurement.

3.1.7. Paper G: Analisa Tingkat Kematangan Sistem Informasi Akademik STMIK AMIK Riau Menggunakan ITIL V3 Domain Service Operation[50]

The study at STMIK Amik Riau evaluated the maturity level of their Academic Information System (SIASAR) using the ITIL V3 framework, specifically focusing on the Service Operation domain. This assessment included the sub-domains of event management, incident management, request fulfillment, problem management, and access management. The findings revealed that the SIASAR system is at a maturity level 2, classified as "Repeatable" with a score of 1.78. This level indicates that the system has a basic discipline and compliance with the existing operational standards and regulations, but it lacks comprehensive documentation and standardized procedures.

3.1.8. Paper H: Evaluasi Maturitas Manajemen Layanan Sistem Informasi Learning NSCApplication(LENSA) Menggunakan FrameworkITIL Versi 3 Domain Service Operation(Studi Pada Politeknik NSC Surabaya)[51]

The study evaluated the maturity of the Learning NSC Application (LENSA) information system at Politeknik NSC Surabaya using the ITIL V3 framework, specifically within the Service Operation domain. The evaluation aimed to identify the current maturity level of the system and provide recommendations for improvement. The findings revealed that LENSA's overall Service Operation domain's maturity level was calculated at 1.87. This score suggests that while the system has established certain operational standards and disciplines, it still lacks robust procedural documentation and control mechanisms. Such limitations can lead to slow responses to system errors and other operational inefficiencies.

3.1.9. Paper I: ANALISIS LAYANAN APLIKASI SIMPKB MENGGUNAKAN FRAMEWORK ITIL V3 DOMAIN SERVICE OPERATION PADA SMK UNGGUL NEGERI 2 BANYUASIN III[52]

Research conducted at SMK Unggul Negeri 2 Banyuasin III aimed to assess the maturity level of IT governance using the ITIL V3 framework. The study employed a mixed approach, combining interviews with IT staff, direct observation of daily operations, and analysis of existing IT system documentation. Its goal was to provide a comprehensive overview of the current IT governance practices and their alignment with the ITIL V3 standard, particularly in the Service Operation domain. The analysis revealed that SMK Unggul Negeri 2 Banyuasin III demonstrates a high level of maturity, scoring an overall 4.57, close to the “Optimized” level. However, there are technological aspects that need improvement, scoring at the “Managed” level of 4.33. Although key processes have been optimized, further enhancement is needed in integrating and managing technology to achieve full synergy between processes and technology.

In summary, while SMK Unggul Negeri 2 Banyuasin III has achieved a high level of maturity in IT service management, there are still areas for improvement, particularly in technology. Recommendations include adopting cloud solutions and upgrading IT infrastructure to enhance synergy between processes and technology, improve service flexibility and scalability, and effectively support educational objectives.

3.1.10. Paper J: Analisis Tingkat Kepuasan Mahasiswa Terhadap E-Learning di Politeknik Negeri Sriwijaya Menggunakan Framework ITIL V3[53]

Research conducted at Politeknik Negeri Sriwijaya focused on assessing the maturity level of their e-learning services using the ITIL V3 framework. The primary method of data collection was distributing questionnaires to students to gauge their satisfaction with the e-learning system. This approach efficiently gathered quantitative data from a large number of participants. The collected data underwent analysis using SPSS, enabling detailed statistical examination and interpretation.

The analysis revealed an operational maturity score of 2.45, indicating significant room for improvement, especially in incident management processes. This score suggests that while procedures have been implemented, they are not fully integrated or optimized across e-learning operations. Weaknesses in areas such as documentation, training, and IT resource management indicate the need for improvement in organizing, documenting, and auditing procedures to reach higher levels within the ITIL framework.

To address these shortcomings, strategic recommendations include developing ITIL V3 best practices for incident management, providing additional training for IT teams, and establishing more robust Service Level Agreements (SLAs) to enhance the reliability and availability of e-learning services. Implementing these suggestions can elevate Politeknik Negeri Sriwijaya's service operations maturity, leading to improved user satisfaction and e-learning experience.

3.2. Comparison

Table 1. Analysis results

Paper	Score	Maturity Level	Description
A	4.57	5	"Optimized process" - Highly effective and optimized IT management practices.
B	N/A	Between 2-3	"Repeatable" to "Defined" stages - Foundational yet inconsistent practices.
C	N/A	Between 3-4	"Defined" to "Managed" stages - Systematic and effective management, with challenges in incident and problem management.
D	1	1	Initial stage - Reactive and unstructured approach to IT service management.
E	N/A	1	Basic maturity - Foundational processes in place but lack fully managed or optimized approaches.
F	3.37	4	"Managed" - Well-organized, routinely executed processes with established standards.
G	1.78	2	"Repeatable" - Basic discipline and compliance but lacks comprehensive documentation and standardized procedures.
H	1.87	1	Basic maturity - Established operational standards but lacks robust procedural documentation and control mechanisms.
I	4.57	5	Close to "Optimized" - Key processes have been optimized, but further enhancement is needed, particularly in technology integration.
J	2.45	Between 2-3	Foundational to Defined stages - Significant room for improvement, especially in incident management processes.

Maturity levels in IT service management across Indonesian universities vary significantly. While some institutions demonstrate high maturity (Level 4-5), others are in the early stages (Level 1-2). For example, Palembang Open University and SMK Unggul Negeri 2 Banyuasin III exhibit advanced maturity, with optimized processes. Conversely, IPDN and Universitas Multimedia Nusantara are at basic levels, indicating foundational processes but lack of optimization. Continuous improvement is crucial for institutions like Politeknik NSC Surabaya and Politeknik Negeri Sriwijaya, which are in the early to mid-level stages and have room for enhancement, particularly in incident management. Overall, a systematic approach to ITIL implementation is essential for advancing IT service management maturity in Indonesian universities.

3.3. Lesson Learn

Through the analysis of the research findings, several valuable lessons have been identified. First the research highlights the critical role of IT governance within Indonesian universities, particularly focusing on the Service Operation domain. Effective IT governance is paramount for ensuring the smooth operation of IT services and meeting the diverse needs of users. This includes maintaining clear and standardized documentation, which many studies emphasize as essential for efficient incident management, problem resolution, and overall service operation. Lack of comprehensive documentation often correlates with lower maturity levels, indicating the importance of detailed procedures to support IT service management practices.

Furthermore, achieving high maturity levels in IT service management requires a commitment to continuous improvement. While some universities have demonstrated advanced stages of maturity, there remains ample room for enhancement. Regular assessment, feedback, and adjustment are crucial for staying aligned with best practices and addressing the evolving needs of users. Additionally, the integration and effective management of technology significantly contribute to IT service management maturity. Universities must not only optimize processes but also ensure the strategic utilization of technology to support these processes effectively. Moreover, user satisfaction and engagement play a pivotal role in evaluating IT service management. Actively seeking feedback from users and involving them in the improvement process are crucial steps in identifying areas of enhancement and enhancing overall service quality. Finally, providing adequate training and skill development for IT staff is imperative, as skill and knowledge gaps often hinder achieving higher maturity levels. Investing in training programs and certifications empowers IT personnel to implement ITIL practices effectively and drive continuous improvement initiatives.

Overall, these lessons underscore the importance of effective IT governance, comprehensive documentation, continual improvement, technology integration, user satisfaction, training, and strategic planning in enhancing IT service management practices within Indonesian universities.

4. CONCLUSION

In summary, the comparative analysis of IT governance implementation using the ITIL Service Operation domain in Indonesian universities highlights both accomplishments and areas for improvement. While certain institutions have displayed advanced maturity levels in IT service management, others are still

in early stages of development. The research highlights the significance of effective IT governance, comprehensive documentation, continuous improvement, technology integration, user satisfaction, training, and strategic planning.

Moving forward, Indonesian universities should focus on improving their IT service management practices to better support educational objectives and meet the evolving needs of users. This requires a concerted effort from university leadership, IT staff, and other stakeholders to prioritize IT governance, invest in technology, develop skills, and engage users. By adopting a systematic approach and leveraging best practices from the ITIL framework, universities can optimize their IT services, improve operational efficiency, and ultimately contribute to a more productive and innovative educational environment.

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