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Implementation of IT Governance Using ITIL Domain Service Operation in the Education Sector in Indonesia

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ABSTRACT

In the dynamic landscape of the Indonesian education sector, effective incident management within the Service Operation domain of ITIL V3 is essential for ensuring smooth IT service delivery and enhancing educational experiences. Utilizing a Systematic Literature Review approach, this study comprehensively examines incident management practices across various educational institutions in Indonesia. Findings reveal varying maturity levels in incident management, with institutions such as Politeknik Negeri Sriwijaya and Universitas Terbuka Palembang showcasing different degrees of maturity. While some institutions have reached advanced levels of maturity, others still require significant improvements. The implementation of ITIL frameworks offers substantial benefits in enhancing IT service management. However, there remains ample room for improvement, particularly in standardizing procedures and providing adequate training for IT staff. Consistent implementation of ITIL principles is crucial for advancing operational efficiency and service quality in the education sector.

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1. INTRODUCTION

In an era of rapid technological advances, Indonesia still has obstacles in implementing effective information technology governance. One such sector is the education sector. Many Indonesian educational institutions still face difficulties in managing their IT assets and difficulties in implementing clear policies regarding data security and privacy. Information technology has a very important role in the education sector because by utilizing information technology, an institution can carry out operational activities effectively and accurately to achieve the goals that have been set [1]. Advances in technology and information today require various sectors, one of which is education, to keep adapting to existing advances in order to remain relevant in responding to problems that may occur [2].

Information Technology Service Management or abbreviated as ITSM. Information technology has become an important part of the organization and smooth IT service delivery is required to ensure smooth operations. To meet these needs, IT services are becoming more service-oriented to achieve customer expectations [3][4]. By adopting ITSM, organizations are expected to improve the alignment of their IT resources with current and future customer needs, thereby improving the contribution of those resources to processes and operations [5][6][7]. In the context of education, ITSM facilitates institutions in delivering

significant value to users through the services offered, known as service management. ITIL is a framework that contains best practices and guidelines in ITSM, which helps service providers in the education sector to offer high-quality services to their users [8]. This is particularly important as IT service performance plays a critical role in The significance of customer relationship management and service management in the digital era, and how businesses can effectively engage and retain customers improving the educational experience in an institution [9][10][11]. The benefits of implementing ITIL in educational institutions include increased service availability which has a positive impact on the learning experience, increased user satisfaction with IT services, time and cost savings by reducing repetitive work and waste, accelerating the introduction of educational technology into learning, and reducing risk in decision making [12][13][14]. The connection between students' satisfaction with the faculty and overall satisfaction with student life significantly impacts student performance and shapes the institution's reputation [15]. One important aspect of ITSM that needs to be given special attention is service operation. In the context of ITIL, service operation is to coordinate and manage ongoing activities that add business value carried out during the early stages of ITIL namely Service Strategy, Service Design, and Service Transition [16]. Prioritizing service operations in the IT Service Management strategy is crucial for educational institutions to ensure reliable, available, and responsive IT services that can adapt to changing needs efficiently [17]. This is important not only to maintain smooth day-to-day operations but also to ensure that IT services can adapt to changing needs and challenges quickly and efficiently [18]. By prioritizing service operations in the ITSM strategy, educational institutions can more effectively handle IT problems and incidents, minimize downtime, and ensure that educational technology can be optimally used to support learning objectives [19]. Effective IT service management is essential for supporting the business goals of enterprises and organizations [3]. Implementing ITSM strategies using frameworks like ITIL can lead to improved IT services and operational efficiency [20][21]. The continual process improvement in ITIL service operations, from a lean perspective, emphasizes maximizing uptime through service management alignment and communication [22]. With a focus on continuous improvement, institutions can continuously adjust and improve their IT services to meet changing user expectations, while leveraging the latest technological innovations to improve learning quality. Incident management is a crucial aspect of service operations, directly impacting the services provided to customers. It involves the processes and operations that manage customer services during their utilization, integrating tools and best practices [23]. The primary objective of incident management is to restore normal service operation as quickly as possible, minimizing the negative impact on the business [24]. This process deals with events causing degradation or loss of service functionality, aiming to restore services with minimal negative impact [25]. Incidents, defined as service disruptions, can significantly impact the business capability of IT organizations, emphasizing the need for efficient incident management and service restoration processes [26]. Efficient incident management is essential in the dynamic context of service operations, especially with the emergence of Cloud services. Proper database design, such as normalization and data modelling, can ensure the consistency, availability and quality of data needed to support operational services in the education sector [27]. Proactive service management approaches are necessary, incorporating incident management tools, policies, and templates throughout the service life cycle to enable effective incident resolution [28]. Large enterprises encounter challenges in ensuring service quality in incident management due to difficulties in handling frequent incidents timely, despite established IT service management processes [29]. Prioritizing incidents based on their impact on aligning with business objectives is crucial for effective incident management [25][30]. In conclusion, incident management plays a vital role in maintaining service continuity and customer satisfaction. By adopting proactive approaches, leveraging incident management tools, and prioritizing incidents based on business impact, organizations can enhance their service operations and ensure minimal disruptions to their services.

Related previous research written by Krisdayanti entitled "*Analisis* IT Service Management *Pada Layanan Administrasi Mahasiswa* STIPER Sriwigama *Menggunakan* Framework ITIL V3" [31]. This research shows that ITIL V3 can be applied to improve the management of student administration services at STIPER Sriwigama. The results showed that the ITSM level at STIPER Sriwigama was at level 4 "managed", but there were several areas that needed to be improved, such as event management, incident management, request fulfillment, and access management. Improvements in these areas can improve service quality and student satisfaction. This research is useful for improving the quality of administrative services and increasing student satisfaction at STIPER Sriwigama. Implementation of ITIL V3 can help STIPER Sriwigama to improve the efficiency and effectiveness of administrative services, improve service quality and student satisfaction, and improve the competitiveness of STIPER Sriwigama. This research shows that ITIL V3 can be an effective tool for improving IT service management in student administration. The implementation of ITIL V3 can help STIPER Sriwigama to achieve its goals in providing quality and satisfying administrative services for its students.

Other research conducted by Lora Ersitha and Tata Sutabri analyzed the maturity level of IT governance at the Universitas Terbuka Palembang in a study entitled "*Analisis* Maturity Level *Tata Kelola* IT *Menggunakan* Framework ITIL V3 Domain Service Operation *Pada Universitas Terbuka* Palembang" [32]. The study aimed to evaluate the maturity of IT governance at UT Palembang, as well as provide an overview and suggestions for necessary improvements. The research method was conducted through literature review and online questionnaire distribution to UT Palembang staff. The results of the analysis showed that the IT governance maturity level for all services at UT Palembang, including academic and learning systems, reached maturity level 5, indicating the achievement of optimized processes. However, in the Technology Considerations subdomain, the maturity level only reached 4.33 at level 4 (managed processes). The recommendation from this research is to improve the integration, use, and management of technology in the Technology Considerations subdomain, in order to meet the targets or expectations of the Universitas Terbuka Palembang.

Based on this background, the research will solely investigate the implementation of IT governance service across a selection of reference papers within the education sector. It will focus on identifying the advantages and disadvantages of this implementation. Through a thorough examination of the referenced papers, the study aims to elucidate the strengths and weaknesses inherent in the deployment of IT governance services within educational institutions. By analyzing the findings from these papers, the research seeks to provide valuable insights into the effectiveness of IT governance strategies in optimizing service delivery within the educational landscape.

2. METHOD

This research uses the Systematic Literature Review method to review and analyze the literature relevant to the research topic. This method is an approach to identifying, evaluating, and interpreting all available research relevant to a specific research question, or topic area, or phenomenon under study. They are considered to be efficient and of high quality in identifying and evaluating extensive bodies of literature [33]. The individual studies that contribute to a systematic review are referred to as primary studies; the systematic review itself can be considered a form of secondary research [34].

Conducting a Systematic Literature Review has several potential benefits. A systematic literature review makes it possible to synthesize findings from multiple studies, providing a comprehensive overview of the current knowledge on a particular topic [35]. Systematic literature reviews can help identify gaps in existing research and highlight areas that need further investigation. In addition, systematic reviews can assist in evidence-based decision-making by providing a rigorous and transparent summary of the available evidence. They also contribute to the development of research methodologies and might lead to the establishment of a more thorough terminology system for systematic reviews. In addition, systematic reviews can also be used to answer a variety of research questions, are not limited to interventions, and can be applied to different areas of research. These reviews are also valuable, as they add to the process of evidence-informed knowledge development through a structured examination of existing literature [36]. Overall, the benefits of conducting a systematic literature review include advancing knowledge, informing policy and practice, and contributing to the development of research methodologies and terminology [37]. Researchers have emphasized the importance of adhering to a strict protocol in conducting systematic literature reviews to ensure clarity, replicability, and reliability of the review process [38]. This emphasis on methodological rigor is crucial in maintaining the integrity of the review and in producing credible and trustworthy results [39]. Despite its many benefits, SLR is not without its challenges. One of the biggest challenges is the time and effort required to conduct a comprehensive SLR. Also, SLRs can be difficult to replicate, and results from SLRs can be prone to bias [40].

The first step in this research was to define specific and focused research questions. This step involves defining the research question, selecting appropriate databases, determining search terms, and establishing criteria for screening and reviewing relevant literature. This phase is essential for guiding the systematic search and ensuring the comprehensiveness and replicability of the review [41]. Next, a literature search was conducted using various scientific database sources, such as Google Scholar, Scopus, and IEEE Xplore. The keywords used in the search were adjusted to the research questions that had been set.

The literature obtained from the search process was then selected based on predetermined criteria, such as relevance to the research topic, quality of the research methodology, and credibility of the source. To verify the relevance of a publication and whether it should be included, the inclusion criteria must be carefully considered. There are situations where simply reading the title and abstract is enough to rule out a potential publication, while in other cases, a thorough reading of the entire text may be required [42]. The selected

literature was then systematically analyzed to extract information relevant to the research questions. The extracted data was then synthesized to produce research findings.

The research findings are then interpreted and discussed to answer the research questions that have been set. Following this, the results are compiled into a systematic and easy-to-understand report. This structured methodology ensures that the review is conducted in a replicable manner, enhancing the transparency and credibility of the research process [43]. The report should include a description of the research question, the methods used, the results of the analysis, and the interpretation of the results. Additionally, it should be written in a clear and concise manner [44].

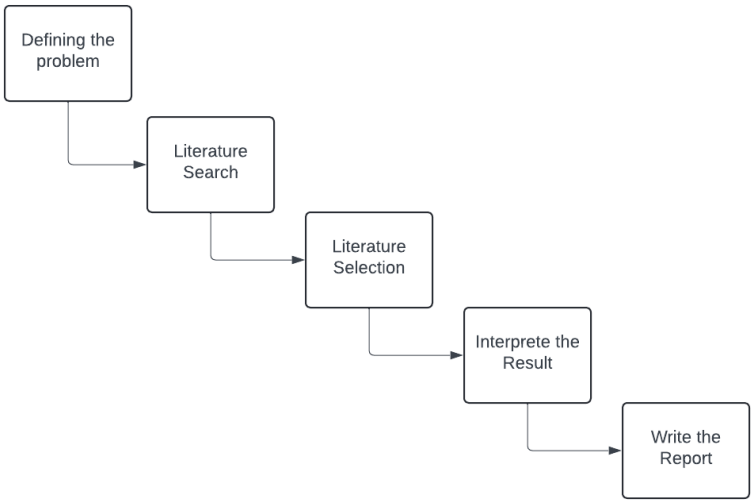

Figure 1 Systematic Literature Review Method

3. RESULTS AND DISCUSSION

3.1 Research Analysis

Incident management holds a pivotal role within the Service Operation domain of ITIL V3, strategically positioned to swiftly address and recover IT services post-incident, thereby mitigating adverse impacts on crucial business operations [45]. This process not only ensures the restoration of normalcy but also bolsters resilience against future disruptions. In the context of the Indonesian education sector, where technological integration is increasingly vital, the implementation and handling of incident management have garnered significant attention. Through an in-depth analysis of ten distinct studies within the realm of IT governance, this paper explores the nuanced approaches and challenges encountered in effectively managing incidents within educational institutions.

3.1.1 *Analisis Tingkat Kepuasan Mahasiswa Terhadap* E-Learning *di* Politeknik Negeri Sriwijaya *Menggunakan* Framework ITIL V3 [46]

In the research conducted at Politeknik Negeri Sriwijaya, the main emphasis was on measuring the maturity level of their e-learning service operations using the ITIL V3 framework. Data was collected through questionnaires distributed to students as the main tool for collecting data regarding their satisfaction with the e-learning system. This method allows for the efficient collection of quantitative data from a significant number of participants. The data obtained from the questionnaires were processed and analyzed using SPSS (Statistical Package for the Social Sciences), which facilitated detailed statistical analysis and interpretation of the results.

A comprehensive analysis of the data revealed that the operational maturity score stood at 2.45, which signifies that there is significant room for improvement and that the incident management process is not yet fully developed. This maturity level marks a phase where procedures have been implemented but are not yet fully integrated or consistently optimized across e-learning operations. Weaknesses in certain aspects such as documentation, training, and management of information technology resources indicate that although the basics of incident management have been established, Sriwijaya State Polytechnic still requires improvement in organizing, documenting, and auditing existing procedures to approach the “Defined” or even “Managed” level within the ITIL framework.

The results of this study offer strategic recommendations to achieve such improvements, including the development of ITIL V3 best practices for incident management, further training for IT teams, and the

creation of more robust Service Level Agreements (SLAs) to ensure the reliability and availability of e-learning services. By implementing these recommendations, Politeknik Negeri Sriwijaya can improve their maturity in service operations, which will ultimately improve user satisfaction and experience in their e-learning environment.

3.1.2 *Analisis* Maturity Level *Tata Kelola* IT *Menggunakan* Framework ITIL V3 Domain Service Operation *Pada* Universitas Terbuka Palembang[32]

The research conducted at Universitas Terbuka Palembang provides a thorough insight into the implementation of IT governance within the service operation domain using the ITIL V3 framework. Originally employing extensive data sampling through surveys and interviews to evaluate the maturity levels of existing processes, the methodology for this study is now adjusted to include a literature review and a structured questionnaire. The questionnaire, distributed as a Google Form, targets the staff of UT Palembang to gather detailed information about their IT service management practices. Although the study does not directly highlight incident management, the analysis indicates that the university has achieved a high level of maturity in its overall IT governance. With scores approaching the "Optimized" level, the research suggests that the incident management process is well-handled, aligning with the best practices recommended by ITIL V3, even though specific details of these practices are not fully elaborated in the study.

The maturity level measurement in this study reflects the effective use of ITIL practices and principles in providing high quality and reliable IT services. This includes aspects such as incident management, where Universitas Terbuka Palembang has demonstrated the ability to manage and respond to IT incidents in a way that ensures service continuity with minimal impact to daily operations. This result indicates that the university has not only established efficient processes and procedures but has also successfully integrated them with user needs and the institution's strategic goals.

While there are many positive aspects to this result, the study also suggests that in order to maintain and improve this maturity level, Universitas Terbuka Palembang needs to ensure that its incident handling processes are continuously updated and adapted to the latest technology and practices. This includes adopting advanced tools and technologies for incident monitoring and management, developing ongoing training programs for IT staff, and implementing a continuous review and improvement process for all aspects of IT governance. With this proactive approach, Universitas Terbuka Palembang can maintain and improve their IT governance standards, which will ultimately result in a more satisfying user experience and more efficient institutional operations.

3.1.3 *Analisis Tingkat Pelayanan* IT Service Management *Pada Penerapan Ujian Satuan di* SMK Negeri 8 Palembang [47]

The research on the implementation of unit exams at SMK Negeri 8 Palembang emphasized incident management within the IT Service Management (ITSM) framework, using the ITIL V3 framework. Data was collected through direct observation during the exams, interviews with system administrators and users, and analysis of existing procedural documents. This helped identify how incidents are currently managed and which areas still require improvement.

The findings of this study showed that the incident management process is well-defined, achieving a "Defined" maturity level. This indicates that SMK Negeri 8 Palembang has structured and systematic procedures to identify, manage, and resolve incidents, consistent with ITIL V3 best practices. However, although the basic processes are solid, there is still room for improvement, especially in incident handling and documentation, to reach a higher maturity level.

Recommendations for improvement include further development of incident documentation procedures to ensure that all incidents are accurately recorded and can be reviewed for future learning. This will aid the institution in improving incident response and minimizing negative impacts on exam operations. Additionally, enhancing training and resources for the IT team is expected to increase efficiency in handling incidents and support the overall stability of the exam system. Implementing more sophisticated ITSM tools, such as ServiceNow or JIRA, could also be considered to facilitate real-time incident tracking and ticket management, which would contribute to improved service quality and user satisfaction.

3.1.4 *Analisis* IT Service Management (ITSM) *Pada Layanan Administrasi Mahasiswa di* STIPER Sriwigama [31]

The research conducted at STIPER Sriwigama examined the implementation of IT Service Management (ITSM) within the scope of student administration services, utilizing the ITIL V3 framework.

Data collection in this study was conducted through a survey method that involved questionnaires sent to administrative staff and students, as well as in-depth interviews with the IT team handling administrative services. Additionally, an analysis of documents related to existing IT service policies and procedures was conducted to obtain a clearer picture of the incident management practices applied.

The study results indicated that STIPER Sriwigama possesses a good incident management maturity level, achieving a "Managed" status. This signifies that the incident management processes at this institution are mature, with documented and measurable processes in accordance with ITIL V3 standards. However, despite the well-functioning incident management system, there are still opportunities for improvement, particularly in enhancing administrative performance and adopting a more proactive approach to incident handling to reach an "Optimized" maturity level.

The recommendations provided by this study include enhancing administrative performance through more effective training and the implementation of more advanced technologies to support administrative functions. Furthermore, the development of existing procedures and policies is also proposed to facilitate quicker and more effective incident handling, thereby preventing the recurrence of the same incidents in the future. These improvements are expected to move STIPER Sriwigama towards an "Optimized" maturity level, contributing to operational efficiency and user satisfaction with student administration services.

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

The research conducted at Universitas Multimedia Nusantara (UMN) explored the level of operational maturity of IT services using the ITIL V3 framework version 2011, with the main focus on the Service Operation domain. This domain includes five main indicators: Incident Management, Problem Management, Access Management, Event Management, and Request Fulfillment. To collect the required data, the methods used include analysis of existing documentation, surveys of IT service users, and interviews with IT teams responsible for service operations. This service maturity assessment aims to identify areas that require improvement and to plan a suitable improvement strategy.

The measurement results show that incident management, problem management, event management, and request fulfillment are all at maturity level 1, indicating that these processes are still at an early stage of development and require significant improvements to reach higher maturity levels. Meanwhile, access management has reached level 2, signifying little progress in managing access to IT services and resources. This shows that efforts are being made to organize access more efficiently, but there is still much room for improvement in terms of more effective incident and problem management.

Recommendations from this research are to improve the training and development of human resources involved in managing IT services, as well as the application of new technologies that can support the efficiency and effectiveness of IT service operations. In addition, improvements are needed in standardizing procedures and better practices in incident management and request fulfillment to bring UMN to a higher level of maturity. This research emphasizes the importance of continuous improvement in IT service management to support the academic and administrative needs of the university more effectively.

3.1.6 *Analisis Pengelolaan Layanan Teknologi Informasi Menggunakan* IT Infrastructure Library *Versi* 3.0 Area Service Operation (*Studi Kasus*: Universitas Singaperbangsa Karawang) [49]

Research conducted at Singaperbangsa University of Karawang (Unsika) examined information technology (IT) service management practices using IT Infrastructure Library (ITIL) version 3.0 with a particular focus on the service operations area. The method used was exploratory, covering the identification, analysis and recommendation of existing IT services, involving network infrastructure as well as academic and non-academic information systems. This was done through surveys, in-depth interviews with IT teams, and analysis of IT operations-related documents aimed at assessing the effectiveness of existing incident management and troubleshooting.

During the research, several incidents were found where high demand for server services led to server crashes, indicating that the server specifications used were not optimal. These findings show that the maturity level in incident management is still at a low level, marking an area that requires significant improvement. To address this, this study recommends improving server specifications as well as website management knowledge. In addition, the creation of a Service Level Agreement (SLA) is recommended to improve management efficiency and adherence to expected service standards, thereby improving the reliability and availability of IT services to users.

The implementation of these recommendations is expected to not only increase server capacity and operational efficiency but also bring Unsika's IT management maturity level to a higher level, towards process optimization and service quality improvement. Further research and continuous evaluation are required to

monitor the effectiveness of the implementation of the recommendations and to measure the impact of the improvements on the overall maturity level in IT management.

3.1.7 *Evaluasi Maturitas Manajemen Layanan Sistem Informasi* Learning NSC Application (LENSA) *Menggunakan* Framework ITIL *Versi 3* Domain Service Operation (*Studi Pada* Politeknik NSC Surabaya) [50]

Research on the LENSA system at Politeknik NSC Surabaya used an evaluative approach to assess the maturity level of IT service management based on the ITIL V3 framework. Data was collected through a questionnaire designed to measure various operational aspects of IT services, which include incident management, problem management, and access management, among others. The questionnaire was distributed to IT staff directly involved in the management and maintenance of the LENSA system, as well as to system users to obtain feedback on the effectiveness and efficiency of the services provided.

From the results of the questionnaire, a maturity score of 1.87 was obtained, which places incident management practices at the "Initial" level. This indicates that the system is still very basic and requires a lot of improvement, especially in terms of automation and incident tracking. To address this, the research recommends the implementation of an IT Service Management (ITSM) system such as ServiceNow or JIRA Service Desk, which will facilitate automation and real-time incident tracking. In addition, the implementation of a dashboard that displays key performance indicators (KPIs) related to incident response and resolution in real-time is proposed to improve operational visibility and accountability.

Through these enhancements, it is expected that Politeknik NSC Surabaya can increase the maturity of their IT operational processes, thus not only improving incident management but also increasing user satisfaction and overall operational efficiency. The development of an interactive knowledge base and regular training for IT staff on ITIL best practices will also support the improvement of incident management capabilities, in line with the institution's goal to utilize information technology to support the education and learning process.

3.1.8 *Analisis Layanan Aplikasi* SIM PKB *Menggunakan Framework* ITIL V3 Domain Service Operation *Pada* SMK Unggul Negeri 2 Banyuasin III [51]

In the research conducted at SMK Unggul Negeri 2 Banyuasin III, data was collected through several methods to evaluate the maturity level of IT governance with the ITIL V3 framework. This research adopts a mixed approach that includes interviews with IT staff and direct observation of daily operations, as well as analysis of existing IT system documentation. It aims to get a comprehensive picture of the IT governance practices that are being carried out and how well these practices comply with the ITIL V3 standard specifically in the Service Operation domain.

The analysis shows that SMK Unggul Negeri 2 Banyuasin III has a high level of maturity with an overall score of 4.57, close to the "Optimized" level. However, it was found that there are technological aspects that still require improvement, with a score at the "Managed" level of 4.33. Although key processes have been optimized, the research suggests that there is a need to further improve the integration and management of technology to achieve full synergy between existing processes and technology.

In conclusion, although SMK Unggul Negeri 2 Banyuasin III has reached a high level of maturity in IT service management, there are opportunities for improvement especially in the technology aspect. Recommendations for the adoption of cloud solutions and IT infrastructure upgrades are expected to help the school achieve better synergy between processes and technology, improve the flexibility and scalability of their services, and ensure effective application of technology in supporting educational goals.

3.1.9 Framework ITIL V3 Domain Service Operation *Dalam Analisis Pengelolaan Teknologi* Blended Learning [52]

In this study of blended learning technology management in several educational institutions using the ITIL V3 Domain Service Operation framework, the data collection methods used include in-depth interviews with system administrators and service users, as well as document analysis related to operations and incident management. This research aims to understand the extent to which incident management practices have been integrated in the management of e-learning and educational technology. The research also involved an electronic survey to collect feedback from direct users of the existing e-learning system, which provided valuable insight into the effectiveness of the IT services provided.

The results of this study show that most institutions are still at the "Initial" to "Repeatable" maturity level for their service operations. This indicates that while incident identification, diagnosis, and resolution processes have begun to be implemented, there is still a significant need for improvement in the standardization

of procedures and effectiveness of implementation. This low maturity level illustrates that many educational institutions are still in the early stages of adopting and adapting ITIL best practices in their daily operations.

To improve the situation, it is recommended that educational institutions adopt ITSM tools that enable real-time incident management and use e-learning platforms that support integration with incident management systems. The use of tools such as Moodle, equipped with plugins for incident management, along with intensive training for IT staff and lecturers on the use of such tools, is expected to improve the effectiveness of learning technology management. These measures aim to strengthen the institution's capacity to manage IT incidents, thereby improving the overall quality and availability of e-learning services.

3.1.10 *Perancangan Manajemen Layanan Teknologi Informasi Menggunakan* Framework Information Technology Infrastucture Library (ITIL) *Versi 3* Domain Service Operation *Studi Kasus* Di Smk Negeri 3 Bandung[53]

In a study conducted at SMK Negeri 3 Bandung, data was collected using two main methods. First, the development of a questionnaire specifically targeted at IT staff and survey management conducted together with the management. This aimed to gain a deeper understanding of IT service management practices in accordance with the ITIL V3 framework. Second, direct observation of daily IT service operations was conducted to assess how procedures and policies were practically implemented in the field.

The evaluation results showed that SMK Negeri 3 Bandung is at the "Initial" to "Repeatable" maturity levels in various Service Operation Domain processes. This indicates that although some basic procedures have been implemented, there is still a significant need for development and formalization of these processes to become more mature and effective. The study also revealed that service documentation and control mechanisms still require substantial improvements, where enhancing documentation can support the improvement of incident management and service request efficiency.

Based on these findings, the implementation of an electronic documentation system accessible by all IT staff and users is recommended. This system would facilitate the storage, searching, and updating of procedures to manage incidents and service requests. Periodic training on the ITIL V3 framework and the use of the electronic documentation system for IT staff and users will support the development of more mature and efficient IT service management capabilities.

3.2. PROS AND CONS COMPARISON

Some institutions such as the Universitas Terbuka Palembang and Politeknik Negeri Sriwijaya showed a high level of maturity in IT governance and incident management, signifying effective adoption of ITIL V3 practices. Both institutions also used data analysis tools such as SPSS to interpret the questionnaire results, which added to the accuracy and reliability of their findings.

Table 1. Pros Found

Pros	Found in Paper
High maturity level in IT governance	Universitas Terbuka Palembang, Politeknik Negeri Sriwijaya
Effective incident management	Universitas Terbuka Palembang, Politeknik Negeri Sriwijaya, Universitas Multimedia Nusantara
Use of SPSS for data analysis	Politeknik Negeri Sriwijaya
Detailed documentation and control processes	SMK Unggul Negeri 2 Banyuasin III
Efficient use of ITIL for continuous service improvement	All papers involving ITIL implementations

However, some challenges still remain. For example, Universitas Multimedia Nusantara experienced deficiencies in documentation and process integration, which shows that although the basics of incident management have been established, there is still much room for improvement in the aspects of documentation and training. On the other hand, SMK Negeri 8 Palembang and SMK Unggul Negeri 2 Banyuasin III face challenges in managing existing technology resources, with the need to upgrade their IT infrastructure to support effective operations.

Table 2. The Cons found

Cons	Found in Paper
Low process maturity and need for improvement	Universitas Multimedia Nusantara
Inadequate documentation and training	Politeknik Negeri Sriwijaya, Universitas Terbuka Palembang Negeri Sriwijaya, Universitas Multimedia Nusantara

Dependency on outdated technologies	SMK Negeri 8 Palembang
Processes not fully integrated or optimized	Universitas Multimedia Nusantara, Universitas Terbuka Palembang
Lack of managing technology resources	Politeknik Negeri Sriwijaya, SMK Unggul Negeri 2 Banyuasin III

This observation shows that while the ITIL V3 framework has been widely adopted and provides many benefits, especially in improving IT governance and incident management effectiveness, its implementation is still uneven and some institutions are still struggling with certain aspects of the framework. Continuous improvements in documentation, training, and technology management are needed to ensure that all institutions can reach a higher level of maturity and, ultimately, improve efficiency and user satisfaction.

3.3 LESSON LEARN

From this research and analysis, we have gleaned several key lessons about applying the ITIL framework in IT service management within educational institutions. A crucial takeaway is the importance of using the right indicators for assessing maturity levels. This not only helps gauge the effectiveness of ITIL implementation but also aids in planning systematic improvements. The creation of a validated questionnaire tailored to ITIL standards improved data accuracy, ensuring that it is representative and reliable for thorough analysis. Additionally, choosing respondents with firsthand knowledge of the implemented systems enriched the insights gained, providing a deeper understanding of the ITIL landscape.

The study also highlighted the need for clear and actionable recommendations that guide both strategic and operational implementation. Developing explicit working procedures for each aspect of IT service management is vital to reduce misunderstandings and enhance protocol compliance. Successful ITIL implementation depends heavily on rigorous planning, precise execution, and adaptability to institutional needs. These findings are particularly valuable for institutions looking to adopt or enhance ITIL frameworks in their dynamic educational environments, helping them to effectively meet both current and future challenges

4. CONCLUSION

There are several educational institutions that have demonstrated a high level of maturity in information technology management, particularly in incident management, indicating effective adoption of the ITIL V3 framework. Consistency with ITIL V3 was seen across all studies, with some institutions such as Politeknik Negeri Sriwijaya using sophisticated data analysis methods such as SPSS to improve the accuracy and reliability of their research results.

However, the research also revealed some significant challenges. Limitations in documentation and training were common issues, especially at Politeknik Negeri Sriwijaya and Universitas Terbuka Palembang, indicating a need for improvement in process standardization and human resource development. In addition, reliance on outdated technology and deficiencies in managing technology resources suggest that there is still considerable room for improvement in IT infrastructure in some institutions.

The overall findings emphasize the importance of implementation and continuous improvement in IT management to achieve higher operational efficiency and user satisfaction. This requires special attention to process integration, infrastructure upgrades, and better training, in order for all institutions to reach a higher level of maturity and fully utilize the benefits of the ITIL V3 framework.

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