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Design of Information Technology Service Strategy for Higher Education Institutions

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Abstract

The development of information technology (IT) has become an important foundation in supporting operational and academic activities in higher education institutions. Pamulang University as one of the private universities that continues to grow requires an effective and sustainable IT service strategy to support the institution's vision and mission. This study aims to design an integrated information technology service strategy that is in line with academic, administrative, and institutional development needs at Pamulang University. The methodology used in this study refers to the ITIL (Information Technology Infrastructure Library) and COBIT (Control Objectives for Information and Related Technology) frameworks as an approach in formulating IT service planning that focuses on business value and risk control. Data were obtained through observation, interviews, and internal document studies to identify existing IT infrastructure conditions, user needs, and existing service gaps. The results of the strategy design include improvements in IT governance, improvements to online-based service systems, and strengthening security and technical support. This strategy is expected to improve service efficiency, user satisfaction, and the resilience of information systems in the campus environment. With proper implementation, Pamulang University can utilize IT as a key driver in the digital transformation of higher education that is adaptive and competitive in the industrial era 4.0.

Keywords: IT strategy; Information technology services; Higher education; ITIL; Pamulang University

1. Introduction

Along with the increasing frequency of service needs in organizations, as well as increasingly complex computing systems and information technology, the role of Information Technology (IT) in organizations today has experienced a paradigm shift. Initially, IT only focused on data automation, data processing or data manipulation, but now it has shifted to the function of managing strategy and services (Oktaviani et al., 2024). The suitability and performance of IT services can be a determining factor in achieving organizational goals, if positioned, used and have the right strategy and are aligned with business goals(Wensi 2026). This is certainly done with a comprehensive perspective on the organization, function and interconnectedness of components in the organization, both internal and external, as well as factors of change that will affect the organization(Istyanto & Nasrullah, 2022).

Higher education institutions in order to realize various reliable educational programs and achieve institutional goals and objectives, require the right strategy and tactics. From several publications of the results of the 2009 survey conducted by the Universities and Colleges Information Systems Association (UCISA) on 13 Higher Education Institutions in Europe(Wildan et al., 2025), each higher education institution made various efforts related to fulfilling the

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service needs that must be provided for the entire academic community, starting from managing service strategies, service design, service transition, service operations and improving service management.

In general, the efforts that have been made position service management as part of the business and in line with business objectives, also positioned for handling problems and changes, delivering quality, resilience, service availability and control including costs, as a recognized framework standard, as a common language for IT, business and vendors. And the most important thing is the effort to achieve awareness from all elements, and to be embedded as a culture in higher education institutions. 2. Management of service model design with the right strategy can be the starting point in achieving service quality for a higher education institution. Related to the overall service management system that involves various departments and other supporting units. In reality, the applications and platforms used in each unit with their respective levels of system complexity are likely to be diverse. This requires an appropriate architectural approach strategy to fulfill the availability and integration of services. This condition causes data redundancy, repeated authentication when users use the system, many manual processes that must be carried out, and the organization's ability to manage and maintain the system is very difficult, because there is no awareness and guidelines that regulate it. (Wijaya et al., 2023).

These issues can be addressed by establishing alignment between the institution's technological perspective and business perspective, to ensure that services can be provided and integrated with the right architecture, so that they can be a determinant in realizing a quality, efficient, and adaptive academic environment to changes that occur. (Hindarto, 2023) Siliwangi University is a higher education institution located in Tasikmalaya City (Nuriadi, 2021) In carrying out its functions, it has been supported by adequate infrastructure but still has shortcomings (Thoyyibah et al., 2020). Some of the main weaknesses are that the IT service management system still does not meet the standard needs of the institution, the utilization of existing infrastructure has not been optimally utilized, the IT management unit does not yet have a clear guide, documentation, and IT blueprint development plan and strategy.

In line with these conditions, the main challenge faced is how to optimize the utilization of ready-to-use information systems and technologies with precise and clear access targets. In this study, the solution taken is to define an IT service strategy design to improve the performance of higher education institution services. To achieve the success of defining the design, the strategy implemented is to use a governance and architectural approach to organizational and operational cultural changes that must be carried out by all levels of the University.(Biondi & Russo, 2022)

2 Research Method

The methodology used in this thesis research, with the following stages:

a. Identification of current processes and environments, including(Nuriadi 2021):

Conducting an initial investigation of the organization's culture and environment as a whole, including value chain analysis, to define the focus of service development goals and targets, analyzing and measuring the maturity of service system activities or processes, and conducting an analysis of service information needs, based on the ITIL service design perspective, to determine the scope of development(Hindarto 2023; Mohamed Ashmel Mohamed Hashim, Issam Tlemsani 2022; Ouyang et al. 2025)

b. Analysis of IT service needs, including:

The analysis of IT service needs is carried out based on the ITIL and SOA approaches. Conducting a review and evaluation of the results of the initial investigation and process maturity assessment, as well as an analysis of service information needs, to determine service improvement opportunity targets, as a reference in designing the required IT service strategy(Santosa & Mulyana, 2023)(Fotaleno, Sahid, and Info 2024; Tarhan 2026)

c. Design and determination of solutions

Design and determination of solutions are made based on the results of the analysis of the previous stages, at this stage the correlation of the IT process maturity monitoring matrix and the results of the value chain analysis is determined, to determine the requirements of recommendations, as a strategy for the service architecture management and provision model, for the functionality of IT service management and provision for higher education institutions with ITIL and SOA strategies(Luis and Rubio 2021).

d. Evaluation of models and implementation strategies

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Model evaluation is carried out with the aim of determining the suitability and success of the strategy design that has been made, namely by conducting a review and assessment of the proposed recommendations, using the COBIT maturity model, which is mapped from the ITIL service design criteria. And the implementation strategy is intended to determine what strategies must be carried out to achieve the sustainability of the implementation of the mode(B et al. 2023; Tarhan 2026)

e. Process Maturity Level Analysis

Mapping of maturity models and questionnaire forms The focus of the questions in the questionnaire is related to the service design area, consisting of 12 parts of questions(Ramos, L. F., 2020) (Fernández et al. 2023; Fotaleno et al. 2024)including:

a. a.Service Strategy Principles
b. b.Service Development Technology Considerations (Service Design)
c. c.Service Development Aspects and Activities (Development Standards)
d. d.Organizing Services
e. e.Managing Service Catalogs
f. Managing Service Levels
g. Managing Service Capacity
h. Managing Service Availability
i. Managing Information Security
j. Managing Suppliers
k. Managing IT Service Sustainability
l. IT Service Monitoring

Each of these questions involves 2 (two) questions that represent the current condition and the expected condition, and are grouped according to 6 (six) attributes that indicate the maturity level of each process(Sliż, P. 2018). the 6 (six) process maturity attributes are:

a. Concern and Communication
b. Policy, Planning and Procedures
c. Devices and Automation
d. Expertise and Expertise
e. Responsibility and Accountability
f. Determination and Measurement of Goal Achievement

Maturity analysis is carried out by assessing the level of maturity for each question asked(Fotaleno, F., Rusadi, U., & Mustaqim, A. 2024), which is represented through 6 (six) levels, consisting of:

a. 0-No/no process management
b. 1-There is process management, but it is carried out ad hoc and at any time, and is not organized.
c. 2-There is routine process management, but it is carried out informally and intuitively
d. 3-The process has been documented and communicated, but has not been integrated.
e. 4-The process has been standardized and is monitored and measured.
f. 5-The process has been automated and has reached the best practice level.

Based on the results of the questionnaire and interviews that have been conducted, answers were obtained from the level of maturity of each current IT process and the level of maturity of the process that is expected or targeted(B et al. 2023; Istyanto and Nasrullah 2022; Tarhan 2026; Wijaya 2023; Yunanti, Andi, and Wiguna 2025). The maturity level of each existing process is identified as ranging from maturity level 1- (Process management is in place but is done ad hoc), to maturity level 2- (The process is repeated but is done informally and intuitively)

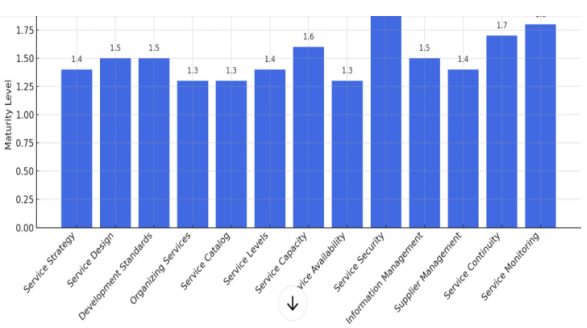

Figure 2.1 Current Condition Maturity Level Charts

Table 2.1 Results of Current Condition Maturity Level Assessment.

IT Process	Maturity Level
Service Strategy Principles	1.35
Technology Consideration / Service Design	1.53
Development Standards and Activities	1.57
Organizing Services	1.67
Managing Service Catalog	1.15
Managing Service Levels	1.02
Managing Service Capacity	1.58
Managing Service Availability	1.85
Managing Information Security	1.83
Managing Suppliers	1.43
Managing IT Service Continuity	1.63
IT Service Monitoring	1.83

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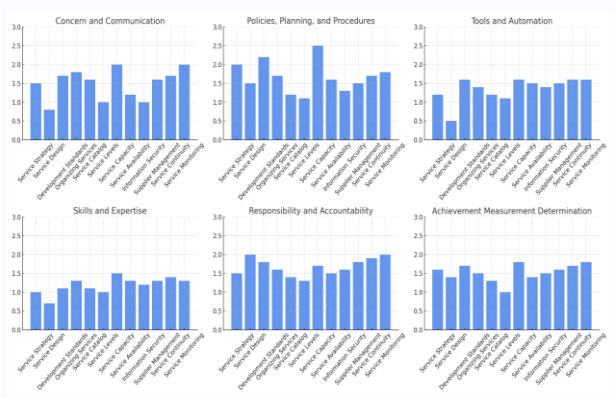

Figure 2.2 Maturity Level Condition Graph Based on Attributes

3 Result and Discussion

Pamulang University to realize improvements and enhancements in the IT sector, with the commitment of top management, budgeted funds, adequate infrastructure conditions, and documented university work policies and arrangements. All of these can be used as triggers and capital in order to carry out comprehensive improvements, to move towards a better direction. Pamulang University has the opportunity to develop, with the growing trust in society for education at Pamulang University, this is indicated by the increasing number of new student registrants each year. The network of cooperation that is owned is increasingly extensive both domestically and abroad.

a. Strategy Model

The first strategy model to overcome the gap in the level of process maturity that occurs in Table III.19, is to equalize the maturity of the process, this is related to efforts or improvement activities that must be carried out to achieve the expected level of process maturity. The impact of this level of process maturity will have an impact on the achievement of IT governance objectives, namely the achievement of IT performance to support total business needs, as well as its compliance with applicable policies and regulations to fulfill business goals. Recommendations for all IT processes at Siliwangi University are carried out by providing directions for achieving maturity levels sequentially, by referring to the stages of the COBIT maturity attribute levels.

The second strategy model based on the identified process maturity level, will determine recommendations for the provision of IT services for business needs as a whole, both internal and external, and in accordance with user needs.

Figure. 3.1 Pamulang University IT Service Architecture Model

b. Process Gap Equalization Model

The recommended equalization process is carried out sequentially, starting from the recommendation to achieve maturity level 2 (two), followed by achieving maturity level 3 (three), and finally maturity level 4 (four) according to the expected conditions. The priority of equalizing each process is carried out based on the logic of the IT service life cycle. For example, before carrying out the equalization of the maturity of the service level process, the service catalog process must have the appropriate maturity, because service level management is determined by the existence of the service catalog.

Recommendations to address the gaps in the service catalog management process and the service levels that occur are carried out through activities as can be seen in Figure 3.1 and Figure 3.2

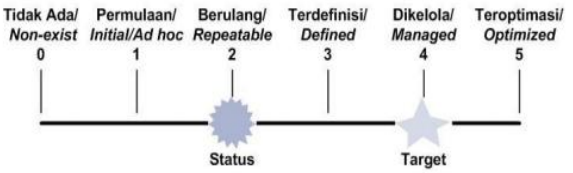

Figure. 3.2 Service Catalog Management Recommendations

Recommendations to achieve maturity level 2 (two):

a. Instilling awareness of the main role and importance of the service catalog for service provision.
b. Defining the service catalog to determine the services needed.
c. Creating and managing service catalogs for processes that are considered important, and communicating them.
d. Using certain methods/techniques in defining the service catalog.

c. Process Gap Equalization Model

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The recommended equalization process is carried out sequentially, starting from the recommendation to achieve maturity level 2 (two), followed by achieving maturity level 3 (three), and finally maturity level 4 (four) according to the expected conditions. The priority of equalizing each process is carried out based on the logic of the IT service life cycle. For example, before carrying out the equalization of the maturity of the service level process, the service catalog process must have the appropriate maturity, because service level management is determined by the existence of the service catalog.

Recommendations to address the gaps in the service catalog management process and the service levels that occur are carried out through activities as can be seen in Figure 3.2 and Figure 3.3.

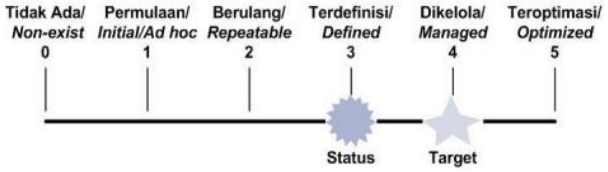

Figure. 3.3 Service Catalog Management Recommendations

Recommendations to achieve maturity level 3 (three):

a. Define a service catalog to manage gaps that occur between processes and their relationships.
b. Develop, document and communicate service catalogs to execute IT strategic planning.
c. Define functions for performance management, as well as expertise and key service catalog needs.
d. The service catalog is defined and managed using standards.

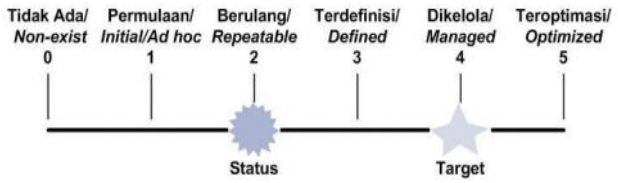

Figure. 3.4 Service Level Management Recommendations

Recommendations to achieve maturity level 2 (two):

a. Instilling awareness of compliance with service level agreements (SLAs).
b. Defining and implementing SLAs on a case-by-case basis.
c. Defining responsibilities for coordinating service levels.
d. Reporting service level management activities following individual procedures.

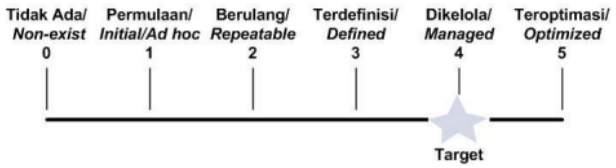

Figure. 3.5 Managing Service Levels

Recommendations for achieving maturity level 4 (four):

a. SLA is defined through the system requirement stage, and integrates it into the application design and operating environment.
b. Criteria in defining SLA based on business needs, including availability, correctness, performance, increasing capacity, supporting users, sustainable planning and
c. considering security.
d. Conducting regular measurements and assessments of customer satisfaction and performance, SLA measurements are standardized and reflect industry norms.
e. Conducting routine root cause analysis, monitoring reporting is done
f. automatically.
g. Defining and understanding financial and operational risks, and conducting formal measurements.

One of the service-oriented architecture strategies is the effectiveness of the architectural approach used to utilize legacy applications that are integrated into the service architecture. Integration must have its own domain with a focus on organizational strategy. This applies to all views of the integration layer (conceptual, logical, physical, and strategic). The main point is that this layer will have visibility (especially for the business), visibility will decrease in value over time if the asset is not built as a business service asset. The integration strategy must provide direction on how legacy applications can support the service architecture, and this system has high strategic value for the organization.

e. Overview of IT Service Model

Based on all stages of modeling that have been carried out, in order to meet the needs of IT services at Siliwangi

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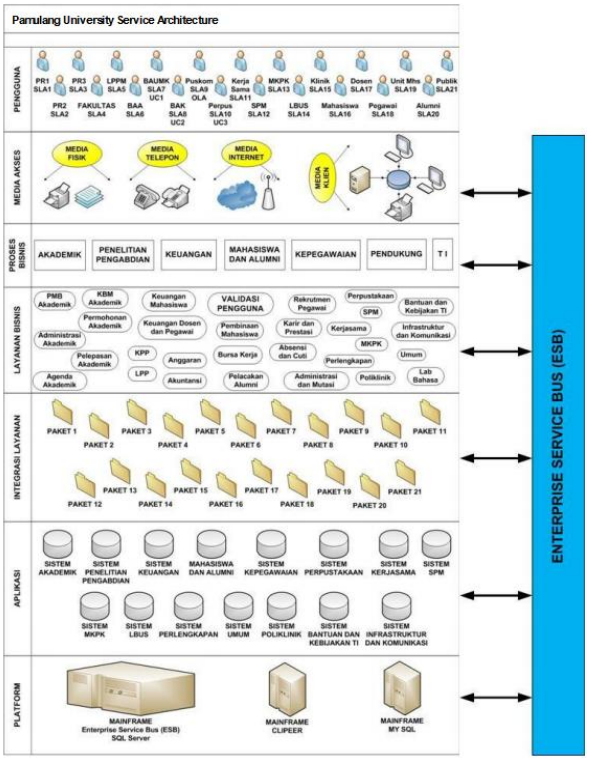

Figure. 3.6 Pamulang University Service Architecture

University, an overview of the model is obtained that can be used as a reference or guideline in planning the development of IT services, as can be seen in Figure 4.3. However, the environmental architecture components are not discussed in this thesis research.

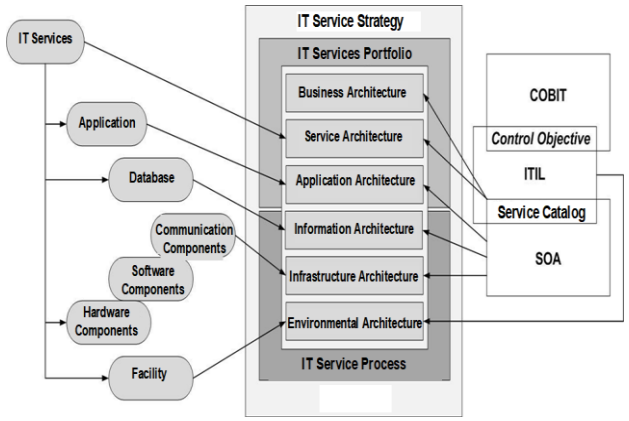

Figure. 3.7 Overview of IT Service Architecture Models

4 Conclusions

Based on the results of the case study and modeling strategies that have been carried out in this thesis research, the following conclusions were obtained:

1. All levels of maturity of the existing processes have not reached the expected level of maturity, or in accordance with the target. To achieve the target conditions, an equalization process is needed, in the form of providing recommendations to eliminate the gaps that occur.
2. The strategy design made in this thesis research, in the form of providing recommendations consisting of two models, namely IT service management and IT service provision. The process created for the 2 (two) models is determined based on the process that has the lowest level of maturity and the logic of the IT service cycle, namely the service catalog management process and service level.
3. The IT service management model created, in the form of guidelines and policies for IT service management, consists of policy documents, standard operating procedures (SOPs) and other related document attachments.
4. The IT service provision model created, in the form of guidelines and policies for IT service architecture, consists of:
   a. Business modeling through value chain analysis that produces business services that must be available in the service catalog, to meet the needs of business functions throughout the organization.
   b. List of service statuses that need to be changed or modernized.
   c. List of service assets in the form of applications, data, infrastructure and other components that support the delivery of each IT service value.

Modeling of IT service architecture for the needs of comprehensive service integration, along with the technical recommendations needed.

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