

Design of SLM IT Services on Academic Services in Higher Education

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Abstract— Management of IT services needs to be done so that companies in all areas including higher education in order to improve their competitiveness, especially in providing quality services for stakeholders. The main process at higher education is the academic process. At the XYZ Institute the main academic process consists of registrations, teaching and learning, and examinations. There are 4 major IT services to support the process: Single Sign-On, Cyber Campus, E-Learning, and Internet Connection. Currently IT service providers have not yet established the exact level of IT services provided. The purpose of this research is to formulate Service Level Management (SLM) to manage the IT services. Best practice ITIL is used as a reference for preparing SLM. The resulting SLM includes SLR, SLA, and OLA.

Keywords—SLM; IT Services; ITSM; ITIL; Higher Education

I. INTRODUCTION

Information Technology (IT) plays an important role in supporting business functions and meeting business needs [1]. The use of IT in a company requires good management, in order to meet business and customer needs. Good IT management provides benefits for companies such as process improvement, higher user satisfaction, and time and cost savings [2]. College is one of the complex organizations, because it has a fairly complete business processes and inter-related. One of them is the XYZ Institute, which has an academic business process consisting of registrations, teaching and learning, and examinations. At the academic service, there has been an IT service implemented. Currently IT service providers at the XYZ Institute do not yet have IT service level management [3]. Service level management (SLM) is important for organizations, including the XYZ Institute. If the level of service can not be mitigated or not in accordance with business needs, the services provided do not meet the business expectations and there will be problems [4]. The purpose of this research is to design SLM IT services on academic process of XYZ Institute.

II. LITERATURE REVIEW

A. Information Technology Service Management

IT developments that previously focused on hardware and software-based solutions have shifted to an IT-oriented approach [5]. In managing IT services, IT service providers require Information Technology Service Management (ITSM) and Information Technology Service Governance (ITSG) to ensure the successful delivery of services to customers [6].

ITSM is part of Service Science that focuses on IT operations such as service delivery and service support. The focus of ITSM is to provide specific processes, metrics and guidelines to enable and manage IT service assessment, planning, and implementation processes to optimize the use of tactical and strategic IT assets [1]. ITSM is the implementation and management of IT quality to meet business needs. It involves a combination of people, processes, and IT [7]. ITSG focuses on governing people, information, technology, and processes to provide quality IT services, while the focus of ITSM is more on the benefits of IT service providers [6].

To provide quality services to customers, reliable Human Resources (HR) is required in managing IT. According to Ribiere et al. in Jäntti and Hotti [6], HR has experience, skills, and knowledge. IT services will work well because of good training for HR IT departments and best practice implementation of IT services management such as Information Technology Infrastructure Library (ITIL) [8]. In addition Melendez et al. [2] provide some recommendations for the successful implementation of IT in the company. There are 5 recommendations given by Melendez et al. [2] that is determining needs, training, defining IT services, formulating IT service model, and support from management.

B. IT Service

According to OGC [7], service is the process of delivering value to customers by facilitating the results customers want to achieve without certain cost and risk ownership. While IT services are services provided by IT service providers. IT services are built using a combination of IT, People, and

Processes. Customer satisfaction is important. Customers want excellent service quality. The difficulty is that customers' expectations continue to shift, and these non-tracking service providers will soon find themselves losing business [7].

To manage IT services required best practice as a guide for the company. ITIL is not only a best practice for ITSM, but also provides a set of core processes and terminology for managing IT services [9]. The latest version of ITIL is version 3 of 2011 edition, which consists of 26 processes divided into 5 life cycles, and has 4 functions. These functions are: Service Desk, Application Management, Technical Management, and IT Operational Management [7].

C. *ITIL as Best Practice for ITSM*

The shift of IT-based hardware and software solutions to IT service oriented solutions, the company will adopt IT governance models such as ITSM and ITIL [5]. Jäntti and Hotti [6] said that ITIL is the main framework within ITSM. According to Eikebrokk and Iden [10], ITIL is a management tool to influence behavior in producing services that reinforce the climate of IT services directly and indirectly through process management.

The current ITIL is version 3, the best practice best suited to ITSM. This is primarily aimed at providing the best quality IT services that can be used for ITSM. There are two main reasons for this, namely: ITIL is more customer focused, and effective governance for IT [11]. According to Vaitha and Francis [12] ITIL provides ITSM guides for companies to deliver good IT services to customers.

ITIL succeeds because it depicts practices that enable a company to gain profits related to returning investment and sustained success. Some of the things governed by ITIL to manage IT services are Deliver value for customers through services, Integrate the strategy for services with the business strategy and customer needs, Measure, monitor and optimize IT services and service provider performance, Manage the IT investment and budget, Manage risk, Manage knowledge, Manage capabilities and resources to deliver services effectively and efficiently, Enable adoption of a standard approach to service management across the enterprise, Change the organizational culture to support the achievement of sustained success, Improve the interaction and relationship with customers, Coordinate the delivery of goods and services, across the value network, Optimize and reduce costs [7].

In Indonesia there are many companies that implement ITIL to manage IT services. Although not all apply 100%, most focus on the Service Operation process [13].

According to [14], ITIL implementation process to manage IT services takes a long time. Companies, especially stakeholders, want real benefits in the near future so that processes that implementation can be quickly perceived by stakeholders, especially customers. The process that can be done first and have a real impact are Service Level Management (SLM), Service Level Agreement (SLA), and Operational Level Agreement (OLA).

D. *Service Level Management*

SLM is a vital process for any IT service provider organization because it is responsible for approving and documenting service level targets and responsibilities in SLAs and service level requirements (SLRs) for each related services and activities within IT. If these targets are accurate and accurately reflect the business requirements, then the services delivered by the service provider will be aligned with business requirements and meet the expectations of customers and users in terms of service quality. If the target does not meet the needs of the business, then the service provider's activity and service level will not be aligned with the expectations and business issues will arise [4].

Important products from SLM are Service Level Requirement (SLR), Service Level Agreement (SLA), and Operation Level Agreement (OLA). SLR is a statement of need or customer demand about IT services that IT service providers must meet. The SLA is a written agreement between an IT service provider and an external customer. OLA is an agreement between IT service providers and other parts of the same organization that help IT service providers provide IT services [14].

SLR content can at least answer questions about What service levels are required by the customer in order for them to be able to receive the value of the utility of the service? How available does the service need to be? How secure? How fast must it be restored if it should fail? The SLA content contains about the specific targets measured by the SLR formula. OLA contains about any activity that supports the achievement of SLAs [4].

III. RESEARCH METHODOLOGY

Stages in this study consisted of 3 stages. The first phase conducts literature studies, observations, and interviews with service providers and service users. Literature map in conducting literature study can be seen in Fig. 1. Observations are made to view the academic business processes at the XYZ Institute. The second phase is designing SLM which includes the development of SLA and OLA. SLM is designed to refer to the Service Design process that existed in ITIL version 3 edition 2011. The third stage is the stages of preparing SLM documents which include SLR, SLA, and OLA which have received approval from related parties. In this process also conducted Forum Group Discussion (FGD) to discuss the SLM that has been produced.

IV. DISCUSSION

A. *Literature Study*

At this stage, the process of developing ideas through the literature review. To facilitate this process, a literature map was created that aims to show the linkage between the literature and the research topic. The result of the literature map can be seen in Fig. 1.

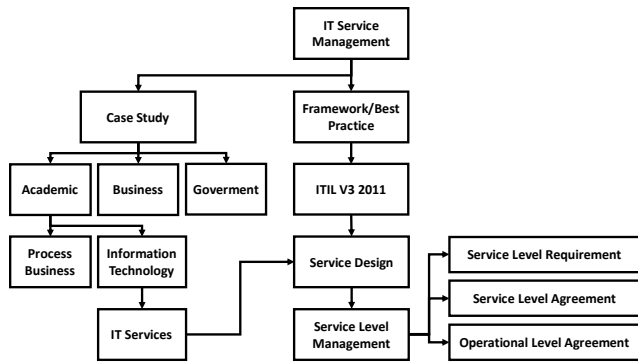


Fig. 1. Literature map

B. Observation

Observations are made to know the real business processes performed by IT service providers. The business process observed is the academic business process. The process is a major process at the XYZ Institute. The academic business process consists of registration, teaching and learning, and examinations. The main IT services that support the business process are 4 services, as shown in Table I. Users of these services are Lecturers, Students and Employees.

TABLE I. IT SERVICES THAT ARE PROVIDED

IT Services	Description
Single Sign-On	Provides a web portal to enter multiple applications at once.
Cyber Campus	Provide access to academic information for Students, Lecturers, and Employees.
E-Learning	Electronic learning service facility for interaction between Lecturers and Students.
Internet Connection	Provide communication channels for all IT services.

C. Interview

The interview process was conducted with 3 staff of the service provider. They are 1 person Head of Department, and 2 person Head of unit. The interview process is conducted to confirm the data that has been obtained. The relevance of SLM development can be seen in Fig. 2.

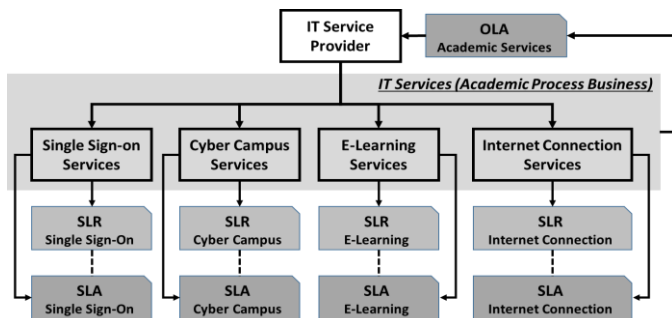


Fig. 2. SLM development scheme

D. Designing SLR

After the initial process is done, then start compiling the SLR. Activities undertaken are determining needs and approving needs. The process of formulating the SLR is done by studying the IT Service Catalogue and interviews with Heads of Departments and Heads of Units. The results obtained related to Availability, Capacity, Continuity, and Security.

1) Availability

Single Sign-On Service, Cyber Campus, E-Learning, and wifi internet connection are expected to be available and operate 24 hours a day, 7 days a week. For non wifi network connections can be accessed during business hours, Monday to Friday 07:00 - 19:00 hours while on Saturdays at 07:00 - 12:00.

Compatibility for Single Sign-On, Cyber Campus, and E-Learning services can be accessed using any type of browser from various gadgets. Load Time, it is assumed that all IT services academic business processes are accessed from campus through the XYZ Institute's Internet connection speed with up to 100 kbps / user. Load time for Single Sign-On, Cyber Campus, and E-Learning services is a maximum of 5 seconds.

2) Capacity

Internet connection speed can provide 100 Kps / user for wifi network, and 100 Mbps / user for non wifi network. Up-time internet network is expected to reach 96% per year.

Single Sign-On Service, Cyber Campus is accessible to 70% of users. While E-Learning services can be accessed by 5 parallel classes at the same time.

3) Continuity

To keep each user from using the service even when it is not online or not working, a policy is specified. If Single Sign-On and Cyber Campus services are not working, users can contact the Academic Administration department. If the E-Learning service is not working, then the user can contact the Course lecturer. Service recovery time when service stops working, up to 3 hours when it is related to internal constraints. In case of obstacles with external parties, the recovery time is cultivated for a maximum of 8 hours.

4) Security

Single Sign-On, Cyber Campus, and E-Learning services security must be encrypted and unique to each user. The process of access to the service uses user-id authentication that applies to the user's XYZ Institute.

E. Designing SLA

After the SLR is completed, the next is compiled SLA. SLA content is compiled based on SLRs, in addition to joint discussions with service providers. The process of compiling the SLA is as follows.

1) *Determining the Stakeholders involved*: identifying who is involved in the IT services. Based on the results of the discussion and studying the IT Service Catalogue, the parties involved are Employees, Lecturers, and Students.

2) *Set a target*: set targets on any IT services provided to all parties. These targets include Availability, Capacity, Continuity, and Security. The results obtained are unchanged as from the established SLR.

F. Designing OLA

The preparation of SLA is done by studying IT Service Catalog, SLR, SLA, and interview with service providers. In the process of preparing OLA there are 3 processes:

1) *Indicates the parties that work together.*

Parties involved in OLA are network development units and information systems development units.

2) *Describe the tasks and responsibilities per unit involved.*

Determination of the tasks and responsibilities required by the service provider for the division of tasks related to the handling of problems that may arise. The network development unit has the main task of doing network administration, such as analyzing networks, performing routine audits, managing security, including performing backup and restore processes. Information system development unit has the main task of designing database including doing backup and restore database or application, analysis and application development, and also to manage problem that happened.

Each task has a person in charge of each. This is necessary to facilitate coordination for handling constraints.

3) *Manage Problems.*

OLA content is similar to SLA content. Different on the availability and capacity of services that consider handling constraints since the constraints occur or are reported until they are addressed. Created a reference for respond time in case of constraints. Respond time can be seen in Table II.

TABLE II. RESPOND TIME

Criteria	Respond Time
High	The problem should be responded <1 hour from the time the report is received.
Medium	The problem should be responded up to 3 hours from the date of receipt of the report.
Low	the problem should be responded up to 8 hours from the date of receipt of the report.

Time of completion of the constraint, which has been agreed is during working hours that is at 07:00 - 16:30. In the event of any constraints during the working hours, the service provider handling constraints refers to the respond time in Table II.

V. CONCLUSION

The resulting SLM documents consist of SLR, SLA, and OLA. These documents can help IT service providers to improve their relationship with users. In addition, users also have certainty about the IT service guarantees used. The SLM document needs to be observed and evaluated periodically, at least annually or annually.

Further research that can be done is to analyze the achievement of service targets that have been set. This can be done after the service provider implements the SLM.

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