HELPDESK SYSTEM DESIGN AND DEVELOPMENT IN A UNIVERSITY BASED ON ITIL V3 FRAMEWORK (CASE STUDY: AL AZHAR INDONESIA UNIVERSITY)

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ABSTRACT

Helpdesk is a service function provided by Pusat Komputer dan Sistem Informasi (PKSI) in Al Azhar Indonesia University (UAI) to handle incoming complaints on IT problems from employees. Without computerized system, the IT staff faces difficulties in managing incoming problems and management cannot monitor PKSI performance. In this study, we used ITIL V3 as a framework to establish good governance in incident management. We started with analyzing the current level of user satisfaction and Helpdesk system maturity. Then we analyzed the requirements and design for the system using Service Operation Module in ITIL V3 Framework. In developing the system, we used PHP programming language and MySQL as the database engine. When completed, the system is expected to improve PKSI performance in supporting the users.

Keywords*: ITIL Framework, Helpdesk, incident management.*

1. INTRODUCTION

In the service industry especially in information technology (IT), we must consistently develop and change to keep up with the the rapid change of technology, especially in information technology (IT).

Most companies or institutions have developed integrated information system that shifted issues from technology problem to management problem. To have a good IT governance, one need to have a proven framework. *Information Technology Infrastructure Library* (ITIL) is a common framework that shows best practices in IT good governance. ITIL Framework provides solutions starting from service strategy, service design, service transition through to service operations and continual service improvement. We tried to use this framework to improve services provided by Helpdesk in terms of incident management in Al Azhar Indonesia University.

1.1. Study Method

The methodology of this study is divided into three phases. The first phase is data collection using questionnaire, to measure user satisfaction and current system maturity. We executed validation and reliability test on the questionnaire to get an accurate assessment. In the second phase, we analysed the current condition and users expectation using ITIL framework on Helpdesk and Incident Management. The last phase is designing and developing Helpdesk System to manage incoming incidents and resolutions, and subsequently transform it into knowledge.

1.2. Study Goal

This study aims to develop a Helpdesk System using ITIL V3 framework to improve incident management.

2. THEORETICAL BACKGROUND

2.1. IT Governance

Reseach conducted by Weill and Ross (2004), and Lunardi, et al (2009) proved that a company with a good IT governance and adhering to operation standard will have a higher business performance compared to companies that has not adopted IT governance.

According to the IT Governance Institute (2007): “IT Governance is an integral part of enterprise governance and consists of the leadership and organizational structures and process that ensure that the organization’s

IT sustains and extends the organization's strategy and objectives".

2.2. ITIL Framework

Information Technology Infrastructure Library (ITIL) was established in 1980 by Office of Goverment Commerce (OGC), England. It is the most accepted approach worldwide for IT service. ITIL provides *best practice* in a comprehensive IT service. Throughout its development, ITIL has released 3 versions. In 2007, ITIL version 2 was improved by providing a complete service life cycle, starting from service strategy, service design, service transition through to service operations, and it was consolidated in ITIL V3 and completed with continual service improvement. In this study we focused on Incident Management. According to OGC (2003), *incident* is an unplanned interruption to an IT service or reduction in quality of an IT service. An *incident* is usually caused by system error or malfunction in IT infrastructure and potentially results in operations disruption. *Incident Management* is a process management in ITIL to provide a fast recovery and minimize the impact to business (OGC, 2003).

IT Helpdesk plays an important role in *Incident Management* (OGC, 2003). The difference between *Incident Management* and *Problem Management* lies in the type of resolution. *Incident Management* can only solve a problem when the problem occurs, while *Problem Management* can solve a problem even before it occurs and may develop into a permanent solution.

2.3. Helpdesk

Helpdesk is a common name used for a center providing services for end-user. Nowadays *helpdesk* becomes a service, and is responsible for solving problems and fulfilling end-user's requests.

According to Alex D Paul, ITIL is the *best practice* to ensure IT service is delivered, which includes incident management, problem management, and change management. Peter Gilbert, Roger Morse and Monica Lee stated that helpdesk implementation may establish *knowledge management* as a collection of resolution documentation and in turn may be used by other IT Support and end-user when similar problem occurs in the future.

3. CURRENT CONDITION ANALYSIS AND PROPOSED SYSTEM

3.1. Helpdesk Service Analysis

To measure Helpdesk performance, we used two types of questionnaires. the first one is to assess user satisfaction level and the second one is to assess system maturity.

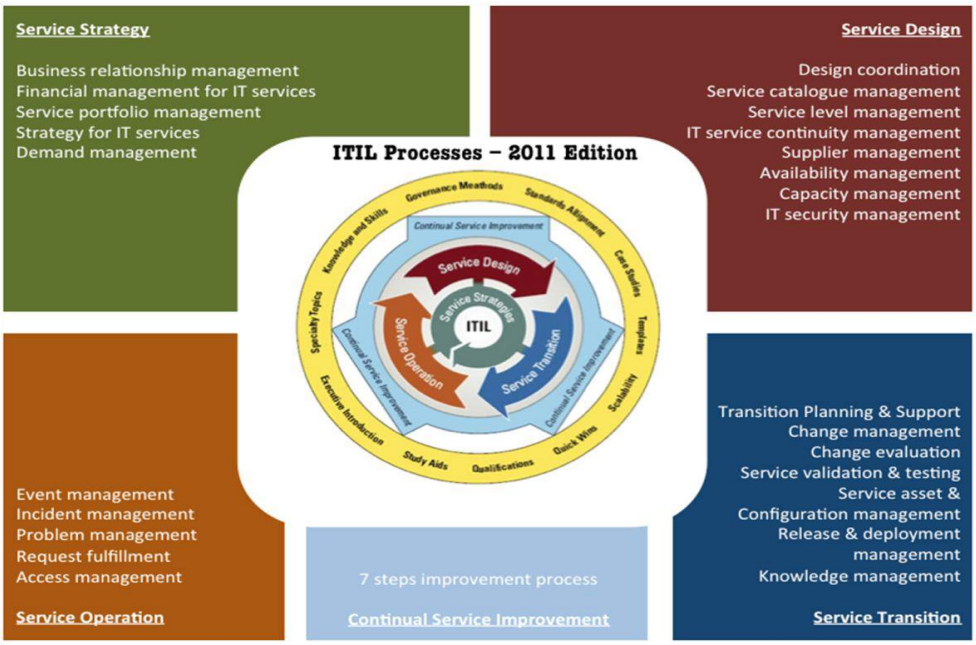

Figure 1 - ITIL Framework V3 (OGC, 2007)

The questions were carefully designed to assess which process is important to be implemented in helpdesk services based on the ITIL framework.

Both questionnaires were processed in two stages. The first stage is instrumentation test, which includes validity test that was analysed using *Corrected Item-Total Correlation* technique with significant value of 5%, and realiability test which used *Cronbach's Alpha* (α) technique. The second stage is analyse the level of user satisfactory using SPSS *for Windows* version 16.0.

Maturity level measurement was performed based on COBIT maturity level. The absolute value ranged between 0 (non-existent) and 5 (optimized). The result shows that the maturity level of current Helpdesk service is 0.75 which was categorized as Initial level.

3.2. Proposed System

ITIL framework is implemented in scoping the incident management and helpdesk services, and to identify activities to be provided in the Helpdesk system. Based on the user satisfactory assessment and interview with PKSI management, the new system requirements were formulated. Infrastructure and UAI culture were also taken into account in designing the system.

Table 1 - ITIL activities in the proposed system

ITIL activities	Current System	Proposed System
1. Incident identifications	No standard procedure to identify incoming incident.	Provide feature to identify incoming ticket, distinguish between incidents and requests.
2. Incident notes	Incoming incidents were documented in spreadsheet.	Provide feature to record every incoming incident and manage in a database.
3. Incident categorization	Nonexistent.	Provide feature to categorize incidents.
4. Incident priority	Nonexistent.	Provide feature to prioritise incidents, so that PKSI can deliver better response time for an urgent incident.
5. Preliminary diagnose	Nonexistent.	Provide feature for Dispatcher to do some preliminary diagnosis and conduct a standard resolution if available in the knowledge-based module.
6. Incident escalation	There is an informal escalation, only based on the first available staff.	Provide feature to escalate incident based on category. System will push notification to the IT Support to deliver better response time. If needed, incident may be escalated to the 2nd level to get best resolution.
7. Investigation	Investigation available, but not recorded.	Provide feature to record investigation process by IT Support.
8. Resolution	Resolution available, but not recorded.	Provide feature to record resolution by IT Support.
9. Closing	Nonexistent.	Provide feature to close ticket incident. Closing procedure includes notifications of incident status to end-user. This procedure is important to monitor Helpdesk performance in delivering their services.

The proposed system involves a workflow procedure. End-user can access the system directly and input their problem. If the user is not satisfied with the system, he/she can call Helpdesk and the Dispatcher will enter it into the system. A ticket is issued for each incoming incident.

The dispatcher will categorise the incident and do the preliminary diagnosis based on the knowledge management module. If the problem can be solved directly, the incident may be closed immediately; otherwise it would be escalated to IT Support. IT Support will investigate and

provide resolution. Should it need higher support, then the problem can be escalated to the 2nd level of support. The resolution of an incident must be reported to the end-user who raised the problem, in order for IT Support to close the ticket. The workflow is shown in Figure 2.

The system can produce reports for the management to present the level of incident frequency and the response time of IT Staff.

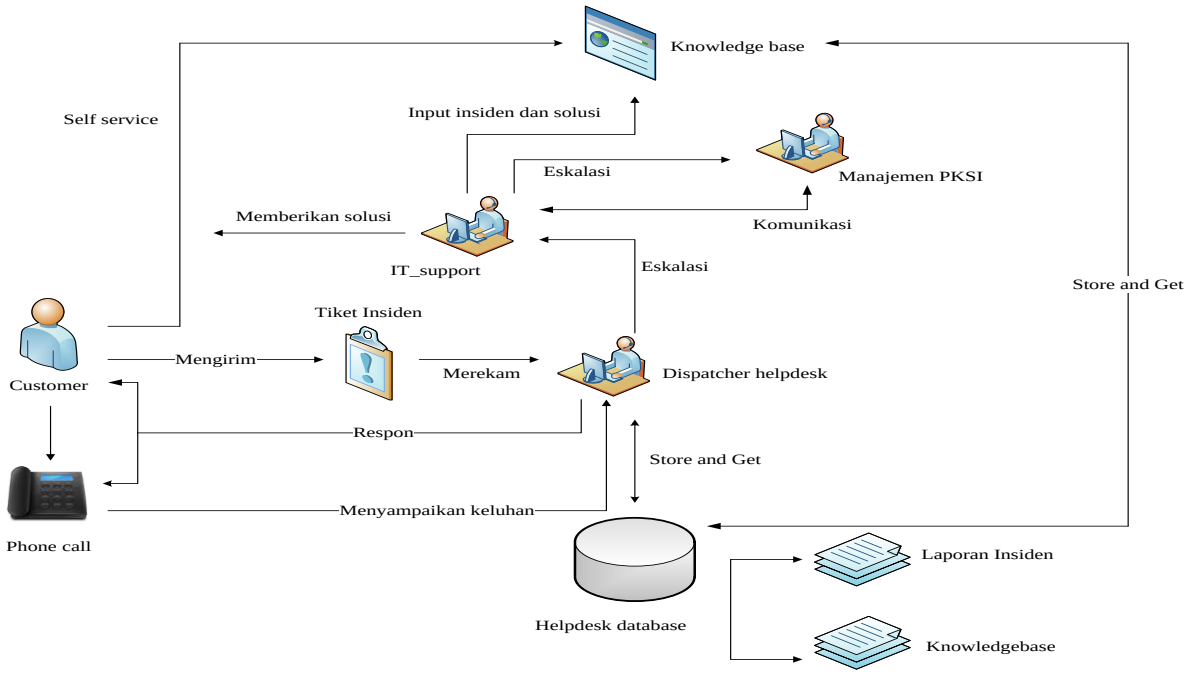

Figure 2 - Workflow in the proposed system

It will be an input for the management to form strategic plan in improving Helpdesk services.

4. SYSTEM DESIGN AND DEVELOPMENT

Helpdesk system is designed to conform to user requirements and workflow agreed by the Head of PKSI, and to safeguard IT condition in the university.

As the output of the design stage, we also produced recommendations in the form of *Standard Operating Procedure* (SOP) and ideal organization to enable an optimum system operation.

4.1. Actor Definitions

The proposed *Helpdesk System* involves 5 actors with their specific responsibilities:

a) Dispatcher: to receive and dispatch incidents, and also issue and escalate tickets.
b) Admin: to maintain system users.
c) End-User: any UAI employee who needs Helpdesk Service.
d) IT Support: PKSI IT staff acts as 1st level of service, to provide solutions to incoming incidents.
e) PKSI Management: act as 2nd level of service to back up 1st level of service.

4.2. System Design

The proposed system is designed using Unified Modeling Language (UML) – Use Case Diagram to identify what functions needed by each actor. We made clear the difference of roles between front-end and back-end of the system. The back-end of the system holds more importance because it is where we manage ticket escalations until it is closed completely.

4.2.1. Use case Diagram

The front-end provides user interface for End-Users to submit their ticket and track the status of their problem. The PKSI Management has the facility to monitor incidents and its status, and check response time to monitor PKSI's service level.

At the back-end, Dispatcher and IT Supports follow up incoming incidents. Given the

condition that IT Supports are always mobile, the system will push *short message service* (sms) notification to IT Support once Dispatcher assigns a ticket to IT Support.
An important function developed in this study is the knowledge-based management module where IT Support will input any resolution of problems, so that it becomes knowledge that can be used by any other IT Support, Dispatcher or by End-User in case of similar problem being raised in the future.

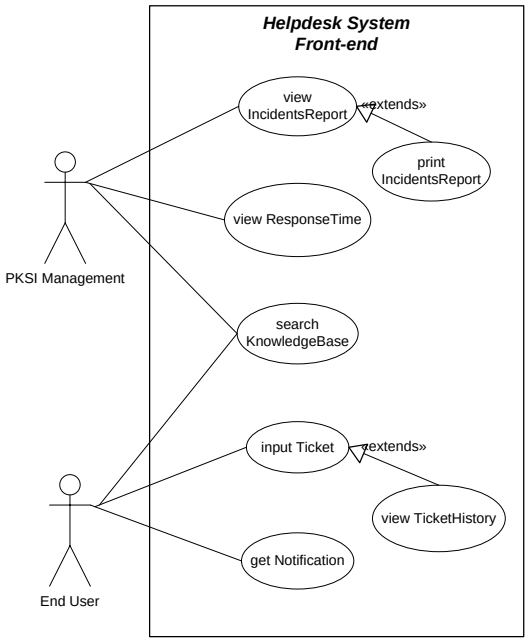

Figure 3 - *Use case Diagram* for front-end

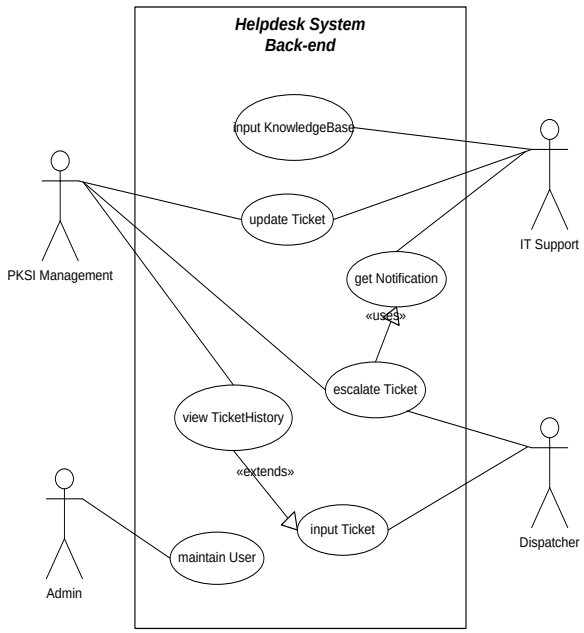

Figure 4 - *Use case Diagram* for back-end

5. CONCLUSION

Implementation of ITIL framework in incident management of Helpdesk Service may improve the following areas:

a) Management of incoming problems is easy and PKSI can provide better service in a timely manner. Management can monitor pending issues and find better solutions.
b) Past experience and knowledge can be easily accessed to get lessons learned and provide quick solutions.

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