

# IT Service Management for Campus Environment – Practical Concerns in Implementation

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**Abstract**— Adequate definition and adoption of standardized management processes form the foundation to enhance IT Service Management (ITSM) especially in tally with the arrangement of outsourcing operation management and contracting project development. With the establishment of *de facto* standard IT Infrastructure Library (ITIL) for ITSM implementation in these days, management software tools are available in the market. However, proper service management processes shall be developed to align with the existing daily operations workflow, model around ITIL framework, rather than compromising commercial product standard template. This paper first evaluates the effect of ITSM tools in practical adoption in supporting various types of service category in campus environment of technology industries. Experience sharing to address specific concerns in developing customized management process modules for the campus with service outsourcing will be discussed afterwards. Finally, a future work on proactive service impact analysis framework is defined.

*Keywords*- ITSM, ITIL, outsourcing, campus

## I. INTRODUCTION

Historically, IT support plays as a best effort role to help business function in an organization. Service level agreement and its management are luxury in nature. This mindset and practice have significantly changed over the last decade with the introduction of service outsourcing and service management frameworks like ITIL [1]. A campus built as a hub for technology companies emphasizes the role of IT in enabling and delivering better service to tenant for innovation and technology development in the focused clusters and the upgrading of manufacturing and service industry capabilities.

The intrusion of IT into the building operation has caused substantial change from traditional manual processes in managing campus environment into an era where the business operations are IT-enabled. In this paper, we first took a real campus site in technology industries as a case study to present the effect of adopting ITSM process tools in supporting various service categories in campus environment. In view of the increased trend in outsourcing service management in the commercial market, we then share the experience and discuss the specific concerns in developing management process modules under the service outsourcing model.

## II. RELATED WORKS

To our knowledge, no approach can be found in the literature that addresses an overall process framework completely suitable for the campus operations environment with the consideration of outsourcing implication. Most of the related works were done individually in the entire ITSM processes. In [2] the aim is a better incident prioritization, [3] addresses automating Change Management activities. Enhanced Telecom Operations Map (eTOM) [4], a business process framework outlines by Telemanagement Forum (TM Forum) to guide the development and management of key processes within a telecommunications service provider. eTOM lacks more useful information than ITIL regarding each specific service management sub-process including benefits and best practices. [5] presents a service-oriented architecture approach to integrate service management application, but was without ITIL processes modeling.

## III. THE CAMPUS

We took a real case to illustrate the effects and concerns of ITSM processes implementation in a campus environment with outsourcing IT services support. The campus is located in Hong Kong which provides rentable floor space for research and development (R&D) offices and laboratories with supporting facilities for tenants in innovation and technology clusters of IT and telecommunications, Electronics, Biotechnology, and Precision engineering. It is a non-labor-intensive campus for research and development industries which comprises 3 development phases. Phase 1 was completed in 2002; there are 10 buildings with occupancy of 153 companies and over 4,500 employees as of the submission date of this paper.

The campus IT service support was outsourced by the campus management to a technology service operator while the building operation support was outsourced to another facility management service operator. The daily IT service support includes all aspects in Information and Communications Technology (ICT) infrastructure which were grouped into 10 categories:

- Server farm
- Office Automation (OA) and Desktop applications

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- Public facilities - Kiosks and Displays
- Campus network
- Web portal and User applications
- Main IT room / control centre
- Wireless communications
- Campus cabling
- IT security
- Telephony and Unified messaging system (UMS)

Compare with the average enterprise with satellite offices or subsidiary companies, the distinct features in campus IT operations are the ad-hoc and daily service offerings for tenants, visitors and the public, such as ad-hoc VLAN setup for tenants and conference events, publicly accessible wireless network services, real-time multimedia event broadcast and guidance information. The operations' knowledge management in handling different setup environment in each tenant office is another key issue in campus operations.

#### IV. IT SERVICE MANAGEMENT PROCESSES

ITIL provides a comprehensive, consistent and coherent set of best practices for IT service management processes, promoting a quality approach to achieving business effectiveness and efficiency in the use of information systems [1]. It is not a process model but a description of activities, documents, roles, success factors, key performance indicators (KPI), etc. [6]. In the ITSM hierarchy, Service support and Service delivery form the bases for service management. Service support aims to deal with day-to-day operational support of IT services while Service delivery provides long term planning and improvement of IT service provision.

The adoption of ITIL process elements and its

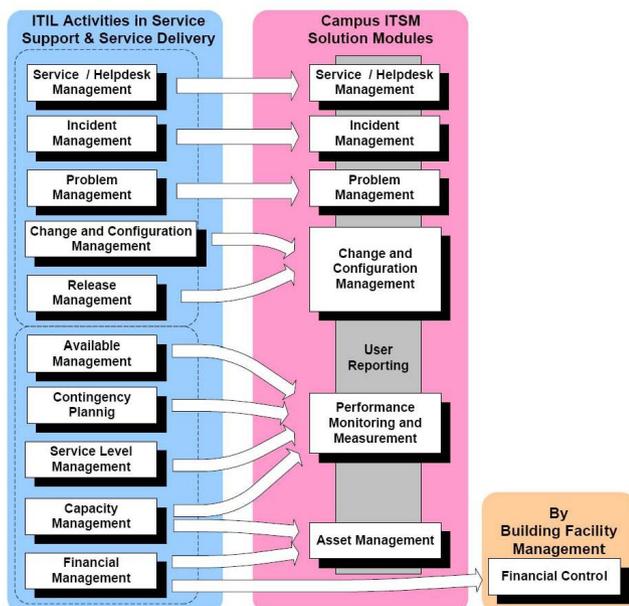


Figure 1 Campus ITSM Solution

downstream components would depend on the organization's business needs and resources allocation. In practice, not all of the process activities in Service support and Service delivery could be automated or aided by software management tools but require manual process in administrative determinations instead to bridge over the other process activities. Once an organization understood the required process activities, relevant process modules would be formed accordingly as a set of standardized framework for ITSM.

#### V. IMPLEMENTATION IN PRACTICE

To avoid chaos operations management and achieve systematic process instead, ITSM workflow processes were adopted in stages for the IT operation team since the campus was put into operation in 2002. Figure 1 illustrates the mapping of ITIL activities to campus ITSM solution. The process modules combined some of the activities in ITIL for better efficiency in workflow arrangement in practical adoption. In which the Service Helpdesk and Incident Management were aided by proprietary management software tools in 2005. The software tools were customized according to the management workflow with knowledge repository to handle requests and incidents efficiently.

##### A. Outsourcing Model Implications

In service outsourcing model, the service operator is selected either through strategic partnership or competitive tender bidding. Unlike the management of direct staff employment, the relationship between the company and the employer organization is built on the contract itself. Some implications were observed during the stages in planning, design and implementation of ITSM for campus environment.

##### 1) Conflict of Interest

The financial element in ITSM brought to the concerns of conflict-of-interest. It is especially a sensitive subject for government and public agencies that require serious attention. Unless there are plenty supply of vendor-neutral service provider companies in the regional market, which is actually not the case in reality, the procurement of new equipment in order to satisfy user request shall be done by a third party so as to get rid of conflict-of-interest during the course of equipment vendor selection. The service providers in IT and building facility management are therefore required to take up the asset management and financial control respectively in order to match with the financial management activity in ITIL.

##### 2) Standardization of Processes

Implementation of ITSM with KPI and service level agreement (SLA) measures is crucial in service outsourcing environment for achieving success in service support and delivery. Standardization of process activities, documents, procedures, roles, etc. are the native elements with the establishment of ITSM. With the knowledge-base processes built in the management tools, it could minimize the service impact of human resource turnover or skill transfer due to the change of service provider contract.

### 3) Owner of the Tools

Although the ITSM tools could be included by subscription under the service outsourcing contract, in practical operations, it is recommended that the employer organization builds his own ITSM tools. Such arrangement ensures transit seamlessly the know-how from existing service operator to its successor; minimizes data conversion from one tool to another. All relevant historical intelligences could therefore be retrievable.

### B. Performance Monitoring and Measurement

Performance monitoring and measurement service module captures and provides historical and real-time performance data during end-user simulation, which quantifies the specifics in service level, capacity, and availability. It works together with reporting tools in user reporting service module and leverage data from asset management module to facilitate an operation team to ensure business demand is met by adequate capacity.

The metrics used for evaluating ITSM comprise five KPIs in helpdesk services, problem management and bug fixing, change request / enhancement, system monitoring and optimization, and production support and request. In which the indicator of helpdesk services is derived from the performance attainment in SLA. The products of SLA, KPI criteria, contingency planning, etc., once administratively developed, will be put under a knowledge-base to interact with the real time measurement in system and the incident event records to provide useful results for service management. However, some of the activities in ITSM in respect of the human processes in service management and availability management, like service level improvement plan, availability improvement plan, etc. are crucial yet and cannot be replaced by functions provided by this service module.

### C. User Reporting

This module is the underlying service which could not be omitted in the entire ITSM solution. It is not a service management process but offers effective means to facilitate documentation. By sharing the backend database and corresponding data stored, user reporting service integrates with other ITSM modules for report generation. Authorized user could generate management report according to the selected information from the captured data.

## VI. RESULTS

We collected data in two stages: the 1st stage before deployment of management software tools from January 2004 to January 2005 and; the 2<sup>nd</sup> stage after deployment from February 2005 to December 2006.

### 1) Service Target Improvement

Level of achieving predetermined service target is one of the primary concerns in service-oriented IT support. It is especially important when the service is provided through outsourcing. In this campus environment, there are four pre-defined severity levels for incident / problem cases in IT operation. Performance target in terms of the relevant service

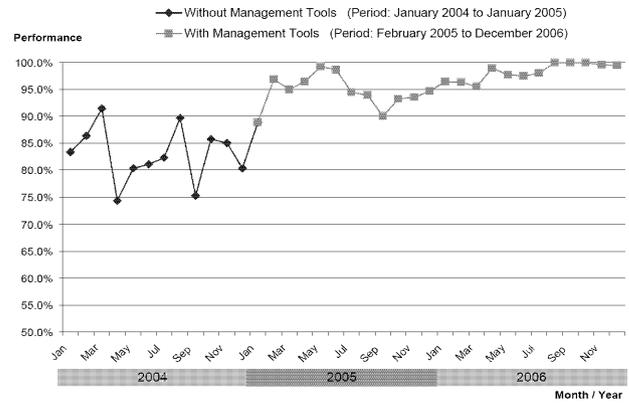


Figure 2 Service Target Improvement

level requirements for each severity level are also defined, ranging from low impact of 48 hours recovery period to very high impact of 2 hours recovery period. Incident case cannot be resolved according to the SLA; would be classified as non-compliant case. Therefore, service performance in response to incidents =  $1 - (\text{non-complaint cases} / \text{total no. of cases}) \times 100\%$ .

Figure 2 illustrates the service performance before and after the deployment of management tools by comparing 36 months' figures. The data showed that the service target had been improved by 13.4% in average and 25% at maximum. More stable performance was observed after 12 months usage in which 95% was attained. The performance result provides proven records demonstrating the following observations:

- a) *Better communications and transparency* – Standardized workflow-oriented communications between users and service support team, openly web accessible by campus management at anytime;
- b) *Accountability* - Traceable details for event and its respective handling operator;
- c) *Efficient event resolution* - Utilizes historical knowledge-base track records to shorten response and turnaround time for similar event.

### 2) The Most Requested Users

Knowing the most requested users in the campus could help the management to understand the current situations and provide forward planning in supporting these users. We made use of the aggregated system logged data in Service Helpdesk and identified the most requested user groups in the campus, namely campus facility management; campus helpdesk; tenants; and remote operation centre.

Considering the business nature and operation model of the campus, we have the following interpretation. There is a stringent leasing requirement for the campus that an eligible company must satisfy the condition of having not less than 40% activities in R&D for its business. In this connection, tenants are technology companies with internal IT services support. The IT problems in their daily business are mainly tackled by their internal support rather than the campus IT support. The service requests to campus IT support, however,

