Seminar report

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**Abstract**: This article gives the different definitions of system maintenance covered in the course. And expressed the theory about ITSM and its processes, mainly including support and delivery processes through comparing and discussing similarities and differences between COBIT and SIX SIGMA models in small and medium-sized enterprises.

**Keywords**: ITIL, ITSM, COBIT, SIX SIGMA

# Introduction

ITIL have taken the world of IT by storm. The number of ITIL certified professionals is growing at 30% a year, one of the fastest growing phenomena in the IT industry. Businesses of all sizes are learning how to benefit from this powerful approach. At its most basic level, ITIL is a set of best practices that help IT organizations deliver reliable and consistent services to end users at a cost that they can afford. As it has evolved, many complementary frameworks have emerged, but the basic principles of quality improvement remain the same, and they apply to businesses of all sizes.

In addition to expressing my understanding of ITSM and ITIL, I will take small and medium-sized enterprises as an example to illustrate the different impacts of different models on small and medium-sized enterprises.

Support and delivery processes are significant parts in ITSM. In the following article, I mainly wrote about how Support and delivery management interact and influence each other.

## *1.1* System maintenance

Before we discuss about ITIL, we need to know that system maintenance is a rather large business in many organizations. Vast sums of money and vast amounts of time have been invested in computerizing businesses. Originally, the common purpose was to rationalize businesses and increase productivity, but with the passing of time, the purpose has more often become to increase the quality of decisions and administration (Falk and Olve, 2000). Maintenance objects, maintenance assignments and maintenance organization are means for organizing system maintenance businesses. Which demarcating effective maintenance objects from object business products, letting the maintenance objects contain IT systems and permanent maintenance products and managing maintenance objects through well-defined maintenance assignments that are documented in contracts that in turn are instruments of control for the maintenance business. (1)

As Riggs(2) moves toward a wider view of maintenance in his definition: "Systems maintenance is the activity associated with keeping operational computer systems continuously in tune with the requirements of users, data processing operations, associated clerical functions, and external demands from government and other agencies."

## *1.2* IT service management

IT service management (ITSM) is an integrated process approach that enables an IT organization to deliver services that meet business and customer requirements.(3)

ITSM focuses on managing the entire life cycle of IT services. Its scope usually does not cover project or program management, nor does it cover application or software development. However, ITSM processes should be designed and implemented in a manner that is integrated and integrated with project and program management and application and software development processes.

The term IT Service Management refers to an orderly and professional method followed by an IT department to provide reliable and efficient information systems and support to meet the business requirements.

The ITIL definition of IT service management is: ‘The implementation and management of quality IT services that meet the needs of the business. IT service management is performed by IT service providers through an appropriate mix of people, process and information technology.’(4)

## *1.3* ITIL

The Information Technology Infrastructure Library (ITIL) is a set of guidance developed by the United Kingdom’s Office of Government Commerce (OGC). The guidance framework, published as a series of books, describe an integrated, process based, best practice approach to managing IT services.(Effective IT service management to ITIL and beyond, Rob Addy(5) It consists of a series of statements defining the processes, controls, and resources that should be applied to various IT-related processes.

We will focus on the three that are most likely to matter to the SME: COBIT and Six Sigma:

# Analysis and discussion

## *2.1* CONTROLLED OBJECTIVES FOR INFORMATION AND RELATED TECHNOLOGY (COBIT)

Many businesses come across COBIT before they consider ITIL.

COBIT is published and maintained by the Information Systems Audit and Control Foundation (ISACA) and the IT Governance Institute. Like ITIL, COBIT is in the public domain. COBIT is often used in conjunction with ITIL to formalize the accountability link between various aspects of IT and the financial governance structure of the enterprise.

COBIT focuses on the most important factors: risk management, security, data consistency, and cost control. To do this, COBIT has established 34 control targets, each linked to specific activities. These are linked by a common control framework and are supported by a number of management guidelines.

Many of the control objectives in COBIT exist in ITIL. Therefore, using them together is not a "one or the other" proposition -- processes in ITIL will help rather than hinder COBIT adoption. There is some overlap, particularly in the financial management functions of ITIL, but this is easy to manage. COBIT adds more detail in terms of finance and management and integrates well with formal accounting and auditing principles. Although COBIT is related to formal auditing, it is an "adopt and adapt" framework. As a case in point, the IT Governance Institute has released COBIT online, making IT easy for users to modify IT for their own businesses. In addition, there is a version called COBIT QuickStart, which is particularly interested in small and medium enterprises, which are designed for small and medium enterprises that do not have as deep a need as large enterprises. (6)

## *2.2* SIX SIGMA

Six Sigma and ITIL have common roots. The beginnings of six Sigma date back to 1920, when Walter Shewhart, founder of the same Shewhart circle used by ITIL, established a set of statistical principles about the dynamics of product change. The big breakthrough for Six Sigma, however, came in the 1980s, at the same time that ITIL was created. MOTOROLA vice President Bill Smith created the actual six Sigma body of knowledge for his business. Six Sigma remains a registered trademark of MOTOROLA. However, much of six Sigma's notoriety is due to its high-profile adoption by General Electric in the 1990s under Jack Welch.

As an approach, Six Sigma provides a set of tools to quantify change and plan performance around quantifiable goals. Six Sigma adheres to the following multi-layer structure:

• As a measurement tool, it provides a method for calculating mass deviations. The most important law is that defects must be limited to 3.4 per 10,000.

• As an approach, it provides a toolset for quality improvement projects. In ITIL, these projects include teamwork and eliminating functional silos.

• Six Sigma is also a philosophy that promotes a culture of quality. Many vendors offer six Sigma consulting as a complement to ITIL, which can be used to help businesses understand how successful they are in managing their IT infrastructure. In fact, many SMEs considering ITIL already have a six Sigma process in place. These two approaches usually have complementary relationships. If ITIL is the machine that monitors and regulates it, six Sigma is the precision measuring tool. (6)

## *2.3* Differences in the definitions of system maintenance

1. The term refers to the activity of keeping the computer operating system consistent with user requirements, data processing operations, related clerical functions, and requirements from external and other organizations. (P227)
2. Changes to any necessary system element to eliminate errors in that element, accommodate changes in that element or any other element, or improve the performance characteristics of the element. (P241)
3. Information system maintenance is a more complex and comprehensive task than described in the literature. It involves not only the maintenance of the application, but also all the other elements of the operating system. Its complexity manifests itself in the fact that the literature review on the maintenance of each element reveals serious underdevelopment in some fields and splits between elements. (P237)

# Support and delivery processes of ITSM

For service management, we need to combine the balanced process model and a well-worked service definition to get the balanced best practice process model. According to Rob Addy, he described this ideal model about IT service management as three parts: assets, people, and process. All three parts contain support or delivery processes, which means the balanced management processes should be interactive.

For support processes, five main management are put forward: incident management, problem management, change management, configuration management, and release management.

*3.1* incident management  
For incident management, it is an operation aiming to deal with incidents quickly and efficiently. These incidents will lead to interruptions and even information lost. From management perspective, when handling it, we need to firstly think about the response and plans after incidents occur, aiming to lower the lost and potential risks. The emergency procedures should be effective. Many companies have their groups or emails to command the situation of systems every time. Then users can reflect problems in time. Next we need to think about how to prevent incidents. We can collect data and error reports. Microsoft is doing this when the applications break down. Besides, high-priority issues should be settled firstly. I recommend there is a team in the company to handle these important issues specially to reduce negative impacts. But for different companies, their classification should be different. So as a manager, it is recommended to classify all the possible incidents in advance.

*3.2* problem management  
For problem management, it focuses on the root causes of incidents. Incidents happened and to eliminate future risks, we need to investigate and identify the problems behind them. As the problem manager, we need to find the problem behind an incident to conclude a general phenomenon for the technical team. The problems should be written down as a report to record their current status. By analyzing these, the manager should have a clearer view of the importance of these types of problems.

*3.3* change management  
For change management, it aims to command the systems by controlling changes. By controlling them, their importance and roles can be clearly found during this process. Systems can also be optimized for better performance. This management process can be linked with problem management. Problem manager finds a problem and then put forward the expected change to change manager. The change manager assesses whether the worth of the change. Often, as a manager, we may get many change points to test or analyze. High-priority changes should be recognized such as system upgrade, anti-virus update, and application update. Some unnecessary changes should be recognized according to their contributions to the business. This is a management, which means we just put forward the expected changes after analyzing the impacts and submitting RFC. The actual implement should belong to the delivery part. The analysis can be taken from reasons(why the change is needed), the predicted costs, and the urgency. Different changes require different departments to cooperate, which means managers should have a clear mind of the change.

*3.4* release management  
For release management, it is responsible for the approved changes from change management working efficiently in a live environment. Release managers need to ensure the workable of the changes and make plans for the release process. They need to provide guidelines and support for the deployment of releases and give plans about how to carry out the release, including the release type. Also, the managers need to ensure the right components are released to test and live environments. It is like an exit guard that needs to let the correct part out to work for the IT system and remain the less effective or with low business value part. For the early stage of the process, they need to cooperate with the technical team to ensure the release process are going the right direction.

*3.5* configuration management  
For configuration management, it focuses on configuration items to ensure normal actions of the system. These items can either be hardware or software. They can be part of the configuration management system, which is a possible indicator of incidents, problems, changes and releases. So this management process is the overall presentation of all the incident management, problem management, change management, and release management.

Configuration management allows IT departments to have a complete picture of all hardware, software, documentation, versions, locations, relationships and status that exist in their organization.

When you have a complete picture of all configuration items you own and their relationships, it will be easier to maintain and update them. And it is different with the inventory management. Inventory management only maintain the asset above certain value. However, configuration management includes everything that organization owns. More important, configuration management focus on the relationship between configuration items. For example, document A is stored in database B.

Among all the five management, incident management and problem management are about the service operation phase while the other three are about the service transition phase of the ITSM core lifestyle. They work together to ensure the  normal performance of support processes of ITSM. They also influence each other step by step and even provide a prerequisite for the next stage management.  
Next, for delivery processes, another five management are put forward: service level management, accessibility management, capacity management, continuity management, and identify&allocating costs and security management.

*3.6* service level management

For service level management, it is responsible for all ITSM processes and agreements are met the business targets. They are usually not the front desk person to deal with the problem, but provide the solutions or regulations for end-users and help desk to solve the problems to met the business targets or user needs. As service level managers, they need to firstly ensure that the service level management is stable by designing the structure and requirements. Then they need to monitor the achieves service levels to check whether they meet the targets. The service level manager is like a project responsible person who set the regulations and rules for the whole project. They don’t need to involve in the actual implementation but need to command the process of each step.

*3.7* accessibility management

For accessibility management, it monitors the authorized person to use a device. It has right to give users privileges to enter a service, which is like the department internal document. It’s used for security most times. Managers can design the work or user group easily by this to command data and information better. They are people who decide whether or not to provide the rights and check the status at any time. In companies, we can see this kind of management when asking for a document or rights. Some companies choose to use emails to approve while other companies may have their own systems to asking for a right. This means the manager has an access to command the user’s or the candidate’s role and current status.

*3.8* capacity management  
For capacity management, it focuses on the device needs of IT systems. This processes needs to have a basic idea of the capacity of all the business and service needs. Then equip the departments with relative devices. Sometimes the needs can be fake so managers need to assess the needs based on the situation and predicted costs. Also, when setting capacity targets, managers need to think profoundly that cannot just focus on the current needs. They need to reasonably predict the needs in the several coming years and remain some spaces for their future growth. A good manager is supposed to make plans for timely upgrades and all possible growth without wasting too much resources and money.

*3.9* identify and allocating costs and security management

For information security management, the process that ensures the confidentiality，integrity and availability of an organization’s assets，information，data and IT services.Information security management usually forms part of an organizational approach to security management which has a wider scope than the IT service provider, and includes handling of paper，building-access，phone-calls.

All these five management work from different aspects to handle the delivery process efficiently. They seem that they work independently but actually they associate with each other. For example, capacity management decides how big the container is, while the accessibility management decides what should be put into the container. All these five management make up a container with suitable contents. The structure, design ideas, and security considerations are also given in this process. So for the delivery part, all five processes are important and necessary, which means without anyone, the system cannot be complete.

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