An ITIL-based IT Service Management Model for Chinese Universities

Wang Zhen, Zhang Xin-yu
Computer and Information Management Center of Tsinghua University, Beijing 100084, China
wangzhen@cic.tsinghua.edu.cn

Abstract

Considering the exigency of establishing an IT service management model that accords with the characteristics of universities, this paper has developed the organization model, the process model and the technology model of campus IT service management based on the ITIL theory and the realities of Chinese universities.

1. Background

The high-speed development and application of information technology has brought about profound changes in terms of our work, study, thinking and living styles. In China’s Tenth Five-year Plan, IT-based education has been listed as one of the key national projects, with informationization promoting the modernization process of education. Up to now, IT has been widely applied in the education field and informationization has become a basic means in education management, teaching modernization and management of teaching affairs, as shown in the online enrollment, modern long-distance education, digital libraries, etc. This has further highlighted the importance of university IT service. It has become a main concern of university IT departments: how to provide teachers, students and the management staff with better IT service through best utilizing the limited human and financial resources.

Internationally, ITIL (IT Infrastructure Library) has become the standard for IT service management available and provides a set of best-practice guidelines for IT service management developed by the British office of Government Commerce. The ITIL guide breaks down the key principles of the IT service management discipline into the following sub-categories, which are collectively known as the ITIL framework, shown in Figure 1[5][6].

2. ITIL and comparisons of existing models

2.1. What is ITIL?

ITIL (IT Infrastructure Library) is currently the most widely-adopted approach to IT service management available and provides a set of best-practice guidelines for IT service management developed by the British office of Government Commerce. The ITIL guide breaks down the key principles of the IT service management discipline into the following sub-categories, which are collectively known as the ITIL framework, shown in Figure 1[5][6].

As you can see from the diagram above, the Business Perspective module is closely aligned to the Business, and the ICT Infrastructure Management module is closely aligned to the Technology. The Planning to implement Service Management module handles all the issues and tasks involved in planning, implementing, and improving the IT service management processes that will be deployed.

The Service Management module is really the crux of the framework and contains the Service Support and Service Delivery sub-modules within it. The Service Delivery module covers the processes involved in planning and delivering IT Services, and the Service Support module describes the processes required for those IT Services’ daily support and maintenance. The Application Management module details the processes required to manage an application through all phases of its application lifecycle. Security Management is a concern that cross-cuts many of the processes in the other
modules of the framework, and the security processes in the framework are displayed as such.

2.2. How to apply ITIL?

Although the ITIL standards contain basic concepts, functions and processes involved in IT service management, it can not yet be directly applied to the practical IT service management of an organization. This is because ITIL, which only provides a theoretical framework based on best-practice, does not lay out how to develop an appropriate IT service management model for an company in relation to its organization complexity, its levels of informationization and IT application as well as its need for IT service management.

Many companies, such as Microsoft and HP, have developed their own ITIL models and approaches. These models, however, were mainly designed to meet the needs of the products and service of the companies. They are intended for company clients instead of universities which differ from the companies in terms of organization, cultural atmosphere, technical background and service recipients. Based on the consideration of the actual situations of Chinese universities, this paper has proposed an appropriate IT service model for universities.

3. Comparisons in IT construction between universities and companies

To design an IT service model suitable for Chinese universities requires a thorough comprehension of them. Universities and companies differ greatly not only in their cultural environment, living space and missions in society, but also in their informationization, although few attempts have been made to compare their informationization characteristics. The following comparisons made by us show the IT system’s and IT department’s differences between campus and company.

3.1. Comparison of IT systems

<table>
<thead>
<tr>
<th></th>
<th>Campus</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ultimate goal</td>
<td>To create knowledge value</td>
<td>To create economical value(profits)</td>
</tr>
<tr>
<td>Focus of information</td>
<td>Knowledge</td>
<td>Capital, Material flow</td>
</tr>
<tr>
<td>Key resource</td>
<td>Educational</td>
<td>Client and product</td>
</tr>
</tbody>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical systems</td>
<td>E-learning, E-campus</td>
<td>ERP/ MR/ CRM</td>
</tr>
<tr>
<td>Main source of alteration</td>
<td>Teaching patterns</td>
<td>Marketing/ production patterns</td>
</tr>
<tr>
<td>Relevant IT theories</td>
<td>Few</td>
<td>ERP/ BPM/ Value Chain, etc.</td>
</tr>
<tr>
<td>Time relativity</td>
<td>Each semester as a cycle; system load varying periodically.</td>
<td>Relatively stable</td>
</tr>
</tbody>
</table>

3.2. Comparison of IT departments

<table>
<thead>
<tr>
<th></th>
<th>Campus</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service recipients</td>
<td>Teachers and students.</td>
<td>Employees</td>
</tr>
<tr>
<td>Capital investment</td>
<td>More attention to network construction, less to the application system construction</td>
<td>More attention to the application system construction</td>
</tr>
<tr>
<td>Time relativity</td>
<td>Each semester as a cycle; work pressure and personnel alteration varying periodically.</td>
<td>Relatively stable</td>
</tr>
<tr>
<td>Cultural atmosphere</td>
<td>Campus culture characterized by freedom and open-mindedness</td>
<td>Company culture characterized by discipline and efficiency</td>
</tr>
</tbody>
</table>

4. Methods and Models for university IT service

The IT service management in universities consists of three factors: Person, Process and Technology. Process refers to the various working processes involved in IT service and maintenance. Process is the foundation of these three factors. Person refers to the organizational form and culture of IT construction and maintenance. Technology refers to the technical means used in IT construction and maintenance. Only through the close cooperation of the three factors can a fine IT service system be established.
The following sections will dwell on the organization model, the process model and the technology model of university IT service.

4.1. Organization model

A fine and strong organization is a person guarantee of the implementation of ITIL. Different from companies, the organization of universities is characterized by a relative independence between departments (especially between various colleges and departments).

**Table 3. Different organizational characteristics between campus and company**

<table>
<thead>
<tr>
<th>Relation between departments</th>
<th>Campus</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Relatively independent; loosely-connected</td>
<td>Closely connected</td>
</tr>
<tr>
<td>Number of personnel</td>
<td>Usually a lot, some with an enrollment of 60,000 students[7]</td>
<td>From very few to a great many</td>
</tr>
<tr>
<td>Knowledge structure</td>
<td>Many experts at computer in different departments</td>
<td>Few experts at computer in other departments</td>
</tr>
<tr>
<td>Personnel mobility</td>
<td>Noticeable periodical mobility (such as freshmen coming to and graduates leaving the school)</td>
<td>No noticeable periodical mobility</td>
</tr>
</tbody>
</table>

Based on the above campus characteristics and general ITIL Organisation model [8][9], we have developed a suitable organization model for campus IT departments, shown in Figure 2.

The major elements of the organization model are the following:

1) IT Construction Leading Group at the university level.

As table 2 and table 3 shown, university has looser organization among departments, so the direct leadership from the top leader of university is very important.

The leading group, with the president as its head and vice presidents in charge of finance or personnel as its member, is set up to gain support from the decision-making group. Its duties include orienting the IT development, coordinating IT construction between departments and making decisions on major matters related to IT construction.

2) IT service management involves many subject, such as IT technology, management, economics. At the same time, there are many departments in university. This is an advantage can be used.

The IT Expert Committee, headed by a vice president and made up of computer experts from different departments, serves to advise, evaluate, review and direct important technical questions, such as the technology course and scheme and the choice of product models.

The General Framing Group, which is set up under the IT Department, is responsible for planning, defining and designing IT infrastructure and application truss.

3) At the department level, a system administrator is to be appointed to take charge of the technical training and data maintenance at that level. As table 1 shown, the number of personnel of university is huge, so this method is need for fast responding to user’s request.

4) The IT Department takes charge of implementation and service. The implementation of the whole project including system analysis, program design, standardization, training, as well as the modeling, promotion and application of model programs.

4.2. Process Model

Basically, the IT Department should orient its IT service management process and model to serve the university’s strategy. As table 1 shown, we know that the ultimate goal of university is very different from company’s. However, this strategy can not be directly used to guide the specific work of IT service management and application management for it focuses more on the macro description of the university’s vision and
mission at the strategic level. The complete cycle model from university strategy to IT service management is shown in Figure 3.

**Figure 3. Process model**

**Step One**
Formulate the informationization strategy according to the university strategy. The design of informationization strategy must conform to the university strategy as well as the university’s traits such as its key specialties and cultural atmosphere. This phase will yield a document of Informationization Strategy.

**Step Two**
Formulate the service management strategy according to the informationization strategy and meanwhile carry out the top level design of campus IT application.

The top level design of campus IT application, which includes the whole work model, data model, process model and network model, is characterized by the aim to plan various information systems and their relationships from the university’s perspective so as to avoid the appearance of Information Island.

**Step Three**
Construct and improve the IT service system under the guidance of ITIL approach, this phase takes as its core task to establish the core process of IT service delivery and IT service support according to the fundamentals of project management and the IT application level in the university. With particular attention given to service quality management and risk control, it also tries to strike a balance between service, profits, risk and user’s satisfaction.

It should be noted that university IT construction is a spiral process that need to be perfected step by step. The construction should be checked after each period of time and reviewed and perfected again in the above way.

4.3. Technology Model

The technology model comprises five levels of technology frames and two systems, shown in Figure 4.

**4.3.1. Five levels of technology frames**
The first level: operating environment, including the environment of computer rooms and service counters. The environment management includes the management of temperature, moisture, air-conditioning UPS, smoke, fire protection, and so on.

**Figure 4. Technology model**

The second level: hardware, including network equipments, computers and their peripheral equipments and backup equipments.

The third level: operation systems, including Unix, Linux, Windows, etc.

The fourth level: platform software, including software systems like data bank servers, application servers and web servers.

The fifth level: application software, referring to the various application software designed for the university’s specific work.

**4.3.2. The two systems refer to the standard system and the security system.**
These two systems will have to be considered in the designing of each of the above five levels of technology frames. In other words, the construction of the two systems, which includes the formulation of regulations and the equipments of special hardware and software, is carried out throughout the five levels.

5. Conclusions

Based on the ITIL theory and the consideration the realities of Chinese universities, this paper proposes the organization model, process model and technology model of campus IT service management. These models have already been successfully implemented at some Chinese Universities.

References


