Information Technology Helps The Collective Account Management

Peng Yu[1] Li YanXia[1] Yu Yue[2] Qi YunYun[1]

[1] Information Technology Center, Tsinghua University,100084, Beijing, China
[2]Security Department Tsinghua University,100084, Beijing, China

Abstract

Collective account management is a day-to-day work of the university security departments, but also a complex trivial, professional policy very basic work. In order to improve the management efficiency, better services for students and teachers, we have developed a collective account management system, the use of information technology to streamline account, scientific and standardized management. The article details the information model of the system, system implementation and application.

Keywords: Information technology, model, the collective account management

1. Preface

The collective account management is a trivial daily work in the university security departments which is also complex, and policy-based. With the improvement of account policy, more requirements arise accordingly which ask for a more standard, process-oriented and scientific management system. It has become a trend to provide an one-stop service for daily account management tasks by using information technology which can simply process and transform account management from manual mode to automated network mode. The collective account management system in Tsinghua University was officially roll-out in 2008. After 4 years, the system has covered all most required activities involved in account management including immigration, emigration, borrowing and returning, served teachers and students for account query and borrowing, etc. The article below introduces in detail how the system was designed, implemented and applied[1].

2. Information Model

The Information Model is a method which defines how the data will be represented. By using information models, we can reuse, change and share master data managed via different applications. It can help us understand the account management system well. So we introduce the information model in advance. Based on the understanding of daily activities in account management and the status report after go-live, we did some change to make information models perfect. Details can be found in Figure 1 below:

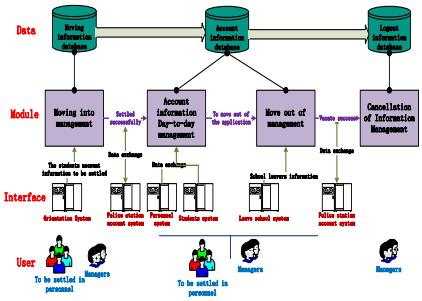

Figure 1: Information Model

The information models mainly include 4 parts: data, module, interface and user[2].

2.1. Data

According to process definition, the data is saved in 3 separated databases: immigration, emigration and cancellation. There's no redundancy and duplication data. The data of each person can only be saved in one database. The architecture of three databases is the same which can ensure the data can be transferred among 3 databases smoothly[2].

2.2. Module

It compromises of 4 modules: immigration, regular, emigration and cancellation. The immigration is responsible for information transfer and procedures of candidates who want to move in. The regular one is in charge of daily management activities like information query, exception management, and borrowing/returning management. The emigration is similar to the immigration but for who want to move out. The cancellation maintains the information of people who already moved out.

2.3. Interface

System interfaces include two parts: interfaces with other internal application systems and with other high-level management systems[3].

With other internal application systems: it shares master data with internal systems like welcome system, leaving system, students system and human resource system. The welcome system sends the fresh information of who needs to move into our account system, while the leaving system provides the people's data who have to move out. Currently, account of teachers and other non-students has to be input manually because there's no corresponding system. The student and human resource systems will share with us the photos, and some basic information, e.g. personal ID, work ID and departments.

With other high-level management system: major means the system with local police account management systems. In the phases of immigration and emigration, it's necessary to exchange master data with them. We'll report master data to high-level management systems and the data will be sent back to our systems after approval. Now, the interfaces are implemented via excel file, and meanwhile, we also provides the query functionality for high-level management system. They can logon to our systems remotely to query the key information before confirmation.

2.4. User

End-users who'll use the system which can be separated into two categories: the administrators and the people who want to move in or already registered. The people who want to move in are the new comers like fresh under-graduate students, graduate students, and newly born baby or the spouses of the registered teachers. The administrators include not only the people who're responsible for administration tasks but also the high-level management people. Different roles will be assigned to different people to provide different functionalities[3].

3. System Implementation

3.1. Technical Architecture

The collective account management system uses the integrated architecture of C/S and B/s. C/S is uses to provide the complicated application data process while B/S provides relatively simply functionalities like information query. The seamless integration and roaming access between C/S and B/S is imple-

mented via Citrix and EAI. PB 7.0 is the coding language used in C/S. By using Citrix, end users don't need to install client software, and they can access the system easily by using web browser. J2EE is used in B/S which is based on spring MVC and hibernate.

3.2. Authorization Management

Because the system is also the part of digit campus of Tsinghua University, we uses the integrated user management system which rolled out earlier. It's linked to information portal. The users have to be authenticated by information portal and then can be redirected to the collective account management system. But the authorization management is independent which is authorized by role definition. The users have to be bind with their roles assigned which are then mapped to corresponding functionalities [3].

3.3. Functionalities

The system functionalities are described in Figure 2. The functionalities marked in black and italic font are from C/S part while the purples are from B/S. The C/S functionalities are focus on daily work and used by most of administrators while B/S are used mostly by teachers and students for information query.

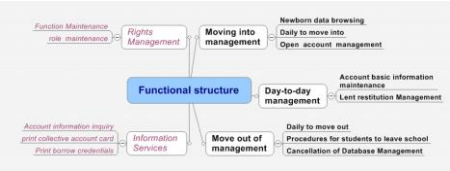

Figure 2: Functionalites

4. Application

In order to ensure the system runs in a relatively stable and effective way after go-live, we also planned a lot on how the system will be deployed, monitored and optimized based on performance analysis. The running architecture, the deployment solution and key parameters had to be well-defined before go-live.

4.1. Running architecture

The C/S architecture normally comprises of two layers client and database. The information exchange is done by client application.Now most of C/S architectures were now replaced by B/S. The problems caused by C/S architecture can be solved by using some business softwares (like Citrix Meta Frame) to allow end-users access systems from web browser. In this way, C/S application is simply changed to B/S application which can be accessed at any time, and not necessary to install client software and no upgrading issues any more.

The B/S architecture normally uses web servers, application servers, and database servers, and the load can also be balanced easily.

4.2. Deployment

To ensure the system is running well, two Citrix servers are used in C/S part, and two web servers, application servers and database servers are used in B/S part. By using this solution, the load can be balanced well and the single point of failure problem can be solved too.

4.3. Running policy

The running policies include load balance, access control and security control. The running policy and parameters were configured in the early phase and can be adjusted in the later phase. Before go-live, the administrators can define the running policies and parameters not only refer to previous experience but also base on the real situation. They can also initialize some parameters by doing performance testing. After go-live, there might be some difference between expectation and

real results. The previously configured parameters won't meet the real requirements, like some resources might be allocated too much or less. So the continuous optimization and adjustment is required during the running phase.

The figure 3 is used to represent the real running situation. As B/S is mainly used by teachers and students, the load is minor, and it works pretty well after go-live.

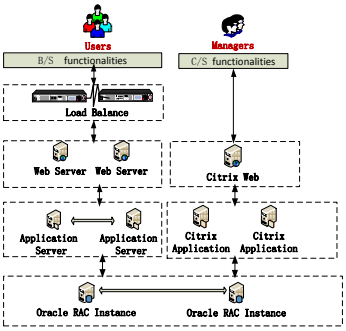

Figure 3: Running architecture

5. Effectiveness

We got a very positive feedback after the system went live especially in the welcome activities each year for fresh man. From 2002 to 2007, the account management department was using welcome system to transform account and could only record whether the paper documents were handed out, and then processed the documents manually. From 2009, the account management system was widely used which can help to process all account data fully automated. In 2011, the account management system aslo integrated the main campus and Shenzhen graduate department. The implementation of the account management system and integration with the local police account system, helped to increase the exact rate of data and we are No 1. in the data processing in account management.

6. Summary

It's not a one-day work to implement the information system. It has to be improved and adjusted continuously to adapt to new requirements. With the new development of information technology, we'll try our best to make our systems much perfect, e.g. mobile version delivered that teachers and students can access our systems via mobile devices; seamless integration and roaming access between B/S and C/S so that end-users need not logon two applications. We expect that we could provide more diverse and convenient services for teachers and students, and encourage the account management more standard, process-oriented and scientific by integrating the deep usage of information technology and daily administration tasks.

References

[1] Jiang Dongxing, Guo Dayong, Planning and Practice of New Generation Digital Campus in Tsinghua University, Journal of Xiamen University(Natural Science), pp:173-178,2007

[2] Yu Yue,Yin HongBin,Research and application on information management system for collective registered perma nent residence,Experimental Technology and Management, pp:92-94,2009

[3] Yu Yue,Yin hongbin,The college collective account management and Services Research, University Logistics Research, pp:125-126,2009