

# The Design and Implementation of Educational Resource Management in Colleges and Universities with Active Directory

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**Abstract.** The normal educational resources management has been a significant development and is more mature. However, the normal educational resources management still has many deficiencies, such as data mining, management forecasts, information regeneration. The paper focuses on the management of abnormal academic resources, such as resources manageability, network reliability, equipment availability. It is easy to cause resource wastage and equipment duplication without attention. Many studies in the past are lack of consideration in this regard, with the effective integration of various educational resources and classification management as the goal of this paper. The overall scheme of effective integration and classification management of the educational resources is designed based on Institute of Disaster Prevention. And with Microsoft Active Directory, a high efficient educational LD resources management system is implemented through LDAP and ADSI programming.

**Keywords:** active directory; management; system; educational administration resource

## 1. Introduction

In the daily management of the academic status, arrangement, grade and more hard work has been a significant developed, however, due to various universities education resource allocation in the differences of educational administration, which made it displays diverse characteristics, even with some of the college educational administration system, some of their academic resources are not enough to manage and utilized, so its study of integration and management has great realistic meaning and long-term development.

## 2. System Design

### 2.1. Overall design

Owing to historical reason and the education reform, there are various defects in the administration of most colleges and universities, and the original educational management system software, which difficult to meet the present requirements of the existing educational administration. Main problems existing in the following aspects: the lack of generality, the lack of generality, using different kinds of realization technique, The sharing of resources is very poor, Poor compatibility, data interface and data formats are no unified, there are a lot of data redundancy, data security and reliability and consistency are not guaranteed, plus a repetitive construction and waste a lot of human , material and financial resources, besides software technology and performance can not reach the requirements. on the other hand, software technology and executive performance cannot meet the practical requirements, Teaching-affair management separation, Information collection lag, and cannot on time decision making and the adjustment on the job. Then, using the INTERNET technology to realize the organic integration of resources utilization is to improve the best way. From the location of the teaching resources ,and educational resources can be divided into academic resources and departments resources ,and according to the features of the resources that is divided into two categories .one is hardware resources, including the communication network system equipment and Shared printer, all-in-one

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machine and server, the main resource for teaching management personnel, especially used to academic management personnel, other department managers only in its authorized had access to these resources; Another kind is software resources, including all kinds of sharing data, audio, video, documentation, videos, electronic courseware, animation, question bank, criterion etc, according to different user groups these resources will give different access, so as to realize the effective access to resources.

Educational resource management system involves different managers and participants, which is an important link of teaching work.

the participants of Educational resource management system include educational management, teachers and students, the job of the manager is to manage the educational resources, teacher's mission is to participate in teaching and maintain their teaching resources, and the student is teaching resources of the user. According to the participants to achieve the objectives, the system can be divided into two parts, one is the network environment management, another part of teaching resources management, educational administrators (including the managers of dean and each department is responsible for the management of teaching) With the maintenance of its management system permissions and use resources permissions, such as ,teachers only maintenance and use of teaching resources, and students only use teaching resources. The general idea of system design in resources as the core, according to the user role distributes the corresponding permissions. all users are active directory users, and using active directory realize user permissions besides, by each department managers maintain teachers' and students' user information. The overall scheme of the system is shown in figure 1.

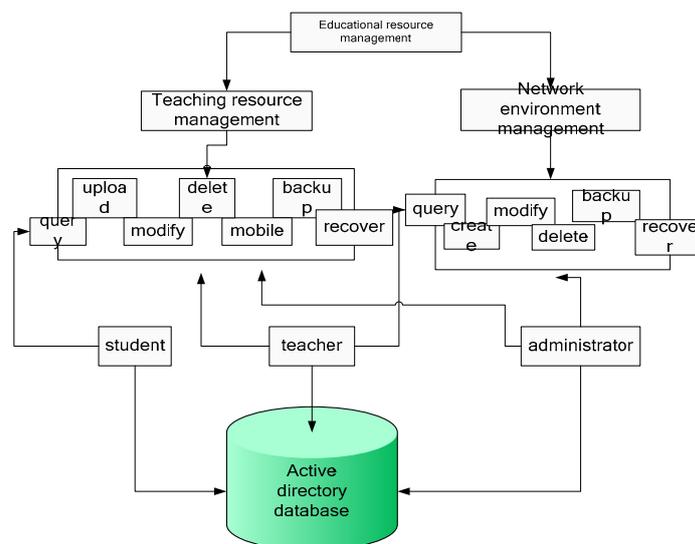


Fig. 1. Takers may of System

## 2.2. Network Environment and Resource Management Design

Construct network environment resources management system's mission is to ensure reliable operation network, and improve operation efficiency. According to the network environment management object it will design to two parts: communication subnet mask management module and resources management module.

Due to the main body of network environment resources management are the College information management center, therefore, the implementation of communications sub network part by the information management center, and educational administrators just give them and put forward a concrete communication needs, Like a guarantee that the network communication bandwidth and the net reliability, etc. As to educational resource management, due to the management of flexibility, we must prevent the single point of failure; ensure the single logon ability and use resources convenience and flexibility. Therefore, the function design of network environment resources management as shown in figure 2.

The management functions of network environment data including data of insert, update, and delete, modify, and inquire. For a good management system should also have data analysis and prediction ability, and also should have moved smoothly and upgrading, of course, when the system malfunction, also should have

log function and system function, the function of system are not provided by active directory technology, so that the function can be a very good use of existing technologies and saving time and cost of system development.

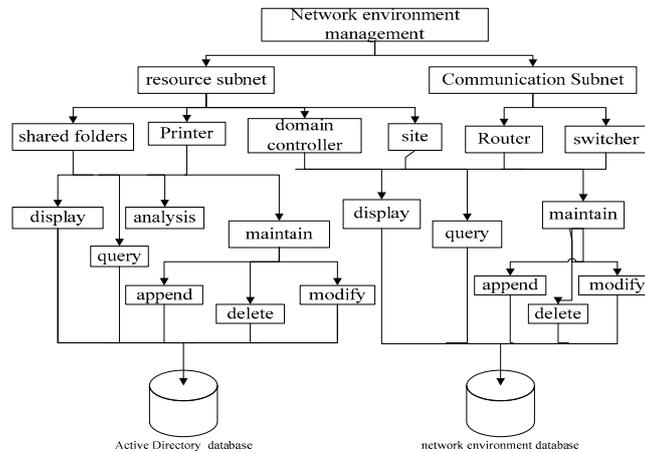


Fig. 2. Function Realization of Network Environment for Management

### 3. How to Implement the System

#### 3.1. The realization of human resource management

The institute of Disaster Prevention, according to level management mode implements and manages. Each level has its own management personnel, all active directory users including administrators, teachers, the teaching staff and students. Besides, to facilitate management for each user assigned a unique Numbers, which is one of the documents. College active directory organizations, like figure 3 shows.

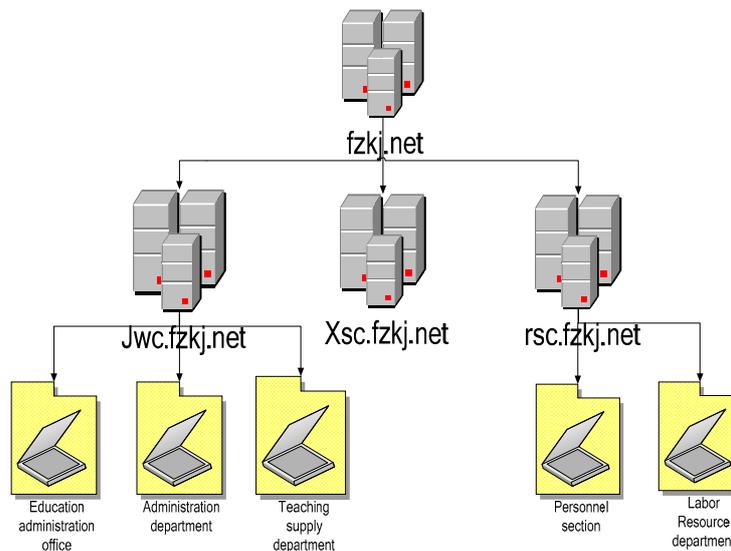


Fig. 3. College organization

#### 3.2. The realization of network environment and resources management

For convenience of key techniques of the system were described, this section describes  $U=\{u_1, u_2, \dots, u_n\}$  as managers,  $S=\{s_1, s_2, \dots, s_n\}$  set for the server,  $C=\{c_1, c_2, \dots, c_n\}$  for the collection of communication network, Which serve  $c_1, c_2$  campus Intranet ,  $c_3$  said the campus external network,  $A=\{a_1, a_2, \dots, a_n\}$  for database access technology,  $D=\{d_1, d_2, \dots, d_n\}$  for resources collection. Wherever administrator was, it can easily maintenance and management to the active directory object and communication network equipment. To achieve this goal, we must solve the network management, i.e. to provide access to data through the network administrator. Through the following form for managers can visit resources:

- ①  $u_i \xleftarrow{c_1} s_i, i=1, 2, \dots, n$ , namely managers in the local access servers;
- ②  $u_i \xleftarrow{c_2} s_i, i=1, 2, \dots, n$ , namely managers in the campus internal access servers;

③  $u_i \xleftarrow{c_3} s_i, i=1,2,\dots,n$ , namely managers in campus external access servers.

Regardless of what roles the users play, as long as he will visit active directory, they must be required to login to active directory, and then allow them to use data. Additional, Because the program doesn't updated with the active directory and transfer. Therefore, to prevent the single point of failure, in each domain controller with the network management procedures, So that just remember to managers on the domain controller can login names, and there is no longer a network maintenance cannot concerns. Set for a domain controller,  $DC=\{dc_1,dc_2,\dots,dc_n\}$  is between any two domain controllers are as follows:

$dc_1 \xleftarrow{\text{update event}} dc_2$ , and  $S_i \subseteq DC$ . Managers and server access form for:  $u_i \longleftrightarrow dc_i \xleftarrow{\text{ticket}} S_i$ , and  $S_i \in dc_i$

Users only through the validation of a domain controller, access to the bill of server resources  $S_i$ . Through the bill, the user can direct access to resources.

### 3.3. The realization of network environment and resources management

In the active directory cannot be released a Shared folder, and representatives of the Shared folder only in the field organization or a Root internal created. This paper applies active directory and ADSI technology programming to achieve Shared folder and find a Shared folder part of code are as follows:

```
"Create network object
Set
network=Wscript.CreateObject("Wscript.network")
"The root object connect LDAP server
Set
objADsRootDSE=GetObject("LDAP://RootDSE")
From the default domain in "a directory path
strPath="LDAP://" +
objADsRootDSE.Get("defaultNamingContext")
The specified path "connected to the directory
Set objADsContainer=GetObject(strPath)
"Only enumerate the Shared folder
objADsContainer.Filter=Array("volume")
"Enumeration Shared folders
For each objADs in objADsContainer
Strsharepath=objADs.Get(uNCName)
Response.write
objADs.Name&"'"&Strsharepath
```

It needs administrator privileges in a Shared folder publishes and maintenances, for the safe ,this system is adopted in the domain controller on the Shared folder and maintenance, the advantage of this method can avoid the misuse of authority.

### 3.4. The realization of managers management

The administrator users responsible for active directory of safety management tasks, for different tasks, they will be divided into different levels, such as there are university administrators, administrators of the department and organization of unit level administrators, and they charge level administrators at all departments of management, including the organizational structure of creation and maintenance, the distribution of user jurisdiction and the issue of resources(such as the Shared folder, printers ), etc. To achieve cross-realm management, also need in each domain, according to the trust relationship between assigned to

appoint a one-way trust, and also to accomplish two-way trust to complete remote management and remote maintenance .Administrator management operation used mainly are:

The main organizing management operation is created, delete, search, etc. Generally speaking, delete operation should be cautious to operate, because of the organizations within the organizational unit delete means that all the information, such as user, the Shared folder, etc, thus, to remote users, the operation is often create and search. In addition to using the active directory basis to create organizational unit, also can use to create program unit effectiveness.

#### **4. Conclusion**

This system has been in Institute of Disaster Prevention running smoothly in some months, after the operation, each management personnel in all departments will no longer need shuttling ,and the efficiency is greatly ascend.

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