Management System of Personnel Records

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Keywords: Personnel records; Management system; ADO technique; Data consistency.

Abstract. In order to meet the the continuously enhanced information service needs of personnel records managers, and to make it easier to manage the huge information for personnel managers,the main functions of the personnel file management system include: adding, deleting and modifying the management of the department information; management of employees' basic information and work experience records; registration of attendance information and evaluation information; addind, deleting and password maintenance of administrator. It uses Visual C++6.0 as the development tool and operates SQL Server database with ADO technique. The practice proves that the application features in complete function and easy to use whose data is advanced in consistency, integrality and security.

Introduction

The management system of personnel records is an indispensable part of an enterprise, its content is of great concern for the enterprise's decision-makers and managers, so the personnel management system should be able to provide sufficient information and the quick inquiry method for the users. But people managed the documents in a traditional manual wayall the time, which had so many shortcomings, such as inefficiency and bad security. Moreover, the time is long, it will produce massive documents and data with time accumalated, which will bring a lot of difficulties for the search, the renewal and the maintenance.

From the micro perspective, it can speed up the turnover of goods and materials and can improve productive efficiency to establish a set of information system of personnel management, so as to strengthen the management of information technology and to improve the economic benefits of the unit. From the macro perspective, it complies with the trends of informatization and socialization, and shortens the period of socialized production. Therefore, it is necessary to develop such a management software.

The overall goal of the personnel records management system is: building an application software system on the computer platform to centralize the relevant information of enterprise personnel records and realize the sharing of information, providing a scientific basis for leadership and second level managers to make decisions and manage.

Analysis of System Requirements

The overall goal of the system is to provide fast and efficient service for the managers, and to reduce the cumbersome and error of manual handling. The whole system includes seven

modules: department information management, basic employee information management, management of information of staff's family members, work experience (primary education experience) management, attendance management, staff evaluation management, management functions of the system users.

Analysis of User's Functional Requirements. Functional Analysis of Main Modules

Department Information Management:

To add department information, including department number, department name, department function description and information of the higher authorities. To delete department information and to look up department information.

Basic Staff Information Management:

To add the basic information of employee, including employee number, name, gender, birthday, nationality, and department etc. It can set a variety of types and levels for employees and positions, save the data of personnel changes, modify, delete and look up the basic employee information.

Information of Staff Family Mmembers Management:

To add information of employees' family member, including name, relationship, work unit, etc. To modify, delete and look up the information of employees' family member.

Management of Staff Work Experience:

To add staff's work experience information, including the information of start date, cut off date, the school or units, and the post etc. To modify, delete and look up the information of staff's learning and work experience.

Staff Attendance Management:

To add employee's attendance information, including attendance month, days of sick leave, days of private affair leave, days of absence, times of being late or leaving early etc. To modify, delete and look up the information of staff's attendance. It can customize the regularities of being on duty, the personnel department can define the scheduling technology, can check attendance records and carry out statistical analysis in the required time period, can manually input and adjust employee attendance and support batch processing, and can support the data import of company attendance.

Staff Evaluation Management:

To add evaluation information of staff's work, including the evaluation month, the reward reason, the amount of reward, the punishment reason, the amount of punishment and the overall evaluation and other information. To modify, delete and look up the evaluation information of staff's work.

Management Functions of the System Users:

To add information of system users, including user's name, password, employee number and user's type (administrators and general users) and etc. Administrators have all permissions and can add other administrators.General users can only browse but can not modify the information after logging in. To modify, delete and look up the information of system users.

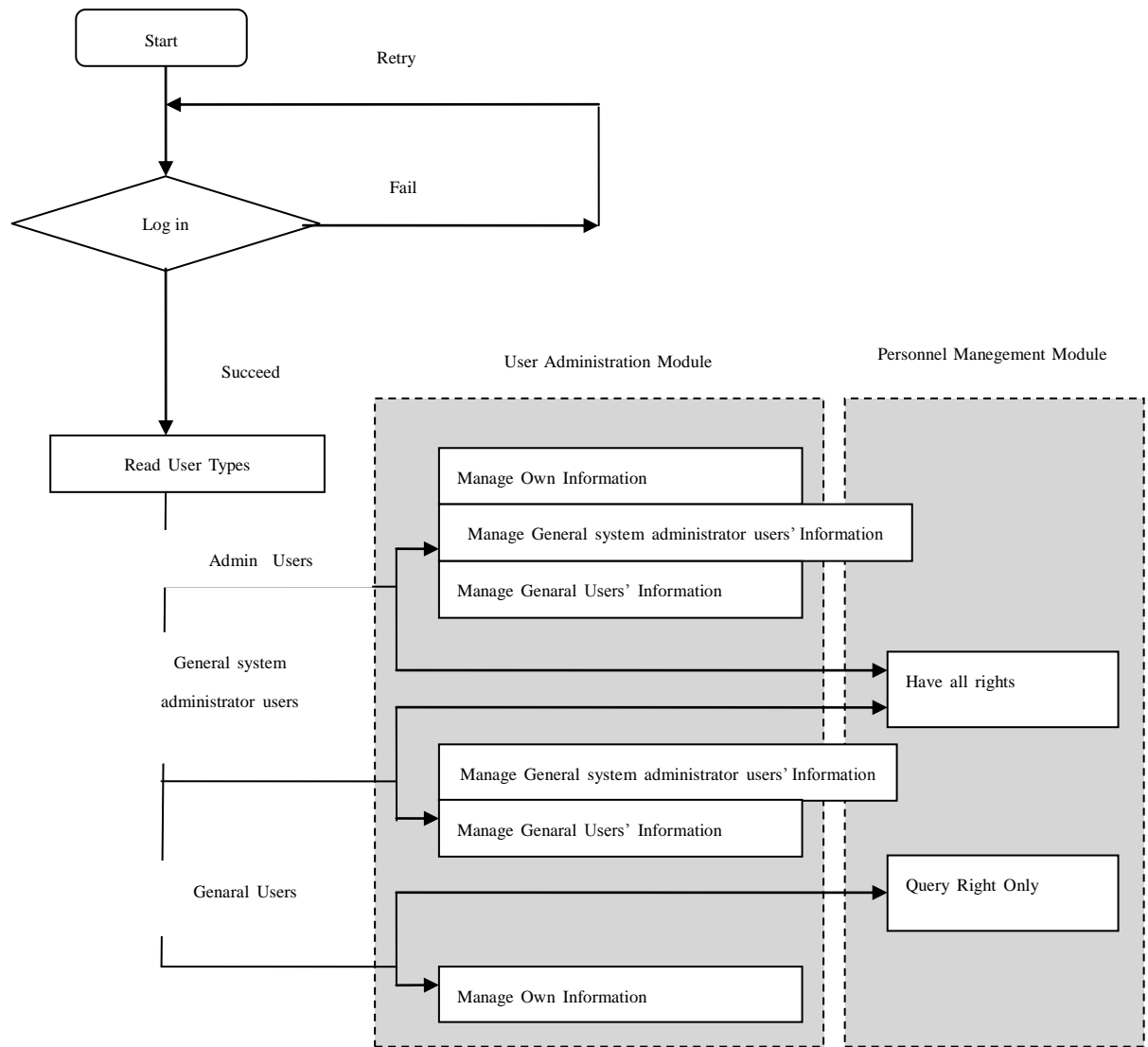**Analysis of System Procedure.** The procedure chart of this system is shown in Fig. 1:

Fig. 1   System Procedure

The procedure chart of information module is shown in Fig. 2:
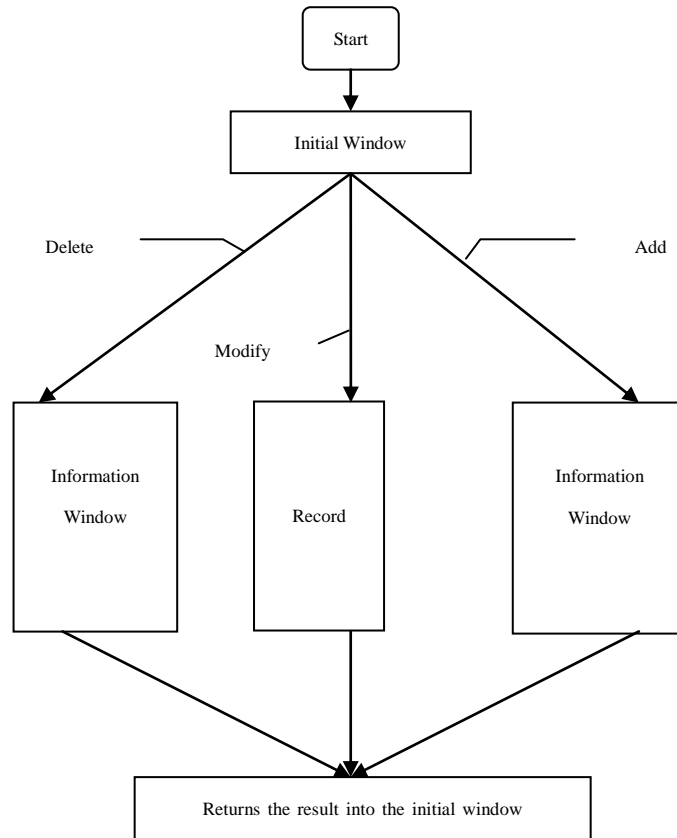
Fig. 2   Procudure of Information Module

The Design of Database

Conceptual Design of Database. The system database (entity-relationship) diagram is shown in Fig. 1 and Fig. 2:
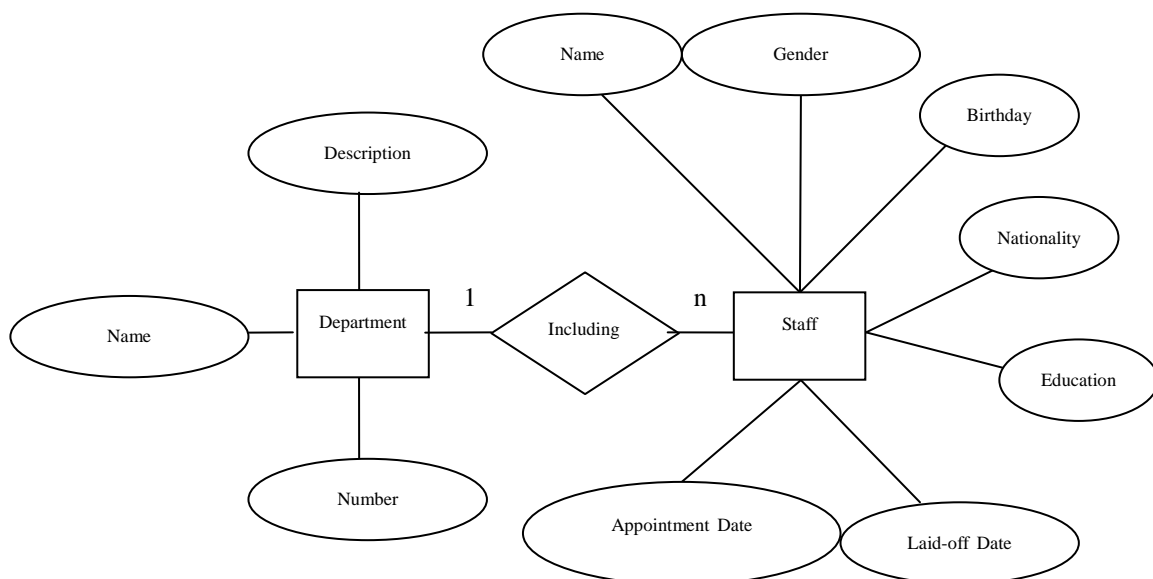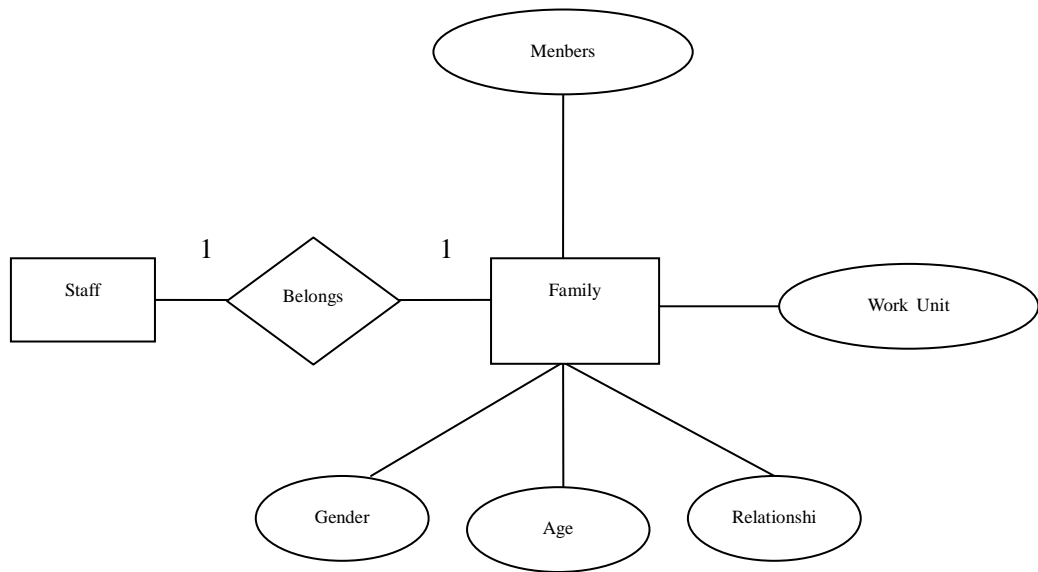

Fig. 3   Database E-R Diagram (1)

Fig. 4　Database E-R Diagram (2)

There are 3 entities. The first one is the Department, used to represent the large internal structure of enterprise, with three attributes: department name, department number, and department description. Staff is the second entity, used to express the basic information of enterprise staff, with the properties of name, gender, age, birthday, appointment date, laid-off date, nationality and academic etc. Family is another entity, used to express the basic information of the family situation, with properties of family members, work units, gender, age, relationship and other attributes. The relationship between the entities is clear, the staff belongs to the family and the department includes employees. The relationship between departments and staff is many to many, different departments can choose different employees, and different employees can also choose different departments. Staff and family is a one-on-one relationship, a staff corresponding to a family.

Design for database structure table:

1. Department Table Bumen

Department table Bumen is used to save information from the enterprise departments. This system uses tree structure to manage department data, which is to establish subordinate relationship among departments. As shown in table 1:

TABLE 1　Structure Table of Bumen

NO.	Field Name	Data Type	Length	Null	Primary Key	Description
1	BumenID	int	4	N	Y	Department Number
2	BumenName	varchar	40	N	N	Department

						Name
3	Describe	varchar	400	Y	N	Department Description
4	UpperID	int	4	N	N	Superior department number

2. Employee Basic Information Table Yuangong

Employee basic information table Yuangong is used to save basic information of enterprise staff. As shown in table 2

<p align="center">TABLE 2   Structure Table of Yuangong</p>

No.	Field Name	Data Type	Lenghth	Null	Main Key	Descripyion
1	yg_ID	int	4	N	Y	Employee Number
2	yg_Name	varchar	50	N	N	Employee Name
3	Photo	image	16	Y	N	Employee Photo
4	Sex	char	2	Y	N	Gender
5	Nationality	varchar	40	Y	N	Nation
6	Birt	varchar	20	Y	N	Birthday
7	Political_Party	varchar	40	Y	N	Political Status
8	Culture_Level	varchar	40	Y	N	Education Level
9	Marital_Condition	varchar	20	Y	N	Marital Status
10	Family_Place	varchar	60	Y	N	Home Address
11	Id_Card	varchar	20	Y	N	ID Card Number
12	BadgeID	varchar	40	Y	N	Employee's Card Number
13	Office_phone	varchar	30	Y	N	Office Phone
14	Mobile	varchar	30	Y	N	Mobile Phone
15	Files_Keep_Org	varchar	100	Y	N	Graduate Institution
16	Hukou	varchar	100	Y	N	Account location
17	HireDate	varchar	20	Y	N	Appointment Date
18	BumenID	int	4	Y	N	Department ID
19	Position	varchar	40	Y	N	Work
20	Title	varchar	20	Y	N	Post

21	State	tinyint	1	Y	N	Personnel Type
22	UpperID	int	4	Y	N	Superior
23	Contract_Duration	varchar	20	Y	N	Contrct Validity
24	Memo	varchar	200	Y	N	Memo
25	FillAdmin	varchar	30	Y	N	Administrator
26	FillDate	varchar	20	Y	N	Date of Filling in

3. Record Sheet of Staff's Family Members Family

Record sheet of staff's family members Family is used to save basic information of key members of the family. As shown in table 3:

TABLE 3   Structure Table of Family

No.	Field Name	Data Type	Lenghth	Null	Main Key	Description
1	Id	tinyint	1	N	Y	
2	yg_ID	int	4	N	N	Employee ID
3	Name	varchar	50	N	N	name
4	Sex	char	2	Y	N	gender
5	Age	tinyint	1	Y	N	year
6	Relationship	varchar	20	Y	N	relation
7	WorkingOrg	varchar	40	Y	N	organization in which one works work unit

4. Record Sheet of Staff's Work Experience Jingli

Record sheet of staff's work experience Jingli is used to save the basic information of employee's work experience. As shown in table 4:

TABLE 4   Structure Table of Jingli

No.	Field Name	Data Type	Lenghth	Null	Main Key	Description
1	Id	tinyint	1	N	Y	Automatically Increasing ID
2	yg_ID	int	4	N	N	Employee ID
3	StartDate	char	10	Y	N	Start Date
4	EndDate	char	10	Y	N	End Date
5	Unit	varchar	50	Y	N	Work Unit
6	Title	varchar	20	Y	N	Post

5. Staff Attendance Record Kaoqin

Staff attendance record Kaoqin is used to save the basic information of employee attendance. As shown in table 5:

TABLE 5   Structure Table of Kaoqin

No.	Field Name	Data Type	Lenghth	Null	Main Key	Description
1	CheckDate	char	10	N	Y	Attendance Date
2	yg_ID	int	4	N	N	Employee Number
3	qqDays	decimal	5	Y	N	Attendance Days
4	ccDays	decimal	5	Y	N	Travel Days
5	bjDays	decimal	5	Y	N	Sick Leave Days
6	sjDays	decimal	5	Y	N	Private Affairs Leave Days
7	kgDays	decimal	5	Y	N	Absence Days
8	fdxjDays	decimal	5	Y	N	Statutory Leave Days
9	nxjDays	decimal	5	Y	N	Annual Leave Days
10	dxjDays	decimal	5	Y	N	Shift Leave Days
11	cdMinutes	tinyint	1	Y	N	Late Time（minute）
12	ztMinutes	tinyint	1	Y	N	Leave Early Time
13	ot1Days	decimal	5	Y	N	A Class Overtime days
14	ot2Days	decimal	5	Y	N	B Class Overtime days
15	ot3Days	decimal	5	Y	N	C Class Overtime days
16	Memo	varchar	200	Y	N	Memo

6. Employee Evaluation Table Kaopin

The employee evaluation table Kaopin is used to save the evaluation information of employee's work. As shown in table 6:

TABLE 6   Structure Table of Kaopin

No.	Field Name	Data Type	Lenghth	Null	Main Key	Description
1	EvaMonth	char	10	N	Y	Evaluation Month
2	yg_ID	int	4	Y	N	Employee Number
3	ztEva	varchar	200	Y	N	Overall Evaluation
4	jlReason	varchar	200	Y	N	Award Reasons
5	jlAmount	smallint	2	Y	N	Award Amount
6	cfReason	varchar	200	Y	N	Punishiment Reason
7	cfAmount	smallint	2	Y	N	Punishiment

						Amount
8	Memo	varchar	200	N	N	Memo

7. Customer Information Form Admin

Customer information form Admin is used to save the information of system users. As shown in table 7:

TABLE 7   Structure Table of Admin

No.	Field Name	Data Type	Lenghth	Null	Main Key	Description
1	UserName	varchar	40	N	Y	User's Name
2	Pwd	varchar	40	N	N	User's Password
3	UserType	tinyint	1	N	N	User's Right

The Relational Chart of the Database Tables

Corresponding to tables in the database, the program established a class for each table to operate the database, so it can directly calls to the member function of these classes whenever needs to operate the database, which make the program more object-oriented designed:

Administrator Table Admin-----------CAdmin Class

Department Table Bumen------------CBumen Class

Employee Table Yuangong----------CYuangong Class

Family Table Jiating--------------CJiating Class

Attandence Table Kaoqin-------------CKaoqin Class

Evaluation Table Kaoping------------CKaoping Class

Work Experience Table Jingli-------------CJingli Class

Overall Design of System

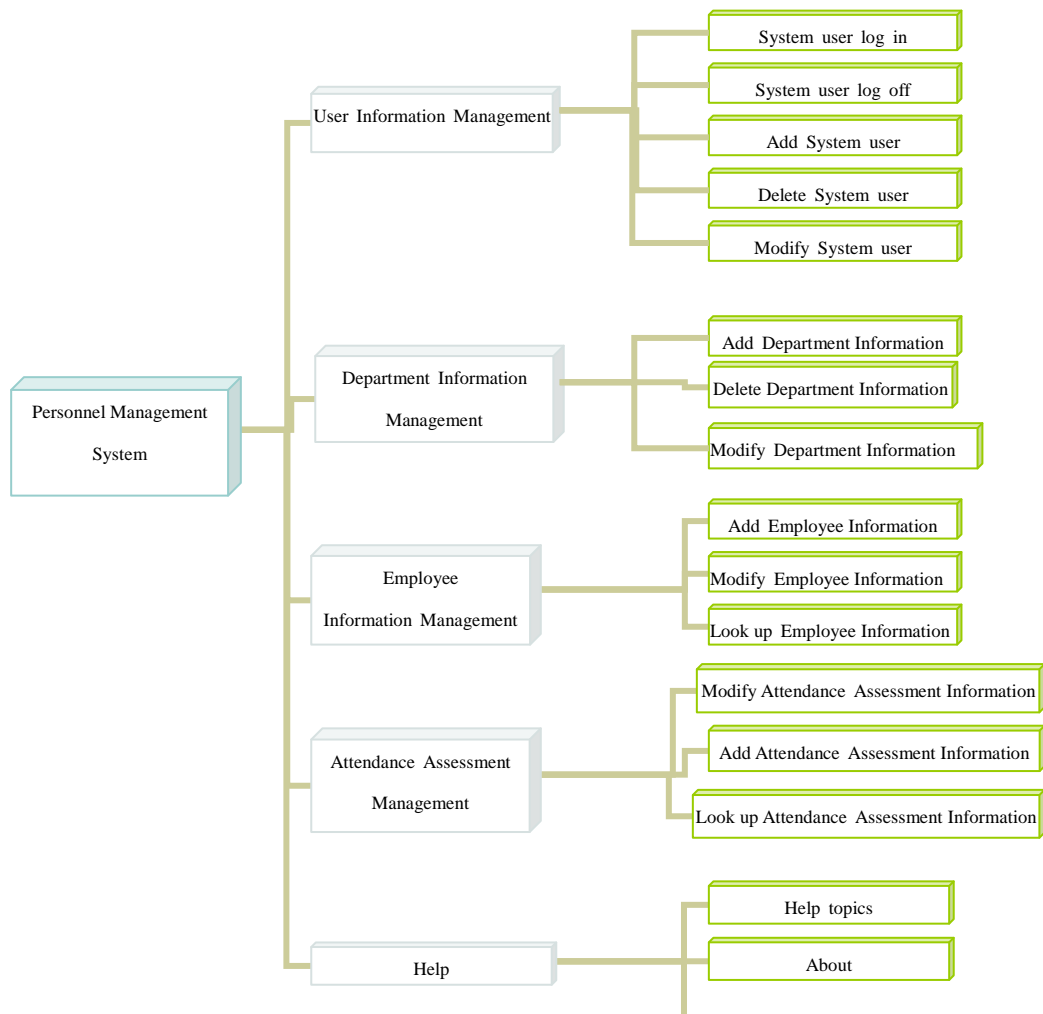**Design of System Structure.** Design of overall structure is shown as Fig. 5

Fig. 5   The overall structure design of the personnel management system

Design of System Functional Module. According to the overall structure design of the system, the system is composed of user information management, department information management, employee information management, attendance assessment management, and help. The main module is the department information management module and employee basic information management module.

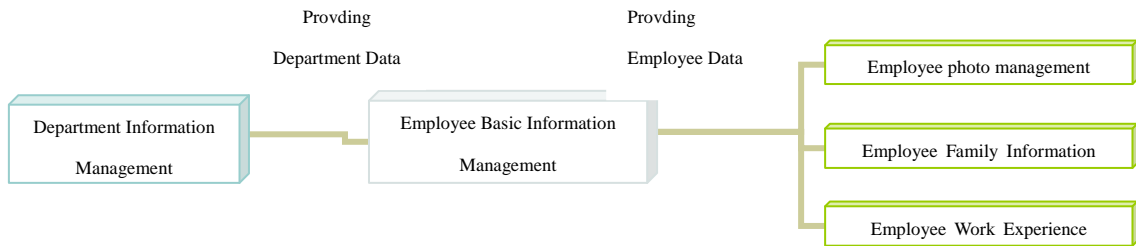The basic functions of basic information management module as shown in Fig. 6:

```
Provding                          Provding
Department Data                   Employee Data
                                              ┌──────────────────────────────┐
                                              │ Employee photo management    │
┌──────────────────────┐  ┌──────────────────────┐  └──────────────────────────────┐
│ Department Information│  │ Employee Basic Information│ ┌──────────────────────────────┐
│                      │──│                      │──│ Employee Family Information   │
│ Management           │  │ Management            │  └──────────────────────────────┐
└──────────────────────┘  └──────────────────────┘  ┌──────────────────────────────┐
                                              │ Employee Work Experience     │
                                              └──────────────────────────────┘
```

Fig. 6   Functional diagram of basic information

The basic function of the attandence assessment management module is shown in Fig. 7:

```
Providing  Employee
Data
                                          ┌──────────────────────────────────┐
                                          │ Employee Attandence Management   │
┌──────────────────────────────────┐      └──────────────────────────────────┘
│ Employee Basic Information  Management │──
└──────────────────────────────────┘      ┌──────────────────────────────────┐
                                          │ Employee Evaluation Management   │
                                          └──────────────────────────────────┘
```
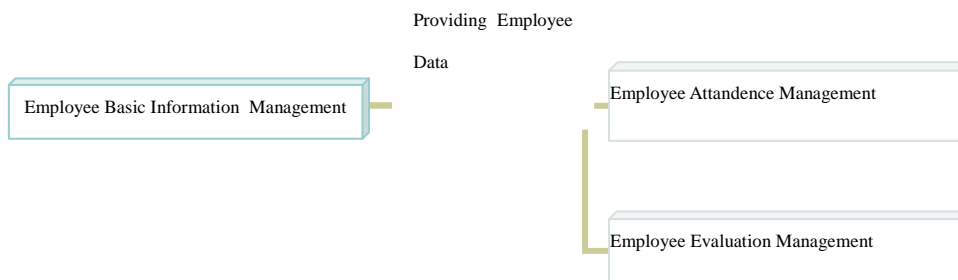
Fig. 7   Functional diagram of attandence assessment module

Detailed Design and Implementation of System

This chapter is the detailed design of modules and sub modules included in the system of personnel archives management information, including the login module, the user

management module, departmental management module, staff information module, attendance and evaluation module and help module. This chapter describes the detailed design of these modules, and introduces the design idea, the setting of the interface and the selection of controls.

Detailed Design and Implementation of Login Module. There is a login interface before entering the main interface of the system, its main function is as a discrimination form to enter the main interface, judging the registrar is administrator or a general user. The administrator enters the system main interface through this interface, and starts the input of the personnel archive information (department information, employee information and attendance assessment information). (The interface is shown as in Fig. 5).

The interface is mainly composed of the information of the user name and password and the button of "OK" and "Cancel". When logging in, ordinary user will enter the personnel archives information query and system maintenance window, where they can query personnel archives information and modify the password, but they have not the permissions to modify the personnel achives information. While the administrators will enter the main interface, in addition to the input of personnel archives information, they also can query the personnel archives information and have the operation authority of personnel archives information maintenance (adding or deleting personnel archives information).

The key code to response the "OK" button is as follows:

```
// If you read the data differently from the user, then return
  if (g_curAdmin.GetPwd() == m_Pwd)
  {
      typedef UINT (CALLBACK* LPFUN)(HWND hwnd, DWORD dwTime,DWORD dwFlags);
      LPFUN pp;
      HINSTANCE hInst=:: LoadLibrary("user32.dll");
      if (hInst)
      {
          pp = (LPFUN):: GetProcAddress(hInst, "AnimateWindow" );
          pp(GetSafeHwnd(), 300,AW_BLEND|AW_HIDE);
          :: FreeLibrary (hInst);
      }
      ((CMainFrame*)AfxGetMainWnd())->m_wndStatusBar.SetPaneText(2,"    Current
Login ： "  +  g_curAdmin.GetUserName()  +  "           Jurisdiction ： "+
(g_curAdmin.GetUserType()==1?" Super Admin":"General User"));
      CDialog::OnOK();
  }
  else
  {
      MessageBox ("Your username or password is incorrect!"," Logon Failure
",MB_OK|MB_ICONSTOP);
  }
  }
```

In the code of logon dialog box, users can only invoke the OnOk () function to close the dialog box after identity authentication, thus can judge that if the return value of dlg.DoModal () is IDOK, the users have been authenticated.

Detailed Design and Implementation of Users Management Module. Depending on the type of user, the user management functions are also different which may include the following situations:

1. Admin user is the default user that comes with system. Admin users can create a system administrator or ordinary users, reset the user's password, delete the system administrator or ordinary users, and can also modify their own passwords;

2. After being created by the Admin user, the system administrator users have all the functions and permissions of the Admin user;

3.General users can only modify their own password.

When a user clicks on the OK button, the OnOK () function is executed, and the corresponding code is as following:

```
void CAdminEditDlg::OnOK()
{
  UpdateData(TRUE);

  CAdmin usr;
  usr.SetUserName(m_strName);
  usr.SetPwd(m_strPwd);
  usr.SetUserType(m_iUserType);   //1 presents Super Admin，0 presents General Users
  if (usr.HaveName(m_strName)) // If you want to add a user already exists
  {
      MessageBox("The user already exists, please choose another user name ","Administrator",MB_ICONINFORMATION|MB_OK);
      return;
  }
  usr.sql_insert();        // Insert user record
  CDialog::OnOK();
}
```

The program will determine if the user has already existed since the system does not allow the user with the same name. If you do not exist with the same name, the program will call the SQL_insert () function to save user data.

The key code responding to OnOK （） function is as following:

```
// If you read the data differently from the user, then return

  if (user.GetPwd() != m_OldPwd)
  {
      MessageBox("User Password Incorrect！");
      return;
  }
  user.SetPwd(m_NewPwd1);
```

```
user.sql_updatePwd(m_UserName);
MessageBox("Password changed, the next login please use the new password ");
CDialog::OnOK();
}
```

The program firstly willcheck the validity of the input data, including:

1. The old password cannot be blank;

2. The new password cannot be blank;

3. The new password must be the same with the confirmed new password;

4. The username and old password must be authenticated.

After the authentication, the program will call the sql_updatePwd () function to update the password for the current user.

Detailed Design and Implementation of Department Management Module. Department management module can achieve the following functions:

1. Administrator users can add, modify, delete and look up the department records;

2. System users view the department data.

When a user clicks on the Add button, the CBumenView::OnBtn_Add () is executed, and the corresponding code is as following:

```
if(dlg.DoModal() == IDOK)
{
    HTREEITEM hSelectedItem=m_tree.GetSelectedItem();
    HTREEITEM hChild = m_tree.InsertItem(dlg.m_strBumenName, hSelectedItem);
    m_tree.SetItemData(hChild, dlg.___BumenID);        // Set the value of the new
node         m_tree.Expand(hSelectedItem, TVE_EXPAND);          // Expand  hNode
node
}
```

When a user clicks on the Modify button, the CBumenView::OnBtn_Modify () is executed, and the corresponding code is as following:

```
HTREEITEM hParent= m_tree.GetParentItem(hNode);    // Read parent node
CBumenEditDlg dlg;
dlg.m_strUpper = m_tree.GetItemText(hParent);
dlg.___UpperID = m_tree.GetItemData(hParent);
dlg.___BumenID = m_tree.GetItemData(hNode);
dlg.___BumenName = m_tree.GetItemText(hNode);
dlg.m_strBumenName = m_tree.GetItemText(hNode);
if(dlg.DoModal() == IDOK)
{
    m_tree.SetItemText(hNode, dlg.m_strBumenName);   // Sets the displayed header
for the current node
    m_tree.Expand(hNode, TVE_EXPAND);                // Expand current node     }
```

When a user clicks on the Delete button, the CBumenView::OnBtn_Delete () is executed, and the corresponding code is as following:

```
if (MessageBox("Delete the current department？", " Please confirm ", MB_YESNO) ==
IDYES)
```

```
    {
        m_bumen.sql_delete(strBumenID);     // Delete the specified record in table Bumen
        m_tree.DeleteItem(hNode);           // Delete the current node in the Tree control
    }
```

Judge the information of the corresponding department before deleting. The following circumstances can not be deleted:

1. Root node;

2. Including the lower level department;

3. Including employee.

When a user clicks on the OK button, the CBumenEditDlg::OnOK () is executed, and the corresponding code is as following:

```
    if (___BumenID == 0)    // If Bumen ID is 0, it indicates the insertion operation.
    {
        if (Bumen.HaveName(m_strBumenName) )
        {
            MessageBox("The Department already exists, please re-enter！","Add/Modify
department information",MB_OK|MB_ICONINFORMATION);
            return;
        }
        else
            ___BumenID = Bumen.sql_insert();    // Return the number of insertion records
    }
    else
    {
        if (m_strBumenName != ___BumenName) // If the user modifies the name of the
Department, it is judged whether the name of the new Department is there       {
            if (Bumen.HaveName(m_strBumenName) )
            {
                MessageBox("The  Department  already  exists,  please  re-enter ！ ","
Add/Modify department information ",MB_OK|MB_ICONINFORMATION);
                return;
            }
        }
    }
```

The program will decide to insert data or modify the data according to the value of the public variable BumenID. When BumenID equals 0, the insertion record is inserted; otherwise, the record whose number is BumenID will be changed.

Detailed Design and Implementation of Employee Basic Information Management Module. Employee Basic Information management module can achieve the following functions:

1. Administrator users can add, modify, delete and look up the employee records;

2. System users can view the employee data only.

Emplyee basic information doesn't include the information of employee photos, family members and work experience.

The "Refresh" function corresponds to the CYuangongView:: OnRefreshButton () function, and the code as follows:

```
void CYuangongView::OnRefreshButton()
{
  m_tree.DeleteAllItems();
  m_Bumen.LoadBumenInfo();       // Load department information
  m_hRoot = m_tree.InsertItem("Personnel management system - Department Information ");
  AddtoTree(m_hRoot, 0);
  m_tree.Expand(m_hRoot, TVE_EXPAND);
  m_tree.SelectItem(m_hRoot);
}
```

Detailed Design and Implementation of Family Member Module. Family member module can achieve the following functions:

Add, modify, delete and view the information of employee family members;

Employee family information management module contains two dialog boxes, that is, family member information management dialog and family member information edition dialog.

Detailed Design and Implementation of Employee Learning and Work Experience Management Module. Employee learning and work experience management module contains two dialog boxes, that is, learning and work experience management dialog and learning and staff work experience dialog

Detailed Design and Implementation of Employee Attandence Management Module.
1. System administrator can create, modify, delete and view the attandence records;

2. General users can view attandence data only.

Detailed Design and Implementation of Employee Evaluation Management Module.
1. System administrator can create, modify, delete and view the evaluation records;

2. General users can view evaluation data only.

Test of the System

Software testing is the final review of the software requirements analysis, design specification and coding before the software being put into operation, which is a key step to guarantee the quality of software; it is a very important link in the system development cycle and its importance is reflected in it is the last pass to ensure the quality and reliability of the system, is the final review of the entire development process of the system. It may cause disastrous consequences if the error can not be found and corrected in the testing phase.

There are many problems found during the testing process, mainly including:

1. The definition of a data type in a program is not consistent with the type of data defined by the database;

2. At the login interface, password can be visual which lacks of security;

3. In the password modification function module, the new password can not be modified.

4. The modification function module cannot be realized.

5. The interface can not be connected.

Main solution:

1. Modifying the data types in the database to make it consistent with the data types in the program;

2. Modifying the properties "passwordprompt" of the input password information "IDC_PWD_EDIT", of which the value being changed into True;

3. In the password modification program, adding a SQL statement of modifying password.

4. It can only add after deleting rather than modifying directly. The delete statement is combined with the add statement.

5. No connection statement is written in the program.

In addition to the above mentioned, we have encountered some technical detailsand through the test. Some are caused by carelessness, such as typos in the interface, text input error, or forgetting writing "end" in programs. And whether it is on an interface testing, functional testing, requirements testing or performance testing, forgetting the problems of database connectivity when calls to the database. Some are caused by thoughtlessness which are not listed out in full her. Therefore, with the increasing complexity of software and more opportunities for errors or defects in software development, I not only need to strengthen the programming ability, but also need to improve the technology of software testing.

Conclusions

This "personnel archive management system" is basically finished. Its function is basically in line with the user's needs, and can complete input and statistics of the basic employee information. And it provides part of the system maintenance functions, facilitating the users to backup, recover and delete data. At the same time, it also takes into account the problem of unit coding in order to reduce the redundancy of data, and the problem of the consistency of data is also solved by the program.

Although the basic function realization has been finished, but there still have some imperfections in the design. There are also many unsatisfactory places, such as online documentation is relatively small, the user interface is not beautiful, and error handling is not enough. All of these need to be further improved. The function is simply implemented, but the system needs to be further improved.

Acknowledgements

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