Development and Design of Production Management System

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Abstract. In today's era, in the global market where competition is fierce, both the process and the discrete manufacturing industry will encounter the following problems: the company may have excellent sales and sales personnel, but the workers on the production line have no way to deliver on time. Workshop managers complained that the purchasing department did not provide the materials they needed in a timely manner. These situations are exactly what most companies are currently facing. In order to solve these problems, a production management system has emerged. This system has emerged to solve various problems caused by the non-coupling of the various loops on the production line.

1. Introduction
With the rapid development of China's economy, people's living standards have been significantly improved, and various manufacturing industries have sprung up like mushrooms. Local government enterprises also regard local manufacturing as one of the important pillars of local economic development, thus promoting the rapid development of the manufacturing industry. At this time, how to use modern advanced management methods to improve the company's management level has become a manufacturing development. It is imperative. This system uses Visual C#.NET as the programming platform and create a database with SQL Server 2012.

2. System-required functions
(1) System login function. The system requires password management when logging in. This function is mainly to strengthen the security of the production management system, but also has the permission restriction function, and assign different usage rights to different personnel.
(2) Personnel management function. This feature is used to set the basic data of the enterprise personnel in production management. It is the basis of the system of manufacturing and manufacturing-related costs.
(3) Production plan management function. This feature is used to manage the company's main production plan and calculate the demand and demand time of related materials.
(4) Material management function. This function is used to manage the inventory information of the enterprise, including inventory inquiry, inventory transfer, inventory count, report loss report, upper and lower limit setting, inventory upper and lower limit alarm, historical query and other functions.
(5) Quality management functions. This function is used to ensure the quality of raw materials and products according to the product process or customer requirements, inspection standards for parts and products.

3. System database design

According to the results of the demand analysis, it is necessary to establish a material information table, a production schedule, a shop employee information table, and a user rights management table in the database. According to the conceptual structure design and E-R diagram analysis, the four physical tables of this database are shown in Table 1 to Table 4.

| Table 1. Material Information Table |
| Field | type | size | Decimal |
| --- | --- | --- | --- |
| Material number | char | 14 | -- |
| Bar code | char | 14 | -- |
| Material name | varchar | 50 | -- |
| unit | char | 10 | -- |
| model | char | 20 | -- |
| long | decimal | (18,3) | automatic |
| width | decimal | (18,3) | automatic |
| high | decimal | (18,3) | automatic |
| weight | decimal | (18,3) | automatic |
| Enterer | char | 8 | -- |
| date | int | | |
| Workshop | char | 10 | -- |

| Table 2. Production schedule |
| Field | type | size | Decimal |
| --- | --- | --- | --- |
| Material number | char | 14 | -- |
| Plan number | char | 14 | -- |
| start date | int | | |
| End date | int | | |
| Current inventory | float | 2 | |
| Planned quantity | float | 2 | |
| Reviewer | varchar | 10 | -- |
| Date of review | int | | |
| status | char | 10 | -- |

| Table 3. Workshop employee information table |
| Field | type | size | Decimal |
| --- | --- | --- | --- |
| EID | int | | |
| EName | char | 20 | -- |
| gender | char | 10 | -- |
| birthday | char | 20 | -- |
| E Date | char | 20 | -- |
| Education | char | 20 | -- |
The database is the core content of the management system. The reasonable design of the data table structure will directly affect whether the data can be accessed correctly. This database was created in SQL Server 2012. The creation process is as follows:

1. Open SQL Server 2012 Enterprise Manager and create a new database.
2. Name the database User and save it.
3. Right-click on "Database" in the pop-up menu and right click on "New Table".
4. Create another table using the same method, so I won't go into details here.
5. You can modify or delete the database directly in the future.

The interface for creating a table is given below. As shown in Figure 1.

4. System function module design

4.1. Login module

The system is used by the internal management personnel of the factory, and the design of the login authority is relatively simple, regardless of the external situation. The user inputs the user name and password, and the system compares the information input by the user with the information stored in the database. If the information is successfully matched, the user permission type is displayed and the user is allowed to enter and the window is jumped to the main window, and the user can operate the permission function. If it does not match, it prompts “Enter the user name or password is incorrect” and refuses the user to enter the system for operation. The login interface is shown in Figure 2.
4.2. Main window module
The main window module is the menu selection page that appears when the program is just started. The left navigation bar includes all the functions of the system and is divided into six categories: production data management, information management, statistical analysis, user management, System maintenance, help. Users can choose the operation of the corresponding function according to their needs.

The system has a rights management system. After the user successfully logs in, the program will display the available function modules according to the user's permission. The functions that are not usable are automatically hidden. At the same time, the drop-down menu controls are also provided at the top of the interface to facilitate all kinds of functions. User usage habits, the status bar below can display detailed information such as the current login user, login time, system time and so on. The main window interface is shown in Figure 3.

4.3. Material information module
In the sub-form, the operations of inserting, editing, deleting, browsing, and querying the data in the material information data table can be realized, and the current processing progress or state of the material can be viewed at the same time.

In the Solution Explorer, right-click the "Production Management System" item and select the [Add][Add Windows Form.] menu command in the pop-up shortcut menu. In the pop-up dialog box, [Template] Select "Windows Form". This will create a new form with the controls shown in Figure 4.
4.4. Employee management module
First, create a new sub-form by the same method in the previous section, and name it: "EmployeeManagementForm.cs". In this sub-form, you can implement various operations on the shop employee information data table, and at the same time, you can bind to employees. The login account used to log in to the system, so that each employee has a unique system operation user name, which can be assigned corresponding permissions, thereby realizing the functions of rights management and responsibility attribution. The employee data management interface and the binding system user account function are shown in Figure 5.

4.5. Production planning and statistical analysis module
Add a new form to the project and name it "produceplan.cs". As with the previous form, add controls as needed and program them, as shown in Figure 6.
As shown in the window, this module can add, delete, and export production plans. At the same time, it adds a search function. Users can search and search records based on material number, plan number, and planning period. When the amount of data is large, it is convenient for the user to make an accurate and correct query. By selecting a specific plan in the plan list, the right plan progress information shows detailed progress information for the current plan completion.

### 4.6. Rights Management Module

Add a new form to the project and name it "UserRightManage.cs". As with the previous form, add controls as needed and program them, as shown in Figure 7.

As shown in the window, this module can modify the permissions of each user role. When the function permission is set to prohibit, after the user logs in to the system, the main interface will automatically hide the function, thus achieving the purpose of prohibiting user operations.

### 5. Conclusion

Through this system, we can realize efficient and intelligent management of production materials, employee information, planning information and other data. The interface of the system is simple and clear, and the operation is simple. It can be compatible with any version of Windows system. At the same time, the system has rich interfaces, which can meet the customization needs of different enterprises.

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