A Construction Idea of an Application System Based on Simple Data Table

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Abstract. Small databases (transcripts, address books, etc.) have fewer associated services, and the performance requirements of interactivity, concurrent connection and response time are not high. They can display data statically by spreadsheet or HTML pages, and can also construct simple information systems to display data dynamically. This paper discusses the idea of constructing an application system based on simple data table, reducing the construction cost of information system and improving the convenience of data migration and maintenance management.

1. Introduction

Large-scale information systems can follow more mature construction models to carry out project demonstration, budget planning, development and deployment, maintenance management and other activities, and small microsystem applications often do not have a mature, complete business model and development processes as a reference, unstable demand and limited costs will affect the construction effect of the project. Therefore, it is necessary to explore low-cost, high-efficiency, easy-to-maintain, good interactivity of simple application system construction ideas.

2. Business Assumptions

For discussion purposes, the database with only one datasheet is called a "simple data table" and the small microsystem application system based on it is analyzed as a case study. It is characterized by the following points:

- There is only one datasheet in the database, which already includes all the necessary data and is not associated with other datasheets;
- The system has simple query, classification retrieval, import and export, and other interactive functions;
- The system has a foreground user interface and background management and maintenance system.
This kind of system structure is simple, and has a certain universality, for example: a unit address book system, a department of special information publicity system, a university topic selection system, etc. Its expected construction objectives generally have the following characteristics:

- Lightweight construction. Compatible with existing application systems, low dependence of hardware and software platform;
- The data layer is independent. The data level of the update, maintenance and management is simple and convenient;
- Interactive interface friendly. Interface elements are relatively fixed and invariant, simple in style and dynamically generated.

3. System Construction Ideas
Taking an organization's "address book" system as an example, a system construction idea is as follows:

3.1. Create business templates to form raw data tables

| Department | Section | Name | Office Phone | Mobile phone |
|------------|---------|------|--------------|--------------|
|            |         |      |              |              |

3.2. The data model is transformed and the database is built

| Sequence number | Department | Section | Name | Office Phone | Mobile Phone | Search keyword |
|-----------------|------------|---------|------|--------------|--------------|----------------|
|                 |            |         |      |              |              |                |

3.3. Application system construction
According to the existing information system platform technology, or according to the basic functions of the system, complete the interactive interface and module design (such as search box, copyright information, contact information, paging, navigation, etc.), realize the business model code construction, and build the phone book. Function modules such as query retrieval, data maintenance, import and export.

3.4. Interactive interface construction
As a simple data table, the advantage is that the data is completely independent, and the disadvantage is that there is redundancy. But using code technology can extract specific fields, specific types of data, and build a more user-friendly interface. Take the "Department" field as an example (see Figure 1):

| Sequence Number | Department       |
|-----------------|------------------|
| 1               | President's Office |
| 2               | Manager's Office  |
| 3               | Manager's Office  |
| 4               | Manager's Office  |
| 5               | Sales Dept.      |

| Sequence Number | Department       |
|-----------------|------------------|
| 1               | President's Office |
| 2               | Manager's Office  |
| 5               | Sales Dept.      |

Department navigation Links:
- President's Office
- Manager's Office
- Sales Dept.

Figure 1. Build a "departmental navigation link"
Figure 1, using data retrieval techniques such as SQL in "SELECT ...GROUP "and other statements), you can pull 5 records sequentially out of the" President's Office ", " Manager Office ", " Sales Department " field data, placed on the home page as a navigation link, but also to achieve by-department search and other automatic classification functions (such as automatic generation of departmental organizational structure, classification of personnel by keyword, etc.).

You can also reorder tables by department in the background using program code, and the foreground automatically builds a new navigation list (see Figure 2):

Figure 2. Automatically generating "departmental navigation links" using data sorting

3.5. Other business function implementations
The advantage of simple data tables is that it doesn’t require particularly complex algorithms, it can easily extract subset data, quickly generate realistic business data templates in specified format, and enhance the friendliness of system management and use. For example, it can automatically export department structure list for printing; generate specific personnel address book for printing and issuing according to specified format template; display office telephone, personal telephone, etc. with sub-authority; and import an updated data form to the whole application system (including some front-end interactive interface display elements). It can also use HTML5 and JS technology to dynamically output adaptive user interface and cross-platform services.

3.6. Application system function expansion
Combined with application server programming technology, database query technology and foreground code building skills, we can further enrich the application system functions, such as: personnel online sorting, personnel by keyword classification, departmental overall sorting, keyword retrieval and fuzzy query, sub-permission retrieval, third-party platform binding user authentication and so on.

4. System Architecture
Combined with real-world business features, the salient features of the architecture shown in Figure 3 are the emphasis on lightweight and simplification, namely: the technology is not complex, the deployment is not cumbersome, the environment is not harsh, the user is simple to use, the background maintenance is simple, the data migration is simple. From the point of view of performance and efficiency, there is some data redundancy in a single datasheet, and the completion of some complex data operation is bound to be affected by performance and efficiency, but considering the actual reality and design needs, most users' high frequency requests only involve data reading, classification and retrieval functions, and a few complex and high-load data operations are limited to service providers. It is accomplished by a few administrators and belongs to the low frequency requirement of a few fixed users, which has little influence on the realization of the main functions of the system.
5. Conclusion
The demand of real application system is complex, flexible and changeable, and software development should avoid the misconception of "big and complete, far and long", but should be based on actual needs, scientific judgment, choose high efficiency, low cost, easy to use friendly development and construction program, to achieve on-demand with the construction, autonomous self-control effect. The application system construction should highlight the main characteristics of lightweight and simplification, provide a simple and easy development and use environment for programmers, users and system managers, and reduce the comprehensive cost of system construction and use maintenance.

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