Crop Production Management Information System Design and Implementation

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Abstract. With the rapid development of information technology, the use of advanced technology to provide production guidance for farmers is the need of modern agricultural production. This premise, the author uses the B/S three-tier structure, with SQL Server database technology based on the use of Microsoft's ASP.NET technology designed a crop production management information system. The system as a practical example of wheat, as well as to achieve the integration of resources relevant factors on the growth of crop production, when the user is presented with information about the various varieties of wheat, wheat information various stages of growth, and wheat at different growth stages occur information and measures to prevent various diseases and the like.

Introduction

With the continuous development of society, People on whether the information can be timely access to information can make full use of the requirements of this area is becoming more and more high. The use of management information system in various fields have different level of demand, More and more agricultural management department with the help of computer and other new and high technology, to obtain different crop production information. Crop production management information system by of crop information and corresponding technical information acquisition and processing, provide a variety of useful agricultural information for agricultural producers, to promote the agricultural modernization and the development of digital.

In the information explosion era, the network will appear all kinds of different types of information and resources, but resources more and more decentralized, not in systems with a view to most of information there is a link between each other. Compared with the data through the search, the network resources to find a lot of convenience, but in order to save time, more convenient operation, there is a need to integrate all kinds of related resources into a system.

At present, at home and abroad for the frequency of use agriculture management information system has become higher and higher, and later the application of information technology in agriculture will also become the mainstream, with flexible, convenient operation and management system to integrate a variety of knowledge and technology in agriculture, especially for the integration of information, at this stage, the most urgent need to address the problem[1].

Research on the construction of crop production management information system, The information technology and crop production management organically, can refer to the production practice guidance for users, is one of the guarantee to increase the income of farmers. On this basis, the user use the existing system to guide the production practice of crops, is fundamental to the future of digital agriculture and precision agriculture.

System Key Technology Introduction

Management Information System Related Knowledge

There are (C/S) and (B/S) two modes of service of the management information system from the development to the present. The former will be divided into a database application client and server
two parts, and the client as a model database server, but also can handle data. And then one (B/S) in recent years has gradually replaced the (C/S) approach. The use of MIS technology to develop B/S system, so that the workload of the installation configuration is reduced, regardless of the user or for developers to facilitate a lot of. Based on the B/S mode, the client only needs to install the browser to be able to access the information system, regardless of the software implementation of the management or user operation is very easy to use, has been widely used.

ASP.NET

ASP.NET is the next generation of Microsoft dynamic web technology, compared to the traditional technology, ASP.NET is easier to write, reuse and share. ASP.NET provides a reliable, automated, extensible host environment. At the same time, benefit to the common LanguageRuntime integration template, simplify the application of the preparation, and provides a simplified application development services (such as state management services) and high level programming template (such as asp.net web forms and asp.net web services)[2].

ASP.NET Architecture

ASP.NET is widely used three layer architecture, B/S model generally adopts three layers of structure: ASP.NET architecture is divided into three layers: including page presentation layer, data service logic layer and data access layer. Page said the main thing to show the user data, through the page presentation layer, you can complete some of the view, modify, and other operations. While the data service logic layer is the data operation service, when the user has the request for the use of the function, the page presentation layer by calling the corresponding data service layer method, to carry on the operation of the data. The data service logic layer directly communicate with the data access layer, and then submit the data of the database to the presentation layer of the page. Data access layer mainly completes the operation of the data and the data source of the data source.

Access database Based on ADO.NET

ADO.NET is a .NET about data access subsystem. In fact, ADO.NET is a class library, the use of the object and method provided in the library, you can complete the database connection and some of the changes to the database operation. These data provide program can meet the requirements of the development of various, including: SQL Server framework data provide program, OLE DB.NET framework data provider, ODBC.NET framework data provide program and Oracle.NET framework data provider.

SQL Server 2008 R2 Data Base

Server SQL 2008 R2 introduced a series of new features to help businesses of all sizes to get more value from the information. Improved Server SQL 2008 R2 enhances the ability to develop, improve the management, and strengthen the business intelligence and data warehouse. Specifically, there are the following aspects:

(1) New FORCESCAN query hint: new FORCESCAN prompts it and literal meaning, can ensure that the query optimizer in a given operation does not use seek, the mandatory use of scan.

(2) The new function of FORCESEEK query hints: FORCESEEK and FORCESCAN two are totally different, it will force the database to use seek. This functionality is also present in the previous version, but in Server SQL 2008 SP1 DBA, R2 can use FORCESEEK to specify the index or column that you need to seek.

(3) New system objects: whenever the Server SQL has a version of the update, there will be some new system objects, the user will each time they are dug out and recorded in the document. Here are some of the new system objects in Server R2 2008 SP1 SQL.
Requirement Analysis

Functional Requirements Analysis

(1) Wheat information management needs
In the information management function of wheat and wheat information management system should be the entry of wheat all kinds of information and data, but also data of wheat information management, such as additions and deletions to change search operation.

(2) Demand for wheat disease management
In the function of wheat diseases, it can manage the information of wheat diseases.

(3) Demand for management of wheat growth phase
The growth stage management function in wheat, wheat in different growth stages can support the information crud.

(4) Pesticide management needs
The pesticide management function, can support pesticide information crud.

(5) Fertilizer management needs
In the fertilizer management function, can support the fertilizer information crud.

(6) News, announcement management needs
In the news bulletin management function, can support the news, announcement information crud and default storage time.

Non Functional Requirements

Stability. System requirements using high reliability technology, fully consider the security strategy and mechanism of the operation of the whole system, has strong ability of fault tolerance and good ability to recover, to ensure the security of the system, stable and efficient operation.

Scalability. System design should fully consider the future development trend of the system function, the system should adopt the platform design idea, and the business function is easy to realize. System software and hardware platform should have a good ability to expand, to support the expansion of the scale of the system and the scope of the expansion of the content, but also should take into account the scale of the day after the expansion of the problem.

Maintainability. In the software configuration management and maintenance must be simple, efficient, not because of the configuration of the system or maintenance of the system is not normal operation, system requirements to complete the system error log records, in exception handling, can according to the recorded log, fast and easily locate the error to the specific location, reasons, and not to the inspection process. Convenient system maintenance.

Feasibility Analysis

(1) The economic feasibility of: economic feasibility, is to ensure that the cost of system development within the acceptable range, and development after is indeed can effectively improve work efficiency, the project is feasible.

(2) The feasibility of Technology: the feasibility of technology, the system use B/S structure to research and development, the use of crop production management information system is completely feasible. Database using Server SQL database for data access and storage can easily control.

System Design and Implementation

Functional Structure Design
According to the system requirements analysis and system design objectives, the function structure of crop management information system is shown in Figure 1. The system is divided into two parts, the
foreground and the background, according to the user's role and authority. The onstage mainly includes the wheat basic information display, wheat growth stage information display, display basic information of pesticide, fertilizer and disease. Information display, news bulletin display function; background is mainly on the front display information, edit, add other functions.

Database Design

The complete management information system must include the database. Using database management data, can be more convenient to modify, you can dynamically present the database data. There are many kinds of database, such as Access database, Oracle, Server SQL[3]. Crop management information system background database using Server SQL 2008 R2 database to design and implement.

Interface Design

Front Desk Information Presentation Design. At the stage of the growth stage of information presentation design as an example: all users can access the view information, only according to the system provided by the stage name to view the corresponding stage description. The interface consists of four parts, namely the head, bottom, left and center part. Header contain can be connected to other pages in the navigation buttons, the left-hand side is mainly associated with the growth stage of navigation links, the bottom is some links and copyright information. The central part is used to present a detailed description of the growth stage of the module. As shown in Figure 2.

Figure 1. System function structure (front and rear).

Figure 2. Stage of growth foreground display interface.

The datalist control, LinkButton control to the data in the database were bound by this page, navigation in the interface on the left side of the columns, click the corresponding growth stage name and information presentation module will be showing a corresponding growth stages are described.
Realization of the Whole Interface Response of the System. All the interfaces of the system are designed by using the popular response page. The interface uses the bootstrap framework to construct the response interface. In response to the framework of the equivalent of the definition of the interface to define the interface of the two models, the computer screen view is a kind of framework, small screen on the phone to view is another kind of framework. As a whole, the arrangement of the position will have a certain change. All the response style is the framework has been defined after the completion of the user according to different needs to modify their own personalized. Taking the navigation bar as an example:

Figure 3 for the use of the computer screen when the effect diagram:

![Image of large screen navigation bar effect chart]

**Summary**

Crop management information system is simple and practical. The use of .Net development platform, using B/S mode design, to achieve the management of data information, presentation, to the relevant crop knowledge system, to achieve the release of all kinds of information and management.

Meet the requirements of each user information access. As an open network window, users can view all kinds of information needed in this system, such as both can view the knowledge of wheat varieties, but also can see the introduction of different pesticides.

Because there is no browser landing, only the administrator management background need to log in, the lack of a message board to understand the needs of users and market dynamics. In addition, in the development process involves a lot of details, but also need to consider a variety of possible problems, and how to solve the problem.

**References**

