System Design and Realization for Searching, Diagnosing, Preventing and Curing the Agriculture Vermin and Diseases Based on Web

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Abstract: The System for Searching, Diagnosing, Preventing and Curing the Agricultural Vermin and Disease Base on Web' is a bran-new networking system to provide information services, using the advancing network technologies and large database technologies. With the characteristics of expert system, summarizing the agriculture experts' experience and knowledge, using the quick, real-time, effective network management technologies and advanced database technologies of Internet, the system is designed after collecting, researching the situation of the normal agricultural vermin and diseases. The system has three outstanding characteristics. First, it's equipped with agricultural vermin and diseases information database and searching system base on Internet. Second, it supports the intelligent identify function base on the characteristics of the vermin and diseases. Third, it has the decision-making function supporting by experts online.

Keywords: The agricultural vermin and diseases; searching; database; intelligent identify; diagnose

1 System Functions

The System for Searching, Diagnosing, Preventing and Curing the Agricultural Vermin and Diseases Base on Web' can be divided into 5 system modules, including: Diagnosis and prevention module, vermin information database module, information searching module, interaction module base on Web and backend management module. The function modules are shown in Figure 1.

The system has the following main functions:

Vermin and diseases diagnosing: the system lists out all kinds of symptoms in detail. As soon as the users input the description of the characteristics of the vermin and the crop's diseases, the system output the names of the diseases and the vermin, and gives out the corresponding methods to prevent and cure. With the function the system intelligent the diagnosis of the agricultural vermin and diseases.

Knowledge searching: online information and searching subsystem has agricultural diseases and vermin's information database with IIS as the server, Access 2003 as database. The data is indexed by outstanding titles in the interface, which is clear to the users.

Decision-making online: agricultural experts and farmers can interact on the Internet. With this function the registered users can emit their points, ask questions, seek the solutions, and the experts can help them at the first time.

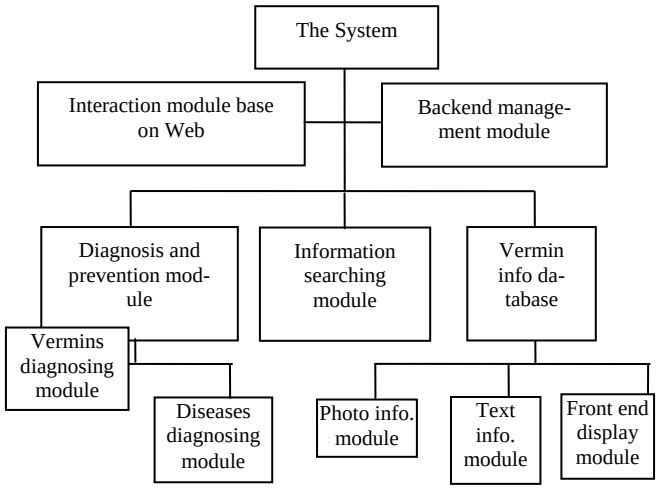

Figure 1. The function modules of the system

User management: different users have different authorities: guests, members, VIP members, experts, administrators, which are the best for the management, security, maintenance of the system.

Backend management: the operations are simple to add and modify the data in the agricultural diseases and vermin's information database at any time. We can update information online to make system real-time.

2 Schemes Options

2.1 Developing and Running Environment

2.1.1 Hardware Environment

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CPU: Intel Pentium; Memory: 64 MB; Hard disk: 500 MB or above; CD-ROM: need CD-ROM to install OS and other software; Net Interface Card: ISA or PCI interface; Video Card: SVGA video adapter. [1-3]

2.1.2 Software Environment

OS: Windows 2000 Server / Windows XP (SP2); Browser: Internet Explore 5.0, 6.0 recommended; E-mail server: Outlook 4.0 version or above; Executive software: Macromedia Dream weaver 8/other; Data storage software: Microsoft SQL Server 2000/Oracle/Sybase/Other; Database: Access 2003; Server: IIS6.0; Resolution: 1024*768 recommended. [4-5]

2.2 Developing Tools Selection

Macromedia Dream weaver 8; Dream weaver MX; ASP (Active Sever Pages); Adobe Photoshop 9.0; UleadGIFAnimator-v5.05. [6-8]

3 System Design

This paper only introduces part of the system design briefly because of the paper's length. Refer to my relevant papers and copyright statement if need other detail.

3.1 The diagnosis, prevention and cure subsystem design

3.1.1 Mechanism

With Macromedia Dream weaver 8, we establish a system list in the Web's design interface. Then add each big class in the system list, as shown in Figure 2, e.g. shepherd's -purse: the vermin's diagnosing system of the shepherd's-purse, the diseases' diagnosing system of the shepherd's-purse. Then add each class in the big class that they belong to, e.g. the big class can be divided into several small classes by the stages of the bug: egg, grub, imago; there are the characteristics' descriptions of all kinds of vermin, e.g. in the egg's small class there are some descriptions for eggs of 8 kinds of different vermin. The users search information by selecting one kind of vermin. The display zone will then show the behaviors and habits of this kind of vermin and provide the schemes to prevent and cure from the experts. This mechanism helps make decision with the experts' suggestions.

3.1.2 The vermin diagnosing module

This module is used to diagnose the vermin in different stages, including eggs, chrysalides, grub, and imago. From the description: eggs' length 1.4 mm, vertical standing and vertical grain, fresh yellow, we can conclude that's the egg of Henosepilachna vigintioctopunctata, then apply some scheme of prevention and cure. The knowledge structure of the vermin diagnosing module is shown in Figure 3.

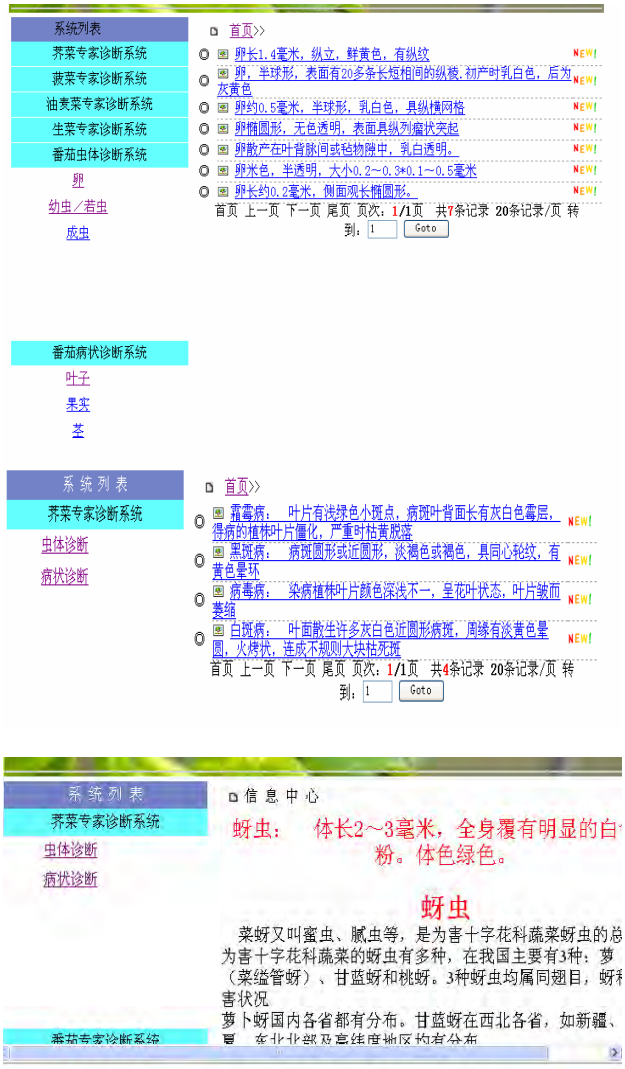

Figure 2. Snapshot picture of the diagnosis, prevention and cure subsystem

3.1.3 The diseases diagnosing module

This module is used to diagnose the characteristics of the diseases in the every part of the corn, such as the leaves, the fruit, the caudexes, and the root. The knowledge structure of the diseases diagnosing module is shown in figure4.

3.2The vermin and diseases' information database design

The aim of the database is to establish a clear database system, so that the administrator can easily update and modify the information of the vermin and the diseases and collect the user's suggestions. Through the database the users can scan and search information expediently.

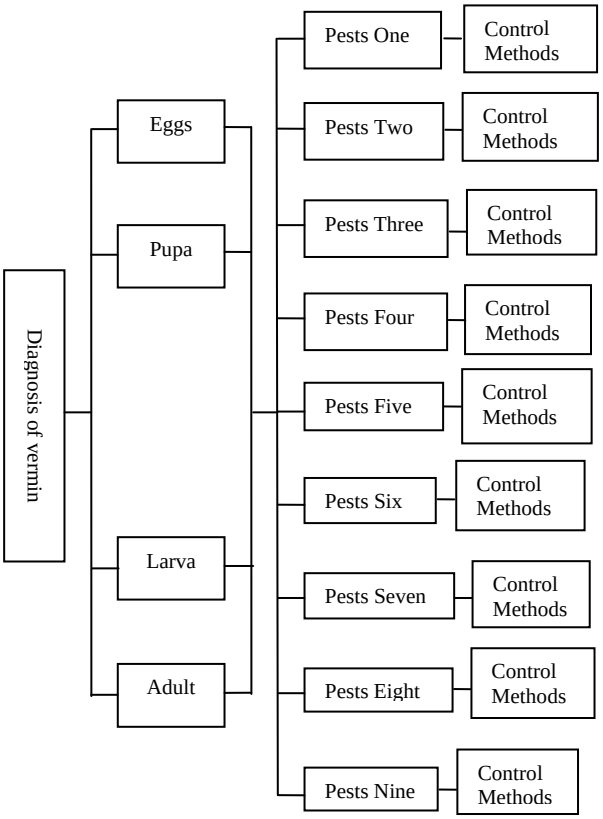

Figure 3. The knowledge structure of the vermin diagnosing module

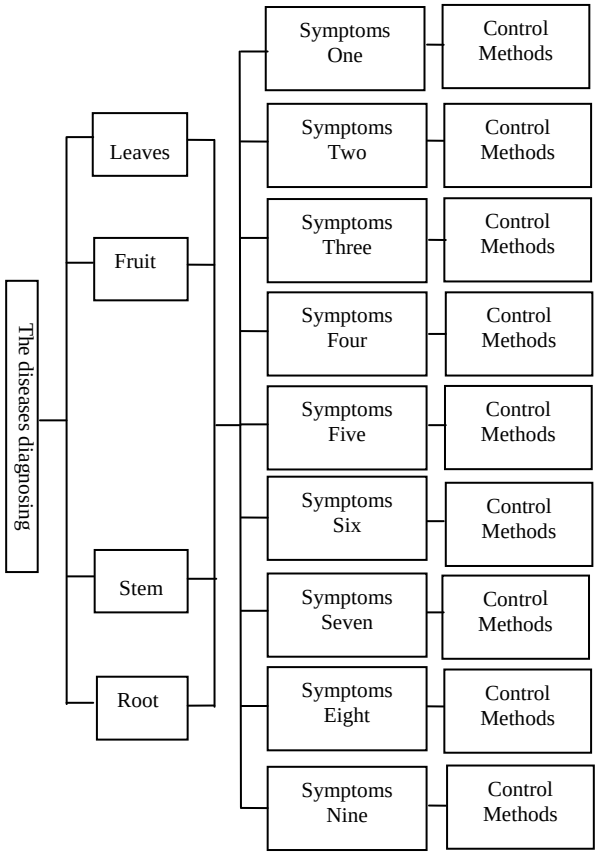

Figure 4. The knowledge structure of the diseases diagnosing module

3.2.1 The database module

The database module includes:

The information list of the user (Admin) – is used to store the user's information, such as the user name, the password, the access right and so on.

The information list of the vermin and the disease (News) – is used to store the information of all kinds of the vermin and the diseases.

The small classes' list of the vermin's information (SmallClass_New) – is used to store the vermin's small classes.

The information list of the vermin's photo (Img) – is used to store the address information of the vermin's photo.

The big classes' list of the vermin's information (BigClass_New) – is used to store the vermin's big classes.

3.2.2 Design of the photo information module

The photo information module is used to upload and manage the relevant photo about the vermin and the diseases. When the News_add.asp file use the file uploads function, the file upload page Upload_Product.asp binds the corresponding photo with the transferred title.

After naming and addressing the photo, call the Upfile_Product.asp file to upload the photo string file in the appointed place, save to the Upload Files folder in the same directory, and write the binding information to the Img list in the database.

New build a photo's information manage file UploadFileManage.asp, search photos' information in the Upload Files, and display in the Web in the form of the lists.

3.2.3 Web station's information displaying in classes

According the appointed the vermin's and the diseases', the system read the content of the information from the database, and show the information in the Web. The system builds News. asp and New_tree.asp files to classify the information by the BigClassName property in the classifying information that exists in the database, and display the information in pages. We call the public database files, search the News list in the database, and filter the information in the News list according to the big class name that is transferred from the construction list in the big class tree file New_tree.asp. We save the result into the data collection and display on the information displaying pages News. asp.

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3.3 Information inquiring and searching module

By the diseases and vermin's name, the users can search and get the special information from the vast amount information in the database, reduce the time for acquiring the information and increase the efficiency. The users can use the inquiring and searching function provided by the system expediently to search the special title and content information, and find out the correlative vermin's information besides the diseases and vermin that the users are searching. In order to do that, build a News_search.asp file to search the titles or content in the database, return the information to the data collection, and show the information in the lists.

The users can acquire the experts' knowledge by search the keyword in the titles or the contents of the information by inputting the words.

3.3 Back and management, information classification and record

New build ASP file, UserMange.asp, Manage_ Admin-edit.asp, UserDel.asp, to accomplish the managing, editing, and deleting user functions. Every page respectively calls the common database file Conn. asp to accomplish the access to the ACCESS database, and complete the searching, editing, deleting operation with the codes.

New build ClassAddBig.asp and ClassAddSmall.asp file to complete the classification of the big classes and the small classes of the information in the database. Call the common database file to save the content into the BigClass_New and the SmallClass_New lists in the database so that the users search the information in the displaying pages.

The New_add.asp file saves the vermin's information in the database. Call the common database file to link the big class lists and the small calss lists in the BigClass_New list and the SmallClass_New list, write in the two drop lists of the page info class item. Call the Ubb information editor page Editor. asp to code the input information into the HTML format, put the code in the News list in the database, and calls the News_save.asp file to add record in the database.

New build ASP file News_modi.asp file to modify the vermin's information in the database. When the users click the link of modifying the specific information in the back end's information lists, the system calls the News_modi.asp page, call the common database file to access the database, transfer the information with the specific id number in the database list New to the two drop lists of the page info class item and the specific controls such as the text title, the text content. Call the Ubb information editor page Editor.asp to display the HTML coding information content in standard. After reading the information the users can edit the information's content or titles. Submit the pages after edition by calling the News_ save. asp to update the content.

4 Conclusions

The System for Searching, Diagnosing, Preventing and Curing the Agricultural Vermin and Diseases Base on Web focuses on the innovation: utilize the high technologies such as the advanced network technology, the database technology, to collect the agricultural experts' professional knowledge and experience; make use of the characteristics that what we see in the network is what we get, to diagnose the normal diseases and vermin of the corps. The system can automatically identify the normal diseases and vermin of the corps in the south china. Reason by the characteristics of the shape or action, judge, and give out the scientific conclusion. At the same time, the system realizes the interaction between the experts and the users online. The searching database system of the diseases and the vermin is well designed and operate simply, providing the knowledge structure layout as the optional path, making the user experience the happiness of acquiring the valued knowledge on the Internet. It's sure that this production will play an important role in the Chinese agricultural informationization.

5. Acknowledgements

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