RESEARCH AND DESIGN OF THE AGRICULTURAL SHORT-MESSAGE MANAGEMENT SYSTEM

Xinlan Jiang [1], Wanlin Gao [1,*], Wei Liu [2], Ganghong Zhang [1], Hongqiang Yang [1], Yang Ping [1]

[1] *College of Information and Electrical Engineering, China Agricultural University, Beijing, China, 100083.*

[2] *Zibo energy supervision center, Zibo City, Shandong Province, China, 255031.*

[*] *Corresponding author, Address: P. O. Box 105, College of Information and Electrical Engineering, China Agricultural University, 17 Tsinghua East Road, Beijing, 100083, P. R. China, Tel:+86-10-62736755, Fax: +86-10-62736746, Email: gaowlin@cau.edu.cn.*

Abstract: Aiming at the current status of the agricultural information service business, this paper elaborates the characteristics of the agricultural short-message resources, and puts forward a kind of framework and a design method that sets up the agricultural short-message management system, and the key technique of carrying out the system. Especially in the upper-level applications of analyzing, processing, and automatic replying the agricultural short-message, this system adopts a method that separate the short-message application support platform from the agricultural short-message management center. The method would make system more practical and flexible. Such quick, convenient, omnipresent information service would make the application have a good future.

Keywords: agricultural information, SMS, SMSC, short-message management system.

1.   INTRODUCTION

On the background of new countryside construction, the rural informationization has already become an important mission of promoting the agricultural development and the society improvement of countryside (Yearly report on agriculture information-based development research in

Chinese countryside in 2006-2007). Our country's countryside information-based have been already turned into a new diversified stage of development currently. The first, the requirements of farmer about the market information have already changed from simple releasing supply and demand information, but earnestly hope to gain more large-scale benefits through a more extensive platform. Second, integrate resources. He Yuan and Wu Yuzheng (2007) says, "Now, a lot of the type of science and technology, and living information all come from the literature of ivory tower, there are a lot of technical terms, the information of farmer's real demand still needs someone to arrange, and data mining."

   At present, farmers obtain the agriculture information mainly through several methods, such as newspaper, broadcast, television, the telephone consultation, the computer network and mobile, etc. Each improvement of method, all obtained various information to provide more convenient path for farmers. Although the Internet comes ubiquitous, it still falls through at home to get to the Internet in largely village, not flourishing region at present. But the current wireless correspondence network almost overlaid national and each corner (Ma, et al., 2006), if use the mobile short-message as the delivering way of agriculture information, can be free from the restriction of time, region and equipments to obtain agriculture information easily.

   However, how the numerous and jumbled agricultural information get to the different farmers, aiming at farmers' miscellaneously need and with low cost, through the mobile short-message method, releasing the farmer's information in time, ensuring the information in time and accurately, preventing from the mistaken agriculture information, is still the three greatest hard nut to cracks of agricultural information-based. Thus this paper elaborates the characteristics of the agricultural short-message resources, and puts forward a kind of framework and a design method that sets up the agricultural short-message management system, and the key technique of carrying out the system.

2.   CHARACTERISTICS OF THE AGRICULTURAL SHORT-MESSAGE RESOURCES

   A suitable agriculture short-message resource is one of the most important conditions of providing characteristic and colorful agriculture short-message service. Because of the specialty that the agricultural short-message resources face to the agriculture and village population, there is higher request on its specialty, easy-understanding, brief-capability, and reliability (He, et al., 2006).

1) Information resources should be abundant, overall, accurate, and practical

The agriculture short-message information resources wants to insure its reliability, accuracy and practicality, the information source is also the key aspect, in addition to the process of professional processing and auditing. Currently the practical technique database of being applicable to the farmer and village in the domestic is mostly small scaled and self-use, the large database is particularly less, and the databases that combine the completely tracking of the comprehensive news and the market dynamic state is tightly lack.

2) The management of the information resources needs a norm

The norm management of the information resources contributes to the knowledge-based and deeply mining of the information resources. Accumulate intelligence of numerous agriculture experts, gather together the research strength of the university, college, the research organization, set up an agriculture mobile short-message database which is easy to manage and use, and have a sea of information, the norm management of the information resources is essential.

3) The information service should be professional and characteristic

The characteristic service means a kind of service that specially provides the service method and the service product according to the need characteristics, such as different service environment, service object and the access habit, etc. Want to carry out the characteristic agriculture short-message service with strongly time-limited efficacy and good instruction, the professional process of the information resources and the extensive understanding of farmer's information demanding is an initial condition.

3.   FRAMEWORK AND DESIGN METHOD OF THE AGRICULTURAL SHORT-MESSAGE MANAGEMENT SYSTEM

3.1   Requirements analysis

The type of the short-message business can basically divided into the following four major types currently: 1. The type of actively sending out like notify; 2. The type of interaction search through question and answer method; 3. The type of sending out on time which subscripted by customer; 4. The type of replying confirmation after passively received (Ren, et al., 2007).

For the sake of the demand of farmers, this system joins above-mentioned ex- service of 3, such as providing some instant information through the notice method to send out actively to the customer; customer and network agricultural information carry on information alternant function with the type of question and answer through the mobile short-message, and categorizing and arranging the agriculture authority information aiming at the actual need, and then converting to the form of short-message, for the purpose of customer can subscribe; Otherwise, the information, such as the farmer self's experience etc., can also send out to the network directly, to provide a basis for enlarging the contents information database later.

3.2   Multi-layer structure of the system

The agricultural short-message management system mainly is absorbed in the upper-level applications of analyzing, processing, and automatic replying the agricultural short-message, carries out the function that customer and network agricultural information carry on the alternant function of information with the question and answer type, through the mobile short-message, and carries on a management to all short-messages. This system adopts a method of separate the short-message application support platform from the agricultural short-message management center, making system more vivid and practical. System framework sketch is following. (Fig. 1).
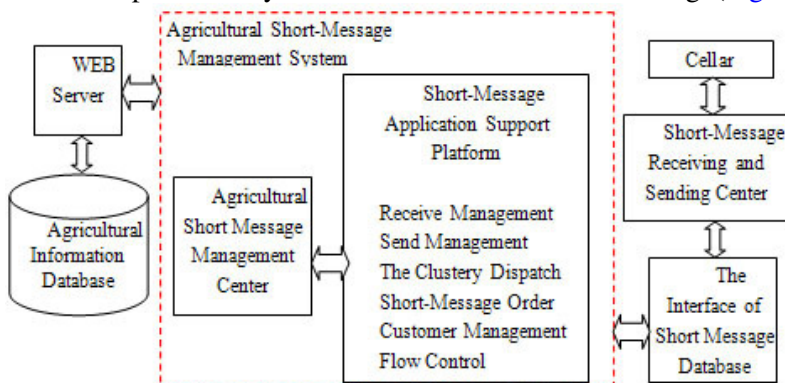

Fig.1 Agricultural Short-message Management System Framework

The message application support platform mainly carry out the functions of data interaction with the short-message receive and dispatch center through the short-message database interface, it has the data transmission and the confirming process after receiving transmission; Having the stable data comes error processing mechanism, interface data transmission control strategy dependable and perfect; Having a stable contents control and filter mechanism.

The information filter module: Provide the information filter mechanism, complete the filter of information through frequently adjusting main factors as keyword etc.; The information that the application hand over is divided into two types to filter and not to filter, The information that passes the information filter module percolation just can be sent out, or enter into the agricultural short-message management center.

The data management module: Realize the functions of taking out and saving the related technique data of each short-message, and business statistics etc.

3.3   Design of the system function module

The service is divided into four parts that the agriculture short-message management system provide, namely the information search function, short-message receive and dispatch management, short-message order module and information release function, its function module structure sketch is following.(Fig.2).
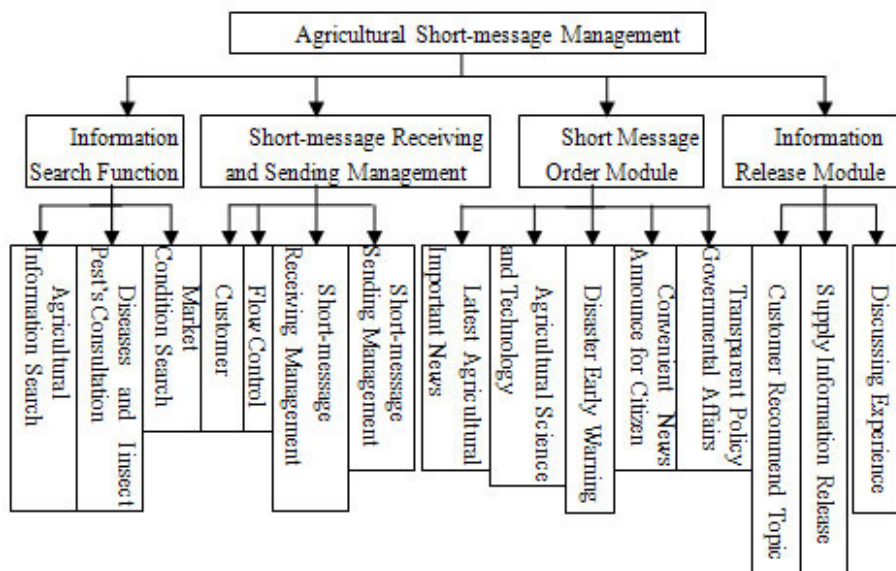

Fig. 2 Agricultural Short-message Management System Function Module

1) The information search function module

This module mainly includes the services, such as the market condition search, the agriculture information search, and plant diseases and insect pest's consultation etc. The customer sends out a message to server through a mobile, the server then carries on match according to the message contents and the keyword, and then filter and sieved the information that the customer need from the agriculture information database, according to the keyword.

After the operation, the system will send out successful search result or the hint information of failure to the customer's mobile.

2) The short-message receiving and sending management module

The short-message receiving and sending management module is mainly providing the functions, such as receiving and sending out short-message management, customer management, and flow control etc.

3) Short-message order module is to provide the instant information for customer to order, such as the transparent policy governmental affairs, the latest agricultural important news, agricultural science and technology, the disaster early warning, and the convenient news announce for citizen etc. It's the expanding function about the Web agriculture information network. This kind of wireless-network-based special service, change into actively providing an information toward the customer from originally waiting customer passively, extend and enrich the function of the agriculture information network, and provide a better and faster service for the customer.

4) For the sake of the biggest degree showing the customer's participation, system establishes an information release function module, mainly including: the customer recommend topic, the supply information release, and discussing experience etc. The functions of the customer recommend topic service: The relevant inquisition forms, which drew up in advance, are filled in by the customer, as the references of information topic, moreover, and provide a basis for enlarging the contents information database later. Customer can release the supply information through the mobile, and can send out own experience feeling to the network for sharing with everyone.

4. KEY TECHNIQUES OF CARRYING OUT THE SYSTEM

4.1 Development environment

This system takes the Visual Studio.NET 2003 as the developing platform, and uses C# programming language to develop the application. The server software is installed as follows: The operating system is the Windows 2003 Server, the server software is an IIS 6.0, and the database is SQL Server 2000.

4.2   ADO.NET data access techniques

The database management uses the advanced ADO.NET technique. The ADO.NET model has two very important characteristics: the first is programmable. It adopts the operation object of type, the object defined by oneself can be programmed by the programmer, can describe business object better and make other customers more easily comprehend. The second is interoperability, this kind of characteristic is shown by using DataSet (the data gather), one DataSet can include arbitrarily many data tables, the DataSet constitute a non-linking database view and this kind of non-linking structure system makes only to just need to use a database server resources while read and write database. As a result, it provides better flexibility (Chen, 2006).

In the system all the data commutations complete through a database, the agriculture short-message management system acquired the data which need to process from the short-message database, and then write the results into the short-message database after the processing completed. Moreover, some module, which alternate with the information source in the exterior system, should possibly convert the accepted original data (like text file's data, electronic spreadsheet...etc.) to the data which is deposited in database, reduce the process task of non- database format data in system (Tang, 2005), so can availably manage data.

4.3   Debug

At initial stage of debug can carry on program test in interior network, finally carry on function debug with real mobile, main contents include: information release, test of the function on the receiving short-message→ analysis and processing→ replying short-message, ordering short-message→ sending out short-message, clustery dispatching short-message→ sending out short-message etc.

5.   CONCLUSIONS

This paper mainly introduced the application of the mobile short-message service at the agriculture information. It has the characteristics of quick, convenience, omnipresent information-based service, and will have a good future. The system can also enlarge a development of which can browse, search, release the agriculture information in the WAP mobile in the future, and will have a greater application in the realm that the Internet can't arrive

or can arrive but with high cost, and will be an important complement to the Web agriculture information network.

REFERENCES

Chen Ying, Song Ling. 2006. Implementation of SMS Platform Management System Based on ASP.NET [J]. Computer Knowledge and Technique (Academic Exchanges), (5): 37-38.

Consultant of SAIDI, Consultation Center of City Information-based. 2007. Yearly report on agriculture information-based development research in Chinese countryside in 2006-2007. http://www.qcdz.cn/InfoHtml/2007-3/20073151600.shtml.

He Qiyun, Huang Liang, Wang Zhong. 2006. The mode and expansion counter plan of agriculture information service based on short-message [J]. Journal of the China Society for Scientific and Technical Information, 25 (10): 176-179.

He Yuan, Wu Yuzheng. 2007. In 10 CIO eyes of 2007: Surmount the technique Fusion business [OL]. The Computer World. http://e.chinabyte.com/346/3031846.shtml.

Ma Xiaojin, Zhou Yong, Jia Shaorui, etc. 2006. Design and realization of score inquiry sub-system based on .NET and WAP mobile [J]. Journal of Hebei Institute of Architectural Science and Technology, 23(3): 80-82.

Ren Chen, Huang Zhengqian. 2007. Face to gather a group of message customers to unify to connect into terrace directly according to the XML [J]. China New Telecommunications (Technical Edition), (5): 83-87.

Tang Chunsheng. 2005. The research and design water conservancy wireless search system based on WAP [J]. Jiang-su Water Conservancy, (8): 8-9.