Research and Design of One Webpage System for Each Village in Shandong Province

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Abstract. With the development of informationization in village in Shandong Province, it needs a system to create a webpage for each village on which the villager can look for their interested information and post message. The article puts forward the frame design of the system from its function, hardware, performance and items etc aspects. The system provides the platform for "information to countryside" so as to make the rural government affairs public, reduce the contradiction between the party and the masses and between the cadres and masses and construct the harmonious new village.

Keywords: Webpage for each village, Frame, Function, Column

1   Introduction

With the development of information technology, the agricultural informationization develops rapidly. Many websites, databases, expert systems and information integrated service platforms related to the agriculture have been built at home and abroad. But there is no one webpage system for each village at home [1][2]. In some developed countries, some systems were used in special farm. For example, many advanced monitoring systems were used in modern greenhouses in Holland. Because of different national conditions, some country needn't a webpage for one village [3].

As of the end of 2010, there are 78015 village committees in Shandong Province [4] which quantity is among the top of the nation. In 2009, there were about 10.8 sets of home computer among 100 rural residents in Shandong Province. At the end of 2010, Shandong realized that the optical cable covered all the areas to towns and 90% areas of villages [5]. During the 12th-five-year plan, Shandong will further prolong optical cable network to make the rural optical cable coverage up to 100%. Shandong is the first pilot province of computer-to-village project which solves the last-one-kilometer question in rural informationization [6].

The infrastructure of rural information in Shandong has been more perfect. But if there is only computer and no information for villagers, the villager only can use the computer to play games or the computer is only for show [7]. It is the focus of rural informationization how to use the modern computer technology to service the new village construction, promote the agricultural development, increase farmer's income and exploit the rural market [8]. Therefore, we designed the system so as to promote rural government affairs public, reduce the contradiction of society and construct the harmonious new village. Some departments of government can also know about some information related to rural affairs, social insurance and so on in time and accurately and then speed up the progress of agricultural and rural informationization in Shandong Province [9][10].

2   System composition and function

The system is mainly composed of register system, publishing system and management system. The management system is the core which manages the register system and publishing system to delete the unreasonable website that register system creates and bad information that the publishing system releases. The system composition and function frame are shown in Fig. 1.
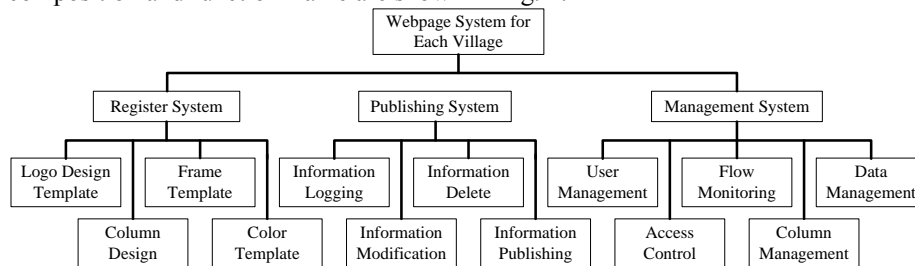

Fig. 1 System composition and function frame diagram

2.1   Register system

There are about 80000 administrative villages in Shandong and the register system provides the unique webpage navigation for each village. In order to avoid the same name of village, the village is registered in according to the regional, urban and rural codes for statistic in 2012 (refer to http://www.stats.gov.cn/tjbz/cxfldm/2012/37.html) released by State Statistics Bureau. The code is as the unique identification. When you look for some village, you can as per the order of province, city, county, town and village to seek. The system provides the visual template and has the following functions:

(1) Logo design template, including the village name and photo etc.

(2) Column customization, when registered, the column is created automatically and can be modified as per requirement.

(3) Frame design template through which you can select proper frame suitable to your design.

(4) Color template to make the webpage with different color.

2.2   Publishing system

The publishing system manages the updating information that need some modification, classifies them with some common characteristic and releases them onto the webpage. The information is loaded into a database by a simple interface and then released onto the webpage through the template format after verified by the administrator.

The publishing system can make the rural messenger conveniently and efficiently classify, add, modify, delete and edit the information etc. The category, title, introduction and photo of products etc can automatically create a page and be saved on the database to make the user inquire conveniently. The main part of the system is the on-line compiler which can carry out many types of word processing by the WYSIWYG edit mode e.g. editing the article, news and notice etc.

2.3   Management system

The management system provides the uniform management and control for the user, access right, page views, column, content and data etc and related auxiliary functions. It is mainly managed by the administrator.

2.3.1 User and access right management

The user is divided into administrator, messenger and ordinary user with different access right. The system certifies the user by login and password. The administrator has all rights of the system including the addition, modification and deletion of basic data. The messenger can only have the rights to register and publish and he can't add, modify and delete any important data. The ordinary user can publish the supply and demand, job wanted and job application etc information. The safety of information publishing system is insured by user management and rights management.

2.3.2 Page views management

The system monitors various information on the website, including page views, data updating etc. The administrator can record and monitor the website through the page views management. The record and statistic analysis of various visitors can provide the basis to regulate the contents and functions of website.

2.3.3 Column management

The column management dynamically configures the column of website and automatically creates the website map. The background program manages column in according to the created tree structure. The tree levels haven't limitation. The frame of column is flexibly customized by XSLT (Page extension) + XML (Data extension) design which realizes the flexible configuration between page and column and

between column and data. It includes the column customization, page model management and data model management etc functions.

2.3.4 Data management

The data management mainly realizes the management and maintenance of data resource within the website. The system can automatically back up the related configuration data. When a fault occurs, the system can automatically restore the data. The system provides the data backup interface through which the administrator can periodically or aperiodically export the backup data to store in other place so as to ensure the safety and completeness of the whole system and ensure the normal and stable working of system.

2.4   Other functions

2.4.1 Information retrieval (search engine) function within the website

The information retrieval system within the website runs through the whole website which makes the user conveniently find the needed information more efficiently. The system provides many finding modes, e.g. as per column, title, content, content and date etc, for the browsers who can find his wanted information among the huge information database as per his favor. The function supports the complicated combination search for random field, combined search of Chinese and English and intelligent fuzzy search.

2.4.2 Statistical form print function

It mainly realizes the statistics, report form and print functions etc.

2.4.3 Log management

It records various running log to realize the analysis and statistics etc functions of them. It manages various user login, operation and accessing for the resource on the website etc logs. And at the same time, it monitors the operation of user to prevent the user from illegal operation. When the system has fault, it can restore some operation in according to the related log information to make the loss of system minimum. The accessing and application degree of different users on the related resource can be traced and counted through the log management.

2.4.4 Database backup and restore

It provides the function of database backup and restore to ensure the safety of database on the website.

3 Performance design

The running and normal visiting of website system can be ensured by configuring Web server, application server and data server etc special servers with high performance and hardware firewall, invading testing equipments and stable network transmission conditions with high speed. The design should consider the following performance index.

3.1 Website stability

The mean free error time of website can be up to 10000 hours (i.e. there is about one time of server fault with one year except for the server fault that occurred by normal maintenance of computer room or natural conditions).

3.2 Concurrent processing capacity of website

The system can undertake the concurrent access with 100,000 levels and the daily accessing quantity can be 50,000,000 levels. The processing capability can be improved double by adding Web server.

3.3 Response speed of webpage

The average response speed of webpage should be controlled with 3s by adopting multilayer cache mechanism and dual-network duplet accessing strategy between China Netcom and Telecom users.

3.4 SEO optimization

All the pages adopt DIV+CSS to optimize the keywords, content, picture, link, page description, page title and content title etc strictly as per the SEO standard.

4 Detailed design

The system provides uniform user login interface to realize the level-to-level administration of access user and administrative user. The system displays by different level and category which structure is distinct and concise.

The design includes two version i.e. village version and comprehensive version. The village version mainly aims at the villager and releases the news, related policies and information of the village. The objective of comprehensive version is wide and its information comes from the village version and includes some information that the village version hasn't e.g. Charming villages (characteristic village, folk customs village and tourism village) etc.

4.1 Column on the home page

4.1.1 Search
The home page displays by the village version which is directed to some village by hierarchy index and map index.

(1) Area search: It is searched by the order of city, county, town and village.

(2) Hierarchy search: It is searched as per the administrative division published by State Statistics Bureau in 2012, sourced by http://www.stats.gov.cn/tjbz/.

(3) Map search: It is searched by the map in according to the order of 17 cities, counties, towns and villages in Shandong Province.

4.1.2 Content
The column on the homepage includes village trends, village official, characteristic product, invite investment, supply and demand, job wanted and application, charming village (rural home inns, leisure tourism etc), township enterprise, cooperative association and service etc.

(1) Village trends: It releases the news information of the village.

(2) Village official: It reports the moving deeds of college-grade village officials and introduces their working experience.

(3) Characteristic product: There is a saying of different manners in five miles and different customs in ten miles. The agricultural products have strong regionalism. The column mainly reports the product that is with special characteristic in the village or in the town.

(4) Invite investment: The column provides the information of finance investing and demanding requirements, investment project resources and business opportunity etc to promote the docking of project, capital and attractive investment requirements.

(5) Supply and demand: It includes the information of supply, purchase, popular product, agricultural business opportunity, rural broker and consumption guide etc.

(6) Job wanted and application: It includes the information of job wanted, recruitment, company homepage, resume center, industry trends, vocational guidance and strategy of job wanted etc.

(7) Charming village: It introduces the information of rural home inns, leisure tourism and folk custom village etc.

(8) Township enterprise: It provides a show window for the township enterprise to promote the development of the township enterprise.

(9) Cooperative association: It introduces various cooperative associations to realize the cooperation of funds, technology, purchase, production, machining and marketing etc.

(10) Service: It includes the weather and train etc information related to rural life and trip.

4.2 Column on the village webpage

It includes fixed column and user-defined column. The fixed column includes village introduction, village leader, news, village affairs, medical treatment and public health,

characteristic product and notification that cover the basic information in the village. The user-defined column includes invite investment, business, charming village etc which is added by the messenger. In addition, there can be some service information.

4.2.1 Fixed column
The fixed column includes:

(1) Village introduction: It introduces the geographic position, population, resource and social production status etc.

(2) Village leader: It mainly introduces the members, duties and office contact etc of village party branch, village committee, villagers group and ladies' committee etc organizations.

(3) News: It releases the news and great event etc.

(4) Village affairs: It makes the village affairs more transparent.

(5) Medical treatment and public health: It releases the information of doctor and new rural cooperative medical system.

(6) Characteristic product: It introduces the agricultural products with regional characteristic in the village or adjacent area.

(7) Notification: It releases the important notification in the village and provides the short message notice.

4.2.2 User-defined column
The user-defined column includes:

(1) Invite investment: It introduces the investment environment, strategic study, planned layout, investment guide and policies and laws related to the inviting investment etc.

(2) Business: It introduces the business information in the village.

(3) Charming village: It includes beautiful village, new village new look and village tourism etc.

(4) Service information: It includes the common contact telephone and contact person in the village etc that provides the convenience for the villagers.

5   Conclusion

The paper designs the frame and function of one webpage system for each village in Shandong Province which realizes the realtime updating and maintenance of the basic date of the village. It is the part study of national science and technology support plan i.e. key technology integration and demonstration of agricultural and rural informationization which will provide the reference for the village information system in other province.

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