Authority Management in Forestry Information System Based on Asp.net Technology and Three Layer Network Architecture

Huaiqiang Li*[1], Qiang Yi[2], Yan Zhang[2]

[1]Henan University of economics and law, Zhengzhou, Henan, China
[2] Henan soil and water conservation monitoring station, Zhengzhou, Henan, China
*Corresponding Author.

Abstract:

Due to the complexity and diversity of forest environment, the data management and authority management of forestry information system are prone to confusion. In order to deal with a large amount of information, it often takes a lot of time, manpower and material resources to update and maintain the permission information. This paper discusses the three-tier network architecture of professional website authority management system based on asp.net technology. This paper elaborates the functions of user interface layer, business logic layer and data access layer, and their roles in authority management. This paper compares and analyzes the advantages and disadvantages of ASP and ASP. Net technology in professional website design. The experimental data show that the professional website authority management system based on asp.net technology improves the security, scalability and maintainability of the website, and achieves good results.

Keywords: *Permission information, forestry information system, network architecture, ASP, permission management system.*

I. INTRODUCTION

With the popularity of computer applications, people need to rely more and more on the network to disseminate relevant information, so each unit has established its own website [1]. However, at present, people use the website not only to release notices, announcements and other information, but also to achieve more functions through the website.

Usually, when using the computer, we often encounter such problems: the disunity of website design style, the disorder of page making and typesetting, a large amount of information complexity, website content publishing is very difficult, content accumulation, user management work efficiency is not high, video and audio information often can not be achieved through manual links [2-3]. The workload of website revision is heavy, the system expansion ability is poor, and the flexibility is reduced when integrating other applications. Why are these reasons? The main reason is that the unified management of its content is not considered in the development of the website, and a separate website is usually established for each theme when creating the website, but the unified management of the website content is not considered, resulting in the low efficiency and poor maintenance of the website construction. In order to solve the above problems, a content management system (CMS) based on. Net is developed. Finally, it realizes a flow and automatic process for users.

II. REQUIREMENT ANALYSIS

2.1 System use case analysis

The so-called participants refer to all the people or other systems that exist outside the system and interact with the system. In the actual operation of the system, an actual user may correspond to multiple participants of the system, and different users may only correspond to one participant, so as to represent different activities of the same participant, and each participant can participate in one or more activities [4].

Through the demand research of the CMS platform, we can see that all the actions are around the CMS platform users and target website administrators. Therefore, we can determine that there are two main types of participants: CMS platform users and administrators. According to the analysis, the system use case analysis diagram is obtained, as shown in Figure 1.
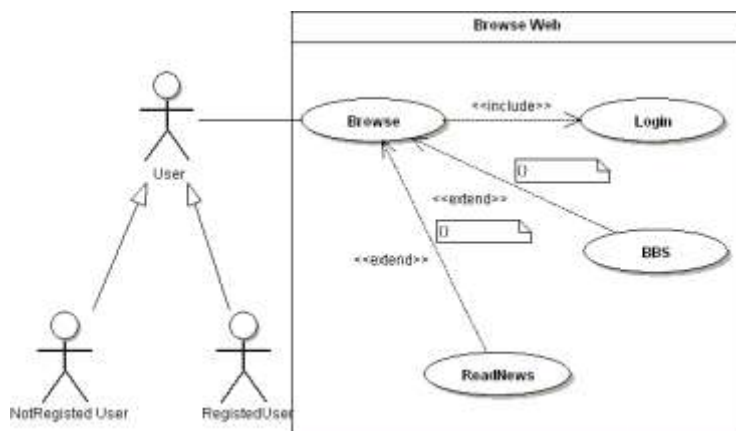
Fig 1: System use case diagram

(1) CMS platform users: in this system, CMS platform users need to participate, and CMS platform users use the system to realize rapid station building [5].

(2) Target website administrator: after using the CMS platform to quickly establish a website, the information of the target website needs to be maintained and managed [6].

(3) Super user: after using the CMS platform to quickly establish a website, the user can also maintain and manage the target website, set different permissions for different website users and administrators, and customize the operation permissions of any ordinary administrator on each module of the system [7-8].

2.2 External interface requirements

(1) User interface: it adopts the general graphical interface of windows, which is easy for users to operate and supports the operation of mouse and keyboard [9]. The design of interface should pay attention to the following principles: the interface should be unified, and the interface should be standardized according to the requirements of MS Windows software interface; Provide general errors and be able to handle them; Provide information feedback, through a variety of information to prompt users of the current operation of the system; The operation is reversible, and its action can be a unilateral operation or an independent operation sequence; Provide good online help function; Display the start-up screen, which is friendly, simple, beautiful and generous; We should follow the national standard of computer vocabulary, use words accurately, unambiguously, and express graphics properly.

(2) Hardware interface: support general PII or higher grade microcomputer, notebook computer.

(3) Software interface: it can run in WINDOWS 95/98/ME/2000/NT environment [10].

(4) Fault handling: the system in normal use to ensure that there will be no error, even if the system runs into unrecoverable errors, it will not damage the integrity of the database.

2.3 Other system requirements

(1) Accuracy and timeliness of system processing: the accuracy and timeliness of system processing are the necessary performance of the system. The recall rate should be guaranteed when querying, and all records containing query keywords in corresponding fields should be able to be found. In the process of system design and development, we should fully consider the current and future workload of the system, so that the processing capacity and response time of

the system can meet the needs of enterprises for information processing. Response time, update processing time are relatively fast and fast, fully meet the requirements of users. The response time of general operation should be within 1-2 seconds, and the operation of data import and export, floppy disk and printer should also be completed within acceptable time.

(2) The openness and expansibility of the system: in the process of system development, the expansibility in the future should be fully considered. When the function module of the system changes, it requires the system to provide enough means to adjust and expand the function. To achieve this, we should complete it through the openness of the system, that is, the system should be an open system. As long as it meets certain specifications, we can simply add and reduce the system modules and configure the system hardware. Through the repair and replacement of software, the system is upgraded and updated.

(3) Ease of use and maintenance of the system: the system is directly facing the user, and the user is often not very familiar with the computer. This requires the system to provide a good user interface, easy-to-use human-computer interaction interface. To achieve this, the system should try to use the familiar terms and Chinese information interface; For the problems that users may have, we should provide enough online help to shorten the process of users getting familiar with the system.

(4) Correctness: after the software is released, it can meet the user's expected needs, and there will be no errors in the running process.

(5) Efficiency: simple operation of user query, browse, delete, add, update information and password setting, requiring response time of 1-2 seconds.

(6) Testability: a lot of time spent in testing the functions of the software should be considered in the design.

(7) Reusability: during the development period, the modular design method is adopted as far as possible, and the requirements of each module port in the system are low coupling and high cohesion, so as to improve the reusability of each module.

(8) Comprehensibility: it is convenient for users to master various menu functions and prompt information operated by the system.

(9) Security and confidentiality: users are required to provide password verification. Users can use the software only when they pass the verification. If the password is entered incorrectly

three times, the system will be forced to shut down.

III. SYSTEM DESIGN

3.1 System architecture design

The content management system based on net architecture adopts the three-tier architecture of browser / Web / database. Browser provides a browsing mode, which belongs to the client operation layer. It is mainly responsible for submitting the data of the system and displaying the final processed results of the system. Web layer, also known as the middle layer, is responsible for the business processing and data format conversion of the system. In order to improve the stability and efficiency of the system, the JSON format of operating system data is used. Business logic class and database operation can complete business processing and data transfer. In traditional development, data is directly fed back to the data operation control of the client, which has a great impact on the performance of the system. Here we process the submitted data in the format, and finally generate the data in JSON format for the client. After the data is submitted in JSON format, the client can use the rich client technology to receive the data, which greatly improves the performance of the system, and truly achieves the efficiency of service request and processing. The specific software architecture design of the system is shown in Figure 2.
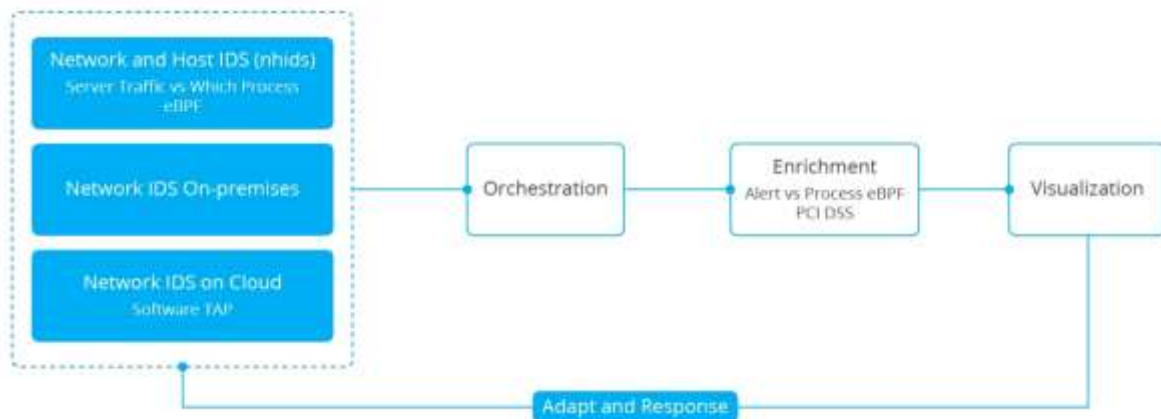
Fig 2: System software architecture diagram

3.2 System function design

Through the detailed analysis and research of the system, the functional requirements of the system are finally obtained. The system can be divided into five subsystems, including system building management, content management, label management, template management and

release management. The component diagram of system building system function industry is shown in Figure 3.
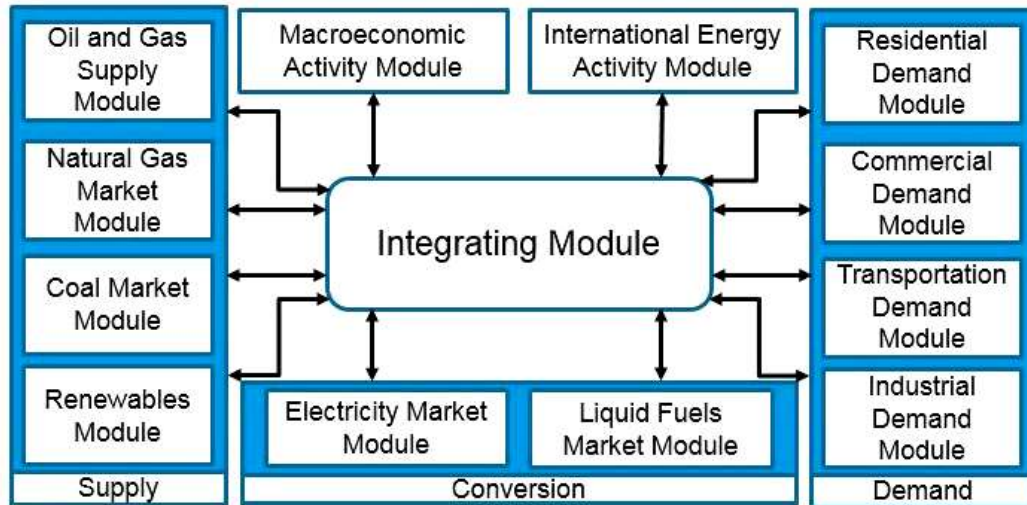

Fig 3: System function component diagram

1. System management system

This module mainly includes the basic operations of the article setting, column setting, website setting, post publishing and comment management of the website, which is the basic function of the content management system, and establishes the data base for other functions of the system. The system administrator can only operate these functions after entering the system, and other users cannot operate the module.

2. Content management system

Content management is the core module of the system. For the convenience of content entry of different systems, the resulting editing management interface integrates column management, article management, batch setting and other functions. Content management module structure diagram.

(1) Article management function: you can paste word directly into the system, you can keep word format, such as form, font, etc., you can also choose to paste content only, without format. Can insert any number of pictures, flash, video animation, visual adjustment position and size. It can directly import worm file and PPT file to automatically process pictures, charts and objects.

(2) Column management: can directly manage the site directory, support batch import files,

import directory, edit files and other functions.

(3) Batch setting management: batch processing of new content information can be realized to improve the efficiency of content management.

3. Release management system

Website publishing management is a module designed for content management. After adding content information, in order to ensure the efficiency of information running in the client, the system needs to publish and compile dynamic content information into corresponding static HTML page. Release management module includes one click static release of home page, list page and content page. Is an important part of the content management system, but also an important guarantee to improve the efficiency of website development and maintenance. Automatic generation of static web pages, the maintenance personnel upload the content, combined with the template made in advance, generate static web pages. There is no need to repeatedly extract information from the database, greatly improving the access speed.

4. Template management subsystem

The system provides a complete set of page template, users can also customize the template, the final output page, such as: website home page, sub channel / special page, news details page, etc. The system strengthens various combinations of system modules and user-defined modules, and realizes rich publishing combination logic.

5. Label management system

Automatically generate system labels, and customize label design and management. Integrate S.QL tags to enhance the scalability of business logic. Tag parsing is to extract the fields interacting with data sources in tags (database fields can be customized), and integrate fields, templates, and required replacement contents to generate pages.

IV. IMPLEMENTATION AND TEST OF THE SYSTEM

4.1 System function realization

1. Basic configuration of website information

The basic information configuration of the website, including website name, website address, file upload directory, system specified directory, website homepage logo, website homepage, record number, whether to enable Member Center, whether to enable anonymous contribution, etc. Through the basic configuration of website information, we can preliminarily determine the website style, framework design, etc., as shown in Figure 4.
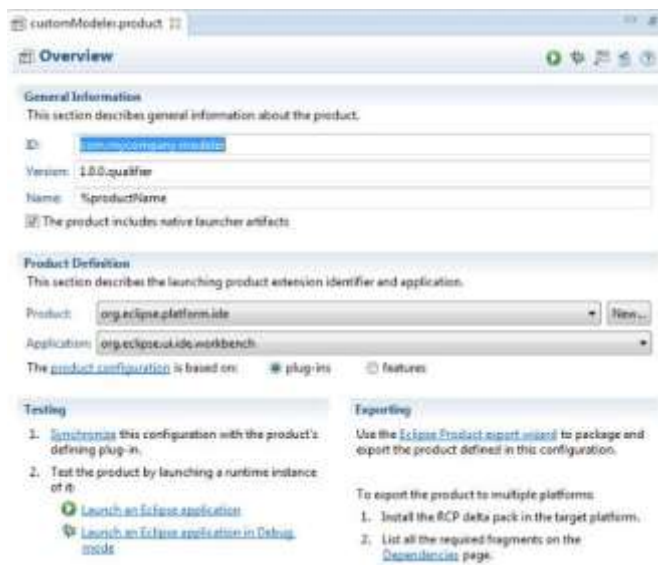
Fig 4: Website basic information configuration

2. Template program isolation processing

In order to realize the "complete separation of website template and program" and strengthen the website's assemblability and user's autonomy, the "template engine" technology is adopted to establish various templates (templates can be customized, and templates shared by others can also be downloaded and installed), so that different templates can be applied to different channels, columns, special topics and content pages to realize the personalized needs of templates. The template can be represented as an HTML page composed of various tags.

In the system, for each specific topic, the system provides a set of page templates (home page template, list page template, content page template), users can also customize the template, the final output page, such as: website home page, sub channel / special page, news details page, etc. The system allows the combination of user-defined modules and implementation templates to realize rich publishing combination logic.

The traditional template engine is the system's own tags and templates, users can not customize, the template engine in this paper further improves the user's autonomy, users can customize tags and templates according to the actual needs, which can greatly enhance the flexibility and scalability of the template engine.

3. Automatic tag parsing engine

In the case of data interaction in the template, label parsing is used to extract the fields interacting with the data source in the label, integrate the fields with the template, and replace

the label content. Finally, the processing results are displayed in the form of a complete "block". Tag parsing plays a bridge role in the interaction between template tags and data sources.

Tag parsing is to extract the fields that interact with the data source in the tag, and integrate the fields with the template to generate the page.

Tags include data source tags, custom tags for processing data, system tags, and custom tags. The data source tag is used to read data. Finally, the processing results are displayed in the form of a complete "block". Tag parsing involves the extraction and replacement of tag content, and the combination of tag and template to generate content page.

4.2 System test

After the system code is written, it must be tested. The goal of the test is to expose the errors in the program. The tester can make the program more perfect by testing. System function integration test is carried out to check whether the whole system meets the function, business and security requirements in the requirements specification. In the function test, we mainly test whether the system can complete the main functions, including: system login verification, system performance analysis test, data integrity test and core code recheck.

It can be seen from the test results that when the number of concurrent users is less than 20, the average response time of the system is less than 5 seconds, and the completion rate of things is 100%. When the number of concurrent users is more than 50, the response time of the system increases significantly, but it is also within the allowable range. This shows that the system can still keep running well when dealing with more operation requests. Through the principal and interest, the stable 7 * 24-hour trouble free operation has been realized. It can be seen that the stability of the system is relatively high.

V. CONCLUSION

With the enrichment and development of network applications, content management system has become a conventional auxiliary tool for website content editing and publishing. It plays an important role in managing huge and complicated background data and information, standardizing background information management process, reducing the complexity of website construction, and strengthening website operation management and content maintenance. Based on the current needs of website content management, through the analysis and comparison of traditional information management system, combined with software engineering methods, this paper studies the content management platform based on asp.net platform, and completes five

functions of system management, content management, label management, template management and release management.

Of course, there are many deficiencies in the design. For such software development, because there is no corresponding practical needs analysis, so in the development process encountered a lot of thorny problems. Now the developed software is not stable enough in the remote data automatic collection operation, and the exception handling is still lacking. At the time of design, due to the limited time and ability, some functions have not been realized. I hope the system can be realized when it is upgraded to a higher version in the future.

ACKNOWLEDGEMENTS

REFERENCES

[1] Bao Xiuguo, Hu Mingzeng, Zhang Hongli. Two Quantitative Analysis Methods for Survivability of Network Security Management Systems. Acta Communication Sinica, 2004, 25 (9): 34-41

[2] Yang Yi, Bian Yuan, Zhang Tianqiao. Network Security Situation Awareness Based on Machine Learning. Computer Science and Application, 2020, 10 (12): 8

[3] Li Zhiyong. Hierarchical Network Security Threat Situation Quantitative Assessment Method. Communication World, 2016, 23: 70-70

[4] Hu Wenji, Xu Mingwei. Analysis of Secure Routing Protocols for Wireless Sensor Networks. Journal of Beijing University of Posts and Telecommunications, 2006, 29 (s1): 107-111

[5] Wei Yonglian, Yi Feng, Feng Dengguo, Yong W, Yifeng L. Network Security Situation Assessment Model Based on Information Fusion. Computer Research and Development, 2009, 46 (3): 353-362

[6] Xu Guoguang, Li Tao, Wang Yifeng. A Network Security Real-time Risk Detection Method Based on Artificial Immune. Computer Engineering, 2005,31 (12): 945-949

[7] Jiang Wei, Fang Binxing, Tian Zhihong. Network Security Evaluation and Optimal Active Defense Based on Attack Defense Game Model. Acta Computer Sinica, 2009, 32 (004): 817-827

[8] Miao Yongqing. Stochastic Model Method and Evaluation Technology of Network Security. China Science and Technology Investment, 2017, 4: 314

[9] Yi Hua Zhou, Wei Min Shi, Wei Ma. Research on Computer Network Security Teaching Mode for Postgraduates Under the Background of New Engineering. Innovation and Practice of Teaching Methods, 2020, 3 (14): 169

[10] Li Weiming, Lei Jie, Dong Jing. an Optimized Real-time Network Security Risk Quantification Method. Acta Computa Sinica, 2009 (04): 793-804