

The Design of Non-Metallic Mineral Website Based on Information Architecture

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Abstract Non-metallic minerals industry is an important industry in China, and its development is related with China's economic development. To address the problems in the development process of China's non-metallic mineral industry, the paper applies information architecture to study the website design of non-metallic minerals industry. It determines the objectives of website and the function expected to be achieved, determines the information content and structure of non-metallic mining website and designs the site's navigation and search system. Based on the information architecture theory, the design of website of non-metallic minerals industry can achieve the effective combination of users, environment and information, and provide standardized information and technology for researchers of China non-metallic minerals industry, which will help promote the development of China non-metallic minerals industry.

Key words Non-metallic minerals; Information architecture; Navigation system; Search system

1 Introduction

At present, China has found about 110 kinds of non-metallic minerals, nearly 90 species has been proven reserves, annual output is more than 40 million tons, and widely distributed^[1]. Along with non-metallic mineral resources exploration and development, while many of our non-metallic mineral resources meet the rapid economic development needs, a large number of them has been exported and also used in many high-tech fields to develop new products. However, there are many problems in our non-metallic mineral industry, such as: low annex value, small-scale production enterprises can not form a cluster and the chain effect^[2]. National "Eleventh Five-Year Scientific and Technological Support Program" sets up "high performance non-metallic mineral material preparation techniques" task, it intends to improve the status of non-metallic mining industry, solve the problems faced by non-metallic mineral industries, promote the development of non-metallic mineral industries, and the task contains nine sub-topics. Issue nine "non-metallic mineral material basic Information testing technology and key equipment research" main research testing methods, testing equipment of betonies and tourmaline, mineral basic information parameters of typical mining and application technology of betonies, tourmaline in China. This subject is the first time of accurately testing the minerals performance of typical betonies and tourmaline mineral point in China, establishing complete and unified betonies and tourmaline test specifications, developing critical test equipment and establishing China's non-metallic mineral materials information resource database, and betonies, tourmaline mineral basic information performance data and application information services function package^[3].

Information construction is basic of organization and management information resources. It describes theory, principles and guidelines that design an effective information management framework must need. The core elements of information construction is the organization system, the marking system, navigation system and search system design, and the purpose is to help people find and manage information in network and Web environment more successfully, and solve the user's information needs effectively^[4]. Information construction has been applied in the website construction by many experts at home and abroad, (Deng Chang 2007) establish evaluating index system that suit to the university library website from the information construction theory^[5]. (Qi Shuxia 2005) puts forward the construction process of website based on IA, points out enterprises website construction based on IA must follow the WEB standards follows the enterprise WEB based on IA comprehensive evaluation method, and discuss the comprehensive evaluation method of enterprise website based on IA^[6].

This is the first time that uses information architecture theory to design the non-metallic mineral website. From the view of information, users and information environment to construct non-metallic mining site has great significance for it: (1) Non-metallic website includes the basic information, application information, patents, standard and test technology, application research, new technology of dynamic etc about non-metallic minerals and products. This can be used to guide us exploit mineral resources rationally and processed mineral resources highly and efficiently. The non-metallic websites can guide users to choose the most suitable mineral materials, promote the development of non-metallic

industry. (2)The building of non-metallic website provides information about non-metallic and users can browse non-metallic websites information conveniently. At the same time the non-metallic website has the function of interactive forum; users can participate in the discussion about non-metallic information. (3)The building of non-metallic websites is conducive to realize integration of users, non-metallic information and t environment, and provides information resource for scientific researchers with non-metallic information, and is conducive to strengthen and perfect cross-industry, multi-level joint research and collaborative mechanism, and promote the development of non-metallic industry.

2 Building Objectives and Functions of Non-metallic Minerals Website

2.1 Building objectives of website

The construction of non-metallic websites uses step by step implement and rolling development strategy: the first stage mainly involves betonies and tourmaline two minerals, including performance parameters of basic information and application information, patent, standard, development trends, application research and testing technology and realizing the functions of query, interactive forum, news information and the function of background management. The first phase of the non-metallic websites is full scalability and provides convent for the second phase; the construction of non-metallic websites in second phase will carry out with the completion of other non-metallic mineral resources information, adding the basic information, application information, patent , standard, development trends and application research and testing technology information of other minerals except betonies and tourmaline, and forming the rolling development of non-metallic industry and adding the function of experts review. The main purpose of non-metallic websites construction is to realize knowledge management about research results done by experts in the field of non-metallic at home and abroad, provide the knowledge service and sharing for scholars and researchers in the field of non-metallic industry, and realize non-metallic industry efficient and rapid development^[7].

2.2 Functions of website

The function of non-metallic website is divided into front and back management functions. The front main includes search, interactive forum, and news information.

(1) Information search main achieves the functions of users query related information of non-metallic mineral. It can be divided into non-metallic mineral resources, Non-metallic mineral materials, patent, and standard by search content, and by the function inquiry module it can be divided into general search and advanced search.

(2) Interactive forum mainly provides users with an exchange platform. Membership in the forum can view the information in the forum, discuss the minerals, products, standards, patents, reports and other information, and issue new posts and reply to other posts.

(3) News information module main provides users with the latest developments and non-metallic minerals industries news in domestic and foreign, the user can understand the development dynamic of non-metallic mineral industry.

(4) Background management function achieves the background management of non-metallic mineral site, it can be divided into four sections by management content: user management, basic information management, news information management and interactive forum management, and it achieves the function of add, delete, modify and so on.

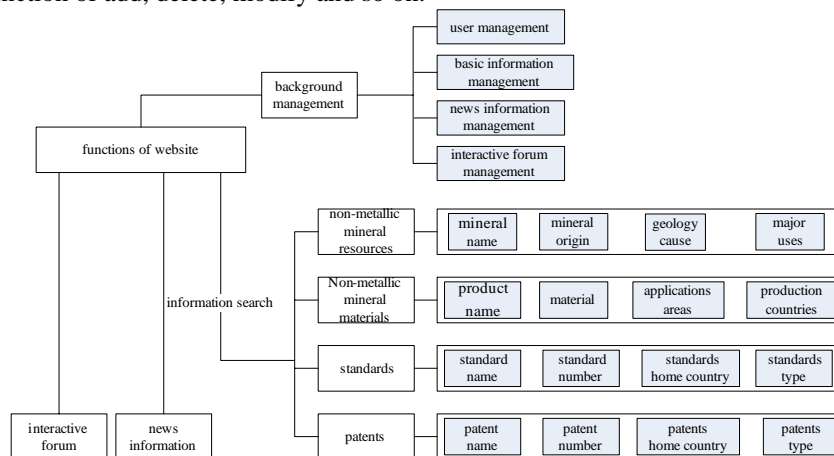


Figure 1 The Function of the Non-metallic Minerals Website

3 The Process of Non-metallic Minerals Website Building

3.1 Information organization stage

At present, the information of non-metallic mineral is too much, but considering the amount of content issues and avoiding the total information overload and shortages of available information. The site according to predetermined objectives and functions to be achieved, it organizes and screens all non-metallic mineral information and identifies non-metallic mining site mainly contains information on the following aspects:

(1) Non-metallic mineral resources. Non-metallic mineral resources mainly include mineral name, mineral origin, profile, geology cause, reserves, type, major uses, physical properties, chemical properties, functional properties and other information.

(2) Non-metallic mineral materials. Non-metallic mineral materials is products made by non-metallic mineral resources, they involve energy efficiency, environmental protection, agriculture, water efficiency, medicine, machinery, electricity, light and chemical nine application areas. Application information describes the main process, product performance, product formulation, use places and other information related to the non-metallic mineral products, it provides basis for us when we make testing of non-metallic mineral products.

(3) Patent information. Patent information in the non-metallic mineral materials information resource database covers all the patents information of non-metallic mineral materials and products at home and abroad, and innovation of new technology, new product in the field of non-metallic mineral; this will lead to the development of non-metallic mineral industries.

(4) Standard information. Standard information is divided into four levels: international standards, national standards, industry standards and enterprise standards. At present, China's non-metallic minerals industry develops slowly, the common key technologies, products preparation methods and certain exploitation methods of some mineral resource have not form uniform standard. The non-metallic mineral material information resource database we constructed is mean to solve the problem in these regards, it will make the non-metallic mineral industry standardization through the study of experts in non-metallic mineral sectors, and make the development of non-metallic more industrialized, and direct the development of other related industries.

(5) New technology dynamic. New technology dynamic is research reports of mineral application and development trend, and they are published by authority organization in different minerals area. The report mainly deals with new technologies, new products and other content in non-metallic mineral industry, as a dynamic report it will lead the development of non-metallic minerals industry.

(6) Testing technology. Testing technology is research reports of test technology related to non-metallic mineral resources and products.

(7) Application research. It main includes applications field, applicable scope and other information of the non-metallic mineral resources and products.

3.2 Design of navigation system

Navigation system determines how users browse and search web content and help users understand their location and what they can gain from this website, like road signs or maps in reality life. Navigation system consist many navigation elements, they embed in the webpage and provide navigation path for users browsing the site. This website's navigation system with global navigation, local navigation and context Navigation mainly, and with site map auxiliary

(1) Global navigation. Global navigation system as an overall navigation of non-metallic mining website, it provides navigation links to any interface under the main page for users. The global navigation in this website is on the top of the website by the form of navigation, it guides users to view the entire website. Navigation mainly includes: non-metallic mineral resources, non-metallic mineral materials, testing techniques, standards and patents, applied research, new technology dynamics, non-metallic mining news, non-metallic mineral forum.

(2) Local Navigation. Local Navigation in this site is set up on the basis of the global navigation, it mean to subdivide the content under global navigation, and the local navigation is different when the content page is different, its main purpose is to allow users to view information according to the hierarchical in the field of contents. For example: In the non-metallic mineral resources page, due to non-metallic mineral resources include a wide variety of minerals, in order to facilitate users' needs of browsing the information of mineral non-metallic mineral resources, we design local navigation, we also design local navigation in other pages.

(3) Context Navigation. Context Navigation is text type links navigation system that embedded in the text paragraph, and more used for non-critical information, allowing users to browse the information that relate to content they are reading. Context navigation on this site primarily as the supplement of global navigation and local navigation, it uses text links navigation system and embeds into the paragraph and text. For example, the link of "physical and chemical nature and function" in the information of betonies can display the detailed information of physical and chemical properties and functional properties of betonies.

(4) Website Map. In addition to global navigation, local navigation, and context navigation systems, the non-metallic mining site also designs the website map; the website map makes part of information together and displays to the user as the form of map.

3.3 Design of search system

Search interface is the channel for user r search information. It searches the site content and submits search results to the users by providing a search tool and according to user's question and some search algorithm.

Navigation and search system are not isolated, but they are interrelated and affect, and supported by invisible component. Search system is the supplement of navigation system. Because the amount of information in website is usually large, it is difficult for users to find the information they need when they face a large amount of information, therefore, users often want to find the information they need quickly through retrieval system. The main purpose of non-metallic mining websites is to provide information (such as: mineral resources, and related products, such as patents, standards, testing technology, and other cutting-edge developments information) for researchers as the form of website and provide convenience for their scientific research work, so the design of website must satisfy the need of finding target information quickly, this requires the non-metallic mining website must have the powerful search system in addition to the navigation system.

The search system of non-metallic mineral site is divided into advanced search and general search. Advanced search main achieves flexible queries which refer to libraries' retrieval systems: users can select inquiry areas actively. First users choose the search scope of information, mainly divided into minerals, product, patent and standard; and then select search criteria in the lower search box; finally input keywords in the search column to complete search. For example, we select patent in the search section; then display search criteria related to patent in the secondary search box: patent name, patent number, patent country and patent types, users enter keywords in the search column, then it displays the associated patent information. The advanced search also can achieve fuzzy search function. User does not specify the query information is minerals, products, patents, or standard but select all directly, and then enters keywords in the search column, it also can display associated information of minerals, products, patents and standards.

General search is similar to the ordinary website. They are placed on the pages of minerals, products, patents, standard, testing technology, applied research and new technological developments, each sub-information can be retrieved by different standards. For example: minerals can be retrieved in accordance with the mineral name, mineral origin, minerals types, main purpose, and geological origin.

4 Conclusions

In this paper we use information architecture theory to design the non-metallic mineral website. It mainly includes the information organization and the design navigation systems and retrieval system.

(1)The information of non-metallic minerals website only includes basic information, application information, patent and standard, testing technology, applied research and new technological developments and other information of betonies and tourmaline now, We will adopt gradually planning and rolling development strategy to cover all the non-metallic mineral information in the future, thus promote the whole development of the non-metallic mining industry.

(2)The navigation system of non-metallic mining website consists of global navigation, local navigation, context navigation and site maps, the four parts is the overall navigation system of non-metallic mining site, and it provides the path for users to visit non-metallic mining website.

(3)The search system of non-metallic mining site includes advanced search and general search two parts. The main purpose of the construction of non-metallic mineral websites is to provide users with non-metallic mineral-related information, facilitate users to browse the information they concern about in the website, so non-metallic mining site designs search system includes advanced search and general search to meet users' need of inquiring related non-metallic mineral information.

Using information architecture theory to design of non-metallic mining website provides basis for the construction and implementation of non-metallic mining website. Starting from user needs, covering all the information of non-metallic minerals, designing environment is conducive to the development of non-metallic mineral industry, it reflects the unity of information resources, users and the environment of non-metallic mining website. The design of non-metallic mining website based on information architecture theory provides help for improve the situation of underdevelopment of non-metallic minerals industry in China, conducive to form standard and achieves information sharing of non-metallic minerals industry, so it can promote the development of non-metallic minerals industry health and orderly.

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