

GOVERNMENT GIS BUILDING BASED ON THE THEORY OF INFORMATION ARCHITECTURE

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Abstract

Geographic Information is the important component of information resource on government affairs. It has been widely used in all aspects of the government transaction processing, such as emergency handling, regional spatial planning, and so on. In China, the Geographic Information Systems for Government are being built in many fields. However, the contradiction lies that GIS for government are usually developed by geographer, and used by the employees in government departments that have no geographic background. How to resolve the contradiction is the key for GIS to play an important role in government. After analyzing the differences in application mode between government geographic information system and professional geographic information system, this paper will bring up the model and methods to build Government Geographic Information System, Including: 1 To build Government Geographic Information System using the construction model of government web sites, makes that people who can use the Internet will be able to use the Government Geographic Information System. 2 Adopting the principle of Information Architecture, establishing the organizational system, identification system, navigation system, search system of Government GIS, the system's information organization will be orderly, reasonable and effective. Thus, the user can easily access to information as well as knowledge, and the user will acquire better experience. 3 Component building the traditional function of GIS and encapsulation of parameter, can realize the geographic information and government affairs information integrated. This will modify the traditional function of GIS into information items accepted by government users.

Key words: Geographic Information System(GIS) Government affairs information E-government Information Architecture(IA)

Introduction

Fundamental geo-spatial database was listed one of four E-government foundation databases in China. Geographic information has been widely used in all aspects of the government transaction processing. GIS was applied to government administration, emergency handling, region spatial planning, and so on. It has been important one of E-government building. In general, Government geographic information system is developed by professionals but used by government departments, non-professional. During the system construction, resolving the conflict well is the key that geographic

information plays an important role in e-government.

Geographic Information System in general is more focused on providing the tools such as geo-spatial data processing, visualization of expression, spatial analysis and multi-source spatial data mining. The system functions operation and information retrieval demand users with high professionalism about geographic information. Professional Geographic Information System rarely takes into account the using way, the information organization and the user's experience. In this paper, the author analyzed the difference between Government GIS applications model with professional GIS on the first. Then, writer brought forward Government GIS building mode and methods of information organization basing on the principles of Information Architecture, geo-coding technology, GIS components technology and so on.

1 Government GIS application mode analysis

The traditional GIS often focus on the geographic information handling, information analysis, and have strong data processing and information analysis functions. Main functions include data collecting and editing, data storage and management, expression of information visualization, cartography, spatial statistics and analysis. The tools above-mentioned, system interface, system information organization mode, are fit for professionals.

Government GIS is faced to government department. It focuses on the integration of Chief resources information and geo-spatial information, and focuses on providing location-related information services for government leaders and related staffs. This demands that government affairs information should be the main body in Government GIS, and integrate geo-spatial information basing on government affairs information. Thus, geographic information will be anywhere, and users can make use of it conveniently anytime. Therefore, Government GIS is different obviously from traditional GIS in functions, interface, information organized. The system must have a user-friendly interface, the users can easily obtain the information they required. System's functions should be simple, easy-to-use, displaying information mainly. The level of information organization should be simple, information indexing and navigation should be clear.

2 Government GIS building mode

The era of information, the Internet is very popular in government departments already. No training, almost everyone can operate the Internet, access the knowledge they need. At the same time, most of the other information systems used by government departments also usually adopt the web's building mode and information displaying means. So, according to the work characteristics of government departments, the needs and applications for information resources, the author brought forward the construction model of Government GIS. That is, using website-building mode to organize the system's information and realize the system's function. The technology and method used to build Government GIS include geographic information services component, web-style information architecture, and geo-coding techniques. Thus, we can complete the rationalization of information resources organizations, and ultimately achieve the system is simple, user-friendly, features available and easy to use, etc.

3 Government GIS website information architecture and organization methods

3.1 Information organization based on the principles of information architecture

IA, acronym for Information Architecture, was creatively put forward by Mr. Richard Saul Wurman, the American Architects. He regarded the information sequence issue as an architectural design work served for specific targets, thereby formed the corresponding field of study ^[1]. In recent years, with computer science and information technology in-depth development, extensive popularity, the theory and practice about IA have been widespread concerned. In accordance with the results of research scholars and the views of Mr. Wurman, IA can be defined as that it is an Arts and Sciences to organize information and design information environment, information space or information structure, to meet the information requester's special needs. IA, including investigation, analysis, designing and implementation process, involves the designing of organization, logo, navigation and search system. It is designed to help people finding and managing information successfully. At present, the principles and methods of information architecture are widely used in the construction of government websites, Science Information Management, etc.

From the macroscopic view, to build the information organization framework of Government GIS needs to reference the way of the government portal website construction, to complete the system of organization system, labeling system, navigation system, searching system Basing on the principles of information architecture. The aims of IA used to organize system information are as following: From the results of information Processing and organizing, it is necessary to achieve the information coherent and information understandable. From the using results, the system should achieve that information is useful and availability strongly, and user has a good experience.

Information organization system should represent the system's function adequately, and it is necessary to accord with the logic that users use information. The information grouped should represent the theme, and according to the services to organize information by category. Information identification system must be canonical and uniform. An appropriate name for each identified category, the name should be fit in with people's habits, and also be able to cover and contained all the information which is in that category. In this way, users can know the location which the current page is. Navigation system can help users to apperceive information content and organizational structure, so that users can maintain a sense of location and direction well, and quickly find the specific content in the system's information collection, access information quickly. Search system can provide users with search engines so that information can be quickly and easily used by users. Information search system is an important part of IA, and it is a main means that the users acquire information in good time. Although the information category and content are numerous in the Government GIS organized basing the principle of IA, but also the system's information organization structure is clear, orderly.

3.2 Information organization basing on the deep integration of Geospatial information with government affairs information

IA Principle applies to all Web-style information systems to build the organization structure. It is mainly used to design information structure of the system, to organize information by classification or by sub-block. But, for Government GIS, there is its particularity. It involves a large number of geo-spatial information. This gives us the conditions to realize information organization building from micro-level through the organic integration between geospatial information with government information. The main methods include the geo-spatial information services component and adopting geo-coding technology.

(1) Organizing information by geo-spatial information services components

By information architecture, after completing the information organization framework such as sites, Columns and so on. , detailed information also needs to be organized and constructed. Through geo-spatial information services component, hyperlink and information entry embed, we can realize the integration of the government affairs information such as geo-spatial information, text, statistic tables and multi-media information. There are three kinds of organization styles. First of all, the geo-spatial information services component are packaged to entry of information directly, unified organization and scheduling with other information entries. Second, geo-spatial information services components are inserted into government information web page, to achieve a deeper level information fusion. The third, using key word extraction and map dictionary technology, by getting word from web page to call geo-spatial information services.

(2) Using geo-coding technology to complete the information organization in micro-level

Information Architecture completed, the system's information organized by category or by blocks according to entry sub-organization, is clearly and easy to be operated. But the best grade of the information layer is 3 to 4, can't be nested indefinitely. Specific to the geographical entity information organizations, geo-coding technology and relational database technology can be used. The geographical entity as the carrier, it will be associated with the attribute information by geo-code, thereby, to achieve information integration. And from the perspective of user-friendly, table shows the information so that the achievement of entity-level information organization and information architecture. For example, the geographic situation, nature resources, socio-economic conditions and other related information of an administrative region can be packaged to the right mouse button information through the code associated, Activation in the region, click the mouse right button will display a list of relevant information of the region. Selecting one item of the catalog can pop-up the corresponding information detailed.

3.3 Synthesis affairs information and geo-spatial information integrated full-text searching

Mentioned above, information searching system is an important aspect of system information architecture, and is an important way that users access to information quickly. The searching system of Government GIS Website not only will achieve the website information searching function in conventional significance, but also achieve the integration retrieval of geographic information with other government affairs

information resource. Because of the data structures heterogeneous and the displaying means differences between geo-spatial information with government affairs information, it has been a more difficult problem to realize the integration full-text information retrieval of geo-spatial information and documents, forms and other information resources. Basing Website information management mode, to achieve full-text searching function of the Government GIS, the following works need to be done. First, the organization structure of database which includes sites, banners, entries, comprehensive information index, place names index and other information should be established. Second, associated with the related inquiries and retrieval functions of relational database, we established the unified index of information for retrieval to all information resources. At the client-side, the interaction information retrieval window was established, thus, we can retrieval the indexing information by the key words, and then pop-up the list to show all of the information retrieved entry, and through linking visualization component of all kinds of information, to complete dispatching and displaying of various types of information which includes geo-spatial information.

4 Applications

The method of information architecture and information organization Mentioned in this article was applied to the National Spatial Information System which provides geographic information services for government departments, and which has achieved good results. The information resources involved in the National Spatial Information System include geo-spatial information, comprehensive national information, resources and environment space and statistical information, natural disasters space and statistical information, population and economic statistics information, the status information about urban development, etc. The system's data amount was counted by TB-level; the information amount is very rich and complex. The methods above mentioned application, we established the clear organizational structure of information, logos, navigation and search system in the National Spatial Information System. At the same time, complex functions of all types of geographic information services were simplified to entry, buttons, etc., users can quickly find the information they need.

5 Conclusions

Government GIS Website building is an important integral part of E-Government construction, and it can not be ignored that its information resources is organized and built effectively and reasonably. Only the system conforming to the principles of Information Architecture and achieving Information Architecture target is the Government GIS which is available and practicably, and it can be accepted and recognized by government departments, and can play an important role in E-government. Therefore, the important role of Information Architecture will be attracted more and more great importance by majority builders of Government GIS. Information Architecture principles and methods will also be used widely in the building of Government GIS. I hope that this paper can provide valuable reference for the similar systems construction.

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