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Design Path and Application Analysis of Integrated Geological Data Management Platform

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Abstract: *Data is the main carrier of geological work to serve the society, and it is also an important information resource to serve the development of geological prospecting and other industries. There are many problems in the management of geological data in most geological data collection institutions. All kinds of reasons lead to the lack of effective management and update of geological data, and even the lack of sharing methods. Based on GIS location service, the provincial basic geographic information data, physical preservation and storage data and the file information of collected physical geological data are integrated, and the provincial information management platform of physical geological data is designed and implemented, which can effectively improve the management, development and utilization rate of physical geological data. From the practice of geological data management in China for more than 50 years, as geological data production units and collection organizations have followed the idea of geological data file management, a geological data-based working mode has been formed, which emphasizes collection and neglects utilization. All kinds of geological data are integrated to realize unified geological data management and model application. By analyzing them, the design scheme of management system is put forward, the functions of each module are introduced in detail, and the corresponding implementation methods are pointed out, which provides an example for the construction and typical application of this kind of management system.*

Keywords: *Geological data; Design path; Application Insights*

1. Introduction

With the development of network technology and information technology, the digital management of geological data information is gradually realized. The use of digital technology has brought great convenience to management work, and the powerful functions of the system platform have also fostered the application of data to better provide social services. On the basis of the continuous progress of science and technology, China has carried out the research and development of green geological exploration technology based on the concept of green environmental protection, and gradually improved the environmental protection of the geological exploration process and technology. Geological data service is not only simple query, borrowing, copying and utilization, but more importantly, secondary development and in-depth development of geological data. The original geological data is rich in information, and the data is relatively accurate and extremely valuable. As an important achievement of geological work, geological data can not only be used directly and effectively in the construction of national economy, but also can be used for further research, statistics and analysis based on the existing geological archives data, and new laws can be found and summarized. , not only to develop and utilize the result information again on the existing data, but also to provide a new idea for the planning and deployment of geological work.

2. Characteristics of geological data

Geological data refers to the original geological data, achievement geological data and rock ore cores, various light flakes, specimens, samples and other physical geological data formed in geological work in the form of sound images, charts, electromagnetic media, texts and so on. For the physical geological data that has been collected and stored in the provincial collection of physical geological data, it must be managed and displayed in the form of a case file in accordance with the norms, so as to improve the information management level and digital utilization efficiency of the physical geological data in the provincial collection. When managing geological material collection institutions, due to the chaotic management system in China, the vegetation growth environment in the excavation area and its

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surrounding area will be damaged during the process of surface excavation, resulting in plant growth being affected. In addition to the social, scientific and economic characteristics of geological data, it also has the following characteristics.

2.1. Originality and foundation

It is the most primitive data obtained in the process of geological survey, mineral resources exploration, geological scientific research, etc. It is the basis and basis for scientific research, comprehensive analysis, national economic planning and construction in the later period. This platform adopts the online geographic location information service of Sky Map to meet the location query and positioning requirements of physical geological data. In the process of geological exploration, surveyors often make improper behaviors, such as overbreak in the process of soil excavation and substandard application of drilling technology, which will directly affect plants and animals, and many surveys need to be stationed in the exploration area for a long time. Geophysical and chemical database, borehole geological database and mineral resources and reserves database, etc., with typical gold deposits as the focus of analysis and excavation, establish the framework of geological data service product system, and realize unified management and model application of geological data information. Regardless of meeting the increasing demand of the public for geological data or comparing with the practice of socialized service of geological data in major developed countries, adhering to socialized service is the development direction of geological data management in China in the future. With the rapid development of economy, the country's demand for mineral resources and geological information is increasing, and the use value of geological data will increase.

2.2. The formation cost is high and the formation time is long

Geological work is a highly exploratory scientific research work, with the characteristics of long cycle, high risk and large investment. When applied in shallow drilling, the application environment and region of the technology should be clearly defined to reduce the disturbance to other parts, thereby reducing the impact on the natural environment. The most important function of the visual geological data management and sharing platform is the socialization service of geological data, combined with the development trend of the industry and the characteristics of geological data. Original documentary is the essential property of archives. This kind of original documentary is manifested on the one hand in the content of the archives, and on the other hand in the form of the archives, such as the manuscripts of the parties, the signatures of the leaders, etc., all of which show the true originality. The results of the project are correspondingly characterized by high cost and long span of time. Therefore, attaching importance to the management and utilization of geological data and improving its utilization rate can save costs and improve efficiency.

2.3. Strong professional technology and wide application range

Geology is the forerunner of national economic construction, and all fields related to human survival and development need geological work, and residents' life needs energy. The research and development of this platform provides an advanced information platform for the management of provincial physical geological data, provides intuitive auxiliary decision support for relevant administrative departments, and effectively improves the service ability of physical geological data. As a result, geological data are neglected in management, and have not been updated for a long time. Moreover, in the employment system, some officials and collectors' organizations with half-time geological resources often become places where some leaders arrange for idle staff to "take care of themselves and provide for the elderly". If the pressure is too small, the crankshaft, piston, bearing and other components will be consumed at an accelerated rate. The main reasons are the poor performance of the oil pump itself, the oil leakage of the oil pipe, the pressure limit of the valve and the weakening of the elasticity of the oil return spring. In addition, the geological data formed in different stages of geological work also have different utilization values. For example, the results of prospecting stage in the process of mineral exploration are the basic data of local economic development planning, and the results of detailed investigation or exploration are the basis of mine construction.

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3. System Design and Implementation

3.1. System Architecture

The visualized geological data management and sharing platform is a database-based network application, and the architecture includes a data layer, network layer, transmission layer, and application layer (Fig. 1).

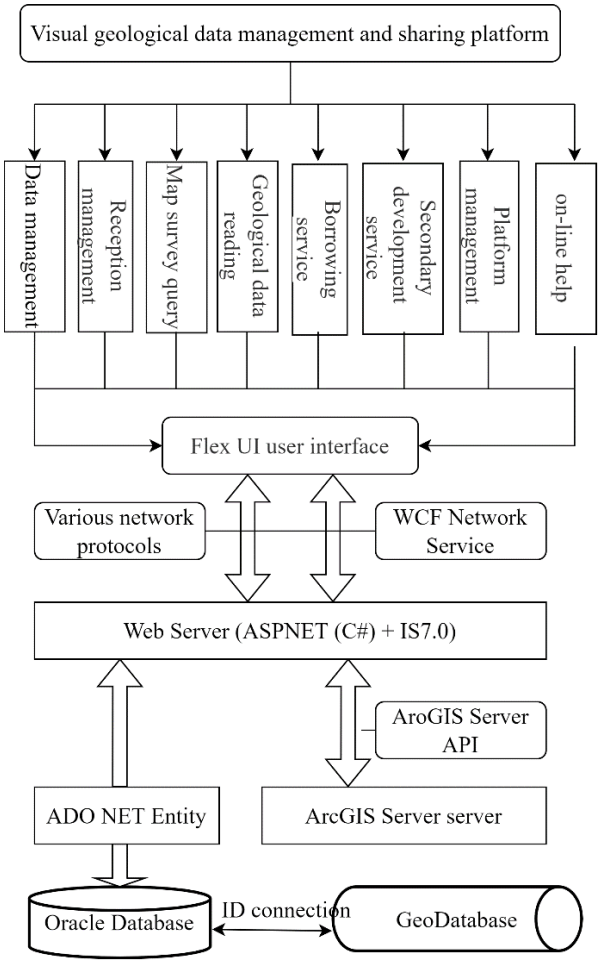

Figure 1: Schematic diagram of system architecture

3.2. System function design

(1) Geological data management function:

It can display all the geological data information in the library by paging, make statistics on geological data, and add, delete, check and change geological data;

(2) Retrieval function: it provides multi-parameter retrieval setting function, which can retrieve all the geological data information in a fuzzy way according to different keyword combinations;

(3) Online upload function: it has the function of uploading electronic files of geological data when adding geological data online;

(4) Online browsing function: It has online display function for common electronic file formats, providing users with browsing and browsing, such as text format, picture format, Office file format, PDF file format, etc.

(5) Online error correction function: provide online error correction function for information errors found by users, and the error correction information will be reviewed by the administrator.

(6) Borrowing service function: providing online borrowing and reservation service function of geological data, which is convenient for users to borrow or view the original physical geological data.

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3.3. Database design system

SQL Server 2005 is selected as the data management platform, which has the advantages of multi-core, business intelligence, high availability and easy management. It is a way and method to get twice the result with half the effort to develop and utilize the achievement information again on the existing data, so that it can provide better utilization value for the development of various social industries and geological prospecting.

4. Conclusions

Geological data is an information resource with great use value, and it is also an intangible asset for the survival and development of geological survey teams. The software combines database technology, network technology, geographic information system technology and other means to complete the development, explores the multi-source data integration method of geological data, and studies and uses mathematical geological methods to process, screen and excavate the original data. The Geological Data Management and Application System is an example of the use of geological data for prospecting. The visual geological data management and sharing platform can solve these problems well, not only to strengthen the management of geological data, improve the utilization rate of data but also provide better social services to meet the needs of users for geological data. Giving full play to the role of geological data achievements in economic activities such as geological prospecting, mineral development, project opening, bidding and financing, and engineering construction will be a huge challenge facing the management institutions of geological achievements, and it is also an important task for the management and development of geological data.

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