Discussion on the New Opportunities for the Development of Geographic Information System

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Abstract: Modern information technology is advancing by leaps and bounds, and geographic information systems is widely used. So this article will specifically explore the connotation of geographic information systems, and put forward new ideas for the development of geographic information systems in order to provide a reference and an insight to the people.

Introduction

After World War II, various countries accelerated the pace of technological research and launched a vigorous scientific and technological revolution. The application range of computers is becoming more and more widespread, and information-based data processing systems have emerged at the historic moment. In the context of the information age, the importance of spatial information is self-evident. People need to use spatial information to achieve optimal allocation of resources and efficient monitoring of the environment. Geographic information system meets the needs of spatial information collection and processing. China should predict the development trend of geographic information systems and increase the development of geographic information systems.

1. Geographic Information System Overview

Geographic information system integrates the knowledge of multiple disciplines, which covers a wide range. Scholars have different research perspectives, and have given different definitions to geographic information system. From the perspective of function, some scholars believe that GIS is an intelligent system with functions of geographic information collection, storage, and analysis [1]. From the perspective of application, some scholars believe that GIS is a computer system that can be applied in the fields of land resource management and urban spatial planning. From the perspective of the toolbox, some scholars believe that GIS is a comprehensive system that integrates collection tools, storage tools, and query tools. From the perspective of data, some scholars believe that geographic information systems are operational systems that contain databases. Geographic information system is based on computer, database as the foundation, and spatial analysis as the key performance. Geographic information system realizes the rapid input and output of data, improves the efficiency of data management, and facilitates data analysis and decision-making.

2. System Design Ideas

Modern technology is constantly updated, the software is updated quickly, and the design of geographic information systems becomes more difficult. In order to achieve the set goals, engineering planning needs to be carried out in accordance with software engineering ideas. Common GIS design methods include structured system analysis methods, etc. This analysis method divides the system into functional modules, forming different development stages, restoring the entire cycle of system development, and gaining good application results. . Some system development projects are relatively complicated, and designers lack reference templates and cannot draw on the actual development experience of similar projects. Developers and users need to spend

a long time to see the full picture of the system [2]. The system developer is responsible for important work tasks. It needs to optimize the system analysis report, adjust the design concept according to the actual situation, and carry out specific operations in accordance with the instructions. Users and system developers are in different positions, and their horizons are different. Despite the efforts of system developers, users cannot see specific things.

With the increasing number of software types, the disadvantages of structured system analysis methods have become increasingly prominent. The prototype method appeared in this background, and to a certain extent, it made up for the shortcomings of structured system analysis methods. When applying this method for system development, we must first grasp the user's needs, control the development environment, and build a prototype system in a short time. System developers need to complete the shell text, do a good job of the user interface, and establish an interoperability relationship with the user, so that the user really recognizes the system design. After the opinions are unified, the prototype system can be appropriately modified and perfected for subsequent data analysis. Compared with the structured system analysis method, the advantages of the prototype method are as follows: First, it takes less time. Second, the cost-effectiveness is relatively high. Third, flexibility is relatively strong. Fourth, the maintenance is relatively difficult. Fifth, user engagement is higher. Sixth, system development is more targeted. It is worth noting that the prototype method also has its shortcomings: on the one hand, the system development time is difficult to estimate. On the other hand, project management is difficult. Only when the system development designer accumulates rich practical experience and completes the work carefully and carefully can the ideal goal be achieved [3].

After the 1990s, the application advantages of object-oriented software technology were recognized, which changed the structure of geographic information systems. This technology starts from real things and uses four abstract semantic mechanisms, which can effectively improve the efficiency of system development. With the support of object-oriented software technology, commercial software tools have appeared in large numbers. In the process of system development, you can construct object-oriented data models, integrate geographic information, and fully restore the original appearance of a certain spatial location.

3. The Traditional Development Method of Geographic Information Systems

There are two traditional development methods of geographic information systems: the first is an independent development method. Independent development has witnessed the process from scratch, the workload is relatively large, and certain risks must be taken. The cost of independent development is very large, and it needs to be maintained at a later stage, which increases the uncertainty of system application. This method can be applied when developing a new geographic information system platform or selling a geographic information system platform [4]. Beyond that, independent development is not recommended. The second is a secondary development approach. Compared with independent development, the secondary development method is based on the existing platform, captures user needs, and uses an object-oriented visual programming tool. Secondary development can be done internally by the organization or by the developer. This development method has great application advantages. It has a high starting point and can realize interactive sharing of data. In addition, the secondary development is less difficult to avoid duplication of labor and maximize the efficiency of human resource allocation. The secondary development language provides a powerful tool for related workers and has become an important symbol in the development history of geographic information systems. However, in the new era, geographic information systems have stepped out of the laboratory, and the lag of secondary development languages has become increasingly prominent.

4. New Opportunities for the Development of Geographic Information Systems

4.1. GIS+

Nowadays, the concept of "Internet +" has been deeply rooted in people's hearts. China has formulated a draft of the development of the Internet, optimized the top-level design work, and created huge economic and social benefits. In this era, geographic information systems have entered a new stage of development and can be described using "GIS +". This concept reflects the penetration of Internet thought, and marks the theoretical and practical research into a new stage of development [5]. From a certain perspective, "GIS +" is an important part of "Internet +". The former is a branch of information technology. It can collect, integrate and classify spatial information, and optimize the management of geographic information resources. With the development and change of the times, the concept of "GIS +" has been enriched and the functions of geographic information systems have been expanded. In the past ten years, the integration of geographic information systems with other industries has become closer, which has promoted the informationization process of urban planning and land management. Most domestic land management departments have built geographic information systems, and regard "GIS +" as a key part of building a smart city. The construction of a smart city does not happen overnight. At the same time as building a geographic information system, it is also necessary to play the role of cloud computing technology and the Internet of Things technology to form a complete geographic framework. During the development of the smart city geographic information system, the physical data of the city needs to be collected, and the following steps are followed: With the first, you need to access the mapping project. Second, you need to get physical data from the database. Third, basic data needs to be obtained based on the mapping results. Fourth, data review is needed. Fifth, the archived data needs to be organized. After data collection, system functions, including planning and comparison functions, image functions, browsing functions, etc. need to be clarified, the platform should be uniformly deployed and designed, and the data layer, core layer, service layer, and application layer should be established.

4.2. Cyberspace

Scholar Gartner predicted the development direction of the IT industry. He believed that the future development of the IT industry must necessarily integrate the real world and the virtual world. The Cyberspace category belongs to the virtual world category, which provides opportunities for the development of geographic information systems. In fact, Cyberspace is no stranger to the GIS industry, and many scholars have carried out research on virtual space. In the network society, the radiative effects of Cyberspace are getting larger and larger. Computers transfer images, and abstract image expressions can be applied to geographic information systems [6]. Cyberspace, as a telecommunication medium, refreshes people's horizons and makes people more world-wide. Cyberspace, as a virtual space, does not have meaning in the geographical environment, but is in an electronic medium. Cyberspace structure includes physical layer, logical layer and social layer. The elements of each layer are related to each other. The location of geographical elements is very important. Each coordinate has a clear location meaning. The core is the geographical mapping of network IP addresses. There is still not much research on the relationship between Cyberspace and GIS in China. In the future development of geographic information systems, we can shift our sights to Cyberspace. For example, in cyberspace, a geographic information system can be developed as a spatial intelligence module. CyberGIS should have the function of receiving instructions. System developers need to rely on the system to sense the information and data in the cyberspace, to achieve interaction between different agents, to achieve the purpose of system development, and ultimately to meet the user's information query and information retrieval needs.

Conclusion

In the new era, the scope of GIS applications has been expanded, and its application value has been proven, but the rapid development of modern technology has guided the development and design of geographic information systems. The Traditional system development and design methods are also becoming increasingly backward, although the relevant practitioners should predict the development trend of geographic information systems, and develop a systems based on "GIS +",

and realize the integration of Cyberspace and GIS.

Project found

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