Exploration and practice of map digital publishing under the background of financial media

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Abstract: From the perspective of service mode and service path, financial media is a resource sharing mechanism relying on certain media, that is, on the basis of respecting the core value system, scientific integration of human and material resources of different media channels, deep integration of their respective services, into a kind of integrated common services. By reviewing the development of map production technology, bearing volume, expression form and other aspects, this paper summarizes the new characteristics of map suitable for the era of fusion media, puts forward the overall design idea based on the hierarchical model, introduces the time and space framework of "narrative map", and constructs the design mode of map content and the service system of fusion media with the help of the integration thinking of culture and technology. The digital map products under the background of integrating media vividly express the cultural space and cultural changes, making the integrated map service an effective path for map digital publishing.

Key words: Rongmedia, narrative map, map service, digital publishing, first encounter Chang 'an

Introduction

As a new comprehensive service mode of media, financial media makes full use of the advantages of various media channels, carriers and technologies, comprehensively integrates various resources of manpower, content and publicity, and realizes the integration of content and technology, the integration of publicity and marketing, and the integration of resources and interests. The publishing industry is accelerating the landing of the technology and concept of financial media, using financial media to carry out industrial innovation, and promote the informationization and media transformation[1,2] of the publishing industry.

Since the 21st century, the role of maps has shifted from professional map products in the past to map services for the public, and maps have quietly integrated into public life. How to change the research oriented to "earth" to "people", how to change the research perspective from the geographical object in "space" to the various events occurring in "time", how to incorporate complex, fuzzy and diverse events into the space-time reference frame for visualization and analysis, and establish a visual expression method that conforms to the common sense cognition of ordinary users, Is the inevitable requirement of the popular development trend of cartography.

While carrying scientific knowledge, modern map needs to integrate cultural knowledge in content, media technology in means, media channels in service providers, and[4,5] art in vision. Through media fusion, the map is popularized and popular. While making the map carry the culture, it also makes the culture have the intuitive spatial recognition, and uses the map to tell the Chinese story well. In the era of media integration, although there are many kinds of map products, there is a lack of map products that truly serve people's lives deeply and have strong interaction. The combination of genre, content, form and map is an important direction of map development and an effective path for digital publishing transformation of map publishing houses. Under the background of financial media, the necessity of map digital publishing has already emerged, and it will also have far-reaching significance for the development of map culture. With the support of the National Demonstration Project on the integration of culture and Science and Technology and the special fund for the development of cultural industry in Shaanxi Province, this paper has carried out related exploration. After fully understanding the dilemma of the existing map products, in the era of "Internet +" financial media, the development direction of integrated service-oriented financial media digital map products for users' needs is proposed, and the idea is verified by examples, which provides a new idea for the future development of map products.

1. Narrative map

Narrative map is a map service[7,8] model that integrates the advantages of cartography in the expression of spatial information and narrates in the expression of time information, and uses map as the presentation carrier and fusion media as the narrative expression mode to tell the story in narrative space.

Publishing is a kind of communication behavior and mode[9] to create information. Map publishing is the behavior and mode of information dissemination with map as the visual carrier. Fusion media technology injects a new communication engine into the traditional narrative expression, and also puts forward new requirements[10] for map service in the media and map language. Narrative has become

an important approach in the study of map and event visualization. Narrative map is also one of the main development directions of GIS. Narrative expands the traditional application scenarios of geographic information in analysis, planning and decision support, making map products and services more widely known and accepted[9].

2. Logical architecture

The system is based on the "historical and cultural digital map · Shaanxi" to dig deep resources, optimize the service as the goal of the results of the transformation product. The system with "Greater Xi 'an Historical and cultural geographic information platform" won the support of Shaanxi provincial cultural industry special fund; With "first encounter Chang 'an", it has been selected as the national key project of cultural and technological integration.

In the environment of fusion media, map service is at a new development node, and the design ideas reflect the new personalized needs[9], requiring the technical structure to be flexible and concise, the content logical and scientific, and the people. Taking Xi 'an as the target research area, this paper explores the mode and path of map digital publishing based on narrative map theory and method under the background of Rongmedia.

1. System logic structure

By integrating all kinds of professional data such as basic geography, terrain, images, cultural heritage and tourism topics, we have used big data technology to build a big data scientific research service platform integrating data collection, storage, management, application, service and scientific research analysis, and developed story-oriented and entertainment-oriented digital map products for mass cultural experience. The overall structure of the system is composed of infrastructure layer, data layer, service layer, platform system layer and user layer under the support of operation and maintenance support security system and standards and specifications technical support system.

2. Content logic

The main content of the system is a historical and cultural digital visualization spatio-temporal database system, which superimposes the historical spatio-temporal framework of the historical map on the basis of modern basic geographic information, and integrates the historical and cultural topics such as place names, place names stories, historical celebrities and historical events. "Da Xi 'an Historical and Cultural Geographic Information Platform" is divided into two forms of products: PC terminal and mini program. The PC end is named "Da Xi 'an Historical and Cultural geographic information database Comprehensive system", and the small program is named "First encounter Chang 'an".

"Da Xi 'an Historical and Cultural Geographic Information Database Comprehensive System" includes 1 digital map, 1 atlas system and 6 historical and cultural thematic plates. Among them, six historical and cultural thematic data sets and the platform's basic geographic information database constitute the living system of the system. The platform is the basis of data storage, management, application, analysis and sharing. The platform is based on cloud computing technology, designed by WebGIS technology and SOA architecture on the basis of historical geographic database, and developed a software system integrating storage, management, visual application, interactive communication and sharing of historical geographic data. It provides services to users by SAAS (Software as a service).

The content design of "First Encounter Chang 'an" includes five categories: relics, celebrities, poems, events and place names. Each type of data is mainly composed of text content, geographical location, pictures, audio and other formats. "First Encounter with Chang 'an" is a systematic and vivid display of the history and culture of ancient Xi 'an.

3. Design principles

1. Principle of advanced nature

The system should adopt the mature technical theories and methods at home and abroad in the top-level structure, system logic structure, development and operation and maintenance technology. This design principle ensures that the system has a certain advanced nature in a certain period of time, and takes into account the extensibility of the provincial transformation of the system, which not only meets the current development direction of the geographic information technology industry, but also ensures the effective application and usefulness of the system, on this basis, the life cycle of the system can be extended to the maximum extent.

2. The principle of efficiency

The system can run quickly and respond quickly is one of the core indicators of modern information system. Reasonable organization of all kinds of data, information query, update, visualization and output is an important content of GIS. The principle of high efficiency is to weaken the influence of the increase of data volume and concurrency on the system running speed. The system realizes the data exchange between distributed databases and the high integration of multi-scale spatial data, reduces the cost of data maintenance and improves the efficiency of data management.

3. Practicability principle

The system can meet the needs of various types of business and functions of users. For this purpose, the system development follows

the idea of easy use, management and maintenance. The system fully considers the convenience of the application and the flexibility of maintenance, the front and back ends have realized the simple and convenient operation, and the humanized visual interface design. The system has the ability of cross-platform operation, can meet the needs of the majority of users, the general secondary development interface makes the provincial and optimization of the system simple and convenient, to a certain extent, alleviate the original pressure of operation and maintenance, component-based customizable services, is the guarantee of system practicability.

4. Standard and open principle

In order to improve the use efficiency and user experience of the platform, the system has determined the goals of scalability and compatibility from the design point out, and all aspects of the system construction are strictly in accordance with the relevant national and industry standards and norms. For example, the organization method of spatial data, hierarchical coding, data structure, data quality, metadata, etc. all follow the relevant data standards, and standardize the interface standards between the subsystems. Only by following all kinds of standards can the system be open and the scalability of the system be improved.

5. The principle of high reliability

The most difficult problem of digital publishing products in the network environment is copyright protection and data security. The data security problem of such digital publishing products that provide services through the Internet is particularly prominent. The development of this kind of system must fully consider its reliability and security strategy. Therefore, the design of this system allows the system to have a proper amount of data redundancy, which is also a data protection measure. Although the system redundancy increases the system load to some extent, it also improves the fault tolerance and robustness of the system. Special safety measures are designed to ensure that the system is safe in the controllable operating environment. At the user level, considering the necessity of scientific management at the same time, the system user has made the authority classification and sub-setting to ensure the safety and reliability of the system and data. In particular, the access level control mechanism is added to the management user on the basis of the classification and sub-item permission setting, and the measures such as data encryption and identity verification are made. In order to ensure the security and recoverability of the data, the administrator is required to regularly backup the data in the physical space outside the system in the way of physical backup, which ensures the legitimate rights and interests of users while ensuring the security and accuracy of the data are not infringed. Internal hierarchical networking and external connection in the operation security and information security can not be ignored, so the system should be stable enough, not easy to hardware failure caused by data damage, loss or leakage and other problems, hardware failure system can automatically save the last node and exit the system, reduce unnecessary losses, at the same time to the administrator feedback error report.

4. Key technologies

1. Multi-data integration management technology based on digital map

Spatiotemporal data has the characteristics of multiple, multi-scale, massive and rich attributes. How to use the database for efficient and reasonable storage and scheduling is the key technology to evaluate whether the platform can provide efficient services to the outside world. In order to achieve this goal, this study adopts the technology of "integrated management of massive spatial data" to carry out integrated storage, management and scheduling of spatial data ontology and its affiliated attribute data of different scales and types.

The database storage adopts large-scale industrial standard database technology to store all the spatial data of the system. The digital elevation model, digital orthographic map, digital line map, digital raster map and other traditional surveying and mapping geographic data and humanities, social and economic data and other different scales, different types of vector data or raster data, three dimensional spatial data and so on to implement integrated storage, management and scheduling. Remote sensing data and other data mainly used as background continue to follow the pyramid technology, as shown in Figure 1.
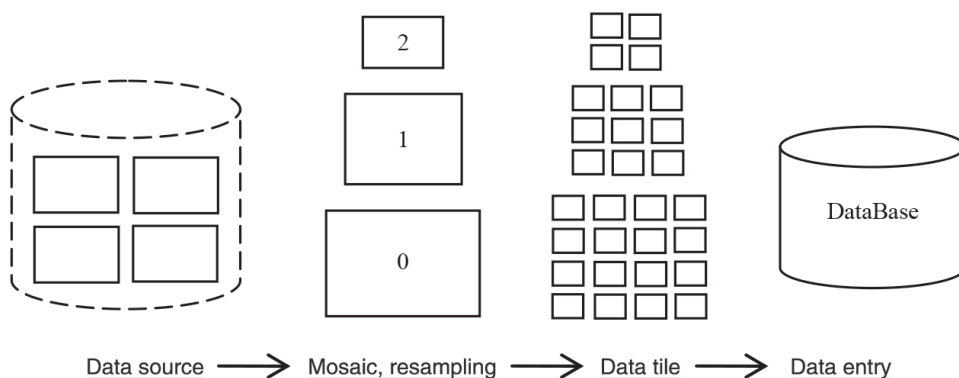

Figure 1 Pyramid data model

2. Digital map under multivariate data fusion

(1) The digital map product based on Internet map service is an activated map service model, which is an interactive streaming map. Digital map in the traditional electronic map display, reading, retrieval, analysis, modification, inkjet and other functions on the basis of one or more thematic maps through hierarchical combination, splicing, adding, deleting and other different forms of integration, the formation of a new digital map. The scale and scope of the digital map can be enlarged, reduced, cut and plot output of any scale or shape.

(2) The compiling period of digital map is significantly shorter than that of traditional drawing, and the professional requirements of draftsmen are more comprehensive. Digital map can be used with digital line drawing map (DLG), digital raster map (DRG), digital building model diagram (DBM), digital elevation model diagram (DEM), digital surface model diagram (DSM) and other vector data. Aerial photogrammetry results and other structured data or other unstructured information on the basis of the database space fusion, information integration, shape fitting, hierarchical display, etc., showing different types of map visualization based on the new map. This is the main data of the graphic information of multi-source spatial geographic information, and the concentrated display of the geographical visual expression of spatiotemporal information. There are many fields that can be expanded and extended in the future, and more and more optimized visualization methods will be produced.

(3) Service oriented technology

The platform is based on SOA service-oriented design architecture, the platform's component units in the form of service encapsulation, especially spatial analysis model, monitoring services and other component units, encapsulation in the form of service can support expansion and secondary development. The platform will assemble different service modules into applications that meet the requirements according to the differences in requirements -- that is, a system matrix that can realize the interconnection of services and use the interconnection, and combine with each other through some algorithm or relationship to complete a certain or some specific tasks. This application service model can be adaptable to changing individual needs. Web Service as the current first choice to achieve SOA framework, mainly lies in the maturity of Web service standards and popular applications. The platform adopts the SOA architecture development method based on REST interface, and realizes the services-based stateless call and platform function development. Data communication Through JSON data transmission.

3. Microservice technology

The basic operation unit is designed and packaged using the concept of microservice technology (Spring Cloud microservice) to ensure the reuse, internal call and multi-language call ability of component services, which can be governed, choreographed and security control of services.

4. Multi-data fusion and mining technology

The superposition and fusion of multivariate data has broken away from the traditional application service model with standardized and standardized symbolic expression and mechanical and professional boring expression of geographic information as the core. It not only shows the ontology of multivariate information, but also internalizes the connotation of multi-source information into space-based information expression and visualization. This kind of visualization is the organic integration of humanization and naturalization, and is a new feature of multivariate data fusion expression. The multi-data fusion of the platform is to superimpose various information sources, multimedia and multi-format information in the form of data on the basis of time and space framework to generate complete, accurate, timely and effective comprehensive information. Data mining is a process in which a variety of data mining theories, algorithms and technical means are comprehensively used to obtain new cognitive abilities on the basis of multivariate data fusion. This project provides a data mining model commonly used in related fields.

5. Application and service

1. Service support

(1) System design concept under user thinking

Adopt the mainstream GIS platform, reduce the compatibility risk; Relational database technology (postgresql) and mainstream software development technology are adopted to reduce the difficulty of multivariate data fusion. On the basis of giving full consideration to the interconnection of information, multi-source data interfaces, the correlation between data and the openness of the network environment, a complete geographic information database is formed, and an important spatial basic geographic information service platform is built on the basis of an open thematic geographic information service platform. This system design adopts the current mainstream application of object-oriented software engineering methods and development technology.

(2) Integrated management of spatial and non-spatial data based on relational database

Through the construction of relational database, the associated management of structured spatial data and unstructured non-spatial data can be realized, and the integrated standardized construction and management of spatial-temporal event ontology and its occurrence elements can be realized. This method can solve the association and integration of structured spatial data and unstructured non-spatial data on the basis, and the standardized data structure and visualization mechanism can facilitate the reverse extraction of metadata through the

database, realize the requirements of automatic classification and classification of data, and facilitate the management, display, mining and application of metadata information.

2. Effect display

"Greater Xi 'an Historical and Cultural Geographic Information Database Comprehensive System" (PC side) for the database five sections of classification display and link, by the home page, ruins, celebrities, poetry, events, place names, to explore to form a functional navigation bar. The interface is simple and clear, and the functional area is clearly divided, which allows users to access the functional area quickly, efficiently and conveniently.

"First encounter Chang 'an" small program is mainly for the public cultural science knowledge learning and exchange platform, in addition to the "Greater Xi 'an historical and cultural geographic information database comprehensive system" content display, open the interface and functions convenient for public use. In order to improve the user stickiness of "First Encounter Chang 'an", its core content is completed by a professional team of related historical content indexing and knowledge services, the development of interactive historical and cultural games, the continuous development of practicability based cultural and creative products also rely on e-commerce functions to provide users with service Windows.

6. Summary and Outlook

The project construction goal is: one library, two platforms, multi-application, multi-channel comprehensive display.

The first database refers to the historical and cultural geographic information database of Greater Xi 'an, which integrates the basic geographic information, planning information, historical and cultural heritage, historical image data of Greater Xi 'an, builds a platform for professional users and ordinary users such as relevant administrative organs and scientific research institutions to understand and obtain historical and cultural information of Greater Xi 'an, and provides relevant digital resource database and related services through websites or mini programs. The two platforms refer to the professional service platform and the public service platform, which can realize the inquiry, management, statistics, analysis, research and output of the historical and cultural information of Greater Xi 'an, and provide convenience for the understanding, management and research of the historical and cultural information of Greater Xi 'an. Multi-application and multi-channel display means that the achievements and contents of the platform can be displayed and disseminated to the public through physical publications, digital publications, animation, VR videos, games and other forms. At the same time, through the continuous integration of new resources through the platform, new achievements are formed, products are constantly updated and evolved, and the number of products is constantly increased, product types are enriched, and product scale is expanded, which can form a good content creation industry chain.

The Greater Xi 'an Historical and Cultural Geographic Information platform is mainly based on 3S technology, and combines traditional research methods such as history and cartography to locate historical and cultural elements such as historical celebrities, relics and culture of Xi 'an in a time-space framework. "Greater Xi 'an Historical and Cultural Geographic Information Platform" relies on various historical and cultural topics and historical maps of Xi 'an's historical periods in various dynasties to extract, reconstruct, transform and load data of various historical and cultural topics, and then establishes a database supporting the platform's application and release. It provides users with services such as visualization, data mining and analysis, network publishing and sharing of historical and cultural resources based on GIS. The database has the characteristics of simple graph structure, small redundancy, simple topological relationship and open data interface. In addition, the non-spatial data in the map has a good data interface and can be compatible with the non-spatial database.

System development projects should fully understand the important role of project management in software development, formulate strict management norms, cultivate positive team consciousness, clear responsibilities among members, division of labor and cooperation, and establish detailed development logs. Accurate demand analysis, detailed demand documents, is the premise of development work, lay a solid foundation for the development of design.

Such projects require the technical service team, content service team and operations team to work closely together in order to achieve the sustainability of the project results. The technology without content is empty shelf, the operation and maintenance without content is fantasy, the content without operation and maintenance is dead water, the technology without operation and maintenance is behind closed doors, the content without technology is useless, the content without operation and maintenance is a waste of resources.

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