

WebGIS-based Tourism Platform Design to Strengthen Red Memory

Qian Lin

250109, Jinan, China

e-mail: 353488387@qq.com

Abstract—Red memory, the cultural heritage and spiritual wealth generated in the process during which the Chinese Communist Party led the Chinese people to fight for national independence and the prosperity of China, is of great importance. Red tourism, regarded as the theme tourism activity of red culture, is an effective means to carry forward and highlight red culture. However, following the development of science and technology, as well as the accelerated pace of life, there appears the difficulty of decline and decomposition faced by red memory. In the Internet era, the red tourism mode needs to be innovated immediately in the critical period determining whether China Dream can be realized. Having acquired the red data of Shandong Province, this paper further strives to take advantage of the stimulation of red scenic spots to construct red memory by means of Web and GIS technology, strengthen the red memory with the help of information visualization, and adjust the ways to develop red tourism resources, in a bid to make a breakthrough in the traditional development mode.

Keywords—red memory; red tourism; development mode; WebGIS

It can be seen from the data of China Statistics Yearbook over the past 10 years that the number of tourists as well as the comprehensive income of red tourism has been growing steadily, and the red tourism market as a whole is taking a turn for the better. It is true that red tourism has become an important part of the tourism industry, however, it is also faced with a variety of challenges. On the whole, the development of red tourism fails to keep pace with the market and tourists have difficulty in generating emotional resonance and strengthening red memory through tourism, as a consequence, it is necessary to innovate the development mode of red tourism urgently. In the Internet era, with the help of the Web and GIS technology, the platform strives to construct red memory by means of the stimulation of red scenic spots, and strengthen red memory through information visualization, therefore, it can be said to be a new way to experience history by means of red tourism and enhance identity in the new era.

I. THE DEVELOPMENT STATUS OF RED TOURISM

A. Vulgarly Exists in Some Scenic Spots.

In spite of the favorable development trend of the red tourism market as a whole, there are still quite a few problems in some scenic spots, among which the most prominent problems are vulgarity, and excessive

entertainment. For example, such behaviors as fabricating false historical scenes, distorting history, and joking about heroes take place in some scenic spots from time to time. Taking the commentary in the scenic spots as another example, some commentaries are inconsistent with the revolutionary historical facts, causing the red culture to be different from what it is expected in some scenic spots, which greatly impacts the image of this serious project.

B. Red Tourism is Faced with Sustainability Challenges.

The development of red tourism in various areas of China is faced with sustainability challenges to varying degrees. On the one hand, the surrounding environment of red tourism is not complete enough in construction to effectively support the corresponding tourism culture. For example, the insufficient protection of revolutionary historical sites as well as the unreasonable development leads to serious waste of red resources and imperfect construction of tourism facilities. On the other hand, there is severe convergence existing in the development mode of tourism projects, manifested in the fact that the majority of red tourism is developed in the form of former residence, memorials and statues, which cannot meet the market demand of young people.

C. The Development Mode of Red Tourism Remains to Be Expanded.

Although there is a certain tendency of integration between red tourism and other advantageous transmission resources, the development mode of red tourism is still relatively “traditional”, mainly focusing on visit and study in memorial halls, performance and ecological sightseeing, etc., all of which are relatively “conservative” and not innovative enough. In the Internet era, it is necessary to reinforce the effective integration of red culture and other tourism resources and to further explore the development mode of red tourism.

II. WEBGIS-BASED DESIGN OF RED TOURISM PLATFORM

A. Platform Demand Analysis

Considering that a variety of factors restrict the development of red tourism, causing the red tourism to vary from region to region, regional collaboration and cooperation is an effective measure to boost the development of red tourism and promote the economic development, in addition, it has become a new trend of regional tourism development to jointly develop red tourism. In the eyes of the public and organizations, the red

tourism products are basically at its primary and extensive stage, manifested in the old-fashioned publicity methods and means of the Party history and figures, the lack of vividness and interactivity of commentary and display methods of some memorial halls, in addition, the traditional tour guide mode is difficult to create a strong attraction for tourists. In terms of the government, there are quite a few problems existing in red tourism, such as the prominent and frequently occurrence of vulgarity, creating topics for the scenic spot with fabricated stories, and the phenomenon that the facilities construction of red scenic spots fails to conform to the policy requirements, which seriously deviates from the original intention of the government to develop red tourism culture. It seems that the previously existing traditional development mode of red tourism is unable to solve the above-mentioned problems. However, the tripartite linkage, namely, the mode integrating public feedback, organization promotion and government execution can further publicize and carry forward the red culture, thereby creating a more healthy development environment for the red tourism and culture industry.

In order to develop the tripartite linkage mode mentioned above, it is feasible to construct and publicize the red tourism platform by means of the software service SaaS and the Internet+ mode, effectively integrate red resources, government resources and information resources, encourage the public to give the government relevant feedbacks through the feedback channels provided by the platform, and tell the story of the scenic spots with the help of the GIS technology and interactive technology, so that the three parties can truly and actively participate in the construction of “red tourism culture”, and the red culture can be effectively integrated with other tourism resources.

B. Overall Framework Design of the System

The system mainly consists of three layers. Generally speaking, the entire business application will be classified into 3-tier architecture, namely, the user interface layer, the business logic layer and the data access layer, aiming to realize the goal of “high cohesion & low coupling”.

(1) Data access layer. Located at the bottom of the 3-tier architecture, data access layer mainly processes non-original data (databases or text files that are used to store data). Specifically speaking, it includes such operations as operating database according to the needs of users, adding, deleting, modifying and querying data, and giving feedback of the operation results to the business logic layer. The data access layer has no logical judgment ability.

(2) Business logic layer. Located in middle of the user interface layer and the data access layer in the 3-tier architecture, the business logic layer is the bridge linking the user interface layer and the data access layer, mainly responsible for connecting the data access layer based on the users’ operations in the front end, processing the data business logic, modifying, acquiring and deleting the data, as well as giving the feedback of the processing results to the user interface layer. Business logic layer requires logic judgment operations.

(3) User interface layer. Located at the top of the three-tier architecture, user interface layer has a direct relationship with the users, mainly refers to the Web pages in the B/S information system, which are mainly responsible for the importing and exporting of system data. Specially speaking, it will transmit the data to the business logic layer for data processing, and give feedbacks of the processing results to the presentation layer. This process does not require logic judgment operations.

C. Function Module Design

The system can be classified into the following five modules according to the functions.

(1) User module. Responsible for user registration, login and personal information management, the user module can enable the users to modify and delete their personal information in this module. Having been transferred into and stored by this interface, the account information will be further transferred to the database for unified management and scheduling.

(2) Map module. The module calls ArcGIS service with one kind of shp data corresponding to one story, through which users can feed back problems or suggestions for a certain place on the map, view the released information of red scenic spots in each province, realize the map operations such as zoom-in, zoom-out, clearing, distance measurement, roaming, positioning, and restoring the whole picture, etc., search for red information with keywords, and make a statistics of the red information in a specific area.

(3) Forum module. Through this module, users can check the hot tour routes and classical tour routes of red culture, participate in the discussion of the forum, initiate activities or comment activities. It can be seen that this module is conducive for users to keeping pace with the latest developments in red tourism, organizing and launching volunteer activities, publishing personal opinions, sharing the user experience, and realizing the autonomy and interconnection of user participation.

(4) Information module. The special topics of “red scenic spots” and “red figures” of the mapping system can tell the users about the detailed stories of red scenic spots and the life story of red figures. In this way, users can quickly discover the information that they want to know about the story with the help of keyword queries.

(5) Management module. This module can realize the addition, deletion, modification and query of red information in the background management, timely check and deal with user feedbacks and suggestions.

III. WEBGIS-BASED DEVELOPMENT OF RED TOURISM PLATFORM

A. Platform Technology System.

In order to meet the display needs of partial data on the platform, the selenium automatic test tool of Python and ChromeDriver are used to realize the data crawling on www.crt.com.

With the help of “HTML5 + CSS3” technology as well as the currently prevalent CSS library such as Bootstrap, the

platform technology system can realize the design of the front-end interface of red tourism, develop the basic page interaction function through JavaScript and JQuery framework, and achieve high reusability of the program by means of style separation; Java is used to realize the functions of the system background and MySQL is taken as the database. In terms of the map function development, relevant map service supplied by ArcGIS Server is adopted to realize the development of the interface based on map function, and the open-source framework OpenLayers is used to meet the basic GIS requirements and functions, and to construct GIS application services and embed them into the Java development environment, in a bid to develop ArcGIS Server in a quick and convenient manner, and to enhance the efficiency of secondary development of WebGIS application software. The development process basically consists of data storage and sorting, cloud platform deployment, map releasing, and invoking the relevant map interface service with OpenLayers technology, thereby achieving the secondary development of geographic information system software.

B. Platform Database Design.

On the whole, the database of the system is comprised of geospatial information database, basic red information database, red forum database and user basic information database.

Used to provide the basic functions to display the map, the geospatial database consists of the longitude and latitude of red scenic spots and shp data, etc., which can allow such operations as the query of red scenic spots, as well as the background editing, modification, addition of red scenic spots, etc. Mainly consisting of the basic information of red scenic spots and red figures, the basic red information database can not only classify the information, but also enable the users to quickly discover the information that they want through keyword search. User information data mainly includes the basic information such as users' account and password, user name, comments, favorites etc. Users can register and log in the personal information center to view or modify their personal information. Red forum database mainly consists of publishing or viewing posts and articles, publishing comments, favorites and likes.

C. Realization of Major Function Modules of the System

1) Map display.

The platform can provide red scenic spot SHP data service through ArcSDE. As soon as the ArcGIS Server receives the map service request, the server will process the request, generate the MapTile cache, and display the related map on the client.

2) Map operations and controls.

The relevant interfaces of OpenLayers OpenStreetMap API is called to realize such operations including zooming in map, zooming out map, restoring full map, positioning, measuring distance, measuring area, clearing selection, eagle-eye map, plotting scale, etc.

3) Map statistical and query.

It allows keyword search so as to quickly query the necessary red information, as well as the overall situation of the red scenic spots in the specific region. It is also possible to improve people's understanding of the red culture in the red scenic spots in the form combining geographical location and text narrative. In addition, it can also request map service query function mainly through ajax. As soon as the client end sends the request, the ArcGIS Server will process the request, identify the relevant map resources, acquire the geographic data, and feed them back to the map.

4) Integrated management of red background information.

MySQL database is used to store and manage the red information and users can register in the system, fill in and submit relevant information and data, which marks the entry of the user information database. Moreover, having added the authorized login of administrators, the platform allows the administrators to log in the background interface as an administrator in the user table, and to add, delete, modify and query the data in the background management interface. The special person who takes the charge of data management can manage the resources in an efficient and unified way, which can facilitate the data management, realize the electronic management of the red data, make it convenient for relevant administrative departments to dynamically view and count the relevant red information, and create a good atmosphere for the development of red tourism.

5) Red forum.

After users type in the basic information of the post such as the subject and content in the corresponding input box and submit them, each part of the post will be encapsulated into json format and transmitted via ajax to the background written in Java. Having received the post in json format, the background will further identify the basic information of the post, judge whether it is in line with the standard, and store the information into the database in case of no mistake, indicating the completion of the process of publishing the post.

IV. CONCLUSION AND PROSPECT

By virtue of the design and exploration of the development mode of red tourism, this system analyzes the current status of red tourism development, and realizes the tripartite linkage comprised of the public, organizations and the government, in other words, the platform can make the public be able to learn more about red tourism as well as share and exchange experiences, enable the organizations to make clear the preferences of the public and refer to other tour routes and allow the government to cope with the feedbacks and update the red information in time. The tripartite linkage not only can create a more healthy development environment for the red tourism culture industry, but also can innovate the previous traditional development mode of red tourism and push forward the effective integration of red culture and other tourism resources. The theoretical research and practical operation of this project remain to be further developed and

improved, nevertheless, with the promoted awareness of participation of the public, the enhanced technological convergence as well as the development of science and technology, various problems existing in the development mode of red tourism are believed to be solved in the near future.

ACKNOWLEDGMENT

It is the phased research result of the project entitled *Research on Innovative Development of Rural Red Tourism in Old Revolutionary Base Areas of Shandong Province* (Project No. 20CLYJ64) listed in Social Science Planning Research Special Projects of Shandong Province.

It is the phased research result of the project entitled *Research on the Tourism Development of Characteristic Towns in Shandong Province Driven by Replacing Old Growth Drivers with New Ones* (Project No. 2019RKB01373) listed in Tourism Development Research

Plan of Characteristic Towns in Shandong Province in 2019.

REFERENCE

- [1] Jiang Hongbo. *On the Application of 3-tier Architecture in Information System Development* [J]. Information & Communications, 2016 (12): 205-206
- [2] Wang Lizhen. *On the Development of Red Tourism Resources under the Background of Internet* [J]. Chinese & Foreign Entrepreneurs, 2020 (5): 120
- [3] Liu Changlong, Xing Luwei. *On the Enlightenment of Yimeng Spirit to College Students in Red Education* [J]. The Theory and Practice of Innovation and Entrepreneurship, 2020, 3 (6): 35-36
- [4] YinYu. Design and implementation of Web-based geographic narrative map application platform[D]. Xidian University, 2019.
- [5] Fan xiujuan, Li Wenxiang, Zhai Kang. Construction of Ecological Protection Redline Integrated management system based on Webgis [J]. Guangdong chemical industry, 2018(8):163-165.
- [6] Zhu Mengze, Zhao haiying. Narrative visualization overview [J]. Journal of computer-aided design and graphics, 2019, 31(10):1719-1727.