RESEARCH ARTICLE

Development of Smart Tourism Platform for Historical Architects

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Abstract: With the rapid development of cities, many excellent architectural heritages are damaged in order to meet the expansion needs of the population and transportation. Thereby, how to protect these historical architects is becoming an important research topic. In the traditional protection of architectural heritage, photographs and videos and other digital forms are used to preserve and display the architectural information. In this paper, we took the architectural heritage in Wuhan city as an example and developed a smart tourism platform. There are several major functions, include the list of the architecture, map navigation, architecture profiles, video and picture display, travel reviews and so on. The smart tourism platform can not only preserve these digital architecture heritages permanent on the platform, but also enable the tourists to understand the historical, artistic value of the architect based on location-based service technology and personalized recommendation technology. It also can promote the local tourism industry by the smart platform.

Keywords: *Architectural heritage, Smart Tourism Platform, Wuhan, Digital technology.*

Introduction

With the rapid development of many cities, it is imperative to expend and transform the cities in order to meet the growing spiritual needs of people. Thereby, how to protect these historical architects has become an urgent research area.

In the traditional protection of historical architects, photographs, documents and video are the basic form. With the rapid development of information technology, various industries are carrying out information construction to meet the needs of people and social development [1].

Therefore, driven by this environment, many scholars have a more in-depth study on the protection and development of historical architects by using information technology. They pay attention to the traditional protection of historical architects, and put more emphasis on the digital protection.

For example, developing the smart tourism platform can not only preserve these digital historical architects on the platform permanently, but also make the users easily understand the historical and artistic value of the architect, which is based on LBS technology and personalized recommendation technology [2].

As a result, these technologies can also help to protect the historical architect and promote cultural tourism.

Methodology

Demand Analysis

With the rapid development of current society, people's material needs are increasing. The transportation; housing and other things are changing constantly. Under this circumstance, we will dismantle the architects that could not satisfy us and rebuild the transportation facilities and high-rise architects according to our demands. Historical architects are the fruit of time wisdom, which will impact our descendant profoundly. Therefore, it is imminently for us to protect the historical architects and develop the tourism.

The Average User's Needs

With the development of the times, people's awareness of the protection of historical architects has been greatly improved. Now, they pay more attention to the internal culture of the historical architect rather than the external of the architect. The quality of people's life has improved, so people's demands of intelligence are also increasing.

The display of documents and photograph in the traditional website cannot make people satisfy.

The Demands of Protection Sectors

The protection sectors need to classify the information of the historical architect. There are large numbers of information of historical architect, so, it's difficult for the sector to deal with the large workload. The intelligent classification, conservation and retrieve of the historical architect are also imminently.

Overall Technical Framework

System design fully considers the close combination of business and function. According to the application requirements and stability principles, the overall structure of the system is divided into five layers, which includes infrastructure layer, data acquisition layer, database layer, system application layer and the user's presentation layer. Data layer, business layer and the user's presentation layer are separated with each other, which is convenient for system expansion. Overall technical framework of system shows in the picture below:
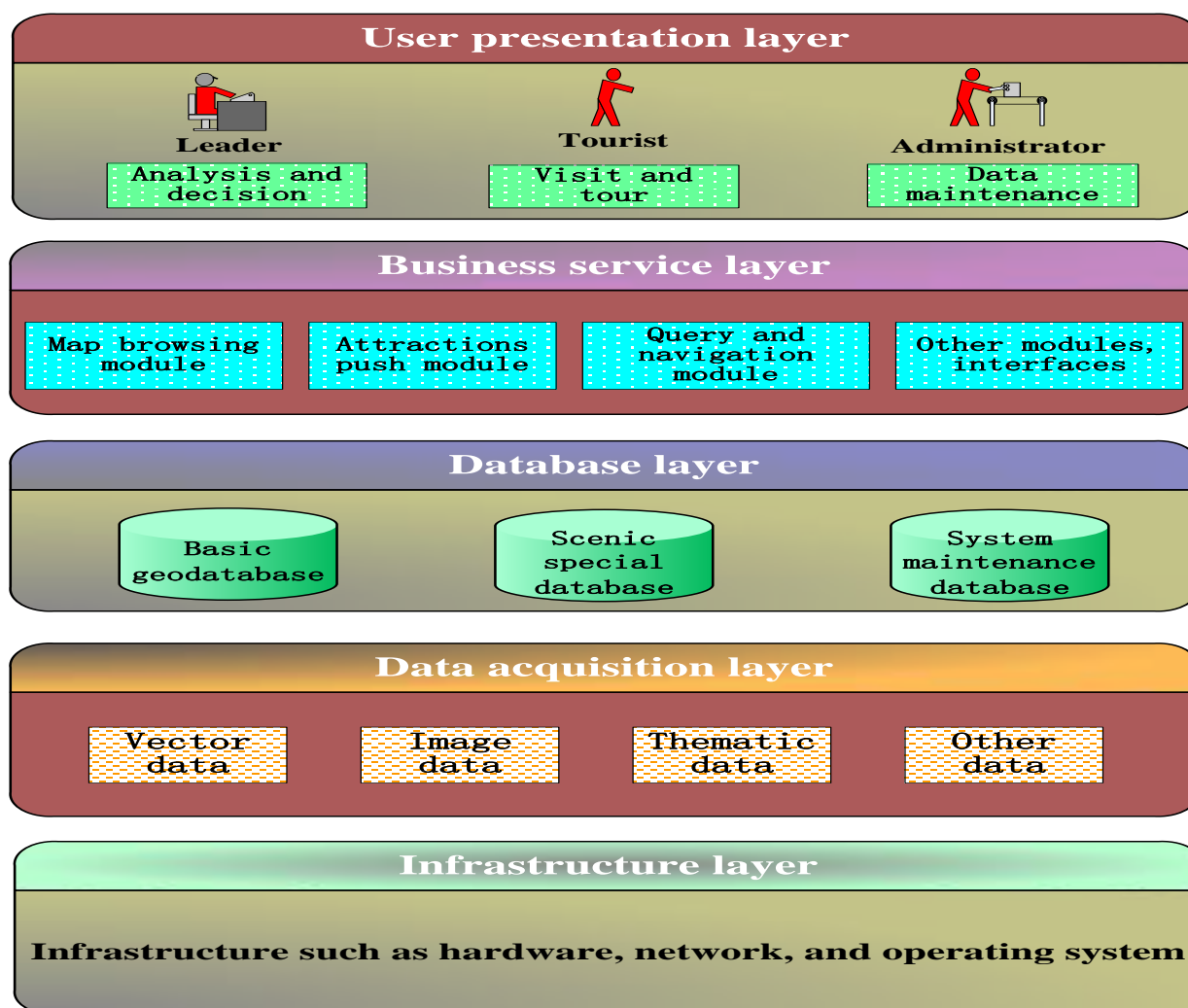

Fig.1: The picture of System construction

Infrastructure Layer

Infrastructure layer consist of hardware, network and operating system software to run the system, which is the guarantee to operate and use the wisdom tourism platform of excellent historical architect.

The Data Collection Layer

The primary function of data collection layer is mainly used to acquire and process basic topographic map, image data and historical architect distribution , it can also collect ,sort out and transmit the digging out information ,the description and the propaganda of the historical architect. Data collection layer provide original data to database layer.

Database Layer

Database layer consists of the geographic database, thematic databases of historical architects and database of system maintenance.

The Business Service Layer

Business service layer provides a variety of professional function services for the users to use the APP based on the database layer. This layer consists of Map browsing, list exhibition, architect search, information push and navigation. For some applications need to access the database of other system, it is provided the specific data interface by the system to expense its using range of the platform.

User's Presentation Layer

Above the business service layer is user's presentation layer, which shows as a platform to offer a variety of applications. The users of our application are composed of three part: uses, the administrator and decision maker of historical architect and the staff of system maintenance. The construction of historical architect digital system will also be divided into two parts. One is a mobile terminal platform which is used by the users to browse, search, locate and navigate the historical architects.

The other one is a back-end platform that can be used by the authorized users to update and maintain the system. The main users of the users' system: System will try it's best to meet the needs of the users, such as information achievement, route inquiry, seeking help online, communication and so on. Administrator and decision maker of historical architect can research the related statistics and the distribution of the architect according to the system.

They can also do some analysis and make some plan on the basis of preference of historical architect. The staffs of system maintenance are mainly responsible for managing and maintaining the users, function and data of the system, which includes data input, update and database backups.

The Developments of Historical Architects Digital Display System

In the system of Wuhan wisdom tourism APP of historical architect, it designed 9 primary functional modules to protect and display every aspect of historical architect. After doing some research, the system appears 9 major modules, which includes architect list, map guidance, architect overview, first class architect, second class architect, third class architect, video area, travel notes and picture area. In the content management module, we classify the historical architect.

According to the level of significance of the architects, Wuhan historical architect can be segmented into first class architect, second class architect and third class architect. By means of this major module, we can digitally displayed the location, picture, video, history and the progression of Wuhan historical architect.

In the procession of designing the homepage, we choose Grid View to do the page layout. The main propose of using it is to make the system more hierarchical and more distinctive. As the Figure 2 shows, the major module includes architect list, map guidance, architect overview, first class architect, second class architect, third class architect, video area, travel notes and picture area of Wuhan.

Fig. 2: Architect list in homepage

The Display of Picture List

In the procession of display, more than 180 architects are appearing, we need to use Bitmap Factory. Because the picture is too big, loading speed will become so slow that the situation of 00M (memory overflow) will happen. Some methods will be used to help Android deal with this problem and has been chosen in this part. Cache is a better and more important technology in Android development, and it can manage the Bitmap memory that solely put into the cache. The capacity of the cache is limited, but it can put the element into the cache constantly and remove the element incessantly. This procession can solve the problem of memory overflow (00M)[3].

There are some limitation to process picture in the software, so we can also process the picture to achieve optimized result in physical way. Google launched a web picture format that can be converted to some picture format such as .png and .jpg. This procession can achieve the purpose of lossless compression and reduce the memory of the picture. Then the problem of memory overflow (00M) will be solved. As the Figure3 shows, every historical architect is displayed by the List view. In the procession of displaying, we use Adapter to display the data. Historical architect text is read directly from the database. It can be seen from the code that the picture is read through the address in the servers and the data is refreshed by the notify Data Set Changed () method.

Fig.3: First class architect list

Image Detail

The description of main content is about the related brief introduction of Wuhan historical architects, which includes general list, first class architect, second class architect and third class architect. The theory of displaying them is identical. They will use the List view to display the picture, text and brief introduction. The techniques used to solve the memory overflow problem (00M) are also the same. In the primary interface, we can find that the technology is the same in four modules: general list, first class architect,

second class architect and third class architect. Because of different type of database, the data inquiry is different too. In the secondary interface, List view is not used, but picture and text can also be displayed in the pages. These pictures are saved in the database and read from the database. The theory of this displaying is the communication from Client and servers and returns the data back to Android Client to display. As Figure 4 shows below:

Fig.4: Secondary class of architect

In this page, the screen adaptation of the image, the reading of the database content and the Web View are used to display the function of website. The following below is to achieve the height and width of the screen of the mobile phone. According to the height and width to adopt the picture.

The Image Display Area

After introduce the text of the system, it will display some picture and video of the architect. As we all know, video and picture have a large consumption to the memory. If we can't solve the problem appropriately, the memory will overflow or the loading of the program will be slow. After this situation the APP will stop running and the users will have bad experience .In the way of displaying the picture, we use View Pager to do some paging display.

During the loading process, 10 pictures will be loaded at the first time. After the users scan the picture, they can slide it down, which can reduce loading time. This method is to optimize the loading process on the number of displaying .And it can be the same way to deal with the picture by using web format and Bitmap, which can achieve a good result of displaying. Specific implementation can be shown in the following picture. As is shown in the picture, the content of the picture is displayed by view page control. First class architect, second class architect and third class architect are separated, and then the picture can be sided. Specific code is shown in the Figure 5.

The Video Display Area

In video module, every historical architect is displayed by Grid View control. During the setting process of the grid, according to the size of the layout, three videos are arranged in one line until the video ended. Clicking on each video, corresponding historical architect video will play. Specific implementation can be shown in the Figure 6.

In the content display module, text module, picture module and video module are the chief module to display the content. We also do some brief analysis to its technology and the theory is in similar: getting data from the server side and the data is read from the database. All data is placed in the MySQL database, and transmit it to the client. According to logic of each module, we can estimate the relationship between each variate. When we understand the logic, we can display the data in Android client. That's the basic principle of content management module in Wuhan historical architect displaying system.

Fig.5: the picture in the image area

Fig.6: video displaying module of historical architect

The Main Function Module of Digital Display System Client of Historical Architect

In the map module, the main purpose is to search the historical architect in Wuhan. And the major function of this module is to search The fixed point of the historical architect, according to specific location of historical architect in Baidu map. As the Figure 7 shows. Inquiry module is responsible for sending the users' inputting information to the server and displaying the returning Information from the server to the users. The returning information from the server is list of a recommended scenic spot. In this list, it includes latitude and longitude, a representative picture and its text label of a scenic spot.

Fig.7: Map inquiry module

Conclusion

The app has been favorably received in the academic settings in which it has been presented. The product will be available at the tourist attractions to be used by visitors by the end of 2018 year. In this year, a publicity campaign will be launched for the app at the attractions itself as well as on its website and on social media. The purpose of the publicity campaign is to introduce the app to visitors and potential visitors, and to encourage them to learn more about the architect's history and culture. In addition, a short questionnaire has been produced to evaluate how well the tool functions. It will be Tested using the data collected from real users and is designed to judge user satisfaction levels with regards to the app.

Acknowledgements

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