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Design and Implementation of Interactive Platform for Sharing Travel Guide Based on Spring Boot

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Abstract: *In order to cope with the traditional way of sharing travel guide information update is not timely, lack of personalized recommendation, limited communication and interaction, media content restrictions, retrieval and use of inconvenience and other problems. The system uses Java as programming language, builds back-end services based on Spring Boot framework, uses Vue/UniApp to develop front-end interface, uses MyBatisPlus to realize data persistence, and uses MySQL database to store data. It has built an efficient and convenient interactive platform for sharing travel tips. The platform provides online editing and multimedia content support functions, users can share travel experience and play guides, keyword search and classification search, the platform for personalized recommendation, users can evaluate, collect posts, and communicate and interact under the post. Through these technical means, a functional and convenient interactive platform for sharing tourism guides is built, which effectively solves the problems of traditional tourism guides.*

Keywords: *Travel guide, Sharing and interaction, Recommendation, Spring Boot*

1. Introduction

With the improvement of people's living standards and the change of consumption concepts, travelers pay more attention to personalized and customized travel experience. We hope to be able to customize my own travel plans and itineraries according to my interests, time and budget. A good tourism strategy can improve the tourist experience. However, there are several problems in the traditional way of sharing travel guides. First, there is a lack of personalized recommendation; Second, communication and interaction are limited; Third, it is inconvenient to retrieve and use [1]. Thus, it is useful to develop an efficient and convenient interactive platform for sharing travel tips.

Previous studies [1,2] have explored how to enhance user interaction and secure content sharing in social networks. These studies have provided us with valuable insights. In the field of tourism strategy platform, the researchers focus on improving the functions of user interaction and content sharing [3,4]. These works have important enlightening significance for systematic research. However, there is still room for improvement in personalized interaction [4], sharing, and intelligent retrieval.

In order to develop an excellent interactive platform for sharing tourism guides, we must first have two requirements, one is the comprehensiveness and timeliness of information, and the guide information provided by the platform should be comprehensive, accurate, and updated in time. Second, the user experience is good. The platform should be easy to use and able to provide personalized recommendations and services according to users' preferences [3]. In response to these requirements, new approaches are planned to be explored in this paper. It will focus on how to better understand users' travel interests and provide them with instant, relevant travel information [5]. The result is a more user-friendly platform that allows users to easily discover new travel destinations [6, 7], share their travel experiences, and quickly retrieve the information they need.

The system uses IntelliJ IDEA integrated development environment, which is based on Java language and Spring Boot framework to build Web applications. MyBatisPlus database persistence layer framework and MySQL database are integrated in the system. Maven construction tools, Vue, Uniapp and other front-end frameworks are used. Knife4j API document generation tool, and using Shrio, Jwt implements a complete permission control mechanism to ensure the security of the system. The system development environment is as follows: jdk: JDK-1.8.0_201. Integrated Development Environment: IntelliJ IDEA 2023.3.2. Operating system: Windows 10 Home Chinese 64-bit (10.0).

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Database system: 8.0.26 MySQL Community Server-GPL.

2. System design

2.1. Overall system architecture

The system is divided into 5 layers, namely access layer, UI layer, interaction layer, back-end logic layer, data cache layer. The access layer includes the mobile side and the PC side, so the front-end involves two technology stacks, namely Vue+Element-ui and Uniapp+Uview. The back-end is implemented based on the Springboot framework, using the persistence layer framework of Mybatis Plus and the permission control technology of Shiro+Jwt. The back-end is mainly divided into two modules, which are App module and management system module. The overall architecture is shown in Figure 1.

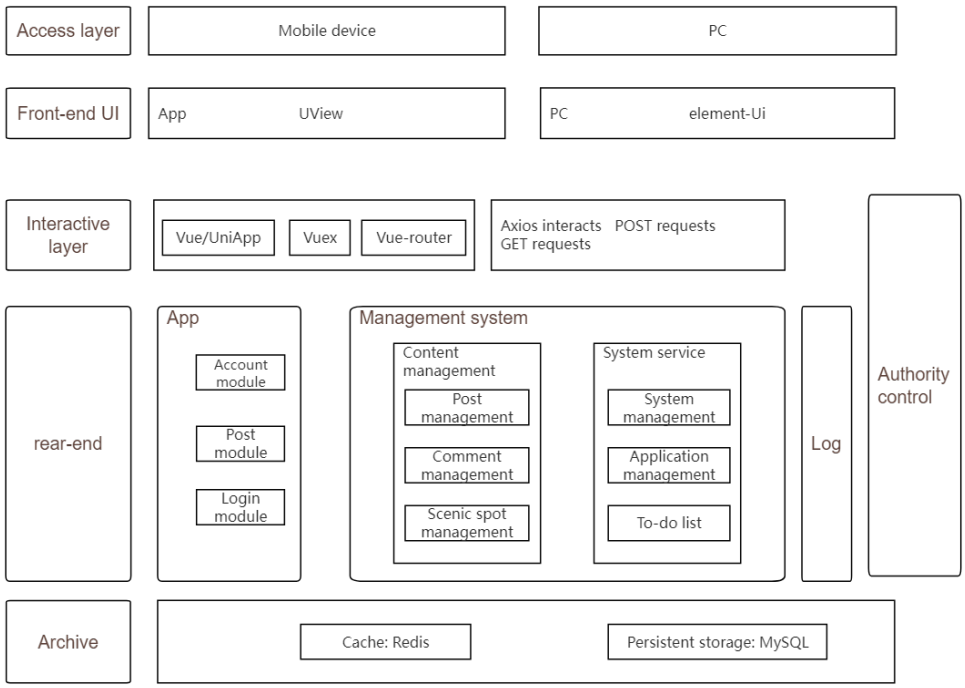

Figure 1: The system architecture.

2.2. System module division

The system is divided into two modules: the App side and the management side. The specific functions and modules of the App side and the management side are discussed below.

The App side of the system contains three big modules: account module, post module and interactive module. The account module includes login, registration, viewing and modifying personal information modules. The post module covers the function modules of post, browse, remove, search, like and comment. The interactive module includes following users, responding to comments, and functional feedback modules. The module diagram of App side of the system is shown in Figure 2.

The content management of the system management side includes: post management, comment management, scenic spot management, notification management. System service is divided into: system management, application management, affairs and other modules. The system management module diagram is shown in Figure 3.

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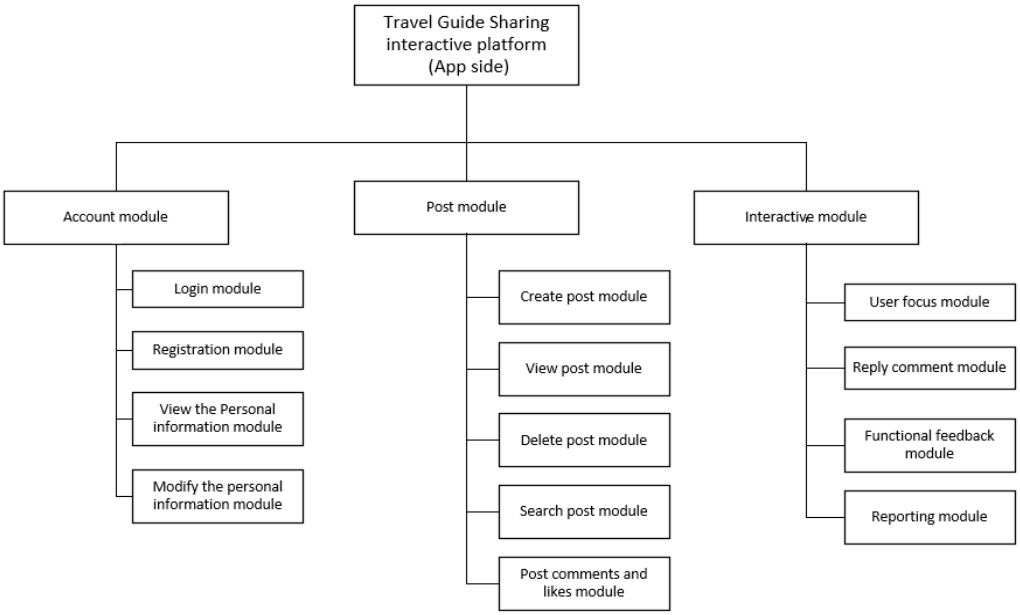

Figure 2: Module diagram of App side of the system.

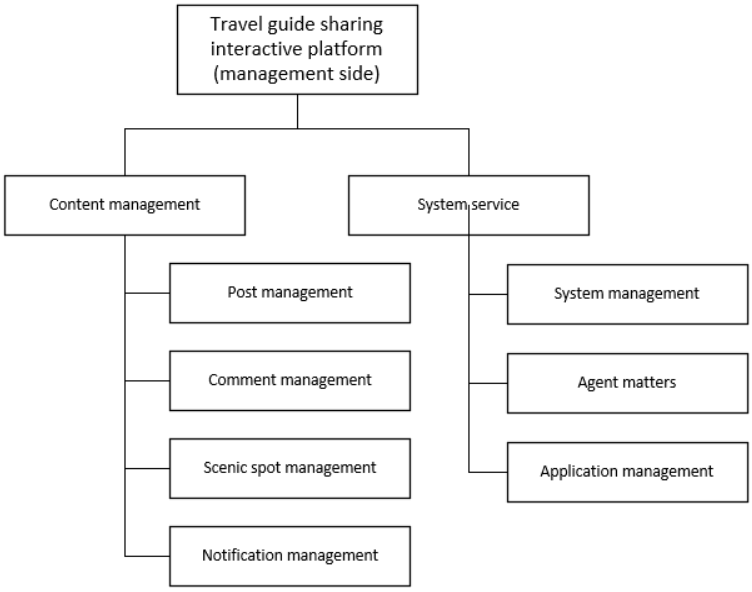

Figure 3: System management module diagram.

2.3. Database design

According to the E-R model, the database table of the system is designed as Table 1 to Table 6.

In Table 1, the user table includes fields such as mobile number, password, gender, city, avatar, creation time, and update time. The user table is used to store user information. The UID field is used to establish relationships with other tables.

In Table 2, the post table contains the post number, post title, content, uploaded image, creator, category, created time, views, status fields. The type field is used to establish a relationship with the type table.

In Table 3, the comment table contains fields such as comment number, post number, author ID, comment content, comment status, replied user id, parent id, and creation time. uid and to_uid are used to store comment information. Uid and to_uid are used to establish a relationship with the user table.

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In Table 4, the attraction table contains primary key id, attraction name, detailed address, introduction, price, rating, views, pictures and other fields. Used to store attraction information, where the id field is used to establish relationships with other tables.

In Table 5, the post category table contains the primary key ID, category name, and recommendation fields. Used to hold post category information, where the id field is used to establish a relationship with the post table.

In Table 6, the post like entity includes primary key, user Uid, post Pid, creation time field. The id, cid, and uid fields are used to establish relationships with other tables.

Table 1: User table.

Field name	Name	Data type
User id	uid	int
Mobile phone number	mobile	varchar(11)
Username	username	varchar(50)
Cipher	password	varchar(32)
Avatar	avatar	varchar(255)
Gender	gender	int
Province	province	varchar(50)
City	city	varchar(20)
Status	status	int
Update time	update_time	datetime
Creation time	create_time	datetime

Table 2: Post table.

Field name	Name	Data type
User id	uid	int
Title	title	varchar(50)
Content	content	longtext
Picture	media	text
Page view	read_count	int
Pinned	post_top	int
Address name	address	varchar(255)
Post type	type	int
Status (0 Normal 1 Audit)	status	int
Creation time	create_time	datetime

Table 3: Comment table.

Field name	Name	Data type
ID	id	bigint
Review author ID	uid	bigint
ID of the user being replied to	to_uid	int
Comment post ID	post_id	bigint
Comment content	content	varchar(255)
Comment status	status	tinyint
Parent comment	Pid	bigint
Creation time	create_time	datetime

Table 4: Scenic spots table.

Field name	Name	Data type
ID	id	int
Name of scenic spot	name	varchar(255)
Detailed address	address	varchar(255)
Introduce	introduce	varchar(255)
Ticket price	price	decimal(10,2)
Star Level	rank_grade	varchar(255)
Page view	read_count	int unsigned
picture	img_url	varchar(255)

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Table 5: Post category table.

Field name	Name	Data type
Primary key id	id	int
Type name	person_type	varchar(255)
Recommended	is_top	int(10)

Table 6: Comment Likes table.

Field name	Name	Data type
Primary key id	id	int
Comment id	c_id	int
User id	uid	int
Creation time	create_time	datetime

3. System function realization

3.1. Login registration function

The user login process includes verifying the validity of the password. After verifying the password, a Token is generated to store the user information, and subsequent requests are authenticated using the Token. The registration process involves verifying the data format of the mobile number and password, which is then stored in the database and directed to the login page.

The implementation effect of the Login function is shown in Figure 4.

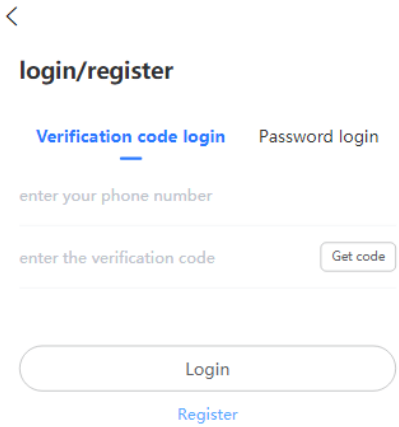

Figure 4: Login page.

3.2. Comment function

The system mainly uses secondary comments to display the interactive effect. First, the list of primary comments is queried, and then the sub-comments under the specified parent comments are queried according to the user's selection.

The implementation effect of the Comments function is shown in Figure 5.

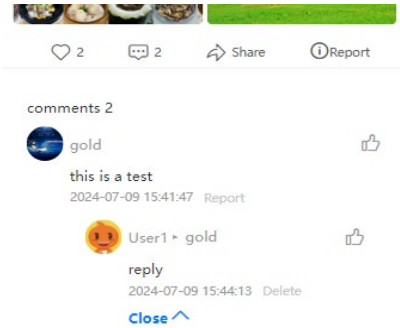

Figure 5: Comment page.

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3.3. Posting function

Users enter the Posting page, you can enter the title, content, upload pictures, you can also choose the post classification, travel time and travel costs and other content, the background will verify the content.

The implementation effect of the Posting function is shown in Figure 6.

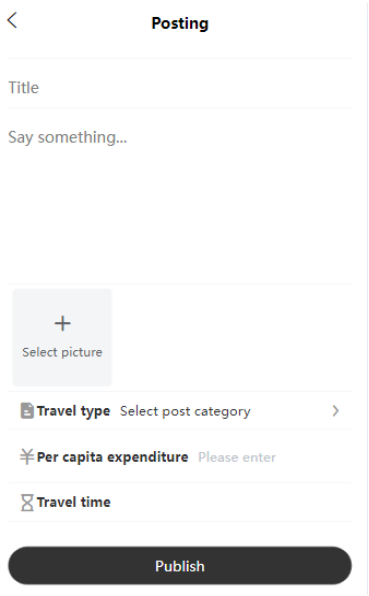

Figure 6: Posting page.

3.4. Recommendation function

According to the collaborative filtering algorithm, posts are recommended based on user similarity, and user behavior data is first collected: including post likes, favorites, and comments data. The similarity between users is then calculated: the Jaccard correlation coefficient is used to calculate the similarity between users. Finally, for each user who is similar to the target user, find posts they like that the target user has not yet interacted with.

The implementation effect of the Recommendation function is shown in Figure 7.

Figure 7: Homepage recommendation page.

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4. System test

The system uses black box testing, which focuses on software functions and user interfaces to find defects related to user interaction and reduce the risk of system failure. The system will carry out input and output black box test, and develop test cases to verify the normal operation of the system.

4.1. Test case

Account module. The account module includes account registration, account login and other functions. We take Login as an example to test the functions. The results are shown in Table 7.

Table 7: Login test table.

ID	input	Expected output	Actual output
1	All empty	The account password cannot be empty	The account password cannot be empty
2	Account error	The user name or password is incorrect	The user name or password is incorrect
3	Password error	The user name or password is incorrect	The user name or password is incorrect
4	Normal information	Login successful	Login successful

Post module. Post module includes creating, deleting, modifying post content and other functions. We take creating post as an example to test the functions. The results are shown in Table 8.

Table 8: Creating a post test table.

ID	input	Expected output	Actual output
1	Title blank	The title cannot be empty	The title cannot be empty
2	Content is empty	The content cannot be empty	The content cannot be empty
3	Travel time is empty	Travel time cannot be empty	Travel time cannot be empty
4	Correct input	Created successfully	Created successfully

Interactive module. The interactive module includes Posting, deleting, reporting comments and other functions. We take Posting comments as an example to test the functions. The results are shown in Table 9.

Table 9: Post a comment test table.

ID	input	Expected output	Actual output
1	Content is empty	The content cannot be empty	The content cannot be empty
2	Correct input	Release success	Release success

4.2. Test result analysis

From the test results, most of the actual output is consistent with the expected output, which means that the function of the system works as expected. For the account module, test cases 1, 2, and 3 of the login function show that the system can correctly handle null and incorrect input, and test case 4 shows that the login function can work properly. For the post creation module, test cases 1, 2, and 3 show that the system can correctly handle mandatory checks for title, content, and travel time. Test case 4 shows that the post creation function works. For the interactive module, test case 1 of the comment function shows that the system can correctly handle checks with empty content. Test case 2 shows that the comment function works. From the above tests, it can be seen that the system function is normal and meets expectations.

5. Conclusions

This paper describes in detail the design and implementation of the interactive platform for sharing travel guides based on SpringBoot technology. From demand analysis to system design, and then to the test and acceptance stage, the platform integrates the functions of publishing, browsing, commenting and collecting travel guides, aiming to provide a convenient and efficient sharing and communication space for travel enthusiasts. Using the flexibility of Spring Boot framework and the responsive design of Vue framework, the development cycle is greatly shortened, and the interface design is concise and

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beautiful through rich plug-ins and custom styles. The platform not only improves the user experience, but also promotes the exchange and dissemination of tourism culture, and successfully builds an interactive and shared online community for tourism enthusiasts.

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