
Design and Implementation of Intelligent Biking Platform Based on PhoneGap

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Abstract

As we all know, China has always been known as a big bicycle country. Almost every family has a bicycle. In recent years, bicycle sport as a unique way of leisure travel, its economic value is increasing. With people's increasing concern about healthy lifestyle, outdoor bicycle industry, which represents the spirit of the times, will be favored by many investors and entrepreneurs, thus creating greater value. At present, Android and IOS are the mainstream operating systems of smartphones in mainland China, with a market share of more than 95%. Therefore, it is necessary to build an adaptive interactive mobile operating platform for mobile terminals based on multi-operating systems for cyclists to facilitate people to travel by bicycle. The intelligent bicycling platform based on PhoneGap proposed in this paper enables people to easily inquire about any line, site and e-commerce information in Android and IOS mobile phones, and find riding partners anytime and anywhere. It can travel in groups and expand the circle of personal friends.

Keywords

Intelligent Biking, PhoneGap, Mobile Terminal.

1. Introduction

In the previous research, we found that at this stage, the functions of the riding platform are relatively single, and it can't achieve comprehensive monitoring of various factors, nor can it effectively record the real-time parameters, which is not conducive to post-analysis and planning for reference, and can't meet the specific application of reality.

At present, there is a blank market for the operation platform of cycling, so we have developed the mobile operation platform of cycling. The platform is an optimization of cycling circle, which can select a safe and reliable cycling route through the geographic location of the cyclists. The cyclists can also search for cycling partners to travel together through the software. The cycling tour can be re-launched after the official operator's review. The route can release recent information and share personal riding experience. In addition, the online communication module can be used to communicate with ordinary customers and cycling organizers online, so that individual cycling ability and related knowledge can be improved. The platform also allows cyclists to consult and subscribe to cycling routes, participate in related activities, effectively manage a large number of cycling customers, cycling routes and cycling derivatives, and organize regular activities to invite all cycling enthusiasts to participate, which provides convenience for cyclists who love cycling.

2. Principles of Intelligent Biking Platform

RideTravel, a mobile platform of Chishan Travel, is developed on the basis of PhoneGap and adopts B/S system + Hybrid APP architecture. It is an independent **management** system, which is divided into backstage Web management terminal and front-end mobile APP operation terminal. Microsoft

Windows NT+/Linux is used in the server-side running platform of the system. It can be applied to large-scale Android and IOS mobile phone users with friendly interface, convenient operation and complete functions. At the same time, the Web management side has good expansibility, portability and maintainability. Company administrators and website administrators can access the Web management side directly through the Web browser. At the same time, the system uses MySql as the database service program for developing software.

Modern technological developments are sufficient to meet the needs of our service system. On the hardware, we need a mobile phone. The storage capacity and running speed of modern smart phones are enough to meet the needs of our system.

In the Android platform system architecture and application program, the Android platform provides a variety of basic libraries, the composition and operation of the program to understand, for the later programming implementation system laid a good foundation. Java, JQuery, Spring MVC, Spring, Hibernate, HTML5, CSS3, Object-C, IOS and Android are the development languages and frameworks for programming software, which are enough to meet our programming needs. At the same time, our system involves the communication between client and server, so the Communication Protocol HTTP is analyzed in detail. Server system, because the development language is Java, so the system can choose Linux and Windows, which have great support for the design and implementation of the system.

2.1 RideTravel System principle description

This system uses B/S system + Hybrid APP architecture, based on PhoneGap development, using Microsoft Windows NT+/Linux as the system server-side operating platform, mobile client support Android and IOS platform, using MySql as the development software database service program. The development environment of the specific system is as follows.

System Development Environment Table 1.

Table 1

Software name	Software application
Window NT	operating system
MySQL	Database Management System
Eclipse	Java+Jquer+Html5+CSS3+PhoneGap



Fig 1 The communication collaboration of various parts of RideTravel system

"RideTravel" will help the official website of cyclists to effectively manage a large number of cycling customers, agents, cycling routes and cycling derivatives. It will facilitate cyclists to access and

subscribe to cycling routes, participate in cycling related activities, and share cycling experience. It will also provide "query statistics" for historical data. "Function, to ensure that the relevant data of riding travel is effectively managed, to achieve the operation of riding travel based on mobile Internet, is an important tool for the promotion and management of riding travel.

RideTravel system is an independent management system, which is divided into background Web management end and front mobile APP operation end. Because PhoneGap currently supports operating systems that include Apple's iOS and Google's Android. For all mobile terminals developed by different systems, our system's APP will automatically adapt. The communication collaboration of various parts of RideTravel system is shown in the figure 1.

2.2 PhoneGap Working principle

Phonegap is an open source development framework based on HTML, CSS and JavaScript. It aims to enable developers to develop cross-platform mobile applications using Web APIs such as HTML, Phonegap Javascript and CSS. It enables developers to take advantage of the core functions of the iPhone, Android, Palm, Symbian, WP7, Bada and Blackberry smartphones, including geolocation, accelerators, contacts, voice and vibration. In addition, PhoneGap has a wealth of plug-ins to extend its unlimited capabilities, originally developed by Nitobi, and now by Adob. E owns.

It requires additional software provided by specific platforms, such as the iPhone SDK for the iPhone, Android SDK for Android, etc. It can also be developed in conjunction with DW5.5 and above. Using PhoneGap is only a little better than building applications for each platform, because although the basic code is the same, you still need to compile applications for each platform separately.

2.3 Backend Management and Web Working Principle

Background management uses traditional Web applications to interact with users and runs on WEB servers accessible to the public network. All three types of users involved in the mobile operation project of Cycling Travel can login to the back-end management page. System users log in to the background, and each role's background display framework adopts a unified style.

The front page of the management platform is divided into three areas, the top is LOGO area, including personal information settings and exit system, personal information settings can modify their login name and password. On the left is the system function navigation. The right side is the main workspace, the home page can not be closed, timely service to users'roles.

User types are divided into three categories, ordinary customers, agents, administrators. After login, the system loads different functions according to user types and permissions. Among them, ordinary customers can view riding routes, share riding experience (sharing content needs administrator review), promote riding travel mobile applications, manage their own ordered riding routes, Book riding routes online and pay online, check the status of their certificates/bills, accept system tips, and query. For your historical order, you can check your points, activities you can participate in, or concessions you can exchange. Export and save in the form of structured documents. Customers can communicate with other customers and cycling organizers through the online communication module. Agent customers can initiate new ride routes, but they can only be displayed to customers on the intelligent ride platform after the official operation manager of the rider checks. Agents can check and manage the ride routes initiated by themselves, but the management operation needs to be checked by the official manager of the rider before it can come into effect. Agents can count and query the number and route of customers booked by themselves, and export and save data in the form of structured documents. Acting customers, can publish information and share riding experience (need to be audited by administrators). Agent customers can communicate online with ordinary customers and cycling organizers through the online communication module.

Administrators are divided into system administrators and business administrators. System administrators have the highest privileges of the system and can use all functional modules. Business administrators can use other business functional modules that remove the system management module.

According to the requirements of the above system, the following requirements are met in design and development:

1. The system has high security and confidentiality.
2. The management of this system is serious and serious. Users can not modify it without principle.
3. The network system should be supported by stable machines and standard network products.
4. User operation menu should adopt popular, mature and practical menu mode, user interface is simple and friendly.
5. In programming, the system has a high exclusion to illegal instructions.
6. The database of background server adopts MySQL database, the mature and universal data interface is used between front and back-end, and the network communication protocol adopts TCP/IP protocol.
7. The technology and scheme adopted in this system meet certain maturity and advancement.
8. The whole system should be fast, convenient, stable, reliable and safe.
9. The software has good maintainability and can be upgraded.

The system server-side use cases and instructions are as figure 2.

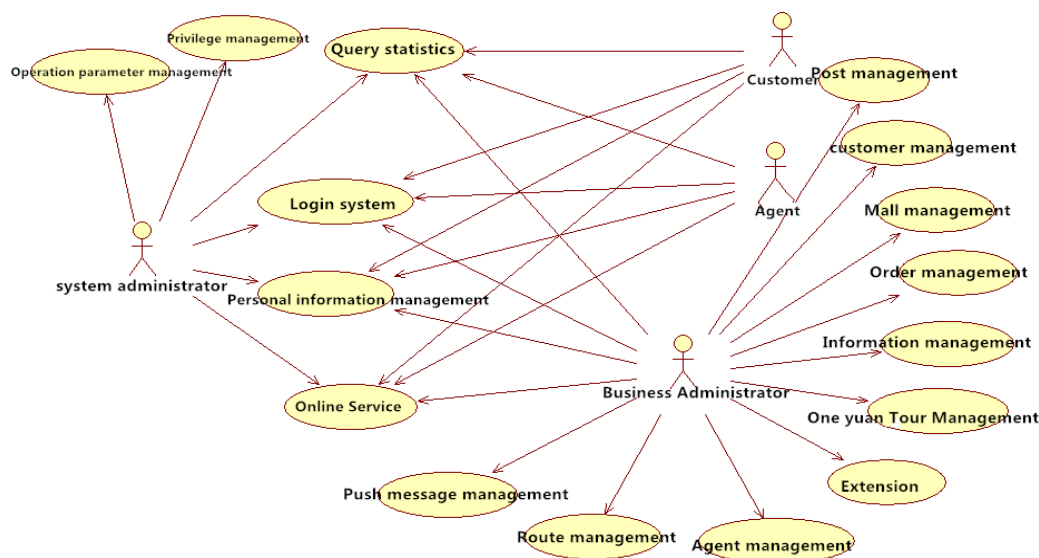


Fig 2 The system server-side use cases and instructions

3. Summary

China has always been known as a big bicycle country. With the development of economy, there are many kinds of transportation tools, such as trains, motor vehicles, high-speed trains, airplanes, private cars, metros and buses. However, bicycles are endowed with low-carbon, environmental protection, fashion and freedom labels on the basis of the traditional functions of pedestrians because of their small size and easy storage. Bicycles play a new role in the new era. With the steady and rapid development of the economy and the gradual improvement of people's living standards, bicycle riding, as a leisure sport, has become an indispensable part of people's life. Technological and applied innovation is the work that must be done in today's society. This design is an innovative application based on the analysis of the needs and difficulties of cyclists. Ride Travel, a mobile operating platform for Ride Travel, is a prerequisite for improving people's quality of life. It realizes the combination of transportation, business and individuals. It will help the official website of Ride Travel effectively manage a large number of riders, agents, ride routes and ride derivatives, and check and order riders for riders. Travel routes, participation in activities related to cycling, and sharing of riding experience are facilitated; historical data are provided with a "query statistics" function to ensure that the relevant data of cycling are effectively managed, and the mobile Internet-based operation of cycling is realized. It is an important tool for the promotion and management of cycling travel. Users and managers of

RideTravel system use computer network system as the medium to manage and communicate the RideTravel system on different user terminals according to the relevant processes and rules of RideTravel.

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