Design and Implementation of Tibetan Online Trading System Based on iOS Platform

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Abstract. This article aims at to design the online version of the Tibetan trading system for the iOS system and make a basic exposition of the system requirements analysis, basic design and implementation, system testing and so on, so as to realize the Tibetan users' shopping Function on the iPhone and iPad terminals, so that users get more convenient and efficient shopping experience.

1. Preface
iOS is a mobile terminal operating system developed by Apple Inc, and is one of the most widely used operating systems. Like the Mac OS X operating system of Apple, iOS belongs to a commercial operating system like Unix. iOS system architecture can be divided into four layers: top to bottom, Cocoa Touch Layer, Media Layer, Core Services Layer and Core OS Layer respectively, each level to provide different services, the lower to provide calls to the upper interface and services, the upper provide more complex services related to the application. Low-level infrastructure to provide basic services such as file system, memory management, I / O operations. High-level structure based on the low-level structure to provide specific services such as UI controls, file access and so on.

In March 2015, the National Development and Reform Commission, the Ministry of Foreign Affairs and the Ministry of Commerce jointly put forward the national-level top strategy named "One Belt and One Road", aiming to improve China's economic development. Currently there are many e-commerce software in China is very stable, but there are few e-commerce platforms for minority languages. In 2015, "Master Ba Yi" was a well-developed ethnic minority O2O provider in Xinjiang Platform, in Qinghai a Tibetan bilingual business platform in 2016. Multi-language e-commerce platform for the development of industrial products for the ethnic minority areas of products to the countryside, agricultural products into the city "to bring in" and "going out" provides a convenient, but also for the economic development of ethnic minority areas to provide assistance.

Based on the iOS mobile device, this paper proposes a design scheme of online trading system for establishing Tibetan language, and briefly introduces user requirements and key technologies.

2. Demand analysis
Based on the iOS operating platform, a B2B2C mode iOS mobile e-commerce system is designed for the transaction of goods. The business process is shown in Figure 1.
2.1. System function

1) Product Search, Category: Users click the product search bar on the top, go directly to the product search page, product search page provides the function of goods by name, you can search by keyword. Category pages provide classified goods display and classification of goods search.

2) Products: The system home page automatically pushes quality product information, user-friendly access to quality product information, and provide users with quick access to specific product list entry. Users to view product details, according to product prices, color, size, user evaluation to determine whether they can meet the demand.

3) User registration and login: After the user enters the platform through the mobile phone website or the mobile phone client, the product list and product details can be obtained, and the product can be selected for purchase. When the user uses the platform for the first time, the user needs to register. The registration information includes the user name and password, Mailing address, postal code and telephone number; if you have already registered, you can modify the registration information, purchase of goods, order inquiry and so on after login. Registered users forget the password can be verified by the mailbox, SMS authentication method to retrieve the password. Similarly, users can modify user information, including user system information and personal information, shipping address and account security settings.

4) Shopping Cart: The registered user can put the purchased product into the shopping cart after login, modify the quantity of the product in the shopping cart from the shopping cart, etc., and make the online payment after confirming the order.

5) Order Management: The user can query the generated order information, modify the status of the order; allow the user to delete the unpaid order, but also modify the order information twice and re-enter the payment process; evaluate the purchased goods, User comment information is displayed as a list on the item details page.

Figure 1. Business process diagram.
6) Favorite users: Favorite products and purchased goods, in my collection in the form of a simple summary of the basic information show the product. Users can also click here to view the product details. Users can also delete items in my favorites list to add items to the shopping cart.

2.2 Security:
In the software development, to ensure user safety is very important, but also must be considered. System through the password login and SMS authentication login to ensure the safety of users.

2.3 Payment method:
Payment is made through the third-party payment platform. After the user submits the order, the system will guide the user to choose the payment method. The system provides three payment methods, one is Alipay payment, the other is WeChat payment and the other is a I s to use online banking online payment.

2.4 User interaction:
1) User graphical interface design: The system seeks to make the interface simple and straightforward. Since the project is a handset-side application, it does not consider the horizontal layout after the screen is rotated, and uses the fixed vertical layout for more stability. Illegal operation or operation failure should have a corresponding prompt.

2) User experience design: The system first requires the operation of the fluency, the interface layout and button set a reasonable position. The first data stored in the local, so read data does not require access to the server, making the interface load more smoothly, only when the user needs to synchronize the data and the server will access the server, so that not only to avoid data loss, but also to maintain the system interface Switch the fluency.

2.5 Tibetan:
Support for multi-language client is the current trend of development, for Tibetan people, the use of Tibetan e-commerce client will undoubtedly be much easier. This article selects the way to manually switch languages in the APP, making the user experience degree be strengthened to a certain extent.

3. iOS Tibetan online trading system design

3.1. System architecture
1) Technical route:
iOS client using Objective-C language, the use of Xcode development software and SQLite database environment, the technical route shown in Figure 2.
Client use a layered architecture model that includes data access, encapsulation, business logic, and presentation layers. Because of the inter-layer interaction defined by the interface, this hierarchical structure is characterized by an extractable and replaceable "drawer" structure. Because the layer is a weakly coupled and has a downwardly dependent structure, changing the design of the upper layer has no effect on the underlying layer.

2) Data flow:
Client data flow shown in Figure.3.

Network access is responsible for the client and server links, through the ASIHTTPRequest class library network connection, complete data exchange.
Client database using SQLite database. Part of the database access is mainly the implementation of SQL statements, as well as create, open, close, optimize the database and other functions. Data exchange part is responsible for the completion of the package GET, POST methods, and parse the server interaction data, image acquisition and so on. Which access pictures using SDWebImage class library, respectively, packaging, downloading part of the package in the network access part of the access part of the database access part. The business logic layer obtains the image URL and returns the corresponding image, and detects if the image is located in the cache and is directly obtained in the cache. Otherwise, access the server to get.

3.2 Client module

1) Product display and product details

The product details section includes the basic information of the product, the detailed introduction and the operation of the product. The three parts mainly use the Cell reuse mechanism in UITableView. The user clicks the picture or text information on the main page of the client, calls the third party open source library of ASIHttpRequest to send the network request, and the client types the page according to the JSON data returned by the server API. Use cell reuse mechanism to save system run time memory and space, improve run time efficiency. When the user clicks the picture or text information in the basic information page of the commodity to jump to the detailed information of the commodity, the client sends a network request to the server and displays the data according to the TableView reuse mechanism. When the user clicks the purchase operation, a pop-up selection size page pops up. After selecting the size and quantity, click the purchase button to complete a complete submission order operation.

2) Product categories

After the user enters the category browsing module, first obtains the category information of the product from the local CoreData, displays the list, and the user can perform the corresponding screening operation on the current category. When users click on the classification information, the client and server data synchronization. Synchronous operation is divided into two ways to upload data to the server and update data from the server to ensure that the client and server data synchronization, to avoid conflict, two-stage classification module using the UITableView to display the list, switching between two levels using a small amount of animation.

3) Product search

After the keyword of the query commodity is executed, the server returns a corresponding list of query results. In the phone interface with TableView product information will be displayed. In order to meet the needs of different users on the display of query results, set the sorting function, providing a total of three different sorts of functions, namely, recommendations, prices, sales. The default sorting of products is based on the relevance of keywords and matching items (ie recommended), sorted from largest to smallest. According to the needs of users, you can choose one of the sorts. For example, if you click Price Sort, the item information Cell will be sorted according to the price of the item, and then click to sort it from price to order.

4) Pay

In the payment process, support for online banking, WeChat and Alipay payment. In the payment interface, setupDescView used to display the payment interface of the order generation, display order type, status, payment methods, consignee information. When the user selects online payment, according to the user's selection jump to the corresponding payment interface such as Alipay. After confirming the payment link, the confirmPay interface is used to confirm the correct payment of the submitted order. If the payment fails, an error message is provided, including information such as network failure and insufficient balance. If successful, the mobile terminal goes to the successful payment interface.

5) User center

The client accepts the user management operation, which is done by the management module. The module sends a request to the server according to the user's operation. The server listens on the port and intercepts the request sent by the client. After receiving the message, the module parses the message according to the function code and data in the message (for example, user registration and
login, modification of product information, Modify contact information, etc.), the database data to operate, add, delete or return data according to user needs, data synchronization storage. The main server data storage for customer purchase information, goods tracking information, and product details information. Mainly in the system management sub-module seller’s users, sellers can order management, data analysis and credit inquiry and other operations, in the background query function to use. Order Management contains 2 different categories of orders. In the data analysis, you can inquire the required order statistics by time period and order type, and display the data and the total information in a list form.

6) Shopping cart
The user interface in the shopping cart by UITableView in the form of group, the first group of cell displays the user's address information. The second group of cell displays the user currently selected product list, product name, unit price and quantity. On the price changes, the external need to interact with the server; on the price calculation, traversing the array has been selected, remove the Model to calculate.

7) Safety
System security mainly has the following six basic requirements: confidentiality, integrity, non-repudiation, availability, key management, authorization and certification. Security content includes customer and security, communication channel security and server security, and several other aspects. A full range of e-commerce security system has five levels, namely: application system layer, security protocol layer, security authentication layer, encryption control layer and network service layer.

The system log in mainly through the password, send SMS verification to ensure the safety of users. Password using AES encryption, save the user name and password is the user name and password into a local sandbox, access to directly read the encrypted file locally, after decryption and user data on the server to compare. Figure 4 for the SMS verification flow chart.

![Figure 4. SMS verification flow chart](image)

3.3. Tibetan shows the realization
This article implements the switch between Tibetan and Chinese, using the steps of international switching manually. Below to do a detailed introduction.

First, you need to define your own .strings files for different languages, and translate the corresponding versions of the internationalized fields for multiple languages. Such as: "Home" = "མཐོང་ངོས།", "Category" = "ཅིགས་དེར". Let Chinese be the default language in .strings and Chinese as key to find the corresponding Tibetan value, so you only need to implement the Tibetan version of .strings file. And then through the code: NS Localized String from Table (context, LANGUAGE_TYPE, nil)
manually load the corresponding Strings file, you can complete the international switch. Due to the need to internationalize the strings in the APP, the redundant code is set to a global macro definition for ease of use.

4. System testing

4.1. Integrated test
Integration testing mainly uses the black box test method, with the added function of the shopping cart as an example. The test cases are as follows:

1) Test environment and use case description:
   Test to ensure the normal network circumstances, respectively, in the real machine and simulator to run APP, test the shopping cart to add the function of the product, the test results for the expected results.

2) Steps:
   a. Click the bottom tab of the home button, enter the home page of the product selection interface;
   b. Click on the shopping cart add button on the first page of a certain product;
   c. Click just selected in the home page of goods, click to jump to the product details interface, check the number of products purchased.

3) Expected result:
   a. Home purchase of goods to buy the number of 2;
   b. Click the product into the product details interface, the purchase of this product is also 2;
   c. Click the bottom of the tab button to enter the shopping cart interface shopping cart interface to the list of products just selected home page, and the number of goods purchased is also 2;

4.2. System test
In the daily test, the system test is to test the software through the system as a general, combined with other modules on the line test, which includes the following aspects:

1) According to the test requirements for system testing, found in the software bug, testing software is wrong. At the same time, it is true that we track the recording system test to see if the test meets the expected goal.

2) In order to ensure that the bugs that appear before going online are no longer reproduced, you need to test the software bugs multiple times before coming online to ensure that the bugs that appear before are indeed repaired.

3) Found that the known bug and solve the bug is the ultimate goal of the test, but does not guarantee that the entire system will not be any problems after going online, but for the problems have been found need timely repair.

4) In the process of system testing, the user experience of multi-language E-commerce APP, and the security and compatibility of APP were also tested to ensure stable operation after the APP was online.

4. Summary
With the development of e-commerce, mobile e-commerce has been in-depth aspects of people's lives, because it is a relatively new mode of development, has broad prospects for development. On the basis of iOS system, this paper elaborates and discusses the design of the basic framework of Tibetan online trading system, including the analysis of user needs and the technical solutions involved in designing and implementing the system. The system is put into use, can provide a Tibetan mobile platform for B2B2C mode of e-commerce, to provide convenience for Tibetan users.

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