Design of a House Lease Management System in Cloud Computing

Young-Long Chen, Siao-Jhu Shih, and Yi-Shang Liu

Abstract—In this paper, we adopt e-commerce technology to realize a house lease management system. Our proposed management system has three important advantages as follows. First, users can release or update their house lease information anytime or place by using an Android smart phone to access the wireless fidelity (Wi-Fi) and 3rd-Generation (3G) mobile network. Second, the system provides functions to inquire and browse house lease social networks for those customers who want to lease houses. Finally, taking advantage of global position system (GPS) information, the presented system can plan the best route for brokers and enable customers to track the brokers. The real estate brokers can edit the path to meet the customer’s requirements.

Index Terms—3G mobile network, android smart phone, GPS, house lease.

1. Introduction

Nowadays house-leasing is very popular, so how to find an ideal house through Internet[1][3] becomes very important. Real estate brokers compete fiercely because of the economic downturn. If housing lease management and customers are closely connected, this can effectively promote the exposure of the house lease salesperson and the market layout. The main work of our proposed housing lease management system involves evaluating, transacting and consulting real estate brokers or assessing real estate transactions. Due to the restrictions of law, the process of signing a lease contract is cumbersome and complex, and it takes too much time. Moreover, if the amount of money involved is very great, it will generate many disputes. A professional and experienced broker can reduce the conflict between lessee and lessor to accelerate the process of real estate transactions and quickly obtain the transaction amount and the real estate title in the transaction phase.

Currently, real estate brokers have become more professional; they use traditional data to construct an integral digital database so that they can know the latest information anytime and arrive at a reasonable price to conduct real estate transactions. The process of house management is an integral part of the real estate business. If the real estate brokers use the house management system proposed in this paper as a development strategy, they can quickly achieve the contract between lessee and lessor. House management is divided into two parts: one is the broker’s period and the other is the real estate broker’s period. The broker’s period is the time that the sellers post the advertisement information on billboards or telegraph poles, etc. The real estate broker’s period means the time that brokers turn towards a diversified business model and extend customer service after lessor's formal registration. In recent years, many people have posted their house information on the Internet due to the rapid development of the Internet. However, customers only obtain house information from a computer. If the amount of house information is too onerous, customers will get tired and feel that is not useful. To solve this problem, the customers can interact with real estate brokers by means of Android smart phone[4][6]. In this way, customers can effectively find the house that they want.

Our research uses the Google Map service[7], global positioning system (GPS) location[8][9] and the Android operating system. Users, no matter where, can immediately add new house information through the Android smart phone to connect 3G[10][11] or Wi-Fi[12]. Apart from adding new information, users can send/receive information anytime, anywhere. After the real estate brokers have finished the process, they can use our system to update the information timely and let the customers know if and how the position of the real estate brokers have been changed. A supervisor can also exploit this function to monitor a real estate broker’s work progress and status. Customers can use this system to access the house information from the real estate brokers so that it is possible to form a community network. Besides, customers can choose the way of subscribing/tracking the preferred house and the information of the real estate brokers. When new information is posted, the real estate brokers will inform the customers right away, meanwhile customers can browse the updated information anytime by using Android smart phone to find a house to their satisfaction. After the business deal is done, customers can evaluate the satisfaction of real estate brokers.

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2. House Lease Management Cloud System

In this section, we introduce the stages of our designed system; we use the Android smart phone as our system environment, and combine the Google Map location service and the wireless network. In addition, we adopt the structured query language (SQL) database as the server to construct this system service. The architecture of our system is shown in Fig. 1. Our target is to shorten the visiting time of the salesman, plan the best path and automatically arrange schedules. When customers use our system anywhere, they not only can find the house that pleases them, but also track the exact position of the salesperson. With the convenience of a smart phone, customers can provide feedback or change the schedule to avoid unnecessary waste of time.

2.1 Technique Applications Background

In the programming and operation of our system, we conduct background technology research and its application by means of the Android system and Google Map.

2.1.1 Android System

Android is a kernel system platform that is based on Linux. It was released in April 2009 by Google. It is divided into two modes: the finger touching mode and the sliding mode such as employed on smart phones and tablet computers. Due to Android having a semi-open-source, it does not need a high standard of hardware, so the cost of hardware device is lower. The Android system is divided into five parts: application, application framework, dynamic libraries, run-time, and Linux kernel.

In terms of Android execution, software development kit (SDK) is divided into two parts, core libraries and Dalvik virtual machines. The Android libraries include functions that are called JAVA programs. Dalvik is a registered type of virtual machine; it uses little memory to operate. In the execution period, it can save more resources.

2.1.2 Google Map

Due to the GPS having become more sophisticated, the Internet service application provider is able to develop and combine accurate numerical maps and the geographic information system (GIS). Even cars are now supplied with navigation software. To avoid road congestion, it gives current road condition information so that commuters may arrive at their destination rapidly. Google Map was published in February 2005; it is allied with the Android system of smart phone. If users complete the Google account registration process and verification, they can use this free service that is provided by Google. Besides, users can use the wireless network of an Android smart phone to connect with the Google Map service, to navigate, and to inquire about map locations. It can also use the GPS location service or assisted global positioning system (AGPS). These two methods utilize the base station of the mobile phone signal to locate the coordinates of the user. Android’s Google Map supports many kinds of map formats such as GPS eXchange format (GPX), keyhole markup language (KML), etc. If a user wants to develop a personal map, Google Map provides its application programming interface (API) for users to develop; if a user wants to use this pack, the user needs to apply the API key.

2.2 Design of House Lease Management Cloud System

In the evaluation stage of our system, our main purpose is how to enable ease of operation. We use this house lease management cloud system which can reflect the overall relationship between user and our system. This system architecture and the various work processes are shown in Fig. 2. We divide our system into four parts: smart housing information platform, schedule planning, social service, and house management. Fig. 3 shows the functions of this system.
2.2.1 Smart Housing Information Platform

Users can browse other house information by accessing the smart housing information platform in the house lease management cloud system. Each home’s information is very detailed. If a user wants to lease a house, the user can post the house information to the smart housing information platform. The seller and buyer can browse and leave a house information message, as shown in Fig. 4.

2.2.2 Schedule Planning Service

Schedule planning service uses the Google Map service to show the map information in the house lease management cloud system. This map information is turned into actual latitude and longitude in a vectored map. Customers can plan routes by themselves or let the system plan the route automatically in order to save time. Therefore, customers can use the itinerary planning service on its house list, as shown in Fig. 5. If customers are unclear about the graphical interface position display, they can switch to the Google street service to help them find their destination.

2.2.3 Social Service

The social service of the house lease management cloud system is divided into three parts: housing trends, list of friends, and interactive maps. Sellers can set up groups to manage their customers and interact with customers, and to immediately respond to messages. Sellers and buyers constitute the big group. The schematic diagram is shown in Fig. 6. Their superiors can know the status of the sellers, their interaction with customers, their current position, etc. Fig. 7 shows the social service architecture which is easily managed by those in charge.

A. Housing Trends

When sellers choose a house, the system will list the customers who are looking for the house and the leasing status. Fig. 8 shows that sellers can convey an instant message to interact with customers.
B. Friend List
A friend list enables users to freely add friends. If a user or friends finds a satisfactory house, the user can show the information of this house to their friends; if his friends fill in their telephone number, the user can immediately call and tell them the good news. The schematic diagram of the friend list is shown in Fig. 9.

C. Interactive Map
Interactive map provides a user the information of the latitude and longitude positions of friends in the friend list.

2.2.4 House Management
After signing the contract between the seller and buyer, the contract may be saved in the house management of the house lease management cloud system. The house management process is shown in Fig. 10.

After a house transaction has been carried out, we analyze our management system and trace its service. The service items are divided into four parts as follows.

A. Buying and Selling Transaction
Whether customers can receive the new house information is determined by the sellers. In recent years, many people have bought or sold real estate not only as a place to live, but also as an investment. In this regard, the people who use our system have better deals and investment options. After the business deal has been finalized, customers can evaluate the real estate brokers as a reference for others. It has two advantages for the seller: enhancing the positive reputation of the brokers and increasing the customer base.

B. Lease Transaction
A house leasing check examines the house records before the management system is enabled. The house records contain the utility bill and the bond that customers need to pay in advance, the furniture list, and the status of house. With these records, customers can be aware of needed repairs, damaged furniture, etc. After the management system has been enabled, the landlord or seller can set the date for the tenant’s monthly payments. The system automatically sends a reminder message before the date. If the tenant does not pay on time, the management system automatically sends the payment notice as a reminder to the tenant. If the tenant has paid, a message may be sent to the landlord stating, “I have already paid.” Once the landlord has received this message, the management system will no longer automatically send the notification. The management system will check the payment record of tenants and the status of furniture and house after the contract has been terminated or has expired.

C. RFID Access Control
The range of applications in access control is widely used. The access control system is no longer limited to a single gateway control such as the access control of buildings, anti-theft alarm, parking management, elevator control, etc; it can also be combined with other systems.

D. Face/Fingerprint Identification System
The face/fingerprint identification system contains two functions: check in and identification. This system is provided for the seller. The seller can use the identification system to establish personal data either by fingerprint or facial image. This system is not only easily managed by superiors, but also lets the customer identify the identification (ID) in order to enhance security.

a) Check in
After sellers clock in every day, they can obtain the work content assigned by their bosses. When sellers have finished their tasks, they can use the check in function to report back, thereby making the boss’s management easier.

b) Identification
This identity function is used in the signing of a contract between customer and seller. It uses the fingerprint or face identification system to establish an electronic contract, so that the transaction becomes more secure.

3. Conclusions
In recent years, house leasing has become very popular. To find a house that gives the customer total satisfaction is very difficult and usually takes a very long time. Our system combines a house browsing platform and a status search, enabling prospective tenants to quickly browse and filter houses that match their needs. In addition, our system contains an instant communication function that can
immediately reach a landlord, thereby saving house-finding time. Presently, real estate investment is becoming very popular, with many landlords renting a house with at least three or four rooms. To manage or take care of each tenant, a landlord can use this system to effectively manage property.

References


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