Review Paper on Food Ordering and Payment System using GPS and Android

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Abstract:
Currently in restaurants, a waiter takes order manually and goes to kitchen to explain the cook to prepare food as per order. Once cook cooked, waiter gets it and serves the customer. Customer again orders next order, waiter again repeats the same and serves the customer. At last waiter submits bill and customer needs to pay it at counter. It is time consuming and manual task. With the advent of GPS technologies more and more applications are getting developed on various independent platforms relating to services offered by smart devices such as smartphones, tablets, Pc’s based on locations fetched by the GPS (Global positioning system). And with the world going online for purchasing their day to day basic things the need of clubbing GPS based services with other important sectors of the economy such as retail, hotel industry is the need of the fast becoming world. We would like to use location based services to help user to find good restaurants from its current place. Here we would like to propose location based food ordering and parcel system which will help user to place order from its location and save his/her time by making him the facility of paying his incurred amount online. Ones the user places his/her order, the application on the client side forwards the order to the server for checking the if the order is viable or not. After the order is verified by the server, a message is sent to the restaurant administrator consisting of the order and the delivery address of the user. Once the order is ready, the order is dispatched to the user/client with the process getting completed on receiving the delivery of the ordered food. Application also supports feedback and reviews which will be helpful to restaurants to improve their food and services quality.

Keywords: IP (Internet Protocol), JDK (Java Development Kit), KVM (Keyboard Video Mouse), LBS (Location Based Services), SDK (Software Development kit).

1. INTRODUCTION

In hospitality industry such as restaurants can be improved with the combination of wireless and mobile technologies. The competition in restaurant business has increased with the advancements in food ordering techniques. The prior food ordering system was entirely a manual process which involved waiters, pen and paper. The waiter had to note down orders from customers, take these orders to kitchen, update them in records and again make bill. Even though this system is simple it may involve human errors in noting down the orders. Location based service (LBS) is fast becoming a need of the smart devices getting developed based on Global Positioning System (GPS). With the users also getting smart enough, these applications are being used on daily basis by users worldwide for doing many things such as commuting from one place to another using applications like Google Maps, getting useful information about a place using the feeds provided by the people who have visited that place before, booking of hotels for stay using the list of hotels provided by the application based on the location fetched by the application and many more. Users with location-aware wireless devices can query about their surroundings (e.g., finding the nearest restaurant or all shopping malls within 5 miles) at any place, anytime. While this ubiquitous computing paradigm brings great convenience for information access, the constraints of mobile environments, the spatial property of location-dependent data, and the mobility of mobile users pose a great challenge for the provision of location-based services to mobile users.

2. OVERVIEW

Online food ordering and payment system is a mobile application that is dependent on the location of a mobile device, like mobile phone. This application is part of the larger service viz. the location based services (LBS). [2] LBS services as follows: “Information services accessible with mobile devices through the mobile network and utilizing the ability to make use of the location of the mobile device “Open Geospatial Consortium” [2] defined LBS service similarly: “A wireless-IP service that uses geographic information to serve a mobile user, any application service that exploits the position of a mobile terminal.” A Location Based Service (LBS) is an information and entertainment service, accessible with mobile devices through the mobile network and utilizing the ability to make use of geographical position of the mobile device. A LBS services can be used in a variety of contexts, such as health, work, personal life, etc. LBS include services to identify the location of a person or object, such as discovering the nearest banking cash machine or the where about of a friend or employee. LBS services include parcel tracking and vehicle tracking services.

LBS have two major actions, that is:
1. Obtaining the location of user
2. Utilizing this information to provide a service.

These 2 actions are used to answer these 4 questions (below) for a mobile user in a new, fast, and more accurate way, to form the basis for LBS: Online Hotel Parcel and Payment System Using Gps and Android.
LBS services can be categorized as triggered LBS services (push services) and user-requested LBS services (pull services) [3]. In a triggered (push) LBS service, the location of user's mobile device is retrieved when a condition set in advance is fulfilled. For example, a call to emergency centre can automatically trigger a location request [3]. Advertisement messages can be delivered to users who enter a specific area in a shopping mall, and warning messages can be delivered to users who are in the area where weather conditions will change (e.g. hurricane, rain). In a user-requested (pull) LBS service, the user decides whether and when to retrieve the location of his/her mobile device and use it in the service. User-requested LBS service can involve personal location (i.e. finding the current location of the user) or services location (i.e. finding the location of the nearest restaurant or bank). Navigation and direction system is an example of pull LBS services [3].

3. IMPLEMENTATION

3.1 SYSTEM ARCHITECTURE

The whole product is divided into 4 to 5 functionality. Product supports 3 different types of users namely the Customer, Hotel and System itself. The first basic functionality of the product is to find the exact location of the user when he starts using the application. For this we would be using the mobile GPS and Google Maps to find the users exact location. The extracted location information will be sent to server to find all the listed nearby hotels and their current menus. User will then see the list of all hotels with their menu and users reviews/feedback. User then can explore the hotels and find desired food item which he wants to order as parcel. As part of extra services, system will promote good advertisements to user which will help him to place order quickly. Ones the order is placed, system will inform respective hotel/restaurant to deliver order to the user at the address sent by the user during payment. System will send location of user to hotel so that it will dispatch order to it. System supports PayPal payment gateway to do online payments at the time of paying for the ordered food from the application. For the purpose of transparency the entire security while payment will be handled from the side of PayPal since it’s a very trusted online payment source.

4. TECHNICAL SPECIFICATION AND RESULT ANALYSIS

4.1 ANDROID

Android consists of a kernel based on the Linux kernel, with middleware, libraries and APIs written in C and application software running on an application framework which includes Java-compatible libraries based on Apache Harmony. Android provides access to the above components to facilitate the implementation of LBS services

Through the help of following classes;
1. Location Manager
2. Location Provider
3. Geocoding
4. Google-Map

Location Manager - Location Manager Class of android is present to manage all other components needed to establish a LBS system. Location provider - Location provider represents the technology to determine the physical location i.e. to handle GIS (Geographical Information System). Location Provider component of Android application is a present to facilitate the determination of available provider and selection of suitable one. Finding the List of Available Location Provider, to get a list of names for all the providers available on the device, call get Providers, using a Boolean to indicate if you want all, or only the enabled, providers to be returned:

```java
Boolean enabled = true;
List providers = location Manager.getProviders(enabled Only);
// more criteria here
```

Furthermore for finding the provider on the basis of some criteria we can use the criteria class and then can find the best provider for defined criteria using the Best Provider Method as shown is the following code snaps:

```java
Criteria criteria = new Criteria();
criteria. Set Accuracy(Criteria. ACCURACY_COARSE);
criteria. Set Power Requirement(Criteria. POWER_LOW);
```

4.2 SQLITE DATABASE

The database required for this system is SQLite database for storing details on the tablet itself. It also needs a database on the server which is handled by JSP and SQL. SQLite is a relational database management system contained in a small (~350 KB) C programming library. SQLite is ACID-compliant and implements most of the SQL standard, using a dynamically and weakly typed SQL syntax that does not guarantee the domain integrity. SQLite is a popular choice as embedded database for local/client storage in application software such as web browsers. It is arguably the most widely deployed database engine, as it is used today by several widespread browsers, operating systems, and embedded systems, among others. OS like Android, Web browsers like Mozilla etc.[1]. SQLite is a popular choice as embedded database for local/client storage in application software such as web browsers. It is arguably the most widely deployed database engine, as it is used today by several widespread browsers, operating systems, and embedded systems, among others. OS like Android, Web browsers like Mozilla etc. SQLite has many bindings to programming languages.
5. OPERATING ENVIRONMENT

5.1 MOBILE PHONE
Android Operating system is an open source operating system. There are thousands and thousands of developers are there at sites trying to make android a better a operating system. There are so many eyeballs looking over the code every day. So the loopholes are quickly patched and fixed. Therefore android is secured. It always encourages your creativity. Unlike the iphone OS, Android user interface has been constantly refining and over the years. With Android 4.0 Google has made the user interface much more polished and modern. For running this application need the android mobiles[1].

![Figure 2. The System Architecture of AOS-RTF Without Internet Access][3]

6. ADVANTAGES AND DISADVANTAGES

6.1 ADVANTAGES
- It is Portable application.
- Efficient and fast access.
- Online application.
- Automatically update menus in all restaurants.
- Wastage of paper is avoided as our implementation is working just on tablet and does not need any paper work. e.g.- For taking the order, we are not using papers. Also, our menu card would be digitized.
- A customer going into restaurant does not has to wait for the waiters to take the order. As soon as he occupies a seat, he would order whatever he needs.
- As soon as the order is ready, it would be notified to the customer. So, there would not be any issue of late delivery in spite of the food being ready.

6.2 DISADVANTAGES
- Need of internet.

7. CONCLUSION
In this paper, we present an online food ordering system and payment transaction with GPS and android. This system is convenient, effective and easy thereby improving the performance of restaurant’s staff. It will also provide quality of service and customer satisfaction. Overall conclusion is that, this is a fabulous food ordering system for the restaurant sector, made by combining the Android and Wireless technology. In next phase, we will be working on providing provisions to accept different types of payments like checks, credit cards, debit cards, tips, etc. The system can be further extended to register and link multiple restaurants to enhance the dining experience of customers. It save the customer time.

8. REFERENCES


