© 2016 IJSRSET | Volume 2 | Issue 3 | Print ISSN : 2395-1990 | Online ISSN : 2394-4099
Themed Section: Engineering and Technology

Food Dishes Recommendation System Based on Mobile Context-Aware Services

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ABSTRACT

Context information, such as user location, age, and user profile, Gender, Comments has been popularly applied to analyze user behaviour. In this paper, we develop a Food Dishes recommendation system based on mobile context aware services to provide customized information for users. We analyze the service satisfaction ratings of the users to recommend favored Food Dishes for them. With mobile context awareness, the proposed framework can substantially enhance the capacity to satisfy the user demands for Food Dishes recommendations.

Keywords : Android, Big Data, HDFS, Hadoop, Mapreduce, Smart Phones.

I. INTRODUCTION

With the rapid growth of mobile technologies, their application on mobile devices can be combined with sensor applications and the development of a variety of Apps (Applications), such as the use of the user's location to find nearby businesses applications. However, it is a fact that most of these Apps only use location Based Services (LBS) to help users find the interested location, but yield a lot of irrelevant data. We pointed out that there are two types of recommendations on the Internet, content-based filtering and

Collaborative Filtering. While the former produces results based on the correlation between the content and the user's preferences, the latter derives results based on the correlation between people with similar preferences. Moreover, context awareness is based on user location, which is variable, meaning that as the surrounding host or access state changes, the provision of information services, such as location-based services, varies accordingly. Therefore, we take into consideration the user's own personal features to improve the filtered results.

II. METHODS AND MATERIAL

1. Proposed System

We introduce the Food Dishes recommendation system in the following three steps. The first is to collect the information of the user's contextual information and preferences. The second step is a recommendation based on the use of contextual information or preferences. The third step is to refine the filtering data in terms of the recommended results. Fig. 1shows the system flow of the proposed method.

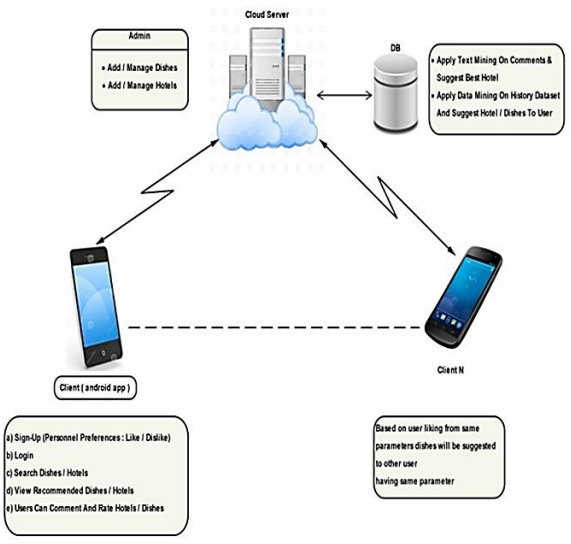

Figure 1. System Architecture

The development of this system can be divided into two major parts, namely the mobile device (Client-side) and the server (Server end). The client side is implemented on Android, Smartphone. The server-side uses an Apache webserver and a MySQL database server. The client-side requests data or the relevant parameters via POST such as user surrounding contextual information, personal preferences, and so on. JSON (Javascript Object Notation) is a data exchange language to respond to the requests.

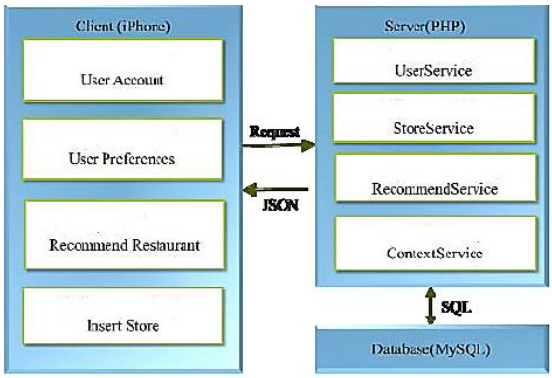

Figure 2. System Flow

Recommendation by Location

Such a method of recommending is dependent on location, which is an important factor in the context-aware system. The system will extract the user's location to find out restaurants based on users distance, preventing the situation in which users receive too much restaurant information. We collect restaurant information, and record the latitude and longitude information of each restaurant by GPS receivers or wireless network positioning assistance.

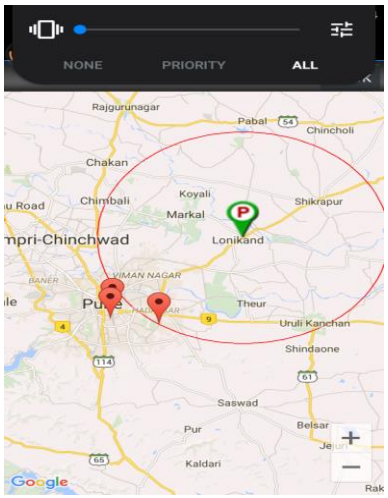

Figure 3. Location Recommendation

Recommendation by Context

Such a recommendation system collects the user's location, season, and preferences of the type of restaurant. Users can set their preferred time, eating habits, or even hide disliked restaurants, and the system collects the logs of the user's browser for an interactive recommending service. The recommendation system mixes these preferences to provide more flexible recommendation services.

	Mean	Variance
System Quality	4.163	0.445
Information Quality	4.000	0.441
Service Quality	4.212	0.484
User Satisfaction	3.375	0.392

Table 1. Statistical Results

Table 1 indicates that the mean is close to 4. This result also suggests that most users are satisfied with the system quality, information quality, service quality, and overall user experience. The statistic indicates the questionnaires used in this study are acceptably reliable.

Proposed System

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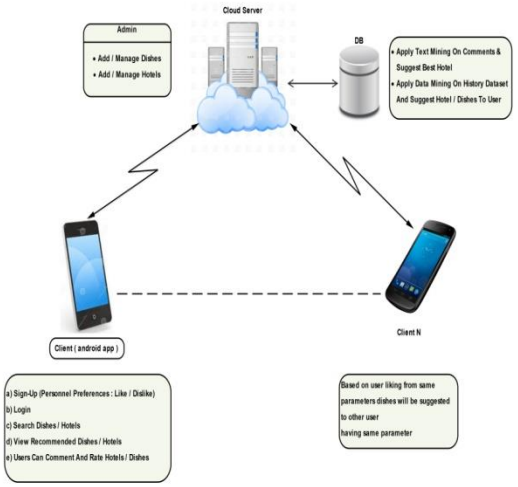

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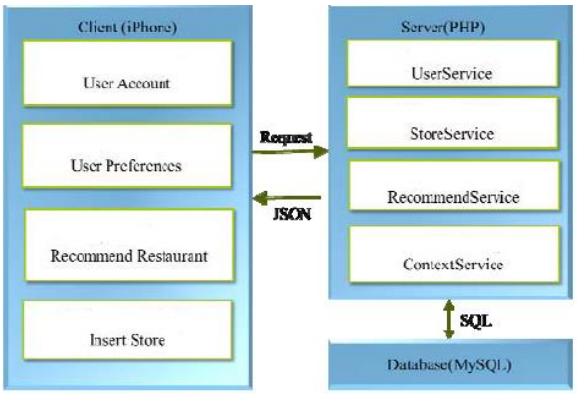

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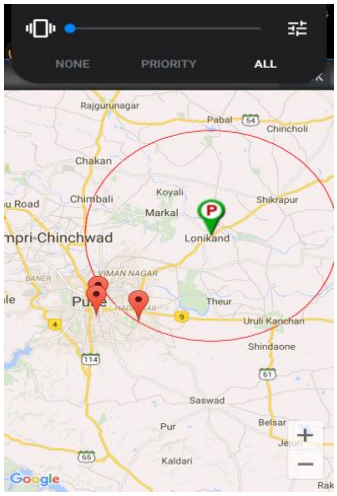

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III. RESULTS AND DISCUSSION

Experimental Results

We design recommendation system database in three tables: restaurant (Restaurant), users (User), and situational (Context) restaurant. The relationship between the restaurant table and the context table is a Restaurant-Context table. Restaurant-Context table is composed of region (Location), time (Time), multi-valued attribute preferences (Preference),Type (Category), and season (Season). The relationship between the user tables and situational data table produces aUser-Context table, which is composed of time (time) tables, multi-valued attribute preferences (Preference), and Type (Category).

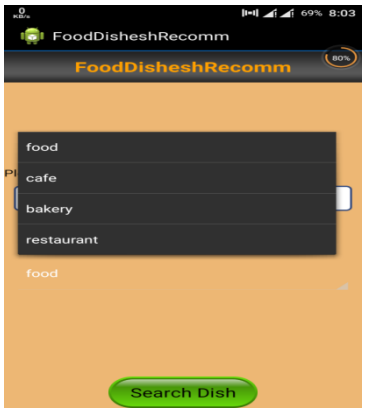

Figure 7. Preferred Options

IV. CONCLUSION

Recently, the uses of mobile devices and wireless network applications have become increasingly widespread. If we only focus on the suitability for the service, the applications will be limited. Furthermore, the interface of mobile devices is limited to screen size, resulting in difficulty of presenting a variety of information on such small screen sizes. In this, we applied the proposed algorithm to a food recommendation system for mobile devices, so that the system can provide more accurate services based on personal locations and the user preferences.

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