

## Mobile Based Market Basket Analysis

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**Abstract**— Mobile application has made human life easy by reducing the human efforts to a greater extent. Shopping is done on a very daily basis from shopping of a daily grocery to clothes and so on. Hence taking in to consideration the daily need as well as eventual needs of human beings we are developing a mobile application for bakery for smart phone users. It is basically a location based application for bakery. We are developing a three-tier architecture that consists of front-end, middle-ware and back-end. The front-end consists of a user-friendly interface through which users can order bakery products on the basis of their location. Middle-ware will be designed using JSON(Java Script Object Notation) that parses the data between the front-end and the back-end. The back-end will be designed using PHP and MySQL. Notifications related to the users orders will be provided through contact details provided via user.

**Key words:** JSON, MySQL, PHP

### I. INTRODUCTION

Mobile application is being used through electronic mobile device which is a gadget. Users can place order through the mobile application itself in the presence of internet connection. The back-end server consists of the details provided by the user. The connection between both is through middle-wares used like JSON. JSON are the web services that takes the input from the user provides to the server and similarly the response from server is provided to the user. Front-end will be designed using Android Studio. Android Studio is a software that provides android setup for a mobile application. It also provides storage Read/Write on the phone as well as External storage. Android Studio provides an APK to be created with the help of an ANDROID SDKs.

It also provides location based services like detecting of a location of a user using GPS services that is in built in Android Studio. There are many other softwares that can be used like eclipse but we are using Android Studio as it provides the same features like the real smart phones allowing to work on emulators. Emulators are virtual phones that runs the applications same as the real phones that gives us the flexibility of designing the application which is user-friendly.

Emulators can be selected according to our compatibility and version of the phones are also chosen according to our comforts. Version is very important part of android Programming as there are some phone that do not support more advanced features. We are also going to use Data mining algorithm Apriori which is a frequent item set algorithm used to take a count of the products selected by the user. JSON is a very popular web service that provides java objects to carry data between various services. Hence we are using JSON to enable java objects to receive and respond the service between the front-end and the back-end. PHP and MySQL is used at the back-end to provide database services. We are going to use XAMPP services.

### II. BACKGROUND AND RELATED WORK

To collect knowledge related to data mining, android studio, JSON services, PHP we referred published papers, some online tutorials, Google. We have also taken guidance from professors. While making the project we referred books such as PHP tutorial point etc and websites such as Google, w3schools, Wikipedia, etc. To learn and understand android and PHP concepts, methodology.

Mobile computing reduces the human efforts by covering all the shopping process of the user through the application deployed on the phone.

Association rule mining which is the apriori algorithm is used to classify the products based on customers demand and groups it hence called frequent item set mining.

Location based services are provided through the android studio software itself that locates the user location and provide the service accordingly.

### III. EXISTING SYSTEMS

There are many existing similar applications like Domino's pizza, Pizza Hut India etc. All these applications are designed for a particular domain say Pizza Hut and Dominos. The application which we are developing is perfectly a bakery application. It is specially designed for a bakery. Existing system uses location based services but is not being operated at a minimal level.

#### A. Disadvantages of Existing System:

- 1) It is particularly designed for a fixed domain instead our application is designed for all the products of the domain.
- 2) Existing application are being used at a very high level which might not be affordable by everyone.

### IV. PROPOSED SYSTEM

The application is going to be developed using three tier architecture which consists of the Front End, Middleware, Back End. Different technologies and work will collaborate with each other.

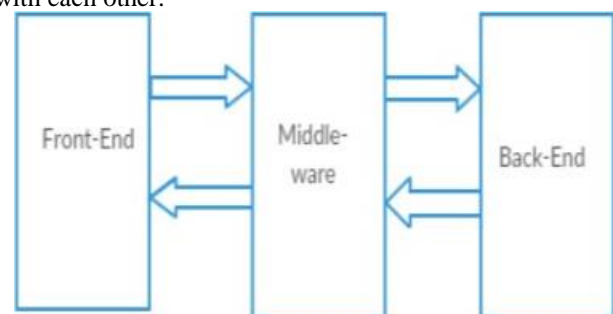


Fig. 1: Block Diagram of Proposed System

As shown in the Figure 1, Middleware will process the request made from Front-End to the Back-End.

JSON format file will be generated at the Back-End and will be parsed to the Front-End.

#### A. Front-End:

The main aim is to design and develop an application which will be compatible for android devices such as HTC Desire C/V/Z/S, Samsung Galaxy Grand 2/Y/Nexus, Sony Xperia series, etc. Customer and shopkeeper can login and register themselves from their respective devices. The Shopkeeper will have to register from the location of the shop and the login credentials will be with the admin which would be confidential. The services will be provided to only those customers whose location will be tracked within 5km distance. The customer must be available within the 5km of the shop so the services will be provided if it extends the distance of 5km then extra charges will be charged.

When the customer will click on the Bakery App the review of best products of the Bakery will be displayed with the help of the Apriori Algorithm and with the help of server side data which is stored in MySQL database detailed information of all products will be provided. The Google Play Services will provide them with the Google API which will help them to connect to the other Google Play Services. MySQL database will permanently register the shopkeeper so that the customer gets an accurate data about the Shop. At the login side of the Shopkeeper, users will be provided with the Product description, Catalog, Feedback. Shopkeeper can also add new items to their list, even modify the details of the items. The Catalog will have an access to the ON and OFF status so that the shopkeeper can change the status of the items according to its availability.

Apart from adding and deleting the request it can find out the pending requests and use association rule mining to find out the best sold products.

When an request will be made to the Shopkeeper. It will provide an notification. All the pending request will be set in an queue so that the related data can be fetched.

After receiving the notification from the customers the request will be accepted or rejected. The declined request will be rejected from the transaction list and an apology will be send to the customer via SMS or Gmail. Accepted request will be sent with a SMS and Gmail about their confirmation and along with the bill that is payment details. To show the association between the products a well-known algorithm which is association rule mining algorithm will be used. After the location is provided the best five products will be displayed along with their details. Also if the user requests for more products the details of other products will be provided with the category (example: chocolate) entered by users.

#### B. Middleware:

Middleware will be designed using various techniques like JSON(Java Script Object Notation) , J2EE(Java2 Enterprise Enable),JDBC(Java Database Connectivity) and JQuery. All these provide Java features which is easily portable, feasible and can run on any platform that is platform independent. Java enabled middleware works at a distributed environment too. That is multiple users can operate the same system from different location at the same time.

These middleware technologies carry the information from the front-end and provide to the back-end. Similarly it carries the information from the back-end and

provides to the front-end. It is compatible with any front-end as well as back-end softwares .Middleware technologies acts as an intermediary between the front-end and the back-end.

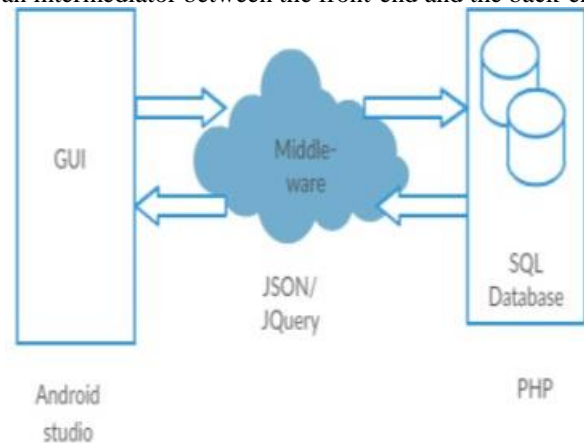


Fig. 2: Architecture of Proposed System

JSON communication takes place in four steps:-

First step application sends http request to the web services, web services accept the data.

In second step a response is generated by back-end and middle-ware which is in the form of JSON output.

In third step, JSON response is generated by web service which is sent to the application, JSON object is should be decoded into string which can be displayed on screen. In step four, these objects are displayed on screen. Java Platform Enterprise Edition extends the Java Platform Standard Edition.

It provides an API for multitier applications and web services. It also provides a runtime environment to develop and run any software. JDBC (Java Database Connectivity) is a middleware technology that can be used to connect to the database without using GUI (Graphical User Interface).

#### C. Back-End:

Back-end will be designed using PHP and MySQL. Back-end will be handled by the administrator and all the details of the administrator will be confidential and will be handled by the system administrator which will be stored at the server. JSON parses the data to and from the back-end. Back-end data may be in the form of images, files or queries JSON accepts all kinds of data formats it into the receiving platform data format and provides the output accordingly. Transaction data is fetched to different text file format for performing association rule mining. Back-end design will be done using MySQL because it is a query language through which data can be easily added, deleted, inserted or updated. It is a Structured Query Language which can be operated easily by anyone.

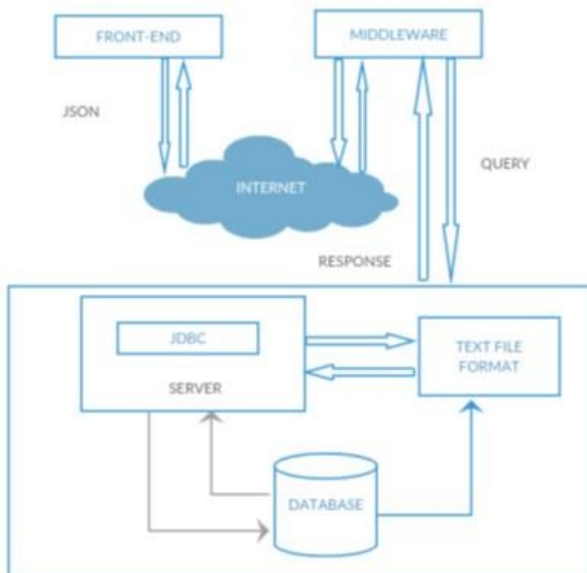


Fig. 3: Detailed Architecture of Proposed System

Association rule mining algorithm includes the rules which has confidence more than 60% are calculated and top 5 association rules are generated which are allowed to be display on front-end of client side. These rules are accessed using JSON objects and results are transmitted.

## V. CONCLUSION

In this paper, we propose a location-based mobile shopping application for bakery shops for android platform at the front-end. This application displays nearby bakery shops that are registered to the application. Data exchange between different front-end and back-end of architecture are operated using web services and that generated JSON format for data transfer.

With the help of mobile computing and mobile processing and storage is transferred to server, which helps in saving battery consumption and improves the performance or speed of execution. Use of the location based services gives flexibility and attractive looks to the application. No extra charges are applied; application can be downloaded and utilized in regular data charges.

Relationship between products gives the attraction information of related bakery. Information about frequently purchased bakery products can help in cross marketing. The design of the project is in such a way that application can be used for any shop system we just need to change the name of products in the coding.

## VI. FUTURE WORK

In future works we consider using more automation in the application by providing information without registration process and whole transaction will happen on the mobile number provided.

We can integrate the routing of GPS to provide direction and distance measurement between shop and customer

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