Smart Shopping: Location Based an Android Application

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Abstract: In this paper, we are trying to explain the importance of Location Based system which will reduce our efforts during various tasks like shopping, finding particular address of some shops, Getting and knowing some good offers on the different products. Various applications will introduce which are designs at based on Location which help to done half work for finding particular location. In this paper, A smart shopping: location-based mobile application for Android devices is proposed. The Geo-position of the user’s mobile device is utilized to produce location information in shopping application (SAGO). By using this application customer will searching shop in his local area up to 3/4km then GPS system work to displaying all the shop related to that particular area with map. According to product list user can select the shop and visit that shop using application provided map.

Key-Words: offer, android, latitude, longitude, filtering, location

1. Introduction

Now days, the technology keeps improving drastically, especially on smart phones or mobile devices. Since the last few years, their hardware and software capabilities have been improved fast. We are able to think that, the current mobile phones are as strong as computers and also they are able to compete with computers. Like, as they have multi-processor. That means they as fast as a computer. Therefore, the customer’s requirement will increase day by day.

On-line shopping is mostly proffered by almost all over the world. But previous shopping application is time consuming. Also from which site on-line shopping is done it is not feasible to customer as distance wise or it is not near to customer’s location.

To overcome this problem we are going to developed “Location Based Smart Shopping Application”. This application is running on android phones. While using this application customer saves their time because customers enter the product which they want to buy then this application gives the list of shops which are nearer to customer’s location and in which that product is available. In this application shop owner has to register their product, multiple offers on all that product. Also shop owner add, delete, update, modify the details of products. This application is smarter than previous shopping application.

2. Scope

The following things can be done in future:

- The current system can be extended to allow the users to create accounts and save product in to wish list.
- The users could subscribe for price alerts which would enable them to receive messages when price for products fall below a particular level.
- The current system is confined only to the shopping cart process. It can be extended to have an easy to use check out process.
- Users can have multiple shipping and billing information saved. During checkout they can use the drag and drop feature to select shipping and billing information.

3. Literature Survey

The survey had been carried out to find out best algorithm strategy available . We had referred research journals, existing system and analyze the results of same, also take the experts opinion. Literature review is focused on a research questions, trying to identify, appraise, select any synthesize all high quality research evidence and argument relevant to that question.
The Prof. Seema Vanjire, Unmesh Kanchan, Ganesh Shitole, Pradnyesh Patil proposed Location Based Services on Smart Phone through the Android Application, in Jan 2014 which describe the Android Application which is based on LBS.

Gnay Gltekin, Oguz Bayat proposed Smart Location Based mobile shopping Android Application, in June 2014 which describe the Jsoup which is a java HTML Parser for collecting data from internet resources. By using Smart Filtering Algorithm, Greedy Search Algorithm, Agglomerative Clustering Algorithm.

Ahmad Jaradat, Noor Azian Mohamad, Ahmad Asadullah, Seyed Ebrahim propose Issue in Location based marketing : review of Literature in Jan 2015 which describe the Marketers and customers issues like, Security Personalization and matching consumers Preferences Customer acceptances of LBM.

Adarsh Borkar, Madhura Ansingkar, Monali Khobragade, Pooja Nashikkar, Arti Raut Propose Smart Shopping An Android Based Shopping Application, in March 2015 which describe the no need to stand in the queue for a long time in malls just for scanning the item.

Some of the research paper were studied to get knowledge of latest technology and implementation designs.

4. Proposed System

In this system, the user will search the item which he wants to purchase with the help of database provided by this app. After searching of the item a web service will get called which will create a connection with the database of the shop. The web service is a method of communication between two electronics devices over a network. As the connection is established, the user is now connected with the database and information related to that item is provided to him. In this whole procedure the overall time of searching of individual items is saved and thus reducing the time of the shopping. The requirement of this app is-

- User has installed the app
- Shop has Wi-Fi facility
- Internet connection

A. Android smart phone:

Android is an open source platform founded in October 2003 currently developed by Google. A smart phone is a mobile phone with advanced mobile operating system which feature combine features of a personal computer with other features useful for mobile. Most smart phones can access the internet have a touch screen user interface can run app, music player.

B. Database:

The shop’s database is designed using MYSQL. It provides interface with any database can be easily designed. The shop’s database consists –

- **Inventory table** - It provides information about the availability of the items, their unique id, product id etc.
- **Item table** - It provides detailed information of each item from its manufacturing date, price, weight, etc.
- **Shop details** - The customer’s information will be stored in this table including his address and phone number that will be used at the time of online payment.
- **Store details** - This table will have detail information about the shop’s name, its branch and unique id that will be retrieved at the time of scanning of the shop’s barcode.
- **Final order table** - This table maintains customer information about his purchases, total cost, session id and all those information that is required to generate a final bill.

C. Web server:

A web server is server which can connect one device to
another that is active in the internet and establish communication between them. web server uses common protocol for communication such as HTTP. Web service is required to establish communication between Android device and Shop’s database to exchange information.

Steps to perform this operation:

- The client register his account and create login id with password.
- Then send request to the web services.
- The web services send this request to shop database.
- The shop database search the particular item from table and responds to web server with available information.
- Next web services packed the item with related offers and send back to client.

Web Server Services:

1. Navigation
2. Location Tracking
3. GPS

1. Navigation:

Navigation is the process of monitoring and controlling the movements of craft and mobile devices from one place to other. User can use the Google map to get the particular location or trace the route between any two locations.

2. Location Tracking:

This is used to trace the individual user location. It contain the data that allow user’s route and it also allow to find nearer location.

- It keeps records on user’s current and past location.
- Notify components when specific user has moved.

3. GPS:

The Global Positioning System (GPS) is a space based satellite navigation system that provides location and time information anywhere. The result is provided in the form of geographic position within an accurate of 10 to 100 meters.

5. Modules of the project

A. Customer side module:

- Registration: Customer first register to the application in order to search the product available as per the location
- Search for the product: Customer can search for the particular product which he/she wants to buy. Once he/she searches it then the shops near to his/her get displayed.
- Buying: The customer can buy the product by going to the shop or he/she can order the product and then payment will be cash on delivery.
- Get Location: It shows the direction of shop and the exact location of the shop on google map.
- Product Offers: show the product offers in particular shop

Fig.2: Customer side module

B. Shop owner side module:

- Registration: shop owner must have to register to the application (app) in order to display his product and offers on the app.
- Add product: shop owner can add the product information, images, price, etc.
- Add offers: shop owner can add an offer of a particular product which will be displayed on consumer side in the form of notification
Modification: shop owner can modify price, offers, and images of particular product.

6. Algorithm

A. Agglomerative algorithm:

The Agglomerative Hierarchical Clustering starts with objects which are set as a cluster, in other words, each object is a cluster at the beginning. Then, the object is added to the closest pair of clusters for each of the iteration if a similar criterion is validated. This algorithm continues until all of the data is merged down as one cluster and this is an agglomerative strategy which is a “bottom up” approach. Traditional hierarchical algorithms use similarity or distance/proximity matrix.

1. The first operation is clustering the similar product using their prices that were mentioned in.

2. The second operation is the normalization process. The output of the first operation in here is the input of the normalization process.

\[ X \text{ Price} = \frac{X_{\text{price}}}{\text{MaxPrice}} \]

In this formula, \( X_{\text{price}} \) is the input parameter and it is the representive price of the product. “MaxPrice” is the maximum price which is selected from the product result list.

B. Smart Filtering Algorithm:

The SAGO Android mobile shopping application uses clustering approach to help the Smart Filtering algorithm to search products results to the mobile users easily. This class of algorithms is such that the text is the input and a Processed or filtered version of the text is the output. This is a typical transformation in IR, for example to reduce the size of a text, and/or standardize it to simplify searching.

The most common filtering processing operations are:

- Common words removed using a list of stop words;
- Uppercase letters transformed to lowercase letters;
- Special symbols removed and sequences of multiple spaces reduced to one space;
- Number and dates transformed to a standard format;
- Word stemming (removing suffixes and/or prefixes);
- Automatic keyword extraction
- Word ranking.

C. IR2 Tree

Current systems searches location on the basis of their geometric location from the user location. In this paper we are going to develop an application which will search the nearest location with given keywords. This algorithm is very efficient to search location with given keywords.

7. Implementation

This location based application take the input as a task form user or customer and will listen for location changes. The new co-ordinates are passed to service routine written for handling task. Following are the benefits of task application

- Adding and editing task
- Storing task in SQLite database
- Tracking and displaying location
- Viewing retail discount information
- Retrieving information on mobile device
- Task around few Km displayed as alert.

A. Service Invocation

Service running in background will track the user location continuously. Android Software Development Kit (SDK) does not provide a special intent that will listen for changes in location. Broadcast Receiver listens for BOOT_COMPLETED event. Therefore once the device is booted on, the location service is invoked...
automatically using our service routine. Permission has to be set in the Android Manifest file

B. Location Services

Application will have to register to the Broadcast Receiver which is an Android component for receiving location updates. These Permissions for location updates are registered. Location information is retrieved with the help of Location Manager System by invoking the command getSystemService (Context.LOCATIONSERVICE).

C. Database

Task data is stored in the SQLite database and can be viewed using special third party browser while running the

program. Database entries are pulled from the device in DDMS perspective and downloaded to the user system for further analysis. Latitude, longitude, distance of interest and essential product details along with product identification code and shop name are stored in MySQL backend for shopping offers display.

D. Discount Information

Retailers wishing to publish product discount information can do so by registering into the webserver. Once done, the administrative rights of uploading discount information are given to the retailer. Request communication from mobile to the web server is done through Hyper Text Transfer Protocol (HTTP). Matched discount information corresponding to latitude and longitude will be passed back to the Android mobile using JSON format and the same will be displayed.

8. Prototype model

The prototyping model is systems development method (SDM) in which a prototype (an early approximation of a final system or product) is built, tested and then reworked as necessary until an acceptable prototype is finally achieved from which the complete system or product can now be developed. This model works best in scenarios where not all of the project requirements are known in detail ahead of time. It is an iterative, trial-and-error process that takes place between the developers and the users.
This is the next activity in which new customer n shop owner can register.

![Fig.8 : dashboard for shop owner](image)

On this activity dashboard is displayed for shop owner for adding new product type, for add new product, for adding offers on product.

![Fig.9: dashboard for customer](image)

This is a dashboard for customer which is display after a customer login. Using this customer can search the product.

9. Conclusion

This paper report developed mobile shopping android application for mobile users that searches and lists the desired products with location information. The main idea is to get the list and product offer from each local store with in stock information and smartly listed product list. Jsoup which is a Java HTML Parser for collecting data from internet resources is used in the SAGO mobile shopping Android application.

The aim of this project is to overcoming the drawbacks of both type of shopping i.e. online and offline, and feels the gap between physical and virtual world.

This application provides safety, security, reliability and also customer can actually feel the quality of the products. Smart phones, that have become an important part of today’s life, have reduced all the efforts that are required for shopping using online shopping application.

10. Acknowledgements

We take this opportunity to thank our project guide Prof. Pranali S. Jadhav for their guidance and providing all the necessary facilities for this paper.

11. References


