Offers to Grasp –Android Application to Compare Local Stores

Veena A Kumar[1], Ananthu B[2], Midhun R Kurup[3], Nakendra Kumar[4], Sandra Susan Shaji[5], Teddy Zachariah[6]

Asst. Professor, Computer Science & Engineering, Saintgits College of Engineering, Kottayam, India[1]

UG Scholar in Computer Science & Engineering, Saintgits College of Engineering, Kottayam, India[2, 3,4,5,6]

Abstract: Today, when people want to buy high value commodities like dress, electronics, grocery, etc., the first thing which comes into their mind is to find the shop which provides that commodity in a lower price; for that they may make time to explore through all the shops to find an appropriate one. Also there are many who are unaware of the location of a particular shop. In today's busy life, time & money are the two leading factors which most our society looks at. As the amount of working class people is increasing year by year, there is a need to develop a common platform where all the above mentioned issues are solved. Offers to Grasp (OTG) is an android application that provides customers with better deals across their locality facilitating smarter saving options and hence an easy shopping experience, all on-the-go.

Keywords: commodity, smart saving, easy shopping.

I. INTRODUCTION

Offers to Grasp are an Android application that provides customers with the prices of all commodities within their locality with a single tap. Predominantly aimed at the working class population of Kerala, this app works to the upliftment of the Local Shopkeepers who are often outshone by the large scale Retailers or Online virtual shops, by providing them with a means to popularize their products among the customer community.

Some analogous apps to ours – BigBasket, Peppertap etc offer Online shopping and often restrict their services to only metropolitan cities such as Delhi or Mumbai. They also operate to the disadvantage of the vast community of local shopkeepers by promoting only virtual online stores. Also minimum purchase amount restrictions and privacy issues during payment transactions are pertinent in them. On the contrary, Offers to Grasp is a truly novel idea in this respect.

II. LITERATURE REVIEW

During the Idea discovery stage of the project, the chosen domain was that of Financial Technology, commonly known as Fin-Tech and many ideas were discussed. We identified some of the common problems which are faced by the people daily and thought of providing solutions to these problems.

One such problem was the hassle in Shopping. As the majority of the society is working class, they may need to find time in the weekends to do the shopping with their family. Being an earning member of a family, he/she may wish to buy all the commodities that are needed at the least cost, in order to manage his/her finance efficiently. In order to facilitate the same, one may need to wander through all the stores in a town and browse each rack seperately, to find the minimum cost or offers available. Time being a highly limited resource; he/she is forced to

purchase the commodities at the available price in whichever store he happens to be at. There are also situations when even though the consumer may be aware of the store with desired commodity at minimum cost, he may have no clue regarding its location.

Taking this as our idea, we thought of developing an Mobile Application that would determine the path through which a person would travel frequently and identify the shops along this path and provide the information about this shop like the location and the offers of commodities along with the prices, provided by it. We also thought to provide a payment system through this App so that special deductions are given to the customer who have been addressed through this application. But after conducting a customer feedback, we came to know that majority of consumers and shopkeepers are concerned with the security of payments. A. Instead they were much more interested in knowing the detailed information about every shop within their locality, which includes the price of each and every commodities sold, offers available, etc. This was because majority of the consumers wish to look for a comparison of prices of products across different stores, which is quite tedious in nature if they have to manually scan the stores.

So we pivoted from our basic idea to the idea of developing an Informative Mobile Application that would determine the current location of the user and determine all shops nearby & provide the prices of each product across the stores.

The retail industry has been advocating "Smart Shopping" for many years by adopting various technologies to enhance the shopping experience at the retail environment. The vision of smart shopping promises is to provide on-the-spot information about various discounts, schemes, etc. at your fingertip.

The advantages of the proposed system are-

- Customer satisfaction
- Cost savings
- New business opportunities
- Time saving
- Allow for considerable profit
- Improvement of Customer relations

The objective behind making this application was to bring the functionalities of an online shopping environment in one's locality onto a mobile device. So while surveying as to which platform or rather operating system the project has to be implemented, we selected Android for the following reasons:

Android is an open source platform

- Supports multifunction
- Provides rich tools to make interactive application

Downloading the softwares required for building the application are absolutely free. Along with this we surveyed the popularity of the operating system. Market share of Android which was mere 2.8% in 2009(initial stage), boosted to 48% till August, 2011 which is almost half the share of the total market. Our basic aim is to make the application reachable to as many people as possible and this goal is achieved by implementing the application on Android.

The Objective behind this is to exploit the functionalities of a mobile phone by making all features available in 'a single app' thus taking Mobility a step higher. Requirement and ample opportunity, behind this project renders it necessary for a system of this kind to be developed. This hopes to breathe new life into the way 'Network Service Providers' relate to customers.

Reason behind choosing this project as an App:

- The user interface is very good
- Access to most APIs like GPS, Accelerometer, address book, contacts etc.
- Apps can handle heavy graphics very well.
- Ease of usage

We have used the Google Maps API to locate the stores. Google launched the Google Maps API in June 2005 to allow developers to integrate Google Maps into their websites. It is a free service, and currently does not contain ads, but Google states in their terms of use that they reserve the right to display ads in the future.

By using the Google Maps API, it is possible to embed Google Maps site into an external website, on to which site specific data can be overlaid. Although initially only a JavaScript API, the Maps API was expanded to include an API for Adobe Flash applications (but this has been deprecated), a service for retrieving static map images, and web services for performing geo-coding, generating driving directions, and obtaining elevation profiles. Over 1,000,000 web sites use the Google Maps API, making it the most heavily used web application development API.

III.PROPOSED SYSTEM

In the proposed system, the customer is provided with an Android Application with 4 basic categories to shop – Grocery, Electronic appliances, Electronic Gadgets and Textiles. He can then choose one among these categories depending on the commodity he intends to purchase. Meanwhile his current Latitude and Longitude (geographical coordinates) are fetched and his exact location will be determined by the app.

Fig.1 Choice of shopping category

Upon choice of a category the customer is provided with a list of all possible items available in that Category. He can now choose the product he intends to purchase, among these list of commodities.
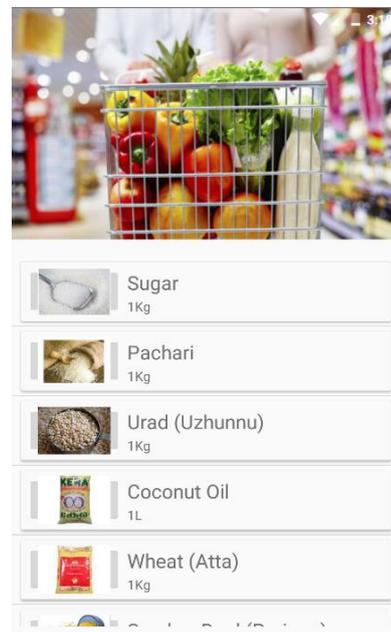

Fig.2. Choice of commodity in a category

Besides these, the customer will be provided with the quantities of each of these commodities to choose depending upon his requirement and desire. The various items displayed in each category will be in such a manner that the most frequently used products that the customer purchases will be displayed first followed by the ones bought the least. Also a provision is provided for the customer to search for the desired commodity in the search option provided to facilitate faster search.

The provision of selecting quantity is only available with Grocery category as it is the only category which needs price list quantity wise; rest of the categories will have a list of prices of one unit each.

Meanwhile a list of all Local stores within a 10 km radius as to his current position where the particular commodity is available. Besides , the price of the commodity and any offers for it , along with its validity will be displayed.
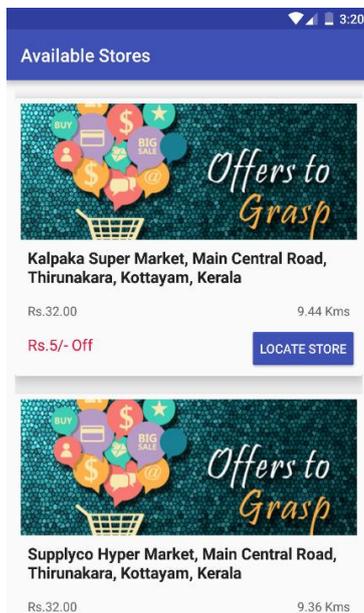

Fig.3. List of all stores along with prices of chosen commodity

Also the distance from the customer's current location to the store along and for those who are on the move, the complete Route map from his current location to the store can be viewed. Now the customer can get the entire pleasure of visiting the right shop for the right commodity-Saving both Time and Money.

At the shopkeeper's perspective, each store/warehouse manager is provided with a Web Interface. Here he logs into his interface using his unique ID and Password provided to him by the Administrator. A list of all items in his store is made visible to him. Along with this prices of each of these commodities and Offers if any is displayed and can be modified. Besides he can also alter the validity of any of these Offers. All changes made here will automatically be reflected in the App for the customer's view.
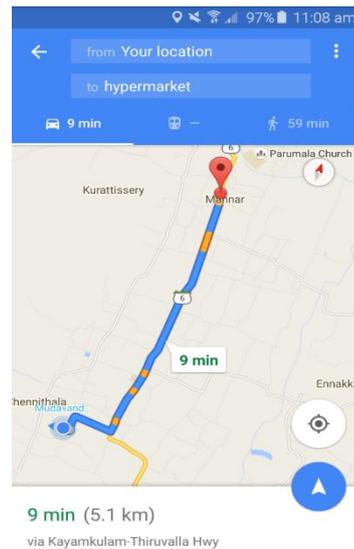

Fig.3. Route map to locate the desired store

IV. EXPERIMENTAL ANALYSIS

I. Prior to user acceptance testing, the Developer team has completed unit, system and integration testing and met all the Requirement's (including quality requirements) based on Requirement Traceability Matrix. User Acceptance testing will be conducted by End-users.

Technical Assumptions	Non-Functional Requirement
portability	Compatibility on smart phone with wifi connectivity.
usability	Ease of use -user can operate without prior training or exposure to the application.
security	Contains a password security feature
modifiability	The software security feature shall be odifiable by the user to change the password.
maintainability	The software shall be maintainable using software updates.
performance	The software shall perform output within 1 second of any user function.
correctness	The software shall output correct scheduling information from communicable devices.
error handling	The software error handling shall notify the user of an error once it is identified.
compatibility	The software shall be compatible with the following calendars: Google, Yahoo etc

Fig.4. Requirement Traceability matrix

Unit Testing
Unit testing was written by the Developer during code development process to ensure that proper functionality and code coverage have been achieved by each developer both during coding and in preparation for acceptance into iterations testing.
The popular JUnit test framework is integrated into Android. JUnit, if used properly, brings two major benefits to the test implementation. JUnit enforces the hierarchical organization of the test cases. The pattern JUnit is based on guarantees the independence of the test cases and minimizes their interference.
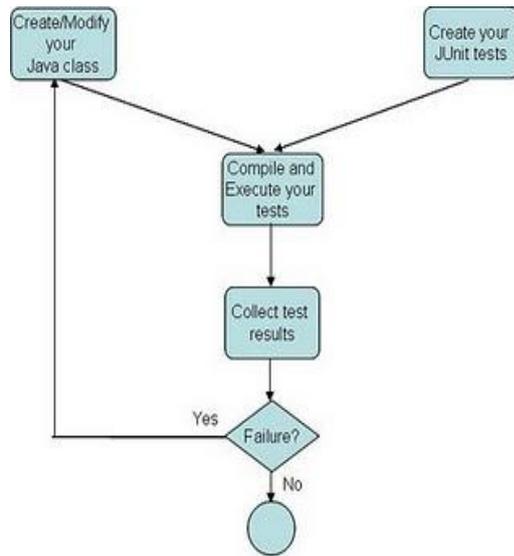
Fig.5.Unit testing plan

Regression Testing

In our designed model we are implementing the regression test on each cycle. To implementing the regression test we are dividing the each sprint up to six phases. On each sprints these are six phages of regression tests would be implemented sequentially

TABLE **ERROR! NO SEQUENCE SPECIFIED.** Phases of Regression testing

Phase	Examining subject and Output
Planning	Sprint Plan and Produce backlogs
Backlog Implementation	Backlog / Unit
Backlog Integration	Combination of backlog for story
Story Implemantation	Completed story
Story confirmed	A story confirmed build
Release	A build with sprint's all backlog

V. FUTURE SCOPE

OTG in short-Offers to Grasp is an Android application that provides customers with the prices of all commodities within their locality with a single tap.

As of now what OTG does is; the customer is provided with 4 basic categories to choose from – Groceries, Electronic Appliances, Electronic Gadgets and Textiles. Upon its choice he is provided with a list of all items in that category. Next he selects the commodity and all shops within his 10km radius selling that particular commodity, its price and distance to reach the store from his current location are displayed. Also the best offers and deals for a product if any and their period of validity, in each of these stores are displayed.

There are a few problems to be solved in the present version of OTG, which is unnoticed.
To be precise with the first one: The distance variable with a value 10km (radius) is a constant. There might be a scenario where a customer might want to know the price of commodities in shops at a wider spectrum.
With the present version of OTG, customer has to be within the 10 km radius of whichever shop for its name and price details to be displayed on the app. This is clearly not to the likeliness of customers, especially if he is not familiar with far off localities, which will end in customers avoiding OTG. Customers prefer apps which reduces their efforts and time spent.

The possible solution which is to be implemented in the next version of OTG is:

UI/UX will be updated with the customer given a privilege to manually choose the distance factor. The customer depending on his interest will be able to browse through the price of commodities in shops within a radius he sets by choosing the corresponding value in the UI of distance variable. With this update, OTG becomes more user-friendly adding to customer satisfaction. The manual time required to scan through each store is saved which in turn minimizes the effort required too.

Secondly: With the present version of OTG, when customers want to buy a list of items, it is not necessary that the customer may find a shop where all the items listed are cheap. There might be situation where item A is cheap in shop A, item B is cheap in shop B and so on. In such situation, the customer is required to visit n shops to purchase n items at cheap rate. Even if the shops are near, this clearly adds to customer inconvenience. If the shops are far from one another then the customer needs to travel to each shop adding to his expense which turns to loss.

The possible solution which is to be implemented in the next version of OTG is:

UI/UX will be updated with the customer given a privilege to manually input a list of items to purchase. OTG does the calculation of price for all the items listed. Taking the total price of all commodities into consideration OTG provides the customers with the list of shops where total price of all commodities are cheap rather than taking individual prices into consideration.

As the business model of OTG mostly works on the Registration funds obtained from the Local Shops, they might find it a necessity to be provided with solid proof /guarantees that the customers visiting their shops and purchasing has accelerated due to the use of OTG. Currently there is no such means to ensure this guarantee.

A possible solution to the above could be that for each commodity in each store a unique key can be assigned that is known to the shopkeepers as well. These unique keys could be random numbers that are of a 'one time use' nature to avoid reuse of values. When the customer visits the shop and presents this unique key, the shopkeeper is fully aware that OTG has been useful.
The above mentioned update guarantees OTG definitely to the likeliness of customers. Within a matter of minutes,

customer is given the information about the shop where he can purchase his entire list of items at cheap rate.

With E-commerce, the local shops are at crisis where they are not able to promote their products. OTG, definitely boosts local shops as well as local shopping.

VI. CONCLUSION

Offers To Grasp – as the name indicates is an Informative Android application developed for providing the information about the various products available across the shops nearby. This Application is mainly developed for the working class of people here in Kerala. During working days, shopping is a troublesome task as one always wishes to buy things at the cheapest rate. So in order to get the different products at minimum rates, one has to wander through all the shops of same kind and finally he/she is forced to purchase a product from a shop (even though the price is not minimum) without satisfaction.

Offers To Grasp (OTG) provides the user with information as on where a particular product is available at the cheapest rate, fetches the current location of the user and displays all the shops of that category with price & offer available for a particular product. In short, the user is able to view the compared prices of a product available in different stores near of his/her current location with a single tap. It also provides with the location of a particular store selected and the path from his/her current location to the selected store if he is on -the -go.

As the Local retail shops are being seriously affected from the online shopping, OTG provides them a platform for showcasing their products directly into the hands of the User. This provides an upliftment for the local shops in Kerala. Thus OTG would be an added advantage to both the customer and the shopkeeper.

In short Offers to grasp provides a one-stop solution to saving money while spending all on-the-go.

REFERENCES

[1] Na Wang, "Study on the Influencing Factors of Online Shopping", Proceedings of the 11th Joint Conference on Information Sciences (2008)

[2] Adarsh Borkar, Madhura Ansingkar, "Smart Shopping An Android Based Shopping Application", International Journal of Advanced Research in Computer Engineering & Technology (IJARCET) Volume 4 Issue 3 , March 2015

[3] Li Ma, Lei Gu and Jin Wang, "Research and Development of Mobile Application for Android Platform", International Journal of Multimedia and Ubiquitous Engineering

[4] Lokhande Priyanka V. , "Location Based An Android Application", Imperial Journal of Interdisciplinary Research (IJIR) Vol.2, Issue-1 , 2016

[5] Google Maps API: //developers.google.com/maps

[6] Creating Lists and Cards | Android Developers :

[7] developer.android.com/training/material/lists-cards.html

[8] RecyclerView:developer.android.com/reference/android/support/.../ RecyclerView.htm802.11, 1997.