

Mobile Application Development HALAL Food and Stores

Nasser I Allheeb

Abstract—This paper to demonstrate how to develop Halal android application, which is called HALAL Food and Stores Finder (HFSF). This Idea I have created and I used it to help people who are interested in getting halal products from market and restaurant. This project aims to implement a mobile application that works as a handheld guide to find halal products. Because of the increasing number of foreign people, especially international students, in the world every year. Those kind of people are not familiar with their surroundings in that city. Because that city is considered as a new environment and area for the International students and immigrants, they face difficulties to find halal products. I implemented this application to enables them to find the places, locations and stores that provide halal product. I used the Android OS and I take advantage of the GPS features to enrich the user experience. It displays all the information that helps users find the store, by quickly and easily locating your current location. In addition, it gives the user access to a map that shows the location of stores and gives the user driving directions to reach there. Finally, this mobile app will be available for download from Google Play. The proposed App has been tested and Rochester city in USA has been selected as case study.

Keywords— Finder Halal food Halal food , Halal App , Halal stores , Mobile application

I. INTRODUCTION

THE impact of rapidly advancing technology in the development of applications leads to many ideas, which aim to make life easier. People tend to use mobile applications (apps) to accomplish their work when it is possible to do. Because smartphones, that contain mobile apps, people can perform tasks much more quickly than the traditional mobile phone, so we have seen more people tend to use the smartphone. According to IDC, in 2011 there are 916 million unit shipments of smartphones reached the worldwide market, but that number grew by 20 percent to 1.1 billion in 2012. In 2016, it is expected to reach to 1.84 billion, more than doubling(Jeff Blagdon ,2012). People prefer to use mobile apps as much as they can. Therefore, banks, popular stores, online markets have developed mobile apps to attract their clients. In addition, people can take advantage of mobile applications to access data even without connecting to the Internet. So. using mobile apps has become a part of our lives.

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The business owners have noticed that there is a disconnected between the owners of halal product businesses and customers of halal products. Many stores provide halal products. However, they complain about the lack of customers for halal products. Because of this, some of them are thinking about not providing halal products anymore. On the other hand, there are many people interested in buying halal products. They struggle to find stores that provide halal products and where the halal products are located. Although some are located in different locations and some of them are close together. This is especially true for international students. They are not familiar with the city or the stores in the city and they do not know which stores provide halal products near the campus. As a result, they believe there are no stores close enough that provide halal products. So, creating a mobile app is a powerful way to market businesses to attract customers that seek halal products. Also, it will become a smart guide for customers to know where the halal products exist. So, creating Halal App will fill the gap between the owners of businesses and customers that desire halal products. I strongly believe that both businesses and customers will have advantages of building this app and it will build relationships between them.

Moreover, Most businesses try to have their own mobile application because they believe that mobile application are a powerful way to market businesses. Mobile application will attract customers to shop from home; also it will reinforce brands and increase visibility for businesses. In addition, using mobile application will allow customers keep in touch daily with businesses when they need products or services from a store. Also, mobile apps can be used as mobile application as feedback system from users to receive customers' suggestions and complaints that let businesses to improve service quality in future.

As a result, I decided to make the life of international students in Rochester easier by implementing a useful mobile app for them. This app aims to help them to find halal products in the area where they live. Halal is an Arabic word that means permissible, especially in reference to food or meat that is permissible according to Islamic law. For example, halal products are not animals that were dead prior to slaughtering or food that contains alcohol. Because of the fact that not all stores provide this kind of food, I implemented a mobile app that works as a handheld guide to find halal products.

I believe that there are international students who struggle to find halal products in the United States, as this was a challenge I came across when I first arrived. Before I came to the US, I thought that halal products were available everywhere. However, it is not too easy to find them. Although stores that

provide halal products are abundant, it is difficult to locate them. As a result, I realized that most international students in Rochester face the challenge of finding halal products. So, this mobile app will determine your location and give you the addresses of all the stores that provide halal products near your current location.

II. RELATED WORK

Mobile applications have been revolutionized in the last decade and many studies have discovered the impact of this revolution (Ruiz & Nagappan & Adams & Hassan, 2012). Mobile applications have become an important opportunity for merchants to attract customers. Mobile applications have ability to reach customers at home, work, or on run. For example, Wal-Mart is doing its best to deploying the Wal-Mart app among customers in order to increase sales. Mobile applications, which run on the smart phone, can be used anywhere. Because it is in the users hand, they have the ability to use it in any place (Gadhiya & Wandra & Vaghela, 2012). As an example, after Amazon launched its mobile app, profits have increase. With the mobile app, the customers of the Amazon can buy the product without any restrictions such as having laptop or logging-in to a website. Customers can even shop from Amazon when they are in anywhere work, restaurant or coffee shop by using mobile app.

Building a mobile application needs a specific platform. Mobile applications have different platforms such as iOS (iPhone) and Android. However, Android platforms are open source operating system for the cell phones (Wu & Jianchao & Lei, 2010). In addition, the Android platform has a big audience, so most company's services work Android platform (Fu & Lin & Li & Faloutsos & Hong & Sadeh, 2013). Because Android OS is basically based on the Java language, it has become one of the most popular OS. (Son & Lee, 2011). Most important companies of smartphones use Android platforms exclusively iPhone or Microsoft (Pieterse & Olivier, 2012). Because there are currently over 150,000 apps available for Android, it has a large community of developers writing mobile applications. (Son & Lee, 2011). So, Android mobile phone software platform may be the next big opportunity for application software developers and be the sale of a new generation of mobile phone application software (Pieterse & Olivier, 2012). Android platforms have the potential to control mobile markets.

Because I would like to create a useful app mobile to serve Rochester community, I am thinking to be in Halal industry. The Halal industry has been the one of the fastest growing global food markets (Kassim & Yahaya & Zaharuddin & Bakar,

2012). Not only Muslims need the Halal industry, but this industry also attracts non-Muslims communities due to its hygienic and contamination-free principles in food production (Kassim & Yahaya & Zaharuddin & Bakar, 2012). Many markets try to attract customers by offering Halal products. However, people still face problems in identifying, verifying or recognizing Halal products in the market (Kassim & Yahaya & Zaharuddin & Bakar, 2012). One exception is Halallogistics.info. They focused on this industry to give official certificates to businesses that provide Halal products and receive responses from consumers who use these services (Pahim & Jemali, & Mohamad, 2012).

III. PLANNING

For this project I used Android OS, and SQLite for the database. In addition, I took advantage of the GPS features that are available in smartphones to enrich the user experience. In order to best be able to achieve this goal, I implemented and plan this work in three phases:

A. First Phase

For this project I would like HFSF to be a successful mobile application. Any successful mobile application must meet its user's needs. It is important to know what exactly the users need from this mobile application. I did a simple survey for the users. They need to know where the Halal products are available. Even if this market provides only Halal products or provides Halal products as a section of its products. Therefore, gathering data in this project is very important. HFSF should have more accurate data. I was looking for the resources, but I did not find any resource for my data. So, I will begin to collect the data by doing survey. First, I did survey on the internet for the people who interested getting Halal products. Then, I started to collect by asking people about stores, looking up on the Internet and Google maps and do paper surveys for international students at RIT and Muslim community to let me know where they can find Halal products. After this step, I started to filter the data that came out from the survey in specific format to start be considered as official stores provide halal products (figure1). I went to some stores in Rochester that provide Halal products, randomly, and ask them about those products to make sure that the data is accurate. After collecting all the sites in Rochester and around the city that provide Halal products, I analyzed those results. The important information I have to have is the name of the store and the address. Then I created the database in order to insert all those results in SQLite database.

Name	Address	Menu	Alcohol	Type	Other	Latitude	Longitude
International Food Market	376 Jefferson Road, Rochester, NY 14623	Full menu	No	Market	It is a good store ,His website is www.him.com	43.09101	-77.64374
Golden Dynasty	1900 South Clinton Avenue, Rochester, NY 14618	Partial menu	Yes	Restaurant	It is Chinese food , has buffet	43.12054	-77.59288
Amaya Bar & Grill	1900 Clinton Avenue South, Rochester, NY 14618	Partial menu	Yes	Restaurant	Indian food, has certificate on display	43.12054	-77.59288
Rumi's Grill & Café	2735 Monroe Avenue, Rochester, NY 14618	Partial menu	Yes	Restaurant	It has Mediterranean food	43.11249	-77.55065
PriceRite of Henrietta	3333 W. Henrietta Rd Rochester, NY 14623		No	Market	It has section to provide halal products. Halal Chicken -Boneless and skinless breast - Chicken Legs and pieces and Whole Chicken	43.08829	-77.64290
PriceRite	1230 University Avenue Rochester, NY 14607		NO	Market	It has section to provide halal products. Halal Chicken -Boneless and skinless breast - Chicken Legs and pieces and Whole Chicken	43.15211	-77.56923
PriceRite	375 Driving Park		NO	Market	It has section to provide halal	43.18091	-77.64019

Fig. 1 Some information from Data collected

B. Second Phase

This phase is the implementation phase. Even though Apple iOS is the first mover to smartphone and it has mobile apps that popular among the smartphone users, Android is the fastest growing product in mobile applications. Also, according to study of comScore, 51 percent of smartphone users in the U.S use Android-based platforms [12]. So, I chose to implement my mobile application by using Android. Android uses the Java programming language and many different manufacturers release smartphones loaded with Android OS systems such as Samsung Galaxy, HTC and Google Nexus. So, I started to implemented this app by Java language. Currently, Most of popular app use splash screen to capture the user's attention for a short time as a promotion, I force myself to do that technique in this app. So, flow chart of this app (Figure 2) will be started by showing splash screen and then will let the user go to home page. The HFSF has a home page when users log in to the mobile app (Figure 3.a). It will locate the current address for the users. After locating current address, it will ask users to click a button to find Halal products near them. Before that, the app has some options to do search, radius and type of store. If user clicks button to find Halal products, the mobile app will read the current address. Then, it will analyze the data depending the current address and will show the best matches. In addition, the user has ability to check the stores in someplace else by entering the address and he will have opportunity to look at what the stores nearby that address. (Figure 3.b).

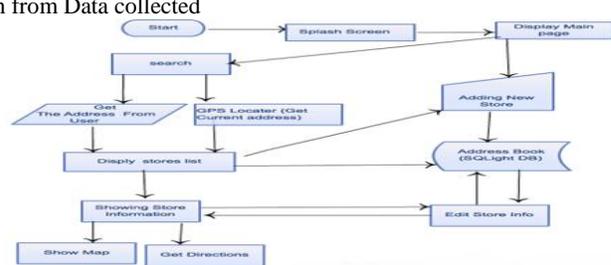
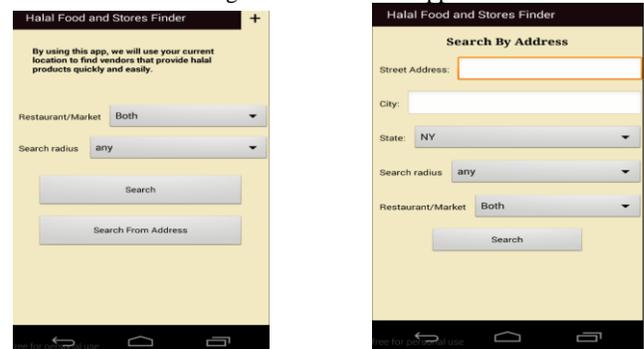


Fig. 2: Flow chart of App



(A): Search page by current location. B): Search by entering address

Fig. 3: Home Page of HFSF App

C. Third Phase

The third phase involves displaying the information to the user. The mobile application will connect with the database–SQLite- in order to produce results and will show the results and arrange them in descending order, beginning the nearest store to the current address of the user. The user will be able to select the favorite store for them. When the user selects the favorite store, they will acquire more detailed information about the store, such as: the address of the store, the logo, the picture of the store, and a description about the store as well show the store on the map (Figure 4). This mobile application will be able to give the user the direction to their favorite store, by clicking on the direction button (Figure 5). Moreover, the user has more options to manage data. The user has ability to

add more stores who like and favorite place. In addition, who has ability to update or add more comments about each store.

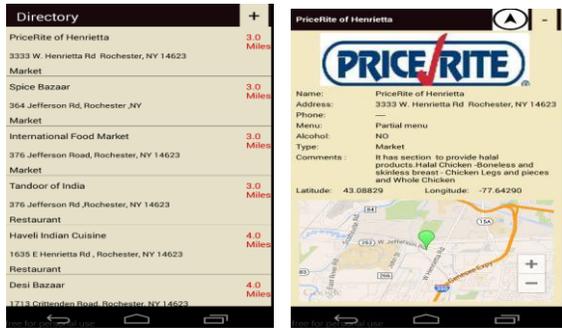


Fig. 4: Lists of stores

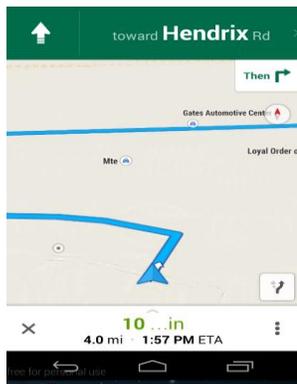


Fig. 5: Direction Road

IV. DEVELOPMENT

A. Design

During the design stage, we needed to build the user interface for the application before I started coding. After doing this, we started coding depending on the Interface layer and database layer.

GUI INTERFACE

app's user interface is everything that the user can see and interact with. Android provides a variety of pre-build UI components such as structured layout objects and UI controls that allow developers to build the graphical user interface for your app. In my project I used the Photoshop software, which is the powerful designer tool, to create the Logo of App and the splash screen. In Android, I declared my layout by instantiating View objects in application code. So, the most effective way to define my layout is with an XML file. To load the XML layout, I loaded the layout from my application code, in the Activity.onCreate() method, by calling the setContentView() method. The following are examples of the most used user interface classes we have in my project.

LINEARLAYOUT VIEW

LinearLayout is a view class that arrange its components in a single direction, vertically or horizontally. we used this view class often in my application when I wanted to display the

content in a single column. So we used this class as container for all the other components.

LISTVIEW

ListView is a view class that displays a list of scrollable items. We used this view class often in my project to display the list of search result. This view class will display all the results as list by using an Adapter that pulls content from a source.

MAP VIEW

This view class is used to display the map of the location. In our project we have used this class to show the location of the result on the Google map. The user can do zoom in and zoom out for the map to show the location. To open this view class I have to add the following line in Android Manifest.XML file to show the map as a child of the <application> element.

```
<uses-library android:name="com.google.android.maps"/>
```

In addition, I have to give permission access to the Internet in order to retrieve map by adding the following in Manifest.XML.

```
<uses-permission  
android:name="android.permission.INTERNET"/>
```

MENU VIEW

Menu views are a common user interface component in many types of applications. In this project we have used this view class to display the user guide of this application.

B. Implementation

In this project, we have more than thirteen classes. And we imported more than fifteen libraries in our project. The most important class I have used is the GPSTracker class. This class is responsible to acquire the current location by the way of latitude and longitude using the GPS and network. Other class we used was LocateAddress class, which is also responsible to get the latitude and longitude for the address that has been entered. In addition, MySQLLigtHelper class is responsible for attracting and connecting with SQLite databases in my application to do adding or updating or any database purpose. we used SQLite Database because SQLite is the ideal database to use with mobile app. SQLite allows the users to view up to date data that lets users add new items. In addition, SQLite is able to handle a large amount of data for mobile application [11].

V. CHALLENGES

Since this project is specific to a type of food, gathering data was resource most difficulty problem that I faced. It is not easy to collect this kind of information especially, if that data is related to the business side. Some of the stores, that provide Halal products, did not help me to provide information and details about competitive stores that provide Halal products. Also, in order to ensure the information is more accurate, mobile app has to update the information when the store moves from one location to another location. While working on this project, I faced those challenges that resulted in delays.

Although I have a experience with the Java like language, I had to spend time to learn the concept of programming Android. Even the Android has java language but it has different manner in which it is programmed. In addition, in Android there are some issues regarding with locating current address of the user. Also, GUI for this mobile application is very important, I have to figure out the best GUI to attract users. Moreover, providing direction of the store needs to be more efficient to work well for the user.

VI. LIMITATIONS

The scope of this project will be for people who live in the city of Rochester (Figure 6) and all its suburban areas. People living in these areas will be able to search for Halal food stores and restaurants using their Android based handheld devices. However, in order to enable future expansion of this application, the source code will be downloadable along with the main application by distributing this software as an open source tool the goal is to allow the user community to contribute by entering the data of Halal food outlets in their living communities.



Fig. 6: This city of Rochester, NY, which is my audience live on it.

VII. FUTURE WORK

Discussion of future work is an important part to any continuous work or project. It provides many opportunities to improve the project in the future. Future versions of this application will be designed to make it more versatile as well as more commercialized. Those plans include expanding from the city of Rochester to a national database in order to give the users the option to search cities other than Rochester so they take advantage of HFSF in other city. Also the development of the iPhone version of the current Android application. According to ComScore's Mobilens study, 49% of smartphone users in USA use IOS platform to expand the number of users. In addition, adding more features to HFSF such as support for languages other than English will give the opportunity to non-English speaking users to use HFSF, especially Arabic, Chinese, Urdu ,Spanish because speakers of these languages are the most expected to use the application. In addition, we need to keep in mind that there must be some kind of control in the data that the users enter for new stores. We need to create a middle layer between the users who are adding new stores and the users who are searching for stores in order to make sure the data has been entered accurately. In fact, HFSF should have evidence that it has accurate data and reliable

sources in order to attract more users in the future. Furthermore, for the comments and reviews, there should be kept and appended to stores and not removed in order to show the overall rating and concerns. Moreover, to make the HFSF more user friendly, adding a rating scale for each store to show the user rating. Also, this structure of HFSF is suitable to be used for other products categorizing which can be used by others such as the community from the Indian sub-continent in the USA since their community is growing every year and they also have specific types of food. As a result of opening the application for more people, the number of users grow an excellent style manual and source of information [9].

VIII. CONCLUSION

Halal products are the type of food that attracts thousands of the students and immigrants in the USA. Most international students and immigrants are not familiar with the surrounding area and what types of products stores provide. This project help those people by using technology instead word of mouth. This will save the time and effort for the users. The information provide through our app is easier to access and more accurate than other sources. Smartphone applications make life easier with apps for routine tasks.

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