Facilitating Pilgrims using Android Mobile Application (Haram Map)

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Summary
Development and implementing of Haram Map application to be used at Hajj season would facilitate the location for visitor of Haram. The systems would also allow assist in achieving the highest degree of pilgrim's safety at Hajj season.
In this paper, the application and research has been performed in order to provide facilities and comfort to the visitors of Masjed Al Nabawi. The fundamental point of the application advancement was to give directing offices to guests visiting Madinah from everywhere throughout the world just as Madinah inhabitants. The application created is an android versatile application that can be downloaded by the guests to get the administrations. It enables the clients to get a guide for better places. It gives directions to guests about the fundamental zones that can be visited for their needs around the Al-Masjed Al-Nabawi. It gives data about the most generally mentioned administrations, for example, plan visits for Al Rawda Al Sharifa at Masjed Al Nabawi. Also, it provides information about the most commonly places and lectures in the Masjed Al Nabawi such as schedule visits for Al Rawda Al Sharifa, lectures from the Quran and some common lectures of Fiqh at the Masjed Al Nabawi. Furthermorethe application additionally furnishes help to its client with valuable data about doors of the Masjed Al Nabawi. One of the noticeable highlights is that clients can include tourist spots on the off chance that it was not found in the application. The application depends on GPS innovation and performs different various activities as offices for clients and increasingly agreeable for them..

Key words:
Al Masjed AlNabawi App; GPS within Al Masjed AlNabawi area; Rawda Times.

1. Introduction

A Muslim believes that an effectively performed Hajj without any evil commitment results in erasing all sins as if the pilgrim has just been born. Umrah is also rewarding and results in erasing numerous sins [12, 13]. For those reasons, millions of Muslims from all over the world perform Hajj and Umrah every year. Hajj is considered the largest human gathering in the world. For example, over 1.8 million pilgrims performed Hajj in 2106 [14]. It is estimated that 2.5 million pilgrims will perform Hajj and 15 million will perform Umrah in 2020 [15]. It is obvious that managing such enormous human gatherings is overly complex. The complexity is not only because of the large number, but also because of many other factors including the difference in languages and cultures. What complicates managing those holy events more is the extremely large number of campaigns or maktabs1 that host and guide groups of pilgrims. Those campaigns typically have different schedules such as different visiting times to Al-Jamart pillars during Hajj to balance the distribution of the number of pilgrims going there throughout the valid ritual time. This is in addition to the several varieties of the rituals performed in Umrah or Hajj even between the pilgrims of the same campaign. Most research studies assume Hajj and Umrah events are controlled centrally by the Hajj and Umrah authorities, which is obviously an impractical assumption. This central management implies that only general information can be communicated (such as how to perform specific rituals or alerts in case of emergencies). Moreover, Al-Masjed Al Nabawi (Prophet's Mosque) invites a large number of guests performing Hajj or Umra consistently. A few guests are unconscious of all administrations inside the mosque and around the mosque as they are outsiders. They face numerous troubles in finding spots of basic needs around Al-Masjed Al Nabawi, for example ATM machines, cash trade workplaces, and drug stores. They likewise face a trouble in finding various doors at the mosque and coming back to inns where they remain during their visits to Al-Masjed Al Nabawi. Hence, there is a considerable requirement for an application that aides them to the spots of intrigue. There are a few applications that give direction to guests of Al-Masjed Al Nabawi yet they give restricted administrations. For instance, the Booking portable application gives data about lodgings around Al-Masjed Al Nabawi and permits web based booking [1]. There is an application that aides guests inside and around Al-Masjed Al Haram named Al-Maqsad [2], but this application is only developed for Al-Masjed Al Haram. This paper proposes an Android portable application that aides the guests of Al-Masjed Al Nabawi to better places of basic needs around Al-Masjed Al Nabawi. It also provides information about: a) schedule of visits to Al Rawda Al Sharifa at Al-Masjed Al Nabawi; b)

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activities such as Quran and Fiqh lectures at Al-Masjed Al Nabawi and respective time and location, c) location of gates of Al-Masjed Al Nabawi. d) Users can add landmarks to the application. This paper is organized as follows: section 2 introduces literature review. Section 3 explains the new proposed method methodology. Section 4 introduces collection data and experimental evaluation and considers the efficiency of this system. Section 5 presents a conclusion and indicates possible future work.

2. Literature Review

2.1 Problem Definition

Guests of Al-Masjed Al Nabawi need direction to spots of day by day interests as they are for the most part visiting Al-Masjed Al Nabawi just because. Additionally, they need direction on the most proficient method to come back to the lodgings where they remain during their visits to Al-Masjed Al Nabawi as they likely get lost and need help.

2.2 Related Work

This section of the project focuses on providing the insight into literatures that have been explored, read and acquired for the purposeful designation and development of the concerned project. This section presents an in-depth analysis for the understanding of the system as well as the correlation existence of the features to be incorporated in the project under discussion and concern.

2.2.1 AlMaqsad AlHaram Navigation

Al-Maqsad [2] it's an indoor route framework application for the intentional use in Almasjed AlHaram in Makkah city. The principle objective of the application is to give offices to Makkah Guests. This causes the guests to find and locate the most precise positions. One of the most significant part of this application is that doesn't require any association with find a predefined area.

2.2.2 Mycitymate

The Mycitymate [3] it’s a web application to discover any city in the world. People can find the best locations and the best event you want when you travel. The application provides you with the nearest location and the application shows you what is the users recommended and liked, you can also book a table at any restaurant you want through the application. You can review and share any location. You can send and receive messages from your friends such as sharing you best locations as in Figure1.

Fig. 1 Mycitymate

2.2.3 Dubai Guide Pal

In [4] this application is available for both android and iPhone. Dubai Guide Pal is good application for tourists and it gives the area and data to every single alluring spot that a vacationer should visit. There is also a feature of automatic visitor recommendations. The application allows the people to find out and locate places of Dubai City. The application is also providing offline maps. It will allow users to follow maps and locate places without internet connection. The most visited places on Dubai are set apart on disconnected maps and give rules with no web association. he application additionally enables the visitor to find areas on the guide utilizing the Global Positioning Systems (GPS).

2.2.4 Visitor Guide for AL Masjid AL Haram

This application [5][6] is supported on the IOS platforms and the language support for this application is by default set to English. This application is for guiding the visitors of Almasjed AlHaram in Makkah the other one is a helpful application that presents and gives data about Hajj or Umrah and the individuals who are visiting Madinah as in Figure 2. This helps and aids visitors visiting Makkah city and it also provides the locations for all the gates at Almasjed AlHaram. It also provides the locations of bathroom locations. Also provide the locations of health centers where patients may need some help. The application is also providing the locations and direction to masjid, Kaaba, the station of Abraham as well as the location to Zamzam well. Another important milestone for visitors is Hajre-aswad which is the black stone from the heavens. It also locates the places of mufti in Al Masjid AL Haram as in Figure 3.

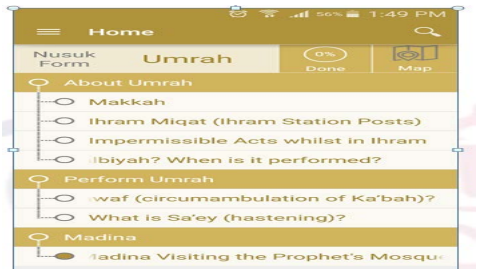


Fig. 2 Nusuk for Hajj and Umrah

Fig. 3 Visitor Guide for AL Masjid AL Haram

2.2.5 Alhara Main App

Alharamain [7] is a very useful application that presents and provides information about Hajj or Umrah, this application is available for both android and iPhone. The main goal of the application is to provide facilities to Makkah and Madinah Visitors. The system supports many languages.

2.2.6 Guide Madinah Visitors using Mobile Application

Madinah Guest [8] is a guide that is created in the point of view of helping a guest to know all recorded, archeological and religious spots with simple interfaces. Almadinah Guest is an application which encourages guests to locate their ideal places effectively with separating indexed lists by separation, rating, and one of a kind highlights, for example, incapacity or vegan sustenance as opposed to going for customary controlling for guests in employing a specialist to manage them and give them a visit in the town, which cause guests to invest energy and waste their cash. The system supports many languages, users can share their geographic locations. Moreover, reservations of hotels can be done via application and augmented reality can used within application as in Figure 4.

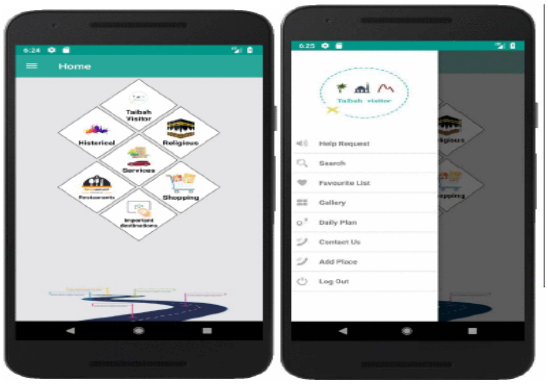


Fig. 4 Tourism Mobile Application Main Menu

2.2.7 Comparing Related Work and Our Own Work

Table 1 shows the comparison between the mobile application that has been done and the features of our new application.

Table 1: Comparison traditional with new work

Apps name	Our Application	Navi Hajj	AlMaqsad	AL masjid AL Haram Visitor Guide	Haramin App
City	Madinah	Makkah and Madinah	Makkah	Makkah	Makkah and Madinah
Hospital	✔	✔	✔	✔	
Hotels	✔	✔			
Police stations	✔				
Locations of gates	✔		✔	✔	✔
ATMs	✔	✔			
Pharmacies	✔				
Visit Time of Rawda Sharifa	✔				✔
Quran and Fiqh lectures	✔				
Visitors add their hotels as a landmark	✔				

3. Proposed Method Methodology

A methodology is the steps or technique we will follow to in our study, there are many methods, as waterfall, incremental, agile and others.

3.1 Conceptual Design

Figure 5 shows the conceptual design of the application where the application code must meet functional and nonfunctional requirements, the users and the Admin are the users of the system.

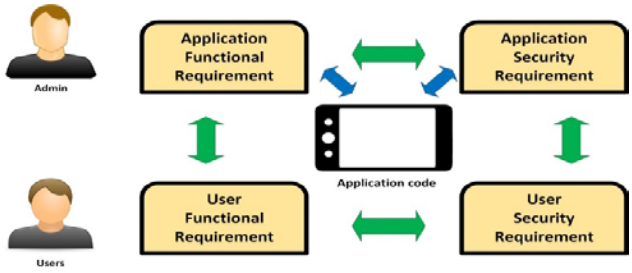


Fig. 5 Conceptual Design

3.2 System Components

The introduction layer is the thing that a framework client sees or associates with. It can comprise of visual items, for example, screens. The business rationale layer, speaks to the business decides that are authorized by means of programming rationale (PC directions) with respect to how those guidelines are applied. The information access layer comprises of the meanings of database tables and segments and the PC rationale that is expected to explore the database.

3.3 System Architecture

The Architecture of the application contains the users of the system, as we can see GPS is used in the application to locate landmarks or to add landmarks. Admin and users log in from the mobile application. There is a data that is hosted online so all data is saved in a central database as shown in Figure 6.

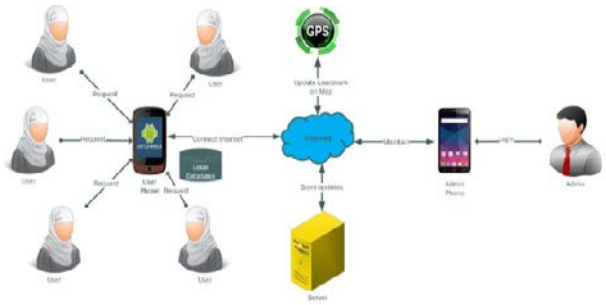


Fig. 6 Architecture Design

3.4 Interface Design and User Interface and Application

3.4.1 Admin Login Interfaces

Admin logs into the Application by providing Username and password as shown in Figure 7.

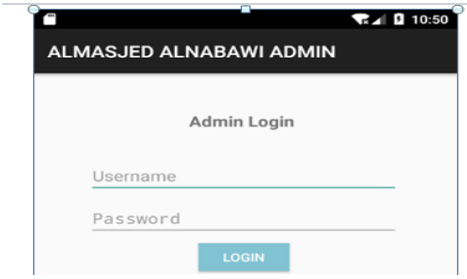


Fig. 7 Admin Login

3.4.2 Admin Dashboard

when admin logs in, he will be forwarded to the dasboard as seen in Figure 8 to carry the tasks he/she can perform.

Fig. 8 Admin Dashboard

3.4.3 Add New Marker

When Admin clicks on Add New Marker from the main menu, Admin can add marker by category to the

application that will be saved on server for all users to access as in Figure 9.

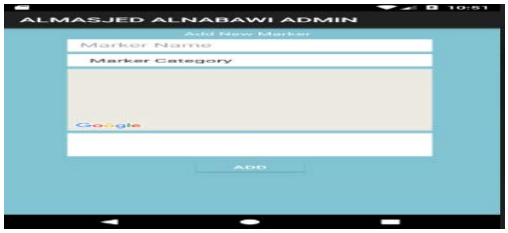


Fig. 9 Add New Marker

3.4.4 Admin Lessons Adding

This feature is for adding Quran or any other religious lessons times, as shown in Figure10

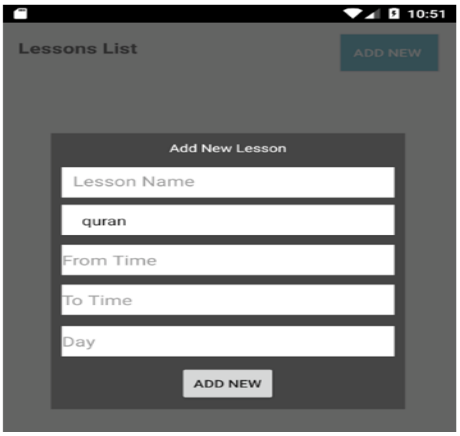


Fig. 10 Add New Lesson

3.4.5 Marker List

This is the list of markers added by the admin, and admin can add a new marker by clicking the “ADD NEW” button on top left, this will open a new window for admin to add marker name and choose its category and current location will be saved along with entered information as shown in Figure 12.

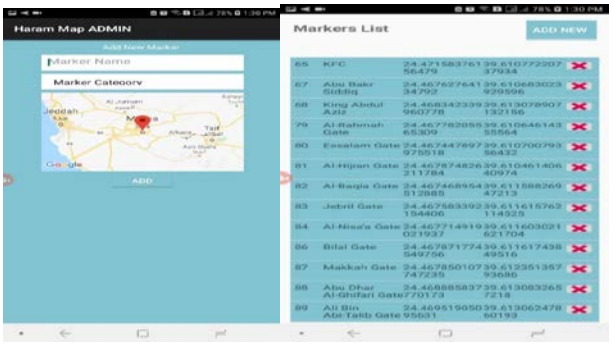


Fig. 12 Markers List

3.4.6 Mazarat Addition

This is the list of Mazarats added by the admin, and admin can add a new Mazar by clicking the “ADD NEW” button on top left, this will open a new window for admin to add new Mazar name, photos URLs, information about Mazar and current location will be saved along with entered information as in Figure 13.

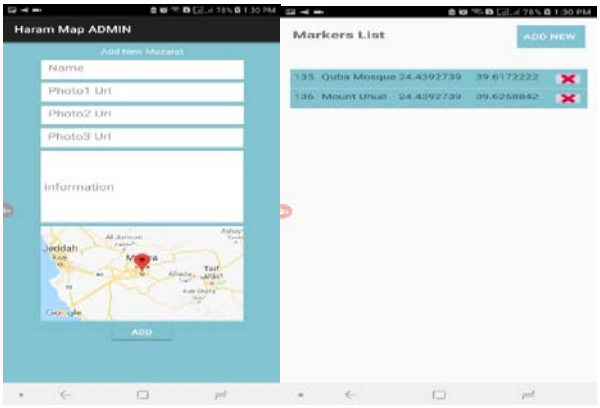


Fig. 13 Add Mazarat

3.4.7 Adding Quran Lessons

This feature is for adding Quran or Fiqh lessons times, as shown in Figure 14.

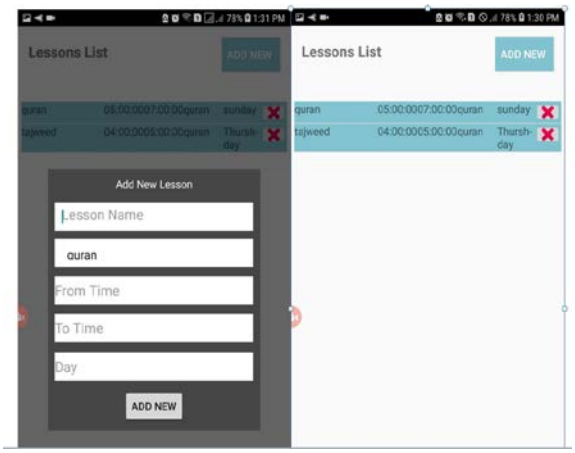


Fig. 14 Add New Quran Lesson

3.4.8 Adding Information Pages

Admin adds the information pages About, Policy and Rawdah Times to be seen by visitors of Masjed AlNabawi as shown in Figure 15

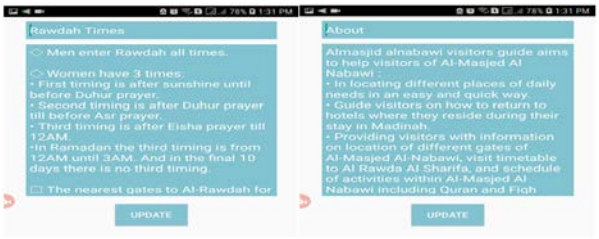


Fig. 15 Information Pages

3.4.9 User Application

3.4.9.1 User Main Menu

Available markers like Gates, Hotels, Pharmacies can be shown to navigate as in Figure 16.

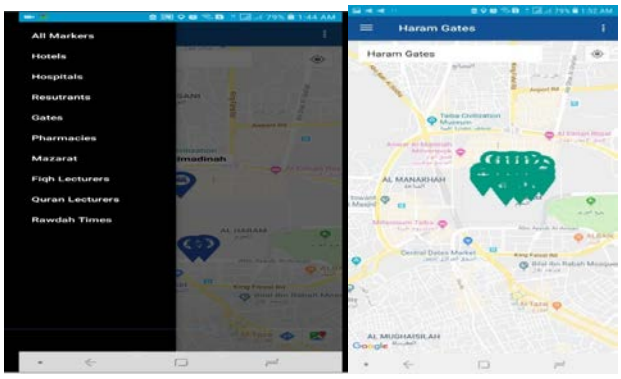


Fig. 16 Haram Gates

3.4.9.2 View Mazarat

Mazarat added by Admin as shown in Figure 13 can be viewed by users of the application and its locations also will be viewed with Mazar name, then the user click on Mazar name and he will view the information added by admin as in Figure 17.

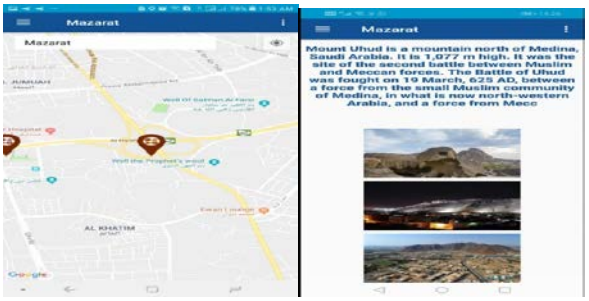


Fig. 17 View Mazarat

3.4.9.3 User Add New Marker

As shown in Figure 18, the user also can add a new marker for himself, like a store or anywhere specific important to the user, satisfying his needs.

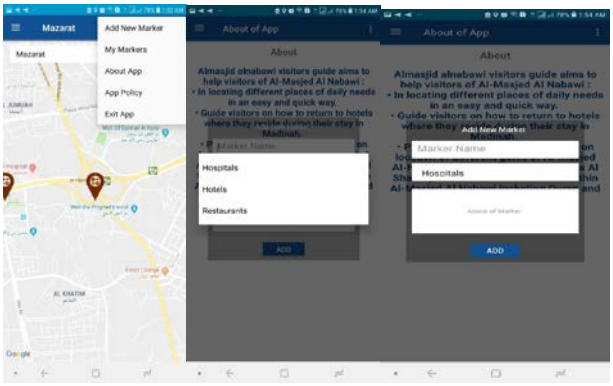


Fig. 18 User Add New Market

4. Experimental Evaluation

4.1 User Data

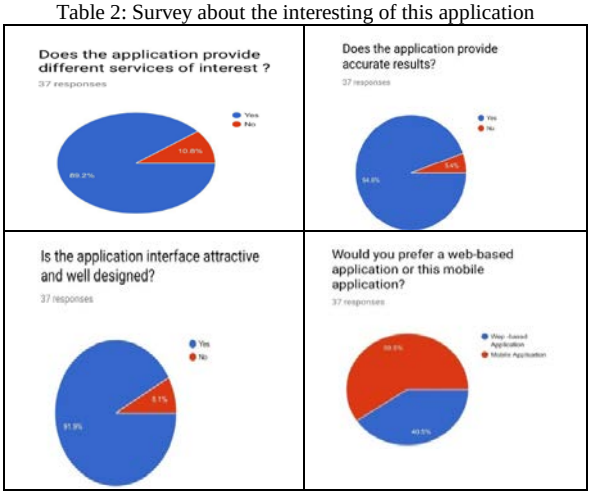
Now we can see that this application is really useful for navigating especially in the Pilgrimage and Umrah seasons, as the visitors of the holy places might be unfamiliar with the place or at least the changes which could happen from a visit to another, so this application will be the optimum choice for them to easily get to their destinations, also if

they forgot the place of something important for them, they can easily save it to the map to be accessible anytime later. Also with the feature of Quran times, no one will pass an important lesson, and it will help people a lot in time management, as for every lesson or activity we have a start-end time, which will help a lot in managing every minute. So far, it's a brilliant idea which will help a lot of people to save time, money, prayer and lessons times, and not to get lost.

4.2 Experimental Analysis

Table 2 shows a survey for queries with the answer as follows: Around 95% agreed that the application provide accurate result; Asking about interface design if it was attractive or not? We got around 92% admit that it's well designed and attractive; We asked if users would prefer having a web based system for the application and around 60% did not prefer to use services via website .
In conclusion a survey result we have conducted, all survey can be found at Appendix A at end of this document, when we asked if the application provides serves that of interest to users around 90% agreed about this.

Table 2: Survey about the interesting of this application



5. Conclusion

In this paper we could build up an application to give steering offices to guests visiting Madinah from everywhere throughout the world just as Madinah occupants. The application is utilizing an android versatile application that can be downloaded by the guests to get the administrations. It enables the clients to get a guide for better places, for example, Al Rawda Al Sharifa at Masjed Al Nabawi, addresses from the Quran and Fiqh at the Masjed Al Nabawi, the doors of the Mosque and data about inns around Al-Masjed Al Nabawi. One of the conspicuous highlights is that clients can include tourist spots in the event that it was not found in the application. Moreover, application provides serves that of interest to users around 90% agreed about this. In our application we use the English Language which is the common language for most people all over the world to communicate. Future work could focus on applying our model by all Languages (Arabic, French, etc.). Furthermore, the application will be offline and will apply for all people from outside KSA.

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