جامعة أم القرى
UMM AL-QURA UNIVERSITY

COMPUTER NETWORK PROJECT

LAP COUNTER

SUBMITTED BY:
Group 4

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INTRODUCTION

Tawaf and Saii are essential rituals performed by many Muslims during Umrah, involving circling the Kaaba seven times and performing seven laps between Safa and Marwa. Families often perform these rituals individually but leave the mosque as a group, necessitating coordination to estimate the time required for each member to complete their laps and decide whether to wait or proceed with other rituals. This application aims to connect the group, track the number of laps completed, show their locations, share the number of laps, and estimate the wait time is to develop an application or system to assist Muslims performing

The project idea

the Tawaf and Saii rituals during Umrah. It aims to coordinate and track their progress during Tawaf and Saii. The project aims to provide a means for individuals and families to stay connected, know when they will finish their circuits, estimate the time remaining, and coordinate their movements. This could be achieved through:

1. An application that allows individuals to register or track the number of circuits they have completed in Tawaf and Saii.
2. Providing real-time location sharing to show the current position of each member of the group.
3. Sharing the number of circuits completed by each member and estimating the remaining time until completion.
4. Providing notifications or alerts when members finish their circuits or when significant milestones are reached.

ABSTRACT:

In the modern world of information technology, smart applications have become an integral part of our daily lives, providing us with many services and advantages that make it easier for us to obtain information and communicate with the world effectively. Among these important and useful applications is an application that offers many diverse services to users, which contributes to facilitating and improving their daily experience.
This application aims to facilitate and monitor the Tawaf and Saii process for pilgrims during
Umrah by providing a means to efficiently organize and monitor the process. Users will be able to track the number of completed and remaining laps, know their current location in Tawaf and Saii, and estimate the time remaining to complete the rituals accurately.

Problem Domain

In today's app market, users face several challenges in finding an app that provides comprehensive and integrated services to meet their diverse needs. While basic functionalities like login and signup are usually available, most apps lack the ability to: establishing a distinct mark for identification, and estimating the time remaining during circumambulation and sa'i rituals. By employing wearable devices, mobile applications, and a centralized tracking system, this approach significantly enhances the organization and management of these rituals. It enables real-time tracking, accurate identification, and estimation of remaining time, ultimately improving the overall experience for participants and organizers alike.

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OBJECTIVES:

1. Efficient Organization: Develop a system to efficiently organize the Tawaf and Saii process during Umrah for pilgrims and their families, ensuring a smooth and coordinated experience.

2. Real-time Monitoring: Enable real-time monitoring of the Tawaf and Saii rituals by tracking the progress of individuals and providing accurate updates on the number of completed and remaining laps.

3. Location Tracking: Implement GPS technology to track the location of individuals withinthe holy mosque, allowing for precise determination of their positions during Tawaf and Saii.

4. Estimation of Completion Time: Develop algorithms to estimate the time remaining for individuals to complete their laps based on their current location and walking speed, providing insights to other group members.

5. Decision Support: Provide users with timely information and recommendations based on the progress of the Tawaf and Saii rituals, helping them make informed decisions about whether to wait or proceed with other activities.

Project Scope of Use :

Personal guidance : The app helps the individual keep track of the number of times he has done the circumambulation, and thus can use it as a tool to measure his religious progress and adherence to Islamic rituals.

Educational guidance: The app can be a way to teach the new generation about Islamic rituals and their importance in religious life.

The collective guidance strategy: involves mosques and religious centers encouraging the community to use the application as a collective tool to stimulate religious interaction and promote the performance of religious rituals

LITERATURE REVIEW:

Previous works

Tawfiq app: Tawfiq is an application specialized in facilitating the experience of pilgrims and Umrah performers while performing Tawaf around the Kaaba. The app offers a range of features that help users organize and facilitate their religious experience, including:

Tawaf Tracking: The app allows users to record and track the number of tawaf times they perform during their visit to the Kaaba, while providing accurate statistics and analysis of their religious performance.

Religious Guidelines: The app provides detailed religious guidance on how to perform Tawaf correctly according to the Sunnah, helping users understand religious rituals and rituals.

Alerts and reminders: The application provides alerts and reminders to users about the times of circumambulation and the importance of adhering to the specified times to ensure that religious rituals are performed regularly.

Share Experience: The app allows users to share their religious experiences and photos with friends and family via social media, enhancing social communication and interaction among Muslims. Tawfik's app is a good example of how technology can be used to facilitate and improve the Hajj and Umrah experience, and reflects efforts in providing innovative solutions to meet the needs of Muslims during religious rituals.

COMPARION OF PREVIOUS WORK WITH WORK PREFORME:

1. Primary Objective:

- **Tawfiq app:** To facilitate and organize the experience of pilgrims and Umrah performers during the Tawaf around the Kaaba.
- **Tawaf app:** To coordinate and track the progress of Umrah performers during the Tawaf and Saii rituals.

2. Features:

- **Lap Tracking:** Track the number of laps completed during Tawaf and Sa'i.

- **Alerts:** Send notifications upon completion of laps.

- **Location Sharing:** Display the location of individuals on the map.

- **Time Estimation:** Estimate the remaining time to complete the laps.

Tawaf app:

- Registration/tracking of the number of circuits completed in Tawaf and Saii
- Real-time location sharing to show the current position of each group member
- Sharing the number of circuits completed by each member and estimating the remaining time
- Providing notifications when members finish their circuits or reach significant milestones

3. Target Audience:

- **Tawfiq app**: Pilgrims and Umrah performers
- **Tawaf app**:Umrah performers and Pilgrims

TECHNOLOGIES USED:

- **Frontend:**

  - **Flutter:** An open-source framework by Google used for building mobile, web, and desktop applications from a single codebase.

  - **Dart:** The programming language used by Flutter.

- **Backend:**

  - **Firebase:** An integrated platform by Google offering a suite of tools and services for app development, including real-time database, authentication, and hosting.

  - **Cloud Firestore:** A NoSQL database managed by Firebase, allowing data storage and synchronization across devices.

  - **Connectivity:**

    - **Firebase Realtime Database:** Provides features for real-time data updates.

    - **Cloud Firestore:** Both enable real-time data updates.

ANSWERS TO SPECIFIC QUESTIONS:

***Question 1*: What is the role of "computer networks" in this project?**

- Computer networks play a crucial role in connecting user devices, enabling real-time tracking of laps and location sharing using technologies like Firebase Realtime.

***Question 2*: What methods are used to ensure information security?**

- Using encryption protocols like SSL/TLS to ensure the confidentiality and privacy of data exchanged between devices and servers.

- Authenticating users with technologies like OAuth2.

***Question 3:* How is communication between devices handled in the project?**

- Communication between devices is handled through technologies like Bluetooth, WiFi, and NFC for data exchange.

- Real-time updates between the frontend and backend are facilitated using Firebase Realtime.

***Question 4*: What are the potential issues and how can they be resolved?**

- **Connectivity Issues:** Can be resolved by using reliable technologies like Firebase Realtime and HTTP/2.

- **Synchronization Issues:** Can be addressed by using real-time databases like Firebase.

Question 5: What are the benefits derived from the project?

- Better organization for the family during Umrah.

- Reduced stress and unnecessary wait

METHODOLOGY:

Flutter is an open-source mobile development framework developed by Google. Flutter is used to build beautiful and smooth-running applications for multiple operating systems such as Android, iOS, and others, providing a consistent and high-quality user experience across all devices.

Firebase is an integrated app development platform developed by Google. Firebase provides a suite of tools and services that help developers build and run mobile applications quickly and efficiently, with features such as real-time databases, authentication, analytics, and instant messaging.

Using Flutter and Firebase in your application brings several benefits:

1. Rapid Development: Flutter allows you to build user interfaces quickly using one of the expressive and easy-to-learn programming languages, reducing development time.

2. High Performance: Flutter provides a smooth user experience and fast response times, helping to attract and retain users.

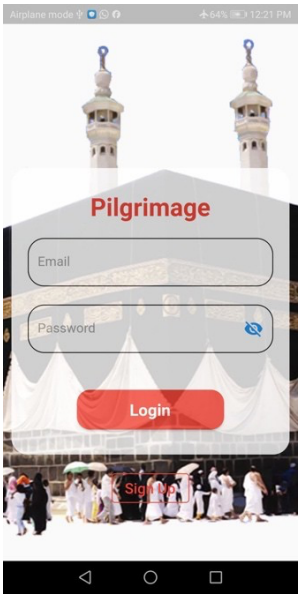
3. Cross-Platform Compatibility: Flutter applications can run on multiple platforms with the same performance and appearance, making it easier to develop a consistent experience across different devices.

4. Easy Integration: Firebase integrates seamlessly with Flutter, making it easy for developers to use Firebase services such as databases, authentication, and analytics within their applications.

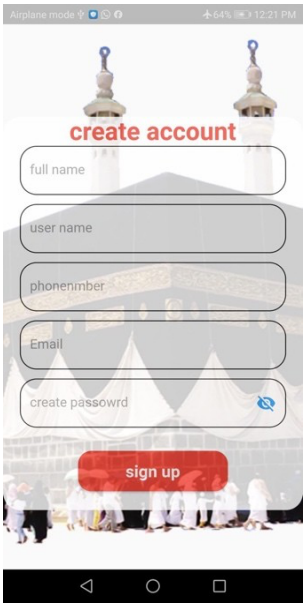
5. Low Cost: Firebase offers a free plan with many services, making it an ideal choice for developers who want to reduce costs in the early stages of application development.

SPECIFICATIONS AND REQUIREMENTS:

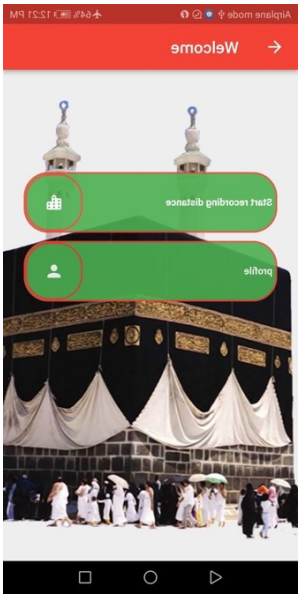
-LOG IN



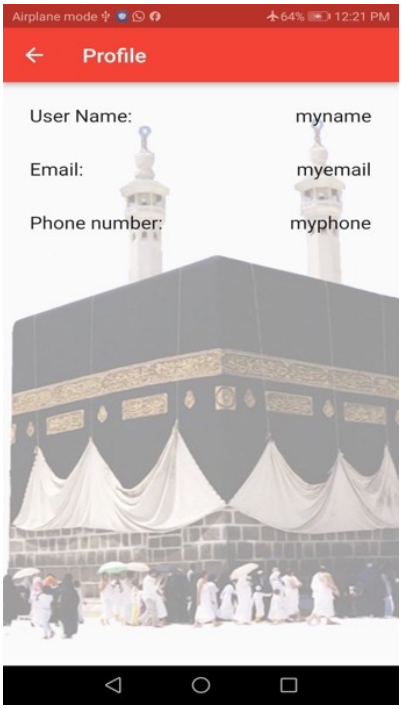
-SIGN UP



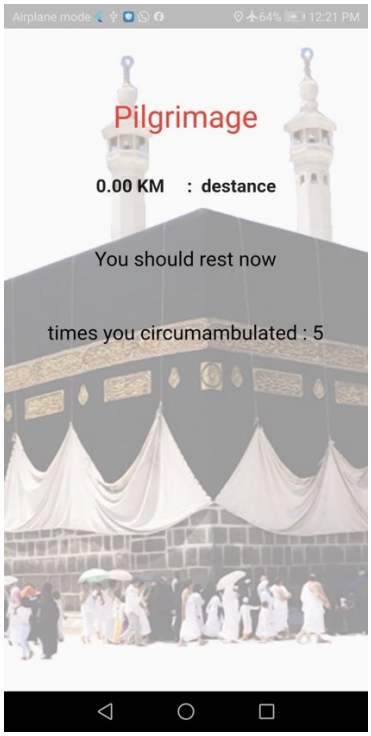
-HOME PAGE



-PROFILE



-MILEAGE RECORDIN PAGE:



REQUIREMENTS:

Functional Requirements :

1 - Login: The application must allow users to log in using their personal accounts .

2 - Tracking Tawaf and Sa'i of Umrah: The application aims to coordinate and track the progress of users during the Tawaf and Sa'i of Umrah .

3 - Notifications and Alerts: The application must provide users with notifications of remembrances (Adhkar) and provide notifications or alerts when members complete their rounds or reach important stations .

4 - Recording and Tracking Rounds: The application allows individuals to record or track the number of rounds they have completed in Tawaf and Sa'I .

5 - Sharing Current Location: The application provides the ability to share the real-time location of each member in the group .

6. Adhkar and Supplications:
   - Supplications and concise Adhkar for each stage of Hajj and Umrah
   - Morning and Evening Adhkar

7. Prayer Times:
   - Times for the five daily prayers
   - Prayer time schedule

Non-Functional Requirements :

1 - Ease of Use: The application must be easy to use and logical for users of all age groups and cultural backgrounds .

2 - Security and Privacy: The application must provide high levels of security and protection for users' personal data .

3 - Device Compatibility: The application must be compatible with different operating systems and a variety of smart devices

4 - Performance and Responsiveness: The application must have fast performance and be responsive to effectively meet the needs of users quickly

5 - Attractive Design: The application must have an attractive and appropriate design to attract users and encourage them to use it regularly .

REQUIREMENTS HARDWARE:

1. Operating Systems:
- For smartphones: The device must run Android (version 4.1 or higher) or iOS (version 8 or higher).
- For tablets: The tablet must run Android (version 4.1 or higher) or iOS (version 8 or higher).

2. Storage Space:
- The device must have sufficient storage space to install the app and store local data.

3. Random Access Memory (RAM):
- It is recommended to have a minimum amount of RAM for the app to run smoothly without delays.

4. Internet Connectivity:
- The app requires an internet connection to access Firebase services, update data, and synchronize with the servers.

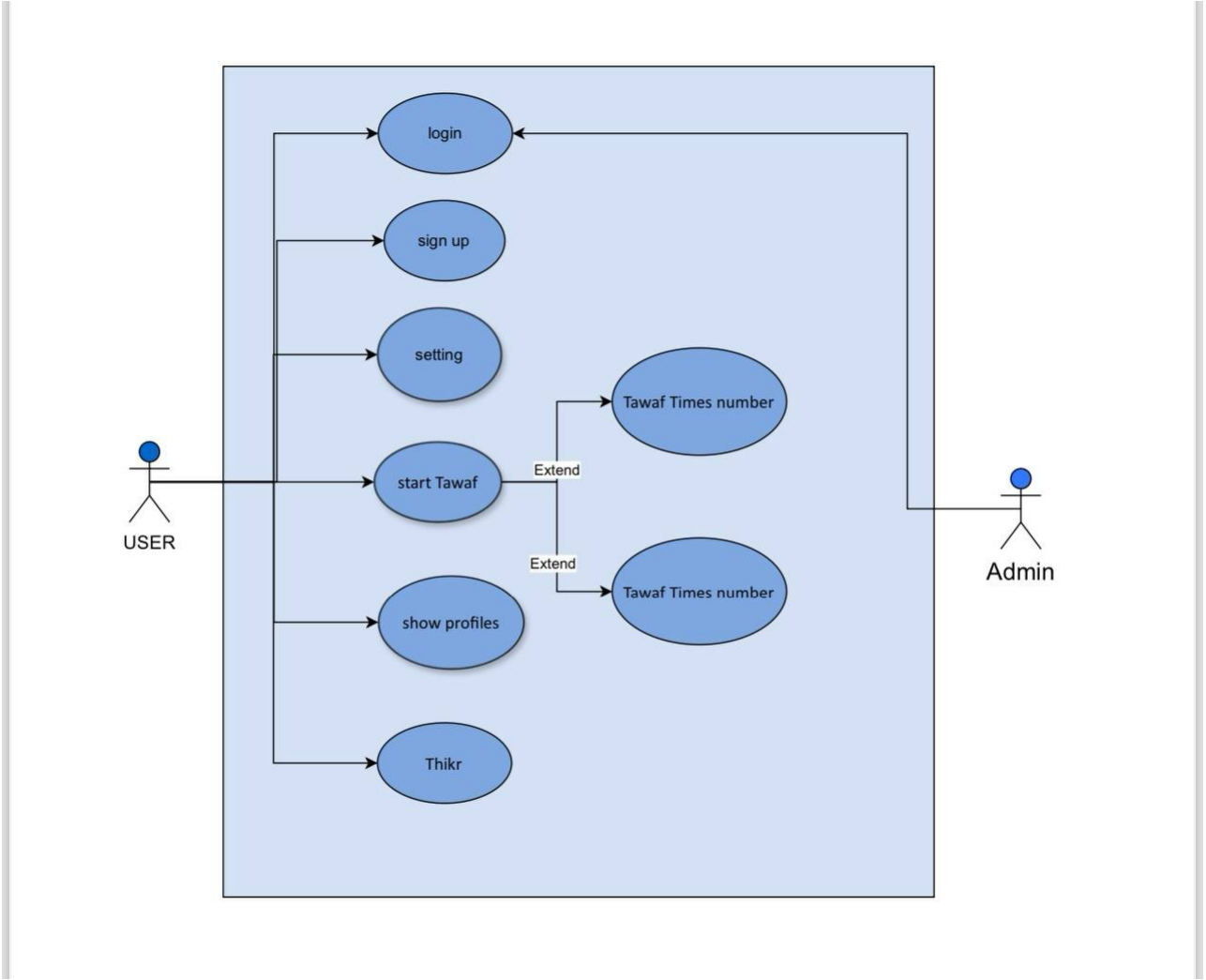
5. Processor:
- The device must have a processor capable of running Flutter applications smoothly without delays.

6. Screen Resolution and Size:
- It is preferable to have a high-resolution screen to provide an attractive and visually appealing user experience.

7. Battery:
- The device must have a battery with sufficient capacity to run the app for extended periods without the need for frequent charging.

USE CASE:

The usecase chart is responsible for clarifying system tasks :



FINAL RESULTS:

1. Simplified and user-friendly interface: This is crucial to ensure easy access and usability of the app for pilgrims, many of whom may not be tech-savvy.

2. Tawaf (circumambulation) guide: Providing a detailed guide to the rituals of Tawaf, including information about holy sites, important locations, and tips for performing Tawaf correctly, will be highly valuable for pilgrims, especially first-time Umrah performers.

3. Support for multiple languages: Catering to pilgrims from different countries by providing support for multiple languages is a well-considered and inclusive feature that will enhance the accessibility and usability of the app.

4. Securing user data: Ensuring the confidentiality and integrity of user data is of utmost importance, as pilgrims will entrust the app with personal and potentially sensitive information.

5. Tracking and coordinating Tawaf and Sa'i (rushing between Safa and Marwah) progress within the group:

- Ability to record or track the number of laps completed by each individual during Tawaf and Sa'i.

- Sharing the current location of each group member in real-time.

- Sharing the number of laps completed by each member and estimating the remaining time until completion.

- Providing notifications or alerts when members complete their laps or reach important milestones.

6. Enhancing the overall experience for pilgrims:

- Helping to stay connected and coordinate movement within the group.

- Improving time management through knowledge of progress and remaining time.

- Ensuring a smooth and organized completion of the rituals.

7. Dhikr (remembrance) and recommended du'a (supplication) list and tips:

- Incorporating the permissible Dhikr and du'a to be recited during the performance of Tawaf and Sa'i rituals.

- Providing the ability to listen to audio recordings of these Dhikr and du'a.

- Displaying the Arabic text with translations into multiple languages.

GROUP WORK REPORT:

Group members	Sign in interface	Profile and Homepage	Distance Measure interface	Build a database	Build the characters of distance measure	Athkar interface	Translation	Linking the faypers
ريم العصيمي	✓	✓	✓	✓	✓	✓	✓	✓
ساره عابد	✓	✓	✓	✓	✓	✓	✓	✓
نهال الزهراني	✓	✓	✓	✓	✓	✓	✓	✓

Group members	Sign in interface	Profile and Homepage	Distance Measure interface	Build a database	Build the characters of distance measure	Athkar interface	Translation	Linking the faypers
ريوف الشريف	✓	✓	✓	✓	✓	✓	✓	✓
جنى الحليس	✓	✓	✓	✓	✓	✓	✓	✓
جود الهذلي	✓	✓	✓	✓	✓	✓	✓	✓
حنين المالكي	✓	✓	✓	✓	✓	✓	✓	✓

REFERENCE:

1. Al-Emadi, Nasser, et al. "Smart Hajj: A conceptual model for hajj services through mobile devices." 2018 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM). IEEE, 2018. (راحة رلإنترنت)

2. Elsaleh, Tarek, et al. "Mobile applications for Hajj: A systematic literature review." Future Generation Computer Systems 91 (2019): 174-190. (راحة عبر الإنترنت)

3. Al-Hayani, A., & Hussain, F. K. (2019). Factors influencing the acceptance of Hajj