



**SUDAN UNIVERSITY OF SCIENCE AND TECHNOLOGY**  
**COLLEGE OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGY**  
**DEPARTMENT OF COMPUTER SYSTEMS AND NETWORKS**

# **C-Me: The Friend Locator Mobile App**

**A THESIS SUMMITTED AS PARTIAL FULFILLMENT OF THE  
REQUIREMENTS FOR THE DEGREE OF B.Sc. (HONORS) IN COMPUTER  
SYSTEMS AND NETWORKS**

**OCTOBER 2016**



بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ

SUDAN UNIVERSITY OF SCIENCE AND TECHNOLOGY  
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# C-Me: The Friend Locator Mobile App

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**Supervisor Signature:**

.....

**Date:**

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# الآية

قال تعالى :

يَا أَيُّهَا الَّذِينَ آمَنُوا إِنَّا جَعَلْنَاكُمْ شُعُوبًا وَقَبَائِلَ لِتَعَارَفُوا إِنَّ  
أَكْرَمَكُمْ عِنْدَ اللَّهِ أَتَقَاهُمْ إِنَّ اللَّهَ عَلِيمٌ خَبِيرٌ

سورة الحجرات (13)

## الحمد لله

الْحَمْدُ لِلَّهِ الَّذِي مَنْ عَلَيْنَا بِالْإِسْلَامِ، الْجَمَّةُ لِلْعَالَمِينَ، الْحَمْدُ لِلَّهِ الَّذِي لَهُ مَا فِي السَّمَوَاتِ وَمَا فِي الْأَرْضِ. الْوَحْدُ الرَّحْمَنُ هُوَ فِي الْحَمْدِ الْخَبِيرُ، الْحَمْدُ لِلَّهِ فَاطِرِ السَّمَوَاتِ وَالْأَرْضِ، الْحَمْدُ لِلَّهِ الَّذِي أَنْزَلَ لِي عَبْدِهِ الْكِتَابَ وَلَمْ يَجْعَلْ لَلَّهِ لِقَوْلِي جَلًّا لِيَتَّخِذُوا صَاحِبَةَ وَلَا وَلَدًا وَلَمْ يَكُنْ لَهُ شَرِيكٌ فِي الْمُلْكِ وَلَمْ يَكُنْ لَهُ وِليٌّ مِنَ الذُّلِّ وَكَبَّرَهُ تَكْبِيرًا.

اللَّهُمَّ لَكَ الْحَمْدُ أَنْتَ نُورُ السَّمَوَاتِ وَالْأَرْضِ وَمَنْ فِيهِنَّ، وَلَكَ الْحَمْدُ، أَنْتَ قِيَمُ السَّمَوَاتِ وَالْأَرْضِ وَمَنْ فِيهِنَّ، الْحَوْلُ، أَنْتَ مَلِكُ السَّمَوَاتِ وَالْأَرْضِ وَمَنْ فِيهِنَّ، وَلَكَ الْحَمْدُ أَنْتَ الْحَقُّ، وَوَعْدُكَ حَقٌّ، وَقَوْلُكَ حَقٌّ وَقَاوُكَ حَقٌّ، وَالْجَنَّةُ حَقٌّ، وَالذَّارُ حَقٌّ وَالسَّاعَةُ حَقٌّ، وَالذَّبْيُونُ حَقٌّ، وَمُحَمَّدٌ صَلَّى اللهُ عَلَيْهِ وَسَلَّمَ حَقٌّ..

الحمد لله فيسريو فيعني  
والحمد لله فيجزنيو فيسعي  
\*\*\*

الحمد لله عمّا كنت أعلمه  
والحمد لله عمّا غاب عن خلدي  
\*\*\*

الحمد لله منعمت فضائله  
وأعمالها عيت منطفا لعدد  
\*\*\*

فالحمد لله ثمّ الشكر يتبعه  
والحمد لله عن شكرىو عن حمدي

اللهم صل على محمد وعلى آل محمد كما صليت على إبراهيم وعلى آل إبراهيم إنك حميد مجيد. اللهم بارك على محمد وعلى آل محمد كما باركت على إبراهيم وعلى آل إبراهيم إنك حميد مجيد

## DEDICATION

### **Ahmed**

*To my dear father,  
To my dear mother,  
To all my brothers and my sisters,  
To my family,  
To my cousin,  
To my self.*

### **Wadah**

*To my dear father,  
To my dear mother,  
To all my brothers and my sisters,  
To my family,  
To Sudan University of Science and Technology (SUST),  
To all my friends and my colleagues,  
To my best friend Mohamed Mubarak Abuzaid,  
To my teachers from basic school till now,  
To my best teachers Dr. NiemahIzzaldinMohamed Osman , Dr. Ameer and  
Dr.Abeer,  
To my uncles and my aunts,  
To my uncles Hussain and Montasir,  
To everyone who knows me.*

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*Thanks for Sudan University of Science and Technology(SUST),*

*Thanks to every teacher who have taught us,*

## **Abstract**

During the past few decades, advancements in technology have been exceptionally fast, especially in computer and mobile technologies. This fast improvement resulted in a need to develop applications and services that enhance human lives.

Global Positioning System (GPS) is the technique that is used to determine the position of objects on the Earth surface. This technique has become widely used in many desktop and mobile applications.

In this project, we develop C-Me, which is a mobile application that tracks user's mobile phones which are nearby or within a certain distance from the user using GPS. It sends notifications to users when someone they know enters their surrounding area. The user can create groups, add and delete users to/from groups and display maps to view locations.



## المستخلص

شهدت تقنيات الحاسوب والاتصالات تطوراً كبيراً خلال العقود القليلة الماضية. ولذلك، كان لابد من الاستفادة من هذه التقنيات لتطوير التطبيقات والخدمات التي تعزز حياة الإنسان. نظام تحديد المواقع العالمي هو أسلوب يستخدم لتحديد موقع الكائنات على سطح الأرض. وقد أصبحت هذه التقنية مستخدمة على نطاق واسع في العديد من تطبيقات الحاسوب والهاتف النقال. قمنا في هذا المشروع بتطوير تطبيق للهاتف النقال، والذي يعمل على تتبع هواتف المستخدمين التي تكون بالقرب من أو على مسافة معينة من المستخدم باستخدام تقنية نظام تحديد المواقع العالمي. يقوم التطبيق بإرسال إشعاراً لمستخدم النظام عندما يدخل شخص يعرفه المستخدم إلى المنطقة المحيطة به. يمكن للمستخدم إنشاء مجموعات وإضافة وحذف المستخدمين مع إمكانية إظهار الخرائط لعرض مواقع المستخدمين.

# LIST OF TERMS

<b>#</b>	<b>Term</b>	<b>Description</b>
1	GPS	Geographical Positioning System
2	2D Position	Two Dimensions (Latitude, Longitude)
3	3D position	Three Dimensions (Latitude , Longitude ,Altitude)
4	SQL	Structured Query Language
5	PHP	Hypertext Preprocessing
6	UML	Unified Modeling Language
7	API	Application program interface
8	JDBC	Java Database Connectivity
9	DoD	Department of Defence

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# **CHAPTER ONE**

## **INTRODUCTION**

## **1.1 Introduction:**

Mobile phones have become a major part of our daily lives. The importance of them is due to the fact that they are an easy way of communication, Internet access and social media. They also save money, ensure safety, help in business and many more [1].

Mobile phones can support a wide range of applications, giving them many of the same functions available on a laptop but without the extra bulk [2].

Anyone who has a smart phone or another mobile device probably uses apps to play games, get directions, access news, books, weather, and so on. Mobile apps are easy to download, are often free and are convenient such that sometimes users might download them without thinking about some key considerations: how they are paid for, what information they may gather from the device, or who gets that information [3].

There is a need to continue to develop new apps that serve the growing demands of mobile users. The market of mobile apps makes use of new mobile and hardware technologies, and therefore expands with the expansion of these technologies.

## **1.2 Problem Definition:**

There is a time when a user happens to be in the same area with someone they know with a small separation in time or space. The result could be losing a chance to hang out and catch up with colleague or missing out on meeting someone dear that they will probably never be able to see again. Either ways, it is unfortunate not being able to have a mobile service that can prevent such circumstances when most mobile phones are equipped with a Geographical Positioning System (GPS) and tools to define and manage users' connections.

## **1.3 Proposed Solution:**

Developing a mobile App (C-Me), that tracks the location of mobile phones and alerts users when someone they know is in their surrounding area. The goal is to get people together. Users:

1. Create and sign up into groups of friends or relatives, etc through group administrators.
2. Specify the radius of the group's circle such that they are notified when someone in their group enters the circle.
3. Specify time constraints (time periods during which they would like to be active). One could specify a radius of 1 kilometer and a time constraint of weekends for his group of co-workers so he is alerted on weekends only.

## **1.4 Objectives:**

The objectives of this project are:

1. Provide a faster way of location update information compared to social networks which depend on the user updating their location with no notifications.
2. Disclose location information in a manageable fashion, as current mobile tracking applications keep track of a selection of phones all the time.
3. Enable the user to join different groups of different connections to enable space and time customization with respect to the group relationship.
4. Provide the user with a choice of showing/hiding their location in each group and hence having the privacy within one group while still being able to receive notifications and notify members of another group.

## **1.5 Scope:**

In this project, the focus is on employing Geographical Positioning System (GPS) and tracking. The user can create groups and add his friends in it, and when one of them is in the zone the server sends notification to the user about them.

The app is created using Android, and therefor it only works on Android powered devices.

## **1.6 Organization of the Thesis:**

This thesis is organized as follows: Chapter 2 explains the previous studies and shows a number of applications and how they work. It also shows the tools and techniques that are used to develop the application. Chapter 3 explains the system description and analysis. Chapter 4 illustrates the implementation of the application. And finally Chapter 5 contains conclusions and recommendations.

# **CHAPTER TWO**

## **LITERATURE REVIEW, TOOLS AND TECHNIQUES**

## **2.1 Introduction:**

This chapter reviews related current applications. It also explains the techniques and software products that are used to develop this application.

## **2.2 Previous Studies<sup>[4]</sup>:**

A number of mobile applications make use of GPS and mobile network for location information. The following, briefly describe a number of famous related mobile applications and conclude with a comparison between them and C-Me.

### ***2.2.1 GPS Tracking Lite:***

This app supports up to 6 users (paid version is unlimited) and integrates with Twitter and Facebook. GPS Tracking populates the user's phone built-in Google Maps with the locations of people in his buddy list. The user can allow others to know where his is, or request their location.

### ***2.2.2 iLOCi2 Lite:***

iLOCi2 is the “Interactive GPS People Finder” Add people to your contact list and you can receive their location through notification alerts.

The app seems like a simpler version of GPS Tracking that is focused more on keeping your contact information organized. This app works in the background as well.

### ***2.2.3 Mobcast:***

Mobcast is a Facebook application that lets users meet up with their friends without calling back and forth. The user views friends' locations on a map and post "Mobcasts" which update the Facebook status with the user's location and push notifications to friends.

It is integrated with Facebook, therefore, the user needs to have an account on Facebook to be able to use this application. Furthermore, all Facebook friends are included automatically to the application.

### ***2.2.4 Friends Around Me:***

This app is used to interact with friends across social networks and meet new friends based on a location-based search. Features include a free group chat, open profiles with alerts, integration with social networks like Facebook and Twitter, and a rewards system. Similar to Mobcasts, an account on other social networks is required to enable this application.

### ***2.2.5 HeyWAY:***

HeyWAY stands for Hey Where Are You. HeyWAY emphasizes privacy individually authorize others to see their location. The user can also choose when to receive updates. The app also logs location updates to allow referring back to friends' locations any time.

HeyWAY works on iPhone and is not available for Android phones. In addition sending and receiving locations is done through confirmation messages, which increase required time to find out someone's location.



### ***2.2.6 Find My Friend:***

The main purpose of the app is to be able to meet up with friends without having to tell each other where they are.

It is integrated with Facebook which means it cannot be used if the user does not have a Facebook account. Users have the ability to accept/reject requests. Privacy is taken into account with this app.

### ***2.2.7 Friend Mapper:***

Friend Mapper updates the user's position live every 15 seconds. Users can hide their position at any time. The application allows calling, texting and location information. The time of users' last update is noted.

The free version of this app only allows the user to view one friend's location. However, the paid version allows up to 23 streams simultaneously. The application does not allow notifications or grouping of friends for personal customization.

### ***2.2.8 GeoTwitts:***

GeoTwitts posts the user's GPS location on Twitter. It also reads user's friends and gives their location, along with directions to meet them. The app uses Google Maps to monitor/display directions and navigation.

The user is required to have an account on Twitter to be able to use this application. Similar to Mobcast, locations of all friends on Twitter are disclosed.

### ***2.2.9 Comparison Between C-Me and Current Applications:***

There are a number of mobile tracking apps in the market. However, they all provide continuous tracking in a one-to-one fashion. Meaning that one user is allowed to continuously monitor the location of another mobile. C-Me only reveals location

information to authorized group members when they are within the same preset radius. In addition, using friend groups offered by C-Me, the user has more control over when, with whom and at what distance his location is to be shared. C-Me is a standalone application that does not require the user to be logged on to social networking applications.

## **2.3 Tools, Techniques and Software Products**

### **2.3.1 Android Operating System:**

Android is a mobile OS (operating system), it is open source system based on the Linux kernel and currently developed by Google. With a user interface based on direct manipulation, Android is designed primarily for touchscreen mobile devices such as smartphones and tablet computers [5].

### **2.3.2 Global Positioning System (GPS):**

#### **2.3.2.1 Definition and Composition:**

The Global Positioning System (GPS) is a satellite-based navigation system made up of a network of 24 satellites placed into orbit by the U.S. Department of Defense (DoD). GPS was originally intended for military applications, but in the 1980s, the government made the system available for civilian use. GPS works in any weather conditions, anywhere in the world, 24 hours a day. There are no subscription fees or setup charges to use GPS.

GPS is a system. It's made up of three parts:

- **Satellites:** act like the stars in constellations—we know where they are supposed to be at any given time.
- **The ground stations:** use radar to make sure they are actually where we think they are.
- **A receiver:** it is the equipment found in phones or cars, and is constantly listening for a signal from these satellites. The receiver figures out how far away they are from some of satellites [6].

### **2.3.2.2 How GPS Works:**

GPS satellites circle the earth twice a day in a very precise orbit and transmit signal information to Earth. GPS receivers take this information and use triangulation to calculate the user's exact location. Essentially, the GPS receiver compares the time a signal was transmitted by a satellite with the time it was received. The time difference tells the GPS receiver how far away the satellite is. Now, with distance measurements from a few more satellites, the receiver can determine the user's position.

A GPS receiver must be locked on to the signal of at least three satellites to calculate a 2D position (latitude and longitude) and track movement. With four or more satellites in view, the receiver can determine the user's 3D position (latitude, longitude and altitude). Once the user's position has been determined, the GPS unit can calculate other information, such as speed, bearing, track, trip distance, distance to destination, sunrise and sunset time and more [7].

### **2.3.3 SQL (Structured Query Language):**

SQL is a standard language used to access and manipulate databases in: MySQL, SQL Server, Access, Oracle and other database systems.

SQL consists of a data definition language, data manipulation language, and a data control language. The scope of SQL includes data insert, query, update and delete, schema creation and modification, and data access control.

SQL allows the user to create, update, delete, and retrieve data from a database and integrates with Java by using an API known as JDBC (Java Database Connectivity) [8].

### **2.3.4 PHP (Hypertext Preprocessor):**

- PHP started out as a small open source project that evolved as more and more people found out how useful it was. And the first version of PHP created by Rasmus Lerdorf in 1994.
- PHP is a server side scripting language that is embedded in HTML. It is used to manage dynamic content, databases, session tracking, even build entire e-commerce sites [9].
- PHP is integrated with a number of popular databases, including MySQL, PostgreSQL, Oracle, Sybase, Informix, and Microsoft SQL Server.
- PHP enables the developer to interact with a database; to retrieve, add or update content and it can also create, open, read, write, delete, and close files on the server.

## 2.3.5 Hostinger:

Hostinger is web hosting platform which allows you to building and hosting of websites.

Some features of Hostinger are:

- It provides hosting absolutely free, there is no catch.
- It allows up to 2000 MB of disk space and 100 GB bandwidth.
- It also has cPanel control panel which is an amazing and easy to use website builder.
- Hostinger support PHP and MySQL without any restrictions. PHP engine comes with all features and functions enabled and the databases can be managed with phpMyAdmin tool [10].

## 2.3.6 UML (Unified Modeling Language):

UML stands for “Unified Modeling Language”. It is an industry-standard graphical language for specifying, visualizing, constructing and documenting the artifacts of an object-oriented system under development [11]. It provides a number of models. In this project we use the following:

### ***1. Use case Model:***

The use case model captures the requirements of a system. Use cases are a means of communication among users and other stakeholders what the system is intended to do. We use case models in the project to illustrate the functionalities of different roles in the application [12].

## ***2. Sequence Model:***

A sequence diagram is a form of interaction diagram which shows objects as lifelines running down the page. Their interactions over time are represented as messages drawn as arrows from the source lifeline to the target lifeline. Sequence models are used in the project to explain the flow of data between different layers of the system [13].

## ***3. Activity diagram:***

Activity diagrams describe dynamic aspects of the system. Activity diagram is a flow chart to represent the flow from one activity to another activity. The activity can be described as an operation of the system.

Activity diagrams deal with all types of flow control by using different elements like fork, join etc [14].

## ***4. Class diagram:***

The class diagram is a static diagram. It represents the static view of an application.

The class diagram describes the attributes and operations of a class and also the constraints imposed on the system. The class diagram shows a collection of classes, interfaces, associations, collaborations and constraints. It is also known as a structural diagram [15].

## ***5. Object diagram:***

Object diagrams are derived from class diagrams so object diagrams are dependent upon class diagrams and represent an instance of a class diagram, also object diagrams represent the static view of a system but this static view is a snapshot of the system at a particular moment.

Object diagrams are used to render a set of objects and their relationships as an instance [16].

### ***6. Component diagram:***

Component diagrams are used to model physical aspects of a system. Component diagrams are used to visualize the organization and relationships among components in a system. These diagrams are also used to make executable systems [17].

### ***7. Deployment diagrams:***

Deployment diagrams are used to visualize the topology of the physical components of a system where the software components are deployed.

Deployment diagrams used to describe the static deployment view of a system. Deployment diagrams consist of nodes and their relationships [18].

## **2.4 Summary**

This chapter has illustrated a number of location-based mobile applications. It has also explained the techniques and products that were used in this project.

# **CHAPTER THREE**

## **SYSTEM DESCRIPTION AND ANALYSIS**



## 3.1 Introduction

This chapter presents description of the system and its functions, and also shows detailed analysis of the operations of the system using the UML diagrams.

## 3.2 System Description

- C-Me is a general case which is a friend locator mobile application, but may specialize this case for more cases like a system to take attendance for a company or institute.
- There are other use cases for this system which can use for police men when there are in wide area and they want to know police men in this area.
- The idea of the system is based on GPS technology and the system mechanism to send notifications to users in the nearby area.
- A database has been created to store and update the users' information and their current location by using GPS in smart phones (client, server).
- The GPS reads the location of the user (longitude and latitude), and the data is send to the database.
- When a user changes location his location is updated in the database.
- A query is performed for all other users to decide if this user has moved into a group boundary.
- In this case the user receives a notification that this friend is in the area.

## 3.3 System Functionality

The system divides users according to their authority into two roles:

1. **Administrator:** by administrator we mean the creator and owner of the group. The administrator manages the group by creating it and chooses the users who will be a part of the group. He also personalizes the group.
2. **User:** the user represents other application users that join and leave groups. The system keeps track of their location for notification and map display.

System functions are divided into functions provided to both the system administrator and the user, and functions provided to the system administrator only.

The system allows the administrator to create groups, add members to groups, delete member from groups.

The system provides to the administrator and the user with the ability to login, signup or register, exit from groups, block notifications completely or for a time duration, display maps and display groups.

### **3.3.1 System Administrator and User Functions**

#### **• Login**

It allows the system administrator or user to login into application by entering username and password.

#### **• Signup**

It allows the system administrator or user to signup into the application by entering email, username, password and phone number.

#### **• Exit group**

This feature allows to leave a specific group.

#### **• Block for a period**

Allows to block or close notifications for a period of time.

#### **• Block notification**

Allows to block or close notifications all the time.

- **Display map**

View the area and the user location in it.

- **Display groups**

Show all groups which is created by the administrator or which the user joined to it.

### **3.3.2 System Administrator Functions**

- **Create group**

It allows the system administrator to create a group by entering group name and radius of the group.

- **Add member to group**

Allows to add a specific user to a group by entering user name.

- **Delete member from group**

Allow to delete a specific user by enter user name.

## **3.4 System Components**

The System components are divided into two categories, hardware and software.

### **3.4.1 System Hardware Components**

**The hardware is divided into two parts:-**

- One part of the system is a device that works as a server which is the web hosting.
- The other part of the system is a smart phone with GPS technique capabilities.

## **3.4.2 System Software Components**

**The software divided into two parts**

### **1. User Part**

This section uses the Android operating system used in smart phones, and requires that the device supports Global Positioning System, access to the Internet. This segment consists of the interface allows the user to deal with the system.

### **2. Administrator Part**

Is a database that stores information about users, it was created using MySQL and is managed using PHP language.

## **3.5 Analysis Using UML Schemes**

UML is an industry-standard graphical language for analysing, describing and documenting the artifacts of an object-oriented system under development. UML was used to analyse and describe our system using use case diagram, sequence diagrams, activity diagram and deployment diagram.

### **3.5.1 Use Case Diagram**

Used for capturing user requirements (describing a set of user scenarios) and shows how system use cases are related to each other and how the users can get at them.

Figure (3.1): show the use case diagram of the proposed system and processes that can be made



Figure (3.1): Use case diagram

## 3.5.2 Sequence Diagram

Used to represent the flow of messages, events and actions between the objects or components of a system.

It has two dimensions:

The horizontal dimension shows the objects participating in the interaction.

The vertical arrangement of messages indicates their order.

### 3.5.2.1 Sign up

The system asks the user to enter username and password to login to the application as shown in Table (3.1) and Figure (3.2)

Table (3.1): Sign up for the application

Use case name	Sing up
Actors	Administrator, user
Precondition	No
Main flow of events	<ol style="list-style-type: none"><li>1. The system asks the user to enter email, username, password and phone number.</li><li>2. The user enters this information.</li><li>3. The system saves the input information in the database.</li><li>4. It is signed up to the system.</li></ol>
Post-condition	The system displays a graphical interface containing successful text.

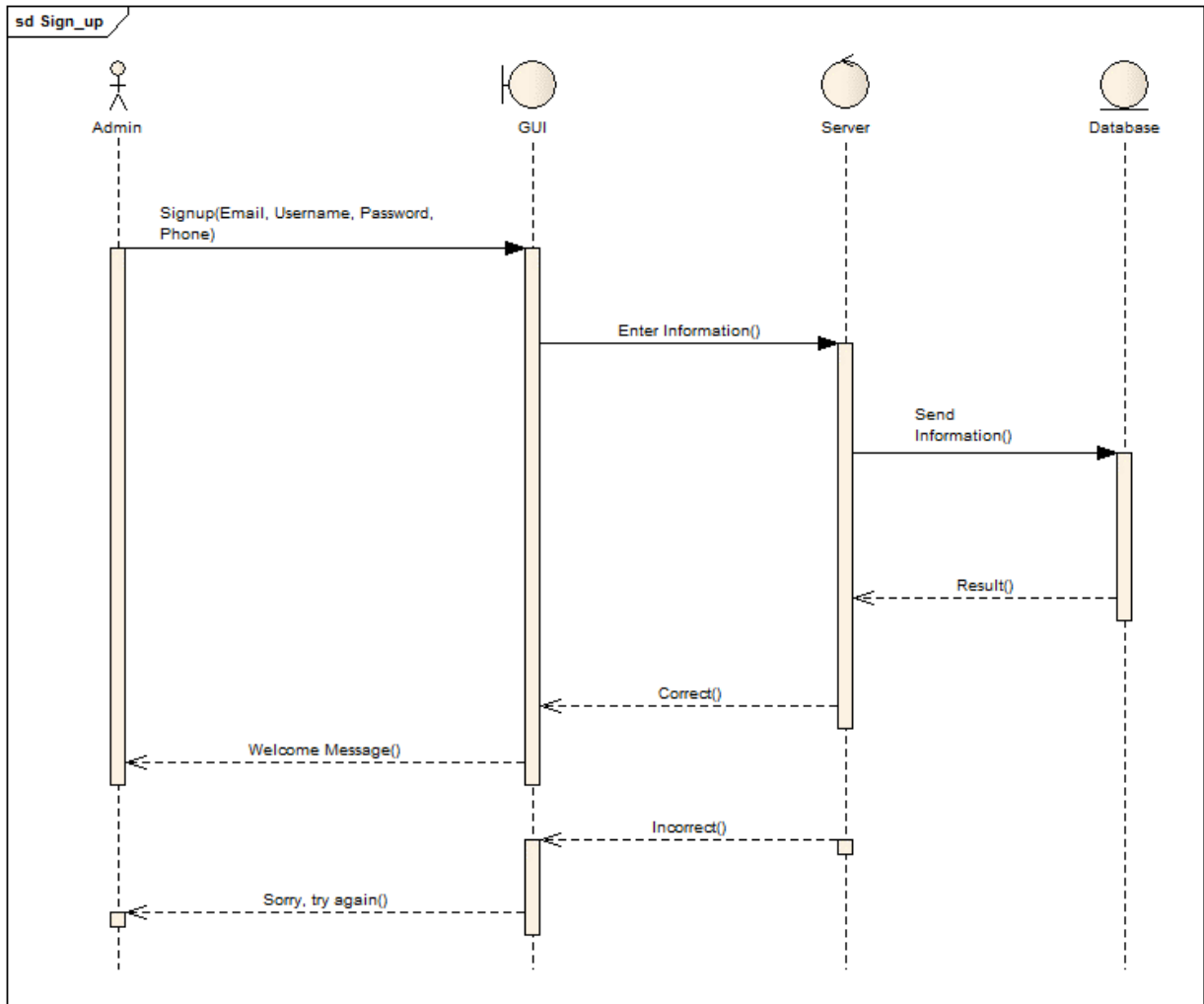


Figure (3.2): Sequence diagram for sign up operation

### 3.5.2.2 Log In

The system asks the user to enter username and password to login to the application as shown in Table (3.2) and Figure (3.3)

Table (3.2): Login for the application

Use case name	Login
Actors	Administrator, user
Precondition	No
Main flow of events	<ol style="list-style-type: none"><li>1. The system asks the user to enter username and password.</li><li>2. The user enters username and password.</li><li>3. The system checks the validity of the input information.</li><li>4. It is logged on to the system.</li></ol>
Post-condition	The system displays a graphical interface containing all the basic operations that can be performed by the system user.



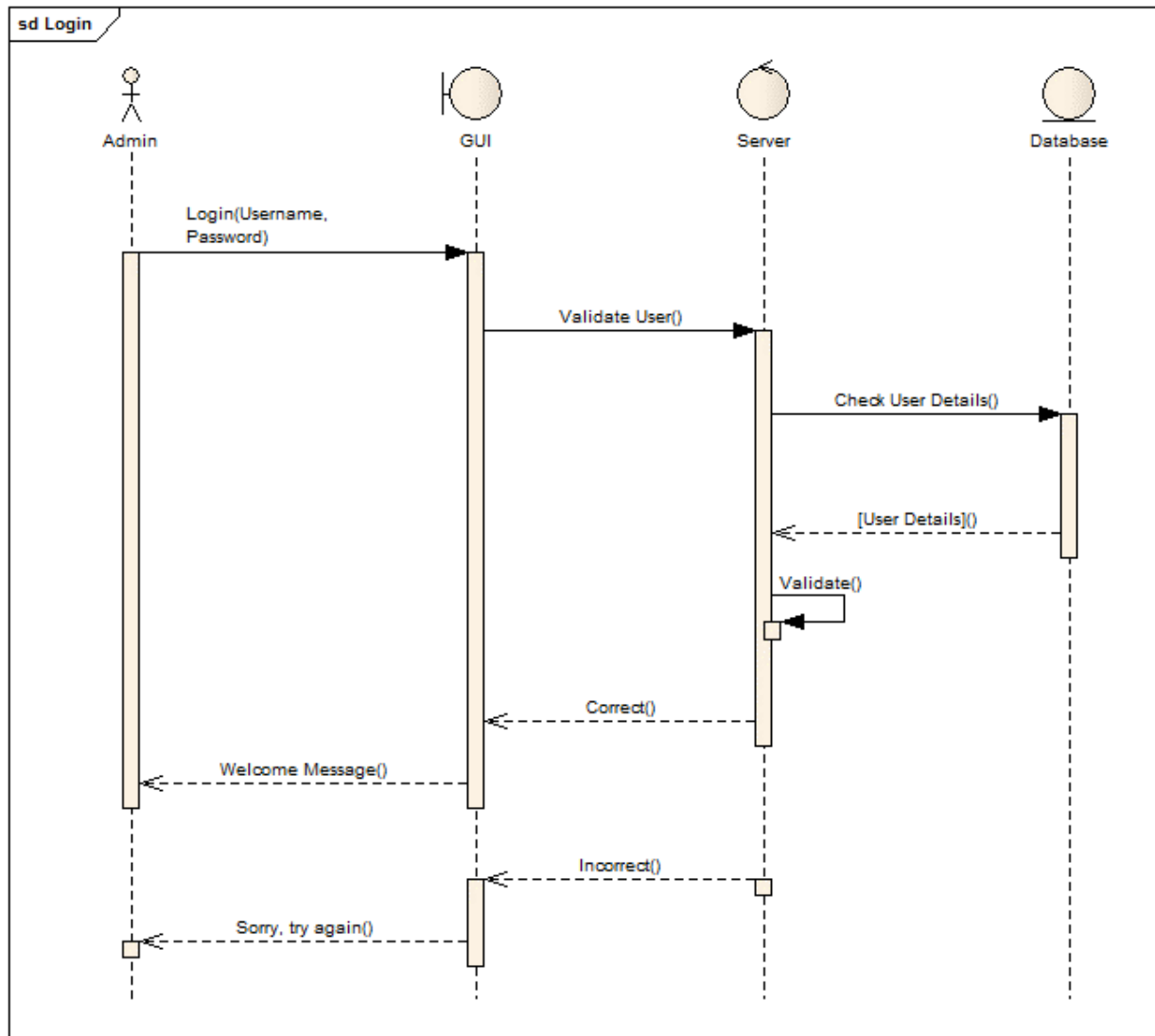


Figure (3.3): Sequence diagram for login operation

### 3.5.2.3 Create group

After a successful login to the system allows the administrator to create groups as shown in Table (3.3) and Figure (3.4)

Table (3.3): Create group

Use case name	Create group
Actors	Administrator
Precondition	No
Main flow of events	<ol style="list-style-type: none"><li>1. The system asks the user to enter group name and the radius of it.</li><li>2. The user enters group name and the radius.</li><li>3. The system saves the information of the group.</li><li>4. Group created successfully.</li></ol>
Post-condition	The system displays a graphical interface containing successful text.

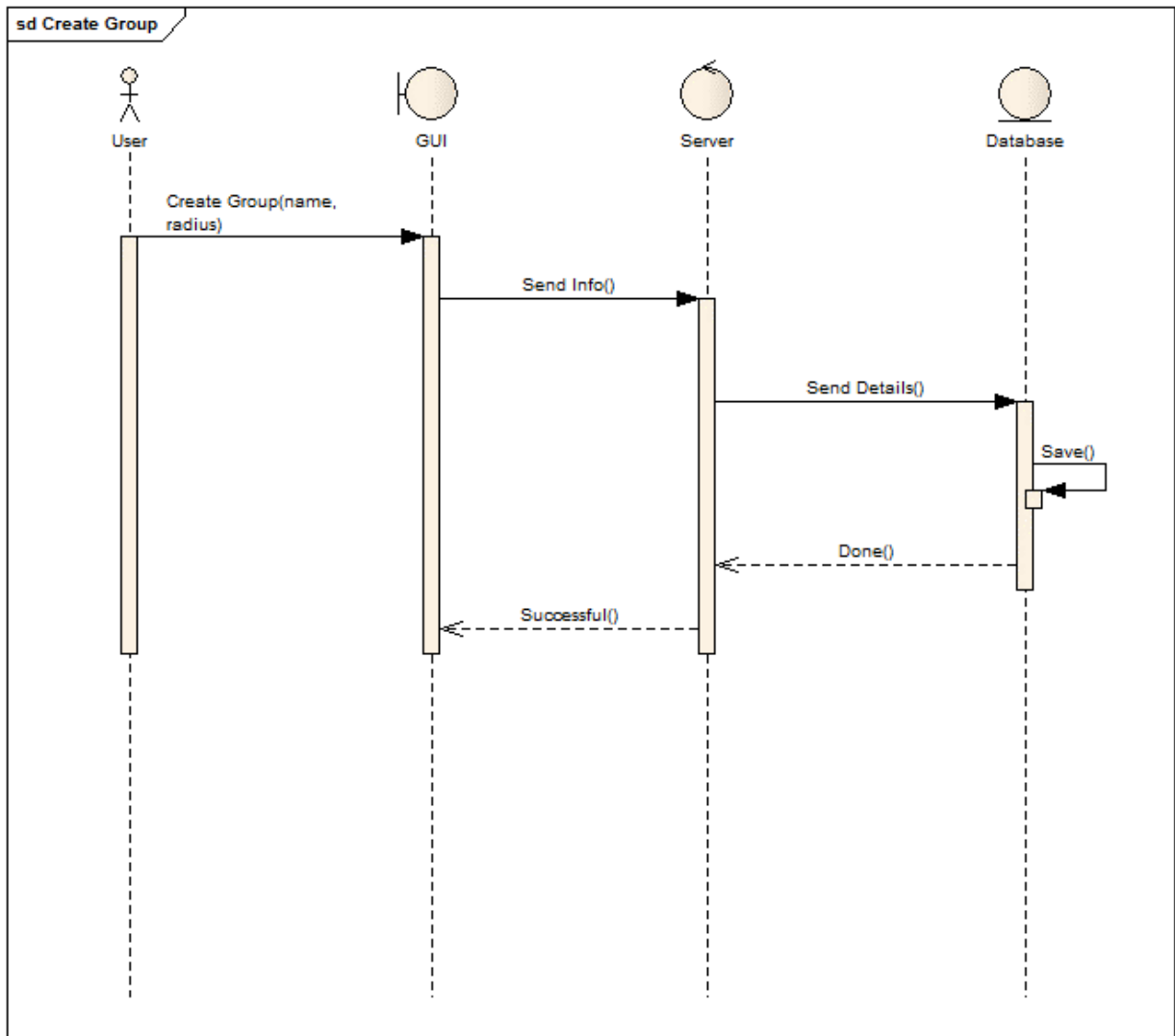


Figure (3.4): Sequence diagram for create group operation operation

### 3.3.2.4 Add member to group

After groups are created the administrator is allowed to add members to groups as shown in the Table (3.4) and Figure (3.5)

Table (3.4): Add member to group

Use case name	Add member to group
Actors	Administrator
Precondition	No
Main flow of events	<ol style="list-style-type: none"><li>1. The system asks the administrator to press on add member button.</li><li>2. The admin enters the name and phone number of the member.</li><li>3. The system saves the information of the member in database.</li><li>4. Member added successfully.</li></ol>
Post-condition	The system displays a graphical interface containing all the members of groups with the last member which added.

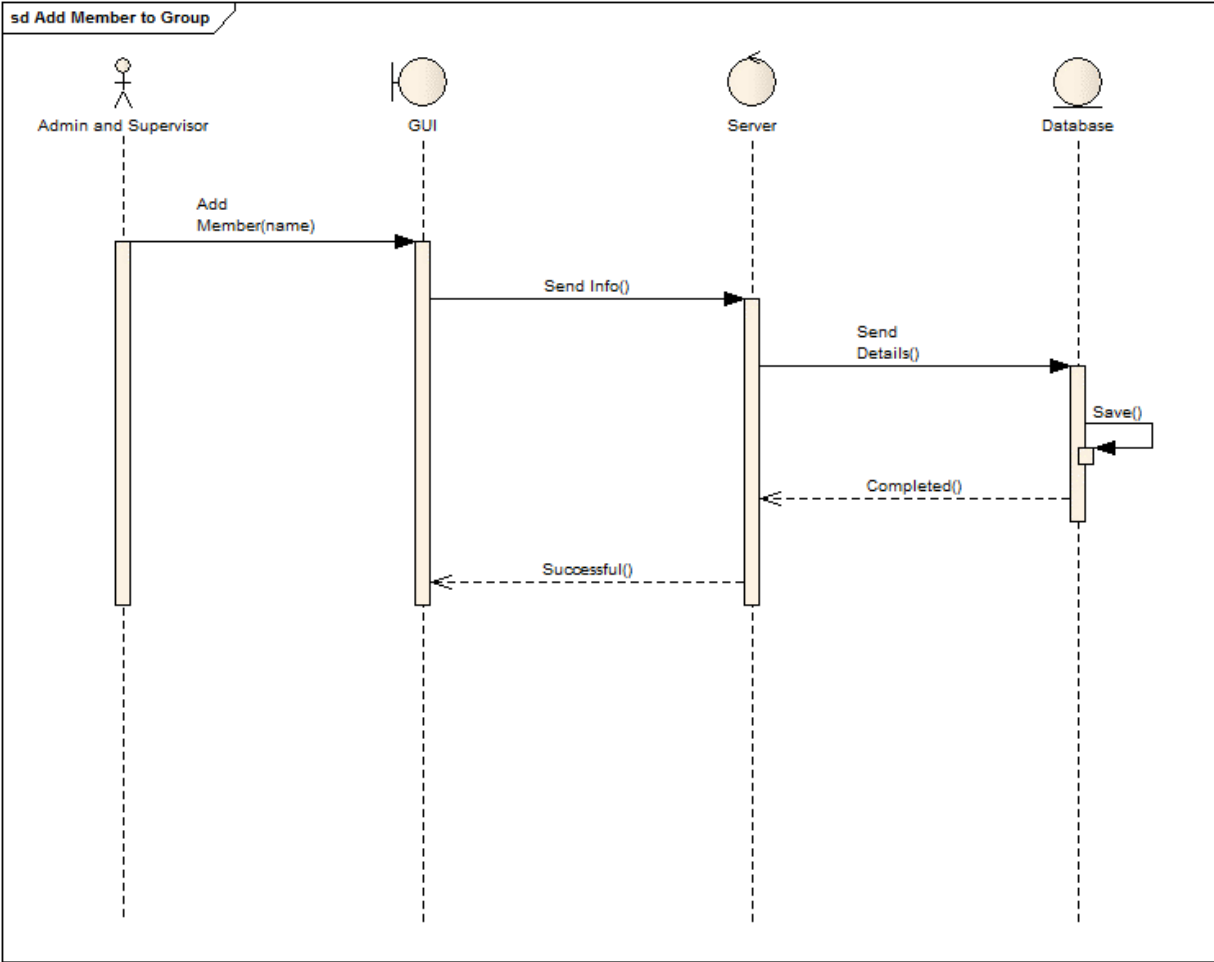


Figure (3.5): Sequence diagram for add member operation

### 3.5.2.5 Delete member from group

The administrator can delete a member from a group as shown in Table (3.5) and Figure (3.6)

Table (3.5): Delete member from group

Use case name	Delete member from group
Actors	Administrator
Precondition	No
Main flow of events	<ol style="list-style-type: none"><li>1. The administrator press on delete member button.</li><li>2. The system asks the administrator to confirm when press on delete member button.</li><li>3. The system delete the information of the member from database.</li><li>4. Member deleted successfully.</li></ol>
Post-condition	The system displays a graphical interface containing all the members of groups with the last member which added.

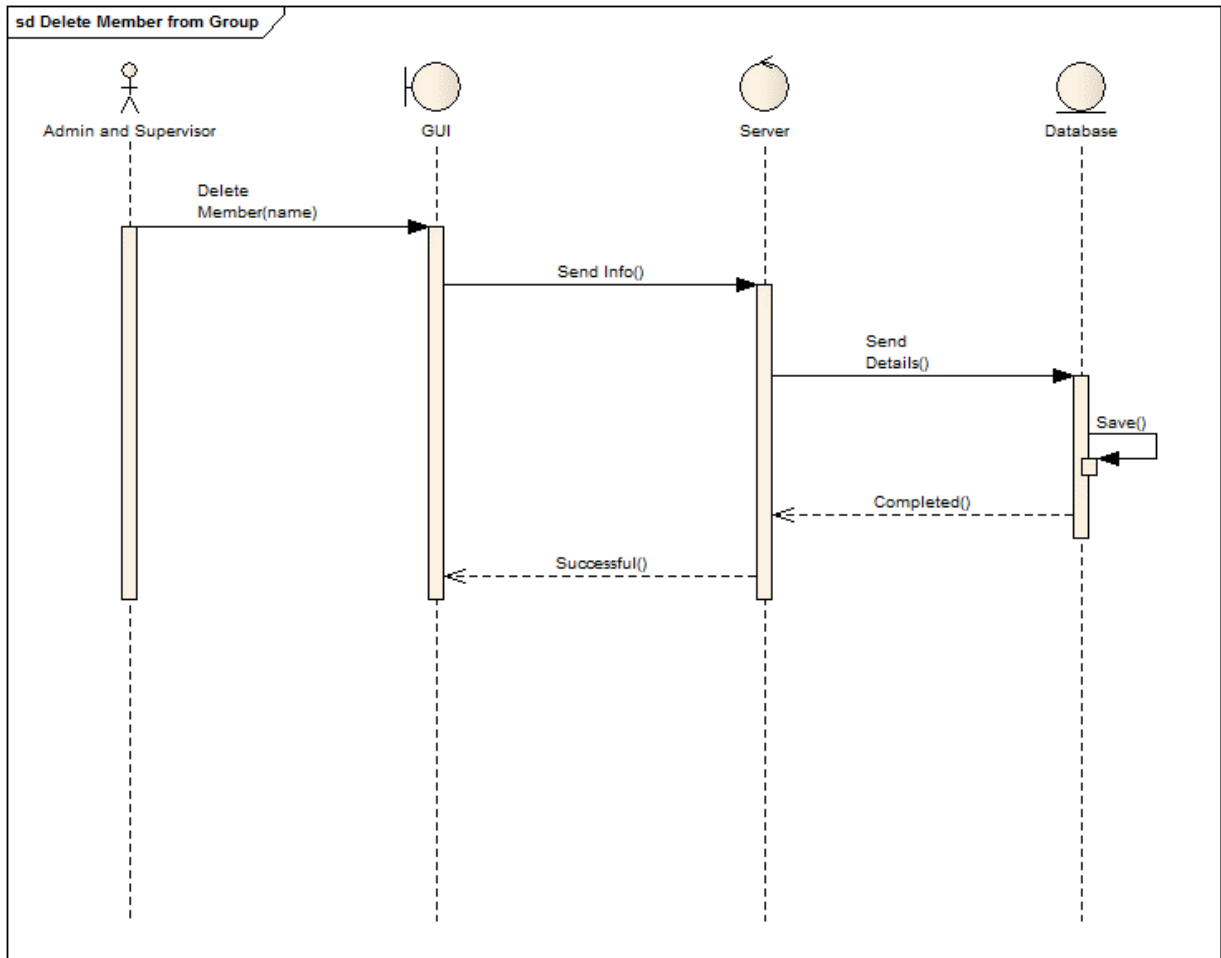


Figure (3.6): Sequence diagram for delete member operation

### 3.5.2.6 Exit group

This operation allows to the administrator and user to leave a specific group as shown in Table (3.6) and Figure (3.7)

Table (3.6): Exit group

Use case name	Exit group
Actors	Administrator, User
Precondition	No
Main flow of events	<ol style="list-style-type: none"><li>1. The system asks the user to press on exitgroup button.</li><li>2. The user presses on theexit group button.</li><li>3. Group exited successfully.</li></ol>
Post-condition	The system displays a graphical interface containing successful text.



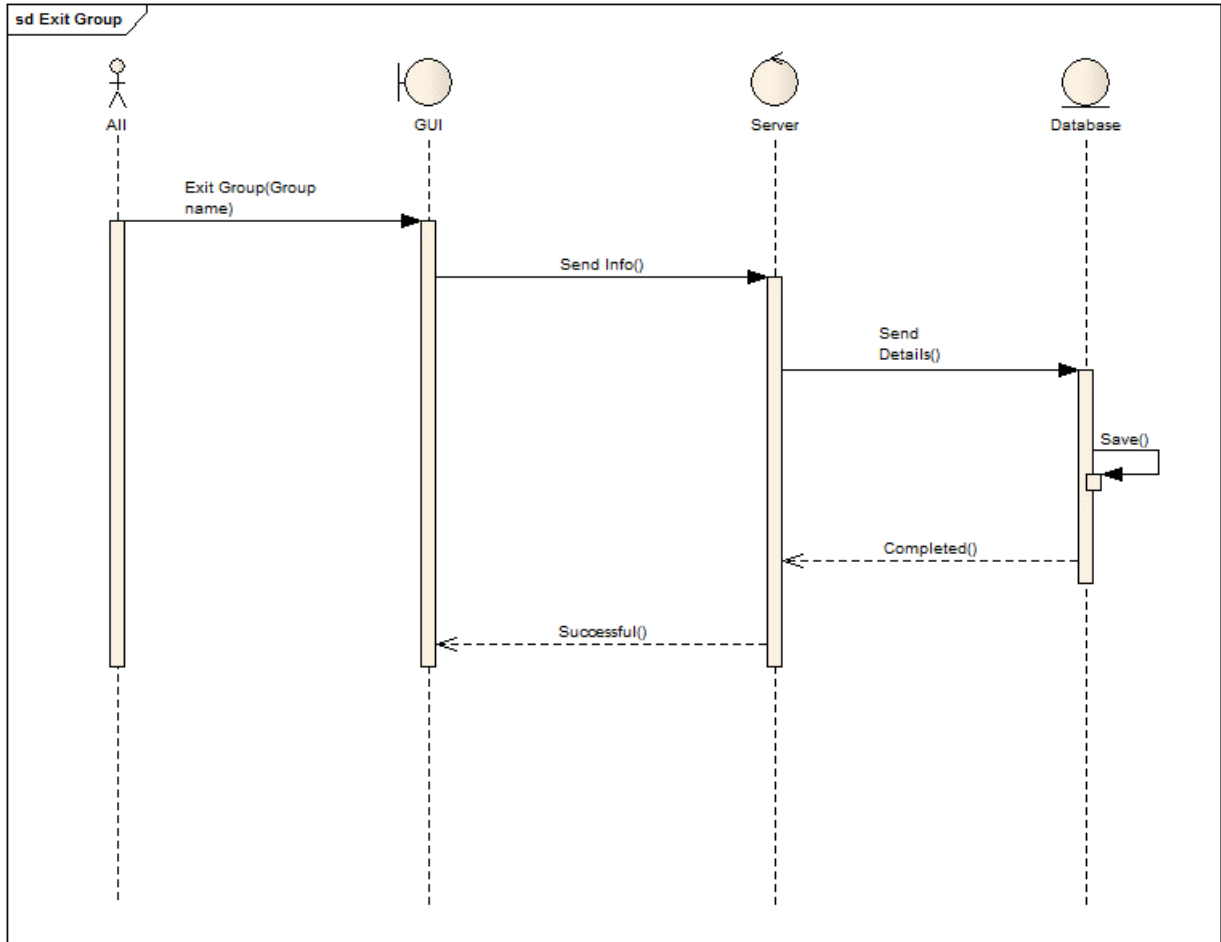


Figure (3.7): Sequence diagram for exit group operation

#### 4.6.2.7 Block Notifications

Which allows to the administrator and user to stop notifications all the time as shown in Table (3.7) and Figure (3.8)

Table (3.7): Block notifications

Use case name	Block notifications
Actors	Administrator, User
Precondition	No
Main flow of events	<ol style="list-style-type: none"><li>1. The system asks the user to press on notification switch.</li><li>2. The user presses on notification switch to switch on or switch of notifications.</li><li>3. Block notification switched on.</li></ol>
Post-condition	The system displays a graphical interface containing switch on block notification.

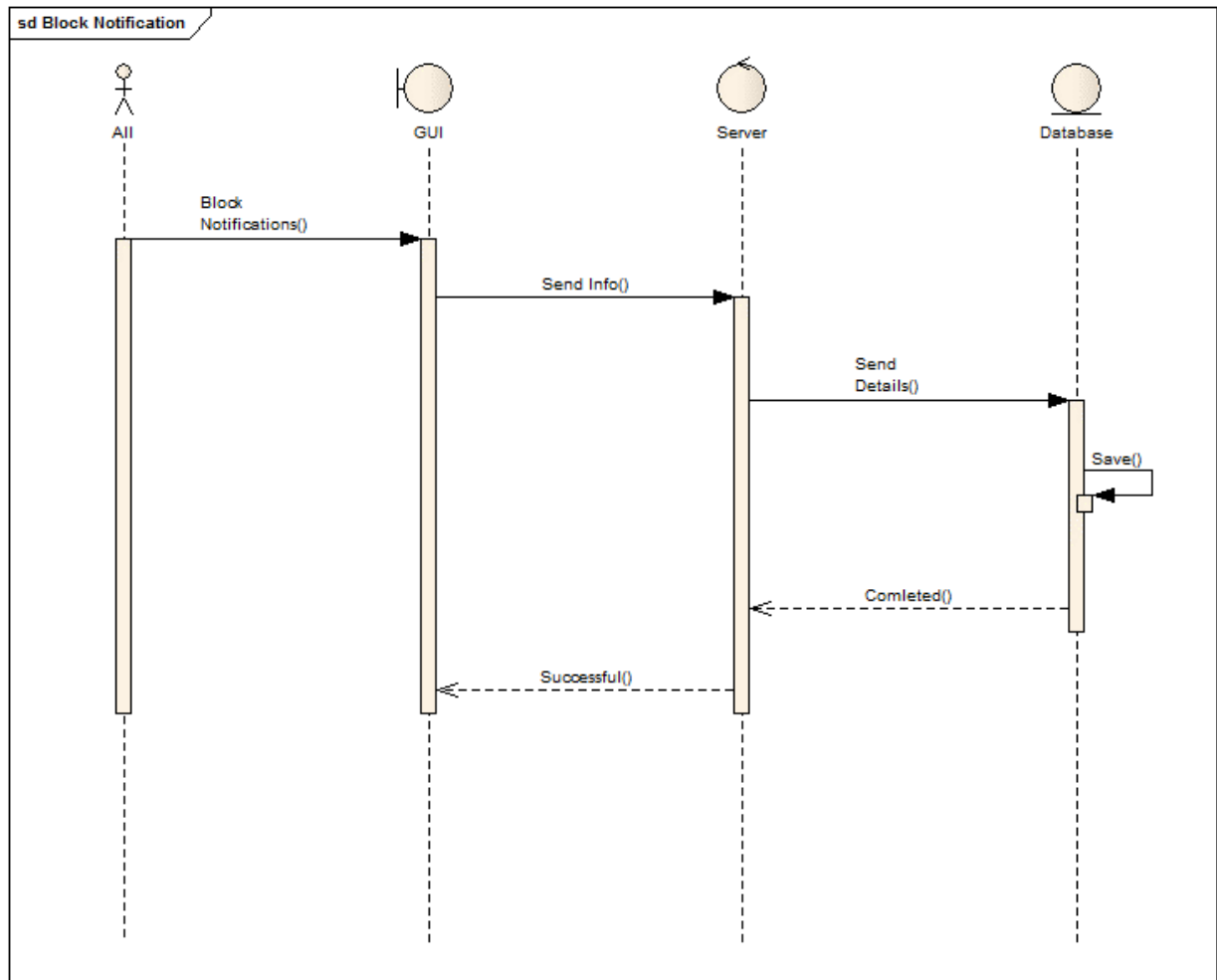


Figure (3.8): Sequence diagram for block notifications operation

### 3.5.2.8 Block Notifications for a period

Allows to the administrator and user to stop notifications for a period of time as shown in Table (3.8) and Figure (3.9)

Table (3.8): Block notifications for a period

Use case name	Block notifications for a period
Actors	Administrator, User
Precondition	No
Main flow of events	<ol style="list-style-type: none"><li>1. The system asks the actor to enter the time.</li><li>2. The actor enters the period.</li><li>3. Notification blocked for a period which is entered.</li></ol>
Post-condition	The system displays successful text.

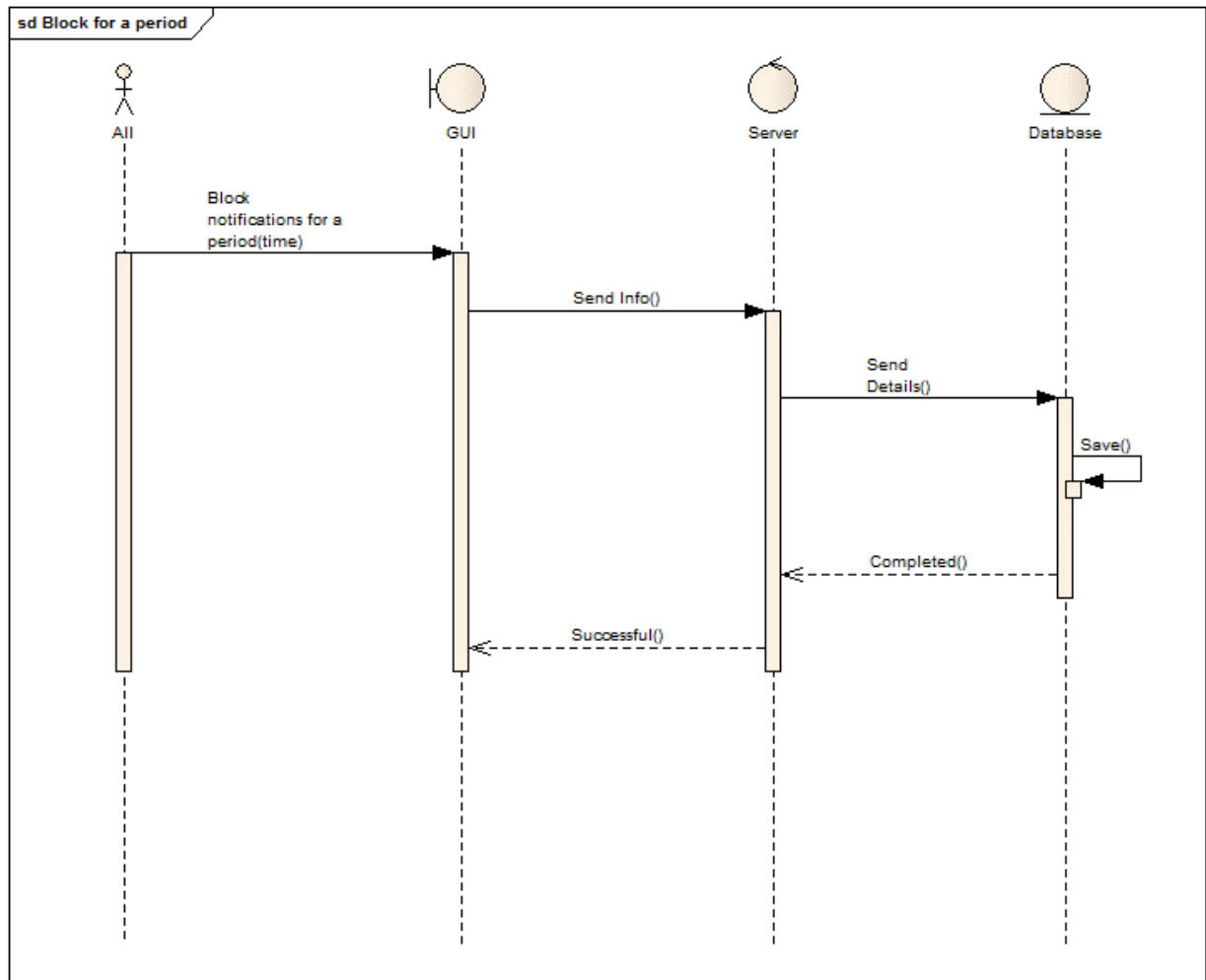


Figure (3.9): Sequence diagram for block notification for a period operation

### 3.5.2.9 Display Map

Allows to the administrator and user to display map as shown in Table (3.9) and Figure (3.10)

Table (3.9): Display map

Use case name	Display map
Actors	Administrator, User
Precondition	No
Main flow of events	<ol style="list-style-type: none"><li>1. The actor presses on the display map button.</li><li>2. The system views the map and the location of the actor.</li><li>3. Display map successful.</li></ol>
Post-condition	The system displays the location.

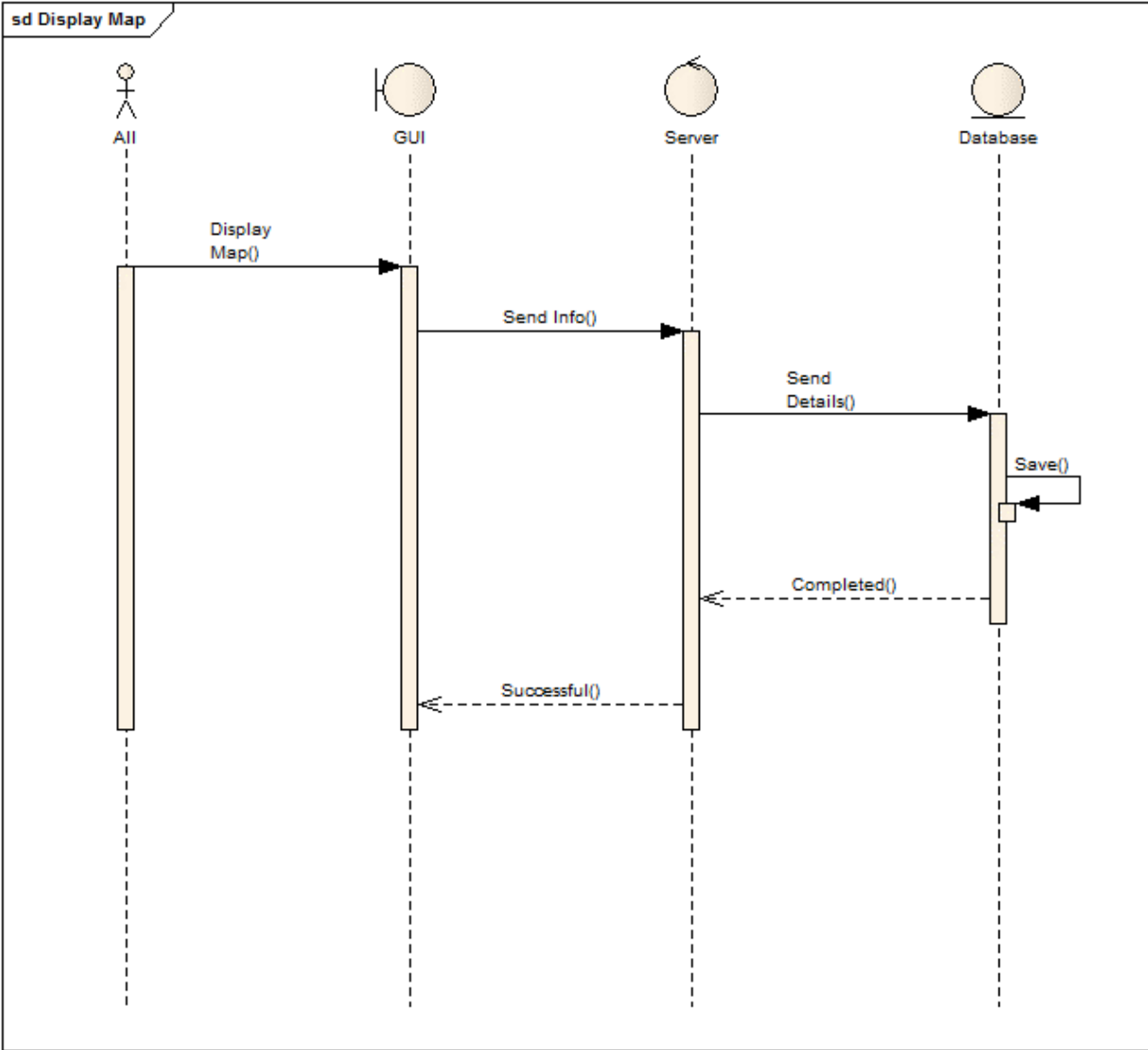


Figure (3.10): Sequence diagram for display map operation

### 3.5.2.10 Display Groups

Allows to the administrator and user to display a group as shown in Table (3.10) and Figure (3.11)

Table (3.10): Display groups

Use case name	Display groups
Actors	Administrator, User
Precondition	No
Main flow of events	<ol style="list-style-type: none"><li>1. The actor presses on the display group button.</li><li>2. The system views the groups.</li><li>3. Display group successful</li></ol>
Post-condition	The system displays two buttons one for admin and other for member.



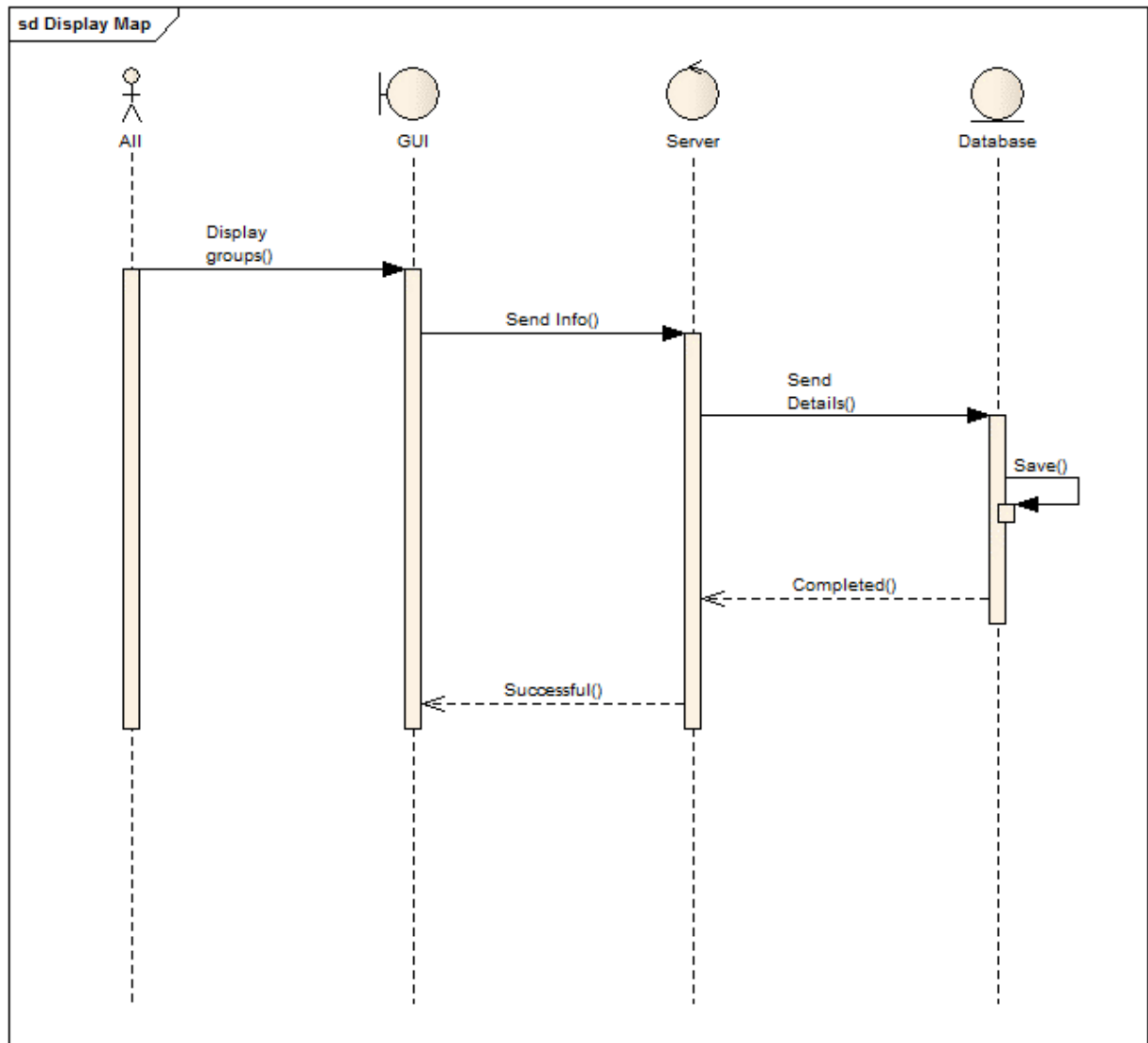


Figure (3.11): Sequence diagram for display groups operation

### **3.5.3 Activity Diagram**

Activity diagrams are intended to model both computational and organizational processes. Activity diagrams show the overall flow of control.

In this system, activity diagram is used to show the flow of activities for both users and administrators as shown in Figure(3.12). These activities include sign up and login, which allow them to perform other activities according to their role.

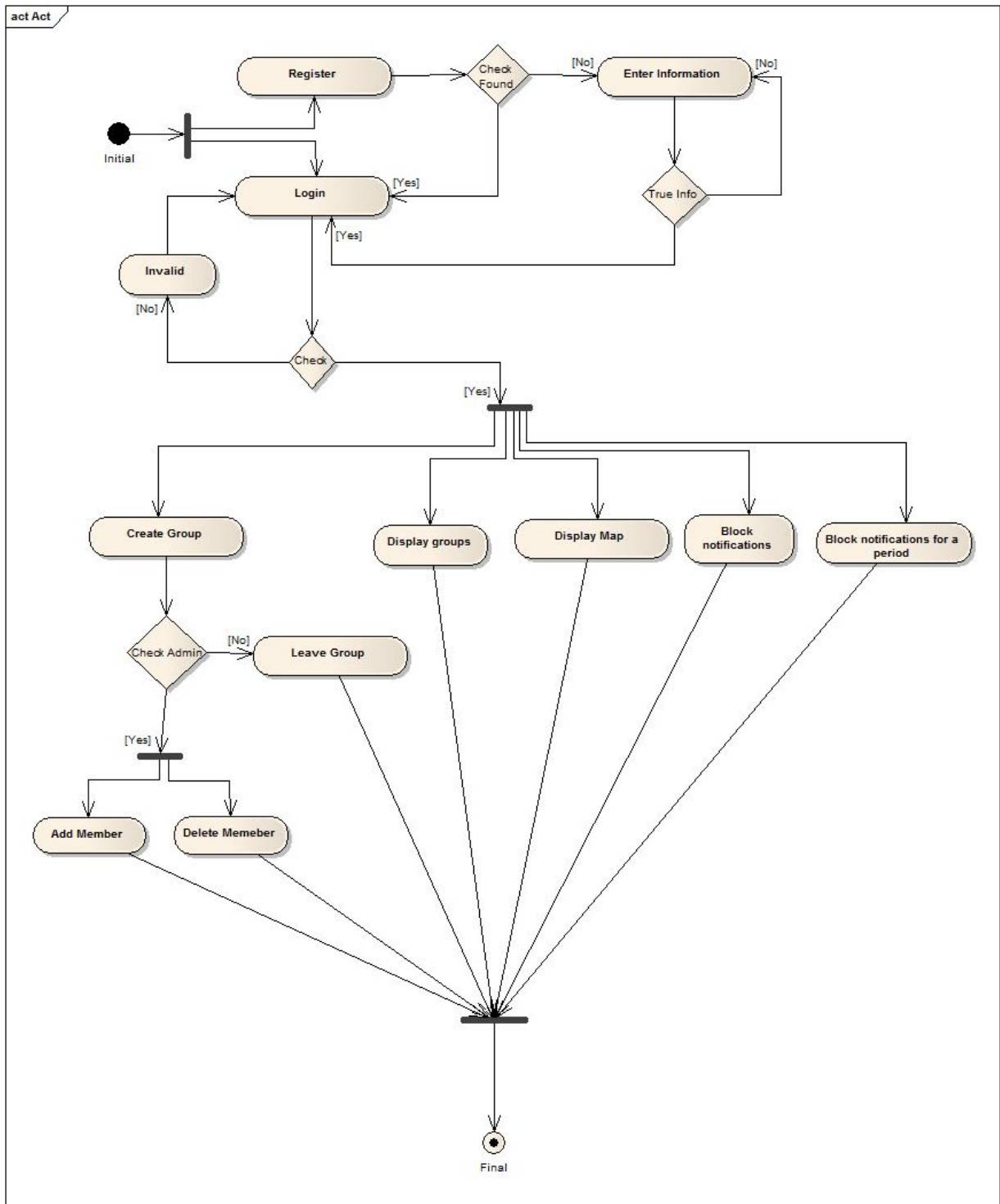


Figure (3.12): Activity diagram

### 3.5.4 Deployment Diagram

Illustrate hardware and software used in the system and how these components interact with each other. Figure (3.13) show has the main three components in the system are connected.

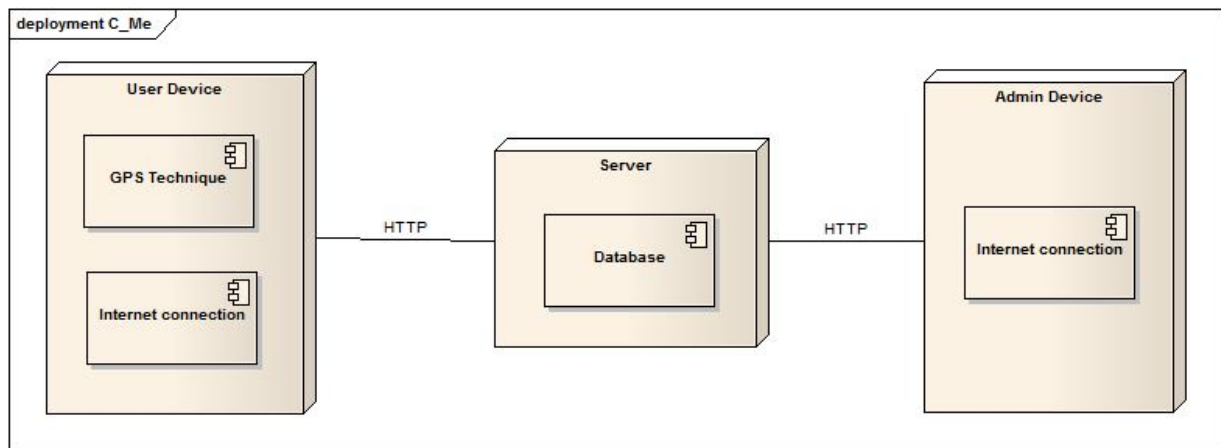


Figure (3.13): Deployment diagram

### 3.6 Summary

This chapter has explained description of the system and its functions. It has also shows detailed analysis of the operations of the system using the UML diagrams.

# **CHAPTER FOUR**

## **IMPLEMENTATION**

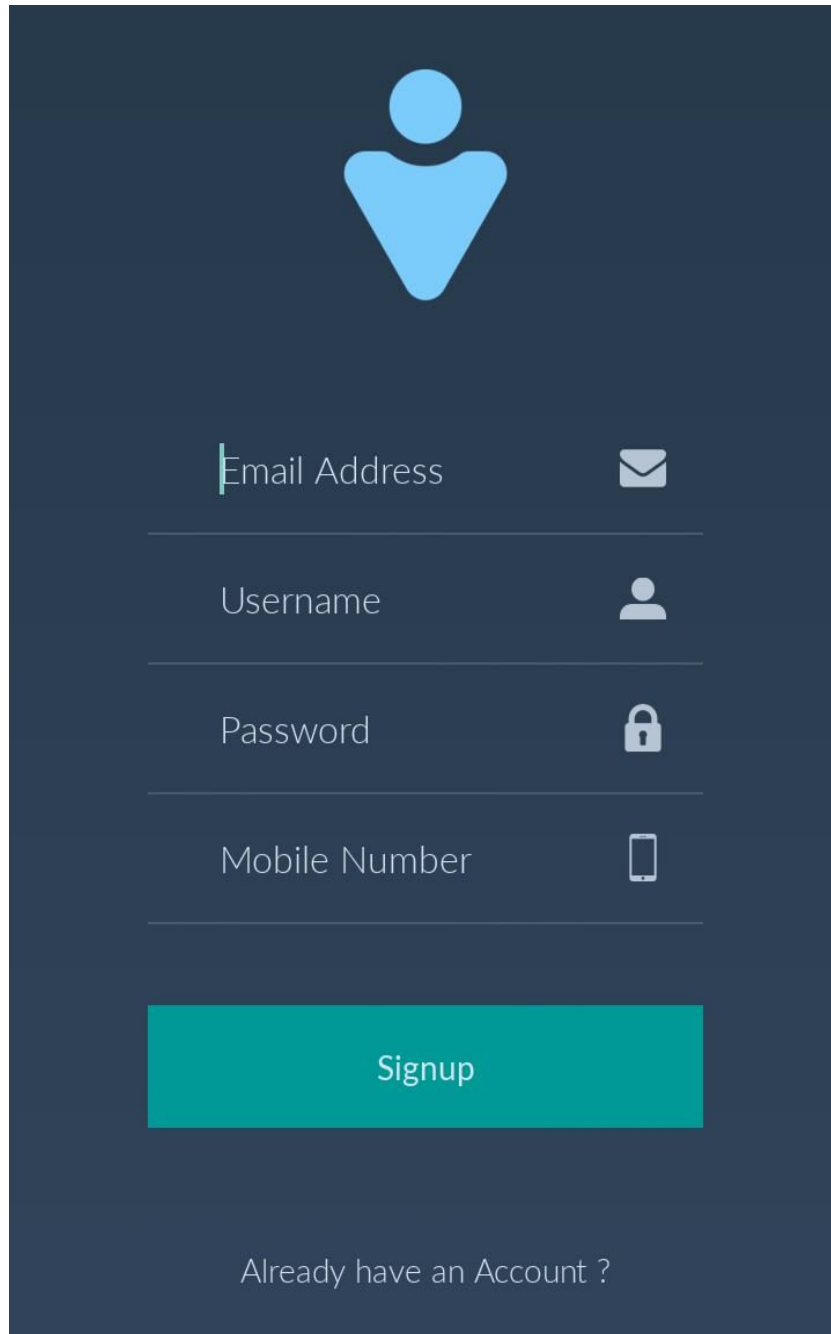
## **4.1 Introduction**

This chapter shows the implementation of our mobile application. It demonstrates graphical interfaces for administrator and user and examples of the execution of the application that has been done.

## **4.2 Application Interfaces**

### **4.2.1 Sign up**

First the administrator or the user must sign up to the system to be saved in the database and then log in normally to the application as shown in Figure (4.1).

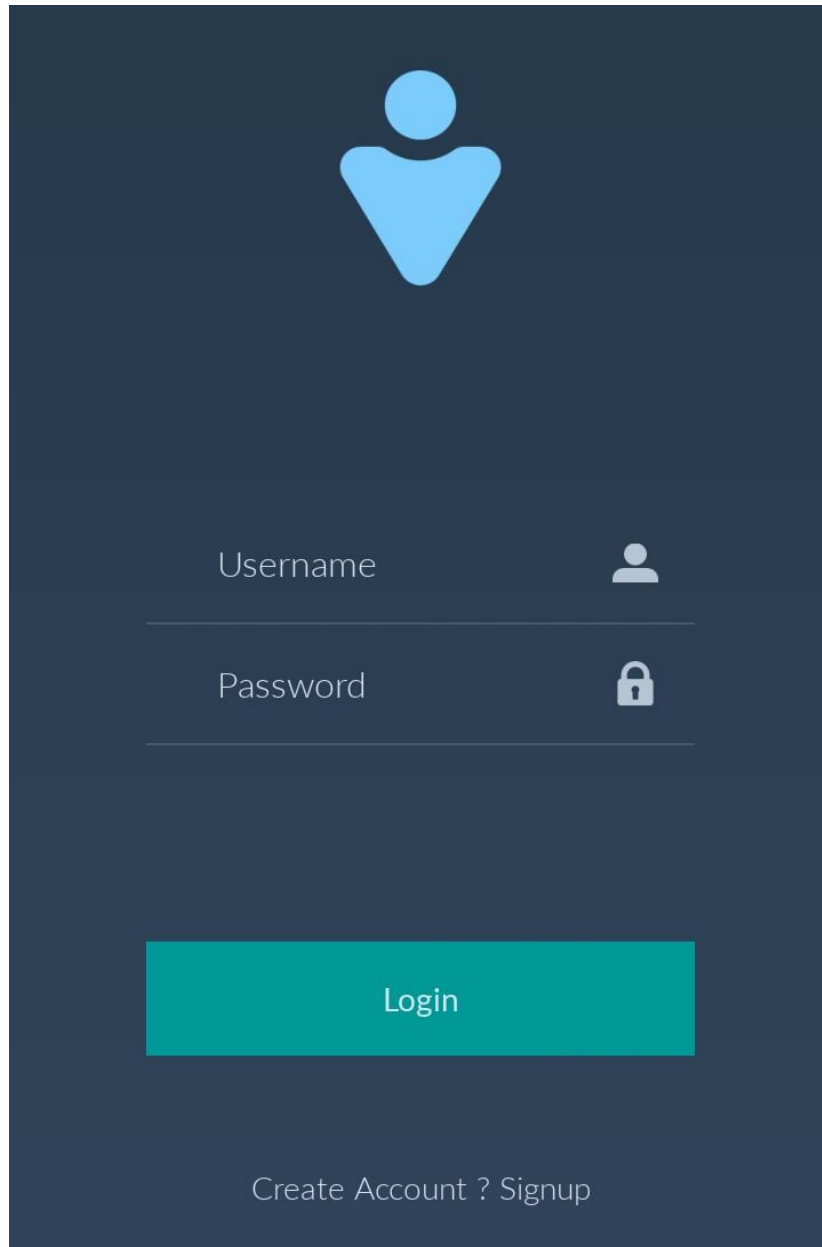


The image shows a sign-up interface on a dark blue background. At the top center is a light blue icon of a person. Below it are four input fields, each with a label and an icon to its right: 'Email Address' with an envelope icon, 'Username' with a person icon, 'Password' with a padlock icon, and 'Mobile Number' with a smartphone icon. Each field is separated by a thin horizontal line. Below the input fields is a large teal button with the text 'Signup'. At the bottom of the interface, the text 'Already have an Account ?' is displayed.

Figure (4.1): Sign up interface

## 4.2.2 Login

The administrator or the user must log to the system to be able to use the application as shown in Figure (4.2).

The image shows a login interface on a dark blue background. At the top center is a light blue icon of a person. Below it are two input fields: 'Username' with a person icon and 'Password' with a lock icon. A teal 'Login' button is centered below the fields. At the bottom, the text 'Create Account ? Signup' is displayed in a light color.

Username

Password

Login

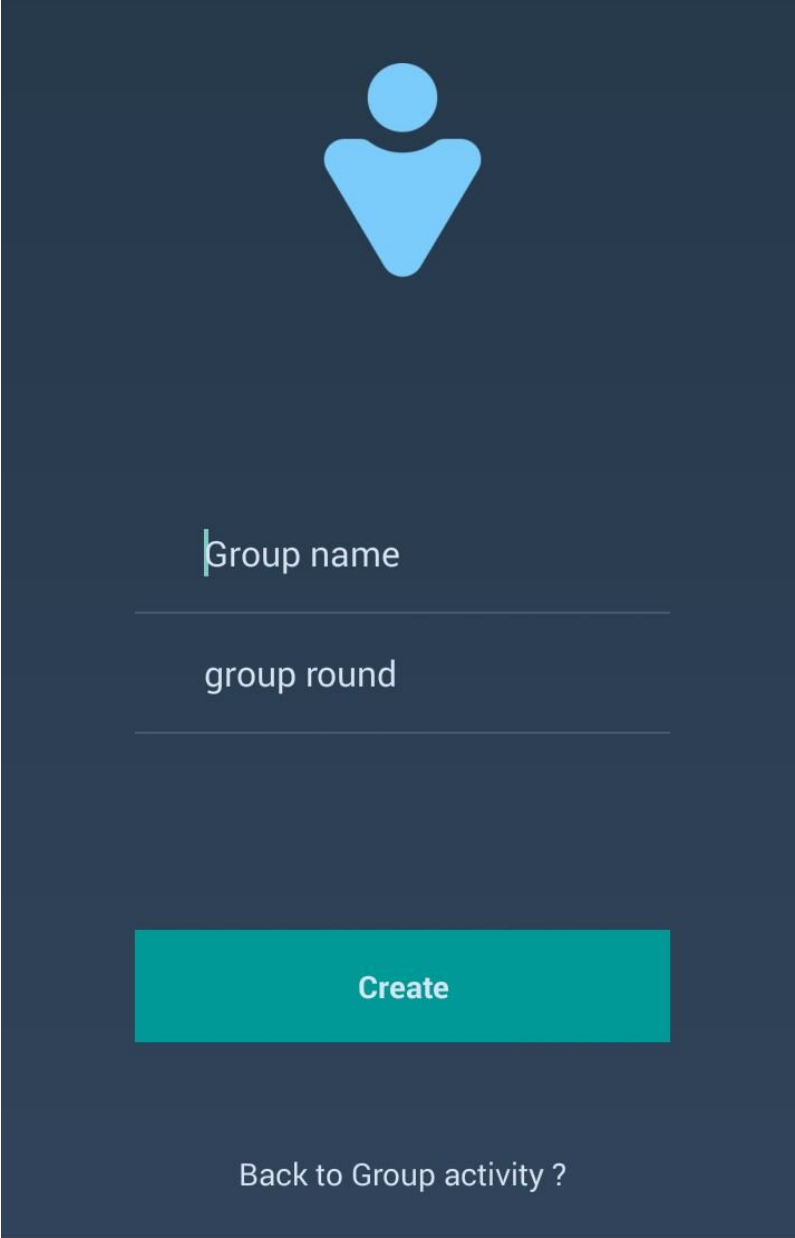
Create Account ? Signup

Figure (4.2): Log in interface



### 4.2.3 Create group

The administrator can create group to add members in it as shown in Figure (4.3).

The image shows a mobile application interface for creating a group. At the top center is a light blue icon of a person. Below it is a text input field with the placeholder text "Group name". The field contains the text "group round". Below the input field is a teal button with the text "Create". At the bottom of the screen is a link that says "Back to Group activity ?".

Group name

group round

Create

Back to Group activity ?

Figure (4.3): Create group interface

## 4.2.4 Add member to group

The administrator can add member or user to group as shown in Figure (4.4).

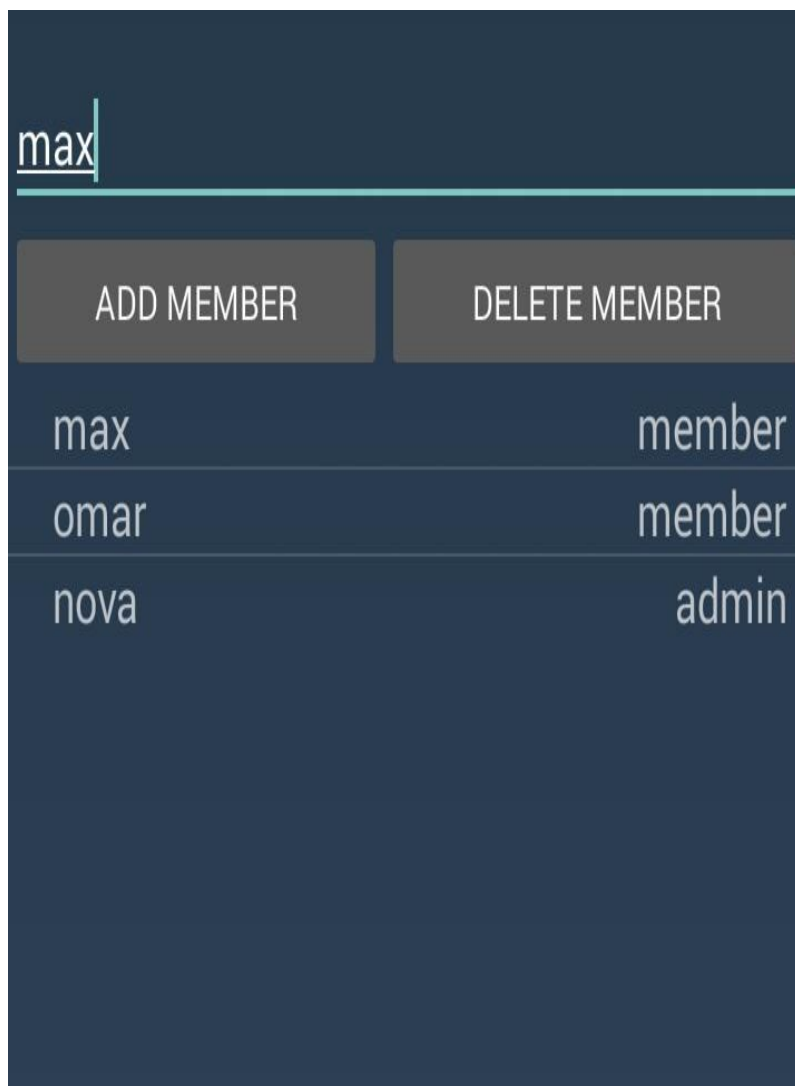


Figure (4.4): Add member to group interface

## 4.2.5 Delete member from group

The administrator can delete member or user as shown in Figure (4.5).

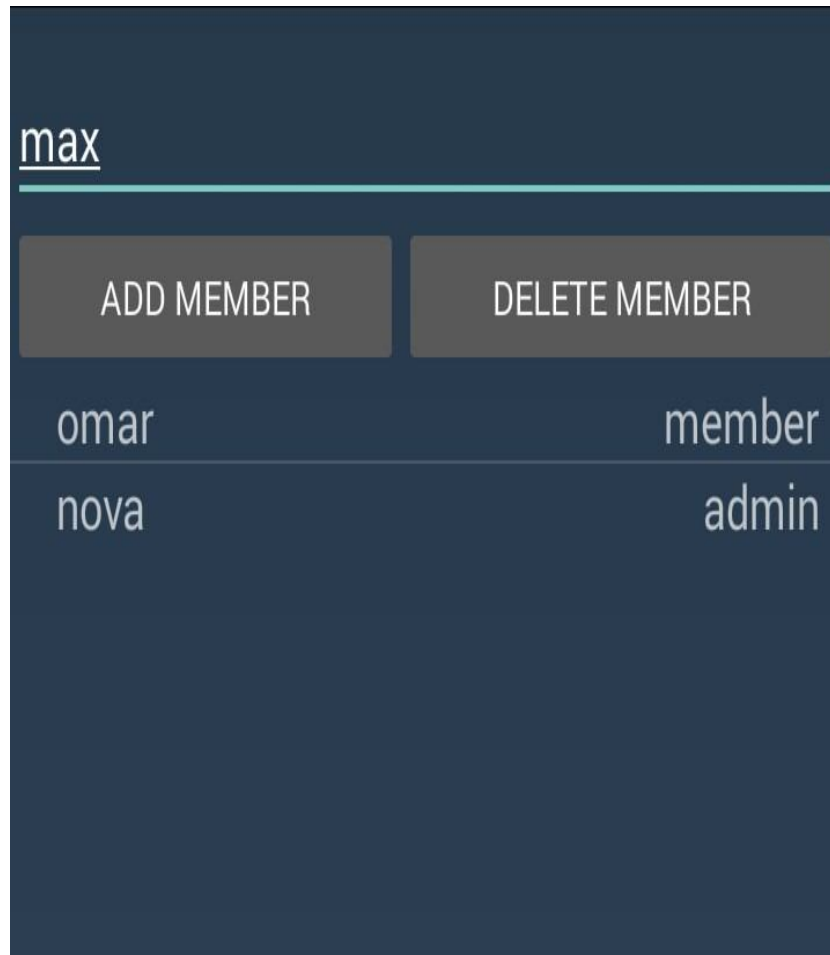


Figure (4.5): Delete member from group interface

## 4.2.6 Block Notification

The administrator or the user can optionally block notifications all the time as shown in Figure (4.6).

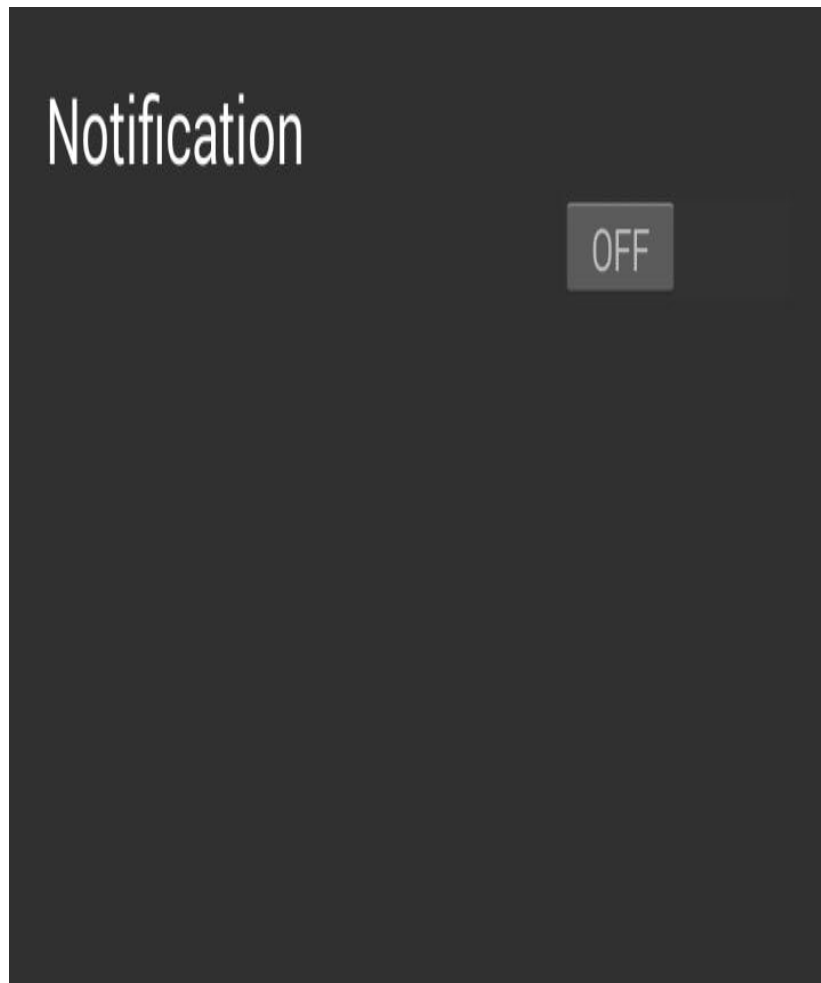


Figure (4.6): Block notification interface

## 4.2.7 Display Map

The administrator or the user can view the map with his location in it as shown in Figure (4.7).

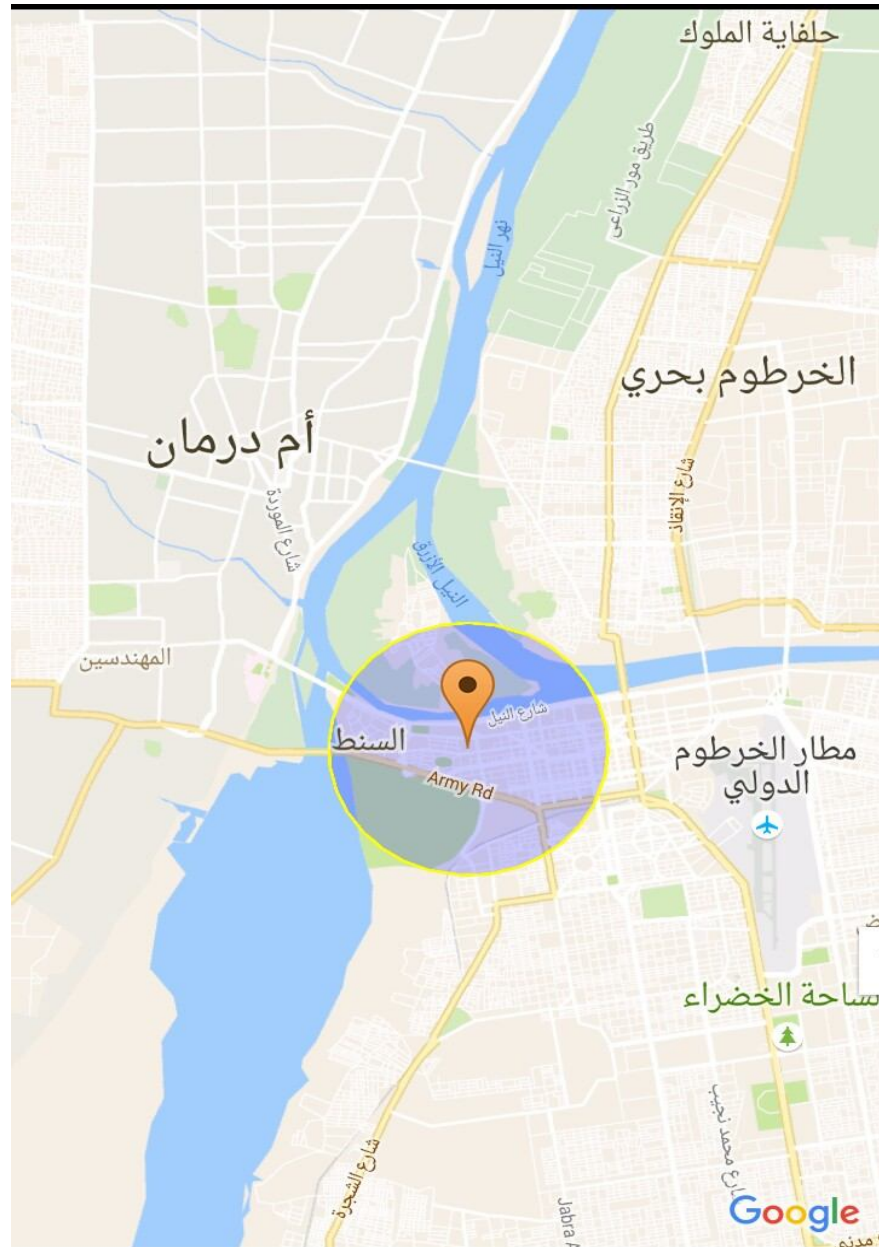


Figure (4.7): Display map interface

## 4.2.8 Display Group

The administrator or the user can view all groups which he owns or added to them as shown in Figure (4.8), Figure (4.9) and Figure (4.10).

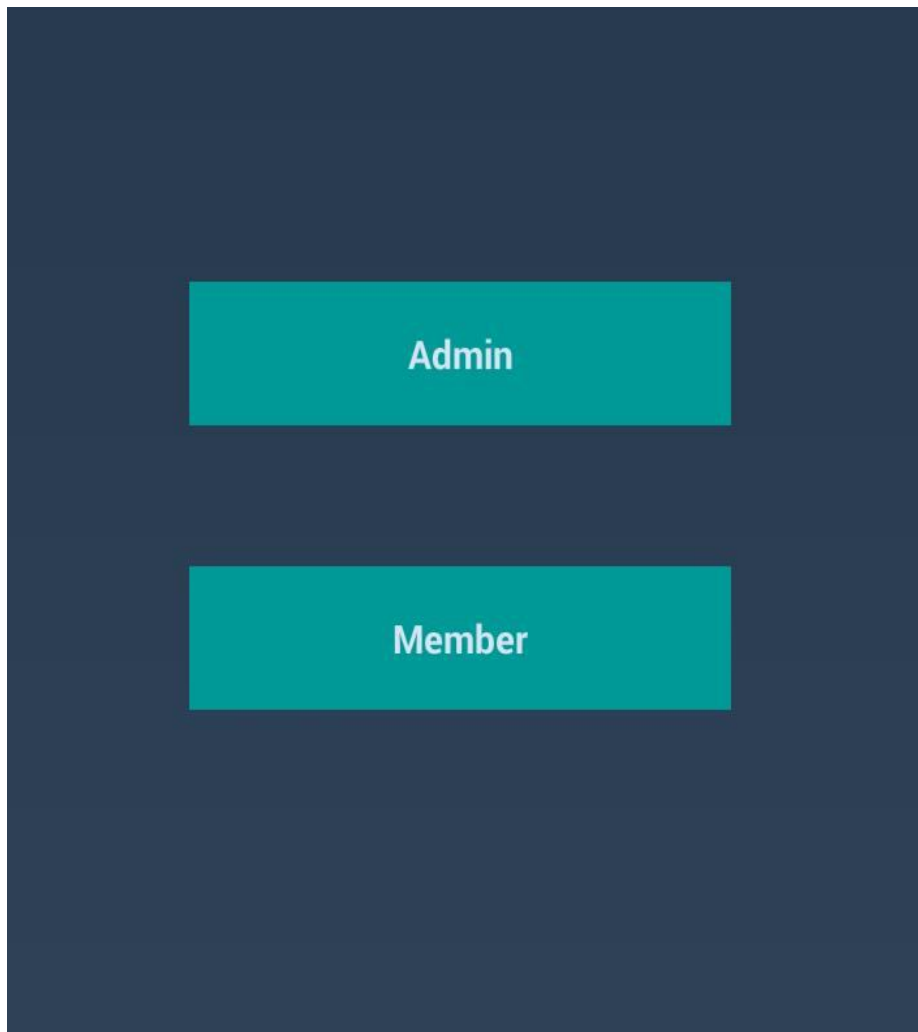


Figure (4.8): Display groups choice interface

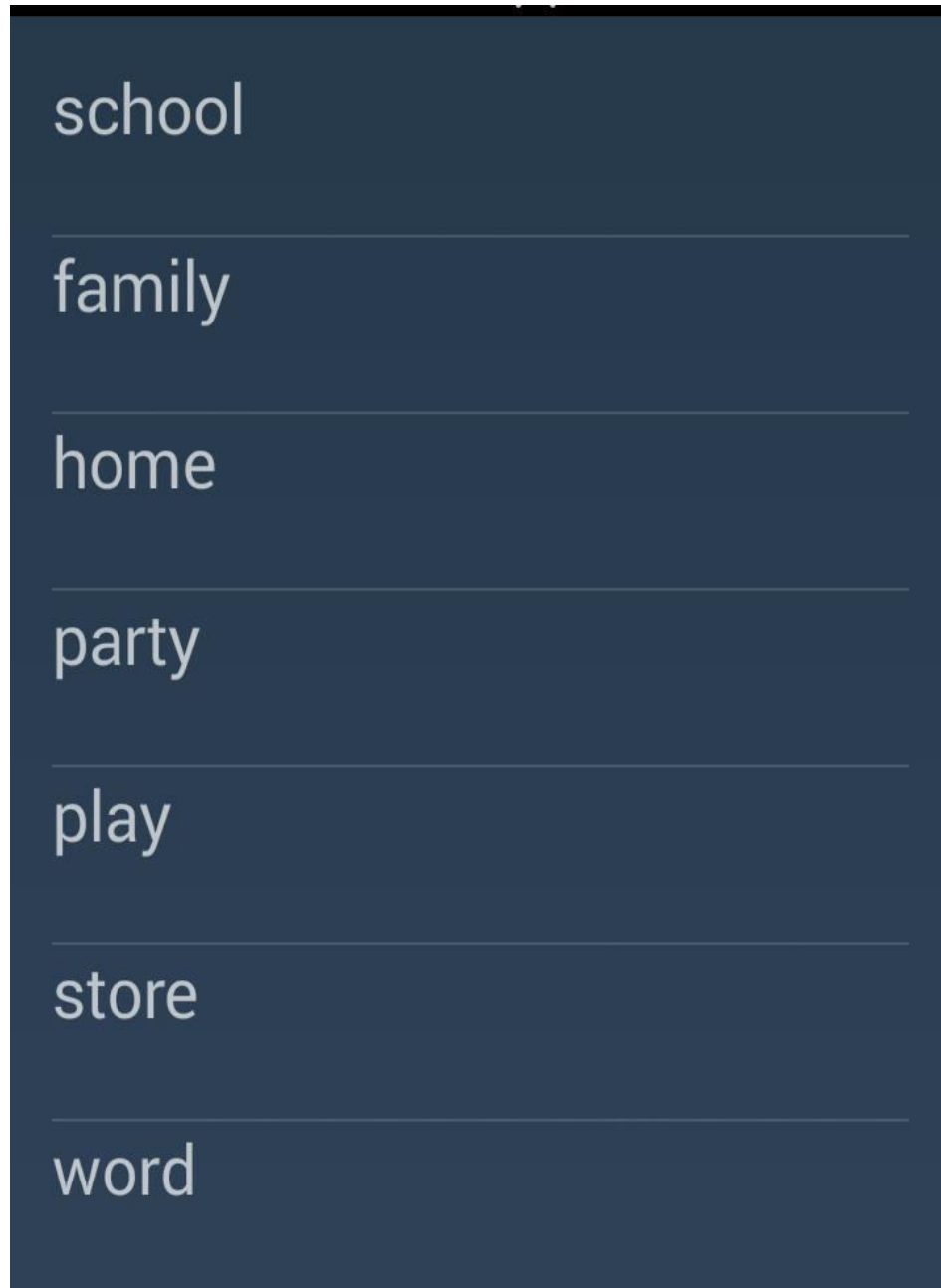


Figure (4.9): Display groups that were created interface

tutorial	8
faculty	6
exam	8

Figure (4.10): Display groups which the user added to it interface



## 4.2.9 Notification

The administrator or the user can receive alerts from the application when someone enters the range of a group as shown in Figure (4.11).

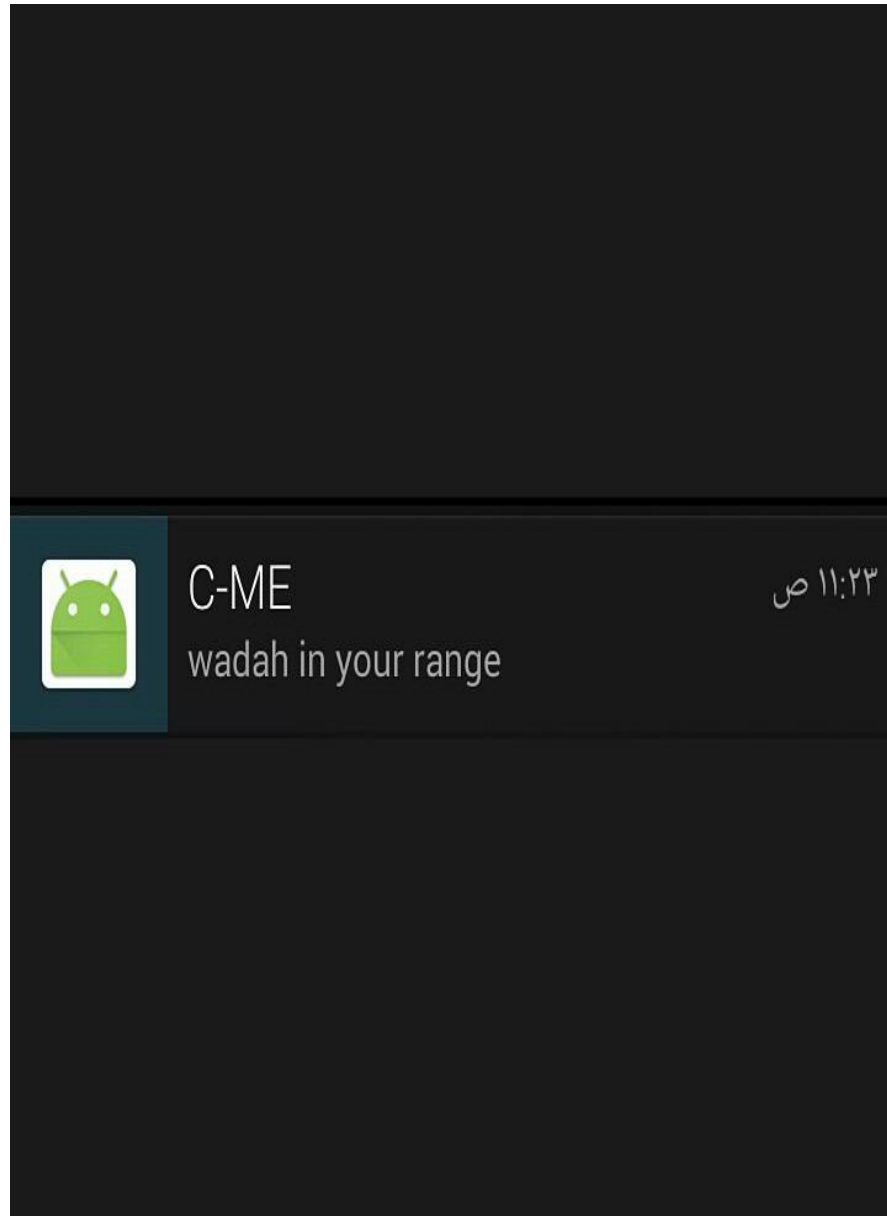


Figure (4.11): Notification interface

## **4.3 Summary**

This chapter has represented the implementation of the mobile application and its interfaces which belong to administrator and user.

# **CHAPTER FIVE**

## **CONCLUSIONS AND RECOMMENDATIONS**

## **5.1 Introduction**

This chapter states conclusions and suggests recommendations for future research and studies.

## **5.2 Results**

In this project, a mobile application have been developed, C-Me, which:

- Alerts the user of a contact being at a close distance.
- Allows creating and personalizing groups to add friends.
- Sends a notification when a friend enters the area monitored by an application user.
- Display maps.

## **5.3 Recommendations**




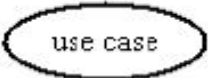
The following is recommended:

- Improving the system by allowing it to work on more than one operating system for smart phones (e.g. iOS, Windows Phone) to keep up with technological evolution, and reach as many users as possible.
- Another user may wish to create a group of friends that are scattered around the globe. He can choose to be alerted whenever he is in the same country with any of these hard to meet friends.
- Deal with the security side in a wide area and focus on it.







## **5.4 Conclusions**

This chapter has represented the results from this research and it also shows the recommendations.

# **APPENDICES**




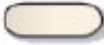

 Actor			
User	connect	Connect task that depends on other	task

Explain the symbols used in (Use case Diagram)

 Actor	 Boundary			 Control	 Entity
User	Graphical User Interface (GUI)	UML message	message Response	Program logic	database

Explain the symbols used in (Sequence Diagram)



				
End	Begin	Decision	Activity	Connect

Explain the symbols used in (Activity Diagram)

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