

# **Software Requirements Specification**

**for**

**RING ME – A Mobile management application**

**Version 1.0**

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## 1. Introduction

### 1.1. Purpose

We often misplace our mobile at various locations and try to find it out by giving a ring from another mobile. We switch the mode of a phone to silent mode in various scenarios like when we are in a meeting, or when we are in class. We must have kept our phone in vibration mode and cannot remember where we left it. Wouldn't it be nice to change our mobile from vibration mode to ringer mode, just by using our friend's phone and sending a message to ours and make it to ring? Let us suppose we have secured our phone in a gym locker and forget the locker number. We usually try to ring the misplaced mobile from another phone, and if it is in silent or vibration mode we cannot hear the ring and there is no other way you can find out except trying to unlock all the lockers with the passcode. This is where the motivation for 'RING ME' has started.

'RING ME' is a new mobile management Android application which allows you remotely perform various tasks from any other mobile device just by sending simple SMS commands. The phone from which we are sending messages need not be an Android phone – even the basic mobile handset which can send SMS would do just fine. The operation is easy. You send an SMS command from another phone to your phone in a registered format and the app responds based on it. For example, a SMS command like 'ring' would turn on the ringer of the phone.

### 1.2. Scope

The main feature of this application is that, either phone does not require any GPS or Internet. This application helps the user to remotely control his misplaced phone and allows him to perform various tasks like – change his phone mode from vibrate/silent to ringer, increase the volume of the phone ringer, turn on/off mobile data, turn on/off WIFI, turn on/off GPS, find the phone's IMEI number, check battery status of the phone, just with the help of formatted SMS commands. The administrator of this application will collect the information of this application user and formats the commands according to his choice for security purposes

### 1.3. Definitions, acronyms and abbreviations

**Android** is a Linux-based operating system designed primarily for touchscreen mobile devices such as smartphones and tablet computers. Initially developed by Android, Inc., which Google backed financially and later bought in 2005. Android is open source and Google releases the code under the Apache License. This open source code and permissive licensing allows the software to be freely modified and distributed by device manufacturers, wireless carriers and enthusiast developers. Additionally, Android has a large community of developers writing applications ("apps") that extend the functionality of devices, written primarily in a customized version of the Java programming language. [3]

**Android Studio** is the official integrated development environment (IDE) for Google's Android operating system, built on JetBrains' IntelliJ IDEA software and designed specifically for Android development. It is available for download on Windows, macOS and Linux based operating systems. It is a replacement for the Eclipse Android Development Tools (ADT) as primary IDE for native Android application development. [4]

**Application programming interface (API)** specifies how some software components should interact with each other. In practice in most of the cases an API is a library that usually includes specification for routines, data structures, object classes, and variables. An API specification can take many forms, including an International Standard such as POSIX, vendor documentation such as the Microsoft Windows API, the libraries of a programming

language, e.g., Standard Template Library in C++ or Java API. [1]

**SDK (Software Development Kit or "devkit")** is typically a set of software development tools that allows for the creation of applications for a certain software package, software framework, hardware platform, computer system, video game console, operating system, or similar development platform. [1]

**SMS** stands for Short Message Service and is also commonly referred to as a "text message". With a SMS, you can send a message of up to 160 characters to another device. Longer messages will automatically be split up into several parts. Most cell phones support this type of text messaging. [1]

**Wi-Fi** is technology for radio wireless local area networking of devices. Devices that can use Wi-Fi technologies include desktops and laptops, videogame consoles, smartphones and tablets, smart TVs, digital audio players and modern printers. Wi-Fi compatible devices can connect to the Internet via a WLAN and a wireless access point. [2]

**Global Positioning System (GPS)** is a space-based navigation system that provides location and time information in all weather conditions, anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites. [1]

<b>UI</b>	–	User Interface
<b>SDK</b>	–	Software Development Kit
<b>GPS</b>	–	Global Positioning System. SMS – Short Message Service
<b>OS</b>	–	Operating System
<b>SIM</b>	–	Subscriber Identity Module
<b>API</b>	–	Application Programming Interface
<b>IDE</b>	–	Integrated Development Environment
<b>SQL</b>	–	Structured Query Language
<b>AES</b>	–	Advanced Encryption Standard

## 1.4. References

[1] [https://www.theseus.fi/bitstream/handle/10024/31139/OLUFOWOBI\\_LAWAL\\_BACHELORS\\_THESIS.pdf?sequence=1](https://www.theseus.fi/bitstream/handle/10024/31139/OLUFOWOBI_LAWAL_BACHELORS_THESIS.pdf?sequence=1)

[2] <https://en.wikipedia.org/wiki/Wi-Fi>

[3] <https://developer.android.com/docs/>

[4] <https://developer.android.com/studio/intro/>

## 2. Overall description

### 2.1. Product perspective

The hardware involved in this project is a mobile phone which can send SMS and a mobile phone in which application is installed. The phone in which application is installed interprets the SMS and changes the mode accordingly. The product is a replacement for an existing application. The products that are currently available use locations to track the phone which requires internet or Wi-Fi connection. To eliminate the usage of internet, this product is being developed. It is more flexible to develop the application and test it on mobile or on emulator itself before deploying in to the mobile. This is the first version of its kind and is developed based on Android platform. The goal

of this project is used to change the profile automatically after some specific time. The main objective of this project is:

- To produce a cost-effective method of input.
- To achieve the highest possible level of accuracy.
- To ensure that the input is acceptable and understood by the user.
- To find mobile when it is silent and forgot where the user put it.
- To monitor your mobile remotely just by using SMS commands.

Figure 2.1. explains the system architecture in which Ring me is our application installed on the android mobile and it makes use of the other applications in the mobile like Wi-Fi, SMS and GPS. User needs to provide permissions to access these applications in his mobile.

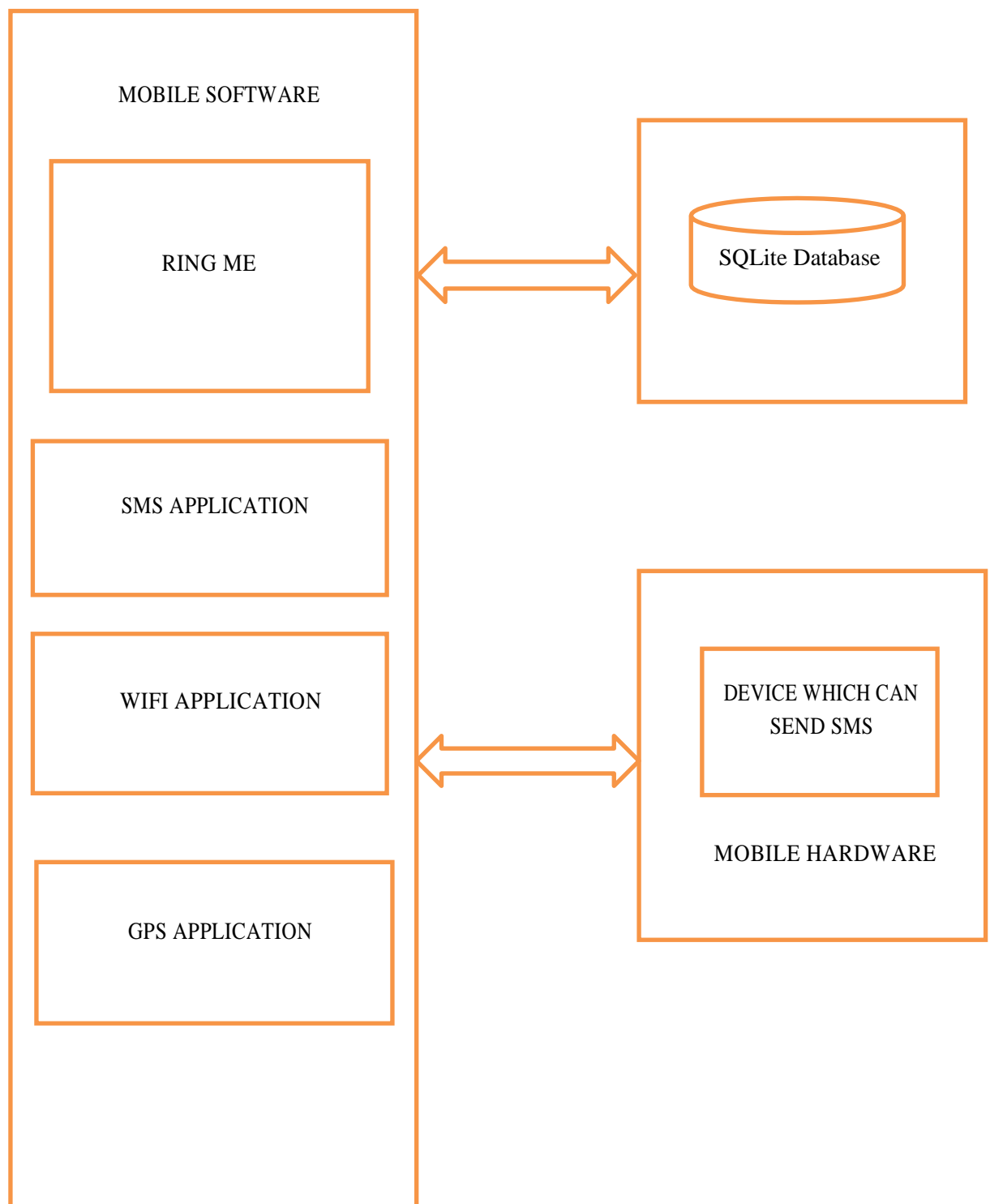


Figure 2.1. System Structure

## 2.2 Product features

1. Change mode of mobile from silent/vibrate to RINGER using SMS command.
2. Change mode of mobile from silent/sound to VIBRATE using SMS command.
3. Change mode of mobile from sound/vibrate to SILENT using SMS command.
4. Alter the volume of mobile ringer using SMS command
5. Home page to display commands.
6. Start/stop GPS using SMS command.
7. Start/stop Mobile Data using SMS command.
8. Start/stop WIFI using SMS command.

9. Signup user page.
10. Login user page.
11. Edit user details page.
12. Edit screen for commands.
13. Lock phone using SMS command.
14. Wipe data from phone using SMS command.
15. Trace location coordinates using SMS command.
16. Find IMEI number using SMS command.
17. Find battery status of phone using SMS command.
18. Activity log.

### 2.3. User characteristics

User must be familiar with Android. User must have knowledge on how to send SMS and must memorize the SMS code which he needs to send.

### 2.4. Design and implementation constraints

- User must always have access to phone so that he can send SMS.
- The phone must be able to receive SMS.
- Phone battery must be available that is it should not be in power OFF mode.
- Only limited to Android OS.

### 2.5. Assumptions and dependencies

- Always dependent on an additional phone.
- We assume that user has knowledge about Android application.

## 3. System Features

This application is designed to have four major features namely Mode changer features, User authentication features, features to secure the remote phone, features to monitor the remote phone. Ring me application provides its users with the above features by which he can remotely control his phone. So, we need to provide user with an interface where he can be able to view the available features and create a command to access it remotely. The below figure explains the feature hierarchy that can be accessed by the users. Feature hierarchy of system features is shown in figure 3.1. User authentication feature are first features encountered to user while using the application in real time which means user needs to login/ register to use this application. Then after successful login, user can access other features.

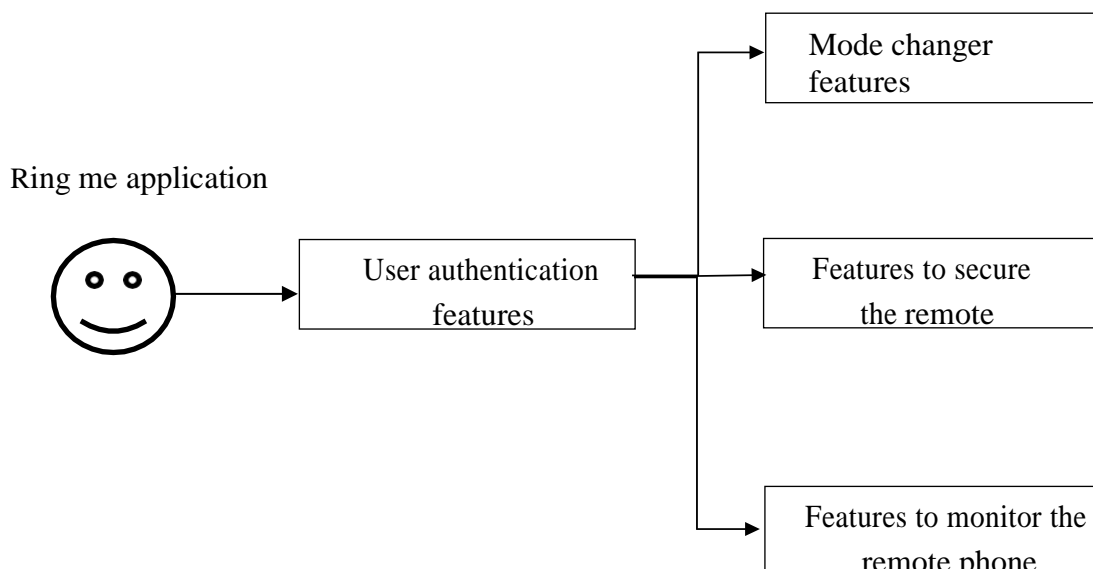


Figure 3.1. Feature hierarchy of system features

### 3.1 Mode changer features

Mode changer features allows user to control ringer modes of the mobile phone. In Android we have three basic ringer modes namely Ringer, Vibration and Silent. This feature aims to develop the functionalities to read the SMS command and alter the ringer modes. This also includes the development of application home screen and alter the ringer volume. Feature hierarchy of Mode changer features is shown in figure 3.2.

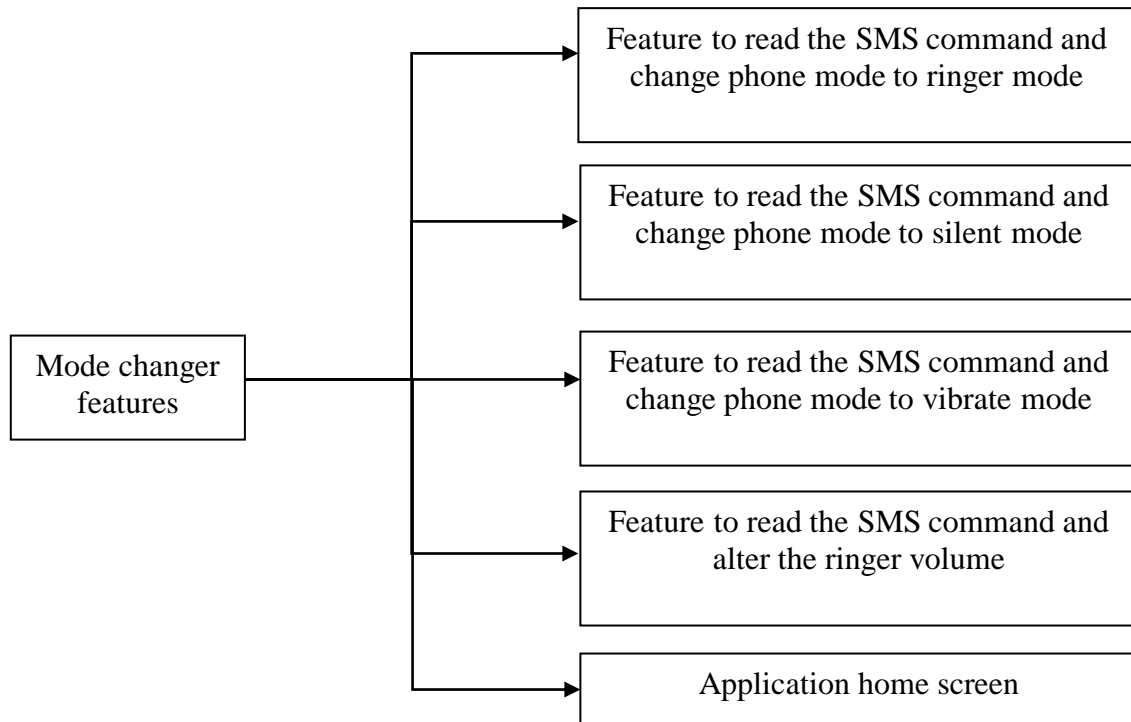


Figure 3.2. Feature hierarchy of Mode changer features

#### 3.1.1 Feature to read the SMS command and change phone mode to ringer mode

Ringer mode is any mobile phone alerts the user with sound by which user will come to know about his incoming phone calls or notifications. This feature is to change the mode of his phone to Ringer as a response to the command received in the SMS. User will be able to select this function 'Ring' and configure a SMS command under it. This command will be stored in our database. This command will be used by the application to identify and respond accordingly by change the mode of the phone to ringer.

#### 3.1.2 Feature to read the SMS command and change phone mode to vibration mode

Vibration mode does not alert the user with any sound but vibrates the phone for all incoming phone calls and notifications. This feature is to change the mode of his phone to Vibrate as a response to the command received in the SMS. User will be able to select this function 'Vibration' and configure a SMS command against it. This command will be stored in our database. This command will be used by the application to identify and respond accordingly by change the mode of the phone to vibration.

#### 3.1.3 Feature to read the SMS command and change phone mode to silent mode

Silent mode in a mobile phone is like DND (Do Not Disturb) mode in which user is not alerted by any sound or vibration for incoming phone calls and notifications. This feature is to change the mode of his phone to Silent as a response to the command received in the SMS. User will be able to select this function 'Silent' and configure a SMS command against



it. This command will be stored in our database. This command will be used by the application to identify and respond accordingly by change the mode of the phone to silent.

### 3.1.4 Feature to read the SMS command and alter the ringer volume

Android has a feature to increase or decrease its ringer volume. This feature is important as there will few situations where user cannot keep neither in high ringer volume nor in silent. This feature is to alter the ringer volume of his phone to maximum or minimum based on the need. User will be able to select these functions 'Ringer high' and 'Ringer low' and configure a SMS commands against them. This command will be stored in our database. These commands will be used by the application to identify and respond accordingly by altering the ringer volume.

### 3.1.5 Application Home screen

This is Home GUI screen will allow user to create new SMS commands for Ring me application. User will be displayed with all the featured supported by Ring me. User will be displayed with all the commands configured by him in this Home screen page.

## 3.2 User authentication features

User authentication features aim to collect the user personal information by registration in the application. This feature allows user to Register, Login and Edit his personal details. Feature hierarchy of User authentication features is shown in figure 3.3.

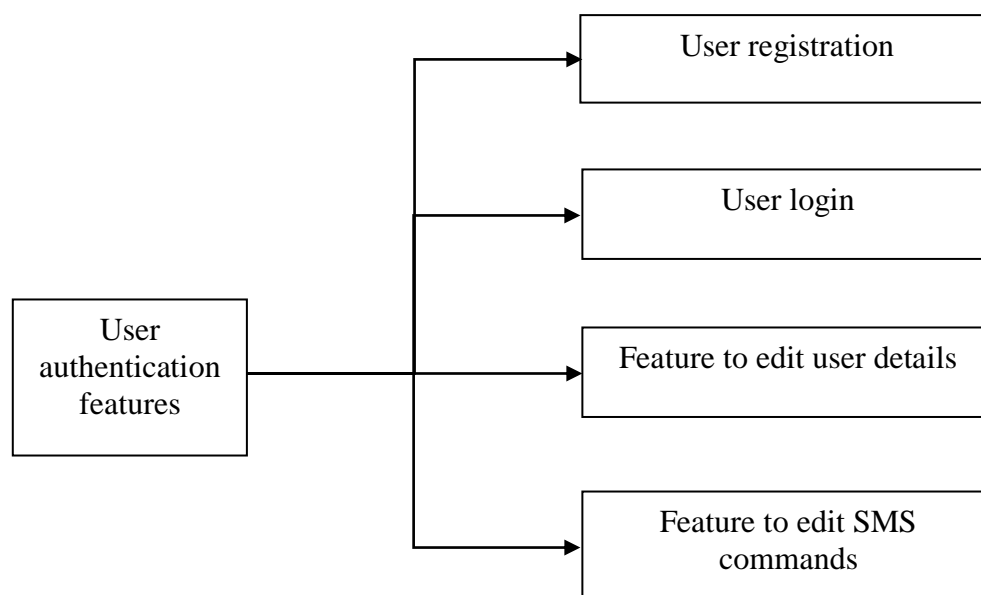


Figure 3.3. Feature hierarchy of User authentication features

### 3.2.1 User registration

New user needs to register for using Ring me application. The registration details of the user are important as a part of application security. Users should be able to register using their email ID and phone number. All users' needs to provide details like - name, email ID, password and contact number. All users' information will be their stored in the User details table in the database. Upon successful registration, the user will be logged into the application and redirected to Application Home screen.

### 3.2.2 User login

Every signed-up user needs to login before using the application every time. User should provide a valid email/phone number and his password given at the time of registration. When login details for a user are entered, they are validated by the application with database. If the details entered are matched, the user will be able to application home page, else a failure prompt will be displayed.

### 3.2.3 Feature to edit user details

Every user will be provided with a feature to edit his personal details. User can edit his personal information like Name, Email, Phone number, and password. After editing by the user, these details will be saved to User details table in the database.

### 3.2.4 Feature to edit SMS commands

Application allows user to edit his SMS commands previously configured for a feature. If user configured 'RINGPHONE' SMS command to Ring function, and now he can edit this command and change it to another new command 'RINGER'. After editing by the user, these new commands will be saved to database table.

## 3.3 Features to secure the remote phone

Secure the remote phone features allows users want to control few security features like WIFI, mobile data, GPS, wiping the data on the phone and locking the phone. These features are needed if misplaced phone is lost and the phone data needs to clear, or it requires to turn on WIFI, GPS or mobile data for tracking purposes. Feature hierarchy of features to secure the remote phone is shown in figure 3.4.

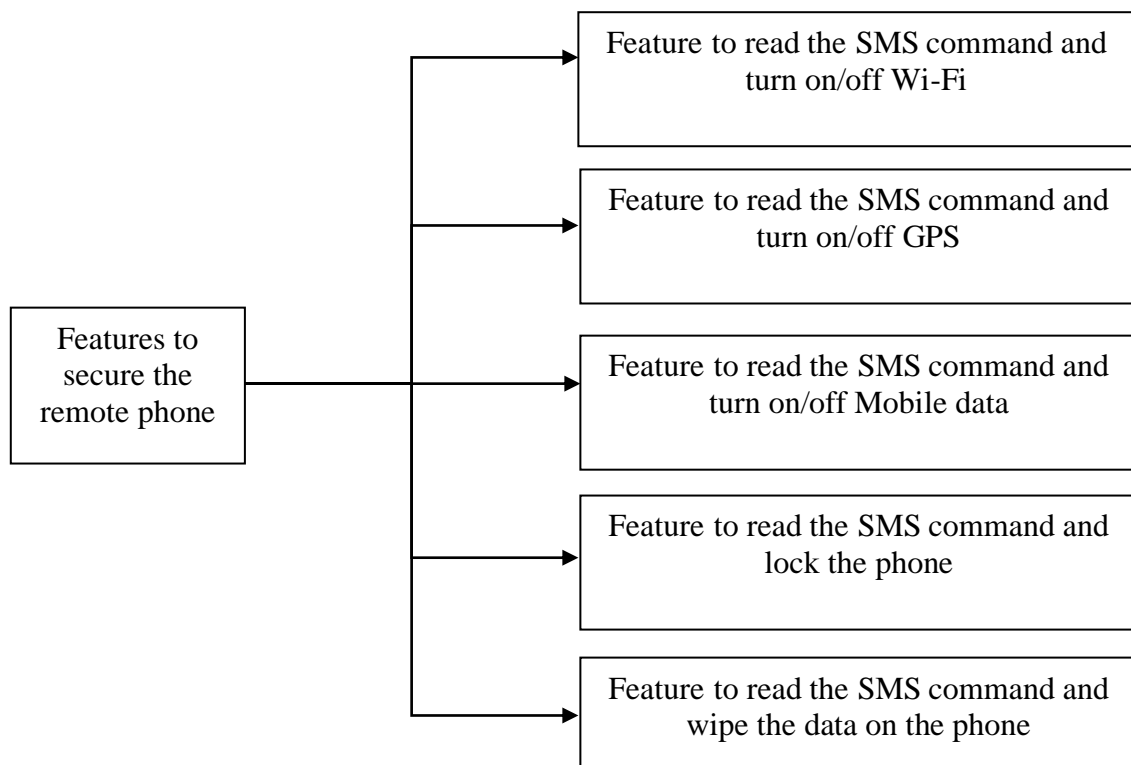


Figure 3.4. Feature hierarchy of features to secure the remote phone

### 3.3.1 Feature to read the SMS command and turn on/off WIFI

WIFI in a mobile phone is used to connect to internet. If user wants to turn on/off his WIFI for various reasons, he can do it using this function. There are many applications which needs WIFI to be turned on to locate the phone. If user phone is lost and he wants to turn on

his WIFI, he can do it by making use Ring me application SMS commands feature. This feature supports turn on and turn off WIFI based on the command received in the SMS. User will be able to select these functions 'WIFI ON' or 'WIFI OFF' and configure a SMS command against them. These commands will be stored in our database. These commands will be used by the application to identify and respond accordingly by turning on/off the WIFI in the remote mobile phone.

### **3.3.2 Feature to read the SMS command and turn on/off Mobile data**

Mobile data in like WIFI is used to connect mobile phone to internet. If user wants to turn on/off his Mobile data for various reasons, he can do it using this function. There are many applications which needs the phone to be connected to internet to locate the phone. If user phone is lost and might not be open free WIFI connection then mobile data needs to be turned on to connect to internet. This feature supports turn on and turn off Mobile data based on the command received in the SMS. User will be able to select these functions 'DATA ON' or 'DATA OFF' and configure a SMS command against them. These commands will be stored in our database. These commands will be used by the application to identify and respond accordingly by turning on/off the mobile data in the remote mobile phone.

### **3.3.3 Feature to read the SMS command and turn on/off GPS**

GPS is used to get the location coordinates and time information in all weather conditions, anywhere on or near the Earth. If user wants to turn on/off his GPS for various reasons, he can do it using this function. Any applications need the phone to be GPS on to get the location of the phone. This feature supports turn on and turn off GPS based on the command received in the SMS. User will be able to select these functions 'LOCATION ON' or 'LOCATION OFF' and configure a SMS command against them. These commands will be stored in our database. These commands will be used by the application to identify and respond accordingly by turning on/off the GPS in the remote mobile phone.

### **3.3.4 Feature to read the SMS command and lock the phone**

If a phone is misplaced and not locked, then user can lock its screen by using 'LOCK' function in the Ring me application. User needs to configure a SMS command against it. This command will be stored in our database. This command will be used by the application to identify and respond accordingly by locking the remote mobile screen.

### **3.3.5 Feature to read the SMS command and wipe the data on the phone**

If a phone is misplaced and lost, and it contains some sensible data, then user can wipe its data by using 'ERASE' function in the Ring me application. User needs to configure a SMS command against it. This command will be stored in our database. This command will be used by the application to identify and respond accordingly by wiping the remote phone data.

## **3.4 Features to monitor the remote phone**

Monitor the remote phone features allows users to view/monitor his phone location coordinates, battery status, IMEI number from the other phone. This also includes a feature to view activity logs of the user. Feature hierarchy of features to monitor the remote phone is shown in figure 3.5.

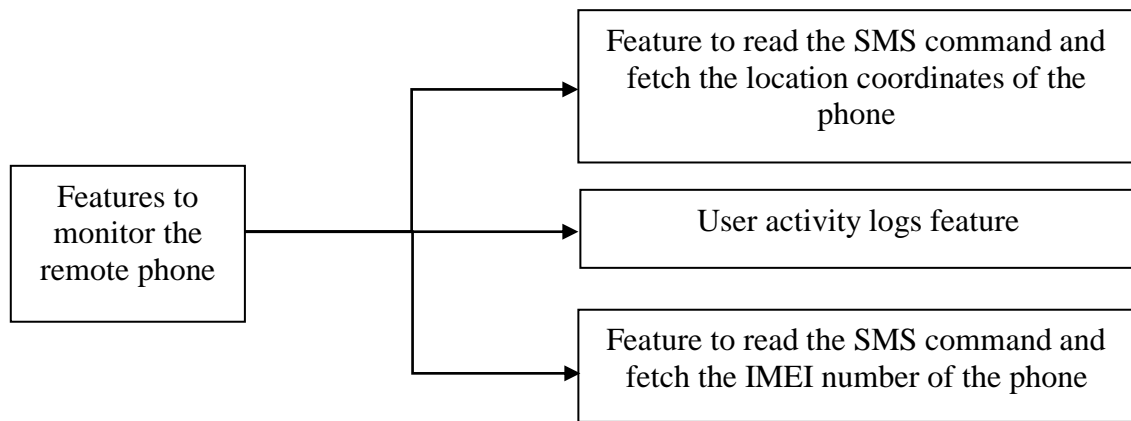


Figure 3.5. Feature hierarchy of features to monitor the remote phone

### 3.4.1 Feature to read the SMS command and fetch the location coordinates of the phone

If a phone is misplaced and lost, then user can try to know the location of the phone by getting its location coordinates. All user needs to do is configure a SMS command against 'LOCATION' in the Ring me application. This command will be stored in our database. This command will be used by the application to identify and respond accordingly by sending location coordinates to the sender phone.

### 3.4.2 User activity logs feature

This feature is provided inside the application which allows user to view his recent activities performed in the app like change of password, change of phone number, change of personal information, change of keywords etc.

### 3.4.3 Feature to read the SMS command and fetch the IMEI number of the phone

If a phone is misplaced and lost, then user there is no way to trace the location of the phone, then user can try the IMEI feature. He can get the IMEI of his remote phone and this can be used for blacklisting the remote phone. User needs to do is configure a SMS command against 'IMEI' in the Ring me application. This command will be stored in our database. This command will be used by the application to identify and respond accordingly by sending IMEI number of the remote phone to the sender phone.

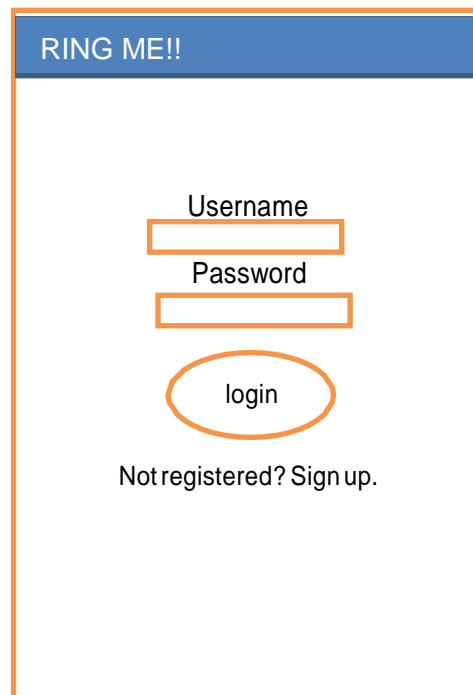
## 4. External Interface Requirements

### 4.1 User Interface

The user interface which we are using here consists of many screens making the users to easily understand this application. It first starts with the Splash screen. As soon as we open the app, a screen appears which displays the logo\theme of our application. We are just making a sample screen below.



As soon as the splash screen appears, it directly goes into the home screen where we can see the login page. We must create or login accordingly.

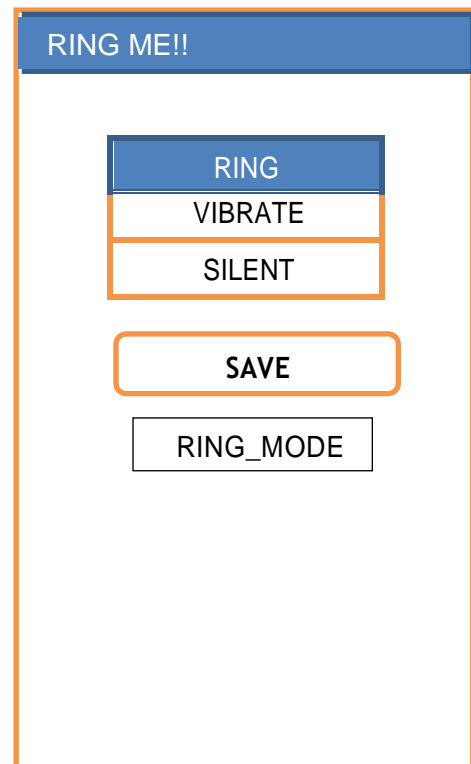


The login screen features a blue header with the text "RING ME!!". Below the header, there are two input fields: "Username" and "Password". A "login" button is positioned below the password field. At the bottom of the screen, there is a link that says "Not registered? Sign up."

After signing in it takes us to the settings page, where we can find default commands, which we are going to provide. The user can change these commands according to his convenience and security. Toast is another feature that pops up, whenever the mobile is changed into any mode.



The settings screen has a blue header with "RING ME!!". It contains three stacked buttons labeled "RING", "VIBRATE", and "SILENT". Below these is a "SAVE" button.



The settings screen has a blue header with "RING ME!!". It contains a stack of three buttons: "RING" (highlighted in blue), "VIBRATE", and "SILENT". Below this stack is a "SAVE" button, and at the bottom is a "RING\_MODE" button.

We shall also have a menu screen option, where we are going to insert the mode change editing option. This is where we are going to select it and change the command which we wish to use. We shall add Network changes option where we are going to decide whether we are going to use mobile data or WIFI and the information pages that is the privacy policy, and about us.

## 4.2 Hardware Interfaces

The hardware interfaces include an android mobile which can receive SMS and another mobile which can send SMS. The data interaction between the 2 devices is done through SMS. SMS messages are sent through a protocol supported by SMSC or SMS gateway. The SMSC protocol which is being used to send SMS is SMPP (Short Message Peer to Peer).

<b>Memory Required</b>	-	Minimum 100 MB
<b>RAM</b>	-	Minimum 2GB
<b>OS</b>	-	Latest Android version
<b>Touch screen</b>	-	Supportive
<b>Network Requirements</b>	-	GPS, WIFI supported device

## 4.3 Software Interfaces

The software interface acts as a connection between the mobile device and the local server. The database we use here is SQLite. It is not a client- server database. All the SMS commands that are sent will go to the local database. We develop this application in the Android Studio and place it in the play store for the users to download it. It is all set up with certain access restrictions and when the users try to download it, they will be asked some access grants.

<b>Operating System</b>	-	Android
<b>Tools Required</b>	-	XAMMP Control Panel
<b>Platform</b>	-	Android SDK Framework
<b>IDE</b>	-	Android Studio
<b>Android Emulator</b>	-	SDK Version 4.0 or Higher
<b>Technologies Used</b>	-	Java, HTML, XML
<b>Database</b>	-	SQLite 3

## 4.4 Communication Interfaces

For communication interface, SMS gateway of SMS service providers often support one or more of protocols like HTTP/ HTTPS (HTTP + SSL encryption). Also, for communication interface of Android, HTTP/HTTPS shall be used since transfer is simple and also connection can be secured through SSL. There is going to be connection established between SQLite and Android.

## 5. Non – functional requirements

### 5.1 Product requirements

#### 5.1.1 Usability

This application can be used by all the Android users. There is no such complexity to understand or use this.

#### 5.1.2 Efficiency

Efficiency mainly concentrates on two things, space and performance. It does not occupy more space of your phone's memory. It works well with all the android phones and does not even require any GPS or internet connections.

#### 5.1.3 Reliability

This application provides with proper user requirements. The user can insert the SMS commands of his choice, so that he can rely on them and perform any task he wishes on his

mobile.

## **5.2 Organizational requirements**

### **5.2.1 Delivery**

The product is made available in the Google playstore. The users can easily download it for free. Before downloading, it asks all the permissions required and then gets downloaded.

### **5.2.2 Implementation**

This application is carried out in three development phases. Each phase develops a greater number of functionalities. Each developer concentrates on product output and quality and will be made available to users on time.

## **5.3 External requirements**

### **5.3.1 Privacy**

When the user installs this application in his/her mobile, it asks for many access permissions, so the user can accept only what he would like to allow and hence the privacy of the user will not be disturbed.

### **5.3.2 Safety**

As the SMS commands which are used, can be designed as per the wish of the users, there will be proper security and the user need not worry about his personal information being lost or forged.

## **6. Development Phases**

Ring me development team has identified four major features namely Mode changer features, User authentication features, features to secure the remote phone, features to monitor the remote phone. Team has decided to implement these in 3 phases of product development cycle.

### **6.1 Development Phase I: (Deadline – 10/24/2018)**

In this phase we concentrate on the main functionality which we decided to prioritize. Mode changer features are like base features which needs to be supported from the first. Hence, we have decided to complete Mode changer features (Section 3.1) first. This phase would be intended to develop Mode changer features in full stack. The functional requirements which are implemented here are:

- Feature to read the SMS command and change phone mode to ringer mode (Section 3.1.1)
- Feature to read the SMS command and change phone mode to vibrate mode (Section 3.1.2)
- Feature to read the SMS command and change phone mode to silent mode (Section 3.1.3)
- Feature to read the SMS command and alter the ringer volume (Section 3.1.4)
- Application Home screen (Section 3.1.5)

### **6.2 Development Phase II: (Deadline – 11/07/2018)**

In this phase we target to finish user authentication features as security is primary concern of any application. So, we shall complete User authentication features (Section 3.2) like User register, Login and edit personal data. The functional requirements in this phase are:

- User registration (Section 3.2.1)
- User login (Section 3.2.2)
- Feature to edit user details (Section 3.2.3)
- Feature to edit SMS commands (Section 3.2.4)

After this phase, user must register/login to use Ring me application.

### **6.3 Development Phase III: (Deadline – 11/26/2018)**

In this phase, we target on enhanced features for application enhancement. This phase will be intended to complete features to secure the remote phone (Section 3.3) and features to monitor the remote phone (Section 3.4). The functional requirements in this phase include:

- Feature to read the SMS command and turn on/off WIFI (Section 3.3.1)
- Feature to read the SMS command and turn on/off Mobile data (Section 3.3.2)
- Feature to read the SMS command and turn on/off GPS (Section 3.3.3)
- Feature to read the SMS command and lock the phone (Section 3.3.4)
- Feature to read the SMS command and wipe the data on the phone (Section 3.3.5)
- Feature to read the SMS command and fetch the location coordinates of the phone (Section 3.4.1)
- User activity logs feature (Section 3.4.2)
- Feature to read the SMS command and fetch the IMEI number of the phone (Section 3.4.3)