A
PROJECT REPORT
ON

SMS BASED REMOTE ACCESS OF ANDROID DEVICES

by

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Under the guidance of
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CERTIFICATE

This is to certify that project titled ”SMS BASED REMOTE ACCESS OF ANDROID DEVICE” is a bona-fide record of Project-B carried out by the following students of final year in Computer Engineering.

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Name:	Name:
(Examiner-I)	(Examiner-II)

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Abstract

Mobile technology is widely used in all classes of society. It is the most effective way of communication. Since the dependency has increased largely, it becomes difficult to live without it. The application intends to address this problem by retrieving data from mobile handset though it is not physically available with the user. The system is designed to be controlled via SMS from anywhere that is covered by GSM service. If ones mobile phone is not available at the moment and one needs to call a person urgently whose contact number is not available at that instant. To get that contact one has to go through very tedious process of calling home and get that contact number etc. The proposed system project helps to simplify this problem. One has to send an SMS to his/her own mobile with the contact name and automatically the contact will be returned to the same number. Also one can get location of the mobile, call log, ring the phone, get unread SMS, get the forgotten cell-phone to call back the phone from where originating message is sent and few other miscellaneous functions.

As a feature designed to prevent unauthorized access, the message needs to contain a password preset by the user. Any access of data would be stored in a local database of the phone to keep track of who is accessing what information. Notifications would also be sent to the user to notify him/her in case of application usage.

The application only needs to be installed and configured once. The user may completely forget about the existence of the application until there is a situation the requires the user to use it.

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Chapter 1

INTRODUCTION

1.1 Background

The Android mobile operating system has, of late, become one of the most popular, free and usable systems in the world. The almost-zero cost and open source functionality has led to Android becoming one of the top contenders when it comes to the mobile OS market. The Android mobile operating system today is used by everyone. This usage has has led to not only our dependence on our android smart phones. But also our over-dependence. Most people dont even wear watches nowadays and use their phones to check the time. If we lose access to our device then we feel as if a part of our body is missing. Due to the revolution in technical field of mobile phones, current mobile phones are capable of storing user data as well as sharing of information with other users. The critical user data includes call records, photos and videos as well as saved passwords of Webpages. So loosing of smart phone is not affordable to user because it cause the loss of large amount of irrecoverable data. In such scenarios, remote access to a mobile phone will be helpful to user in order to access information from mobile phone even if user is not carrying mobile phone with him. Accessing the remote data using internet connection was not a difficult task if user can carry computer every time. But in recent times, android mobile phones and smart phones have replaced the need of computers. These devices can be used not only to store user data but also capable of providing various other information like whether forecast, Google map, different chatting applications, etc. By considering a scenario where user forgets to carry mobile phone and wants to retrieve an important data from mobile phone remotely, an idea to develop a new application emerged by which user can access all required data through SMS.

1.2 Objective

The primary objective of the project is to create a system which allows for easy access of our cell-phones in pre-defined cases. The user would not need to take much effort in procuring the data like messages, call logs etc. The application would also help in case of theft or misplacement by adding a location and a ring function. Our app is designed to be a one click install in the sense that, once user sets the password he could just forget about the app till the time of need. Real life situations- Phone forgotten at home Use message/callog command to retrieve data. Phone misplaced in silent/vibrate mode Use ring command. Phone is stolen Use lock/location command. We propose a simple application for solving all the afore mentioned problems. Our application would request the user to set the password only during the first time opening of the application. The user may forget about our app and continue normally till the time arises when the app is needed. Our application would also be secure since it verifies the password and also stores all access requests and also access numbers.

1.3 Purpose, Scope and Applicability

Our application can have a wide range of application with a fairly large amount of scalability. Following describes its purpose,scope and applicability:

1.3.1 Purpose

The goal of our application is to provide a quick and easy to use interface to access the phone in cases that prevent physical access to the device. This system should be available to be used with the least amount of vairable factors that can affect it. The network range of the device is the only limiting factor of the device.

1.3.2 Scope

Expected Outcome: A functioning system which can access the android device via Text Messaging service.
Required facilities :

1. Android Studio
2. Android device to test the application
3. Ability to send and receive SMSs

Knowledge areas needed for project:

- Good proficiency in JAVA
- Experience in using Android Studio IDE
- Knowledge of android eco-system.
- Knowledge of the protocols used for SMSs

The project is expected to complete in 4 months.

1.3.3 Applicability

The application is intended to be small and resource efficient. This allows for maximum number of installs. The application once installed need not be toyed with on a frequent basis, and the commands used by the application are easy to remember and use. It can be used in multiple situations which include forgotten phone, stolen phone, misplaced phone etc.

Chapter 2

LITERATURE SURVEY

2.1 Literature Survey

Previously all Smartphone manufacturers used to have dedicated software to control the phone using software from their desktops. But especially with the Android smart phones, no particular software is installed. There are plenty of custom third party applications available. But now with our system we can now remotely control your phone without internet.The previous softwares need to have an Internet access. Not any application works without internet. So this type of software requires more cost. This is the biggest disadvantage of previous software. In our application we remove the disadvantage of previous software. And we develop this application which works without internet. Or we can control our android phone remotely without internet. Without using any browser. The application requires only messaging feature. And all android mobile have an inbuilt messaging feature. What you have to do is you just have to send particular command in particular format as provided in application by sending message on your remote device or remote mobile phone, then the remote mobile work according to that command. An important thing to note is the security of data. In our current world the most important product is data. As such more than the actual phone itself the people fear for the data that they have stored in the phone. This can range from memos, images, videos, emails and variety of other data. Our application is intended to not only retrieve data but also protect it in case of theft. [2]

2.1.1 Existing System

The new research areas for the need of the man that controlled the electrical devices remotely, anything from the home such as an air conditioner, security system, set top box, light, and so on. The case of remote control capability and the possibility of achieving it at a reasonably low cost have motivated the need to research into it not only for industrial application but also for domestic use or home use. Home wireless security systems are becoming increasingly popular and it is being a necessary nowadays. The capability of controlling home appliances in a wireless and remote fashion has provided a great convenience to many people in life. Through a wireless remote controller, people can do remote operation without directly accessing the host of a home appliance. The home appliances like fan, lamp, television, washing machines and others. The introduction of the Global System for Mobile Communication (GSM) and particularly the use of hand-held mobile phones brought the innovation of distance communication at remote location. Based on this, research utilizes this facility for remote control of systems and appliances; take for instance, a man on a journey inside his car suddenly remembers that he left the Air Conditioner (AC), ON when it was supposed to be OFF. The normal condition is to drive back and switch OFF or for the home security we also monitor the home through the system but we are not include the option of the monitor in the system; in the system we consider only ON and OFF operation. But with the GSM mobile phone in the hand, one looks on how the same could be used to effect control at any point and time. The existing system was developed for hardware components. The existing system is the combination of hardware and software components both. But our proposed system works for the software components specifically it works with the data stored in our phone and that we require in our day-to-day life.

2.1.2 Proposed System

If you have forgotten your Cell Phone at home and you need to call a person urgently whose contact number is not available at that instant. In that case you have to call home and ask someone to search for that contact and then resend it back to you. It takes your lot of time. Instead of doing this tedious process one can send an SMS from someones cell to his/her own mobile in a predefined syntax. E.g.: GET CONTACT (Contact name/initial) password Also unread SMS can be retrieved using this application. E.g.: password GET SMS Also user can get location of the mobile, Email-id, Call Log. E.g.: password GET LOCATION E.g.: password GET EMAILID E.g.: password GET CALLLOG The contact name which you wish to get should write the way it is saved in his/her contact list. If one want multiple contacts, then send the initial of the contact name along with the syntax and the application will return all the contacts starting from that initial. Also unread SMS can be retrieved using this application.

2.1.3 Security Perspective

If one wants to get to know about this application, he/she can steal or can make an unauthorized access over the contacts. To secure the contacts from unauthorized access we can set a PIN number to be sent along with the syntax which will be known only to you. The application will match the PIN number, the syntax and then process and will reply back.

E.g.: 1234 GET CONTACT (contact name/initial) Or we can use challenge response for security purpose. In this the application will send a random number and user will respond with a number using challenge response. This will be predefined by the user and saved in SETTINGS of the application.

2.2 Problem Definition

Most of the mobile users cant remember their all contacts as they have a facility to save them in the phone book of their phone. This can be taken as advantage as well as a disadvantage. When user doesnt have his/her phone with himself/herself, he/she doesnt have access to the contacts available in that phone. It may also be possible that user doesnt know where he/she left his/her mobile phone. In such scenario, user will waste valuable time in finding for mobile phone. If user forgets his/her mobile phone at unknown place, user may miss important phone calls or messages which can cause delay in work. Possible solutions in existing systems are: User has to travel back to his home and access all missing information. User may call to his family member or friends in case user know the place of mobile phone and access those information. Alternate solution will be to develop a mobile application by which user can able to access all information from his mobile phone remotely.

There are many cases where user places his/her phone in silent/vibrate mode and misplaces it, even in the comfort of his home. The phone could also be stolen. Our application helps during both these cases.

Chapter 3

IMPLEMENTATION

3.1 Methodology

The approach required for implementation of the proposed system would be an iterative model. The iterative process begins with a simple implementation of a subset of the software requirements and iteratively enhances versions until the entire system is implemented. The basic idea is to develop a system through repeated cycles and in small portions at a time. This approach is suitable for the project because: Modifications and improvements maybe required during the course of the life cycle. Attempting to implement entire requirements at one go could prove risky. Smaller iterations will help eliminate issues at an earlier stage.

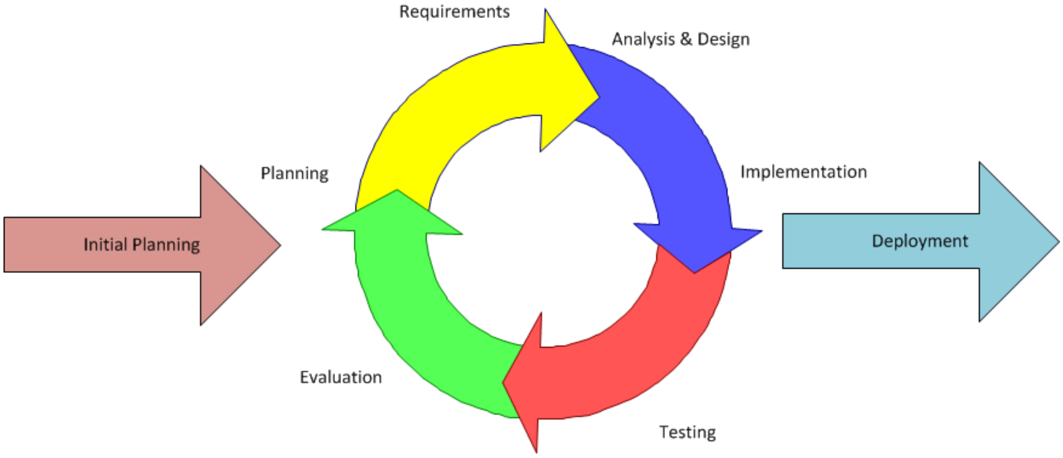


Figure 3.1: Iterative Model of approach

3.2 Software

Technologies Used -

- **GSM :** GSM is a TDMA based wireless network technology developed in Europe that is used throughout most of the world. Therefore in this project the GSM is the type of wireless that chooses. It is because it's the GSM is better than others wireless. It is suitable to install the systems that need a wide range. It also can monitor the signal strength and more adaptable. So it is suitable for our project.

- **SMS :** Short message service is a mechanism of delivery of short messages over the mobile networks. It is a store and forward way of transmitting messages to and from mobiles.SMS supports national and international roaming.

- **Android :** Android is a mobile operating platform owned by Google. 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.

- **IDE Used :** Android Studio

Why Android Studio? The application is coded through the Android Studio IDE. This is a comprehensive IDE for development of an Android application with support on any OS and any memory type(x64 / x86). This IDE is officially supported by Google and as such the higher popularity leads to better documentation and more available resources.

3.3 Design and Modeling

- **Design -** Based on the analysis of the system objectives and knowledge about various tools to be used, a rough system design is created. The different modules to be developed, the interaction between them, and their interaction with the system can be understood. The entire flow, beginning with login process to the hackers attempt is depicted.

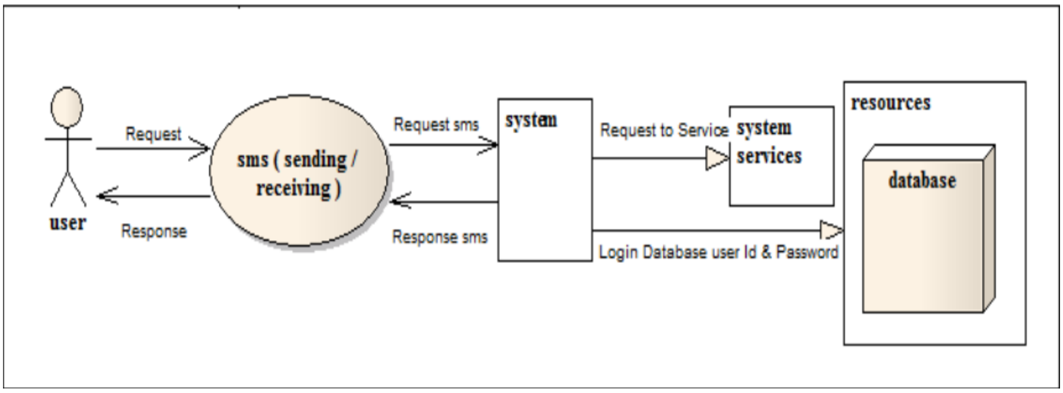


Figure 3.2: System architecture diagram

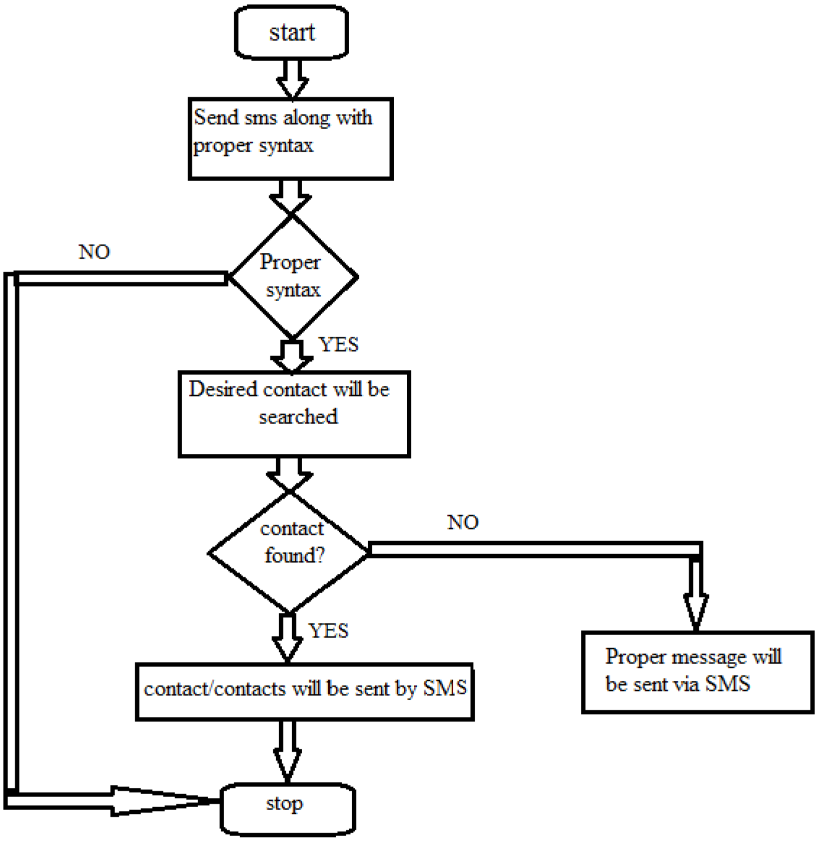

start
Send sms along with proper syntax
Proper syntax
NO
YES
Desired contact will be searched
contact found?
NO
YES
contact/contacts will be sent by SMS
Proper message will be sent via SMS
stop

Figure 3.3: Work Flow diagram

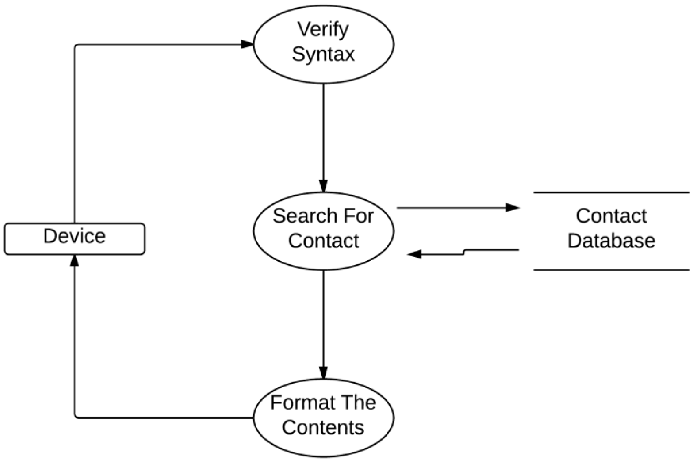


Figure 3.4: Data Flow Diagram

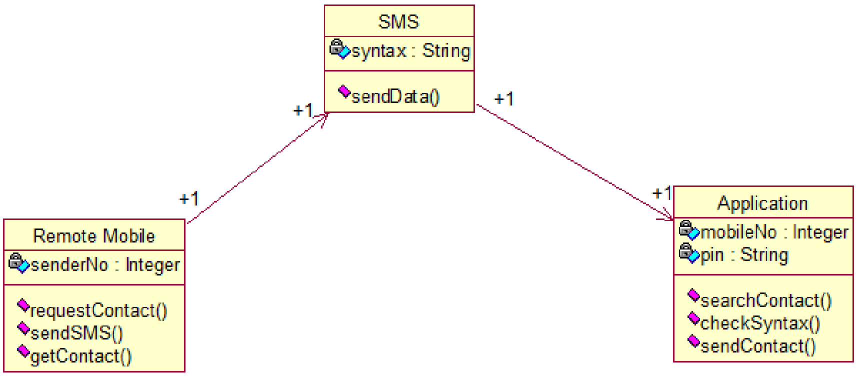


Figure 3.5: Class diagram

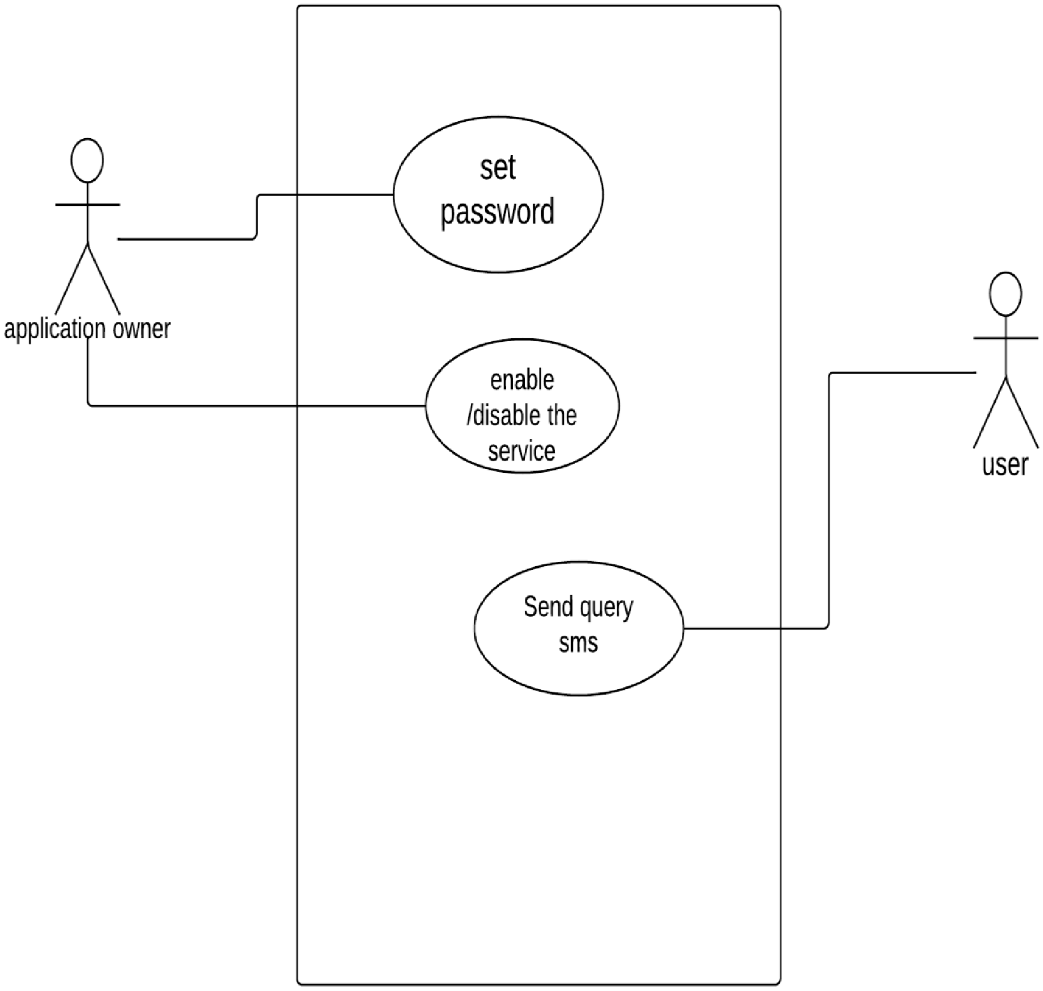


Figure 3.6: Use Case diagram

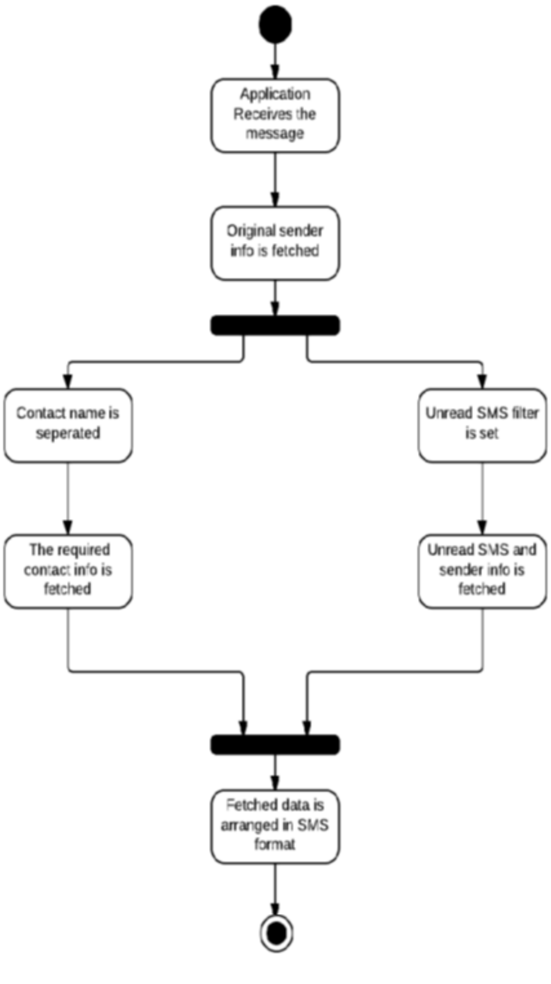

Application Receives the message
Original sender info is fetched
Contact name is seperated
Unread SMS filter is set
The required contact info is fetched
Unread SMS and sender info is fetched
Fetched data is arranged in SMS format

Figure 3.7: Activity diagram

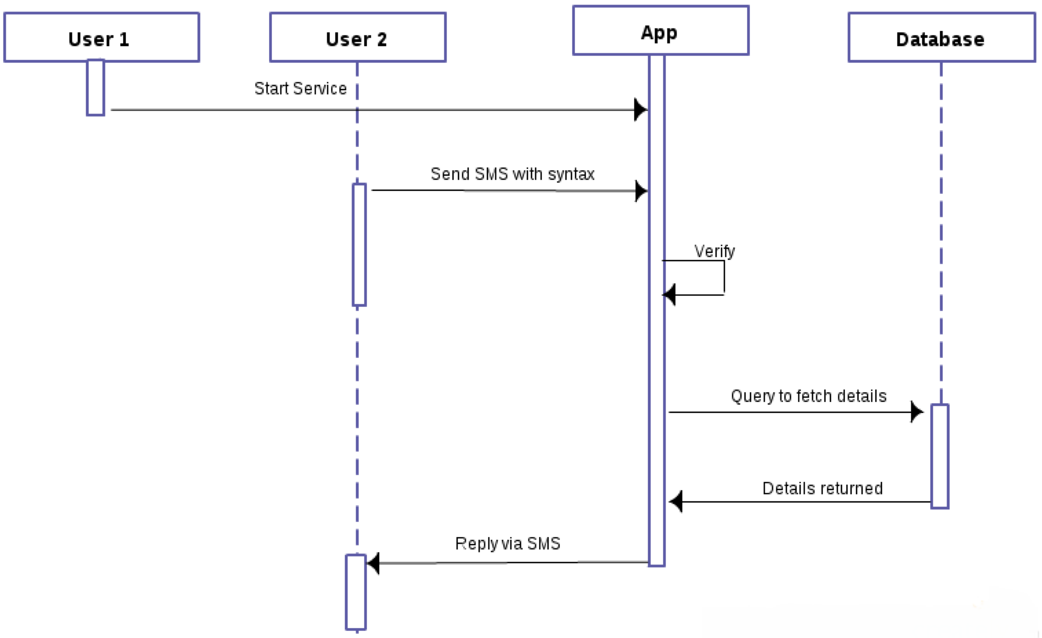


Figure 3.8: Sequence diagram

3.4 Implementation

Code for Detecting received SMS:

```
 public void onReceive(Context context, Intent intent) {

Log.d("IYER","SMS Received");
Toast.makeText(context, "SMS received", Toast.LENGTH_SHORT).show();

if (intent.getAction() != null && (intent.getAction().equals(SMS_RECEIVED))) {

// ---get the SMS message passed in---

Bundle bundle = intent.getExtras();

if (bundle != null) {

// ---retrieve the SMS message received---

Object[] pdus = (Object[]) bundle.get("pdus");

for (int i = 0; i < pdus.length; i++) {

//Need to check diff functions of SmsMesage  like getmsgbody works.
SmsMessage currentMessage = SmsMessage.createFromPdu((byte[]) pdus[i]);

String messageBody = currentMessage.getMessageBody();
String phoneNumber = currentMessage.getOriginatingAddress();
String displayMessageBody = currentMessage.getDisplayMessageBody();

f1.check(context,phoneNumber,messageBody);

} // end for loop
}
}
}
}
```

Code for Retreiving messages:

```
 public void getAllSmsFromProvider() {
List<String> lstSms = new ArrayList<String>();
String s;
ContentResolver cr = mcontext.getContentResolver();

Cursor c = cr.query(Telephony.Sms.Inbox.CONTENT_URI, // Official CONTENT_URI
from docs
new String[] {Telephony.Sms.Inbox.ADDRESS,
Telephony.Sms.Inbox.BODY,  Telephony.Sms.Inbox.DATE_SENT }, // Select body text
null,
null,
Telephony.Sms.Inbox.DEFAULT_SORT_ORDER); // Default sort order

int totalSMS = 5;
StringBuffer sb=new StringBuffer();

if (c.moveToFirst()) {
for (int i = 0; i < totalSMS; i++) {
Date dateTime = new Date(Long.valueOf(c.getString(2)));
s="No-"+c.getString(0)+",Text-"+c.getString(1)+",Date-"+dateTime;
c.moveToNext();
Log.d("IYER",s);
sb.append(s);

}
sendSMS(phNO,sb.toString());
} else {
sendSMS(phNO,"No messages found");
}
c.close();


}
```

Code for Retreiving calllog: [7]

```
    public void calllog(String phoneNumber, String messageBody,
    String password,Context context) {

 StringBuffer sb= new StringBuffer();

ContentResolver c= context.getContentResolver();
Cursor cursor=c.query(CallLog.Calls.CONTENT_URI,null,null,null,null);
int i;
sb.append("CALL LOGs \n");

for(i=0;i<5;i++) {
while (cursor.moveToNext()) {
String phNumber = cursor.getString(cursor.getColumnIndex(CallLog.Calls.NUMBER));
String callType = cursor.getString(cursor.getColumnIndex(CallLog.Calls.TYPE));
String callDate = cursor.getString(cursor.getColumnIndex(CallLog.Calls.DATE));

Date callDayTime = new Date(Long.valueOf(callDate));

if (Integer.parseInt(callType) == CallLog.Calls.INCOMING_TYPE ||
 Integer.parseInt(callType) == CallLog.Calls.MISSED_TYPE || Integer.parseInt(cal
  CallLog.Calls.OUTGOING_TYPE) {
sb.append("\n Phone Number: " + phNumber + "   Call Date: " + callDayTime);
}

}
}
```

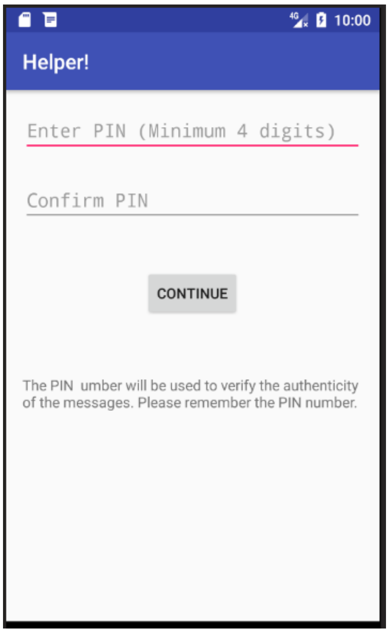
Code for Retreiving contact: [5]

```
 public void contacts(String phoneNumber,String messageBody, String password,
 Context context)
{
StringBuffer sb=new StringBuffer();
ContentResolver c=context.getContentResolver();
Cursor cursor=c.query(ContactsContract.Contacts.CONTENT_URI,null,null,null,null)
String substr=messageBody.substring(messageBody.indexOf("getcontact"));

String[] separated = substr.split(",");
StringBuffer con=new StringBuffer();
int i;

while(cursor.moveToNext()){
String id=cursor.getString(cursor.getColumnIndex(ContactsContract.Contacts._ID))
String name=cursor.getString(cursor.getColumnIndex(
ContactsContract.Contacts.DISPLAY_NAME));

if(!messageBody.toLowerCase().contains(name.toLowerCase()))
{
continue;
}

Cursor pcursor=c.query(ContactsContract.CommonDataKinds.Phone.CONTENT_URI,null,
ContactsContract.CommonDataKinds.Phone.CONTACT_ID+"=?",new String[]{id},null);

while (pcursor.moveToNext()){
String number=pcursor.getString(pcursor.getColumnIndex(
ContactsContract.CommonDataKinds.Phone.NUMBER));
sb.append(name+":"+number+",");
}
pcursor.close();
}
Log.d("IYER","contactsflasg");
Toast.makeText(context, sb.toString(), Toast.LENGTH_SHORT).show();
sendSMS(phoneNumber,sb.toString());
cursor.close();
}
```

Code for Retreiving location: [6]

```
public void locate(Context context, String phoneNumber) {
Toast.makeText(context, "Locating", Toast.LENGTH_SHORT).show();
Log.d("IYER", "Locating");
GoogleApiClient.Builder builder=new GoogleApiClient.Builder(
context.getApplicationContext());
builder.addApi(LocationServices.API);
builder.addConnectionCallbacks(this);
builder.addOnConnectionFailedListener(this);
mLocationClient=builder.build();
if (mLocationClient != null) {
mLocationClient.connect();
}

}


@Override
public void onConnected(Bundle bundle) {
String address="";
mLastLocation=LocationServices.FusedLocationApi.getLastLocation(mLocationClient)

if(mLastLocation!=null){
double latitude=mLastLocation.getLatitude();
double longitude=mLastLocation.getLongitude();


Geocoder geocoder=new Geocoder(mcontext.getApplicationContext(), Locale.ENGLISH)
try{
List<android.location.Address> addresses=geocoder.getFromLocation(latitude,
longitude,1);
if(addresses!=null){
android.location.Address fetchedAddress= addresses.get(0);
address="i am at: "+fetchedAddress.getFeatureName()+","
+fetchedAddress.getSubLocality()+","
+fetchedAddress.getLocality()+"-"+fetchedAddress.getPostalCode()+","
+fetchedAddress.getAdminArea()
+","+fetchedAddress.getCountryName();

}
}
catch (Exception e){
e.printStackTrace();
}
/*
sendSMS(phNO,address.toString());
*/

sendSMS(phNO,"http://maps.google.com/?q="+latitude+","
+longitude+" "+address.toString());

}
else {
address="Location not found";
}

}
```

3.5 GUI



The PIN umber will be used to verify the authenticity of the messages. Please remember the PIN number.

Figure 3.9: Initial screen on 1st usage

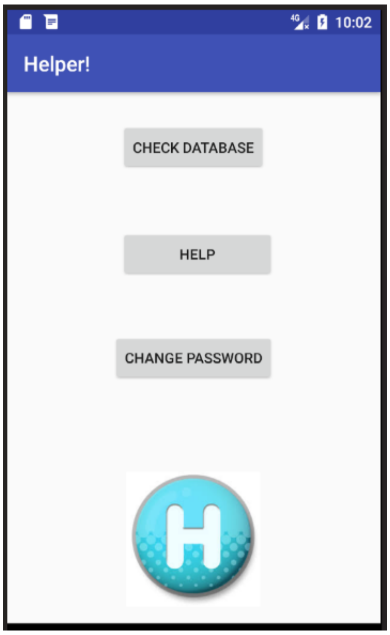
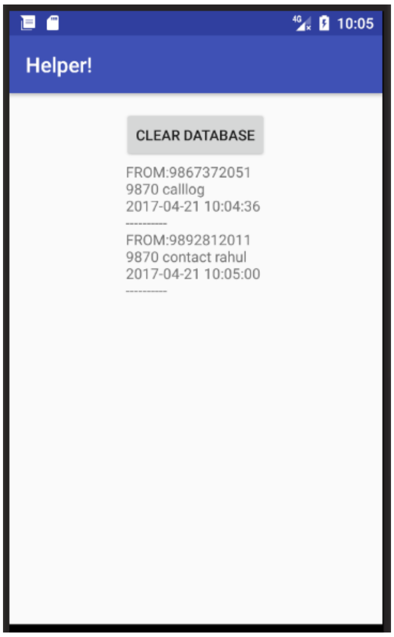


Figure 3.10: Home screen



FROM:9867372051
9870 calllog
2017-04-21 10:04:36

FROM:9892812011
9870 contact rahul
2017-04-21 10:05:00

Figure 3.11: Database

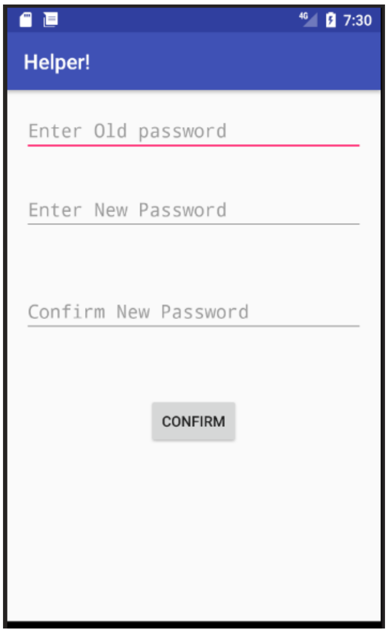
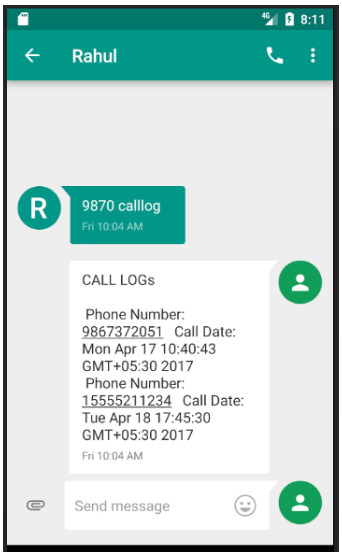


Figure 3.12: Change Password

Chapter 4

RESULT AND DISCUSSION



9870 calllog
Fri 10:04 AM

CALL LOGs

Phone Number: 9867372051 Call Date: Mon Apr 17 10:40:43 GMT+05:30 2017
Phone Number: 15555211234 Call Date: Tue Apr 18 17:45:30 GMT+05:30 2017
Fri 10:04 AM

Figure 4.1: Example of calllog retreival

- The above image is an example of the message that is generated and sent to the user who sent the commmand ”calllog”. Our application has satisfied the goals that had been set during the planning phase.

- The application is suitable for day to day use and most people will find that having this application installed on your phone would be beneficial in the long run. It is better to have the app and not need it, than not having the app and needing it.

- The scope of the application is limited by the system calls which are available to an application in the android eco-system. Some of our ideas on how to add functionality to the application led to a dead end since android simply did not have the necessarily framework to provide the functionality to us.
- **Troubleshooting -** We faced a few problems during the course of this project which include but are not restricted to

    1. Different versions of android behave differently which led to a lot of time wastage just in finding out these peculiarities.
    2. The Android Studio IDE is relatively new and as such many implementations avaialable online are for older IDEs like Eclipse.
    3. Many a times the unreliable mobile networks led to the application being unable to function as expected.

Chapter 5

CONCLUSION AND FUTURE SCOPE

Thus the application is very small, simple and easy to use by using SMS service. The best part of the system is that it has a very low Memory Footprint i.e. it is very light on your phone's resources. The application overcomes the problem of 160 character length of a message. SMS based remote control for general purpose is beneficial for the human generation, because mobile is most recently used technology nowadays. The SMS based remote control for home appliances is easy to implement the system that ON/OFF the electrical device through remotely via SMS or it handled more and more electrical devices which are use in home. In simple automation system where the internet facilities and even PC are not provided, one can use mobile phone based control system which is simple and cost-effective. Alternatively for such requirements landline phone with extension card could also be select for the system. The application can be able to send other information such as email ID, address and other personal details via message using Multimedia service. One will not need to access internet to get the personal information.

The future is endless for an application of this kind as the functionality of such an application depends on the frameworks provided in the android ecosystem. We could add features like retrieval of images, videos and emails. Giving commands via a phone call is also something we researched and intend on implementing in this project in the future.

Thank you

References

[1] Amit Chauhan, Reecha Ranjan Singh, Sangeeta Agrawal, Saurabh Kapoor, S. Sharma (2011): IJCSMS International Journal of Computer Science and Management Studies, Vol. 11, ISSN (Online): 2231-5268

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