

# Remote Data Acquisition From Android Mobile

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**Abstract---** In the recent years it has been seen that mobile has become one of the most important electronic devices. Earlier to mobile devices computers played an important role doing tedious human work with less human effort. Accessing the remote data was not a difficult task since this was done using Internet, but carrying the computer along was not possible to access data. So mobile phones are used. The mobile phones were restricted only for making calls and sending SMS in the beginning, but in past few years it is seen that mobile devices also work as a multimedia device. Looking at these applications, an idea for developing a new application to retrieve the data like contact details, SMS from inbox emerged. We consider a scenario where a user forget to carry his Android mobile and wants to access his/her contacts and SMS from the Android mobile. This can be done by developing an application where the Android mobile will send the requested contacts and inbox messages on receiving a SMS from other mobile phone in a defined format. The format consists of the Password, Name of the contact / the particular date. The project on "Remote Data Acquisition from Android Mobile" is to access the data like Contacts and received messages from his smartphone just by sending simple short messages through any phone. This service is password protected so that only the authorized user can access the information. Android is a growing platform for the Smartphones, tablets and other devices. It's a small effort from us to join our hands to make a user friendly and a handy tool to reduce the human effort in the strange situations.

**Keywords**—Data Acquisition, Remote data, Android

## 1. INTRODUCTION

In the recent years it has been seen that mobile has become one of the most important electronic devices. Earlier to mobile devices computers played an important role doing tedious human work with less human effort. Accessing the remote data was not a difficult task since this was done using Internet, but carrying the computer along was not possible to access data. So mobile phones are used. The mobile phones were restricted only for making calls and sending SMS in the beginning, but in past few years it is seen that mobile devices also work as a multimedia device. The device not only helps to

access data but it does many other tasks such as entertainment, etc. The PDA's and other such devices help the user to access any information around the globe. Some of the applications that help to access remote information are as follows

- Weather Forecast: It is the application of science and technology to predict the state of the atmosphere for a given location. Human beings have attempted to predict the weather informally for millennia, and formally since the nineteenth century. Weather forecasts are made by collecting quantitative data about the current state of the atmosphere and using scientific understanding of atmospheric processes to project how the atmosphere will evolve.
- Fring: Fring is a centralized chat platform where one can integrate famous chat programs like Google Talk, Yahoo Messenger, Yahoo, Skype, and ICQ etc. One can make VOIP calls wherever they can get Wi-Fi network. One can also make cheap international calls through Skype at cheap rates.
- Google map: Google map application is quite useful. One can find information like turn-by-turn direction to a destination that they are seeking; get access to a local business or office.

These applications were developed for symbian operating system phones. It was observed that developing a specific user application was quite difficult for any user over symbian phones. But now the latest operating system - ANDROID is an open source using which any user can develop his own application or can think of an application, which the user phone is not enabled. Some of the applications where the ANDROID phones work are as a virtual machine where the data can be transferred from mobile to mobile or in some cases from mobile to computer.

Looking at these applications, an idea for developing a new application to retrieve the data like contact details, SMS from inbox emerged. We consider a scenario where a user forget to carry his Android mobile and wants to access his/her contacts and SMS from the Android mobile. This can be done by developing an application where the Android mobile

will send the requested contacts and inbox messages on receiving a SMS from other mobile phone in a defined format. The format consists of the Password, Name of the contact / the particular date.

## 2. PROBLEM DEFINITION AND REQUIREMENTS

Consider the situation where the user has Android Smartphone, with irrespective of any work or urgency, unknowingly for some desperate reason he may forget and leave his Android Smartphone at home and then went to some remote place. He realizes that he has left his Smartphone at home itself. Then there are probably chances of missing SMS's and also missing some important contact information that might be very important for him. So he may be in need of those information's like contacts and recent SMSs.

### Possible Solutions

- He might travel back to his home and check those information.
- He may call to his home members/friends and enquire; it can be infeasible in case of absence of home members.  
Also, it leads to enormous wastage of time and effort and it also becomes the irrelevant/infeasible solution.
- Alternatively, the idea here is to help the users to get those contacts and SMS by sending simple SMS securely.

### 2.1 Problem definition

To provide access to remote information securely by sending a simple SMS so as to reduce the workload of the user, allowing only the authenticated user to access the information. The user must access contact details or any messages without any kind of user interactions.

### 2.2 System Requirements Specification

The software requirement specification is produced at the culmination of the analysis task. The function and performance allocated to software as part of system engineering are refined by establishing a complete information description as functional representation, a representation of system behavior, an indication of performance requirements and design constraints, appropriate validation criteria.

#### 2.2.1 Hardware requirements

- Processor: ARM or QUALCOMM Processor (32 bit).

- RAM: **128MB** or more.
- Hard Disk: Minimum 200MB.
- Android Mobile Phone.

#### 2.2.2 Software requirements

- Android SDK 1.5 and more.
- Eclipse IDE
- H Programming language JAVA and XML
- Operating System Android (Linux Kernel).

#### 2.2.3 Functional Requirements

The system is required to perform the following functions.

- Display all the information about the application that is being developed and some set of instructions the user might want to remember before he sets up the system for configuring global time.
- Sign in your application with jar signer before running the application with start and stop facility for the application.
  - Install the apk file with Android bridge (i.e adb).
  - Android operating system version 1.5 and above.
  - Android mobile phone with accelerometer to detect the fall.
- Alert message to notify the user that the fall has occurred
- SMS message-message sent to the social contact giving the details of the fall.

#### 2.2.4 Non-Functional Requirements

The non-functional requirements of the system (to provide safety, security, maintainability, usability and testability) are

- Application framework enabling reuse and replacement of components.
- Dalvik virtual machine optimized for mobile devices.
- Integrated browser based on the open source Web Kit engine.
- Optimized graphics powered by a custom 2D graphics library; 3D graphics based on the OpenGL ES 1.0 specification (hardware acceleration optional).
- SQLite for structured data storage.
- Rich development environment including a device emulator, tools for debugging, memory and performance profiling, and a plug-in for the Eclipse IDE.

### 3. PROPOSED MODEL

The class model and functional model of the Remote Android Access application.

#### 3.1 Class model

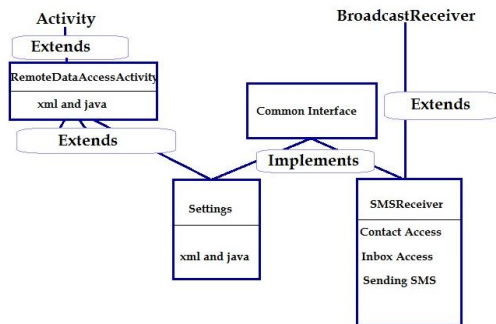


Figure 3.1: Class model

**RemoteDataAccessActivity class:** In the class model, Activity extends RemoteDataAccessActivity class with front end tool xml and back end tool like Java.

**Settings class:** The Settings class extends RemoteDataAccessActivity class. It is used for setting the password using the interface.

**SMSReceiver class:** When the SMS registered in the BroadcastReceiver enables application to receive intents that are broadcast by the system even when the components of application are not running. When the SMS is received it will be stored in onReceive () function of SMSReceive () class which inturn extends BroadCastReceiver.

Here Setting and SMSReceiver implements Common Interface because password will be set in settings and when the SMS is received it should match with format of SMS. When there is a match, the user can easily access contacts and inbox messages. If there are any corresponding matches found with respect to these accesses, it generates text message and sends back to user.

#### 3.2 Functional model

The flow sequence of the Remote Android Access is shown in the below Figure 5.2.

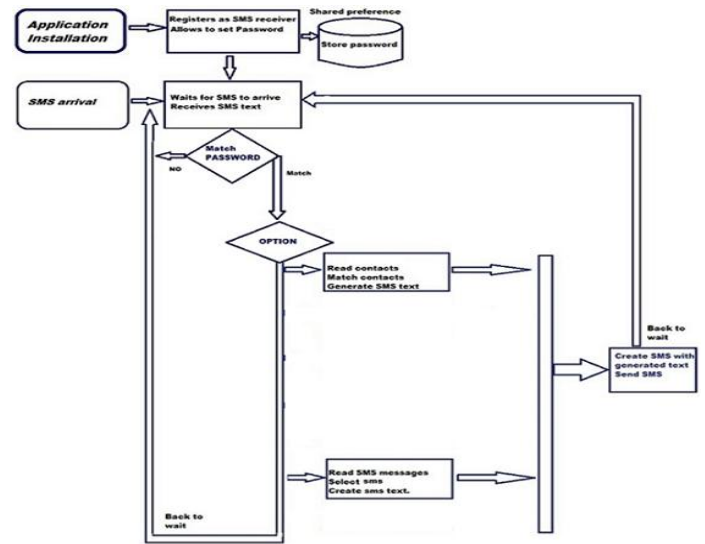


Figure 3.2: Functional model

The very first and foremost thing is that the application needs to be installed. Then the installed application is registered to SMS receiver. Receiving the SMS allows the application to set the authorization and authentication like username and password.

In the development of program code, the program is arranged or associated with password which cannot be modified. However if the user wants to change he has to go back to development and modify it. Run that program, then “apk” file needs to be installed in the mobile and later run the application. To overcome this disadvantage we reset the password, so every time when the .apk file will be installed on mobile device and run we can setup a new password of our own to access the information

The next step is waiting for the SMS arrival. When the SMS is received it is registered as per SmsReceiver, then it calls the BroadcastReceiver which enables the application to receive intents that are broadcast by the system or by others applications even when the other components of application are not running. If password matches then user will be able to access Contacts and Inbox SMS

#### Contact Access

The format followed for contact access is mentioned below,

Getcontact<coma>password<coma>contactname  
 If the entered password is matched with the set password then it will access the requested contact number. Getting the requested contact number may be an issue because user should be sure that he

should know the manner he has saved the contacts in phone memory. It is somewhat case sensitive. To overcome this disadvantage, the string of the contactname will access the contact number.

We know that every contact name that is saved in the phone will be given a unique contact Id. When the contactname is received from the sent SMS it will be assigned with some unique contact Id. It sorts contact details of that particular person on the basis of the contact-Id's and sends back the name and number of that respective person.

If there are any relevant contact numbers found, then it checks the contact name which matches with the same valid contact number stored in phone book and if there some contact number that matches with same contact name it generates text message that includes the informations such as contact name, contact-Id and phone number saved in the phone memory. This message is sent to corresponding user who is in need of such contact details.

### SMS access

The format followed for SMS access is mentioned below,

Getsms<coma>password<coma>date

This option is sent for SMS. If the above format matches, it first checks message in the inbox. If there are any messages in the inbox on that particular date, it will generate a text message and send all the messages on that particular date. If message in the inbox exceeds 160 characters, then the particular message is split into two messages and generates the text message and the message is sent. If there are no messages in the inbox on that particular date then a message is generated as no messages available on that particular date.

## 4. WORKING PROCEDURE OF THE APPLICATION

### Application installation and shared preferences

To run a compiled application, one must load the .apk file to the /data/app/ directory in the Emulator using the adb tool and start the emulator (run \$SDK\_HOME/tools/emulator from the command line)

1. On the emulator, navigate to the home screen.
2. In the emulator, open the list of available applications, and scroll down to select and start your application.

When the specified application runs successfully, it generates .apk file. This .apk file should be installed by the user on the smart phone and then use the application.

### On SMS arrival

The application is waiting for SMS to arrive. When the SMS is sent it will be freely registered in the "SMS-RECEIVED" class. It means that when the SMS is sent it calls BroadcastReceiver as smsrev is object of BroadcastReceiver class. The BroadcastReceiver enables the application to receive intents that are broadcast by other applications even when the other components of application are not running. Once the code returns from this function, the system considers the object to be finished and no longer active.

This has important repercussions to what you can do in an onReceive (Context, Intent) implementation: anything that requires asynchronous operation is not available, because you will need to return from the function to handle the asynchronous operation, but at that point the BroadcastReceiver is no longer active and thus the system is free to kill its process before the asynchronous operation completes. When it calls the BroadcastReceiver, it activates the overall execution process at once.

## 5. RESULTS

### 5.1 Reset Password

As soon as we install the application and run on Android mobile, the screen as shown in figure 5.1a appears.

Here new password can be set using the default password and a new password is used by the user to access information.

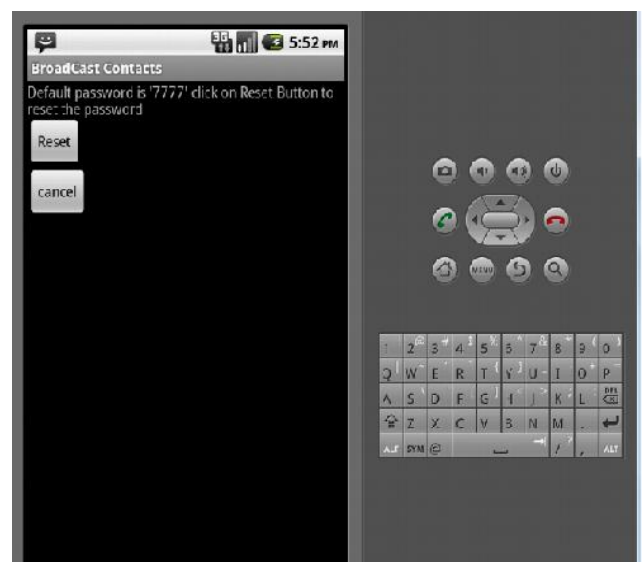




Figure 5.1a: Reset Password

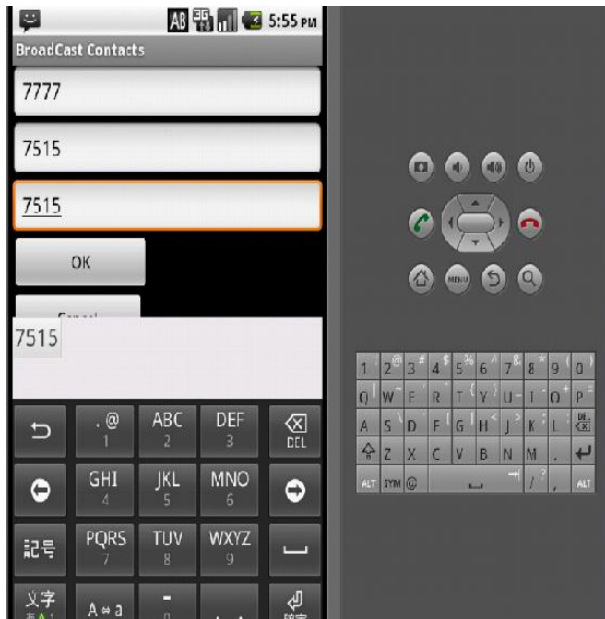


Figure 5.1b: Setting up new password

As seen in the figure 5.1b, the new password is set as **7515** and this password will be used to authenticate the user to access the information. The password will be reset once .apk file is run on the mobile. If the user wants to reset the current password **7515**, he/she has to remember this password.

### 5.2 Format to Access Contact

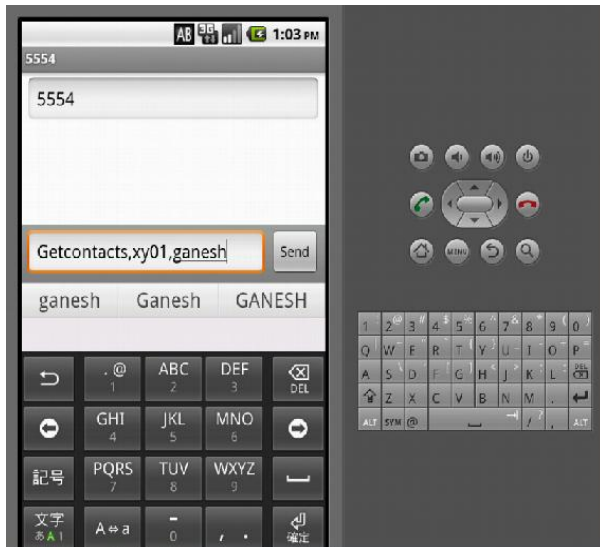


Figure 5.2a: Format to Access Contact

Format to access contact is mentioned below:

Getcontacts <coma> Password <coma> contact name.

If the format matches, Android set replies with the contact details which includes contact name and contact number in the form of text message  
Example 1: To access the contact details of “ganesh”, the message to be sent is

Getcontacts, xy01, ganesh

Example 2: If the user has forgotten the way the contact name is saved in the Android phone, then the user can just send message with “ga” as

Getcontacts, xy01, ga

Now all the contacts starting with “ga” will be retrieved in the textual form.

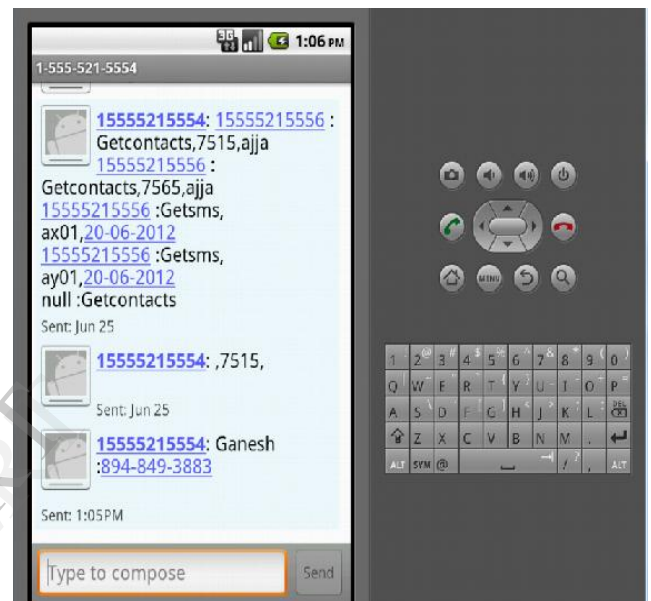


Figure 5.2b: Details found

If the application finds the corresponding contact details, the contact name and contact number is displayed on the relevant user mobile.

If the format is wrong then it sends the error message as “message format or password incorrect”.

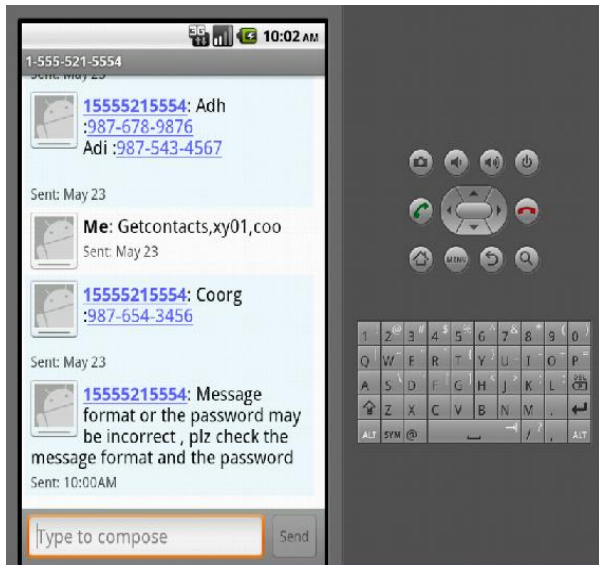


Figure 5.2c: No details found

If the format sent is not correct, then the message is displayed as shown in figure 5.2c.

### 5.3 SMS access

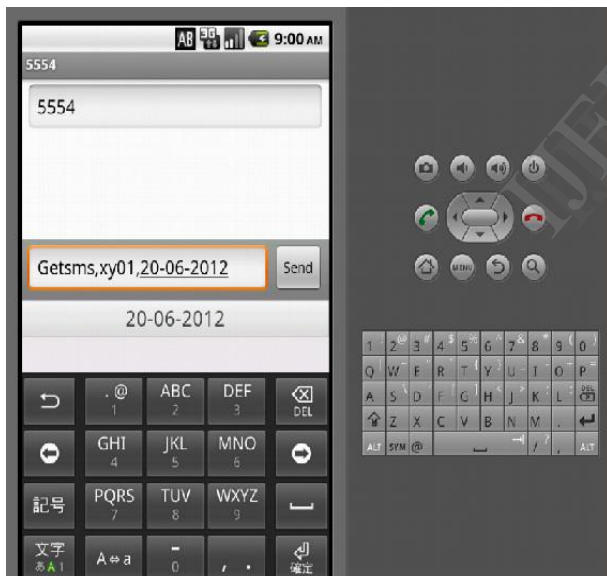


Figure 5.3a: SMS Access

Format is mentioned below:

Getsms <coma> Password <coma> date

If the user wants to access the messages of 20-06-2012, the command sent is

Getsms,xy01,20-06-2012

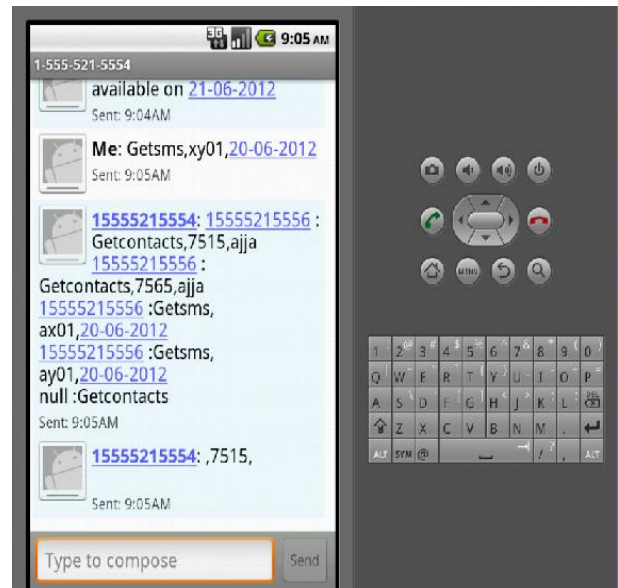


Figure 5.3b: SMS Details Found

After matching the format, Android application searches for the SMS on that particular date and sends back all messages available of that day. The result of SMS request is shown in figure 5.3b

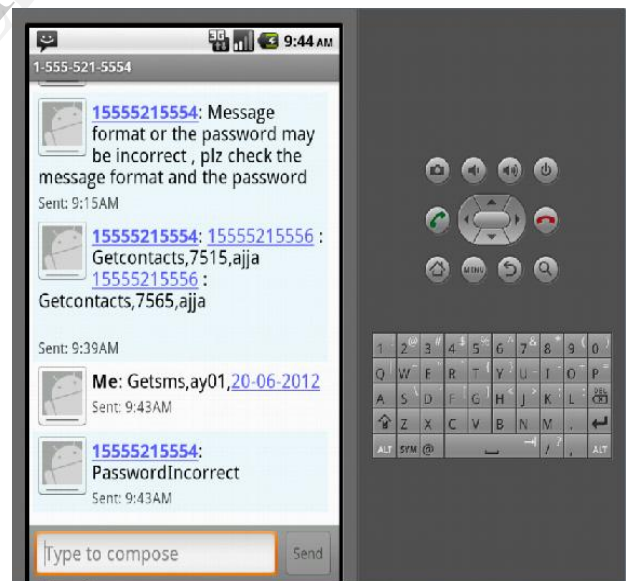


Figure 5.3c: Incorrect Format

If the entered format is incorrect, then there will be reply message as “password incorrect”.

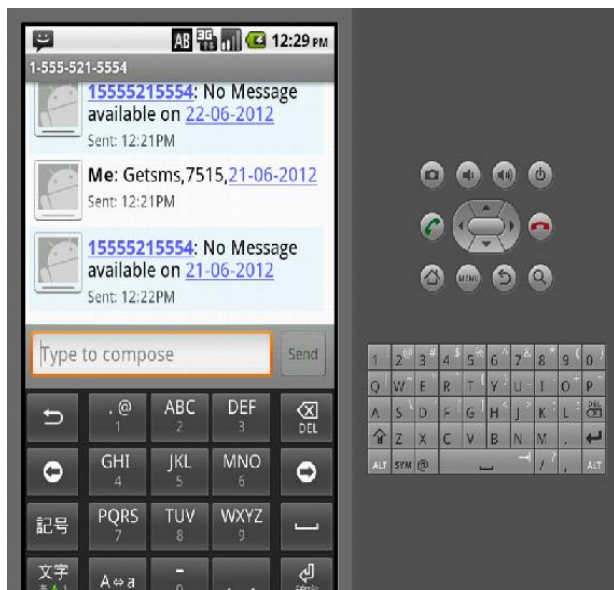


Figure 5.3d: No Details found

If there are no messages found of that particular date, then it displays the error message that “no messages available”.

## 6. CONCLUSION

With the help of Android SDK, Eclipse IDE, JDK and SMS services, the Remote Data Access application is implemented. With this application, accessing the Android Smartphone is just a SMS away. This application is successfully completed with the various tests on emulator and on various handsets. This guarantees reduced human effort in the emergency situations with the simple and handy interface. It's a small effort from us to join our hands to make a user friendly and a handy tool to reduce the human effort in the strange situations.

This work can be extended to access multimedia files and other informations remotely from Android mobile.

## REFERENCES

- [1] Laura Bright, Louiqa Raschid, “Efficient Remote Data Access in a Mobile Computing Environment”, Proc.International workshop on parallel processing 2000.
- [2] Andrew L. Kun, Kadir Doga, “A prototype remote access and mobile data transaction

system for police cruisers”, Vehicular technology conference 2002.

- [3] Jeff Siegel and Paul Lu, “User-Level Remote Data Access in Overlay Metacomputers”, 2002 IEEE.
- [4] Wen-Chih Peng and Ming-Syan Chen, “Shared Data Allocation in a Mobile Computing System: Exploring Local and Global Optimization”, Transactions on parallel & Distributed system Vol. 16, No. 4, APRIL 2005.
- [5] Jarkko Tolvanen, Tapio Suihko, Jaakko Lipasti, and N. Asokan, “Remote Storage for Mobile Devices”, International Conference on Communication system software & middle Ware 2006.
- [6] Malik Sikandar Hayat Khiyal, Aihab Khan, and Erum Shehzadi, “SMS Based Wireless Home Appliance Control System (HACS) for Automating Appliances and Security” Issues in Information Science & Information Technology Vol .6, 2009
- [7] Chen Xiaorong Shi Zhan Ge Zhenhua, “Research on Remote Data Acquisition System Based on GPRS”, International Conference on Electronic Measurement & Instruments 2007
- [8] Daniel Heß and Christof Röhrig, “Remote Controlling of Technical Systems Using Mobile Devices”, International Workshop on Intelligent data acquisition & advanced computing systems 2009.
- [9] Jean Paul Talledo Vilela, Jose Carlos Miranda Valenzuela, “Design and Implementation of a Wireless Remote Data Acquisition System for Mobile Applications” Proc.International Workshop on design of reliable Communication Network 2005.
- [10] Haitao JIA, Li CAO, “A Remote Data Acquisition System Based on SMS” International conference on Systems & Cybernetics 2004.