

PROJECT REPORT on
Smart Assistant

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This Report Submitted as Partial Completion of the Requirements for the Degree
of Bachelor of Science in Computer Science & Engineering

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DAFFODIL INTERNATIONAL UNIVERSITY
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APPROVAL

This Project/internship titled “Smart Assistant”, submitted by **Md. Arifur Rahman, Md. Aklasur Rahman Robin & Md. Mahedi hassan**, ID No: 162-15-7784, 162-15-7708 & 161-15-7418 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 8th July 2020.

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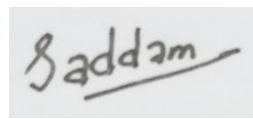
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We hereby announce that, this project has been done by us under the supervision of **MD. Sazzadur Ahamed, Senior Lecturer, Department of CSE at Daffodil International University**. We also announce that this project or any a part of this project hasn't been submitted any other place for award or any kind of degree/diploma.

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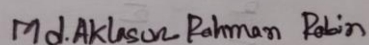


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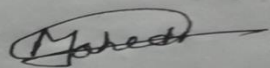
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We would like to reveal our passionated thankfulness to our family. Thanks a lot for their support and unbounded love to us. They always with us when we go through bad situations they gives inspiration & lot of support to us. Without their support, inspiration, this project work would not have completed. So we decided to our project is dedicated to them.

We would like to thankful all the faculty member of Computer Science and Engineering, Daffodil International University.

ABSTRACT

Android is an most used operating system & programming platform developed by Google co.. It is a Linux based operating system & it is designed for mobile phones and other mobile devices, such as tablets. It was developed by the **Open Handset Alliance**, which is led by Google.

The OS have exhibited a lot in last fifteen years. Which was started from black & white phones to recent smartphones or tablets. It can run on different kinds of devices from many manufacturer company. It includes a software development kit also known as SDK, which helps us to write codes and assemble software modules to create & design apps for users. Android also provide market place for developer. It is easy to use and understand. The Software development kit contain software libraries of pre-written codes, a debugger, a device emulator, sample code to use, and tutorials to learn. Google provides a user friendly integrated development environment (IDE) named Android Studio.

It's an online era, in this age it's totally unbelievable to control any Mobile call in personal work time or important work time. The "**Smart Assistant**" has been develop to override the problems prevailing in the practicing manual system. Online is the best way for sending file, to communication each other and to do anything quickly.

Our project based on java language. We use Room Database as data manager. Any people can easily use our application. Our system is highly secure. User can easily create a event and organize their work list in our Smart Assistant app. User can set a location which one user want that his/her mobile will be silent automatically on that spot. There are many emergency numbers that will help the user in the time of emergency. One user can create, edit or delete one or more events at a time. User Interface is so user friendly. This application will give good performance in real time. Location accuracy is so good. This is well organized system.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

It's an online era, in this age it's totally unbelievable to control any Mobile call in personal work time or important work time. The “**Smart Assistant**” has been develop to override the problems prevailing in the practicing manual system. Online is the best way for sending file, to communication each other and to do anything quickly.

In our daily life we should be use time in proper way, because it's the valuable moment for learning. But despite being a technology, for doing small job we waste a lot of time. We are going to create an App to reduce waste of time. This App name is “Smart Assistant”.

At the first moment we just make sure about our unique Idea but the project was very hard for us, because we did not have any knowledge about this, also we had to learn a lot of things to implement this project.

Software development kit also known as SDK, which helps us to write codes and assemble software modules to create & design apps for users. Android also provide market place for developer. It is easy to use and understand. The Software development kit contain software libraries of pre-written codes, a debugger, a device emulator, sample code to use, and tutorials to learn. Google provides a user friendly integrated development environment (IDE) named Android Studio. Our project based on java language. We use Room Database as data manager. Any people can easily use our application. Our system is highly secure.[1]

Smart assistant is an android application which is much user friendly for mobile user. Every people over the world can use this app. This app mainly focused on Silent the mobile of user in a predefine time or predefine location.

1.2 Motivation

The amount of working people is increasing at present time. Every day, they sit in meetings for some important topic discussion, maximum time they forgot to silent their phone. We see in our country we have lot of masjid, mondir etc. Because of religious people maximum time they forgot to silent their phone and disturbed another people. Some time we fall down some dangerous moment then we need family backup. We think these types of Problem then we think about our project and try to solve these problems.

1.3 Objectives

- Emergency Automatic call
- Automatic Silent phone
- Tracking Location where Masjid , mondir
- To avoid manual and repetitive work.
- To reduce waste of time.
- Improving decision making

1.4 Expected Outcome

- Enable Easier access to information
- Provide a new platform for People

- A good way to improve your time without wasting time.
- Enable easier to get perfect result.
- Location based Phone silent.
- Lost phone finder.

CHAPTER 2

BACKGROUND

2.1 Introduction

Android is an most used operating system & programming platform developed by Google co.. It is a Linux based operating system & it is designed for mobile phones and other mobile devices, such as tablets. It was developed by the **Open Handset Alliance**, which is led by Google. The OS have exhibited a lot in last fifteen years. Which was started from black & white phones to recent smartphones or tablets. It can run on different kinds of devices from many manufacturer company. It includes a software development kit also known as SDK, which helps us to write codes and assemble software modules to create & design apps for users. Android also provide market place for developer. It is easy to use and understand. The Software development kit contain software libraries of pre-written codes, a debugger, a device emulator, sample code to use, and tutorials to learn. Google provides a user friendly integrated development environment (IDE) named Android Studio. It's an online era, in this age it's totally unbelievable to control any Mobile call in personal work time or important work time.[2] The "**Smart Assistant**" has been develop to override the problems prevailing in the practicing manual system. Online is the best way for sending file, to communication each other and to do anything quickly. Our project based on java language. We use Room Database as data manager. Any people can easily use our application. Our system is highly secure. User can easily create a event and organize their work list in our Smart Assistant app. User can set a location which one user want that his/her mobile will be silent automatically on that spot. There are many emergency numbers that will help the user in the time of emergency.

One user can create, edit or delete one or more events at a time. User Interface is so user friendly. This application will give good performance in real time. Location accuracy is so good. This is well organized system.

2.2 Research Summary

Smart assistant is a android application which is much user friendly for mobile user. Every people over the world can use this app. This app mainly focused on Silent the mobile of user in a predefine time or predefine location. In our daily life many time we faced a problem. That common problem is phone ringing in unwanted place like meeting, class, mosque. In those place if our phone ringing up then that become more pathetic moment for us. So we thing two solution to solve this type of problem. First one is silent a mobile phone automatically in a pre define time. User will set that time before the event. User also can get a notification about that event before the time. Second one is silent phone on predefine location. Those location can be like Mosque, temple etc. If user reach those location then phone will automatically be silent. User can create events also can edit or delete those. After every successful event completion event will be automatically deleted. During event period if any call reach on user phone an automatic sms will be sent from user phone. User can configure what will be sent as sms during the event period. We develop this application to reduce anxious feeling of ringing up phone in meeting or during prayer.

2.3 Challenges

At the first moment we just make sure about our unique Idea but the project was very hard for us, because we did not have any knowledge about this, also we had to learn a lot of things to implement this project. We have re practicing Java, learn about Room Data, learn about google API, Geo-fencing, also learn many more things. First of all we thing two solution to make our application. First one is silent a mobile phone automatically in a predefine time. User will set that time before

the event. User also can get a notification about that event before the time. Second one is silent phone on predefine location. Those location can be like Mosque, temple etc. If user reach those location then phone will automatically be silent. We also understand that we need to add automatic reply option. Because if user in a meeting or any place and phone become silent then if any important call comes to his phone, he can't receive it. So we design a automatic SMS reply system to solve this problem. Thinking is easy but implementation is the main challenging part. To develop this project we tool help from youtube and google. Our supervisor also help us a lot. Coding is not so easy. We face many errors and had to go different website for those error fixing. We had to think different logic to implement this project. Database management, combining work of alarm manager, work manager, broadcast receiver become so complicated for us. Using google map and place API was challenging for us to implement this project. Sometime location can't be detected accurately. Sometime error on time event. Those was not too easy to enjoy. We have discussed with our honorable teacher to make this project user friendly for every person.

2.4 Project Resource:

- Java
- Google map
- Google place API
- Room Database
- Alarm Manager
- Work Manager
- Broadcast Receiver
- Geofencing
- Live Data
- DataBinding
- Navigation component

- SMS manager
- Audio Manager

2.4.1 Java:

When try to built Android app, the first and the most popular option is Java language. Java is the official language of Android development. That means it is the language that has the most support from Google. Most apps on the Play Store are developed with. The no. one way to develop Android app is to go and download Android Studio IDE. This is a piece of software called an IDE (Integrated Development Environment).[3] It comes as packaged with the Android SDK(Software Development Kit). SDK is a set of tools to simplify Android development specifically and basically this will give us everything we need. Everything contain in one place to get up and running. The tutorials & documentation from Google co. will reference this method. It contain the largest number of libraries (free code to enrich apps) and tutorials to help on this method. Java was released by Sun Microsystems in 1995. It is used for a wide range of programming applications. Java codes is run by a VM(Virtual Machine) which runs on Android device. VM interprets the code.[4]

2.4.2 Google map:

Google Map is a mapping service provided by Google. It offers satellite views, aerial photography, real street views, 360° photographic views of streets real time traffic view, and plan of routes to travel by foot, train, car, bicycle. In 2020, Google Map was hold by more than one billion user in every month. Google Map starts as a C++ desktop program. In October 2004, the company was attained by Google. They converted it into a web application. After additional achievements of a geographical data visualization and a real time traffic analyst, Google Maps was newly introduced in February 2005. It built with JavaScript, XML, and Ajax. Google Maps offers an API to use map on third-party websites. It offers a locator for businesses and other organizations in many countries.

Google Map owner offered users to update the service's mapping world-wide but it was stopped from Mar 2017. Google said features would be moved to the Google Local Guides program. Google Maps' satellite view is a Top-Down view, also known as bird's-eye view. It contain most of the high-resolution images of cities is photography taken from aircraft flying at 240 - 460 m. Most images is from satellites. Most of the available images is no more than 3 years old because it is updated on a regular basis.[5]

2.4.3 Google Place API:

Google Places API can be used to find out nearby places. It help us developing an application that displays the nearby places of our own likes along with the approximate distance and time from our location. Google Places API Web Service has Distance Matrix API in the application. This Web Service allows us to query places based upon a few parameters such as the type of place, whether a place is open etc.

2.4.4 Room Database:

Room gives an abstraction layer over SQLite to offer free database access to use the full power of SQLite. Room is considered as a better access for data persistence than SQLite Database. It build it easier to work with SQLite Database objects in our app. It decrease the amount of boilerplate code & verify SQL queries Compile time. Each & every Query and Entity are checked at the compile time, that preserves our app from crash issue at runtime. It checks the syntax, also checks the missing tables.[6]

2.4.5 Alarm Manager:

This class Gives access to the system alarm services. These offer us to schedule our app to be run at some point in the future. When an alarm goes off, the Intent that had been registered for it is broadcast by the system, starts automatically the target app if it is not already running. Registered

alarms are placed while the device is asleep. It can optionally wake the device up if they go off during that time. But it will be cleared if it is turned off and restarted. The Alarm Manager keeps a CPU wake lock until the alarm receiver's `onReceive()` method is executing. This guarantees that the phone will not sleep until the program has finished handling the broadcast. When `onReceive()` returns, the Alarm Manager releases this wake lock. This means that the phone will in some cases sleep as soon as the `onReceive()` method completes. If the alarm receiver called `Context.startService()`, the phone can be sleep before the requested service is started. To Remove this, the `BroadcastReceiver` & `Service` will need to implement a separate wake lock policy to ensure that the phone will continue run until the service launched.

2.4.6 Work Manager:

Work Manager is one of the Android Architecture Components & part of Android Jetpack. a new and freaky take on how to build modern Android applications. Work Manager is an Android library that runs a stable background work when the work's limitation are satisfied. Work Manager is intended for tasks that require a guarantee that the system will run them even if the app exits. We also can say that Work Manager provides a battery-friendly API that reduce years of evolution of Android's background behavior restrictions. This is hard for Android applications that need to execute background tasks. Work Manager handles background work that needs to run when various limitations are met, regardless of whether the application process is alive or not. Background work can start running when the app is in the background, when the app is in the foreground, or when the app starts in the foreground but goes to the background. What ever the application is doing, background work should continue executing, or be restarted if Android kills its process.

2.4.7 Broadcast Receiver:

Broadcast receiver is an important Android component which gives us the opportunity to send or receive Android system or application events. All the registered application are announce by the Android runtime once event happens. It works almost like the publish subscribe design pattern and used for asynchronous inter-process communication. for instance , applications can register for

various system events like boot complete or battery low, and Android system sends broadcast when specific event occur. Any application also can create its own custom broadcasts.

2.4.8 Geofencing:

A geo-fence may be a virtual perimeter for a real-world geographical area . A geofence may be dynamically generate as during a radius around some extent location, or a geofence are always a predefined set of boundaries. The utilization of a geo-fence is named geo-fencing, and one example of usage involves a location-aware device of a location-based service (LBS) user entering or exiting a geo-fence. This activity could trigger an aware of the device's user also as messaging to the geo-fence operator. This info, which could contain the situation of the device, might be sent to a mobile telephone or an email account.

2.4.9 Live Data:

Live Data is an observable data holder class. Unlike a daily observable, Live Data is lifecycle-aware, meaning it respects the lifecycle of other app components, like activities, fragments, or services. Android Live Data. Live Data may be a a part of the architecture patterns. It's basically a knowledge holder that contains primitive/collection types. It's used for observing changes within the view and updating the view when it's ACTIVE.

2.4.10 Data Binding:

Data binding is a general technique in computer programming that binds data sources of the provider and consumer together and synchronizes them. This is basically done with two data or information sources with different languages as in XML data binding & UI data binding. In UI data binding, data & information objects of the same language and different logic function are tied together like, Java UI elements to Java objects. In data binding process each data change is lighted automatically by the elements that are bound to the data. The term data binding is additionally utilized in those cases where an outer representation of knowledge in a component changes, and therefore the underlying data is automatically updated to reflect the change.

2.4.11 Navigation Component:

There are three key part of the Navigation component. Those are,

i)Navigation graph: An XML resource that have all navigation related info in one centralized location. This includes all of the individual content areas within a app. That is called destinations, as well as the possible paths that a user can take through the app.

NavHost: An empty view that displays destinations from user navigation graph. The Navigation component have a default NavHost implementation and NavHostFragment. NavHostFragment that displays fragment destinations.

NavController: NavController an object that handles app navigation within a NavHost. The NavController specially arrange the swapping of destination content in the NavHost as users move throughout the app.

2.4.12 SMS manager:

SMS manager manages SMS operations such as sending data, text, & pdu SMS messages. We can get this object by calling a static method named getDefault(). To create an instance of SMS Manager associated with a specific ID, need to call getSmsManagerForSubscriptionId(int). This is normally used for devices that support multiple active subscriptions at once.

2.4.13 Audio Manager:

In android, Audio Manager is a class which gives an access to the volume and ringer modes of the device to adjust the volume or ringing modes. Those modes are silent, vibration, ringing, etc.

CHAPTER 3

REQUIREMENT SPECIFICATION

3.1 Business Process Modeling

We know, Business process modeling is the graphical **representation** that define how the system work. This is usually done using different graphing methods, like as the flowchart, data-flow diagram etc. In this diagram we want to show business model using Data Flow Diagram. Data Flow diagram describes that how data is working or processed through a system.

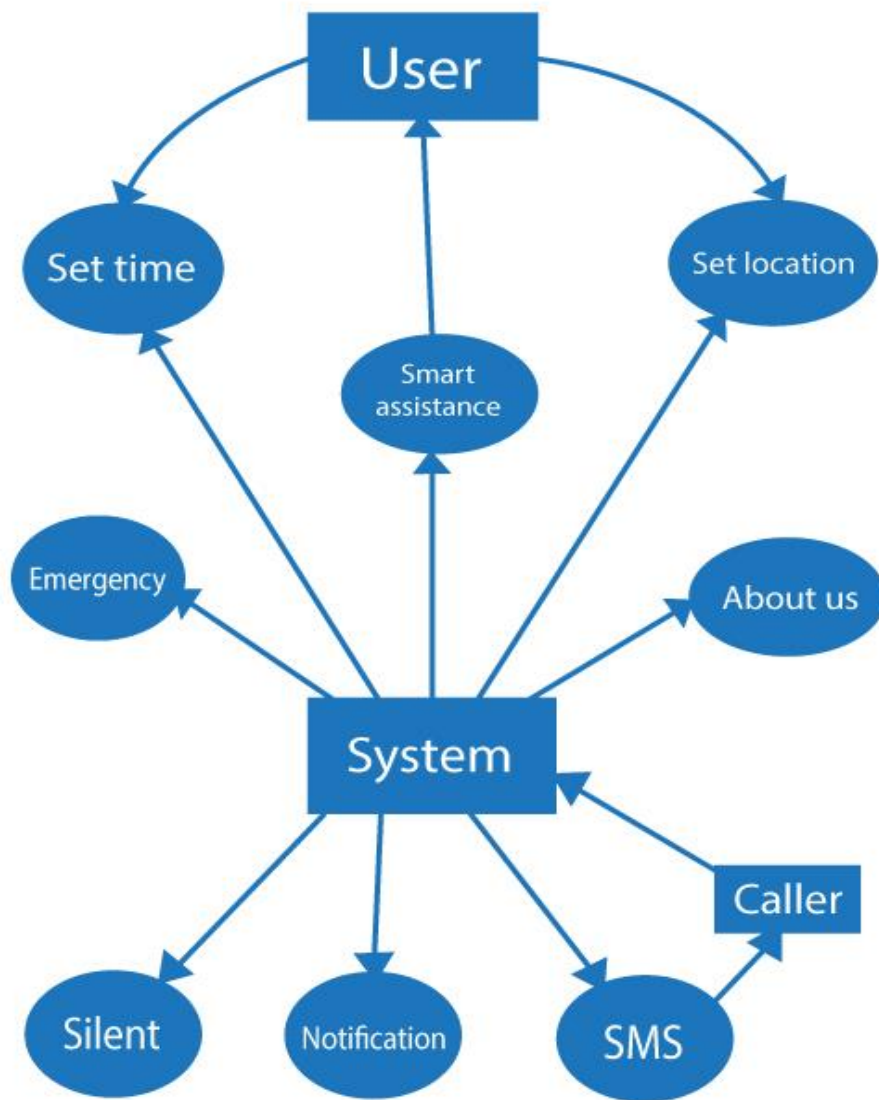


Figure 3.1: Data flow diagram of the system

3.2 Requirement Collection and Analysis

In application development requirement collection and analysis is one of the primary conditions. There are two types of condition in development one is the functional requirement and another is non-functional requirement.

Functional Requirement: In our system it should have many functional requirement like set time, set location, add/delete event, event period, emergency info, sms, notification etc where an user can access. User can edit the event anytime and the user can get emergency info like hospital's address. The caller get the user's update

Non-functional Requirement: For optimize performance, smoother operation, memory consuming, being more efficient we use non-functional requirement.

3.3 Use Case Modeling and Description

Use case modelling is a useful tool for requirements elicitation. It provides a graphical representation of the software system's requirements. This system cannot be used successfully without this features. In this system we need to a smart assistance. For this we need to set the time or location. When we set the time or location we need to get the permission from the system. After that we also define the event period and also current status.

In this diagram three options are available for three rules. There are user, caller and System. This options are set time, set location, event period, current status, delete/ add event, edit event are controlled by user. And another options are controlled by system. System can silent the device, send the notification, emergency info.

Caller can get the current status of user.

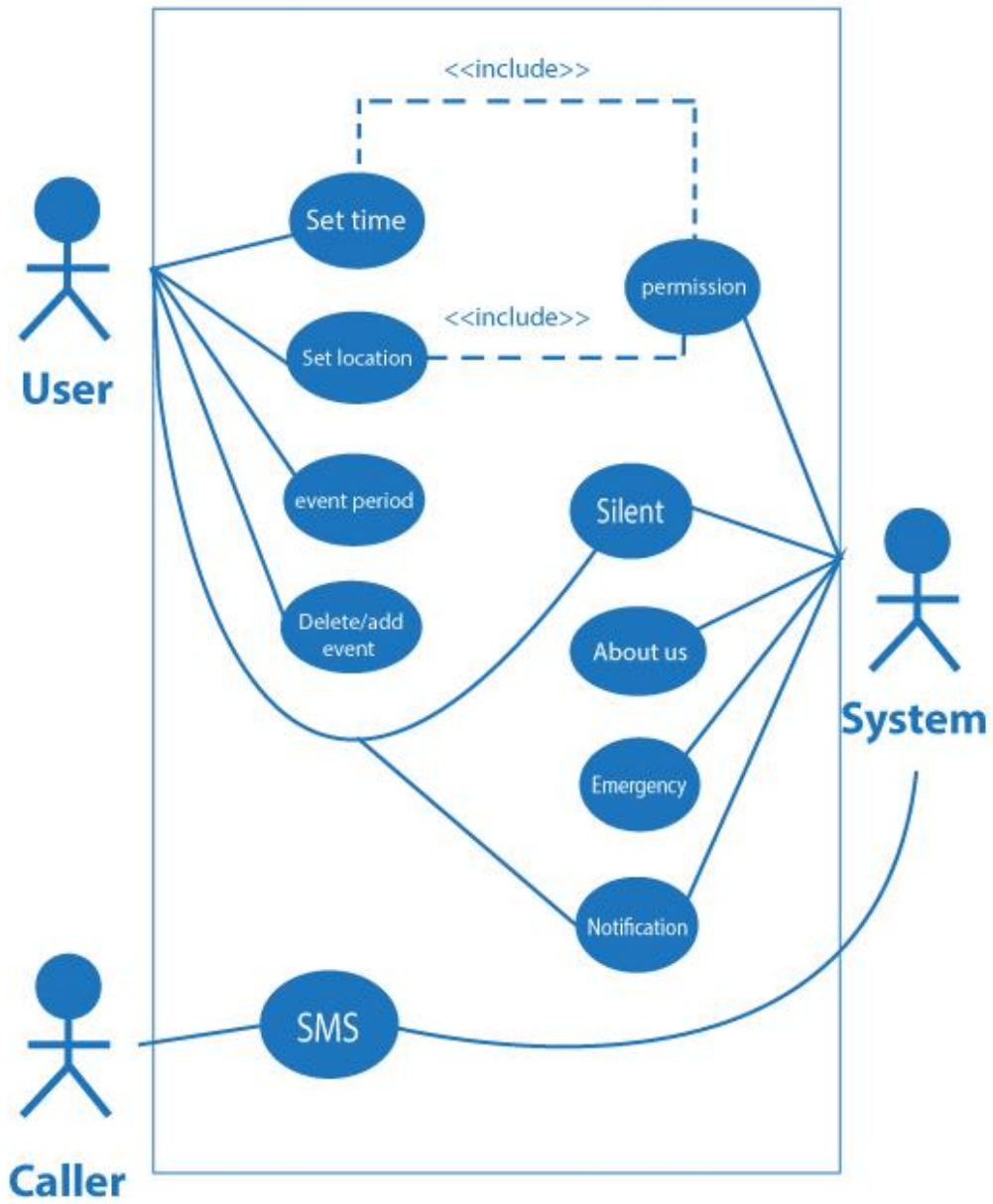


Figure 3.3: Use case diagram of the system

3.4 Design Requirements

In this System building there are two design required. One is user interface design and another one is Programming. By use this design we can run our application. Some points are given below that we follow:

User Friendly: Every mobile application should be user friendly. Because if the application isn't user friendly then the user doesn't use this application in second time. So we are trying to make our application user friendly, every content is understandable and run very first. User can easily set the time and location. And get nearest hospital address, hot line number, email etc.

Compatible to various application: Now this time there are lot of application are available in play store. All of the application are not user friendly, and many application crush when it is run and also hang our device. For that reason, our application always suitable with your device. And always given better performance.

Efficient: As light as possible we tried to make sure our application to run faster. We tried to keep those feature that are helpful for us. Now we discuss some important feature:

- This system contains many user, like student, teacher, Muslim people, and all of the people of our society. If the teacher and student use our application, they never face any interrupt in the class room. Because they can silent their phone automatically.
- User will control all system. They will set the event time, set the location, and also edit the event any time.
- User can delete or add the event.
- For this application user must get the permission from the system.
- After adding the time or location, event period, current status etc. the device will be automatically silent in the expected time.
- User can get emergency information from the application. For example they can get nearest hospital, police station, fire services address, mobile number, email. etc.

CHAPTER 4

DESIGN AND DEVELOP SPECIFICATION

Now we are showing our Project how it was working with Some Picture.[6]

4.1 Configuration:

← Edit Configuration

I am busy
Message Text

hello i am
Notification Title

Google
Notification Description

Selected SIM :

Teletalk 3G Stay Home - GP

UPDATE

Fig-4.1

This is the way to configure the app to start the journey. First of all we Configure then we Start to use and also use Which SIM we operate and message type Notification.

4.2 Home:

This is our home page and there are some Option. We can use any Option. Time Based, Location Based. Emergency Number and Timeline. In the TimeLine we can see our which Event are active.

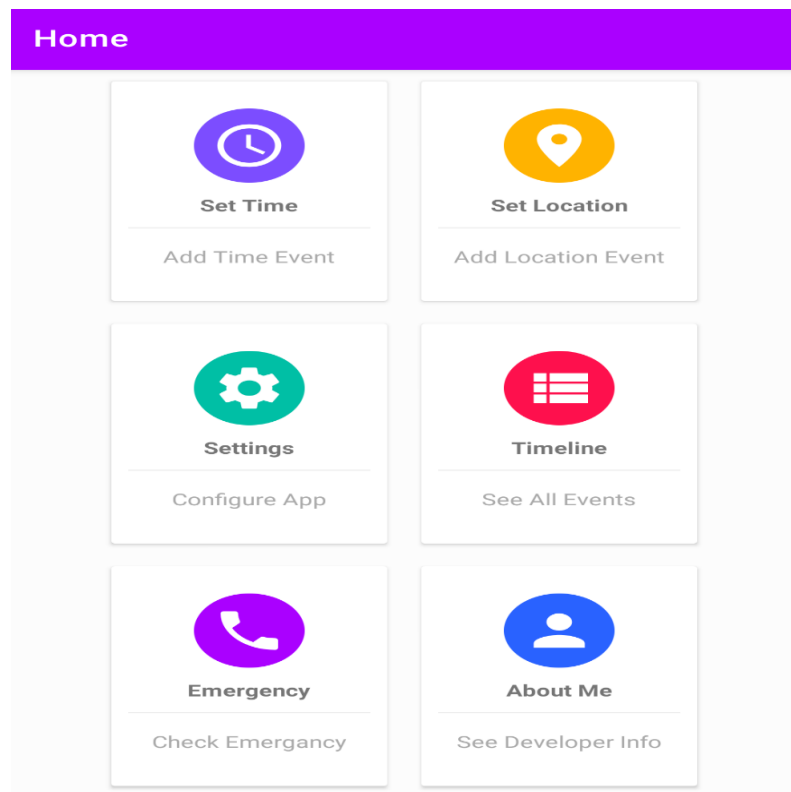


Fig-4.2

4.3 Time Based Event:

In the time based Event we add a time which time we are busy or in the meeting. In the event Period Someone call us It automatically Send message I am busy now call back later and silent The phone.

This is our Time based Event Option configuration.

← Add Time Event

Title
I am Busy Now Please Wait some time Call back late

Event Period
30

SELECT TIME

Selected Time
05:48 PM

Notification Before The Event in Minute
30

Select Type :

Once Daily Weekly

ADD

Fig-4.3

4.4 Location Based Event:

In the location Based Event We set a location and Covered area When we reached our target location it automatically Silent our Phone. Some we forget to silent our phone and Enter Masjid, mandir etc. If we on our internet and set Google location it locked our location and silent our phone.

This is the Picture of location based event.

← Add Location Event

Title
I am Busy now Please Wait Some time Call back later

SELECT LOCATION

Selected Location
Sonir Akhra - Mridha Bari Rd, Dhaka, Bangladesh, Dhaka

The Area to be Covered in Meter
100

ADD

Fig-4.4

4.5 TimeLine Option:

In the Timeline option we see which event are active. We can delete or add new Event in this Option.

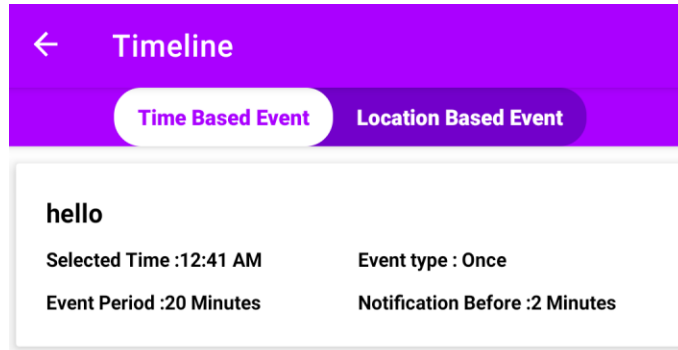


Fig-5.1

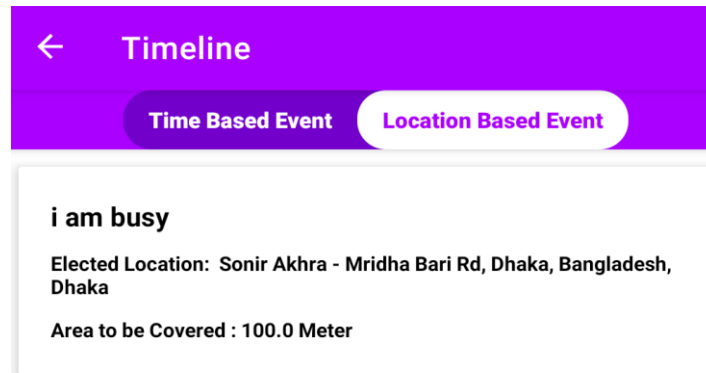


Fig-5.1.1

Here we add two photo in Timeline Event. In this Picture we see Time Based Event and Location Based Event.

4.6 Event Delete and Edit

In this Event we can Edit our Event or delete. When the Event expired we can delete the event.
If we think no need to add another event we can edit our previous event.

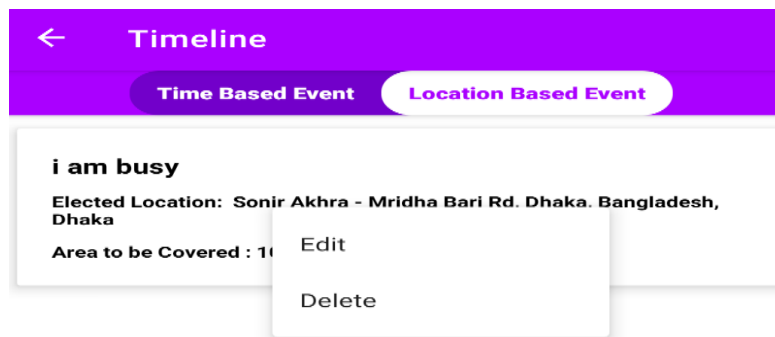


Fig-4.6

4.7 Message

In this Option we can see When the caller called us and we are in Event period when the call Done and our phone was silent caller received a message **“I am busy”**. Not only I am busy Any message we configure to start the event. We can add like **“I am busy call back later Thank you”** etc.

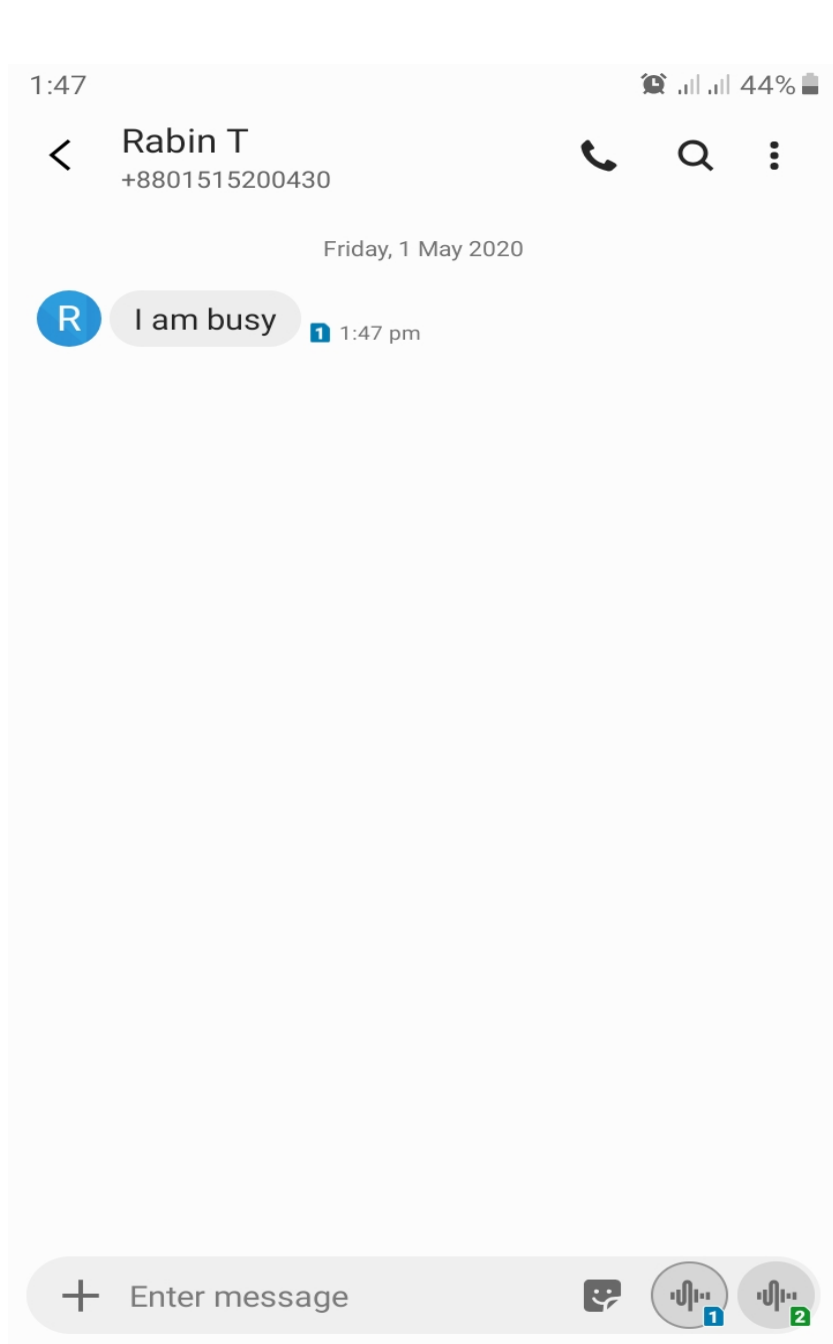


Fig-4.7

This is our Message option when we are in Event period and someone call us he/she received a Message like this.

4.8 Help Line:

In Our help line option we add some Emergency Hospital number.



Fig -4.8

4.9 About Information:

In Our last Option about we add Our Supervisor information and our team member information.



About Developer



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Fig-4.9

CHAPTER 5

IMPLEMENTATION AND TESTING

Thinking and gathering some good idea can be easy but implementation of that idea become so hard for everyone. After planning one point will come that is implementation and then testing. Coding and testing is a big matter of endurance. In this session we will discuss about implementation and testing in this project. Testing is require for knowing all the function of the project is working successfully or not. After every single code been written it required to test.

5.1 Implementation of Event management & Database

In every application like web, mobile or other, we store our data in a database. To manage our data of this application we use Room Database. We create event and load that data in the database. In database data will decorate in column. . One field can take one categorize data. We can control our data by using code. We can edit, delete, and insert data in our database.

5.2 Implementation of Front-end Design

Programing and logic is the hardest part of development a project but after successful logic implementation we must make our application easier to user to use. So we need to design a user friendly User Interface (UI). Our UI is so simple and easier to use. We mainly use some buttons and using to button we separate some activity class. In every view classes there are many different type of content.

5.3 Milestones and deadlines

Table 5.1: Milestones and deadlines

Milestone	Developer	Deadline	Status
Information collection	All team member	September 12, 2019	COMPLETED
Learn required tools	All team member	September 27, 2019	COMPLETED
Time base event	MD. Arifur Rahman MD. Aklasur Rahman Robin	October 15, 2019	INCOMPLETED
Time base event	MD. Arifur Rahman MD. Mahedi Hassan Didar	October 20, 2019	COMPLETED
Location Base Event	MD. Arifur Rahman	November 8, 2019	COMPLETED

Configure App	MD. Aklasur Rahman Robin MD. Mahedi Hassan Didar	November 8, 2019	COMPLETED
UI design and other	All team member	October 5, 2019	COMPLETED

5.4 Testing Implementation

Table 5.2: Testing

Test case	Test input	Expected outcome	Obtained outcome	Pass / Fail	Tested date
1. Configure app	Text message, Title, Description	Successfully updated	Update successful	Pass	2-2-20
2. Set time base event	Title, Period, Time, Type	Event Added	Event added successfully	Pass	17-2-20
3. Set location base event	Title, select location, Area	Event Added	Event added successfully	Pass	28-2-20
4. Auto reply	Caller number	A sms will be sent	SMS sent	Pass	1-3-20

5. Event	Add a event	Phone will be silent	Phone is not silent	Pass	2-3-20
6. Event	Add a event	Phone will be silent	Successfully silent	Pass	3-3-20
7. SMS	A call incoming	SMS will be sent	SMS sent.	Pass	3-3-20

CHAPTER 6

CONCLUSION AND FUTURE SCOPE

6.1 Discussion and Conclusion

Finally, I completed my “**Smart Assistant**” project. This project was a real learning experience for us. For finish this project we faced so many problem because we had little bit knowledge about Android, Java language and its working methodology. We think this project will help all. We have been trying our best for implementing my idea. This system has made as user friendly as far as possible.

It was really a great learning experience for me and we can think a lot of smarter things now.

6.2 Scope for Further Developments

- More categories will be added.
- We will add more information about our organization.
- We will try to be more user friendly.
- In future we will be added Location Based Help Service.

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