Check On An Android Based Security Application

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This Report Presented in Partial Fulfillment of the Requirements for the Degree of
Bachelor of Science in Computer Science and Engineering

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APPROVAL

This Project titled **"Check On An Android Based Sequirty Application"**, submitted by **Hadia Rashid** 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.

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DECLARATION

We hereby declare that this research has been done by us under the supervision of **Rubaiya Hafiz, Lecturer, Department of Computer Science and Engineering,** Faculty of Science and Information Technology, Daffodil International University. We also declare that neither this research nor any part of this research has been submitted elsewhere for the award of any degree.

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ACKNOWLEDGEMENT

I'm also very grateful and thankful to my supervisor **Rubaiya Hafiz**, Lecturer, Department of Computer Science and Engineering. She helped me through all the project and always there for me.Only her endless support, guidance, encouragement, patience and her confidence about my idea motivates me to work on this project and achieve my desire goal. If she is not there I could not complete this project without her help. As this is my very first official project and I have no group member so it's quite hard to complete the project alone by myself so she gave me a lot of guidance and encourage me too. She is such a lovely hearted person.

So I would like to express all my heartiest gratitude to **Rubaiya Hafiz**, Lecturer, Department of Computer Science and Engineering and Prof. **Dr. Syed Akhter Hossain**, Head Department of Computer Science and Engineering. Also to the other faculty members and the stuff of the CSE department of daffodil international university.

Lastly all my lovely course mates they are very talented student and they are also very encouraging.

ABSTRACT

The project "**CHECK ON a security based Android application**" is all about security. It understand your busy life and security issues and make our life easy. Reduce our workload through a very simple security application. This will work on a very simple basis security issue like only for your family or baby left home alone and they need to be on your supervision so you can use this auto call system security app and check on them time to time. It's an android application and you need to install the app then you can use it. It's for free so you don't need to spend money for this security application. Need an android phone, your sim card and internet.

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CHAPTER 1
INTRODUCTION

1.1 Introduction

Android application is a software application that runs on an Android platform. Android application is typically designed for smartphones or tablet that running on Android OS.

Android app can be made available in developers through their website but mostly Android published in Android market.

There are Some online stores dedicated for these application. There are both free and priced Android market. A lot of languages that can be used in developing Android app like; Java, Kotlin, C++, Python and so on. Dalvik is a virtual machine specially design for mobile device. Developers can download Android software development kit from website. The SDK includes tools, sample code and some relevant documents for creating android app. For Android applications there is a very popular handy and easy to use platform called Android Studio. This Android Studio will give such environment that shows how your application is going to look like in mobile. And it's easy to use create an application. Android Studio is not a language but an environment where you can develop your application.

These applications has both kind of uses positive and negative. It totally depends on the user obviously but it also depends on the developer because what they are creating they can make sure that they are not use this platform for any wrong intention. They should not make any wrong theme game or anything that can be harmful to the users. As my project is all about security issue so yes in this case Android application are kind of blessing for us. It saves our time, manages everything in spite of holding a very little space. Security based application are increasing in numbers day by day. And it's very important to make sure that our home, office, workplace, family, love ones, belongings are in a safe zone. Security based applications are very helpful. We cannot take care of our family according to having a busy life but this

Application will definitely going to help us a lot. Even with this issue we cannot concentrate on our work properly. So it's a big issue to work on. And this app is all about it.

1.2 Objective

The object of this Android application is to give a person that scope to take care of their family members through a security call. They don't need to remember and call their family because it will give a auto calls. So this will save our time and also we will be tension free about giving them call. It will also give notification if there is an emergency so it's supper flexible and easy to use.

1.3 Motivation

Our thought depends on the environment around us. And we can see a lot of busyness, lack of consciousness, forgetting behavior because of our busy life. We have to work for 9am to 8pm and it's hard to maintain our work and our family in the same time. So this kind of security apps are just here to help us. Because we are still not taking security issues seriously through every day there are a lot of crime happening in our area and nobody is giving it a dame. We can see a lot of single parents, old parents , working parents and the leave their love one's alone in the home and some people come back home at night but some living very far from their home so they don't come home every night. So these family's needs a security system for their everyday life. And in the opposite hand the working member of the family they also need a flexible security system so that they can easily check on their family members. So this concept inspire me to so do something flexible with this security system issue.

1.4 Expected Outcome:

- Auto security app

- Auto call

- Give notification if there is an emergency

- Call will repeat if not received

- Just install once and use it for as long as u want

- It's for free no charge needed

- Save time and workload

- It will be a flexible security system

1.5 Report Layout:

This project reports includes six chapters in total and the 1st to 5th chapters mainly describe the whole project. So the layouts of the project is given bellow. Chapter one starts with the introduction of Android application, Android developing tools and the security system and the motivation of this project. This chapter also includes the facilities or objectives of the project and the expected outcome. In the second chapter we discuss about the introduction of the background and similar works of these type applications or security apps. And comparative studies of this type of apps and the problems we face during this project and also about upcoming problems. Chapter three includes all the requirements specifications of different type of models like business process model. Collection of requirements and analysis them. Description of use case model and logical data model and design requirements. In chapter for its all about design specifications front end back end Interaction design and UX and the implementation. Last chapter is all about implementation of front end back end design, database and interactions. Sixth chapter is the last discussion and conclusion. Lastly the limitation and future work discuss in this last chapter as the finishing past of the project.

CHAPTER 2
Background Study

2.1 Introduction

CHECK ON is a security based app. It's just keep on checking of caller's family for a regular basis as it has an auto call option. In this app there is 2 type of user, 1st one is the call, who is using the app for his/her family security and the 2nd one is the receiver means the family member. You can chose a person for this call and it will call that person 3 times a day for security check. If the person miss any call it will give a call back again and this process will repeat 3 times then finally it send a notification to the caller that there is an emergency because the call was not been recevied.As the caller is in his/her office or work place so they cannot go and check by themselves so the caller can also chose a 2nd person to get the emergency notification and check the family on behalf of the caller. The 2nd person doesn't need to install the app because this 2nd person will get the notification as a message. Only the caller need to install the application in his/her android device then it's simply ready to use. Even the family or receiver also doesn't need to install the applications.

2.2 Related Works

While choosing this project I was searching for some project that also work for security. So that I can get an idea about what type of security problems we are having nowadays and also what type of works are already done. I found a lot of interesting projects and I am looking forward to my project to make it that type of interesting and handy.

2.2.1 Toy mail:

This TOYMAIL named device is basically a voice mail device. Anybody can send voicemail just clicking a button and send to another person. Its Wi-Fi based so you don't need a phone or a laptop to use it.This hardware is completely rechargeable so that you can put in in a new toy or anything. This device is basically set in a toy so children can play with it and it's expendable also so that parents can add more features to it. The biggest benefit of this Security device is children's are not using phone and any harmful device. Its looks like a toy so nobody can guess that it's a security device. The inventor of the

TOYMAIL Gauri Nanda it was her class project and she decided to start a company TOYMAIL that will be featured in "**Shark Tank**" after seeing all the success of the project. The total cost of making this is $20 but selling it with a higher price.

2.2.2 Ring Alarm:

This is also a security app, the alarm connects to the ring alarm app so that you will get to know what is happening in your home. This includes three security modes.

- Away- monitors all the sensors in and around your home but ignores the ones inside home.
- Door open sensor.
- If it since any movement in your home it will notify you. If you are not available then it will notify 2nd person.

So this app will give you a full home security system.

2.2.3 Girls Security App:

This simple app is just to give an initial security to the working woman's or student or those girls who use to go outside for their work and sometimes the come back home at night. They often feel like someone is following them and they cannot do anything or cannot find any one near them for asking help so this app will help them to find friend near this area and secure them. Just only one click and the app will find the friend of that particular area and let them know that one of their friend is in danger. It is as simple but as powerful.

2.3 COMPARATIVE STUDIES:

Working on this project I searched for something related to this kind of security applications and works. So I found a lot of security apps but this are some of the simplest ideas that actually works in a good way. So I picked these and show as my idea is also very simple but it is very effective too. Whenever we think about any idea of any project we always prefer that how handy, simple and effective that idea could be.

2.4 Scope of the Problem:

This Android application is based on a security issue. It's actually very new and simple concept for us buy at the same time it's very effective for us in many ways.

2.4.1 Auto Call:

The main feature of the app is the auto call. Ones you set the number (whom you want to call through this app) and timer (how many time you want to call) then you don't need to worry about the system it will continue the process.

2.4.2 Get Emergency Notification:

If the receiver miss any call then it will repeat call for three times 10 mins after after then give you a notification that there is an emergency. If you are not able to go and check you can also set a 2nd person to get the same notification and check the family on the behalf of you.

2.4.3 Easy To Use:

Only one person need to install this app and the other receiver doesn't need to install so it's quite easy for everyone and everywhere because they don't need internet or anything.

2.4.4 Cost Free:

Other security application or devices charges a good amount of money but this CHECK ON android based security application is totally free. Only you need is your regular android phone and sim card and Wi-Fi to run this app.

2.5 Challenges:

Security issue is a huge files to work on. Finding a suitable idea that will work for the user and me also as I have to complete this project so it was the biggest challenge.

2.5.1 Go with different idea:

As I chose something different so it was really difficult to finalize the idea of the project and implement this idea and making this project successful.

2.5.2 Never Work With Android:

We had a course called wireless programing and this course includes android study. But only this one course cannot give you the whole idea of a project and project is a huge thing, never did any project alone so it's also a big task for me.

2.5.3 New Technology New Problems:

Every day we found something new or updated version of electric devices and the internet world like new websites, application, and new tools so it's very important to match with these changes. I have to learn how to work with android studio and other tools.

2.5.4 Requirements:

Planning or setting a margin of work is very easy but implementing all the works is really hard. To having a vision of this application and doing it in reality is hard. Fulfill all the requirements is a big challenge for me.

2.5.5 Unnecessary errors:

Sometimes our phone, laptops and electric devices shows unnecessary errors for virus or overload or sometimes without no reason. These are actually undefined errors.

CHAPTER 3
REQUIREMENT SPECIFICATION

3.1 Business Process Modeling:

Business process modeling gives an analytical representation of the process of the application. It will give you a clear vision. Provide consistency and controls in the process. Shows a clear starting and ending of the process. It's also help you to find the difference between two or more than two similar projects. Showing business process modeling for this CHECK ON android based security application
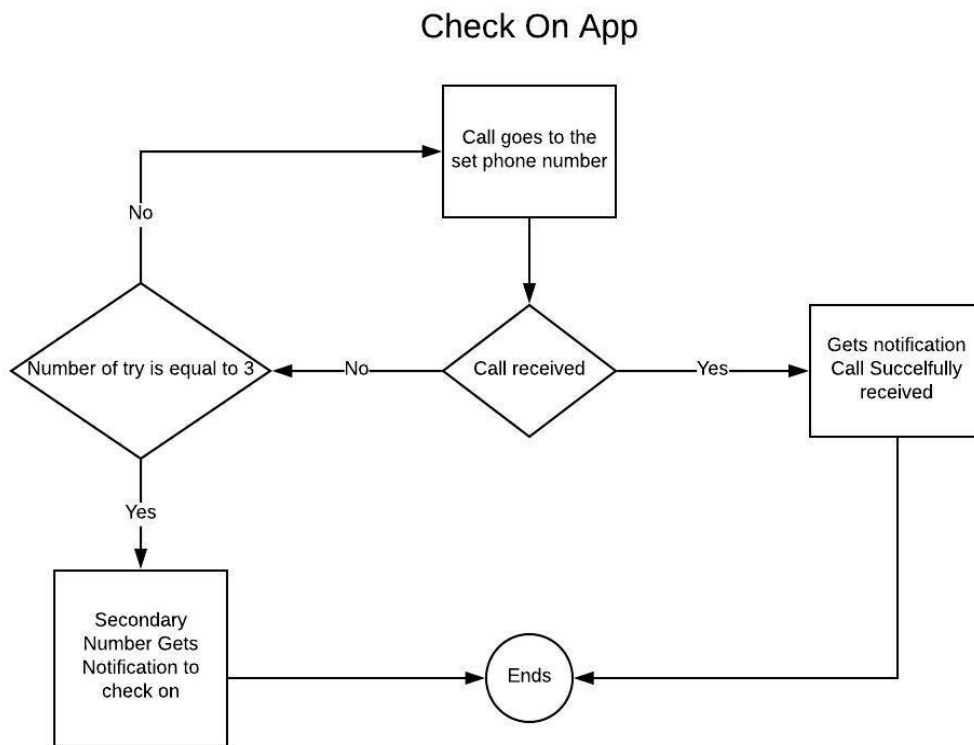

Fig 3.1.1: Business Process Model

3.2 REQUIREMENT COLLECTION AND ANALYSIS:

3.2.1 Requirements:

Application requirements

- Install app
- Select contact number
- Set timer
- Set emergency contact

Developments requirements

- Android studio
- Java jdk
- Android emulator for PC for checking outcome.

Hardware requirements

- Must have an Android phone
- Sim card
- Internet

In the developing part I need Android studio version 3.2 and java jdk. I don't need to install SQLite it's come with the same package with Android studio. To check the output I use Android emulator for PC.

3.2.2 Analysis:

As I chose to do a different project and totally a new field for me so I studied a lot to work on it. I have to learn how android studio android studio works and SQLite. And also how can I present my idea strongly to the user to use this App.

3.3 Use Case Modeling And Description:

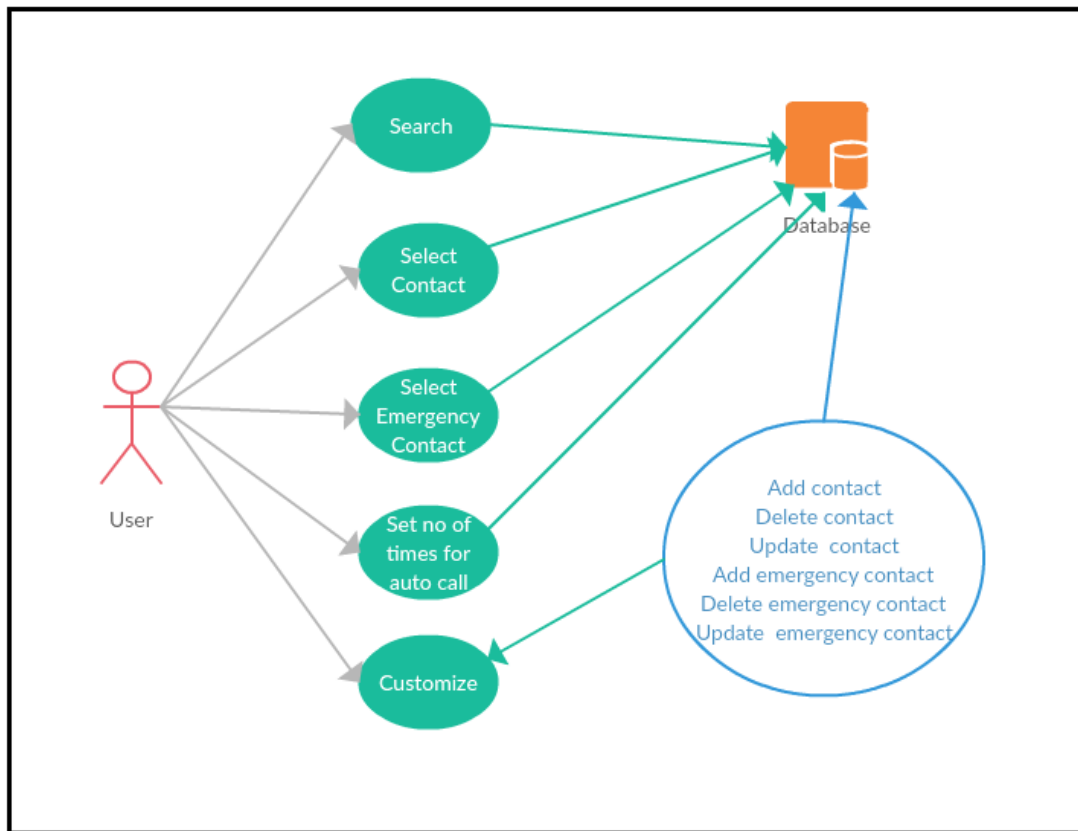The use case modeling of my project is given below:

Fig 3.3.1: Use Case Model

Brief Description:

Actor: App User, Call Receiver and Emergency contact

App User: The main user off the application is the app user or the caller. Only this app user need to install the application. This app user's task:

- Install the app first
- Chose the targeted number to give auto call

- Timer for the auto call if the call is not received
- Set a 2nd number to get the emergency notification
- Can delete and add numbers

Call Receiver will get a call as a phone call. He or she don't need to install the application.

Emergency contact will get an emergency notification as a mobile message option because the caller is too far from receiver so that he/she cannot come to check for the emergencies. So this emergency contact will help the caller to check his/her family on the behalf of the family.

3.4 Logical Data Modeling:

Logical data models represent the abstract structure of a domain of information. A logical data model is sometimes incorrectly called a physical data model. Logical data model is an Entity-Relationship diagram. Entity-Relation Relationship has three main component

CHAPTER 4

DESIGN SPECIFICATION

4.1 Front-End Design:

Front end is the user interface. The front-end is everything involved with what the user sees, including design and some languages. Front end design is the main this of a project because user first see the view of the application then they decide to use it.Android studio gives you this facilities so that you can check how your application will show on your phone. Front end design is very important for mobile application and also for web designs. Because we work for clients or user and they like to use good quality full sites or application.
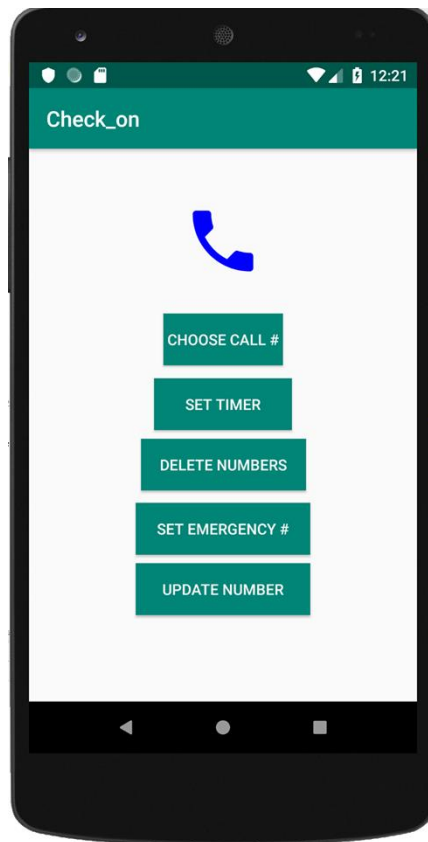

Fig 4.1.1: Front-End of the application

The main part of the app is to set the caller that you want to call. So when the caller click the chose button it will show the contacts be like this image:
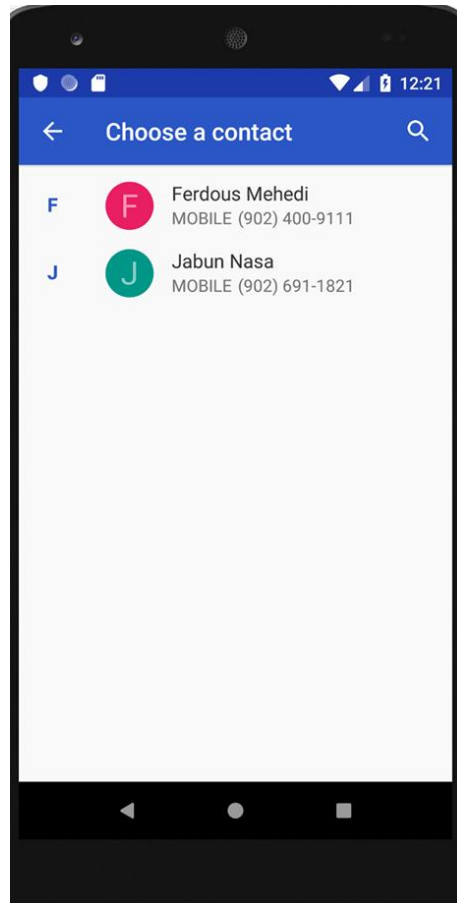
Fig 4.1.2.: Choose a Contact

4.2 Back-end:

Use java jdk for the back end work. And Android studio developing tool helps to do the button automatically create them and I don't need to so separately. Giving a coding image to understand the coding part. It's mainly the number chose option. There is some cases of the number choose option.

```java
//Check whether the database already full or not
if(isFull.equals("true")){
    Toast.makeText( context: this,  text: " Database is already full, you can update the information only ", Toast.LENGTH_LONG).show();
}
//Database is not full then start insertion
else {
    //Check whether a calling number already exist there or not
    boolean _type = false;
    for (int i = 5; i < stringsLngth; i = i + 3) {
        if (strings[i].equals("1")) {
            _type = true;
        }
    }
    //if already calling number exist
    if (_type == true) {
        Toast.makeText( context: this,  text: " A calling number already exist, you can update the information only ", Toast.LENGTH_LONG).show();
    } else {
        isInsertion_done = check_db.addUser(name, number,  type: "1", db);

        //*********************if insertion fails************
        if (isInsertion_done == false) {
            if (isEmptry.equals("true")) {
                Toast.makeText( context: this,  text: " Database issue ", Toast.LENGTH_LONG).show();
            } else {
                boolean isExistNumber = false;
                for (int i = 4; i < stringsLngth; i = i + 3) {
                    if (strings[i].equals(number)) {
                        isExistNumber = true;
                    }
                }
                if (isExistNumber == true) {
                    Toast.makeText( context: this,  text: " This number is already exist in the database " + number, Toast.LENGTH_LONG).show();
                } else {
                    Toast.makeText( context: this,  text: " Database issue ", Toast.LENGTH_LONG).show();
                }

            }
        //end of insertion fail
```

Fig 4.2.1: Back-End (coding part)

4.3 Interaction design and UX:

Interaction is very important for the developer. They have to make sure the users interact with their application, make sure people are using this application. And this interaction will make user experience. If people are not get involve how they can get experience. So to get UX firstly the need to be interact with the application. I design is the process of making interface application with a focus on look and style. I design is typically refers to graphical user interface. And UX is the process of improving the user satisfaction.
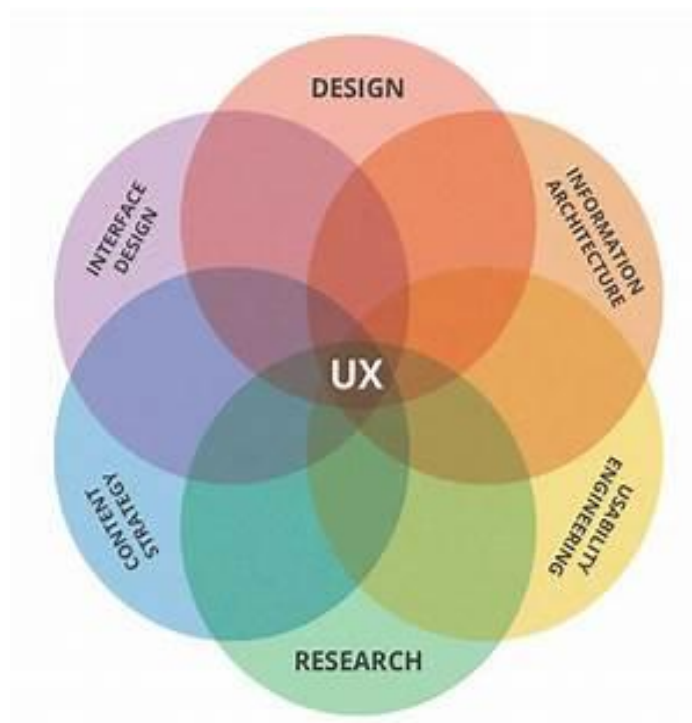

Fig: 4.3.1 UX design

The buttons of the 1st page of the application:

- **1**st button is "CHOOSE CALL" it's for set the number that you want to call to check the security. After click in this button it will ask you to access your mobile contact list and choose from there. You can choose any number from your mobile contact list and

It will be saved in the database. For security check you can only choose one number. If the number is already save then it will show that it's already in your database.
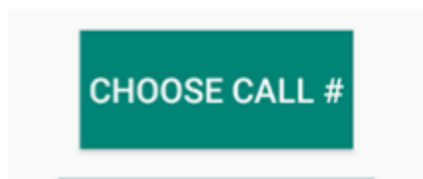
Fig: 4.3.2: Choose call

- **2**nd button is "SET TIMER" it's for the timer. If   the receiver miss any call then the system with repeat the call again. And it will repeat 3 times before sending the emergency notification. So the caller have to receive the call at least in the 2nd time to avoid sending emergency notification to the caller.
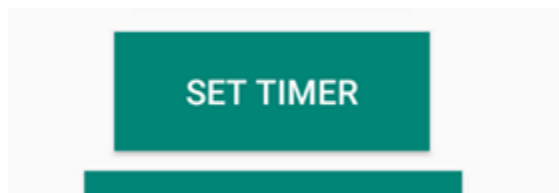

Fig: 4.3.3: Set Timer

- **3**rd button is "DELETE NUMBER" it's for deleting numbers that you add. You can delete the number that you choses 1st then add new as there is only one number can be set for auto call. And this delete option is also work for any changes you want with the numbers like the emergency numbers.

Fig: 4.3.4: Delete Number

- **4**th button is "SET EMERGENCY NUMBER" it's for the emergency number that will help you to check your family or the person you call. When the receiver miss 3 calls that means there is something wrong so receiver need help. But the caller must be in his/her working place so that moment they cannot come to check or help only that point they need this emergency caller. Caller can choose any person near his/her home or any trusted relative who can go for checking if there is an emergency. After setting this persons number for emergency this person will notify by sending a message that he/she need to go and check.

Fig 4.3.5: Set Emergency

- **5**th button is "UPDATE NUMBER" it's for update or change the auto call number. If your parents change the number or you need to change the emergency number this option will do that.
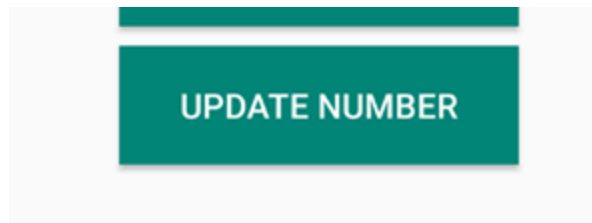
Figure 4.3.6: Update Number

4.4 Implementation Requirements:

Implementation means doing a work for real. The application that I thought to develop make it visible for the users. Implementing the plane step by step. I need android studio java jdk to develop this application and Android emulator for PC to check the outcome. These are the main requirements of the applications.

Developments requirements

- Android studio
- Java jdk
- Android emulator for PC for checking outcome.

SQLite is come with the package with Android studio so don't need to install it separately

CHAPTER 5

IMPLEMENTATION AND TESTING

5.1 Implementation of Database:

I use SQLite to implement the database. Mainly database management handles all the data of the application and save them as a note and act according to it.In my Android security application I just try to make it simple and easy to use. So only the contacts and timer will be in the database. Other this don't need to be in the database because other information's are already in the phone.

So the main 2 data's are,

- Selected contact
- Timer

Other things will be in the phone.

5.2 Implementation of Front-end design:

After you open the app it will show a page and that page is called front-end of the application. As this app is mainly for the parents or children's so it should be as Understandable as it possible. I use the developing tools Android studio and it gives some facilities that you don't need to create all the segments separately because it's already have done those thing like buttons, other option. The front screen will be like this.

5.2.1 User View:

When user open the app they can see this screen with the options off call, timer ext. This is the main page of the application. This options are all available for the user to use.
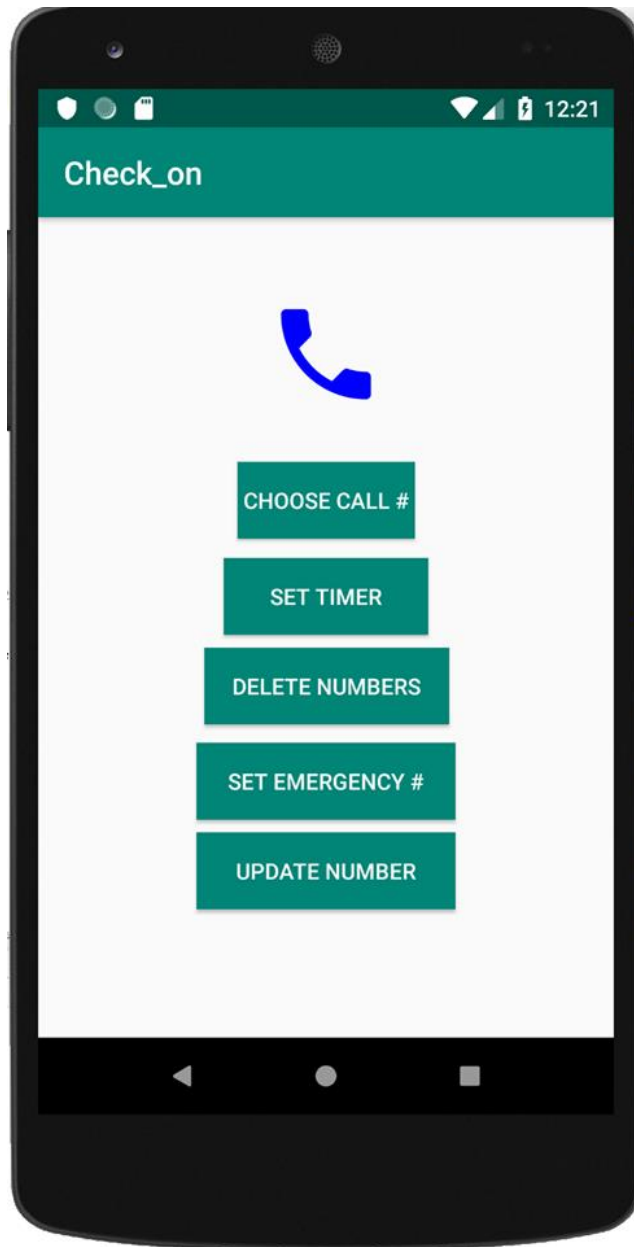
Fig 5.2.1.1: Front-End of the application

Back-End Implementation:

I use Java development kit for the coding side. And The Java Development Kit (JDK) provides the foundation upon which all applications that are targeted toward the Java platform are built. The JDK includes a variety of tools and utilities that perform a variety of tasks, which include compiling source code into bytecode, packaging applications, spinning up Java virtual machines (JVMs) and managing the runtime environment of Java applications.

5.3 Implementation of interaction:

Interaction is the very important element of any project. If the user cannot interact with the app that application will not going to work. Interaction implies when we are in a particular age and want to go to the next page and its only possible if the pagers are interlinked with each other. There are so many components to go for the design of the application.

5.3.1 Testing Implementation:

The feather that I added in my application when am implementing them and they finally work is the operation of the implementing. I added my planed features and also test them that they work or not. That is call tasting. Tasting is must because if one of my feather is not in function that will destroy the total application. As in my application there is no sign in option so mainly the buttons are the main part to test:

- Buttons
- Timers
- Calls
- Emergency message
- Newly add numbers

5.3.2 Testing Implementation:

To evaluate and test the mobile application, some demo phone numbers were saved into android mobile emulator. Then series of extensive tests have been carried out for each of the functions. Steps of the testing are given bellow.

Step 1: Test the manual call button without saving a number and with a number saved in the database.

Step 2: Try to save same number twice. Try to save more than one number to the calling list.

Step 3: Set the timer to check whether it initial the call automatically or not.

Step 4: Try to delete a number when the database is empty. Try to delete a number when the database has some numbers and close the application. After restarting the application make sure whether the database still contain the deleted number or not.

Step 5: Try to save more than three numbers in the emergency list and try to save same number twice.

Step 6: Try to update a number and close the application and open it again to check whether the number was updated in the database or not.

After running these testing experiment with a test dataset, the application worked appropriately on the android emulator but the application has not been tested on a real android mobile set.

CHAPTER 6
CONCLUSION AND FUTURE SCOPE

6.1 Discussion and conclusion:

I choose this idea of this project as it's a different and unique and also it's really suitable for me as it's a simple concept project. This Android application is for them who use to live apart from their family and have old parents or young children who are alone in their home and need to be supervision all the time. Because crime rate is increase now a days. If you are not doing anything wrong but there is no guarantee that your neighbors or your servants or relatives are also good people. So people need a security system to check their family all the time. But in the market devices are so expensive and also very critical to use. So if there is something that can understand your need and financial condition also that would be great. My application does the same for the village people or low income people because it's totally cost free for the application. Even your family don't need any android to use it. The can get call in their normal phones. So I hope this will going to work. And help the peoples who are super busy in their life.

6.2 Scope of Future Development:

To make my application more effective and still cost free I would like to add these things:

- **Voice recognizer**
- **Video call**

Hope adding this tea features my application will be more effective.

APPENDIX

Appendix A: Project Reflection:

This appendix purpose is to provide the reflection of the project. How I enjoy my work and learn through the project. It's actually very difficult to work alone in a project and others part. But no matter how much u suffer at least you learn how to do professional work and take responsibilities. It was a great experience to work on this project and my supervisor **was a** supportive person that why I'm able to complete my project. Whenever I got stacks in any problem I use to take help of my supervisor and some of my friend. This project is full of experience.
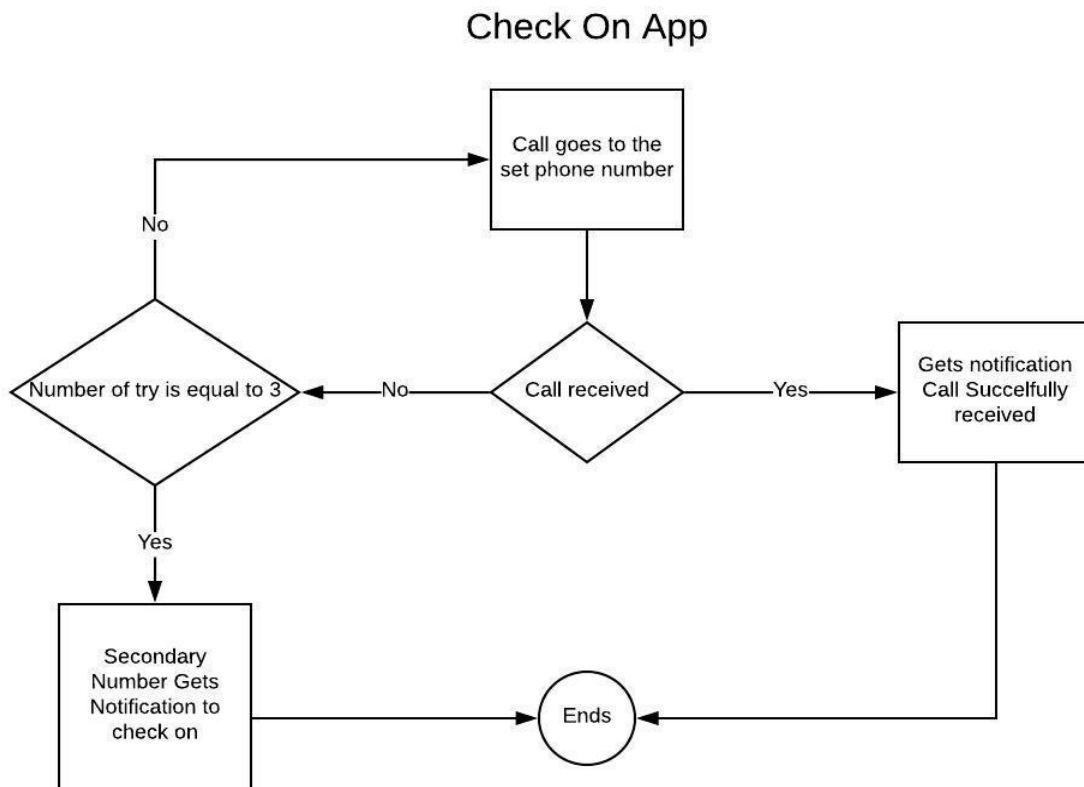
Appendix B: Related Diagram:
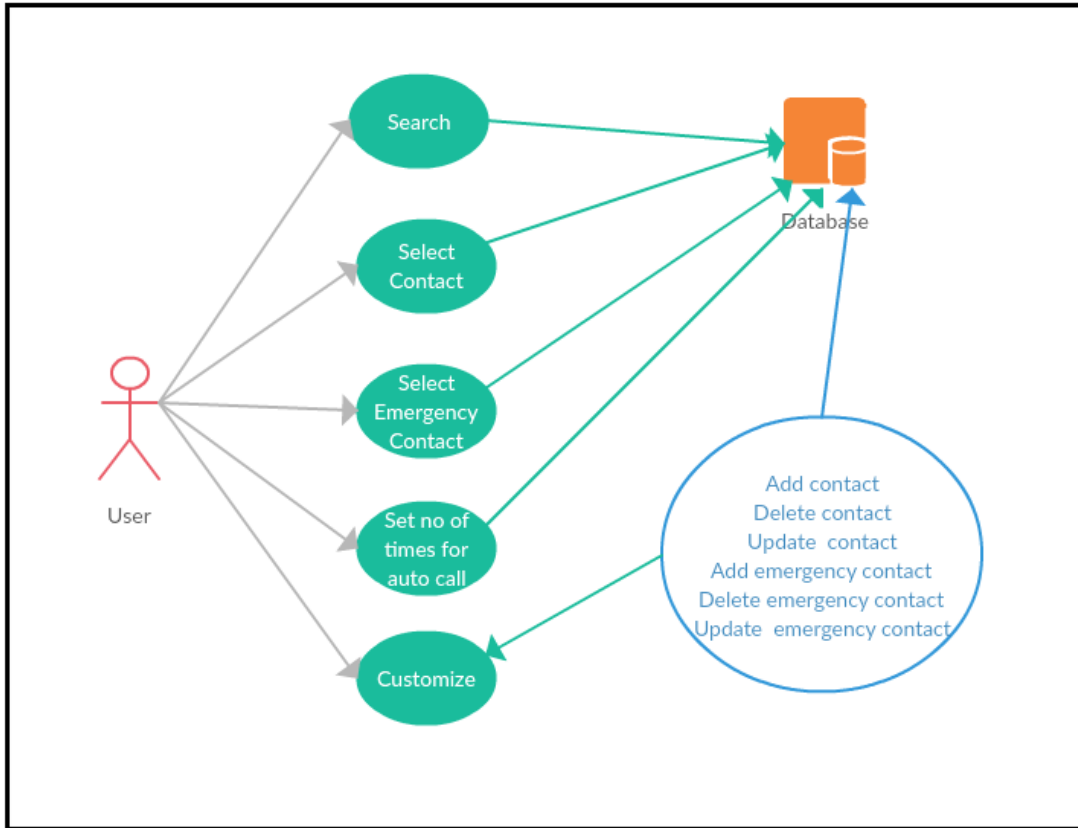
Check On App

Fig 3.1.1: Business Process Model

Fig 3.3.1: Use Case Model

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