“Warranty Expire Reminder” - an android based mobile application

BY

Md. Hasibul Hasan
ID: 162-15-7913
AND

Md. Foyzur Rahman Khan
ID: 162-15-7971

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

Supervised By

Masud Rabbani
Lecturer
Department of CSE
Daffodil International University

Co-Supervised By

Ahmed Al Marouf
Lecturer
Department of CSE
Daffodil International University

DAFFODIL INTERNATIONAL UNIVERSITY

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DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Masud Rabbani, Lecturer, Department of CSE** Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

Supervised by:

MRabbani

Mr. Masud Rabbani
Lecturer
Department of CSE
Daffodil International University

Co-Supervised by:

Ahmed Al Marouf
Lecturer
Department of CSE
Daffodil International University

Submitted by:

Md. Hasibul Hasan

(Md. Hasibul Hasan)
ID: 162-15-7913
Department of CSE
Daffodil International University

Md. Foyzur Rahman Khan

(Md. Foyzur Rahman Khan)
ID: 162-15-7971
Department of CSE
Daffodil International University

APPROVAL

This Project/internship titled **"Warranty Expire Reminder'- an android based mobile application**, submitted by Md. Hasibul Hasan, ID No: 162-15-7913 and Md. Foyzur Rahman Khan, ID No: 162-15-7971 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 09 July 2020.

BOARD OF EXAMINERS

Dr. Syed Akhter Hossain **Chairman**

Professor and Head

Department of Computer Science and Engineering

Faculty of Science & Information Technology

Daffodil International University

Subhenur Latif **Internal Examiner**

Assistant Professor

Department of Computer Science and Engineering

Faculty of Science & Information Technology

Daffodil International University

Raja Tariqul Hasan Tusher **Internal Examiner**

Senior Lecturer

Department of Computer Science and Engineering

Faculty of Science & Information Technology

Daffodil International University

Saddam

Dr. Md. Saddam Hossain **External Examiner**

Assistant Professor

Department of Computer Science and Engineering

United International University

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ABSTRACT

Warranty Expire Reminder is an android application which aims to help those people who easily lost their products warranty card. This whole project is for easing our life style. Just signing up with email and password the user will ready to go. This application provides a wide range of category and sub category of products. The user has to fill some information about their products like name, model, purchase date, warranty card image etc. and that information will be saved to the database automatically. Once the information is stored in the database the user can access those information's from any place and from any android device as they need. User can see all the warranty cards he/she stores along with other information. After the expiration of any warranty card, it will delete automatically from the list and stored into another directory for future purpose.

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CHAPTER 1
INTRODUCTION

1.1 Introduction

Today’s world is going ahead and every technology is going ahead. Now-a-days everyone is highly dependent on technology. Everybody uses smartphones and they want everything in the grip of hand. People shop online, call a cab through online [1], watch tv’s online, read news online, communicate through online. Preserving a piece of paper whether it is valuable or not is hard for people now-a-days. If an application can take the burden of storing, notifying any information people will welcome it warmly.

1.2 Motivation

We always buy different kind of products. Electric products, tv, laptops, phones, cars, motorcycles, gadgets, computers etc. Many of those products provides guaranty/warranty for a certain period of time. For getting the after-sale warranty they provide us a piece of paper which is known as ‘warranty card’ [2].

For getting any service we need to store those cards. We usually store those cards but after a certain period of time we kind of lost these cards. That’s why can’t avail the warranty of many valuable products.

If we just capture and upload those images along with product information to an application then we won’t miss those products after-sales services. Also, we won’t have to bother whether the warranty card is lost or not.

1.3 Objectives

Carrying out warranty card or any kind of piece of paper is always difficult. Suppose, you won't have to carry any of the valuable papers than your life would be easier than ever. Many of us carry papers like NID card, Business cards, warranty cards etc. along with them and sometimes lost it. But carrying soft copy of those papers is easier as you don't have the risk of losing them. But carrying soft copies also sometimes became a mess as we take a lot of pictures in our smartphones. So, if there is any app which will store this kind of papers than it will be much easier and more organized. We can access those papers at any location, at any situation and use them as you need.

1.4 About our App

This app is basically for storing various kind of document which we don't need right now but in future you may need it. The user has to sign up using their email and then they can also set their profile. There are different category and sub category from where any user may find the product information they want to store. The user has to input the brand name, model name, upload the warranty picture of the product and that's it. Those cards will be saved to 'my cards' directory along with other cards the user has added. The user can set any reminder like if they have any servicing after a certain period of time, the app will remind them with notifications.

The user can access that information anytime from anywhere. Even if they uninstall the app or change their smartphones. The user has to just install the app and login using their email and all of their previously saved information is still there.

The best part of the app is that, this app can track the expire date of any warranty card. If any warranty card expires then those cards automatically remove from 'my cards' directory and move to 'expired cards' directory as first come, first serve order.

1.5 Scope of the Project

Basically, this app is very user friendly and any kind of people can use it easily. Signing up to the app is very easy. Just by entering email and creating a password user can have an enormous access of wide privileges. All they have to do is just upload the image. User can select the image from gallery or can capture an image from the app. They also can set a note for any products if they need. The reminder option will help them a lot by giving notifications. Any kind of user will find this application useful and welcome this app warmly.

CHAPTER 2
BACKGROUND

2.1 Introduction

Warranty card is a piece of paper provided by the selling company who sells different kind of products. Traditionally, we store those warranty card somewhere in our house and when we need it the most, can’t find it easily. Sometimes we lost this small piece of paper. The main goal of this project is to reduce the hassle and to ensure the safety of those warranty cards by storing them online along with the product information.

2.2 Related Work

When we decided to build this app as our final year project, we looked through Play-store [3] and found no such app like that. This one is absolutely unique one. However, there are apps which has one or two features like us but not like this, that’s the main different concept of this app. Some of those apps has features for storing images like cloud, google photos etc. and for storing information there are some app too. But for storing both information along with image, there is no such application. We try our best to improve something which really looks different and unique. We try to make the UI as simple as possible. Anyone can use this app easily and comfortably. Our app is dynamic and we used a database to store those images and information’s.

2.3 Our Project Work

We tried and wanted to build an android application related to smart lifestyle. This application can make our life easier. With some extra useful features, of course which will be beneficial to the users. We wanted to build our application as a complete package. In our project we try to focused the concept of storing image and information. As, our project is an android application that’s why we use Java and XML programming language. Front end design is made by XML programming language. Our project contains a database, as the full project is based on database. We use Firebase database to store images and information. In our project we used English font. The language of our project is English. People from any places can use this application. That means, ours is an International project. Our project has some lacking's which we will try to sort out in our next updates.

2.4 Comparative Studies

As there is no such app in Play Store related to our project, we can say that our project is a unique one. Some app which have this kind of feature for using information or images all of them either static or dynamic. Our app is a dynamic app which will dynamically change as we input our information.

In our app, user cannot contact others, as there is no community feature available in the applications. They cannot share their experience and feedback. Although they can give rating once we upload this to play store. This kind of app doesn't need any community as all the information stored here is private and confidential information. So, there is no community for this application.

This application is specifically designed for mobile devices. The interface of our app is so friendly that the user can easily manage the app and enjoy while using it. We hope they will enjoy using it because it is easy to handle and it will be helpful for their any kind of purpose. As, this app is for easier life style, the easiness of interface is too much important.

2.5 Challenges

When someone wants to develop something different, something unique, then they have to face some different types of challenges, contest, competition and obstacles. As like this situation, our project also has some different types of challenges. As, our project is a unique one and there is no such app, that's why our challenges were different. We didn't know how to start the project and how to design this project. As, it's a new idea, so, we had to think a lot about this project, like the design pattern, the implementation part, the interface etc. also we had to think about how people will accept this project easily as it is always difficult to introduce a new thing or to start a new trend. Our project simply will change the conventional method of storing papers or carrying them around, so, it is always difficult to break the convention.

CHAPTER 3
REQUIREMENT SPECIFICATIONS

3.1 Business Process Model

Business process modeling (BPM) [4] is the activity of representing the process of an enterprise so the current process can be improved, automated and analyzed. The term 'business model' is thus used in very familiar way and for a broad range of informal descriptions to represent core aspects of including purpose, structures, operational process and policies. The main characteristics of the methodology is based on diagram as 'Flow diagram'. Here we are trying to describe our projects business model using Data Flow Diagram. Normally, Data Flow Diagram describes form google and how data flow is processed through a system or project.

A DFD shows what kind of information will be input to and output from the system, how the data will advance through the system, and where the data will be stored. It does not show information about process timing or whether processes will operate in sequence or in parallel, unlike a traditional structure flowchart which focused on control flow. It's like a diagram which all application has. Because this is the main structure for any application and for better understanding. By business process model a user can realize how it works and that's the main point. Developers always tries to invent their business model by their own way. Because every application is unique that means there are certain dissimilarity with each other. An UML activity is a workflow diagram, which presents both control and data flows as a unified model.

Figure 3.1 shows the Data Flow Diagram of ‘Warranty Expired Reminder’

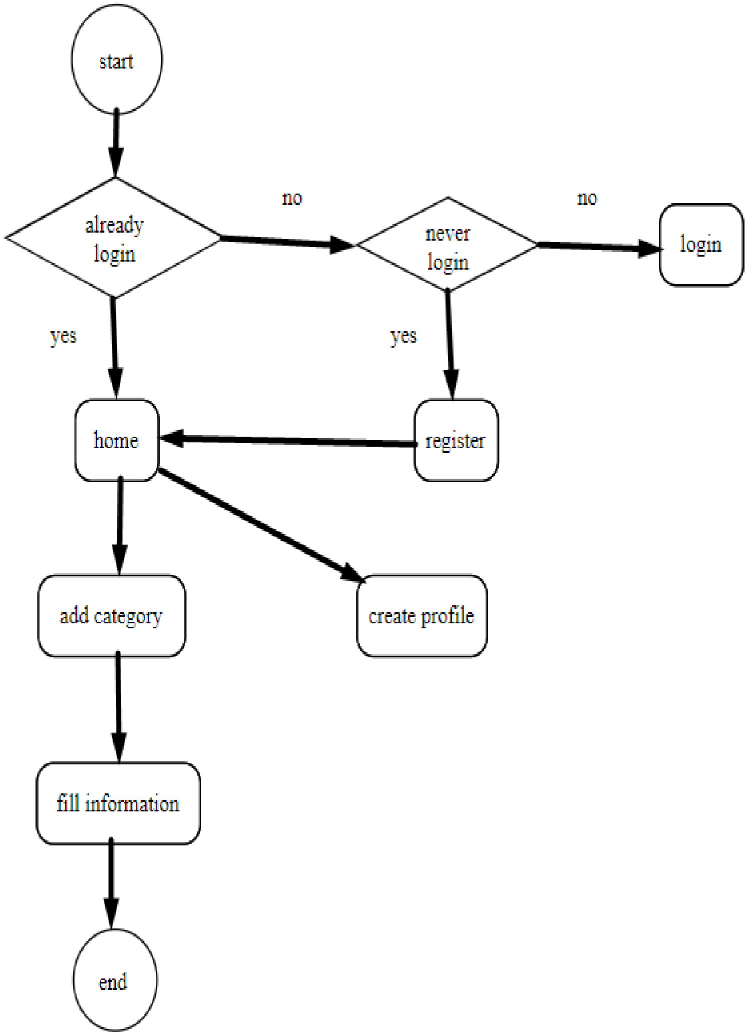


Figure 3.1: The Business Process model of Warranty Expired Reminder

3.2 Requirement Analysis

Requirement analysis is also known as requirement engineering which is the process of determining user expectation from a new system. These features, called requirements, must be quantifiable, relevant and detailed. Requirements analysis involves frequent communication with system users to determine specific feature expectations. Resolution of conflict or ambiguity in requirements as demanded by the various users or groups of users, avoidance of feature creep and documentation of all aspects of the project development process from start to finish.

For the project development process, there are two types of requirements. One is functional requirements and another is non-functional requirement.

3.3 Functional Requirement

Functional requirement is those which are related to the technical functional of the system as like application software can perform. From the point of view of our system, the application has many functional requirements as like maintaining database and maintaining server where only admin section person can access. There are some built in function.

3.4 Non-functional Requirement

Non-functional requirement is a requirement that specifies criteria that can used to judge the operation of a system in particular conditions, rather than specific behaviors as like how much efficient the application is, user friendly, performance issue of the application etc. From the point of view of our system, the application has many functional requirements as more efficient, relevant, optimize performance, memory consumer and smoother operation, loading on quickly and parsing data from online as soon as possible.

Applications user interface is also so user friendly and gorgeous for excellent user experience. There are many Non-functional built in function also use in here.

3.5 Use Case

A use case is a list of actions or event steps typically defining the interactions between a role and a system to achieve a goal. Use-case always use for user understanding and we try our level best for efficiency.

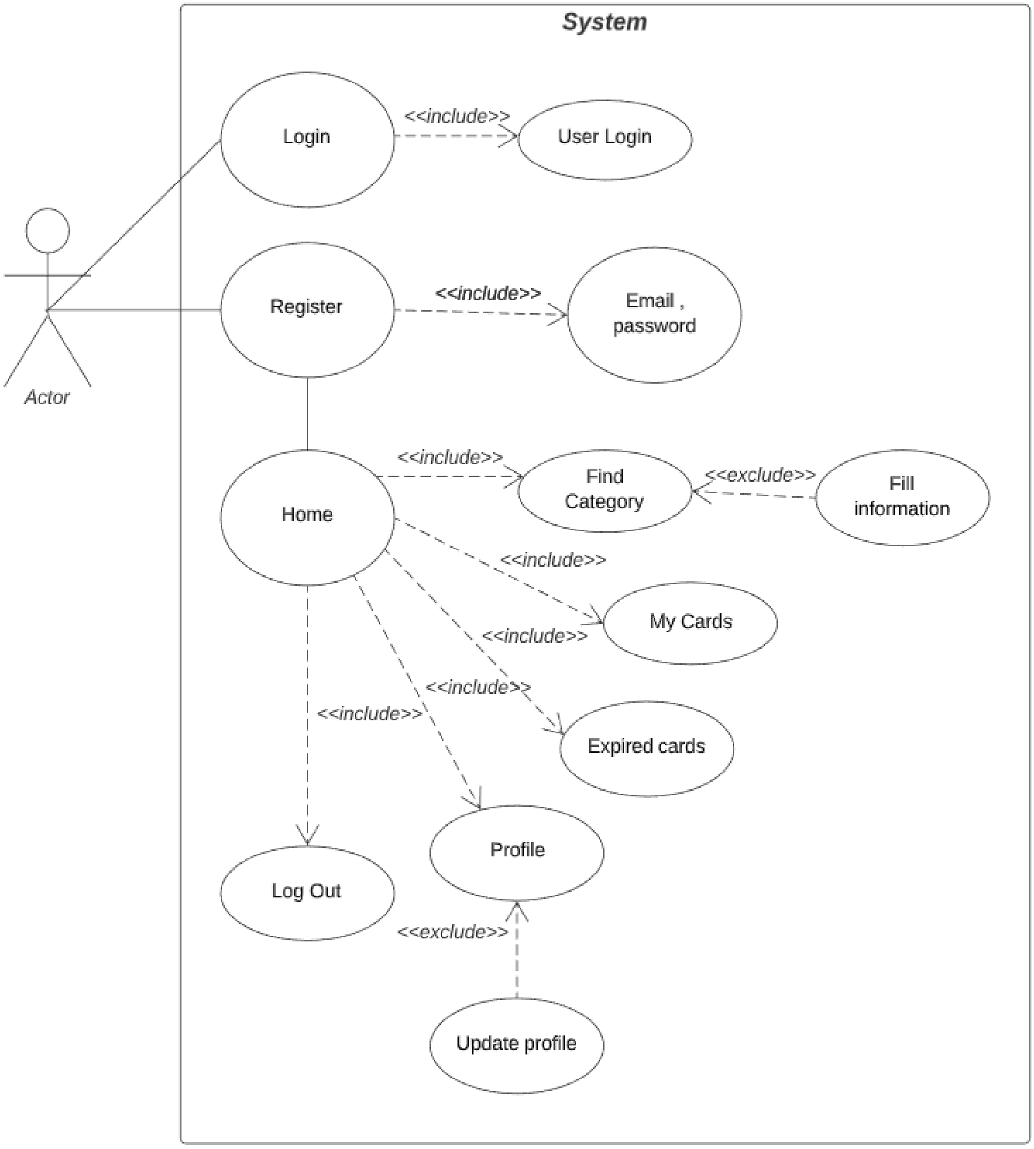


Figure 3.2: Use-case modeling of Warranty expire Reminder

Here in figure 3.2[5] we show the use case diagram of our application. From the beginning user has to create an account if they don't have any. Then they have an access for the homepage and then all. In home page there are some categories and inside the categories there are some sub-categories. Option menu is one of the main parts and some buttons include here. User can select any option from here like profile, my cards etc. In my card's user can see all cards. In profile user can update their profile. Use case mainly show how to use the project or something. This use case indicates the same thing here.

3.6 Logical Data Model

Logical data model [6] mainly consisted of few elements like, data entities, attributes and keys and relationship between the entities. By which the organization data and business rules is defined and govern the relationship between them. As a Back-end we use core object oriented and Front-end XML. In our application we used firebase database for both authentication and storing image and information. We also used our database for storing user information.

3.7 Design Requirements

1. In our system, we used authentication for our user by only valid email because without registration user can't save their data and the app can't define which information is for which users [7].

2. User can set their profile along with profile image in our application. Although setting profile is optional.

3. We design our whole project using English font and language. So, user around the world can use our app and be beneficial.

5. Our app has no community. We only can check our review from play store and can update our application from their suggestions.

6. Our application is a dynamic application. We used real time database for our project.

We tried to build our app as simple as possible. We keep in mind about user while developing and we design our application. That's why, our android application is so user friendly and easy to use. As there is no such app in play store that's why this kind of application is very important and we hope people will accept our application warmly.

CHAPTER 4

DESIGN SPECIFICATION

Design specification is nothing but a design document which describes all data, architectural, interface and component-level design for the application. A design specification provides detailed information about the requirements for an application and how the application is to be put together.

4.1 Front-end Design

The front-end is everything involved with what the user sees, including design and some languages. The front-end design is the interface users see when they open the app or website. That means to keep the users interested in the application and website. Front-end designing is the most important part of a project. Usually most of the users expect a simple and easy user interface or graphical user interface from the developer which they can use comfortably. If the front-end design is so complex, the application fails to attract the user. The front-end design of our project is as follows.

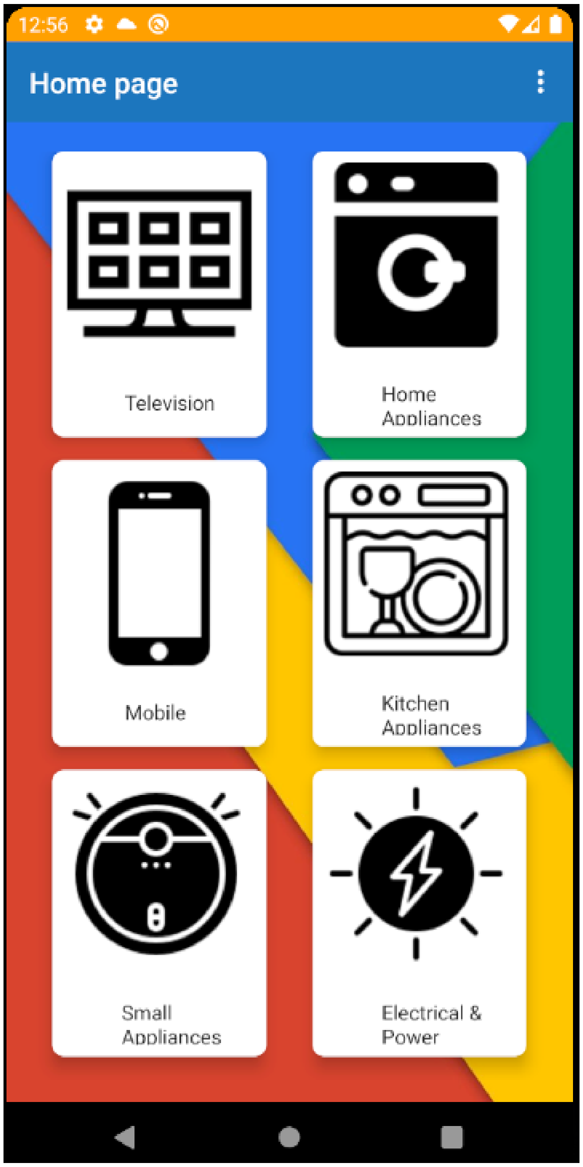


Figure 4.1: A Screenshot of Home Page of Warranty Expire Reminder

Figure 4.1 show us, the homepage of our application. In this page, there are all kind of category of any products. When a user wants to add a product, first he/she have to choose the category. Then after clicking on the category, they will see a whole list of sub-categories.

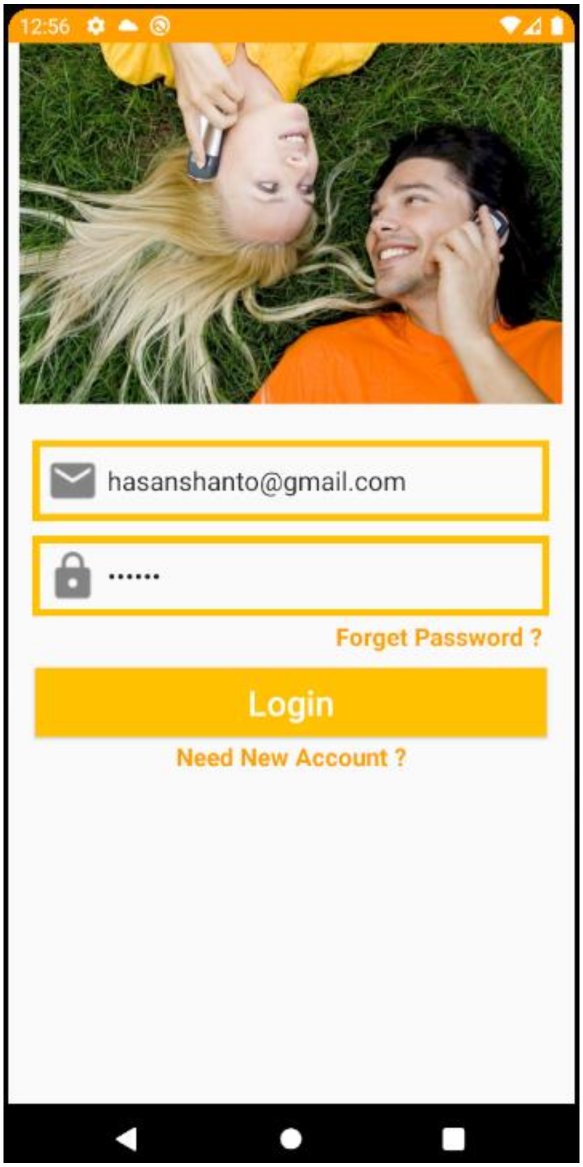


Figure 4.2: A Screenshot of Login Page of Warranty Expire Reminder

Figure 4.2 show us, the Login page our application. After creating account user can login through their email and password. After login into application every time user open the application they will be automatically logged in until they sign out from the application.

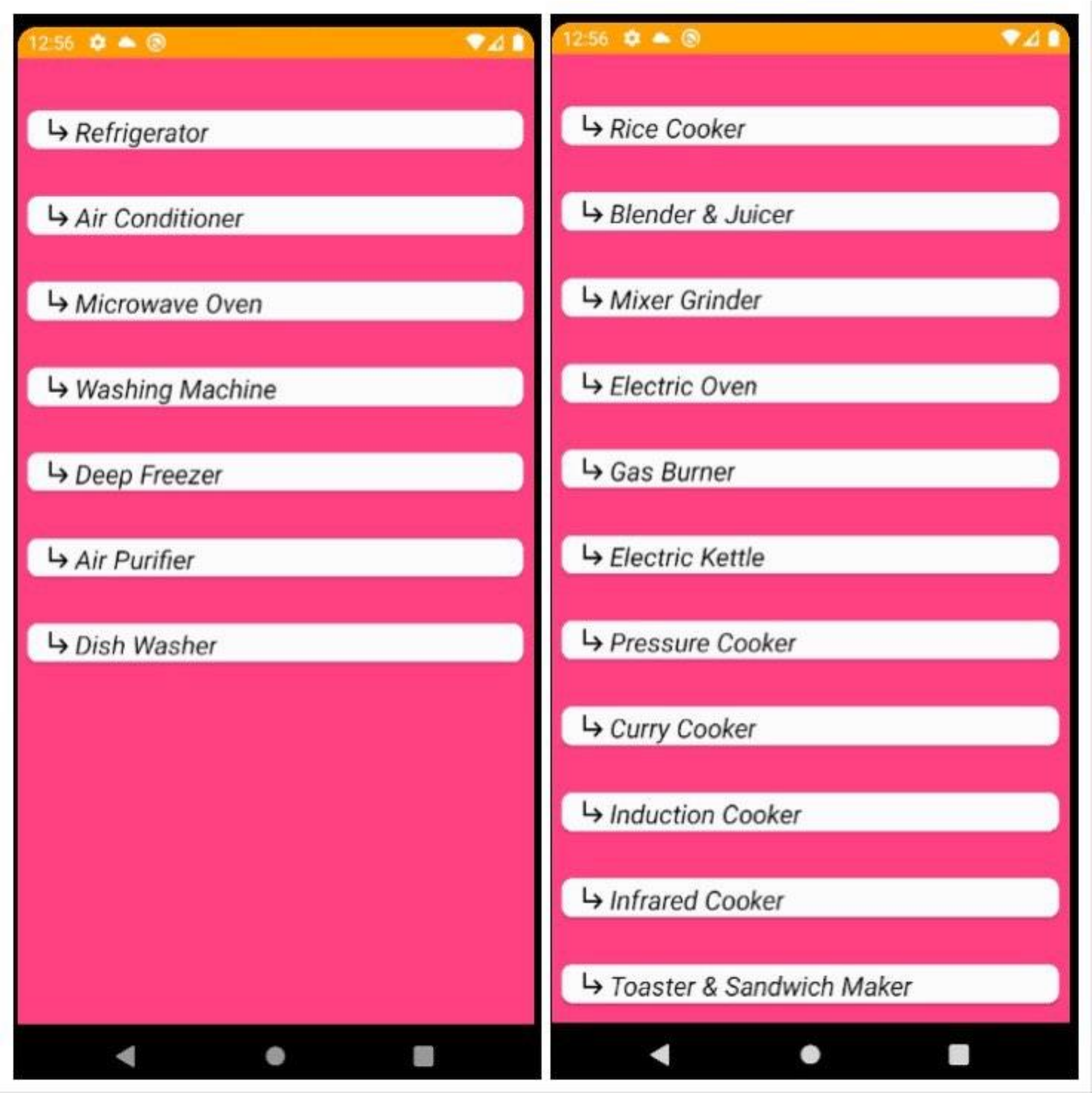


Figure 4.3: A Screenshot of sub-category page of Warranty Expire Reminder

Figure 4.3 show us, the sub-categories of our applications, user can choose their desired product. And after clicking on the sub-category a form will appear before them. And by filling the form with information user’s work is done.

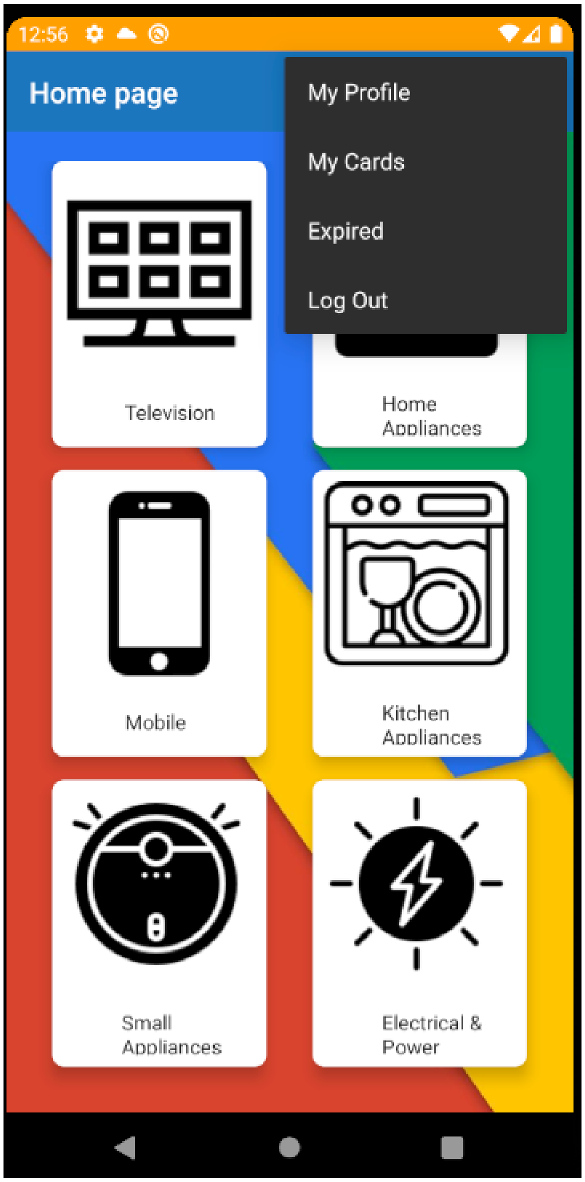
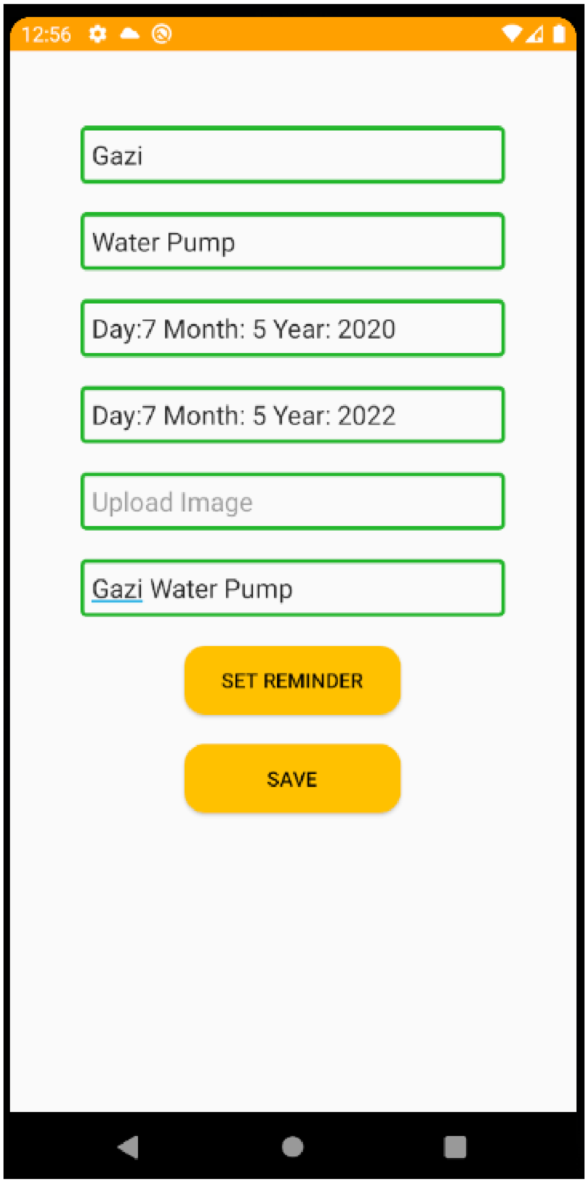


Figure 4.4: A Screenshot of app Menu option of Warranty Expire Reminder

Figure 4.4 show us; this is the menu bar for our app, which consists of profile, my cards, expired cards, logout options. User can choose any of the option from the option menu. By clicking on profile user can set up their profile. In my cards option user can see the list of all cards along with information stored by first come, first serve method. In expired option user can have access to the list of all expired cards. By clicking on sign out user can sign out from the application.



Gazi

Water Pump

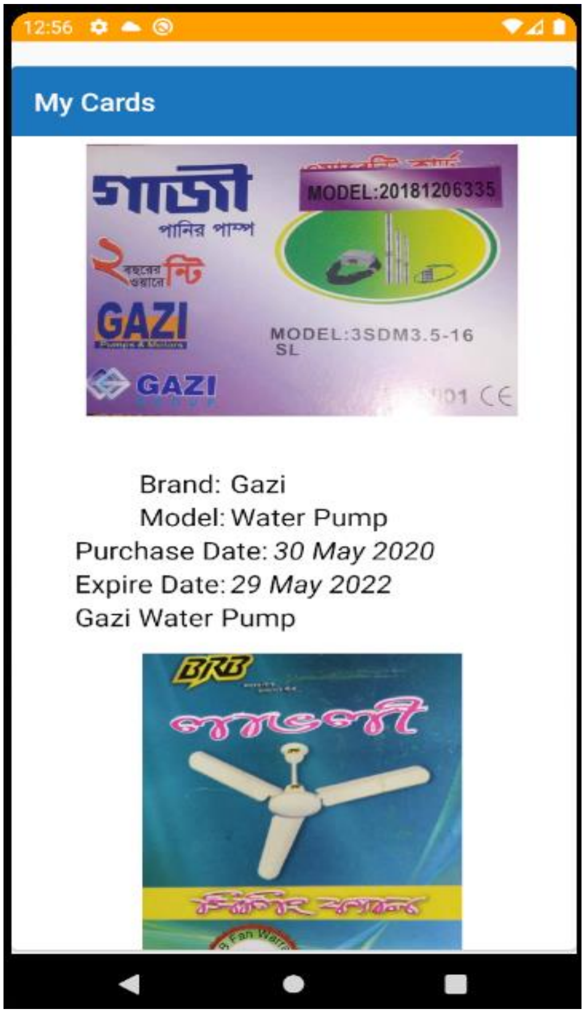
Day:7 Month: 5 Year: 2020

Day:7 Month: 5 Year: 2022

Gazi Water Pump

Figure 4.5: A Screenshot of information fill up form of Warranty Expire Reminder

Figure 4.5 show us, the form where user have to fill-up the form with information like brand name, model name, purchase date of the product etc. and with reminder option. The most important part is to upload the image of the warranty card. After filling this form with all information, the user can save the whole information and all the information will saved to firebase database. User can set notes for the products and reminder for any kind of servicing type works.

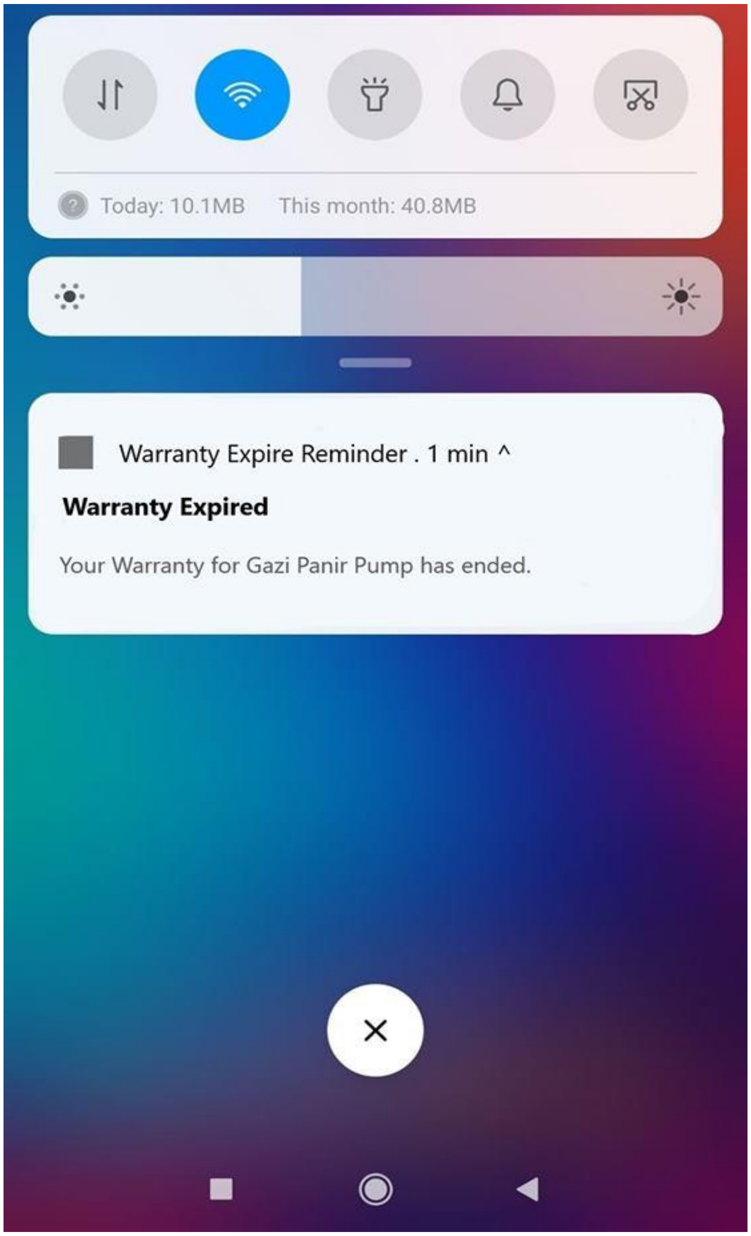


My Cards

Brand: Gazi
Model: Water Pump
Purchase Date: *30 May 2020*
Expire Date: *29 May 2022*
Gazi Water Pump

Figure 4.6: A Screenshot of My cards page of Warranty Expire Reminder

Figure 4.6 shows us; the cards, that we stored in using the app in our database. As, a user can save multiple cards, so, here are all the cards, the user saves for future use. Every card shows all information about the product along with the warranty card image. User can access these image and information any time they want. Most importantly, if the user needs to print the warranty card, then they can print this directly from mobile by printing option. Also, they can share the image by Bluetooth, share it, mail the image also. The most amazing part is that, in this section only those cards will be available, which has the valid warranty. If the cards don’t have any warranty, then the card won’t be in this section.



Today: 10.1MB This month: 40.8MB

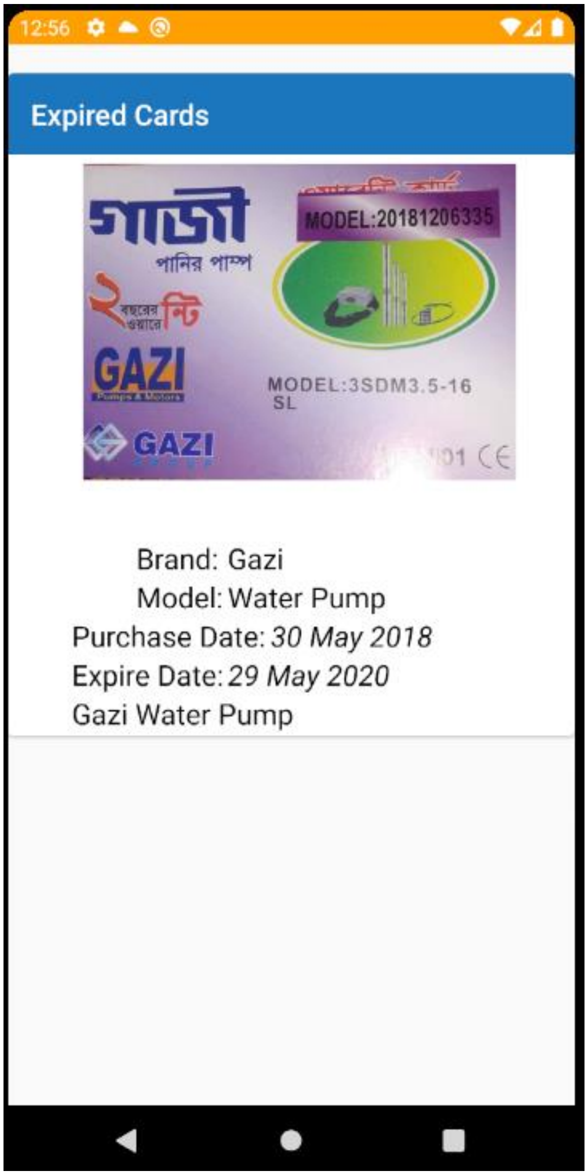
Warranty Expire Reminder . 1 min ^

Warranty Expired

Your Warranty for Gazi Panir Pump has ended.

Figure 4.7: A Screenshot of notification of Warranty Expire Reminder

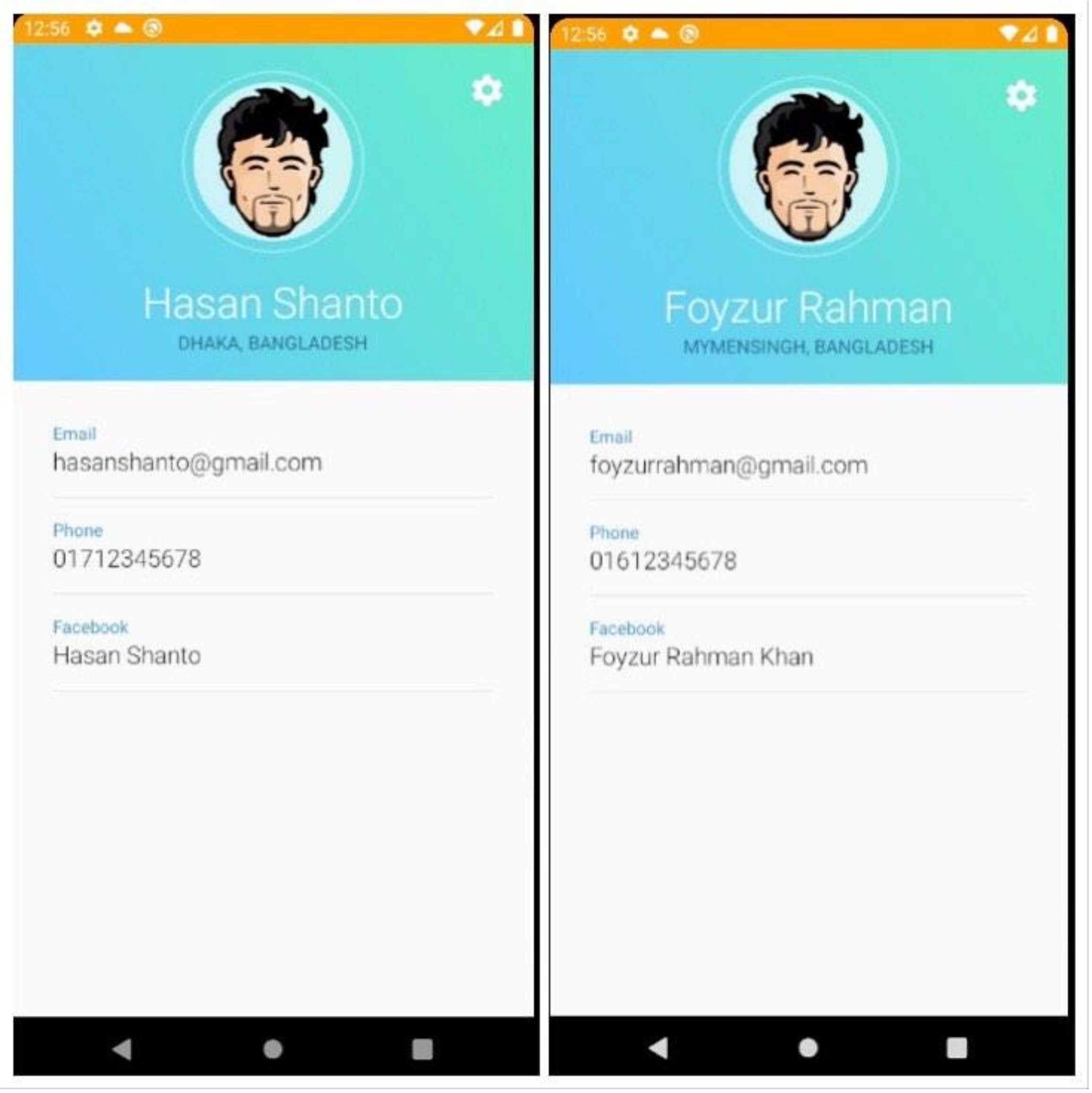
Figure 4.7 shows us the notification window of our application. When a cards warranty is about to expire our app will send a notification to user and will move the cards from my card's directory to expired cards directory. Also, user can set notification anytime if they want for any notification from app regarding any after sales service.



Brand: Gazi
Model: Water Pump
Purchase Date: *30 May 2018*
Expire Date: *29 May 2020*
Gazi Water Pump

Figure 4.8: A Screenshot of expired cards of Warranty Expire Reminder

Figure 4.8 shows the list of all the cards which are expired. These cards were previously stored in my card's directory. But as those cards don't have valid warranty, that's why these card's move from my card's directory to expired cards directory. Our application automatically detects the expiration of warranty and move those cards from my card's directory to expired cards directory. These cards are stored here for future purpose. The user can delete any card if they want.



12:56

Hasan Shanto

DHAKA, BANGLADESH

Email

hasanshanto@gmail.com

Phone

01712345678

Facebook

Hasan Shanto

12:56

Foyzur Rahman

MYMENSINGH, BANGLADESH

Email

foyzurrahman@gmail.com

Phone

01612345678

Facebook

Foyzur Rahman Khan

Figure 4.9: A Screenshot of User Profile Warranty Expire Reminder

Figure 4.9 shows the profile page of user in our application. User can set their profile if they want. User can set their profile picture, name, address, phone number, email, social media id. These information's are necessary, if anyone wants to set their profile in this app. But if anyone choose not to set their profile then there is no problem. Setting profile is optional.

4.2 Back-end Design

The back-end also known as server-side design. It controls the behavior of the application upon an action is taken. The front-end is the visual representation of the back-end only. Whereas back-end is the core portion of any application from where everything is controlled. For any application, software, website back-end is the crucial part. That's why, maintaining security, structure, content is very important. In any application back-end mainly has three part like server side, database and application.

Our application contains a database. We use firebase database for our application. In our database there are two parts. One is the user email storing option along with their information like profile picture, name, address etc. another option is for storing all those cards. We stored those cards as category and sub-category wise. Suppose we want to store an information for the category TV and the sub-category here is LED TV. So, the information will be saved in database as the TV category and LED TV sub-category. If we add another card for LCD TV under TV category then it will store in the TV section along with LED TV sub-category. This database is dynamic and real time database. It will change right after someone made any change or add a new card.

Our application has a simple authentication part although it's not a major deal. When signing to the application user have to submit a valid email address. If the email address pattern doesn't match then user can't sign in to our application.

Our database is totally secure and safe. All that information will remain confidential and no third party is allowed to access that information.

4.3 Implementation Requirement

To build our application, we used different types of implementation tools, attributes and components. By using those tools, it is now easy to access the application easily and the application is useful to any kind of people. In this implementation requirement area, we discuss all those tools, attributes and components we used to develop this whole project.

In our project we implement the core code that’s means the Java and XML code. The special thing is in our application it is very easy compare to other applications.

4.4 Mobile Application Version

Our application is smartphone based, mainly android based. As most of the people use smartphones that’s why ours is a mobile based project. In this part, we will discuss the tools we used to develop this mobile version of our project [8]. It depends in many things like android studio, emulator, firebase database etc. Its fully depend on developer how they develop the project. Because different developer uses different kind of tools. For example, we used firebase for our application for authentication and database.

4.5 Android Studio

Android studio [9] is the official integrated development environment (IDE) for Googles Android operating system, built on Jet Brains IntelliJ IDEA software and Android SDK for both developing our android application and also testing our android application when need to run for seeing output.

4.6 Android Overview

Android is a comprehensive platform, which means it is a complete software stack for a mobile device. It provides all the tools framework for developing mobile application simply, quickly and easily. We design our application with Extensible Markup Language (XML), connected to firebase database server with Java Language in Android Studio. Android is also open source platform where developer can make any types of user interface which the developer needs to design their application. The developer can write any programming language for their application in android studio. So, developer can easily develop different types of mobile application by use it for user interaction.

4.7 Android SDK

Android development starts with android SDK (Software Development Kit) [9][10]. Android SDK is a set of collection of development tools used to develop and build of any kind of android application for android platform. That means Android SDK is essential tools for both developing and building any android application. We use security to file uploads and downloads for our Firebase apps, regardless of network quality. User can use our SDKs to store images, information or other user-generated content. On the server, user can use Google Cloud Storage, to access the same files.

4.8 The Emulator

An emulator is an Android Virtual Device (AVD) [11] that represents a specific android device for emulating any types of android application or project. The developer can use an android emulator as a target platform to run and test their Android applications on their Personal Computer (PC). But Using Android emulators is optional. We run our application in both our personal device and Android emulator too. The emulator runs the same code base as actual device. The emulator is so pretty for emulating android projects. An Android emulator is installed by default during the RAD Studio installation. The installed Android emulator is name pixel 3a, which uses Android 10.0 x86. Before creating an Android emulator, one need to install android studio and then create emulator with the version they want.

4.9 Interaction Design and UX

Interaction Design is an important component within the giant umbrella of User Experience (UX) design. Interaction design is specifically a discipline which examiners the interaction between a system and its user via an interface and User experience (UX) design is the process of creating products that provide meaningful and personally relevant experiences. It may also incorporate design focused on how information should be presented within such a system to enable the user to best understand that information thought this is often considered to be separate discipline of "information design" too. For User Experience (UX) design we have tried to give some fantastic and well experience by using our application. We keep our application too simple and also easily for better experience, feelings and performance for the user of using our application. Hope our systems information is secured and helpful for the user.

CHAPTER 5

IMPLEMENTATION AND TESTING

5.1 Implementation

After clicking on the application our application runs smoothly without any problem. If the user uses it for the first time then they have to register through email else the user will be already logged in to the application. Then, user has to select a category and sub-category according to their cards. After selection, user has to fill up the form with information and image and that's it, user is ready to go. From the menu option user can choose any option like my cards, expired cards etc.

5.2 TESTING

Testing is required for any kind of project and is very important. After finishing the app work, the app needs to test in devices both real time and emulator. The main idea behind testing is to find any kind of error or bug. Also, after any kind of major or minor update any project needs to be tested with small details to see if there is any bug.

5.3 Implementation of Front-end Design

It is really a great challenge to design the front-end design for any project which will be both attractive and user friendly. We kept in our mind about the front-end design from the very beginning when we start our project work. As there is no such app in play store, so we can't take any idea for our app or about our front-end design. But we check and observe many app that has the similar function like us. Function's like sign up page, home page, card view design, forms, menu etc. For interactive design we always tried to think as simple as possible and easier way for user interface design for creating user attraction to our android application. We use some materials and tools for making and creating attraction to the user. On the other hand, the user can enjoy to using a very simple and easier interface. So, designing the front-end of our application was really a good challenge.

We had to keep in mind that our smartphones display size and hardware quality is totally different. So, we designed and build our app in such way so that it supports in any kind of android devices. We made our application as user responsive way, so it will support in any kind of device no matter the display size. Some of the smartphones have very weak hardware component, in a little bit pressure those device gets hang and stop functioning sometime even crash the application. These reasons occur for the difference of versions. So, we design the application which will support all the devices as like older to newer version and we ensure that our android application is secure and will not create any extra pressure on devices.

5.5 Implementation of Java and XML Code

We use android studio [12] for our application user interface design with file and for java code to connect with the XML file, firebase real-time database server [13].

In figure 6.1 of the appendix section, it shows screenshot of Java code.

We use android studio for completion of our project. The language we used is Java [14] and XML [15]. XML used for UX front end design basically and Java for back-end operation. We connect our application with google firebase system to user google firestore for saving our information. We used firebase mainly for database. Figure 6.2 of appendix section we use the screenshot of the XML code.

5.6 Testing Implementation

Table 5.6: Test Case for Project on Warranty Expire Reminder

Test Case	Test Input	Expected Output	Actual Output	Result	Tested On
1.Install Application	Tested on Various – 1. Jelly Bean (4,1-4.3.1) 2. KitKat (4.4-4.4.4) 3. Lollipop (5.5-5.0.2) 4. Marshmallow (6.0) 5. Nougat (7.0-7.1) 6. Oreo (8.0-8.1) 7. Pie (9.0) 8. Q (10.0) 9. R (Android API R)	Successfully installed in all those versions.	Install successful	Passed	04/06/2020
2.Event Create	Create new event with proper information.	Create new event and show in list.	Show the created event successfully.	Passed	04/06/2020
Compile	Compile successfully all code.	Show the actual result.	Actual output.	Passed	04/06/2020

5.7 Test Results and Reports

Test report is needed to reflect the result of testing the application in a formal way, which gives an opportunity to estimate the result of testing quickly. It is a document that records data obtained from a determine experiment in an organization manner, describe the environment and operating system and shows the comparison of test result with objectives, which are so important for any types of application. In table 5.6, we shown test case, test input, expected output, actual output and finally we find our expected result for our application. The test result is quietly successful. The user satisfies to use our application. Our expectation will be that user can easily use and understand our application as a better user interface.

CHAPTER 6

CONCLUSION AND FUTURE SCOPE

6.1 Conclusion

Our android based mobile application has been successfully implemented. For implementing our application, we tested the application with many types of smart phones, we saw that our application worked properly and it also gave the required data form our application. The authentication part works perfectly and firebase database store that information smoothly. Even if we uninstall the application and install it again the app gives us the data we stored just after login using our email. In play store there is no such app. So, this app can be very useful to any user as this is convenient and user friendly.

The design is very user friendly. The user interface is so simple and not looking like as a complex view. User can easily handle our application. We tried our best to complete all requirement for our application. We hope that people will use our application and get proper service.

6.2 Limitations of our Application

As like all application, our application has also some limitation. We will overcome those imitations in future. Here, we want to mention that some of the main limitations of our application are given below:

1. The main limitation is that user can’t create category as their own.
2. User can’t print those cards using the print functionality.
3. User has to upload the image from gallery, can’t use the camera directly.

6.3 Future Scope

We try our best for developing our application in present time. If we find any scope for developing in future, we want to develop and change something of our application. Our future developments scopes are given below:

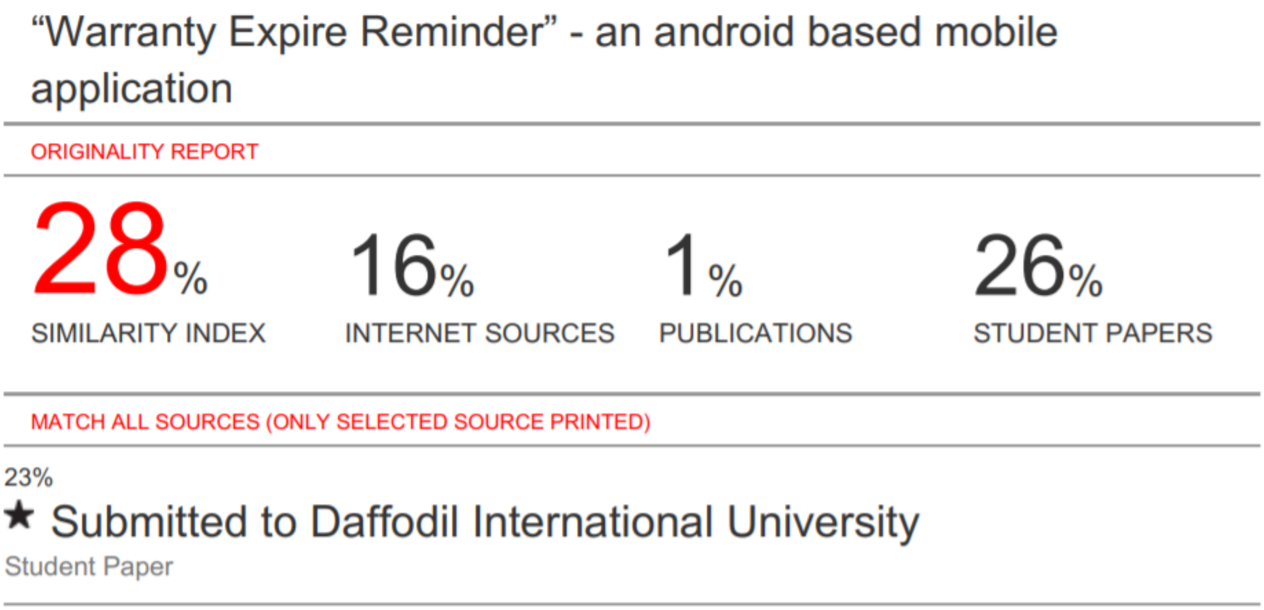
1. In future, we will try to make our application more user friendly.

2. we can implement machine learning feature in our application by which the app itself can extract all the information from the warranty card image.

3. we can improve the notification system even better.

4. user can create any category and sub-category as the need.

Plagiarism Report



“Warranty Expire Reminder” - an android based mobile application

ORIGINALITY REPORT

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SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

MATCH ALL SOURCES (ONLY SELECTED SOURCE PRINTED)

23%

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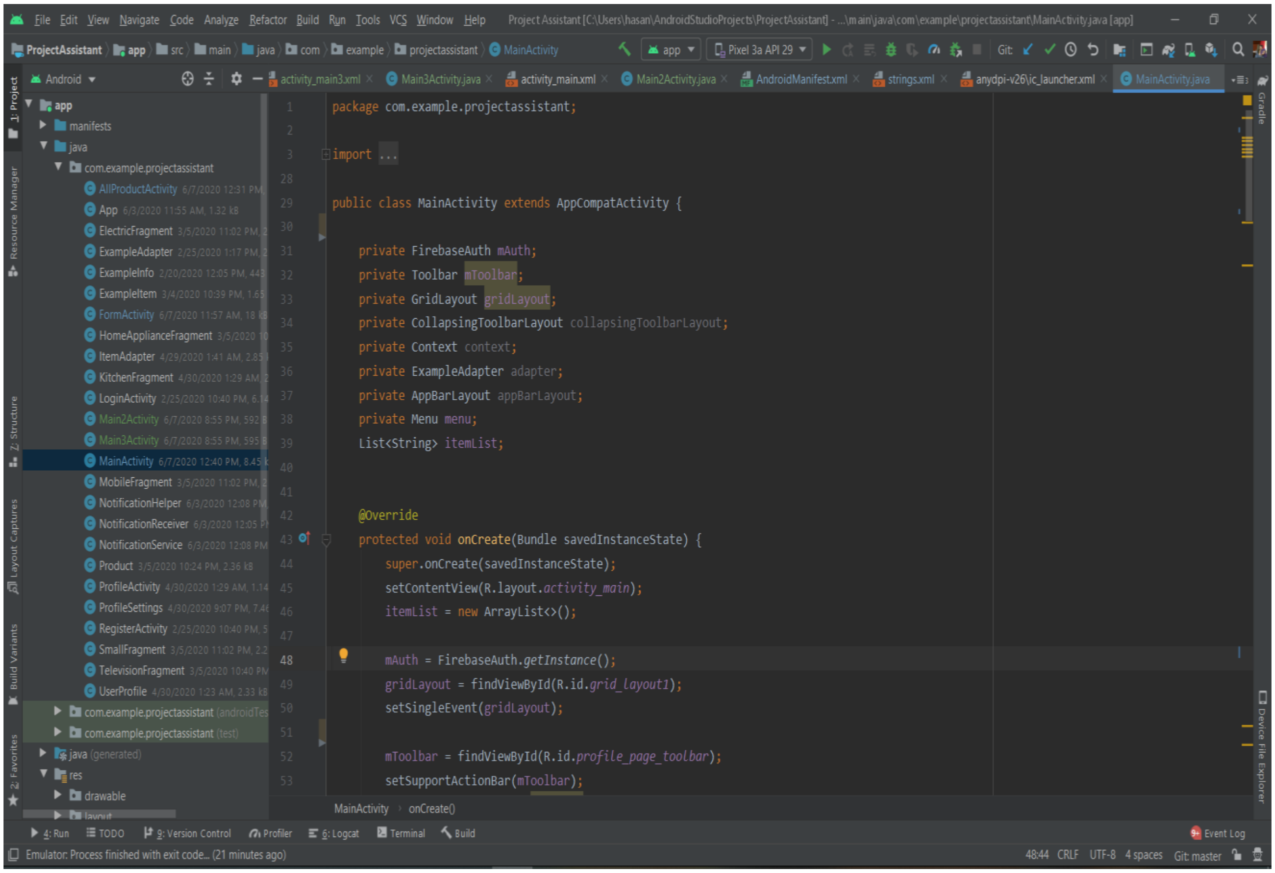
APPENDIX

Java Code

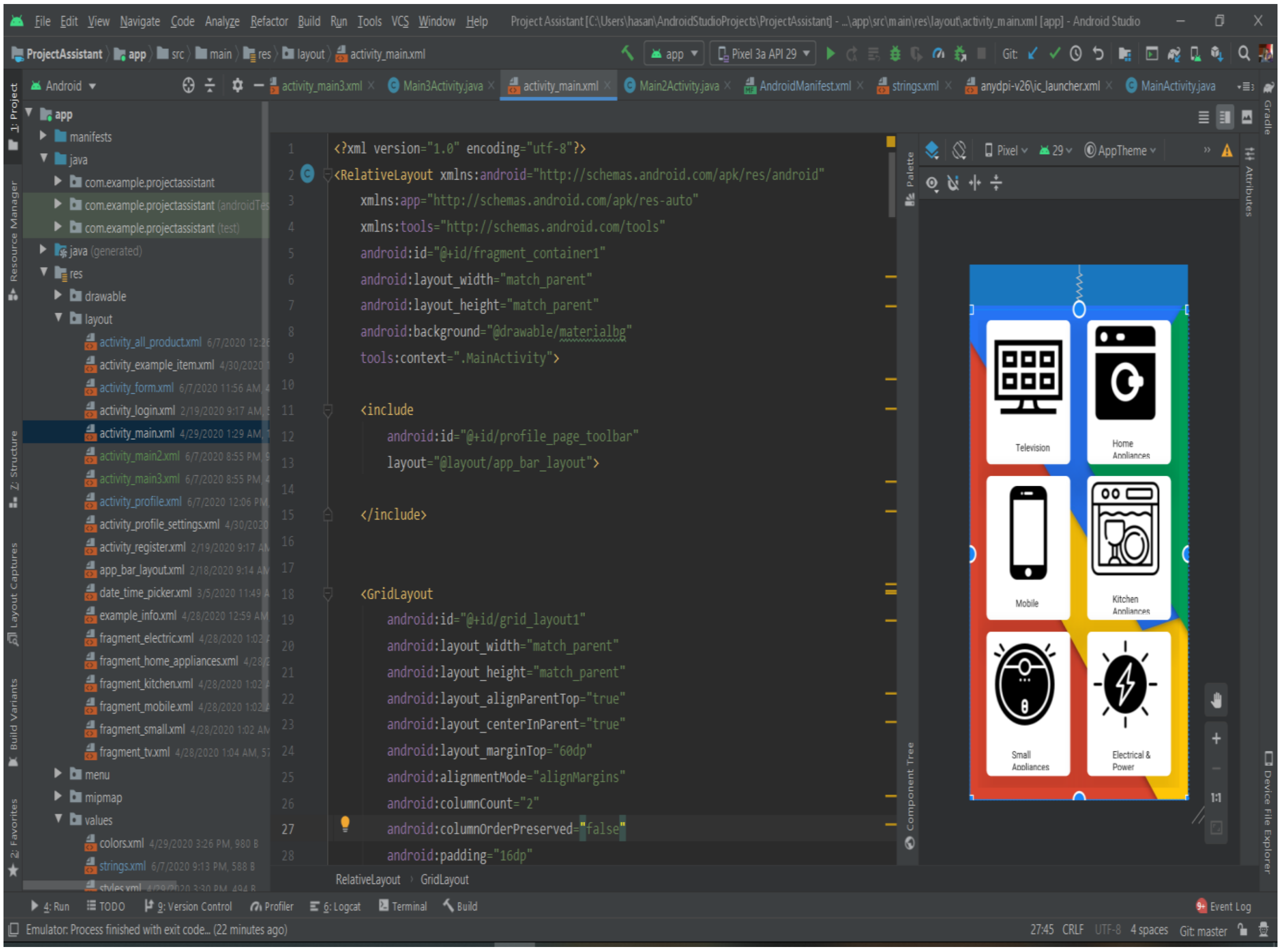


```java
package com.example.projectassistant;

import ...

public class MainActivity extends AppCompatActivity {

    private FirebaseAuth mAuth;
    private Toolbar mToolbar;
    private GridLayout gridLayout;
    private CollapsingToolbarLayout collapsingToolbarLayout;
    private Context context;
    private ExampleAdapter adapter;
    private AppBarLayout appBarLayout;
    private Menu menu;
    List<String> itemList;


    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        itemList = new ArrayList<>();

        mAuth = FirebaseAuth.getInstance();
        gridLayout = findViewById(R.id.grid_layout1);
        setSingleEvent(gridLayout);

        mToolbar = findViewById(R.id.profile_page_toolbar);
        setSupportActionBar(mToolbar);
```

Emulator: Process finished with exit code.. (21 minutes ago)

Figure 6.1: A Screenshot of Java Code of Warranty Expire Reminder

XML Code



```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/fragment_container1"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:background="@drawable/materialbg"
    tools:context=".MainActivity">

    <include
        android:id="@+id/profile_page_toolbar"
        layout="@layout/app_bar_layout">

    </include>


    <GridLayout
        android:id="@+id/grid_layout1"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:layout_alignParentTop="true"
        android:layout_centerInParent="true"
        android:layout_marginTop="60dp"
        android:alignmentMode="alignMargins"
        android:columnCount="2"
        android:columnOrderPreserved="false"
        android:padding="16dp"
```

Figure 6.2: A Screenshot of XML Code of Warranty Expire Reminder

REFERENCES

[1] “ride sharing services”, https://www.techrepublic.com/article/10-ridesharing-companies-that-can-make-your-work-trip-more-efficient/. [Accessed: 04-June- 2020].

[2] “warranty”, https://en.wikipedia.org/wiki/Warranty. [Accessed: 04-June- 2020].

[3] ‘’Google Play’’, https://play.google.com/store/apps?hl=en. [Accessed: 04-June- 2020].

[4] “About Business Data Model”, http://www.ucancode.net/Database-diagramming-tool.htm. [Accessed: 04-June- 2020].

[5] “About Use-Case”, http://www.nawandihalabja.com/airport-use-case-diagram/airport-use-case-diagram-best-of-47-awesome-free-use-case-template/. [Accessed: 04-June-2020].

[6] “Logical Data Model”, https://en.wikipedia.org/wiki/Logical_data_model. [Accessed: 04-June- 2020].

[7] “Design Process”, https://www.sciencebuddies.org/science-fair-projects/engineering-design-process/design-requirements-examples. [Accessed: 04-June- 2020].

[8] “Jet brains Tools”, https://blog.jetbrains.com/clion/2015/09/cpp-annotated-summer-edition/. [Accessed: 04-June- 2020].

[9] “Android Version and Code”, https://developer.android.com/studio/publish/versioning. [Accessed: 04-June- 2020].

[10] “Android SDK”, https://developer.android.com/studio/. [Accessed: 04-June- 2020].

[11] “Emulator”, https://www.androidauthority.com/best-emulators-for-android-315958/. [Accessed: 04-June- 2020].

[12] “Android Studio”, https://developer.android.com/studio/. [Accessed: 04-June- 2020].

[13] ‘’firebase’’ https://firebase.google.com/. [Accessed: 04-June- 2020].

[14] “JAVA Tutorial”, https://www.androidauthority.com/java-tutorial-beginners-2-582147/.

[Accessed: 04-June- 2020].

[15] “XML Tutorial”, https://www.w3schools.com/xml/. [Accessed: 04-June- 2020].