

MOBILE APPLICATION FOR GOODS EXCHANGE

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Degree of Bachelor of Science in Computer Science and Engineering

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APPROVAL

This Project titled “**Mobile Application for Goods Exchange**”, submitted by Marjia Afrin, ID No: 151-15-5474 and Rezwana Mamata, ID No: 151-15-5306 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 11-12-2018.

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We hereby declare that, this project has been done by us under the supervision **Prof. Dr. Syed Akhter Hossain**, Professor and Head, 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.

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ABSTRACT

In our everyday life in the society we often misunderstand our needs and end-up with abundance of goods which sometimes causes additional management. From this perspective we conceived this project “**Mobile Application for Goods Exchange**”. This is an android application for general people. To develop a better virtual communication among the DIU student, so they can exchange or share their unused stuffs is the main goal of our project. This will be accessible to all users who have a valid email. User can send text or call another user through this system. In this system user can communicate with other users through chat. This System contains some features that helps a user creating own profile, post picture of their exchangeable or shareable stuff, find lost things if anyone post the thing’s picture, can have all course materials like slides, book pdf, course outline, and customize own profile. This report is intended as a guide for teachers and engineering students when conducting research is part of coursework requirements. In this project we made an android application which is helpful for common people. So, it is a platform to be connected with each other. Requirements of the proposed system is identified through interaction with end user. In future data analytics with artificial intelligence will help delivering quality services to the end users.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

This is an android based mobile application influenced by some social and environmental cause. Basically, this application is designed for the common people. A huge community with a lots of possibilities. By sharing and caring for each other it will make the bonding strong. It is a communicating software where they can communicate with each other. Sharing extra stuff among each can be new way of making new friends or get to know each other. Reusing these staff will help to save some money. And also good for the environment. Study material section will provide pdf, slides regarding the necessity of the student. Finding all at one place students will perform better and achieve good grades. And of course learn better. **“Save Money, Support the Environment, Meet New People and Learn Better”**.

1.2 Motivation

Think how many stuffs you have? Do you use all of these? I can say no. Nobody needs all of his/her stuffs. Then what can we do with our unused goods? Another important thing consumption of new product has some effect on our environment. Producing new product add carbon to our atmosphere, uses natural resources. And also need money for manufacturing. Our motivation comes from this concept.

If someone wants to give their unused goods to others or exchange, then what will be the way? It seems quite impossible to ask one by one. And sometimes we forget to take our things like pen-drive, notebook, id-card or any other necessary papers from classroom or lab. One more thing, at the beginning of a semester if someone gets all of the course material then it will be helpful throughout the semester.

So, they need a platform to communicate and solve these problems. Here we propose an application to help students.

1.3 Objective

The “Mobile Application for Good Exchange” is the project for common people. Anyone can use this by opening an account through an email. Now we propose such a mobile application which will help the general people to solve these problems. It will be a one place for all. When one will use it, can be able

- To exchange or share goods.
- To provide course material (hand notes, book list, pdf, slide, previous question).
- To find out lost stuff & to communicate.

1.4 Features

Nowadays mobile phone is a part of our daily life. There are many kinds operating system for mobile phone. But among them android is the most popular and user friendly. If we built an android application with our proposed goal in mind, we can get a huge number of users initially. Our application features are-

- Make a platform to communicate.
- A way to share and exchange goods.
- Lost and Found.
- Provide course material.

1.5 Expected Outcomes

The main purpose of this project is to connect the member of DIU. All the students, alumni, teachers can use this and communicate with each other. It will be a platform to help and care for each other. Sharing can be a way for building strong community. It also be a place to find study materials which is beneficial for doing good in the exams. User will be able to create their own profile and manage it. Will also be able to chat through this.

1.6 Report Layout

In Chapter 1: It will give an overall idea about this application. This section contains motivation which actually defines beginning phase of this application. Objective of this application is also given here for understanding the purpose. And then the expected outcome.

In Chapter 2: It contains background about the applications which is fallen in this category. A comparative study about the related applications. What we learn from this application is also provided. Scope of this problem and challenges of this is given in this chapter.

In Chapter 3: Firstly, this chapter will provide information about (BPM) that means business process model. Then it contains requirement collection and analysis. After that use case model and logical data model will provide. Then finally requirement is given.

In chapter 4: All the design processes are here in this chapter like font-end design, back-end design, interaction design and UX and implementation requirement.

In chapter 5: This chapter discussed about the implementation of database, front-end designs, implementation and interactions, testing implementation and the test results of the project.

In chapter 6: About the conclusion of this application, limitation and the scope for further developments of this project is discussed here.

CHAPTER 2

BACKGROUND

2.1 Introduction

Before the innovation of modern day currency people used to barter goods and services from each other ^[1]. Sharing or exchanging goods is an ancient concept. Now, this concept is applying in a whole new way through online platform. Mainly focusing on reducing the product wastage. It also helpful for socializing and building strong community.

2.2 Related Works

Many platform working with the concept of selling or exchanging extra stuffs. An online platform named bikroy.com already built with this principle in our country ^[2]. They provide opportunities to buy or sell second hand products. Another application Trade Made is also used for trading and bartering items and services. Freecycle is a web site for giving away free stuffs. Let go also fall in this category ^[3]. Build for local buying, selling and swapping.

2.3 Comparative Study

Bikroy.com is a classified advertisement website performing in Bangladesh. Anyone can buy and sell easily their second hand products. Membership, Bump Up, Top ad, Banner advertisement these are the paid features of 'Bikroy.com'. New feature added search for property or jobs in Bangladesh. Trade Made provides a user friendly environment to trade and Barter. By using second hand products it may prevent new carbon from entering in the atmosphere. So, it has some social and environmental purpose. It has options like creating a profile, texting with each other. Freecycle and Let go quite similar with TradeMade. Freecycle has an option of giving away free stuffs.

2.4 Scope of the Problem

Real time chatting system is provided by some applications to communicate with others. But it seems difficult to merge. Listing the top posts according to user demand is another problem, in this we need to implement datamining to find out which product advertisement should be on top. Auto suggestion for products is also difficult to provide, because it also requires datamining and machine learning. Ranking users according to their contribution is another issue. For this gamification is needed. Apply all these features is a long term time consuming process. That's why cannot add these extra features.

2.5 Challenges

Very first challenge was to learn about android application development. Figuring out the features which was based on students need. Then comes authentication issue. Find a way to authenticate our real users. Reducing processing time of this application. Facing some problems when started inserting data into the firebase. Arise some issues in retrieving data from the firebase and representing on a recycler view with card view. Inserting files to the firebase storage and faced problem on getting the download url from the firebase storage. Android gradle version conflict is another problem we faced in completion of this project.

CHAPTER 3

Requirement Specification

3.1 Business Process Modeling

Students, teachers, employee, worker these are the entities. Any member of DIU family who had an email can use this application. They can post about any product or try to find any by login. The process of adding items is a category based and need to provide a short description about that specific item. They can add the picture to the post from their gallery . They also need to specify the product type. Anyone can look for the stuff they need category wise. It has four sections sharing, exchange, lost and found and study material. Lost and found is implemented to find the lost stuffs. In study material section student can find their pdf books, slides according to their course.

3.2 Requirement Collection & Analysis

Admin: In this application no admin is required to maintain the system or provide any materials. As it is a communication based application to share, exchange and communicate with each other.

User: Every person has some extra stuff which has no use for them. People just putting those on a box or bag and forgets. And someday those become fully useless. Finding someone who is in need is difficult cause people feel shy to ask for. So, for sharing those extra stuff a platform is required where extra stuff can easily share with others or exchange. Share and exchange option in this application will resolve this problem and which will encourage them to share. After all, sharing is caring. Which will create a bonding between them. Using second hand product could be beneficial for our environment. As it will reduce the consumption rate of using new product. That will prevent new carbon from entering the atmosphere and also reduce the pressure on our natural resources. So, it has both social and environmental issue.

People often losses their valuable things and it quite impossible to search it everywhere. If the place is known, it could easy to find out but there is a chance the object may not be in same place.

On the other hand, the person who detect that object faces difficulties to track down its real owner. And tracking down its owner is a time consuming process. So, he/she could lose their interest to give it back. Lost & found section will provide an easy way to communicate between them and making new friends. Last but not least student faces some issues in gathering the study material the night before their exam. Finding pdf books, slides may hamper their study. In this application study material section will be helpful for them to study better.

3.3 Use Case Modeling and Description

Figure 3.3.1 represents the use case model of “**Mobile Application for Goods Exchange**”. Which is given below,

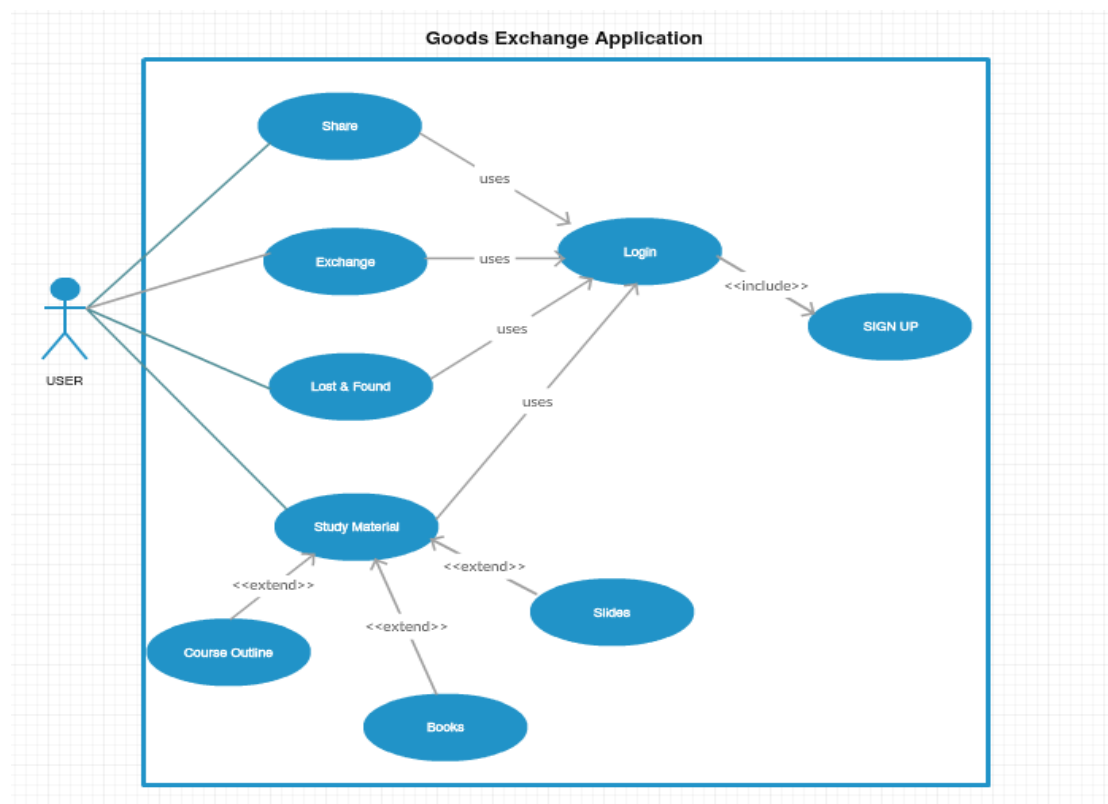


Figure 3.3.1: Use Case Model for User

Use case description: In software and system engineering, a **use case** is a methodology to identify, clarify and organize system requirements. It consists of a set of possible sequences of interactions between systems and users (known in the Unified Modeling Language as an actor) in a particular environment and related to a particular goal [4]. The actor can be a human or other external system. Every use case used in this application represented with a table in the section bellow. Each table contains use case name, actor, pre-condition, primary path, exceptional path.

Table 3.3.1 gives a description on “**Sign Up**” process of this project and a way of understanding how this process operates. It has three primary paths which are enter e-mail, enter first &last name and enter password. One exceptional path for each primary path.

Table 3.3.1: Use Case Description of Sign-up

Use Case Name:	Sign-up
Actor:	User
Pre-condition:	None
Primary Path:	<ol style="list-style-type: none"> 1. Enter email 2. Enter first &last name 3. Enter password
Exceptional Path:	<ol style="list-style-type: none"> 1.1 Invalid e-mail 2.1 User name already exists 3.1 Password length at least 6 characters

Table 3.3.2 contains detail about the process “**login**” and gives an understanding of the working methodology of this process in this project.

Table 3.3.2: Use Case Description of Login

Use Case Name:	Login
Actor:	User
Pre-condition:	Sign Up
Primary Path:	1. Enter user e-mail 2. Enter password
Exceptional Path:	1.1 e-mail is invalid 2.1 Invalid password

Table 3.3.3 describes about “**Share**” process of this project and gives an understanding how the process works in this project. It contains three primary path and two exceptional path.

Table 3.3.3: Use Case Description of Share

Use Case Name:	Share
Actor:	User
Pre-condition:	Login
Primary Path:	1. Click on share 2. Select image 3. Contact i) via phone ii) via message
Exceptional Path:	3.1 phone is not reachable 3.2 message is not sent

Table 3.3.4 contains detail about the process “**Exchange**” and gives an understanding how the process works in this project. It contains three primary path and two exceptional path.

Table 3.3.4: Use Case Description of Exchange

Use Case Name:	Exchange
Actor:	User
Pre-condition:	Login
Primary Path:	<ol style="list-style-type: none"> 1. Click on exchange 2. Select image 3. Contact <ol style="list-style-type: none"> i) via phone ii) via message
Exceptional Path:	<ol style="list-style-type: none"> 3.1 phone is not reachable 3.2 message is not sent

Table 3.3.5 defines about the process “**Lost & Found**” and gives an understanding how the process works in this project. It contains three primary path and two exceptional path.

Table 3.3.5: Use Case Description of Lost & Found

Use Case Name:	Lost & Found
Actor:	User
Pre-condition:	Login
Primary Path:	<ol style="list-style-type: none"> 1. Click on exchange 2. Select image 3. Contact <ol style="list-style-type: none"> i) via phone ii) via message
Exceptional Path:	<ol style="list-style-type: none"> 3.1 phone is not reachable 3.2 message is not sent

Table 3.3.6 gives a description on “**Study Material**” process of this project and a way of understanding how this process operates. For entering this process, a pre-condition is required. It has three primary paths.

Table 3.3.6: Use Case Description of Study Material

Use Case Name:	Study Material
Actor:	User
Pre-condition:	Login
Primary Path:	1. Click on study material 2. Select department 3. Select semester
Exceptional Path:	

Table 3.3.7 gives an idea on “**Book**” process of this project and a way of understanding how this process works. For entering this process, a pre-condition is required. It has three primary paths.

Table 3.3.7: Use Case Description of Book

Use Case Name:	Book
Actor:	User
Pre-condition:	Study Material
Primary Path:	1. Click on Books 2. Select subject 3. Click on pdf
Exceptional Path:	3.1 pdf isn't available 3.2 File couldn't found

Table 3.3.8 gives a description on “**Hand Notes**” process of this project and a way of understanding how this process works. For entering this process, a pre-condition is required. It has three primary paths.

Table 3.3.8: Use Case Description of Hand Notes

Use Case Name:	Hand Notes
Actor:	User
Pre-condition:	Study Material
Primary Path:	1. Click on hand notes 2. Select course 3. Download hand notes
Exceptional Path:	3.1 File type unknown

Table 3.3.9 gives an idea on “**Slides**” process of this project and a way of understanding how this process works. For entering this process, a pre-condition is required. It has two primary paths.

Table 3.3.9: Use Case Description of Slides

Use Case Name:	Slides
Actor:	User
Pre-condition:	Study Material
Primary Path:	1. Click on slide 2. Select subject 3. Download slide
Exceptional Path:	3.1 File isn't available

3.4 Logical Data Model

A logical data model is also known as logical schema. The abstract structure of a domain of information is represented by logical data model. A logical data model generally consists of data entities, keys and the attributes and relationships between the entities. In business processes logical data model uses to capture the important things of an organization and how they connect to one another. Entity-Relationship Model (ER diagram) is an abstract data model which represents important things needed to perform business processes [5]. ER diagrams illustrate the logical structure of databases that means how a data or information structure can be implemented in database. In E-R diagram all relationship between entities and attributes of each entity are specified. The primary key, foreign key and other attributes are specified in the diagram.

In Figure 3.4.1 the ER diagram of this application is shown below,

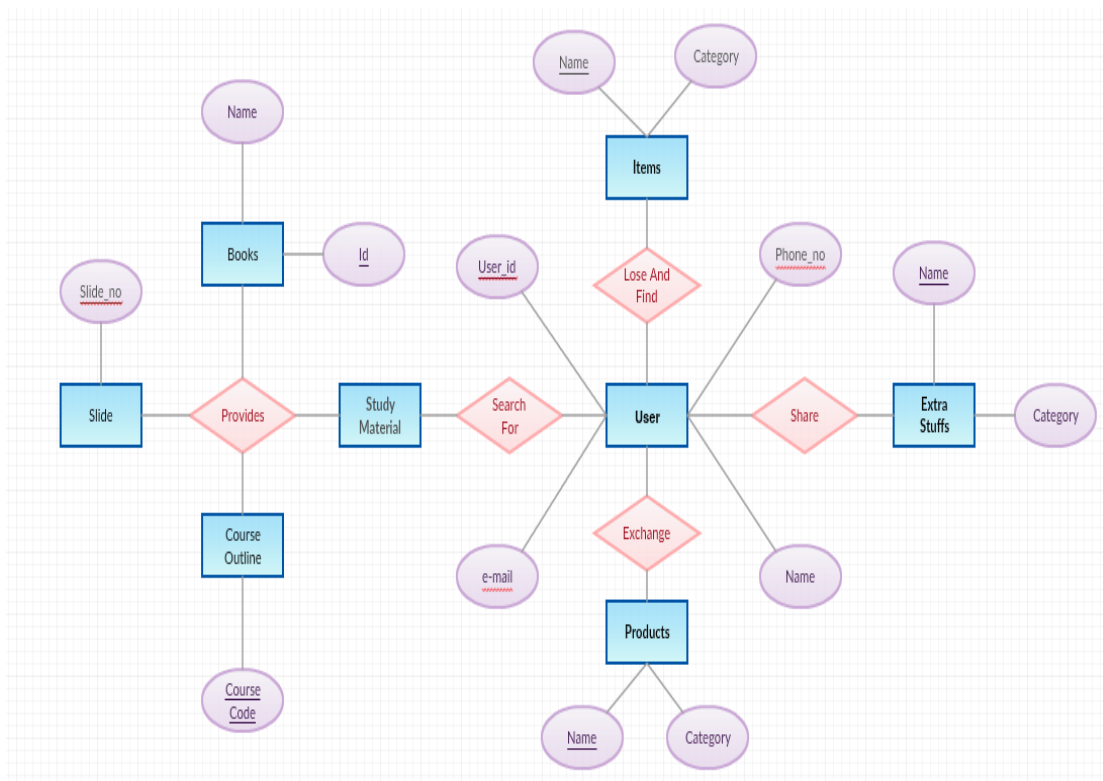


Figure 3.4.1: E-R Diagram of Mobile Application for Goods Exchange

3.5 Design Requirements

Designing is important because it connects the consumers with the application. To run the system smoothly front-end and back-end design plays a vital role. The front-end design influences the subconscious mind of the consumers. There are some requirements for designing an application to make it more efficient. In this application which points are followed are given below.

User Friendly: The first and most important point. A project will be successful when the application is accessible or easily operable by any kind of users. So, the application must be user friendly to communicate with each other and finding necessary elements. Need to provide a simple graphical user interface to operate the application. And the functionality of the application should be easily understandable for the consumers.

Compatible to various Android Version: There are a lots of android SDK (Software Development Kit) version. Alfa to now Nougat is running in the market. They are named after the delicious deserts and maintain an alphabetical naming sequence. While the latest versions of Android often provide great APIs for application but need to support older versions of Android until more devices get updated. It's a good practice to support about 90% of the active devices, while targeting to the latest version. So, this application will support from SDK 17-26 ^[6].

App Compatibility: Need to check whether an **app is compatible** with each potential device configuration. Because Android runs on a wide range of device configurations, some features are not available on all devices. The features of this application is available for all devices. So, anyone can use this application.

Efficient: To get the most effective result and faster run time tried to make this application as light as possible.

Now, considering some extra features of this application.

- This system contains only user, no admin provided
- User will go through with the options available
- In share, exchange and lost & found section user will select the image of their interest
- After that a description of image will be provided
- Along with a way of contacting through call or message
- User can add a post by clicking on add icon
- Where user has to provide a description and contact information
- Student will find pdfs, slides in the study material section
- User need to Sign Up for login to the app
- User need to install this application and communicate with others

CHAPTER 4

DESIGN SPECIFICATION

Design specification is the documentation of stages which a system need to perform according to the functional requirements. Considering the system this could be testing specific requirements, configuration settings, or review of functions ^[7]. Design specification is an important part to ensure that a design activity is addressing according to the task require. This actually shows how a design will be developed for a system. It checks where a structure of a product has to be specially made to meet a need. In this design specification chapter, the front-end and back-end design of the application is shown. Also discussed about the tools and platforms used in this application.

4.1 Front-End Design

Front-end design actually refers to the user interface of an application. Which provides a way to the user to interact with the application. Android application developers use XML which is a markup language, to set up the layout of their apps ^[8]. This type of design is known as client side development. The front-end design of a good application needs to be user friendly and should be interactive.

User interface design and interaction with respective function of this application is given below

Figure 4.1.1 shows the splash screen of this application. Which is used to notify the user that the application is in loading phase.

Figure 4.1.2 shows about the sign in ways for a user. Two ways available either sign in using email or using phone number. In this project sign in using phone number is not yet implemented. It will be implemented in future.

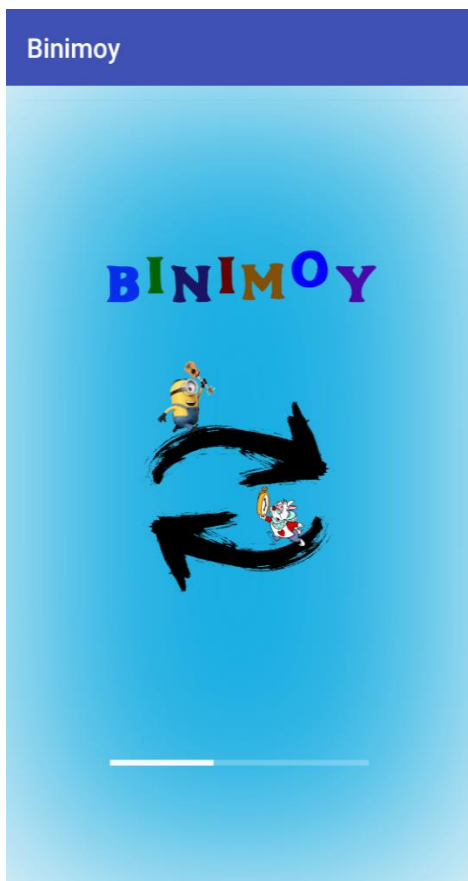


Figure 4.1.1 Splash Screen

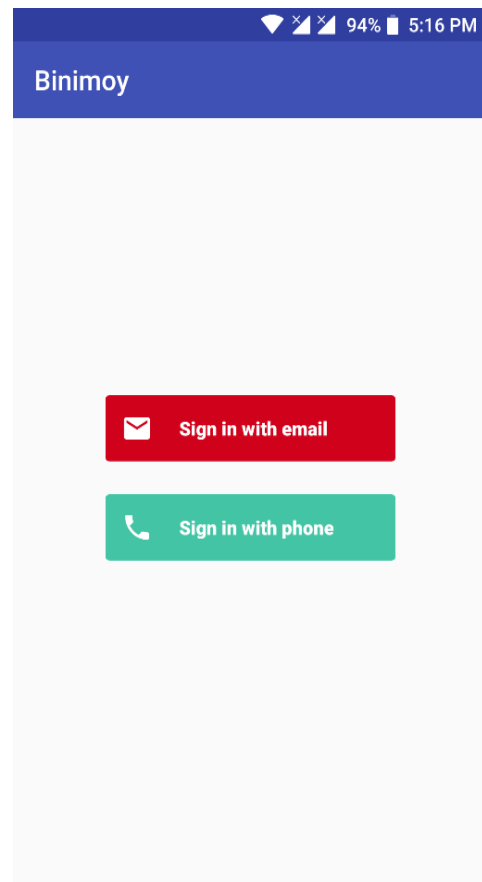


Figure 4.1.2: Sign in ways for User

Figure 4.1.3 describes about the Sign Up procedure for a user. A user needs to provide a valid email. First name and last name is also required in this process. At last need to provide a password which length will be at least six characters.

Figure 4.1.4 describes about the sign in procedure. If already have an account open. Then just need to provide email and password. It will suggest email if you already sign in using that device earlier.

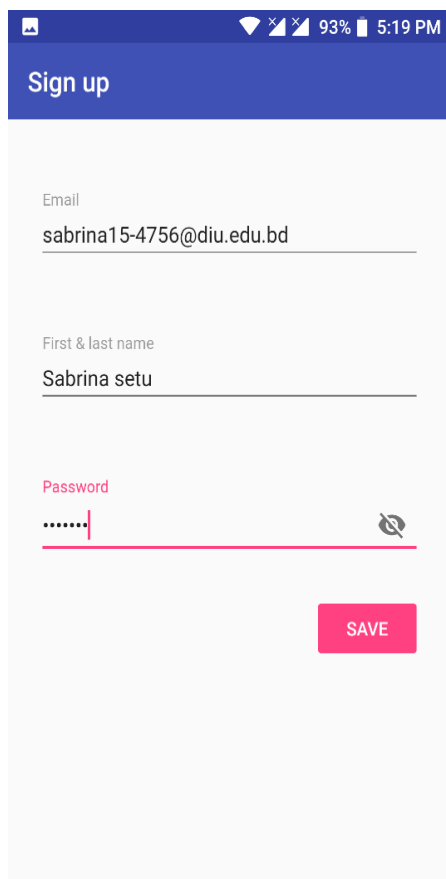


Figure 4.1.3: Sign Up page for User

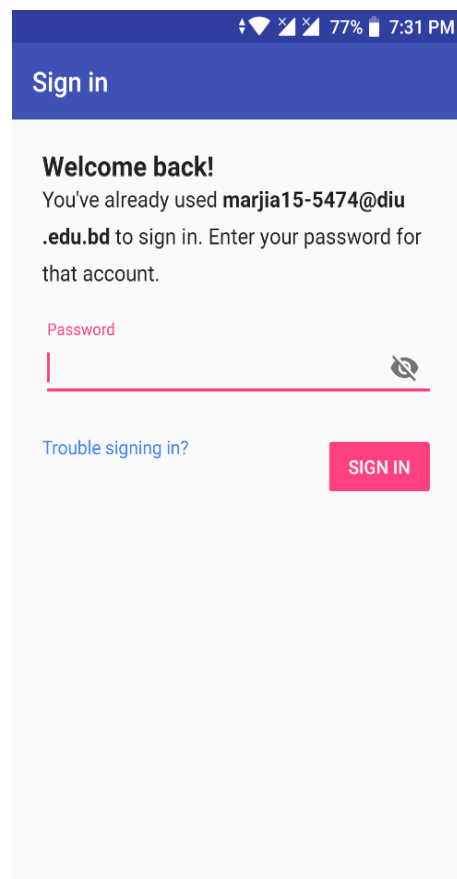


Figure 4.1.4: User Sign in page

Figure 4.1.5 represents the account of a user. Shows the email id which user used for sign-in in this application.

Figure 4.1.6 shows the home page of user. Home page contains the products which user posted in share, exchange and lost & found. User can delete their posts from here.

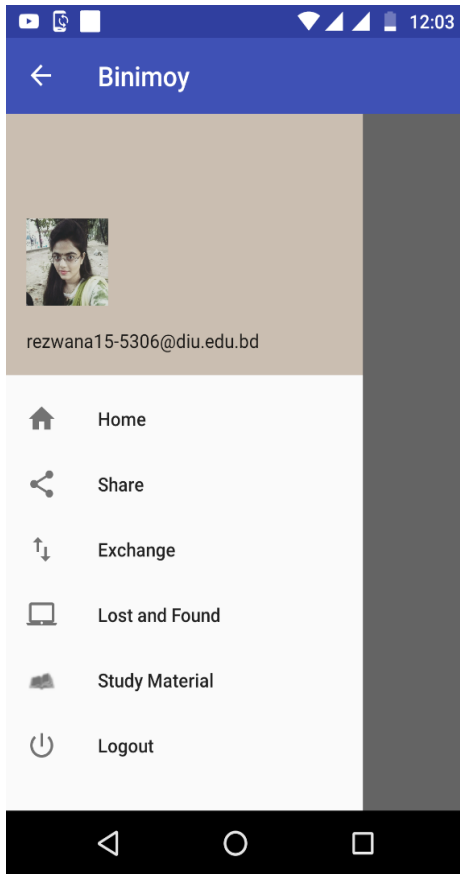


Figure 4.1.5: User Account



Figure 4.1.5: Home page of User

Figure 4.1.7 shows the share page of this application. Which contains about the posts of extra stuff.

Figure 4.1.8 showing the process of adding items into share. First select the product type. Then a short description about that product. Finally, the contact number is required.



Figure 4.1.7: Extra stuffs of Share page

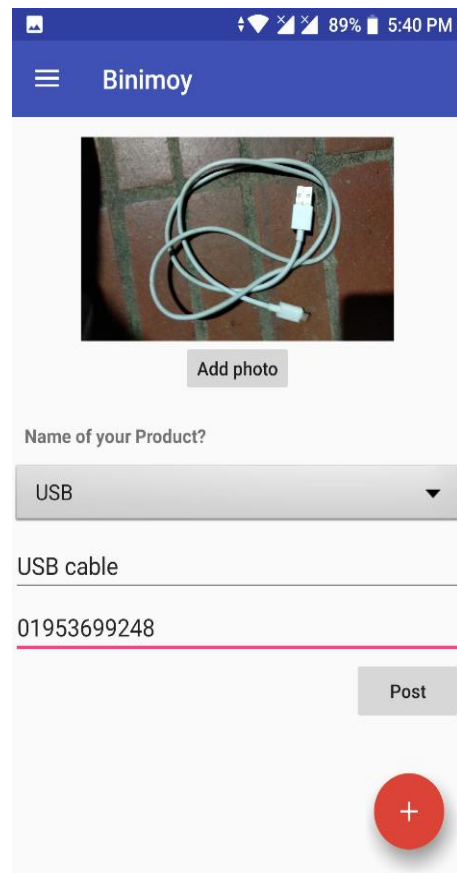


Figure 4.1.8: Adding items to share

Figure 4.1.9 shows the page of exchange products in this application. Which contains about the lists of available posts.

Figure 4.1.10 describes adding process of exchange product. Name of the product and description need to add. Also requires the name of the product which user wants in exchange. Contact information is also needed.

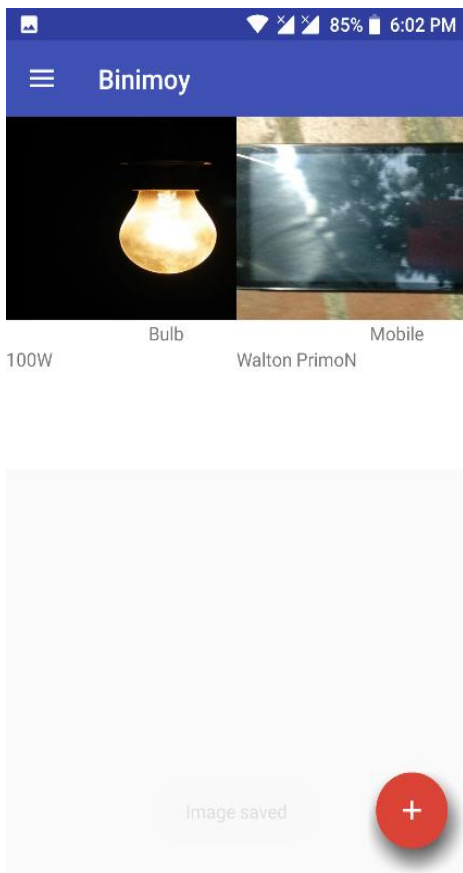


Figure 4.1.9: Items for Exchange

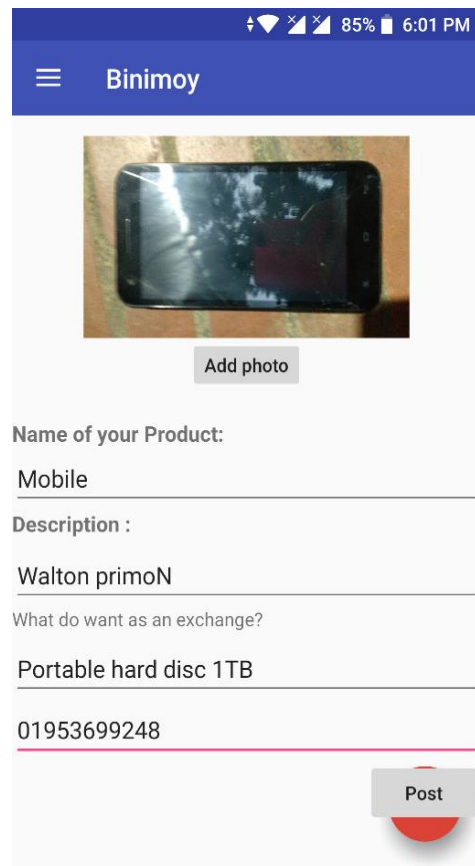


Figure 4.1.10: Add Exchange items

Figure 4.1.11 shows the collection of lost items. User can go through the list to find their lost valuable items.

Figure 4.1.12 describes the process of posting about lost items. Need to add information what you found and where. Contact information is also required.

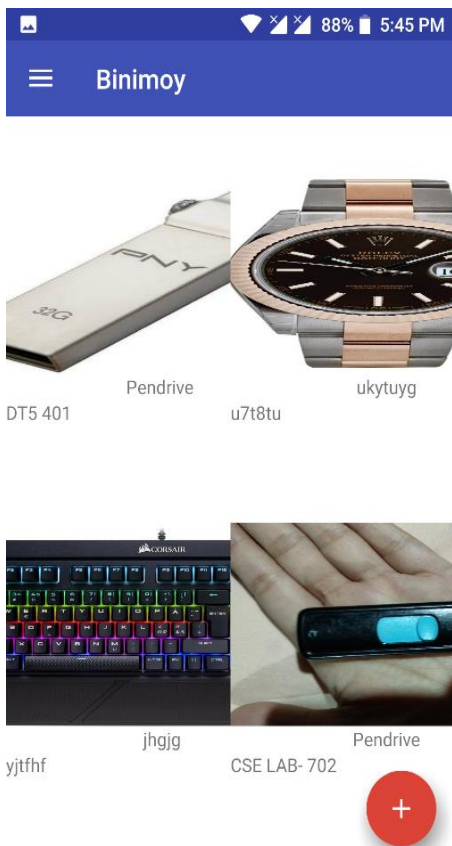


Figure 4.1.11: Lost & Found items

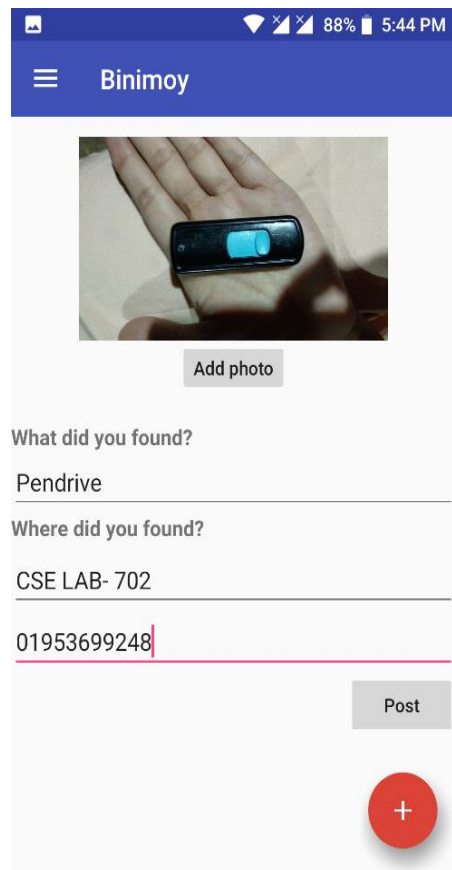


Figure 4.1.12: Adding the lost items

Figure 4.1.13 shows one of the communication process to contact other user which is call. Simply click on call icon.

Figure 4.1.14 shows alternative process for communication which is messaging. User can type their message here and send.

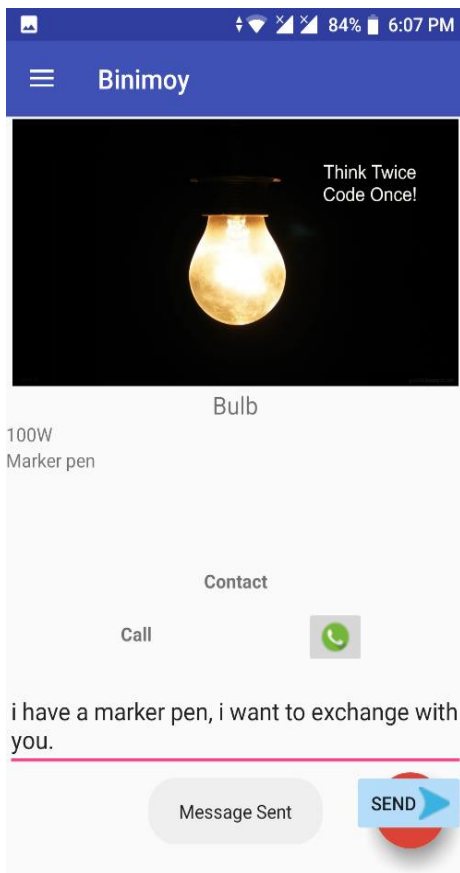


Figure 4.1.13: Calling to Contact

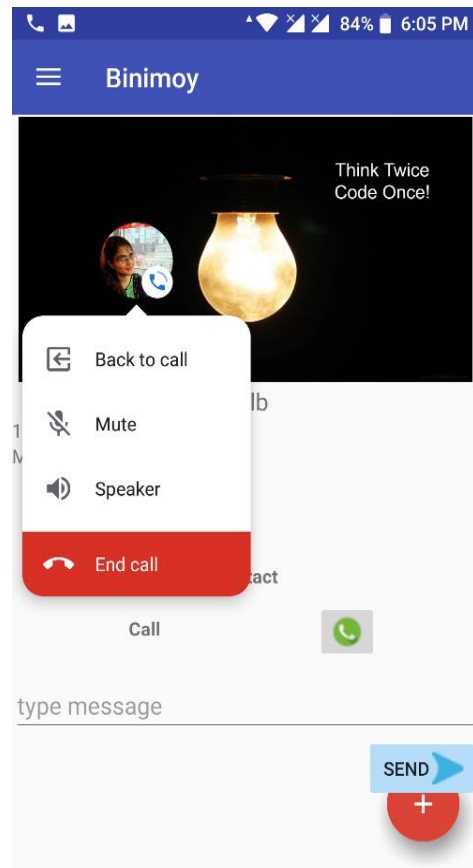


Figure 4.1.14: Sending Message

Figure 4.1.15 shows the study material page. Department and semester need to select to find the study material.

Figure 4.1.16 shows the available pdf books, slides and hand notes. By clicking on this item user can download their required item.

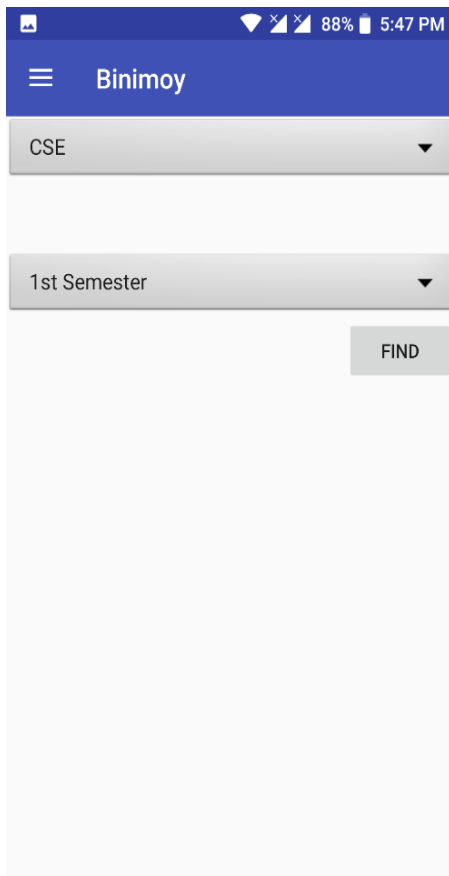


Figure 4.1.15: Study material page

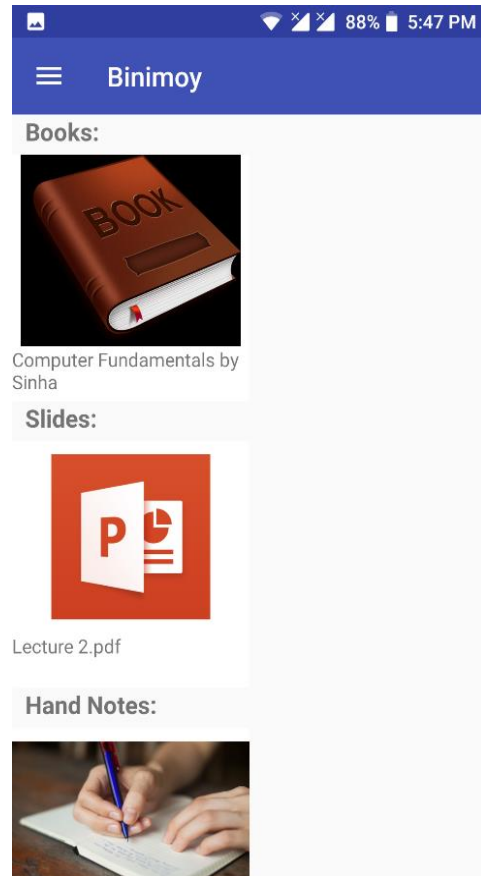


Figure 4.1.16: Pdfs, slides and notes

4.2 Back-End Design

The logical part of an application implemented in the back-end. The business logic implementation, third party system integration and data handling is performed in the back-end. After finishing the front-end it requires data to show in one form or another. This process is take place in the back-end. It consists of many factors like the scripting languages and the server side language, automated framework, database management, security, authentication, authorization, data parsing, data validating, data backups and so on. “Goods Exchange Application” is developed using XML and java. Firebase database is used in this application. It is a real-time database which is cloud hosted ^[9]. Data is stored as Jason and synchronized in real-time to every connected client. After connecting with this real-time database user automatically receive updates with the newest data.

Figure 4.2.1 shows the authentication process using e-mail

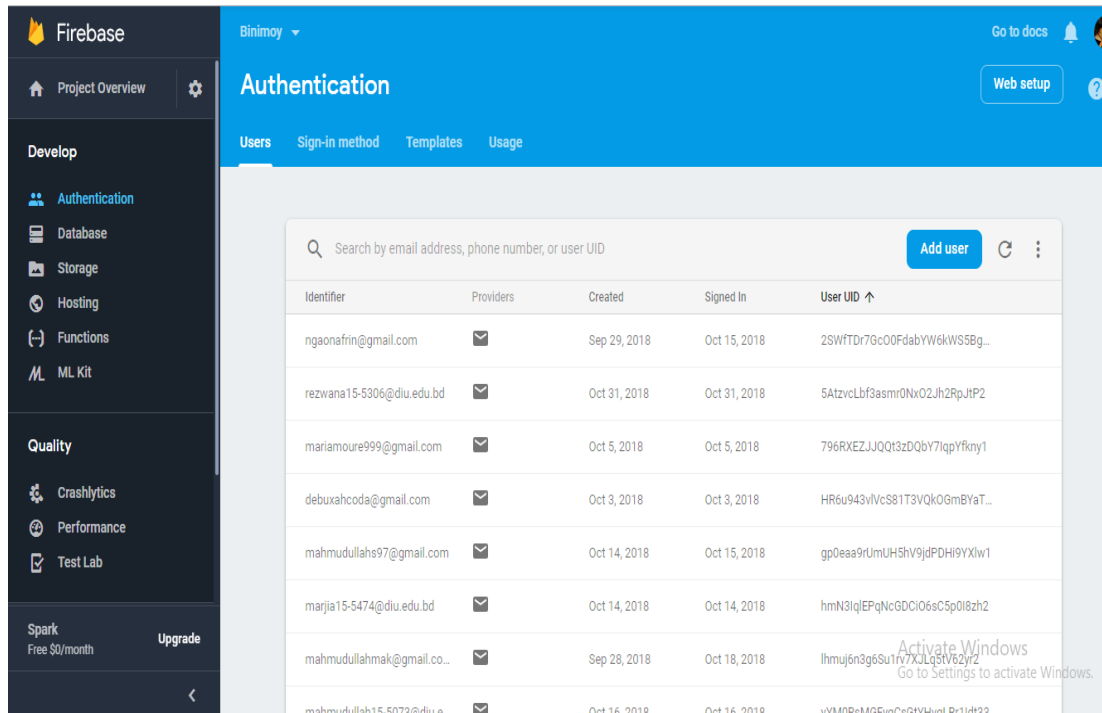


Figure 4.2.1: Authentication using e-mail

Figure 4.2.2 shows the real-time database of this application.

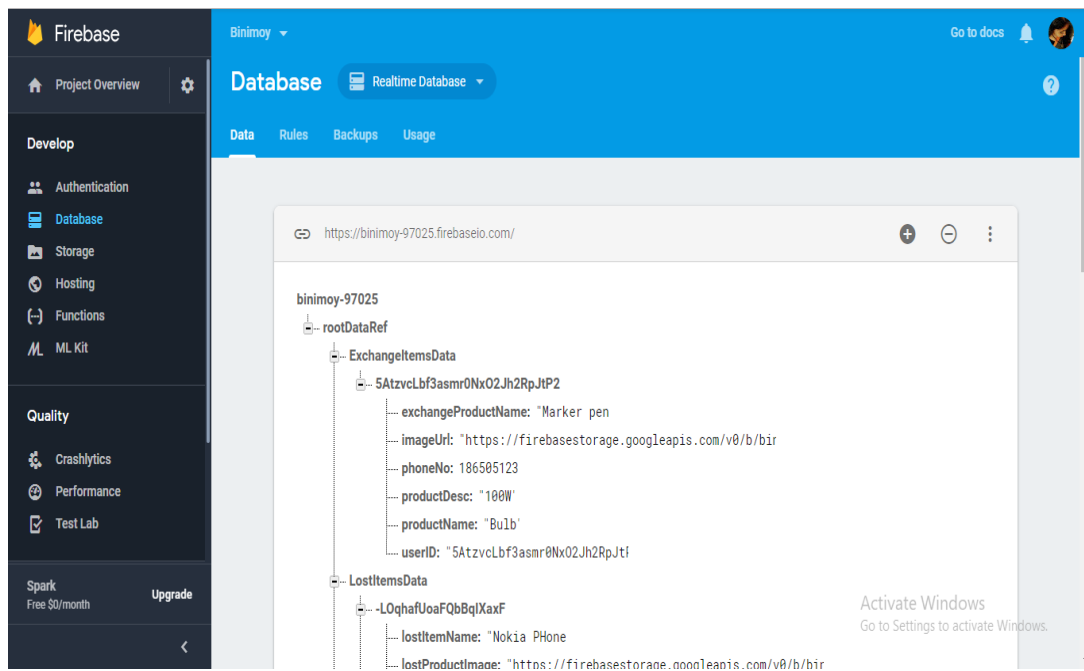


Figure 4.2.2: Real-time database

Figure 4.2.3 shows the storage of files and images.

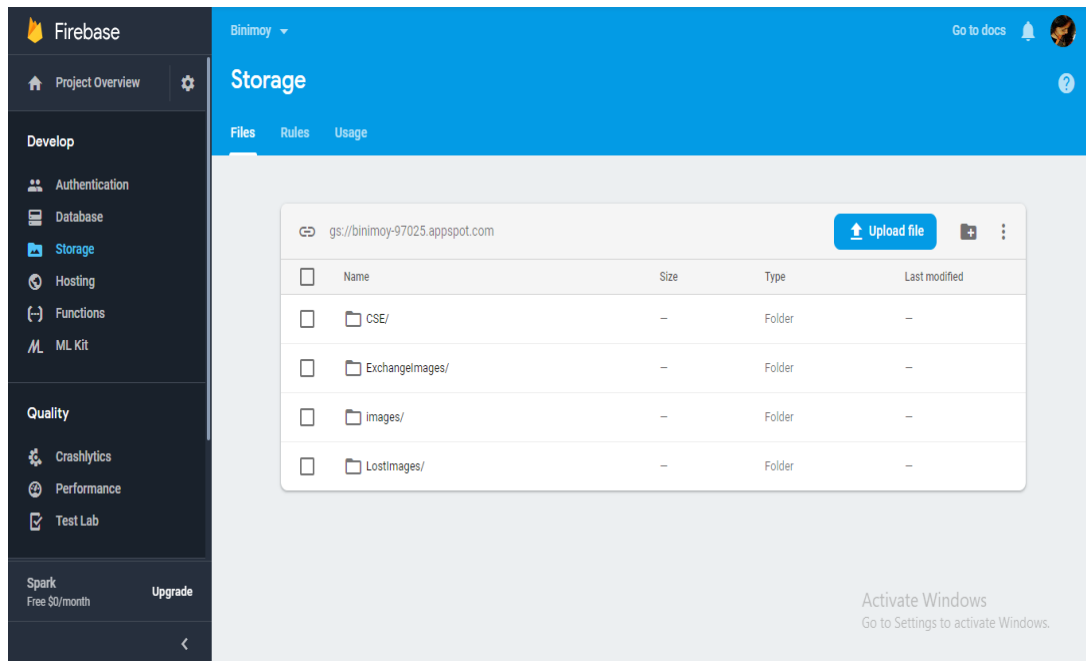


Figure 4.2.3: Storage of files and images

Figure 4.2.4 shows the storage of study materials.

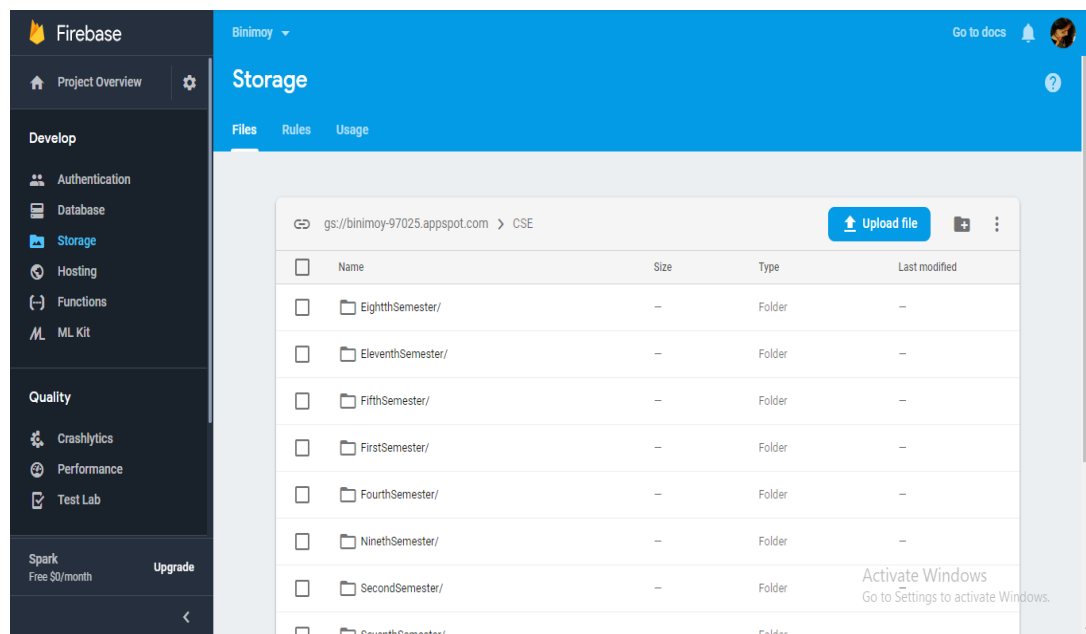


Figure 4.2.4: Storage for Study Materials

Figure 4.2.5 shows image storage of exchange.

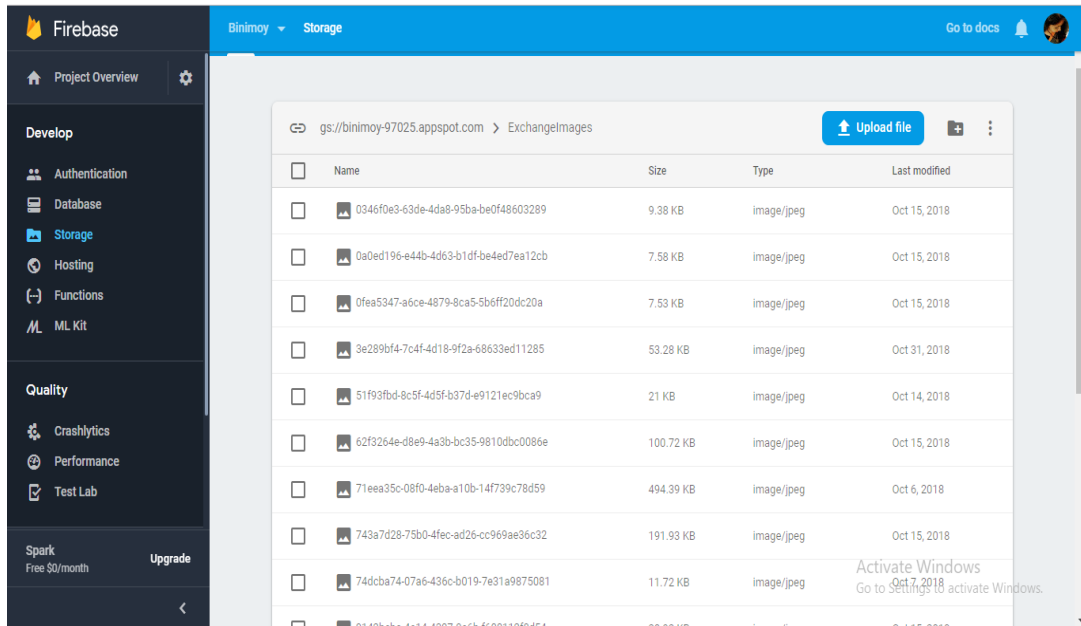


Figure 4.2.5: Image storage of Exchange

Figure 4.2.6 shows the image list stored in share.

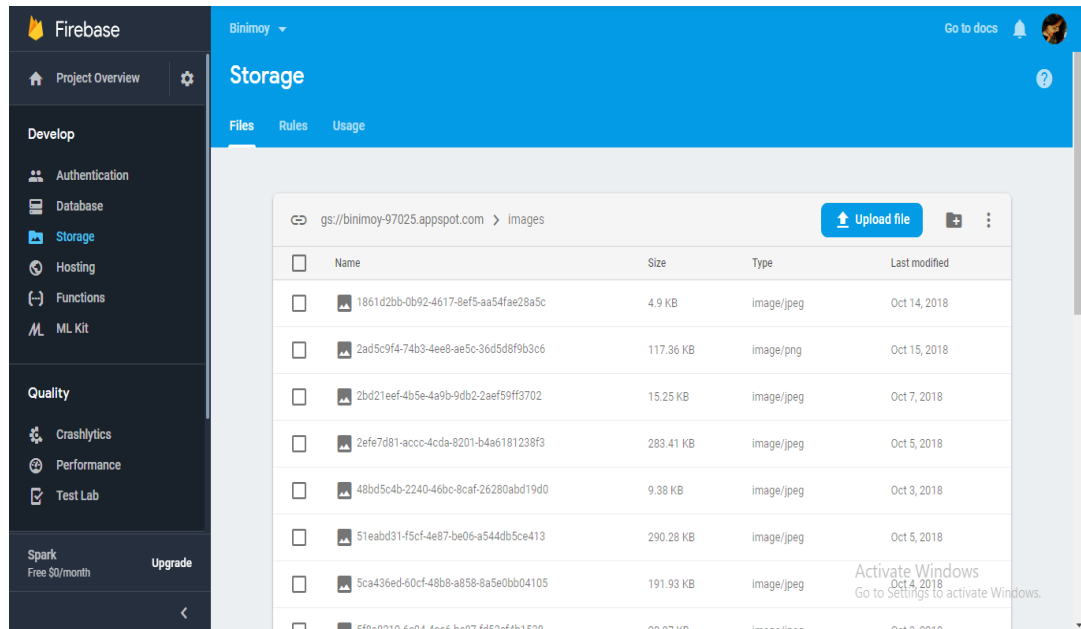


Figure 4.2.6: Image storage of Share

Figure 4.2.7 shows the image items stored in lost & found

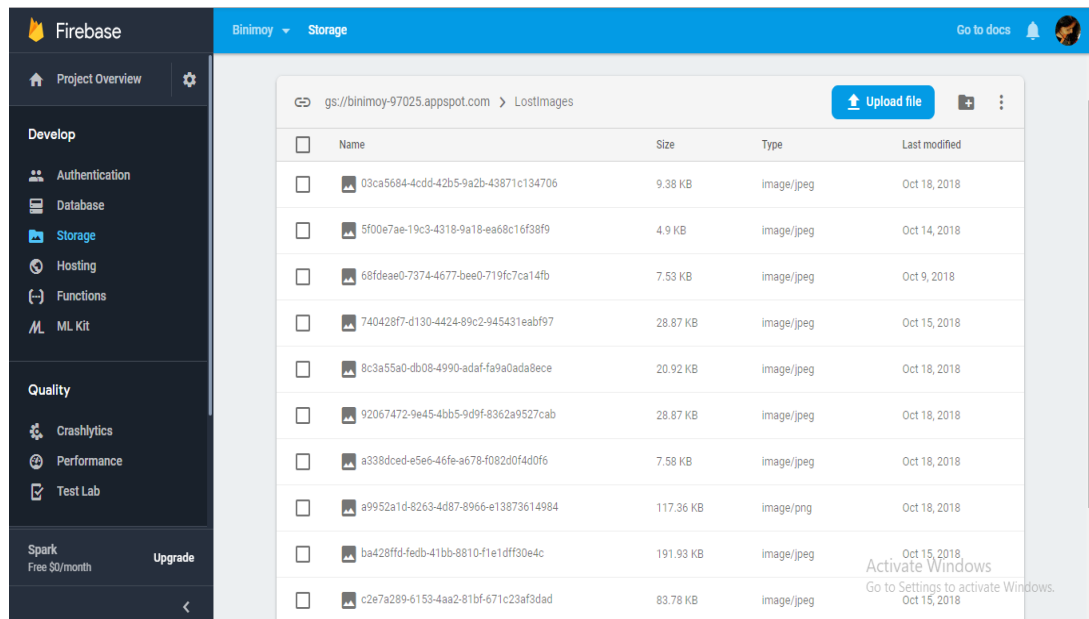


Figure 4.2.7: Lost and founds image storage

4.3 Interaction Design and UX

Interaction design is an important part of user experience (UX) design. Interaction design can be described in simple terms: it is the design of the interaction between users and products. A proper way to observe the response of user towards the application. The main goal of interaction design is to produce products that meets the objectives of the users in the best way possible. Interaction design, often abbreviated as IxD. Actually interaction design is the process to understand the user problem, process the problem and find out the results, perform actions by the respecting results and solve the problem [10].

User experience (UX) refers to the complete process of achieving and putting together the product. It works with the overall user experience. A process of enhancing user satisfaction by providing quality product. In this application anyone can post about any item category wise and provided a way of communication. So, they can contact with each other.

Tasted it by fifteen people for user experiences. Twelve of them gave positive feedback about this application. According to their comment it is a user friendly application. One gave negative feedback. And another two complains why live chatting system is missing.

4.4 Implementation of requirements

Use java and XML coding to implement this project. The UX/UI is designed by the XML which is a markup language. This is an android based application but we use firebase as database. So, internet connection is required to run this application.

CHAPTER 5

IMPLEMENTATION AND TESTING

5.1 Implementation of Database

In database information are stored in an organized way for easily access, manage and update. Because of indexing in the database it seems easier to find relevant information. In implementation phase installation of database is required. For storing the necessary information and retrieve them according to user need. Installation of database means connect the database with the system for better performance and loading the data. In this application firebase is implemented as database which is a real time database. Android studio version 2.2 or higher can install it easily with firebase assistant. But lower version needs to implement it manually ^[11].

5.2 Implementation of Front-end Design

Login page for user: First user needs to create an account. Then they can login to their account and use it. For login e-mail and password is required. By creating an account, a unique id generated in the database for that specific user.

Adding items by User: For adding items, first user needs to decide in which category he/she wants to add. After selecting the category, they can add image from their device. Along with this they need to provide a short description about the item and contact information.

Figure 5.2.1 shows the sign up process implementation for users.

Figure 5.2.2 shows the process of adding items by user.

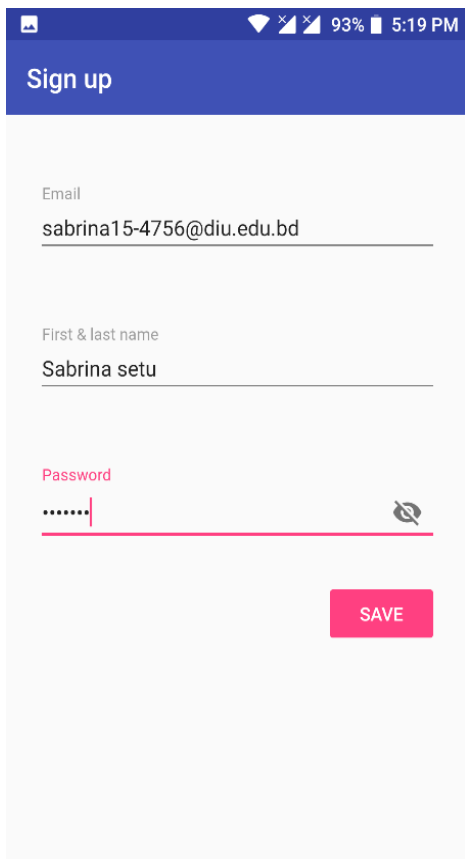


Figure 5.2.1: Sign Up page for User

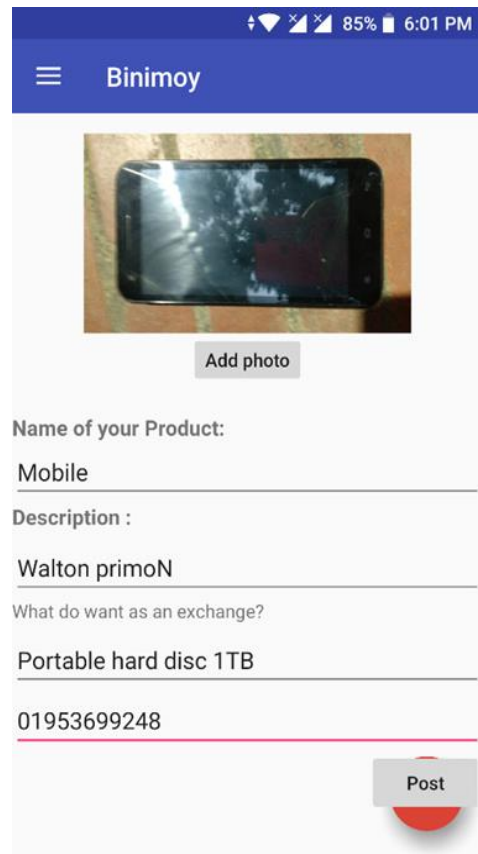


Figure 5.2.2: Adding items by User

Contacting with other User: Each posts contains information of its owner. For getting that information user needs to click on that image post and will get the information of owner. Two options available contact through message or email.

Figure 5.2.3 shows the communication between two users via call.

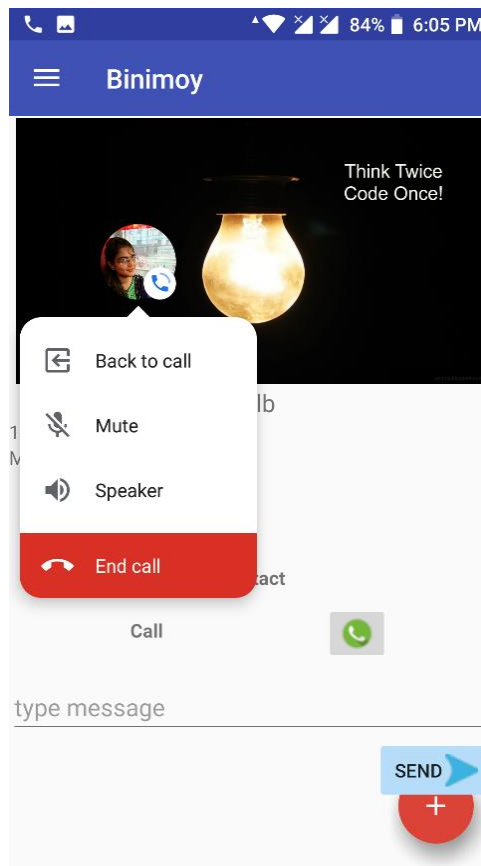


Figure 5.2.3: Contacting with other User

5.3 Implementation of interaction

For user satisfaction a responsive user interface is a prime requirement, which makes the system more interactive with its consumers. The UI of this application simple, easy to use. Posts are list with image. And image gives a better understanding. Tried to design this application in a familiar way so that users can operate easily. Image, icons, text, button used to make it simply interactive. This system build considering the demand of users.

5.4 Testing Implementation

Third level of software testing is known as system testing. Use to test a complete and integrated software. To evaluate the system's compliance with the specified requirements is the main purpose of this test. ISTQB provides a definition of system testing: The process

of testing an integrated system to verify that it meets specified ^[12]. Putting an action to execute a formulate plan is called implementation. Testing implementation means testing each one of those actions formulated in the plan. According to system cases and specification, system architect checks whether is it implementable or have limitations to develop this system.

Table 5.4.1: Evaluation of Test Case

Test case	Test input	Expected outcome	Obtained outcome	Pass/Fail	Tested on
1.Login	Login using various android version	Login successfully	Successful login	Pass	5-10-2018
2.Image input	Need to add image in the post	Image will be added in the database	Image have been added in the database	Pass	7-10-2018
3.Contact Information input	Need to add contact info in the post	Information will be added on the database.	Information have been added on the database	Pass	10-10-2018
4.Pdf input	Need to add pdf in the study material	Pdf will be added on the database.	Pdf have been added on the database	Pass	13-10-2018
5.Slide input	Need to add slide in the study material	Slide will be added on the database	Slide have been added on the database	Pass	15-10-2018

6.Interface testing	Checks in different types of android device	Every device support perfectly	Supported in all device	Pass	18-10-2018
7.SDK testing	Checking in 17-22 of SDK version	Support in all version	Support successfully	Pass	20-10-2018
8.Calling	Checking connection	After selecting it will call	Successfully called	Pass	22-10-2018
9.Messageing	Checking connection	After selection it will send message	Successfully message sent	Pass	22-0-2018
10.Data load	Data will load from database	Data will show in the application	Successfully load data	Pass	25-10-2018

5.5 Test Results and Reports

Test report is a formal way to represent test reports, which provides a better understanding to estimate testing result quickly. A documentation which stores the data obtained from an evaluation experiment in an organization manner, describes the environmental or operating conditions, and shows the comparison of test results with objectives.

The test case test input, expected output, actual output already shown. And finally the results and the test result of this application was quite satisfying. Usability testing

checks the following feature of this application (Mobile Application for Goods Exchange).

- How easy it is to use the application?
- How easy it is to learn the application?
- How convenient is the application to end-user?

After finishing the development, the result can be used as the advantage of usability testing

- User friendly.
- Application is easier to the users.
- Interactive UI.

CHAPTER 6

CONCLUSION AND FUTURE SCOPE

6.1 Discussion and conclusion

The project is completed fulfilling the utmost requirements. The design of the project implemented same as the design specification. A message and call option available for end user to communicate among them which is very user friendly. But it will be more efficient if the real-time chatting option is available. Items are represented through image so user can get basic idea about product from that. But no options for suggesting posts to end users according to their preference. There is a specific option for user where they can manipulate their own posts.

This application is very easy to operate so anyone can use it. And successfully fulfils its purpose of connecting people in a new way.

6.2 Limitations

- This application does not have any chat-box
- The category here is limited
- It need to increase functionality
- Cannot register through phone number.
- There isn't any comment option.
- It is not developed in any other platform except android.

6.3 Future Scope

- We will add the chat-box.
- We will make it more functional and dynamic.
- We will add comment and notification option.

REFERENCES

- [1] "Wikipedia" Barter, available at << <https://en.wikipedia.org/wiki/Barter> >> last accessed on 08-10-2018 at 7pm
- [2] "Bikroy.com" Selling secondhand product, available at << <https://bikroy.com> >> last accessed on 08-10-2018 at 10pm
- [3] "TradeMade-app.com" Three best app for swapping, available at << <http://www.trademade-app.com/best-apps-websites-for-trading-bartering-swapping-stuff> >> last accessed on 08-10-2018 at 11pm
- [4] "Wikipedia" Use case, available at << https://en.wikipedia.org/wiki/Use_case >> last accessed on 10-10-2018 at 12am
- [5] "TechTarget" ERD, available at << <https://searchdatamanagement.techtarget.com> >> last accessed on 10-10-2018 at 2am
- [6] "developer.android.com" Support different platform, available at << <https://developer.android.com/training/basics/supporting-devices/platforms> >> last accessed on 16-10-2018 at 10am.
- [7] "ResearchGate" Designspecification, available at << https://www.researchgate.net/publication/318563018_design_specification >> last accessed on 18-10-2018 at 8pm
- [8] "Wikipedia" XML, available at << <https://en.wikipedia.org/wiki/XML> >> last accessed on 22-10-2018 at 10pm
- [9] "Firebase" Back-end design, available at << <https://firebase.google.com/products/realtime-database> >> last accessed on 24-10-2018 at 12am
- [10] "usability.gov" Interaction design, available at << <https://www.usability.gov/what-and-why/interaction-design.html> >> last accessed on 28-10-2018 at 1am
- [11] "firebase" Database implementation, available at << <https://firebase.google.com/docs/android/setup> >> last accessed on 29-10-2018 at 3am
- [12] "Software Testing" System testing, available at << <http://softwaretestingfundamentals.com/system-testing> >> last accessed on 31-10-2018 at 2am