

# **WE APP: AN ANDROID BASED 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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**DAFFODIL INTERNATIONAL UNIVERSITY**

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**DECEMBER 2019**

## APPROVAL

“WE APP”, submitted by Marica Akter, ID No: 161-15-6711, Chitrosen Biswas, ID No: 161-15-7435, Mofachhal Hossain, ID No: 161-15-6722 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 5th December.

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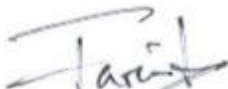
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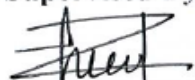
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## DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Md. Jueal Mia, 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.

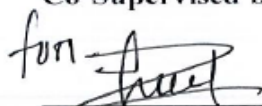
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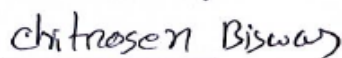
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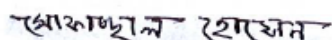
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At last, we must acknowledge with due respect the constant support and patience of our parents.

## **ABSTRACT**

The aim of this project is to help the students of Daffodil International University, to do some important and common tasks easily through their smartphone. This service deals with every student at our university. By using this service every student can know every information of their faculty members, available books on library, information of university transport schedule, a communication feature like chat and can pay their university payments by transaction feature. That's why he/she can easily find his/her faculty teacher's information easily without any trouble of other sites, he/she will never miss his/her bus to go main to permanent or permanent to main campus because has correct information of the university transports, students will not suffer for searching his/her books that book he/she needs actually is available or not in the library. They can communicate with each other by chat option which will help them to discuss their course studies, day to day class works and so on. Finally, by the transaction option students will able to pay their university course payments which will help them to pay without trouble. After execution, the system is tested in various circumstances and it is proved effective as a demo application.

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# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

WE app is an android application for the students of the CSE department of Daffodil International University where students have to register with their name, id, valid email, password and confirm password. After email verification and successful registration, their information will be gathered into the database and they will be able to log in and set their profile in the application. In the application, there are Faculty Member's Information, Library, Transaction, and Transportation features to make the student's life easier. The Faculty Member's Information and Library feature are connected with the database to search the information of the faculties and available books for the students. Faculty member's full name, designation, phone number & email address will be known from 'Faculty members' feature. The necessary book is available or not, will be known by using library feature. The transport feature contains the current schedule of buses, route and driver's phone number. Using the Transaction feature, users will be able to pay their installment.

All the student information data and the database of the app is controlled/organized by Admin. Users can only know information via mobile app.

We are trying to implement one app system for the students of CSE department of Daffodil International University that will make their life less trouble. The users will be facilitated by this app. They won't need to install more apps or waste time using more apps. Although varsity has many websites for these, users can get all the benefits of using an app. No need to use different apps or visit websites.

### 1.2 Motivation

The title "WE" refers to the students of this university who often face some problems from which our idea was generated. Here we are pointing those specific problems:

- The reason of developing faculty member's information is that whenever we need the phone number, email address of any faculty of CSE department to contact or need to know the designation, we can get it. We do not have to visit the website or don't need a network connection.
- Semester fee and registration fee payment system is another major problem. Because within one day students must have to pay their fee. After that day, they must have to pay with late fine. Not only that, they stand in line a long time for

paying fees and taking clearance. Students want to pay installment from anywhere to save time, travel expenses and avoid standing in long lines.

- The library of our university is so much enriched with a huge collection of books. But when a student needs any book, the student can't able to know that the book is available or not in a library without searching in the bookshelf. By this feature, user can know that the book is available or not in the library.
- The university provides many buses for our transportation. But we can't able to know the time schedule, the routes of the bus, driver's contact numbers instantly when we need it. Because our phone does not always have a network connection. The transport feature contains the time and location of the bus and the phone number of driver.

So, we have wanted to solve these problems through one app named WE. WE app contains all information on faculties that's why students don't need to search other sites thoroughly. Students will not hamper for transports. Library books appearance to find will be reliable. Transaction feature will reduce the length of a line of students on the last day of payment

### **1.3 Objectives**

- Students have to sign up first by their university name, valid email, id, password and confirm password.
- After email verification, they will be able to log in.
- After creating their accounts, they will set profile information and all the information will be stored in the database.
- Users will able to know about the faculty's information such as full name, designation, phone number, and email address.
- Finding books in the library is more easy by library feature and not need to go to the website for finding which books are available.
- There has transport feature by which users can know about the time schedule of buses, route and driver's phone number instead of being offline and not need to go to the website.
- Pay installments will be easy by transaction feature.
- After successful sign-up & sign-in, network connection won't need.

## **1.4 Expected Outcome**

- Easy to know faculty member's information
- Reliable bus schedule.
- Easy transaction
- Saving time
- Knowledge about library books

## **1.5 Report Layout**

In the first chapter, we discuss the aim of the project, the motivation to work with the expected outcome.

In the second chapter, we fix the content of the discussion of the background circumstances of our project. We also mention the challenges that we have faced, adding related work and the future scope of our project.

In the third chapter, kinds of requirements like business process model, requirement collection and Analysis, Use Case Modeling and Description, Logical Data Model, Design Requirements are defined.

In the fourth chapter, describes the design of my project's visual view and detailed about the front end and the back end design.

In the fifth chapter, execution and testing parts we discuss the execution of the database, execution of authentication system, interaction and test result of this project.

In the sixth chapter, discussing the conclusion and future scope for the development of our project. Finally, all report references which are related to our work ensure the information in the report is correct.

## **CHAPTER 2**

### **BACKGROUND**

#### **2.1 Introduction**

The application is easy to use for all the students of the university. When a student gets admission to the university, he/she faces too many troubles in starting university life. Through this application, they will get rid of it and make their university life free and enjoyable. The application is user-friendly.

#### **2.2 Related Works**

If we see China, they use WeChat as an alternative as Facebook, Amazon, Uber, Tinder and their credit card. From local to e-commerce transaction they use WeChat to feel free. WeChat has partnered with many government services and local businesses. Anybody can find easily food, clothing even renting a house. On the other side from paying a utility bill to buying stuff from a super shop, transactions are held by this mobile application. Even they make the community for their Chinese new year to make it enjoyable by this app.

#### **2.3 Comparative Studies**

We developed this application which is almost similar to other mobile application but different in many features. Like WeChat some software and other companies implemented this kind of application for their own purpose. In some sectors, this type of application has massive use and regular update by its developers. But we are working for our university students to help them with this application which is not implemented in previous.

#### **2.4 Scope of Problem**

- Updated information
- user-friendly interface
- Database management
- Transaction privacy

#### **2.5 Challenges**

- Collecting information about faculties
- Collecting information about library
- Checking, Debug, and test
- Making user-friendly UI

# CHAPTER 3

## REQUIREMENT SPECIFICATION

### 3.1 Business Process Modeling

It is a technique and graphical representation of the company's business process and workflow. It can be done following many methods like flowcharts and data-flow diagrams [4].

The Business Process Model of this application is shown in figure 3.1.

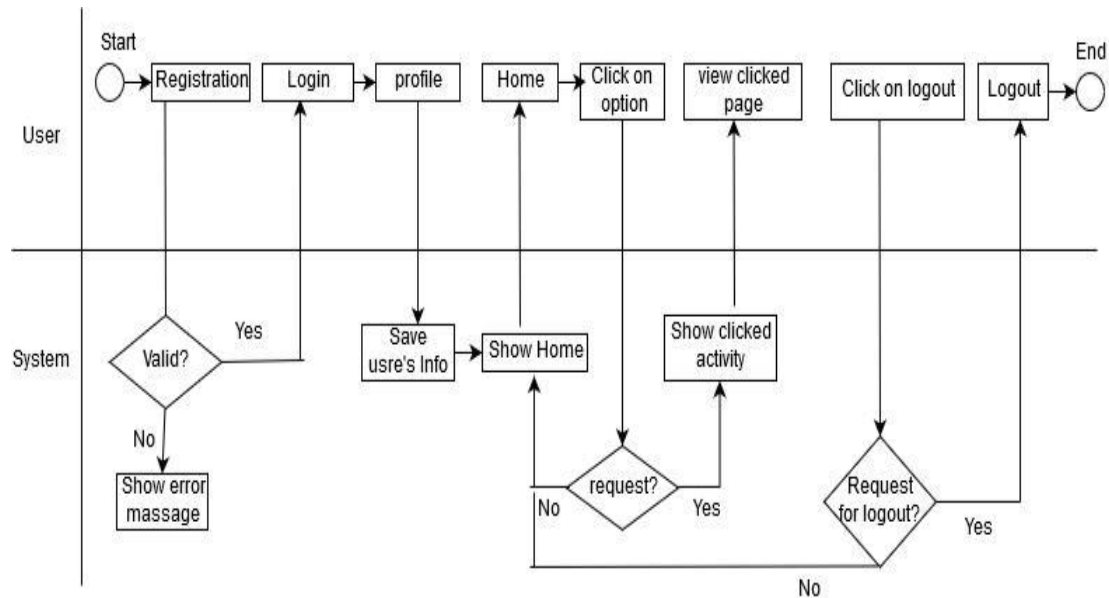


Figure 3.1: Business Process Model

### 3.2 Requirement collection & Analysis

#### 3.2.1 Software Requirements:

- Android Studio
- AVD
- Firebase Database
- Firebase Storage
- Firebase Authentication

#### 3.2.2 Hardware Requirements:

- OS
- Android support device
- Computer configuration
  1. Processor – Clock speed 1.60GHz (Min)

2. Ram – 4GB(Min)
3. Hard Drive -150GB(Min)
4. Graphics – Integrated Graphics

### 3.2.3 Requirement for Users:

- Android supported device
- Minimum SDK version 16
- Internet Connection
- Install this application

### 3.3 Use Case Modeling and Design

It is a technique used in system analysis and design to describe, clear up and coordinate the system criteria. It consists of a set of possible sequences of interactions and interrelation between systems and users in a specific environment and related to a specific goal. It comprises of a group of components. It should carry all the system features that have important to the users. It is a collection of possible scenarios related to a specific goal [3].

Figure 3.3 shows the use case diagram of this application.

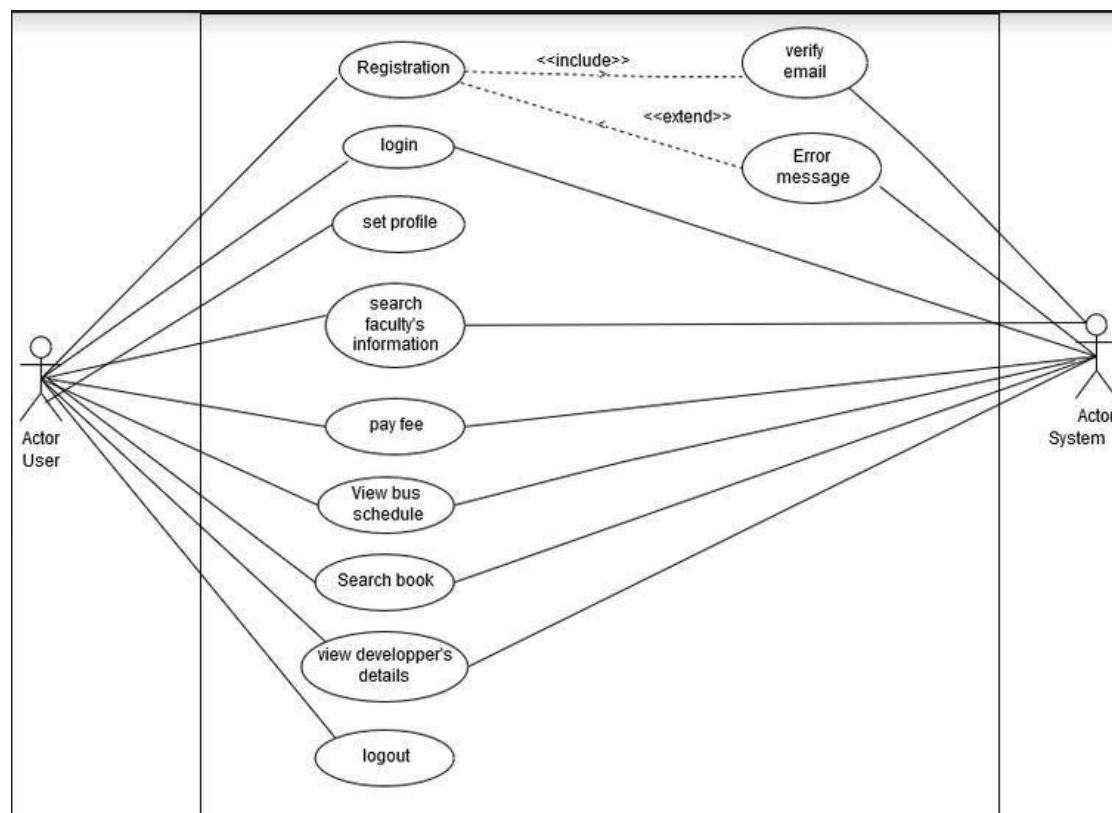


Figure 3.3: Use case Diagram

Table 3.3: Illustrates the idea of use cases

Use cases	User, admin & system
Primary Actor	User
Pre-Condition	Users must have an Account for login. If the user doesn't have an account, he/she needs to give all the correct information for creating an account.
Description	If user have an account, he/she will get all listed services
Post Condition	Show an acknowledgment to the user "Successfully logged in". Then he/she will be able to take all the services.

### 3.4 Logical Data Model

Logical data models represent the abstract structure of a domain information. It is a map of the whole project. Access this user need his/her full name, id, email, password and confirm password. After that user can chat, can pay semester fees, can get information about transportation, department, and library [4].

The following figure 3.4 shows the Logical Data Model of this application.

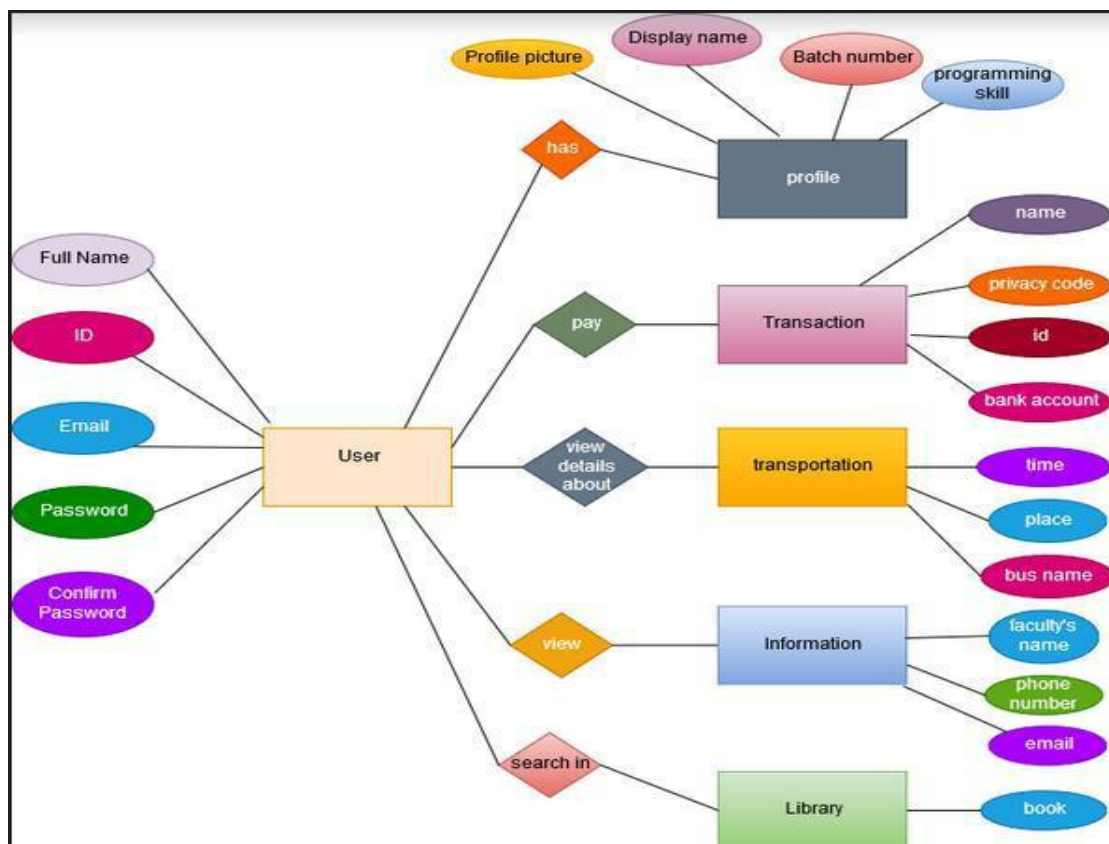


Figure 3.4: Logical Data Model



### **3.5 Design Requirements**

When designing application, the following issues must be considered that reproduce the overall design of the goals that the system expected to achieve. When we have designed the application, the following objectives were kept in mind.

At first, we use Android Studio IDE to design basic UI (the XML) file and build the project and to make it responsive for all android devices. We use OOP (Java Object Oriented Programming) to develop this application. For real Time Database System, We use Google Firebase, Google Firebase Database, Google Firebase Storage. For image cropping system we use Android Image Cropper API. We implemented our Basis Logo and icon using Adobe illustrator which is necessary to provide a better, attractive and user-friendly interface. The Business Process Model, use case diagram and other diagrams are designed using Diagram Editor (extension of Google Chrome) which is more user-Friendly and reduced time to design a complex diagram.

## CHAPTER 4

### Design Specification

#### 4.1 Front-end Design

In this section, I'm going to discuss the user interface which is developed in front end design and also the view of the application features.

##### 4.1.1 Login Page

The application "WE" starts with a login page. The user is requested to give their email and password for login. There has a signup option for a new user. A new user can sign up easily by clicking on the sign-up option.

The following figure 4.1.1 shows the login page of the application.

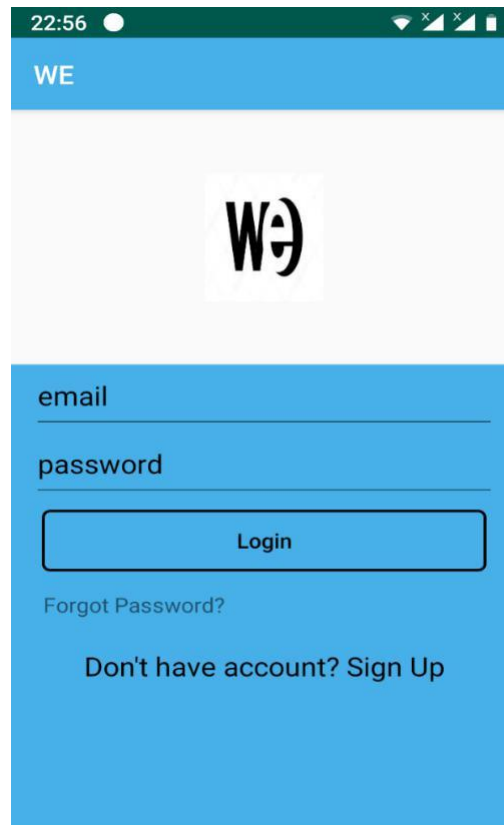


Figure 4.1.1: Login Page

##### 4.1.2 Signup Page

The user is requested to give their full name, ID number, email, password and confirm the password for signup. For validation, there has an email verification process where the system will check the providing email address is valid or not [5] [6] [7] [8].

The following figure 4.1.2 shows the signup page of the application.



Figure 4.1.2: Signup Page

### 4.1.3 Profile Setting

After successful registration and verification, users have to set the profile page. The user needs to add a profile picture, name, batch number, and programming skills. The information will store in the Real-time database by clicking the save button. The following figure 4.1.3 shows profile setting of the application.

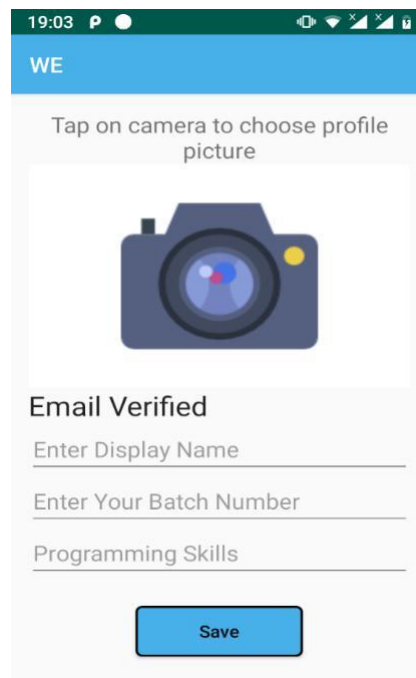


Figure 4.1.3: Profile setting

#### 4.1.4 Home Page

On the home page, everything is ordered systematically. There has information, chat, library, transaction, transport and about option. Users can choose any specific option according to their needs [2].

The following figure 4.1.4 shows the home page of the application.

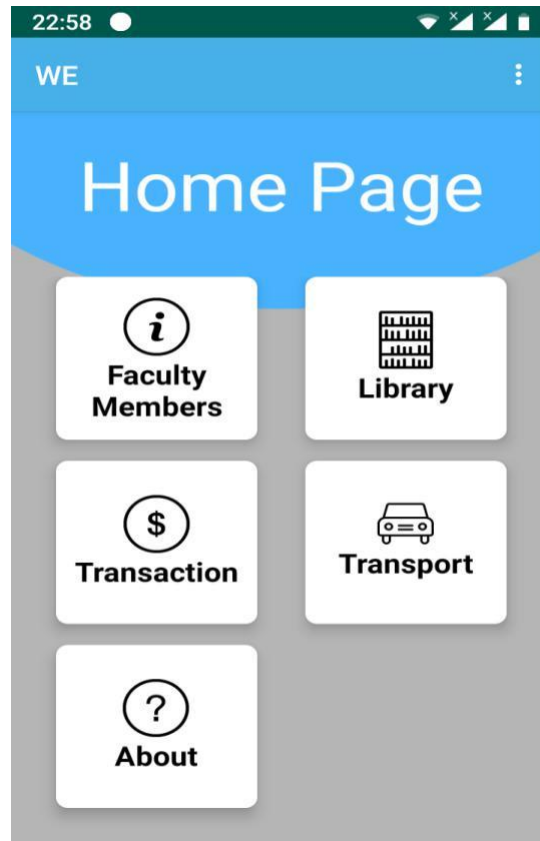


Figure 4.1.4: Home Page

#### 4.1.5 Transaction

There has a money transaction page that will help the students. By clicking on the transaction option user can see the transaction page. Users can pay installment from anywhere to save time, travel expenses and avoid standing in long lines.

The following figure 4.1.5 shows the transaction page of the application.

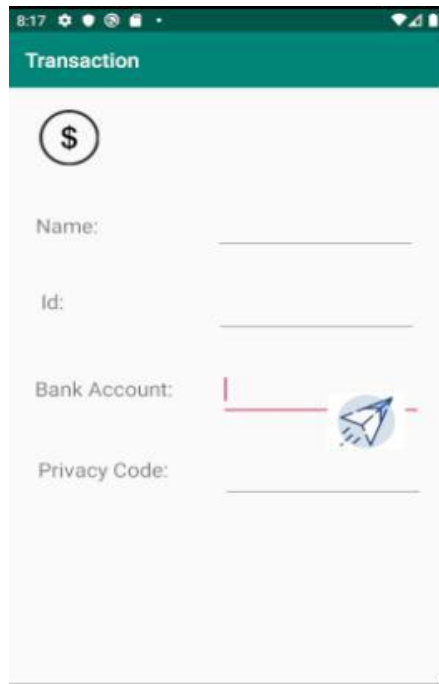


Figure 4.1.5: Transaction page

#### 4.1.6 Transportation Page

There has a time schedule of buses, the routes and the driver's contact number on the transportation page. Users can easily all information by clicking on transportation options and can be benefitted.

The following figure 4.1.6.1 shows the transportation page of the application.



Figure 4.1.6.1: Transportation page

The following figure 4.1.6.2 shows transportation of the application.



Figure 4.1.6.2: Transportation page

#### 4.1.7 About Page

User can able to see the about page by clicking about the option. On this page, the user can see the name of the developers and supervisor and co-supervisor. The following figure 4.1.7 shows about page of the application.

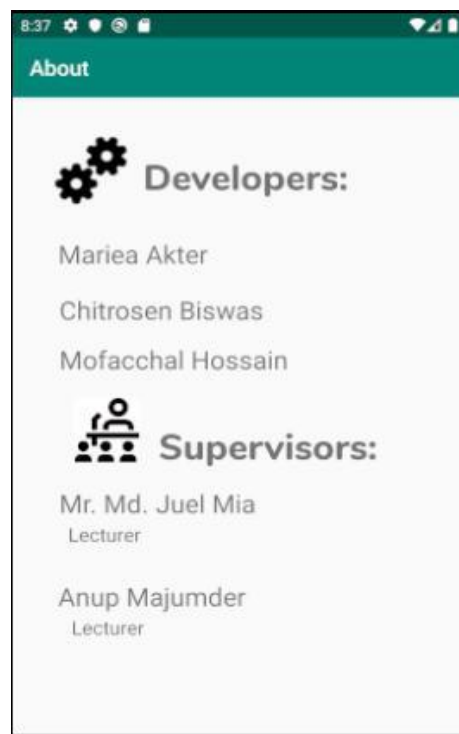


Figure 4.1.7: About Page

## 4.1.8 Library Page

By library feature, user can able to know which books are available in our DIU library. They can search for books. There has also a night mood option. They don't need to visit the website or don't need a network connection for this.

The following figure 4.1.8.1 shows the library page of the application.

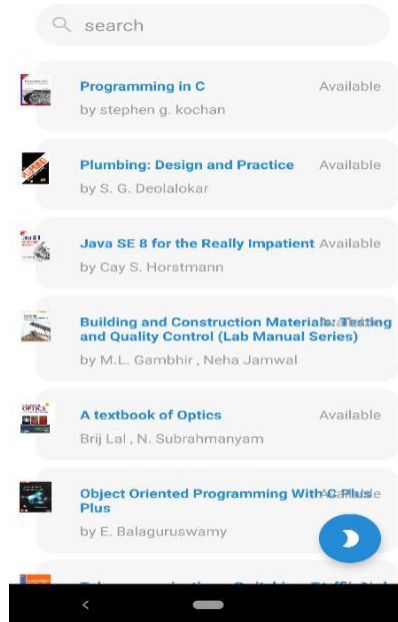


Figure 4.1.8.1: Library Page

The following figure 4.1.8.2 shows the night mood view of the library page.

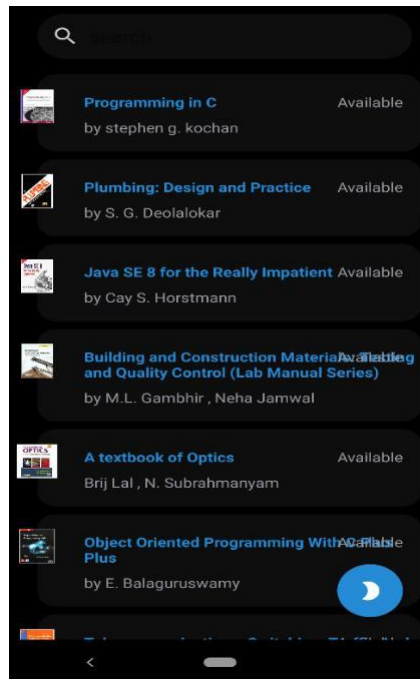


Figure 4.1.8.2: Night Mood View Of Library Page

The following figure 4.1.8.3 shows the book search.



Figure 4.1.8.3: Book Search

## 4.1.9 Faculty Members

Users will be able to know about faculty member's information of the CSE department such as designation, phone number, and email address. Users can also see this feature in the night mood view and can search whether they need their essential information.

The following figure 4.1.9.1 shows the faculty members page of the application.

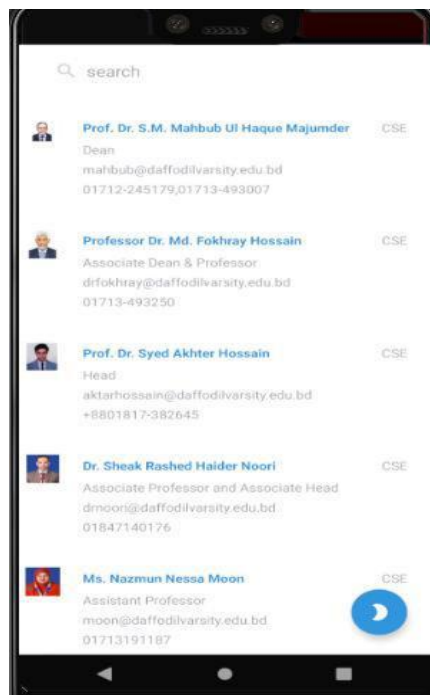


Figure 4.1.9.1: Faculty Members



The following figure 4.1.9.2 shows the night mood view of Faculty Members page.



Figure 4.1.9.2: Night Mood View Of Faculty Members

The following figure 4.1.9.3 shows the faculty member's information searching.

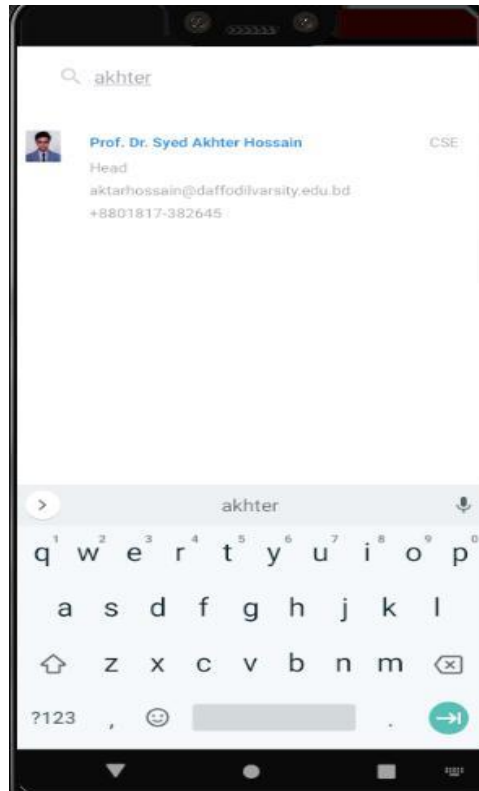


Figure 4.1.9.3: Information Search

### 4.1.10 Reset Password

Users can reset the password using the registered email address. The following figure 4.1.10 shows the password reset page.

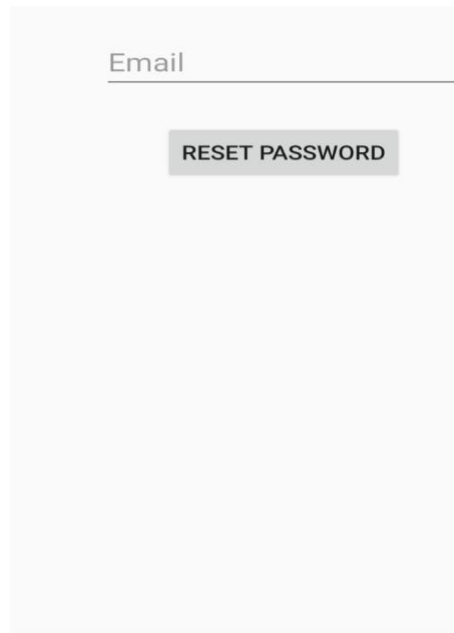


Figure 4.1.10: Reset password

### 4.1.11 Logout

There has a logout menu. Users can log out if they want. The following figure 4.1.11 shows the logout.

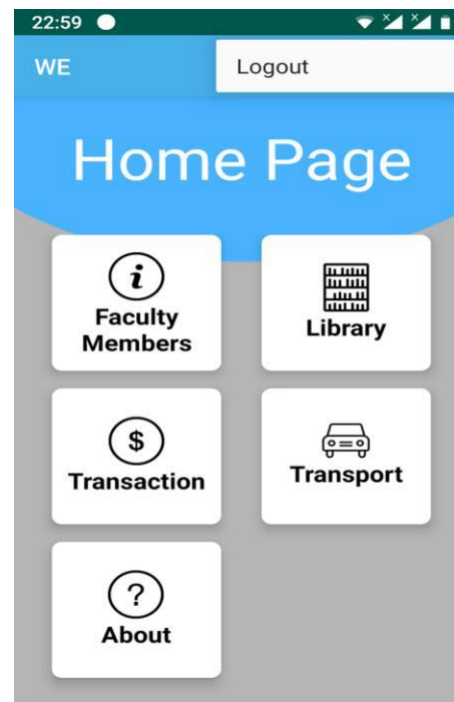


Figure 4.1.11: Logout

### 4.1.12 Exit Dialog Box

If users want to exit the app without logout, then exit alert message shows.

The following figure 4.1.12 shows the exit dialog box.

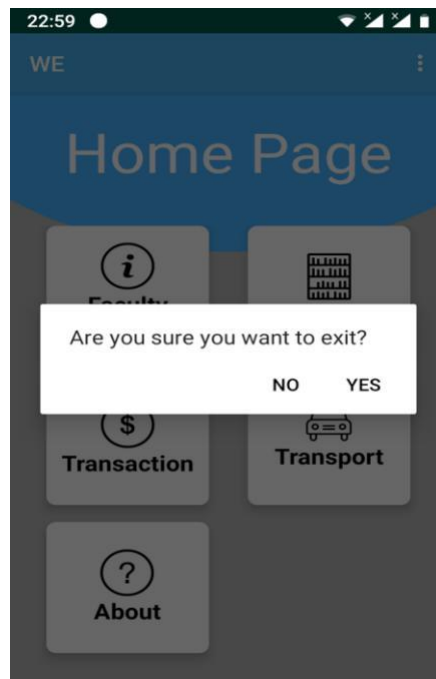


Figure 4.1.12: Exit Dialog Box

## 4.2 Back-end Design

Back end design is the ultimate destination of this application. Interaction design is a must for an application to perform swiftly. We tried to do our best to make this application easy and user-friendly as much as possible. We have used buttons and icons to create a user-friendly application.

## 4.3 Interaction Design and UX

Interaction design can be defined as the relationship into the users of the products and the products. Very often these products are virtual products like different apps, websites, etc. Interaction design aims to give the best service to its user what he/she gets online. It works on the improvement of the product quality, availability, validity and the delight the user gets using the products.

We tried to make this application simple, easy and user-friendly to use and get services within a short time according to their needs. The mechanism of this application is also simple to understand and improve in the future. We have implemented related icons, proper descriptions for better user experience.

## 4.4 Implementation Requirements

- Firebase console
- Firebase API [1]
- Gmail
- JSON

## CHAPTER 5

### IMPLEMENTATION AND TESTING

#### 5.1 Implementation of Database

We are using an online database system firebase real-time database server for storing the data. We use firebase hosting for host user and data entry from application. Users will be able to use only data. The whole database will be controlled only by admin. Admin will put and handle all the necessary data and these data will be stored in the database. All data will be stored by the category. The admin panel will handle it and manage it properly to maintain the database [1].

The following figure 5.1 shows the implementation of the database.

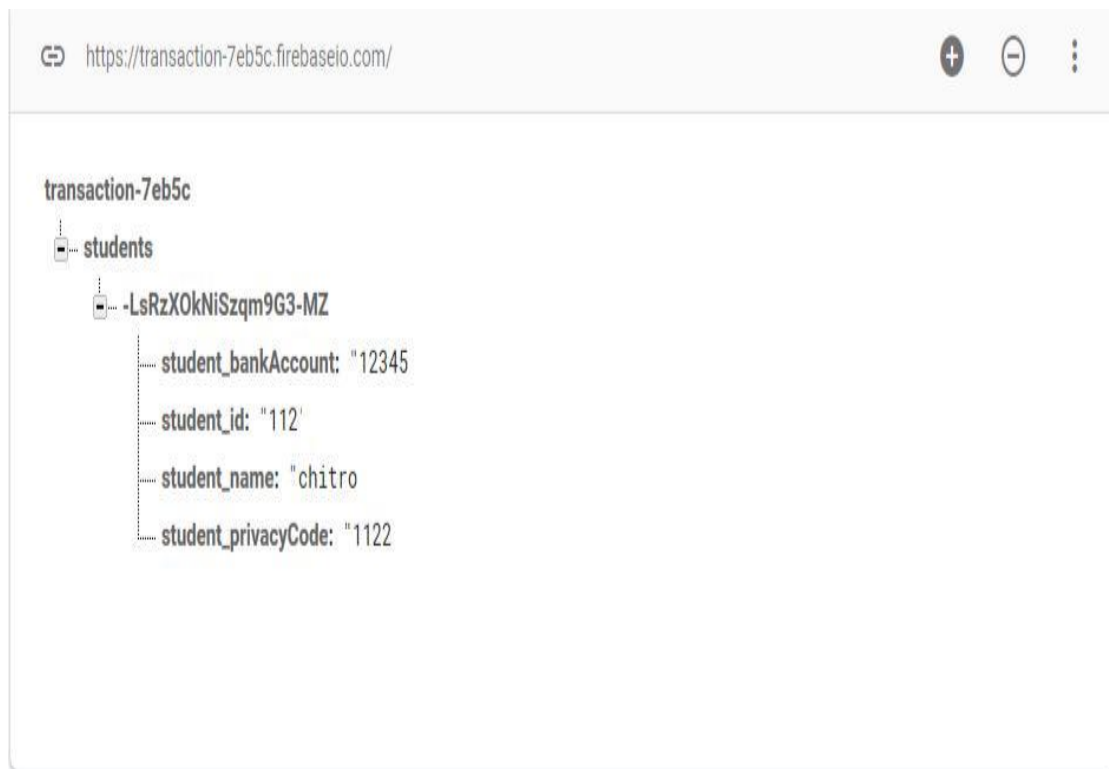


Figure 5.1: Firebase database structure.

#### 5.2 Implementation of Storage

For file and image storage in real-time, we used Firebase storage and make object key values such as profile image [1].

The following figure 5.2 shows the implementation of storage.

Name	Size	Type	Last modified
1563461980656.jpg	20.49 KB	image/jpeg	Jul 18, 2019
1563462334518.jpg	20.49 KB	image/jpeg	Jul 18, 2019
1563468544856.jpg	330.97 KB	image/jpeg	Jul 18, 2019
1563468571080.jpg	477.21 KB	image/png	Jul 18, 2019
1563548882535.jpg	3.91 MB	image/jpeg	Jul 19, 2019
1572378536086.jpg	59.77 KB	image/png	Oct 30, 2019
1574431240015.jpg	54.92 KB	image/jpeg	Nov 22, 2019
1574431314277.jpg	275.38 KB	image/jpeg	Nov 22, 2019

Figure 5.2: Firebase storage

### 5.3 Implementation of Authentication System

For authentication, we use a firebase authentication system. It is also a Realtime Authentication system. The user verification process is done by this [1].

The following figure 5.3 shows the implementation of authentication system.

Identifier	Providers	Created	Signed In	User UID ↑
mariea15-6711@diu.edu.bd	✉	Aug 15, 2019	Nov 30, 2019	5709cRFRUlgzclBkeBuLZp76H0U2
chitrosen6@gmail.com	✉	Jul 19, 2019	Nov 22, 2019	80hB5NqEbtMdsxvoX0yclXbigel1
salauddingaliv1985@gmail.c...	✉	Nov 2, 2019	Nov 2, 2019	PpiiWltTsyVisFHZKLDE7lXl50b2
marieaaakter@gmail.com	✉	Nov 2, 2019	Nov 2, 2019	QCxwfd62ZwU3JPYNSbsVp9X7z...
shuvoray56@gmail.com	✉	Nov 22, 2019	Nov 22, 2019	aWafq8DOSvhDyq97c6zwAV2M9C...
kundu.amit517@gmail.com	✉	Nov 22, 2019	Nov 22, 2019	mvRhIM34JDUzV4k4HbGwEo40WP...

Figure 5.3: Implementation of Authentication System

## 5.4 Implementation of Front-end Design

We tried to keep our front-end design simple and easy to understand for students. We made it too lite so that users can easily understand the features and necessary options. We used Scroll view layout, Search, Image view, Buttons, Image button, and many features to keep an interactive design. We used simple and relative images and icons to help users.

The following figure 5.4 shows the implementation of front-end design.

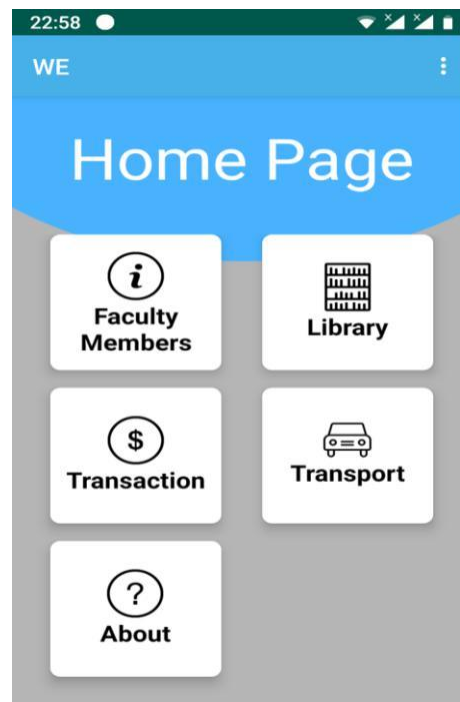


Figure 5.4: Implementation of front-end design

## 5.5 Give access to data

After sign in properly, students can be able to search and use of data. When users want to see information, they will be able to see. Finding books in the library is now easier. When users want to see data, it will come up with details.

## 5.6 Testing Implementation

It is a process to check the implementation of technological approaches. On one side, it implements the approaches to check if it works in real life or not, on the other side, it presents the progress and lacking on the application. It aids in promoting the quality and interoperability by solving the lacking.

Some students from our department installed our app and registered by their email. After successful verification, they were able to sign in and used the features of the application. The app is very useful for the students and working fine in real life.

The following figure 5.6 shows the Unit Testing Life cycle.

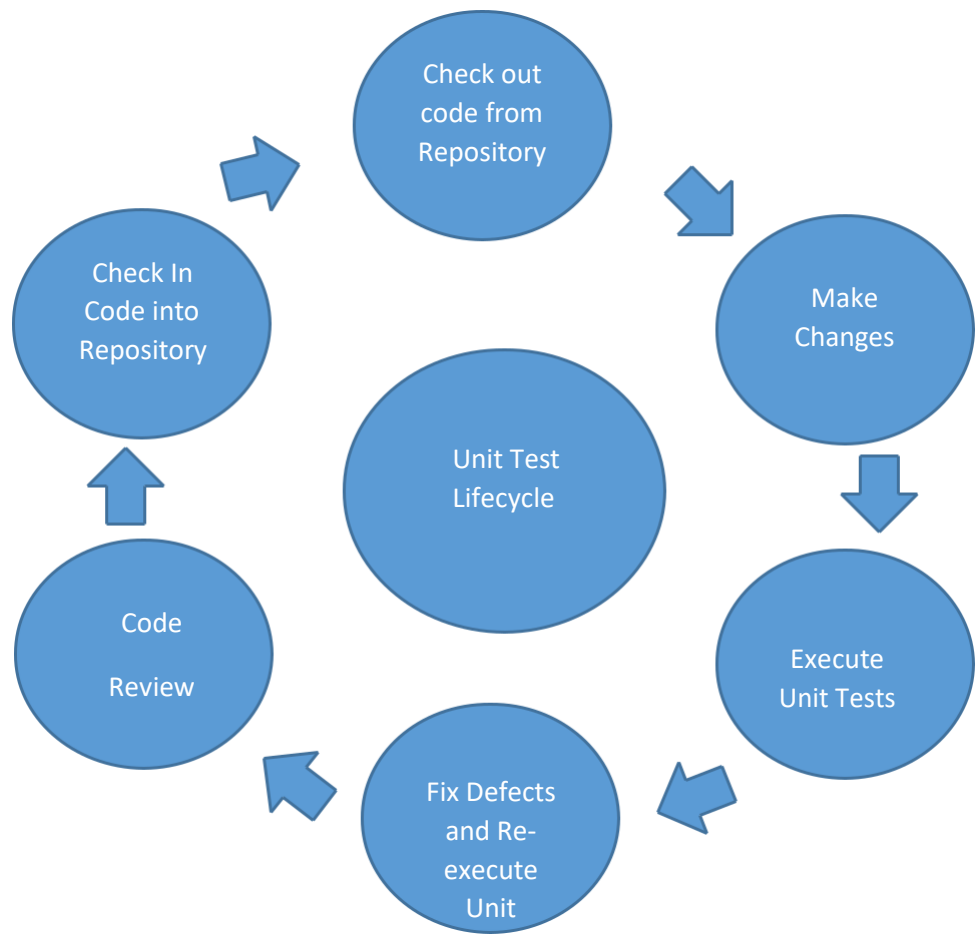


Figure 5.6: Unit Testing life cycle



## **CHAPTER 6**

### **CONCLUSION AND FUTURE SCOPES**

#### **6.1 Discussion and Conclusion**

For the grace of Almighty God, we have successfully completed our project and documentation. After the long-term of thinking, Discussion, implementation we are in the last session and happy of completion. Our system reduces the hassle of time.

We believe that our developed application has the utmost possibility and it can go further way to solve many complex situations. Daffodil Varsity students can get everything in their hands with our app. With just one app, student teachers can get together and almost all of Daffodil Varsity's information can be found here, all in one word describe, all services under one umbrella.

#### **6.2 Scope for Further Developments**

We have a future plan for the application. Some of the plans are:

1. Improve the user interface
2. Develop on IOS Version
3. Improve security
4. Adding more functionality
5. Adding real-time database search in library page
6. Adding real-time database search in the information page

## **APPENDIX: PROJECT REFLECTION**

We have developed an android app for the students of our university. By using this app they can able to know about faculty's information, available books of our library, time schedule of buses and also pay fees. After successful registration, they don't need a network connection for using information, library, transport feature except for transaction. So, users won't need to visit websites. We had enough learning about the android application and java programming during making this project. Now we understand how to work better on android studio to work on better than before, and also had a better understanding of mobile application design. We have a better idea now to make an interactive interface. We also had a great experience through this journey. We have a high expectation about this project if varsity provides this application.

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