COMMERCIAL DISCOUNT MARKETING PLATFORM: DEVELOPMENT OF AN ANDROID APPLICATION

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

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APPROVAL

This Project titled **"COMMERCIAL DISCOUNT MARKETING PLATFORM: DEVELOPMENT OF AN ANDROID APPLICATION"**, submitted by Mehedul Ahsan, ID No: 161-15-7181, Rafia Islam, ID No: 161-15-6945, and Shejuti Islam Lizin, ID No: 161-15-6831 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 6 December 2019 .

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DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Anup Majumdar, Designation, 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

This android application is developed for all Bangladeshi people especially those who always want to save some bucks by grabbing offers. The main target of this application is to find the best deals from shops in a user-friendly environment as well as people can easily search for shops that are having offers going on for the easier experience. This will make our shopping easier and much more comfortable. While shopping many of us always search for offers and discounts so that we can save some money. According to these reasons, we wanted to develop an application where people can find all the running offer and discount without any difficulty. On the other hand, this will be a useful application for shop owners also. By giving a discount or offer on a product the shop can get a boost on sell. Along with that, it helps those shops who are offering a discount for getting acquainted. Sometimes a new shop owner can be popular by giving a promotional offer through our application.

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CHAPTER 1
INTRODUCTION

1.1 Introduction

Most of the time while shopping we check out those shops first which is having some discount offer going on rather than the regular shop. That's the reason, we wanted to make an application where all the ongoing offers will be listed so that it would be easier to find the best deal for our users. In spite to make our app user-friendly we have organized the offer in a different category. In offer details, we have added shop names and google map locations. So that effortlessly our user can find the best deal and shop which is having a discount. Our app will help people to save some of their valuable time and money.

1.2 Motivation

As we belong to the middle-class family, so before going for shopping or going to any restaurants for eating we always search for the places where we can avail some discount offers and where a sale is going on. In these cases, we faced so many problems because there is no enough platform where we can find and collect all discount offer or sale offer together, therefore, we ended up searching on Facebook. By experiencing those kinds of the situation we got an idea to make a mobile application where we will put all the running discount offer as well as the sale offer in a simplified and user-friendly way.

1.3 Objective

From the perspective of Bangladesh, almost everyone wants to save some money by grabbing some offers while shopping and there is no better platform where all offers and discount can be available together. So thereby our application will be a perfect solution to this problem. In our application all those things can be found in one place within a minute. All the offers are well organized categorically so that it will be a great experience for the users. For more simplicity people will be able to set favorite category so that whenever a new offer appears they can be notified. Our application is also an excellent platform for promoting offers.

1.4 Expected Outcome

The main target of our application is to find all the offers in one place. So that it is easier to find the best deals for users. Sometimes we search on Facebook and google for hours to find the best deals for us by using our app we don't have to search in Facebook google so it will save our time. Also, before going shopping user can check which shop is offering an offer for his/her needs in this way our application will save some money also. If we talk about shop owners, they can have a boost in their selling also.

1.4 Report Layout

From looking at the report layout anyone can understand which chapter representing which part of the project. Our report layout is also representing the same thing.

In the very first chapter, there is an introduction from which anyone can find basic information about our project. In outcome, we have discussed why we wanted to make this application and in the expected outcome we have discussed what are the things we expect from our project. And last but not least in the report layout part we have discussed what are the things we have discussed in the whole report.

In the second chapter which is named background, at the beginning of this chapter we have discussed the background of our project then we have discussed some application which is related to our project. After that, we have discussed the difference between related works and our project. then we have discussed which problem we can face in the future with this application and lastly, we have discussed the challenges while making this application.

In the third chapter of our report, we have shown the business process model, use case model and logical model of our project. We have also discussed the requirement collection and analysis and design requirements of our project.

In chapter four which is called design specification, we had started discussing the technical part of our project. In the first part of this chapter, we discussed front end design which helps us to build our user interface. Then we have discussed the back end design part of our project where we have used firebase as our database server. Then we have described what interaction design an UX is and lastly, we talked what are the implementation requirements of our project

In chapter 5 named implementation and testing, where we have discussed how we implement back end, front end design and interaction in our project. then in the next part, we showed the test result

of our project in a table where we have shown different test cases which we had tested to ensure or app's stability and in the last part of this chapter we have analyzed what we understood seeing the test case results.

The then last but not least in chapter 6 which is the final chapter of our project report. Where we have discussed the conclusion and which things we wanted to add in the future to the application. Then we have added references which we took from different websites. And on the last page of this report, we have added the plagiarism result of this project.

CHAPTER 2

BACKGROUND

2.1 Background

When we first came to Dhaka, we realize that there is no such application that contains offers. So we thought that there should be an application which contains offers for easy access. In our android course, we thought we will make this application but for time limitation we could not make it happen. For that, in our final project, we thought to make this application. Then we first planed what element should be there in our application. After that, we make a sketch for our application.

2.2 Related Works

When we started our working for this application, firstly we start searching similar application. By doing this step we found that there are several applications in the play store that contains different sim's like Grameen Phone, Robi, etc. all offers. But this is not as same as ours though our application contains offers so we have mentioned this here. On the other hand, we found another application names "treato" which gives a discount to its users at their registered shops. It's also not as similar to our concept however it is offer related. So, we have mentioned this.

2.3 Comparative Studies

We have done comparative studies between our application and existing similar applications. There are a lot of differences between these two applications. First, we want to talk about those applications which contain sim offers. These applications contain the only sim offers like a minute, internet, and SMS offers. Sometimes it only contains an internet offer. Our concept is similar but not actually the same. Our application contains all types of discount offers like fashion, food, shoes, electronics, etc. Second, we want to talk about "treato". This application gives a discount to only "treato" users at their partner shop. Which makes this not so much user-friendly because it only gives a discount to its user. This is not as same as our concept. Our goal is to promote ongoing discounts for any store for our users. In this way, our user will know which shops having offers.

For this, they will be able to grab those offers and save some cash. After that, they can invest this saved money in something else.

2.4 Scope of the Problem

In every project, there will always be some problems. In our project, there is also some problem that we faced. Some of these are given below

- Collecting data is a huge problem in our application.
- Shop owners can change any offer whenever they need if we do not update at the same time as the shop there will be a huge problem.
- It is tough to input offer one by one sometimes some mistakes can occur.

2.5 Challenges

As we are not so good at programming. So, while making this application, we faced a lot of challenges. Show some of these in the following

- We had to take java and android course and then we start working on this application.
- We use firebase as our database. As we have never used this database before. That's why we had a lot of difficulties implementing the database in our application.
- In the middle of our project developing a new android version named AndoirdX was released for this. For this reason, we had to change a lot of our XML code which gives us a lot of problems.

CHAPTER 3

REQUIREMENT SPECIFICATION

3.1 Business Process Modeling

Business process modeling is a graphical illustration of the function of any application. By business process model any software can easily be improved. This is normally done through various shapes, lines, suchlike as the flowchart diagram [1].

BPM is shown in figure 3.1.

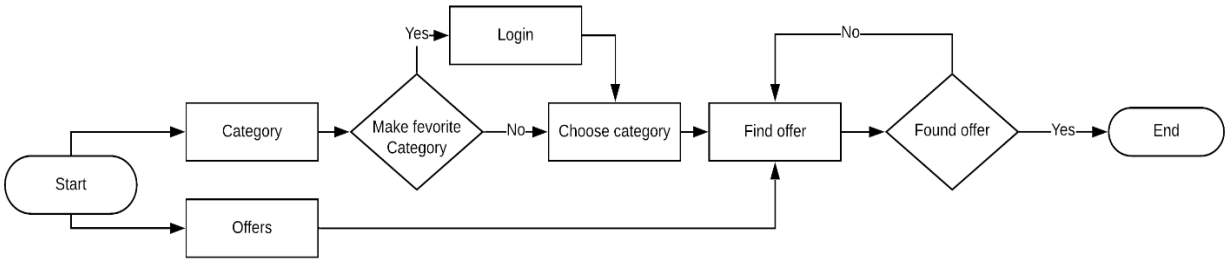

Figure 3.1: Business process model of Proffer

3.2 Requirement Collection and Analysis

Requirement collection and analysis play a most important role in our application. In the context of our application, it is mainly based on different types of offers. For the implemental purpose, we must need to know which element gives our user the best experience and. So according to this, first of all, we analyze which things will more be required and preferred by our users. For instance, gives them a better feeling into our application. So, we tried to implement those things first. One of the most focused things in our application is the category section because one user could have the capacity to search for one specific product so we divided our offers categorically. Here we added a favorite option especially to meet our user needs. If anyone wants they can make a favorite category. In order to avail of offer details, we need a google map so that our users can easily found the shop they are searching for. It helps them to catch the exact location and protects from troubles.

3.3 Use Case Modeling and Description

The use case model is an illustration of a user's communication with the software. It shows the communication between the user and various use cases in which the user is intricated. A use case model can be identified by various categories of users of that system and the various use cases and will usually be related by other types of diagrams also[2]. Use case model shown in figure 3.2.

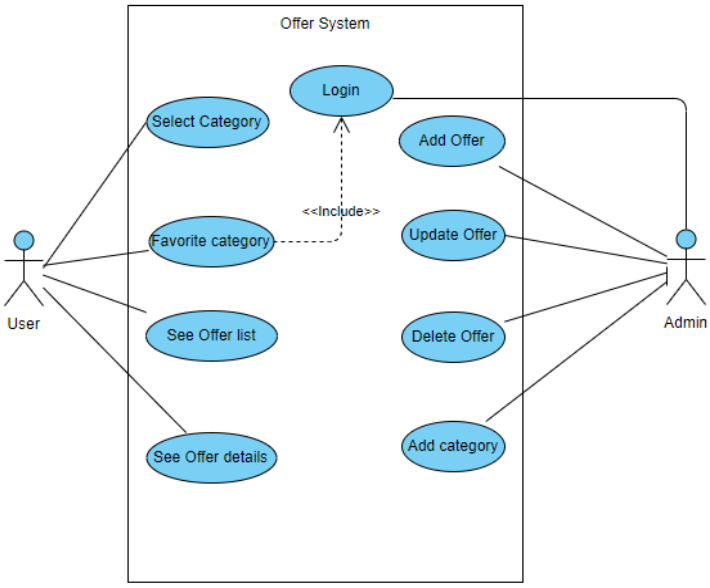

Figure 3.2: Use case Diagram for Proffer

3.4 Logical data model

Logical data modeling is the illustration of data planning and formulation in a graphical way without any regard to the physical utilization of the database administration system technology involved in saving the data in the database. A logical data model accommodates all the information about the different entities and the communication between the entities the time being in a database[3].

Shown in figure 3.3.

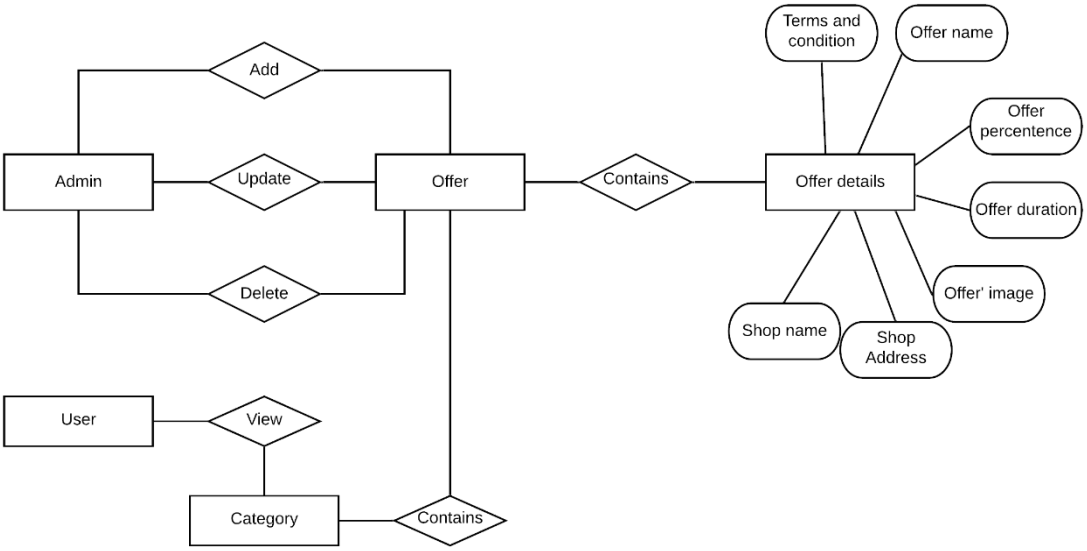

Figure 3.3: Logical data model

3.5 Design Requirement

While designing the whole application every developer should keep some things in mind to make the best user experience for anyone who uses the application. We did the same. we wanted to ensure a stable application so that no one while using this application can have a smooth UI experience. Efficiency is another important requirement. Because the application will be used in different android versions and different mobile phones. So our application has to be efficient enough to run in all the mobile and in any android phone effortlessly. Also, another most important requirement is a user-friendly user interface because if a user does not feel comfortable then they will not use our application so we have to make our design very much user-friendly.

CHAPTER 4

DESIGN SPECIFICATION

4.1 Front-end Design

The front end design is used to design a UI so that the user can interact with the server. This is mainly known as client-server development for an application. This is the most important thing in developing an application. We wanted to make a simple front-end design so that it would be user-friendly to our user.

We have used XML language to design our front end design. And to make our XML code in work we have used JAVA language. Our application has so many activities. So, we are not giving all the codes and XML design here otherwise we had to add so many pages of codes here.

4.2 Back-end Design

Back end design is the most important thing in the software. Generally, all the logical work is done in the back end design. The user usually cannot interact with the back end part of any software. Designing the back end part perfectly is the most important thing in developing an application. In our project, we had to invest a good amount of time in the back end design to make our application work according to our expectations.

We have used the firebase database in our application for doing backend work. Firebase is a Google product. It helps in using real-time data and also in the authentication. We used firebase as our database because it is relatively easy to use and also it helps to build other google extensions easily. For using firebase as our database, it will be easier for us in the future to improve our application easily.

This is the main database of our project. We have created a database for easier management. Where the first one is an admin. Admin can add delete offer from the application and of course, admin can control a lot more things from the server.

The second one is categories, where all the different categories are added. Then the other one is interests which are not fixed. When any user wants to make any categories favorite those categories stores here and later show them in favorite offer section.

The last one is an offer where all the offer stores. Showed in figure 4.1.

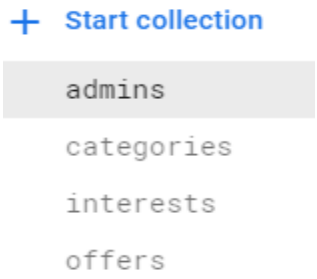

Figure 4.1: Firebase database

In categories, we have added the category name and the picture which will represent the specific category. And there is a number which is working as the primary key for that category. Shown in figure 4.2.

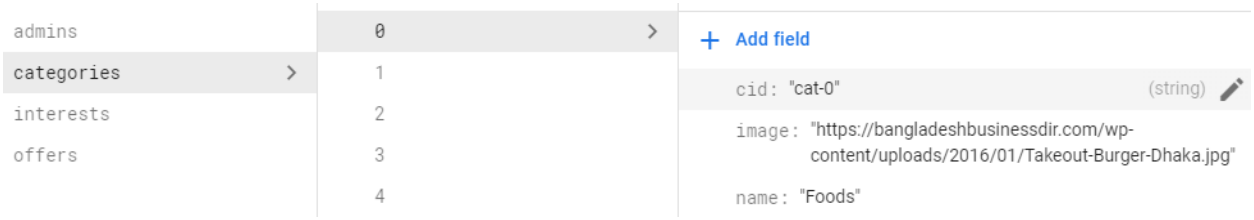

Figure 4.2: Category in database

In the offer section we have a website address and then in which category the offer belongs to, discount percent, the duration of offer and lastly the image for the offer. Shown in figure 4.3.

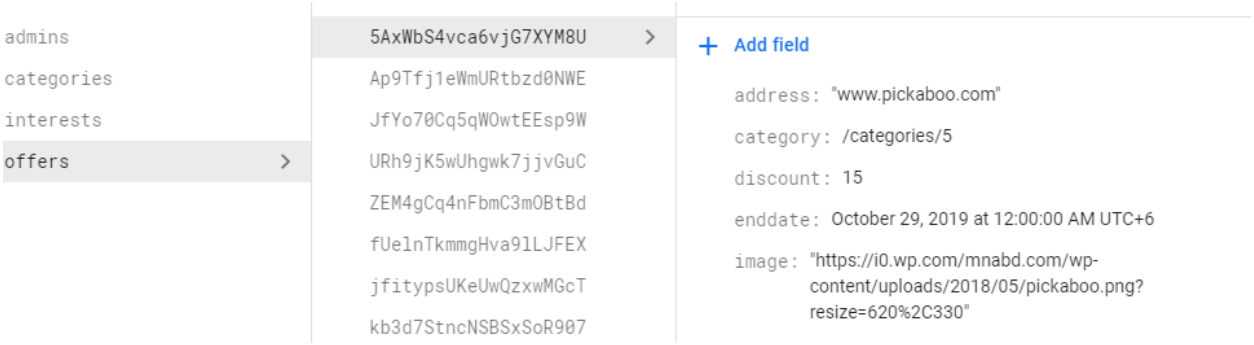

Figure 4.3: Offers in database

The hardest part of our project was keeping track of the interested category. From figure 4.4 we can see for a specific user there are three categories in which that user made favorite categories.

Figure 4.4: Database for interest category

4.3 Interaction Design and UX

Interaction Design is the architecture of interactive products and services in which is the designer's main target that goes beyond the item in improvement to combine the way users will collaborate with the product and services. Thus, close scrutiny of the user's needs, limitations, and contexts, etc. give designers ideas and information to customize the output to meet the user's demands[4].

User experience (UX) design is the process diagram teams use to develop products that accommodate essential and significant experiences to users. This associates the diagram of the entire process of promoting and integrating the product, including the appearance of branding, design, usability, and function[5].

While developing this project these two factors were out top priority so that our user can have a great experience using our application. And so, we wanted to design our user interface design as easy as possible so that everyone can use this application without any problem and can have a great experience using this application anytime.

4.4 Implementation Requirements

As our final project is based on android. There are two tools that are used for establishing the android application. one is android studio IDE and another one is Eclipse IDE. We used Android Studio as our tool for developing our project.

Now, we will talk about the requirements which were needed for developing our project,

Android Studio:

Android Studio is the official integrated development environment (IDE) for Google's Android operating system. It is a replacement for the Eclipse Android Development Tools (ADT) as the primary IDE for native Android application development[6]. I have used version 3.5.1 Android Studio for developing my project.

Android SDK:

The Android SDK (software development kit) is a set of development tools used to develop applications for the Android platform. The Android SDK includes Required libraries, Debugger, An emulator, Relevant documentation for the Android application program, interfaces (APIs), Sample source code, Tutorials for the Android OS[7].

Firebase:

The Firebase Realtime Database is a cloud-hosted database. Data is stored as JSON and synchronized in real-time to every connected client. When you build cross-platform apps with our iOS, Android, and JavaScript SDKs, all of your clients share one Realtime Database instance and automatically receive updates with the newest data[8].

CHAPTER 5

IMPLEMENTATION AND TESTING

5.1 Implementation of Database

The Firebase Realtime Database is a cloud-hosted database. Data is stored as JSON and synchronized in real-time to every connected client. The Realtime Database provides a flexible, expression-based rules language, called Firebase Realtime Database Security Rules, to define how data should be structured and when data can be read from or written to. When integrated with Firebase Authentication, developers can define who has access to what data, and how they can access it[8].

To implement firebase in our application there are several steps. First, we had to log in to the console part of the firebase and needed to add a project for our application shown in figure 5.1.

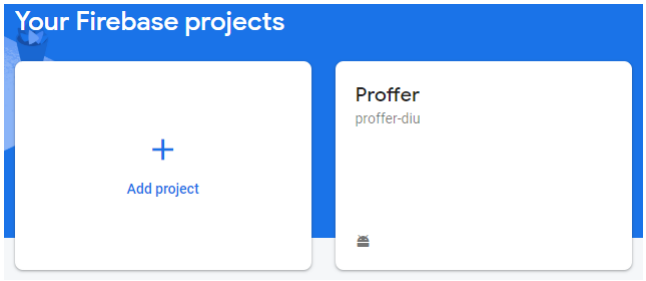

Figure 5.1: Firebase project for our application

Then we had to import the google-services.json file in our project repository shown in figure 5.2.

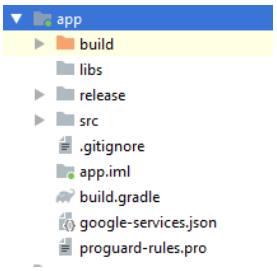

Figure 5.2: Adding JSON file

Then we had to edit our Gradle to connect our android studio project with firebase. To load firebase in our application we had to write java codes. To connect we had to write codes shown in figure 5.3.

```
private FirebaseFirestore db = FirebaseFirestore.getInstance();
private FirebaseAuth mAuth = FirebaseAuth.getInstance();
```

Figure 5.3: Load Firebase

5.2 Implementation of Front-end Design

We have implemented our font-end design by writing XML code and we made the XML codes work by connecting XML with java code. We have implemented the front-end design with the screens which are given below,

5.2.1 Screen main application

After opening our application our user will see category first. Users can select which category of offer they want to see. If our user clicks food then all the food-related offers will open shown in figure 5.4.

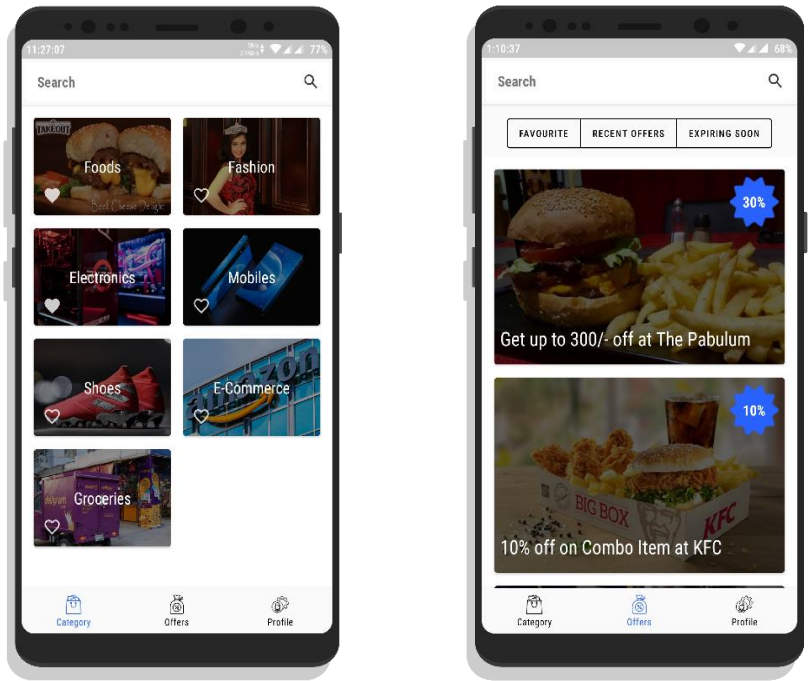

Figure 5.4: Category wise offers

Our user can also see offer without category. In that case, they have to click “Offers” which is implemented in the recycle view shown in figure 5.5.

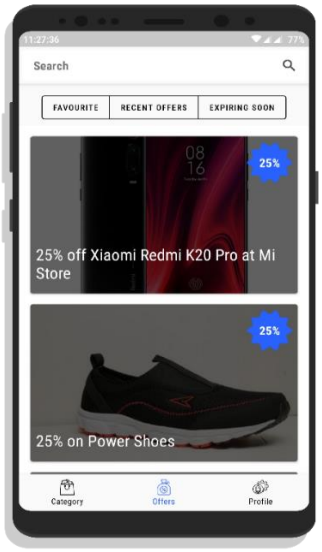

Figure 5.5: All offer

If our user wants to see the offers which are recent offers then they have to click Recent offers. Which will take then to recent offers.

Also, our user can see the offers which are expiring soon by clicking expiring soon shown in figure 5.6.

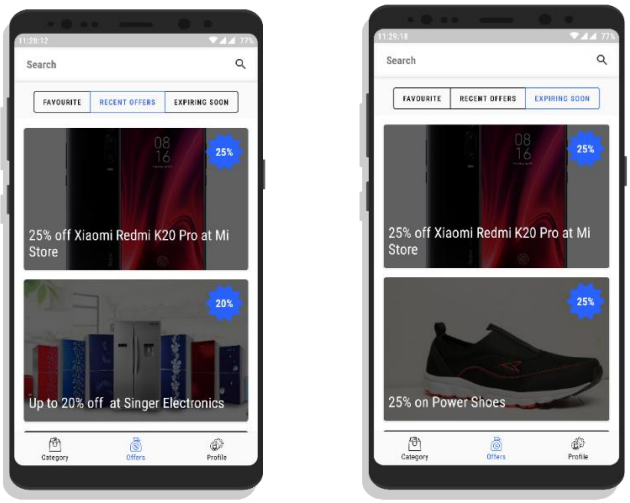

Figure 5.6: a) UI for recent offer b) UI for expiring soon offer

Our user can select favorite categories, in that case, they have to login first. Then the user can see the categories which they have made favorite in the favorite tab shown in figure 5.7.

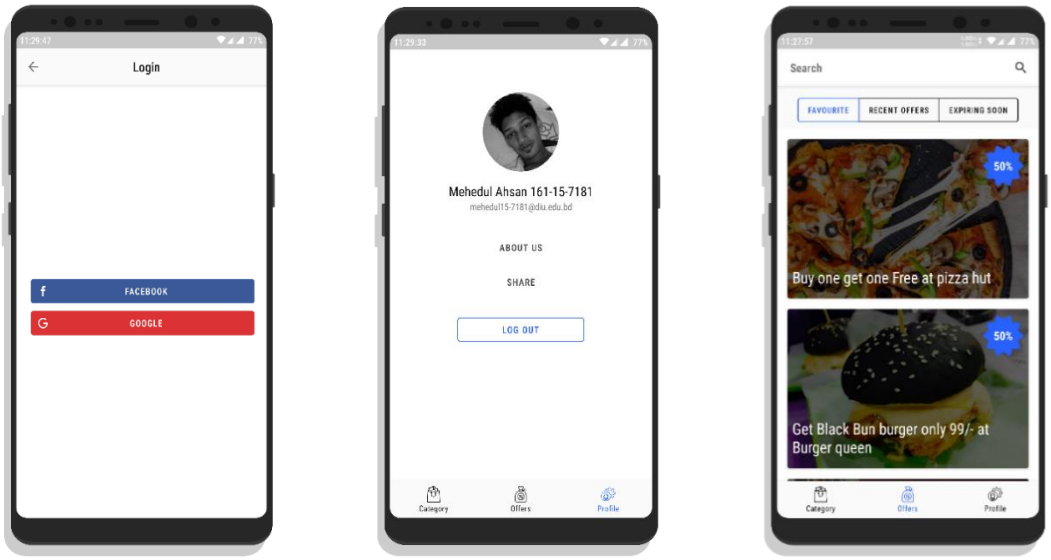

Figure 5.7: a) Login b) Profile c) Category

After clicking the offer, the offer detail tab will open. In offer details, we have offer name, discount percentage, shop name, shop address, offer duration, and google map. Users can also visit the shop web site from the offer details page. We have implemented the google map location in our application for our users to find shops easily. Shown in figure 5.8.

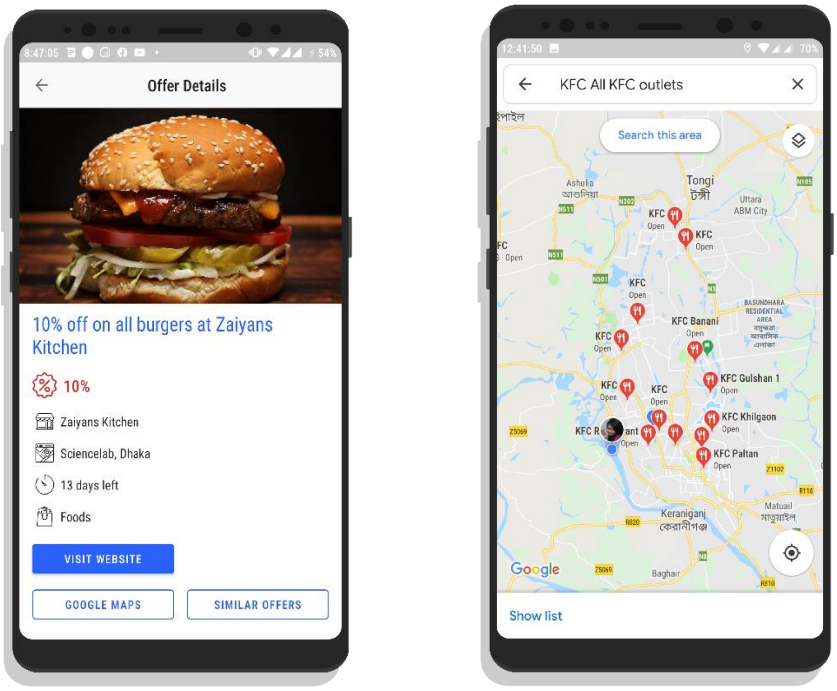

Figure 5.8: Offer details

We have added three Gmail as admin in our firebase. When we login with those three Gmail screens for admin will appear.

There is an option to add offer and delete expired offer from our application. After tapping on add offer a tab will open where is some fields like Offer name, shop name, shop address, discount percentage, offer start date end date, etc. After feeling all these field offer will be added in our database and will be shown in our application shown in 5.9.

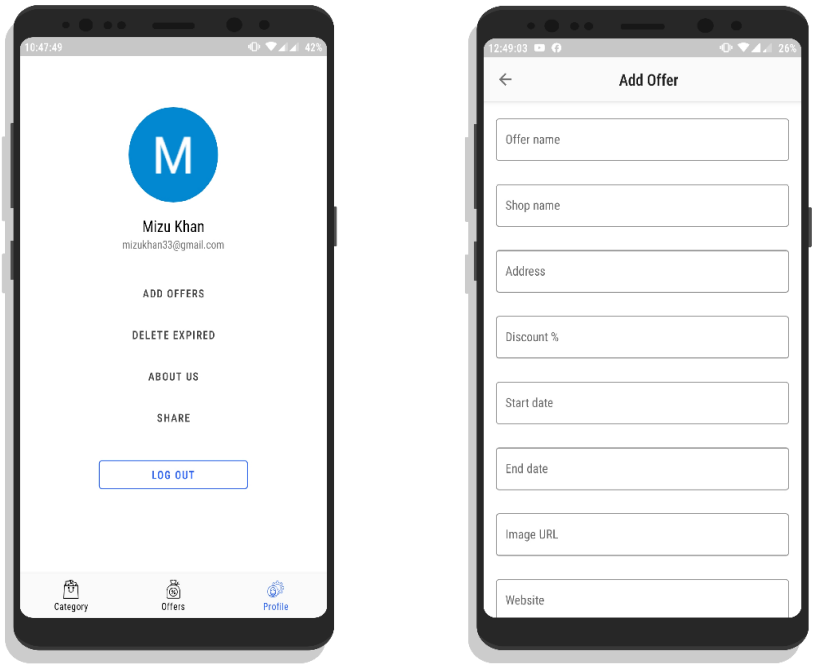

Figure 5.9: Admin Portal

There is also an option to delete the offer so that we can get upgraded with shop owners shown in 5.10.

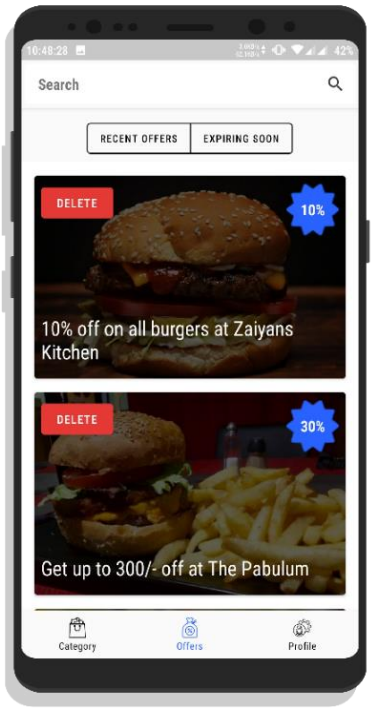

Figure 5.10: Delete Offer

When new offer added in database user will receive a notification shown in figure 5.11.

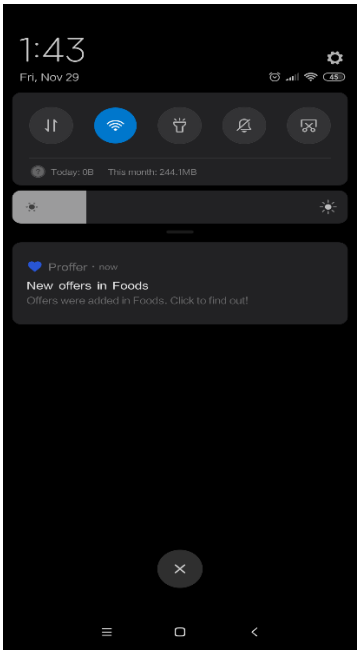

Figure 5.11: Notification

5.2.2 Screen for merchant application

In the merchant application in the opening page, we have kept an option to log in. The merchant can both log in with Gmail or Facebook account. After logging in they will have an option to add offer so they can add their running offer shown in figure 5.11. after that, they can fill up all the information on their offer and add that offer.

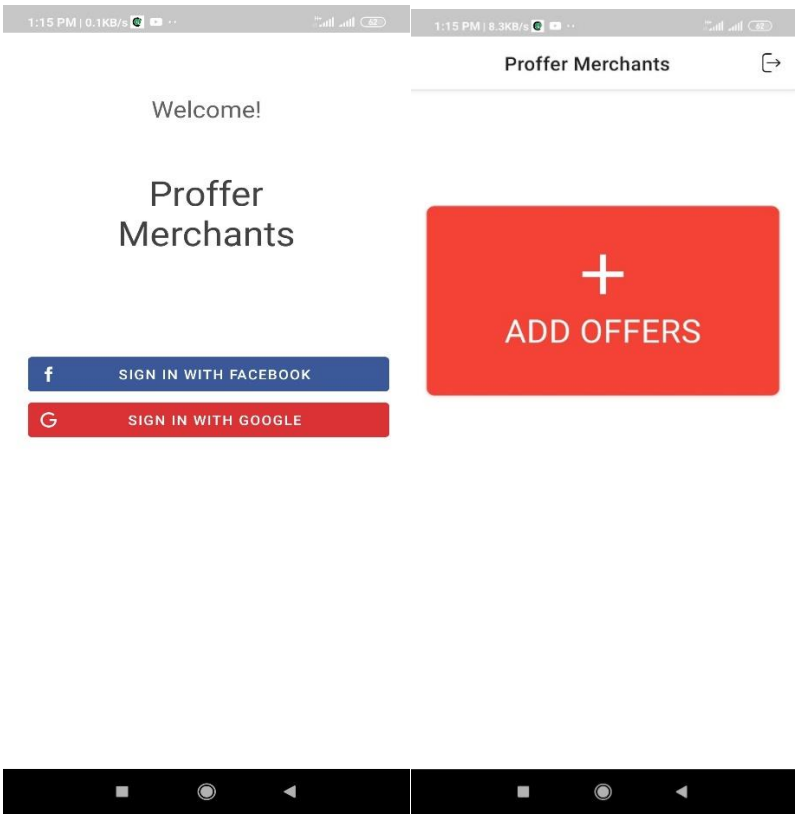

Figure 5.12: Ul for merchants

Admin can also login to the merchant application so that they can check offers before adding them in the main database. Admin can approve offer and also can delete offer shown in figure 5.12.

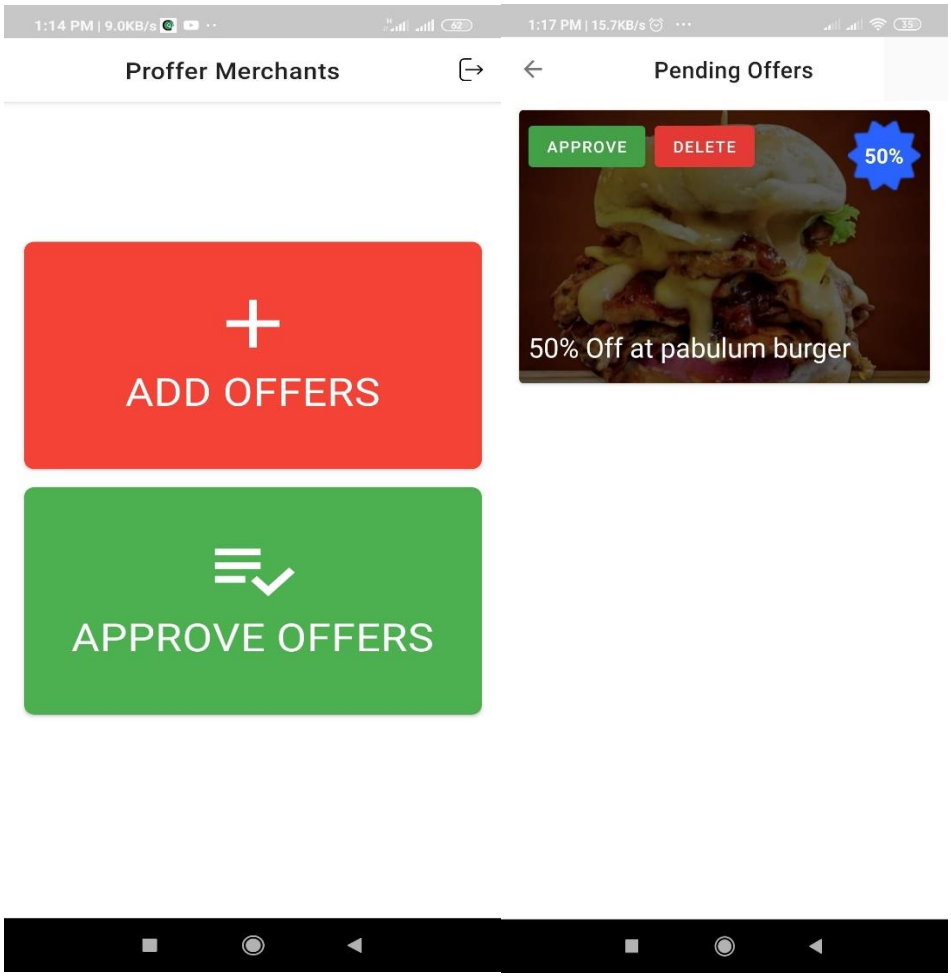

Figure 5.13: UI for admin in merchant application

5.3 Implementation of Interactions

If any software is interactive enough to catch people's attention then it will be used more. So, every developer while developing application keeps this thing mind and make their application as interactive as possible. To make an application interactive application design should be as simple as possible and should use related icons and pictures so that users can have a smooth experience while using our application.

While developing our project we kept in mind that we have to make our application very interactive. And tried to make this application as interactive as possible. So, our apps become interactive and more people use our application.

5.4 Testing Implementation

The testing application is the way to know whether our application is working properly or not. We have tested the following cases to ensure or application is working properly.

Table 5.1: Testing implementation

S.N.	TESTED CASE	TEST INPUT	EXPECTED OUTCOME	ACTUAL OUTCOME	RESULT	TESTED ON
1	Login	Admin login	To login successfully	Successfully logged in	Passed	10.10.19
2	Login	User login	To login successfully	Successfully logged in	Passed	10.10.19
3	Category	Click on category	To see offers category wise	Showed offer category wise	Passed	10.10.19
4	Offer details	Click on offer	To see offer details	Showed offer details	Passed	10.10.19
5	Favorite	Registered user chooses favorite	To make category favorite	Choose as favorite	Passed	10.10.19
6	Favorite	New user login first	To pop login screen	Popped login screen	Passed	10.10.19
7	Search	Search for offers	To show searched offer	Showed searched offer	Passed	10.10.19
8	Add new offer	Admin enter all offer detail	To add in offers	Showed in offers	Passed	10.10.19

9	Delete offer	Admin delete	To delete from offer	Deleted from offers	Passed	10.10.19
10	Log out	Click logout	Logged out successfully	Logged out successfully	Passed	10.10.19

5.5 Test Results and Reports

Testing applications is very important for the stability of an application. That is why we have tested or application several times or different android phones. So that we can be sure that our application is stable. Also, while developing our application we tested our application every step. We have tested several test cases and all the test cases passed while we tested our application.

CHAPTER 6

CONCLUSION AND FUTURE SCOPE

6.1 Discussion and Conclusion

Proffer is a platform where anyone can get many ongoing offers which are currently getting offered city and find the best one according to their need. It is also very useful for shop owners to clearing their stock by giving discount offers. In this way, both the shop owner and our user will be helpful.

In the process of making this application at work, we learn a lot of things which will be very helpful for our professional life.

6.2 Scope for Further Developments

In this application, there are several scopes for future developments to improve our application.

- In the future, we will definitely try to include some exclusive offers for our user partnering with shop owners like a special discount or coupon.
- Improve stability.
- We will upgrade our search option.
- We will develop a separate application for our partner.
- We will also organize offer shop wise.

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APPENDIX

Appendix A: Project Reflection

From the middle of spring 2019, we started working for our application which we choose in Fall 2018 by giving title defense. At first, we made a design for our application. After deciding the final design of our application, we started implementing that using XML language and JAVA using the android studio. Which took a long time because of the new update of the android studio a lot of XML language was changed. After a lot of difficulties, we are finally able to finish our work for our project.

We mainly develop this project for those who wanted to save their time and some money while shopping. Using our application our valuable user can find offers, search for offers, categorically scroll through offers, and scroll through favorite offers.

PLAGIARISM CHECK

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