

**DESIGN AND DEVELOPMENT OF AN ANDROID BASED APPLICATION FOR
STUDENT CANTEEN**

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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 “**Student Canteen**”, submitted by Md. Mahfuzur Rahman (ID: 181-15-10620), Md. Atikur Rahman Niyam (ID: 181-15-10683) and Samsad Zaman Samanta (ID: 181-15-10902) to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the some 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 - January-2022.

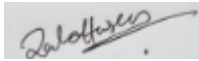
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We hereby declare that, this project has been done by us under the supervision of **Afsara Tasneem Misha, Lecturer Department of CSE** Daffodil International University. We also declare that neither this project nor any part of this project has been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

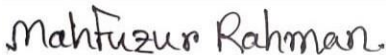
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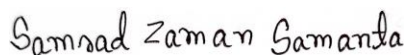
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ABSTRACT

With the advance of technology and internet people all over the world are using digital technology-based services to make life easy. In this modern era modern technology added simplicity and efficiency. Due to rapid growth of it, smart approaches are getting widely use our everyday life. “Student Canteen” which is a mobile application where we achieve to advanced technology and digital frame to help users to get food in the canteen. In this project there will be two sides, one is for admin side and other is for user side. The main work of the admin is to entry available food list, canteen’s picture, a regular food list regularly, and if wants to give some offer for user’s. He can also update all of these if he needs. Admin can also receive feedback and wish list given by user. On the other hand the main work of the user is to see the food menu, canteens picture and offer. User can also give feedback based on price, services and food quality. User can desire his wishes.

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Chapter 1

Introduction

1.1 Introduction

Day by day our world is running towards modernization and it is happening through the touch of technology. In every aspect of life technology has made it easier for us. If we take a look at the canteen system of any institution so far we can see that most of the canteens are not technology based and students have to suffer for this. This also hampers study a lot. And they can't complain to anyone about this problem. If they can see the availability of foods in a modern way then most of this problem will be solved.

The main advantage of the modernized automated student canteen is that students can check the availability of food easily in one place with picture and price. So they don't need to run to a canteen to another to search food. And they can also give feedback about food and can place their feedback and wishes. They can also get some discount on some food through using the technology. Over all this application can save both the time and money.

1.2 Motivation

Students in different institution face problem regularly in their campus canteen. Though they have limited time in their class break, in this time they have to go each and every canteen differently to check the availability of their wanted food item. And sometime after going to canteen they get to know that there is shortage of some food item and it is quite annoying. Then they have to run for another canteen and this make the waste of precious time. This is a matter of harassment for students.

Even if the students get the food then some of them may not like the taste of some food. So they can take this as a waste of money. So we want to create a smarter way to find the availability of food and also check others feedback for the food. They can also place their wishes to the authority. From this perspective we propose the idea of our automated student canteen system.

1.3 Objectives

- Help students, teachers and staffs.
- To show the availability of all food in one place.
- To make the management easier.
- To make it favorable for the time limited people.
- To reduce harassment.
- To reduce the waste of money and time.

1.4 Expected Outcome

- Students will be able to check the available food menu in their canteen.
- Reduce student's harassment and save time.
- Students will be able to check the feedback of others in any food item.
- Students can choose food according to their thinking over the feedback.
- Save money.
- Students can place their wish.

1.5 Report Layout

Chapter 1: Introduction

Here we have given the overview of this project. At first we discussed about the introduction and motivation, then we have discussed the objectives and expected outcomes of the project.

Chapter 2: Background

Here we have talked about the base of our project. We have also discussed the related works, problem areas and challenges of the project. And compare it with other competitor systems as well.

Chapter 3: Requirement Specification

To make a successful project we need some diagram to implement it properly. Here we will use some diagram to make our work easier.

Chapter 4: Design Specification

Here we use, how to apply the back-end work and database system.

Chapter 5: Implementation and Testing

Here we shows the outcome of the project and user interface.

Chapter 6: Conclusion and Future Scope

Here we are mainly focused our future planning about this application. Mainly how far we will fork in future is being described here.

Chapter 2

Background

2.1 Introduction

To keep pace with the modern world we need to modernize things day by day. So we thought to make our university canteen modern so that students don't have to suffer in canteen. They can save both time and money by using this android application. They can find every details of every canteen in our application like availability of food, regular food list, available food list, offer list etc. And they can also share their feedback and wishes with the canteen authority.

2.2 Related Works

In our application user can create account with an email account. He/she can check the food availability, see the regular food list, pictures of food, check the offer list, and give some feedback to admin and share his/her wishes with admin.

Admin can update the pictures of food, regular food list, available food list, offer list and he can also edit and delete them. Admin can also check the feedback and wish list given by the user.

2.3 Comparative Studies

Though in our university there is no application for our canteen and we faced too many problems regarding this. So we used the idea from some of the popular online food service applications in our country. Such as Food panda, HungryNaki, Pathao Food. From these applications we can easily find the availability of food and order them from different restaurants. So we thought to make an application for our university canteen from where students can find the available food easily and share their feedback.

2.4 Scope of the Problem

- Both admin and user have to use same application for their needs.
- Only one admin can work in the application and update the whole data.
- Admin cannot block any user account if needed.
- User can not directly contact with admin without sharing feedback in application.

2.5 Challenges

To make an application there we may face some problems. We need to study hard to solve them.

Our project is mainly based on food availability checking where database, authentication is used as back-end, for logic part java is used. This makes it very hard. So we face some problem.

Here some major challenges are given below-

- Providing maximum security for this application.
- Being able to provide user with all the food information.
- Ensuring providing with the real information about food.
- Maintain the user's need.
- Maintain the application.
- Admin access to the database.
- Using email authentication.

Chapter 3

Requirement Specification

3.1 Block Diagram

When we decide to make an application or project we need to make a sketch of application to implement it easily. From this, block diagram is one of them. For our application, block diagram is given below.

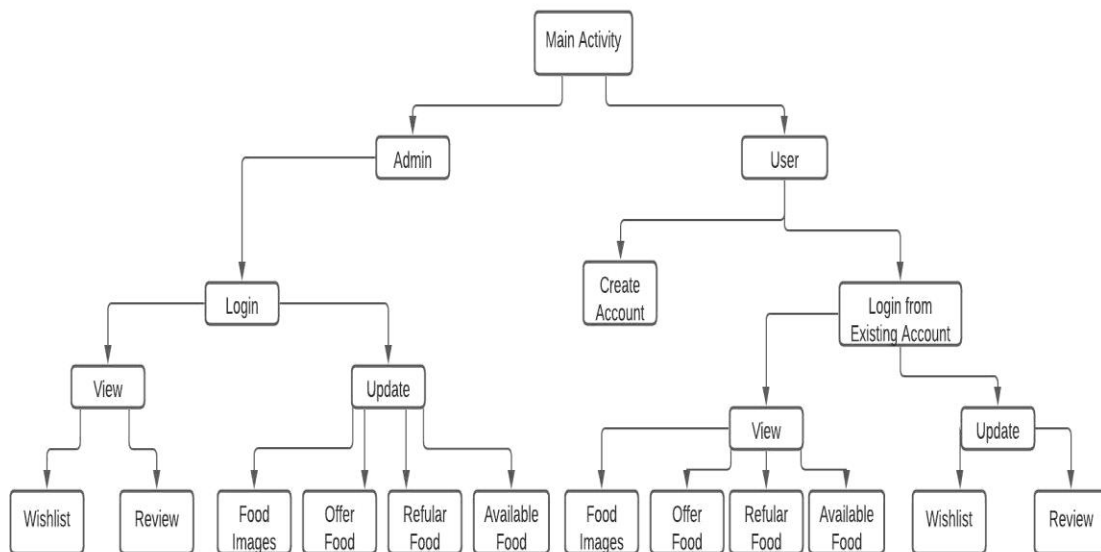


Figure 3.1: Block Diagram of Student canteen

3.2 Requirement Collection and Analysis

For developing a user friendly application, at first we need to collect some data and find out the requirements that people needs around us. So requirement collection is very important step.

Here the basic requirements are given below:

- A valid email is needed to register or login into the application.
- User must have to create a new account to explore the application.
- Only admin can update all the data about food.
- Only admin can have access to the database.
- Admin can view the feedback and wishes of users.

3.3 Use Case Modeling and Description

Use case model shows the interactions between the user and the system. It also shows the way that how a user can reach to his/her solution to a problem. It graphically represents the goal of the user.

Mainly, a Use Case Model can easily represent the basic process of an application. Without making this none application can be understand easily to anyone. [1]

For our application, we also make this, it is given below -

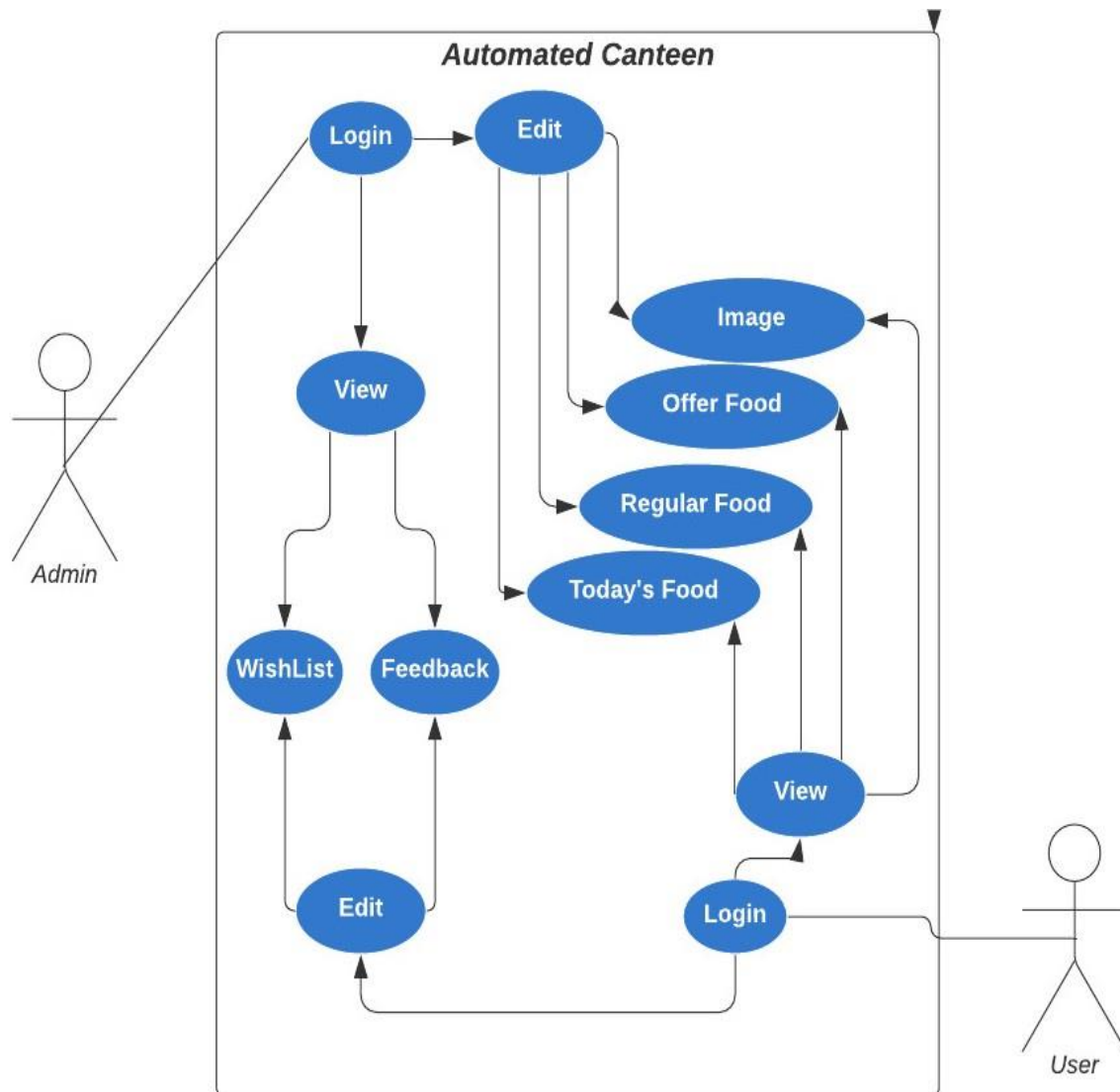


Figure 3.2: Use case Diagram of Student canteen

3.4 Design Requirements

- This application will have two types of user: Admin that means the canteen authority and the user that is the students.
- Admin can update the food picture, regular food list, available food list, offer list and can also delete them.
- New user first have to create an account.
- User can view the food picture, regular food list, available food list and offer list.
- User can give their precious feedback to admin.
- User can share their wishes with admin.
- Admin can view the feedback and wishes from the users.
- Admin will have access to the database.

Chapter 4

Design specification

In this chapter we will describe briefly about design of our user friendly layout which will viewed by user and admin.

4.1 Front-End Design

Front-end is a layer where user can easily see the output. It is a very important part of an application because it is very crucial path to interact the user and the application. It is mainly a Client side area. As Client or user can access here so it has to be easier to them. From front-end, it collects information form user and pass the data through backend, besides back-end passes data and it displays to the users through backend. So a good and attractive front-end design is very important. In front end Login page, Image view, button, radio button etc. So, for understand an application and for attract the user it's very much important that, front-end design must be simple and user friendly.

- Log in page.
- Create account page (User and Admin).
- Forget password page.
- Home page (User and Admin).
- Regular food, Offer food, Available food, Food Image (Users View Only).
- Regular food, Offer food, Available food, Food Image (Admin Edit and View).
- Feedback and wishes page (Users Edit Only).
- Feedback and wishes page (Admin View Only).

4.2 Back-End Design

To access all the data, edit and update we need to connect the application through the back-end. Mainly back-end is the main part of an application. Without it no data can delete, update and edited. An application can be built using front-end and back-end, but user cannot see the work of the back-end. User can only see the front-end which is worked in

front-end. Back-end mainly a storage system where save, edit or update can be happened. In this system it gives the user to perform his act for database.

Here are the main back-end design which is given below-

- Database create.
- Application logic.

4.3 Interaction Design and UX

UX is a design where user can use an application and easily understand all the functions. There are a lot of way to implement it properly but all the way is not perfect and easy to implement. Here we use the best way to implement out application so that user can easily execute it properly.

- Create user friendly relation.
- Provide minimum option to make it more usable.

User experience design is known as UX design. UX design is basically an understanding method which you have to cognition what user might need from this application. Through UX design we can predict user need.

- Try to understand user's basic need.
- Provide information considering user's choice and need.

4.4 Implementation Requirements

- The design need to be implemented in android mobile based application using java language.
- Preferred database is fire base real-time database.
- Fore remembering previous user, we used shared preference.
- Data storage system is json structured.
- User email id authenticate using fire base.
- Using xml here we create user interface.
- Store data using real-time database.
- Store documents using firebase storage.
- Fetch data using recycle view.

4.4.1 Java Language

Among object oriented programming, Java is the most popular languages. In mobile application development there are dart, Java, python, Kotlin. But for easier and well resources, java is the best. In google, java is the official languages. Java can get all kinds of supports like IDE. It will come with some facilities with Android SDK [2].

4.4.2 Android Studio

To make an android application, most of the cases we use Android studio. Android studio is an environment for build applications. For android operating system it is the integrated development environment. Developers use it to create user friendly UI. It has a flexible grade build system. Developers can develop applications for all android devices in this platform. It has make the testing faster and easier.

4.4.3 XML

There are many markup languages, among them XML is one of them. User interface and a screen which consist of elements can easily designed by XML. Here every layout contains single root element.

- **UI Elements in XML.** In front end development, to make a perfect UI for user we use XML for designing the screen. There are many layouts in XML, based on layout, design may vary. But here we use drag and drop system using Android Studio's layout editor to save time and less complexity.
- **Instantiate layout elements at runtime.** We can create View and View Group objects in our application. Declaring a UI in XML allows us to separate the presentation of our app from the code that controls its behavior. Using XML files also makes it easy to provide different layouts for different screen sizes and orientations.

The Android framework gives us more flexibility to design our UI easily and we can build application using methods [5].

4.4.4 Firebase Real-time Database

Fire base real-time database supports android, which supports iOS and web is a cloud hosting database. Using json structured method here all kinds of data and information can be saved easily. It manages to sync across all kinds of platforms like iOS, android, web etc.

JSON Structured Data Storage Firebase real-time database is a format where all kinds of data and information can be stored based on JSON format. The whole storage process database runs through json structured method. So whenever we need to edit like update, add or delete any data we have structure a json tree which is available in easier way by avoiding nesting of child nodes [6].

4.4.5 Firebase Storage

It is another way of saving data using firebase. Any finds of file, images, ppt, documents etc. can be stored here easily. Any uploaded file is uploaded here and can be access [7].

4.4.5 Animation

Animation makes any project or interface more and more attractive. The best sources of readymade animation is “Lottie Animation” which is free and easy to use. [8]

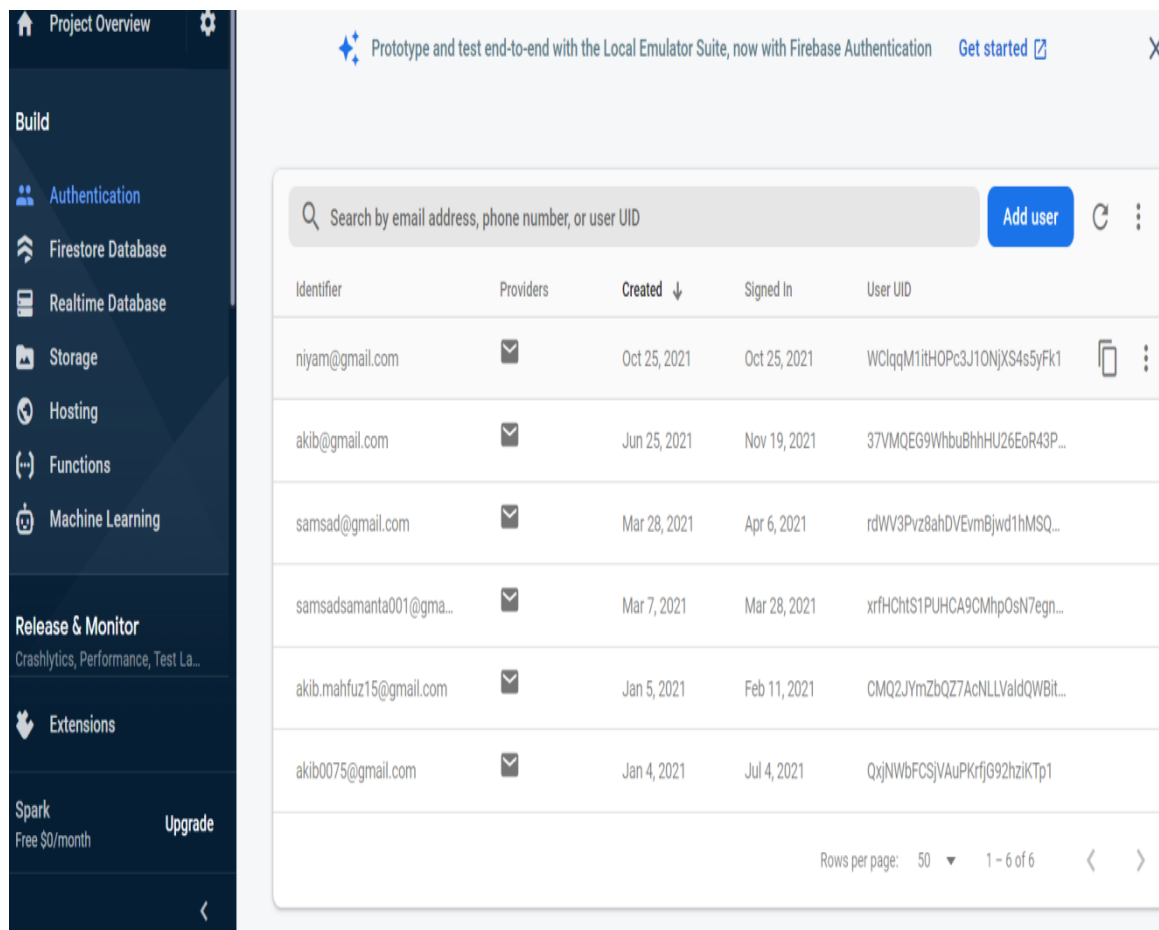
Chapter 5

Implementation and Testing

5.1 Implementation of Database

In our application we use Firebase Real-time Database. It is the easiest way to create an application with real-time user experience. It maintain the json structured method in storing and delivering data. It is a highly secured database and only admin can set who can access the data and who cannot.

Users Registration Table: Here User's email id and password stored ere for further login.



Identifier	Providers	Created ↓	Signed In	User UID
niyam@gmail.com	✉	Oct 25, 2021	Oct 25, 2021	WClqM1itHOPc3J1ONjXS4s5yFk1
akib@gmail.com	✉	Jun 25, 2021	Nov 19, 2021	37VMQEG9WfhuBhhHU26EoR43P...
samsad@gmail.com	✉	Mar 28, 2021	Apr 6, 2021	rdWV3Pvz8ahDVEvmBjwd1hMSQ...
samsadsamanta001@gma...	✉	Mar 7, 2021	Mar 28, 2021	xrfHCh1S1PUHCA9CMhp0sN7egn...
akib.mahfuz15@gmail.com	✉	Jan 5, 2021	Feb 11, 2021	CMQ2JYmZbQZ7AcNLLVldQWBit...
akib0075@gmail.com	✉	Jan 4, 2021	Jul 4, 2021	QxjNwBfCSjVAuPKrfjG92hzikTp1

Fig 5.1: Registration Database.

Stored Data Table: Information of regular food, available food, offer food, user's review and user's feedback is stored here.

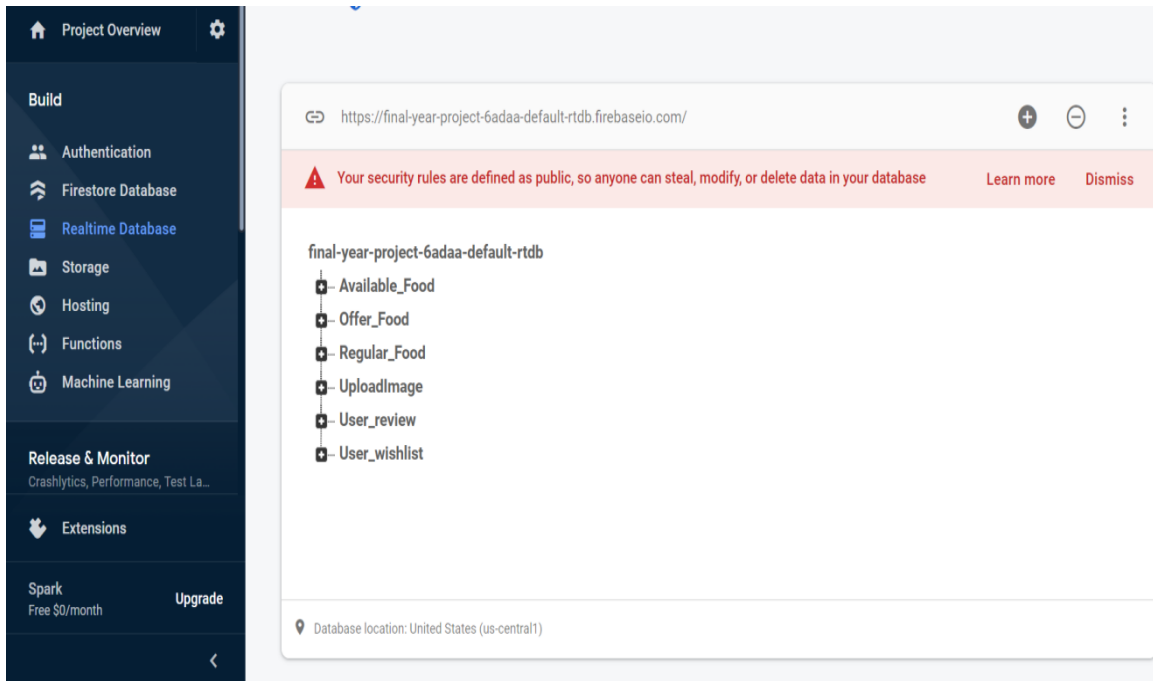


Fig 5.2: Stored Data Database.

Upload Image Table: All kinds of images which are uploaded, is stored here.

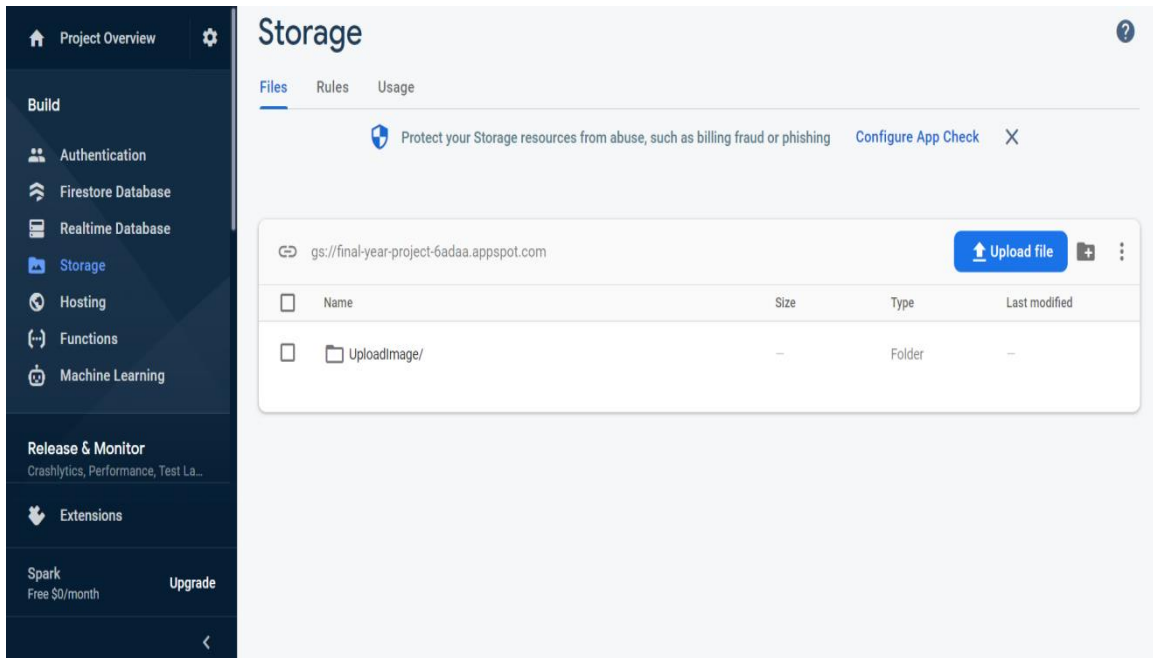


Fig 5.3: Upload Image Database.

5.2 Implementation of Front-end Design

We are concern to make a user friendly front end design for our users.

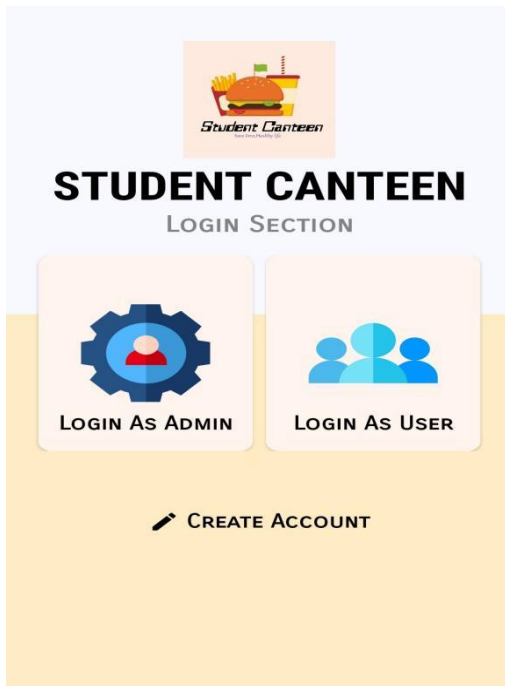


Fig 5.4: Main Activity.

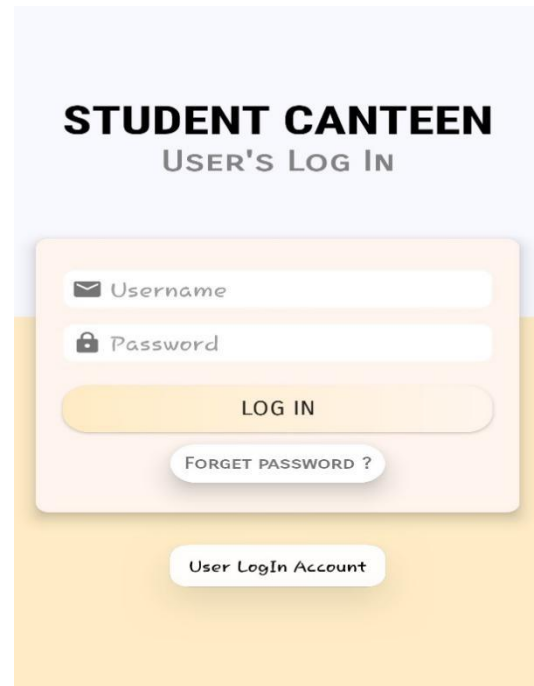


Fig 5.5: User's Login.

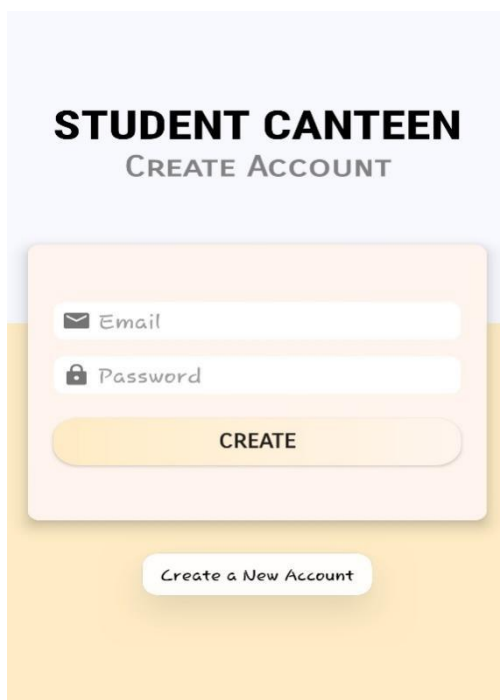


Fig 5.6: Create Account.

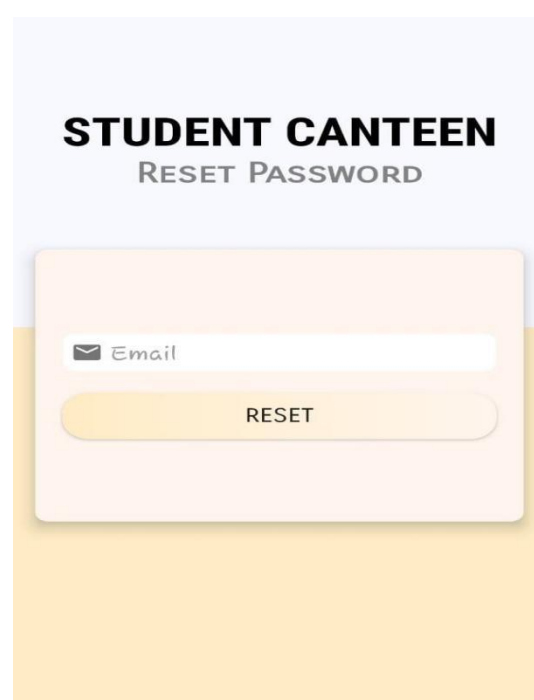


Fig 5.7: Reset Password.



Fig 5.8: User's Activity

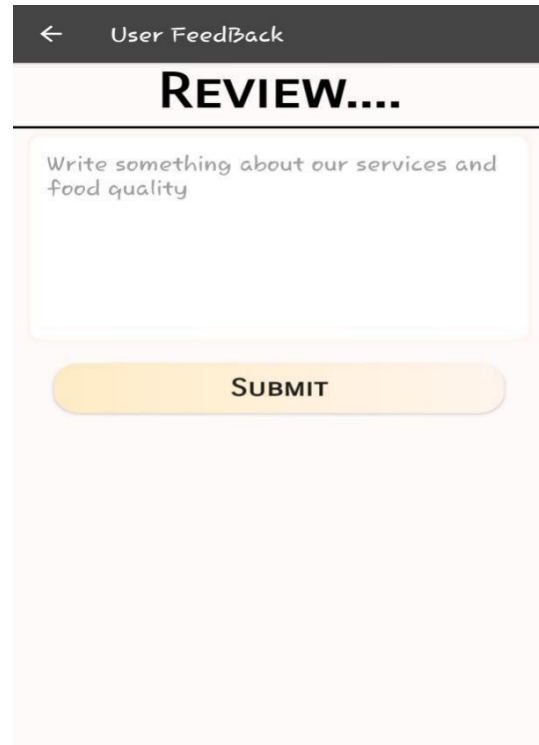


Fig 5.9: User's Review.



Fig 5.10: User's Data

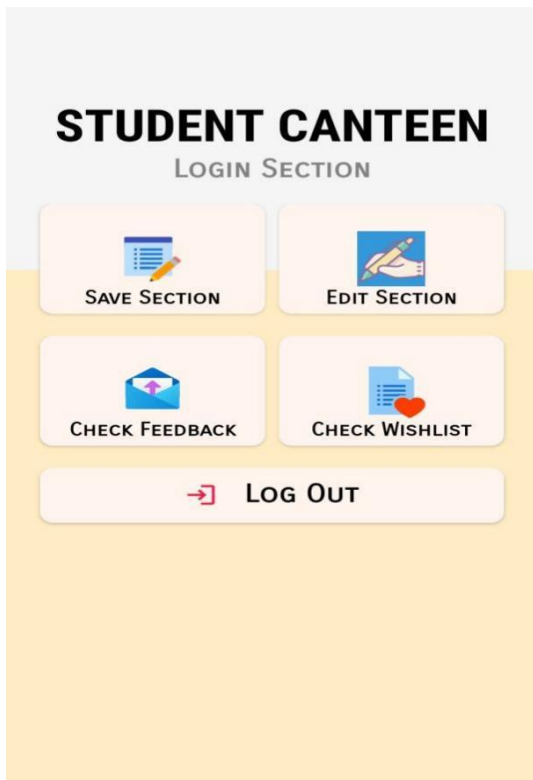


Fig 5.11: Admin Activity



Fig 5.12: Admin Edit Section.



Fig 5.13: Admin save Section.

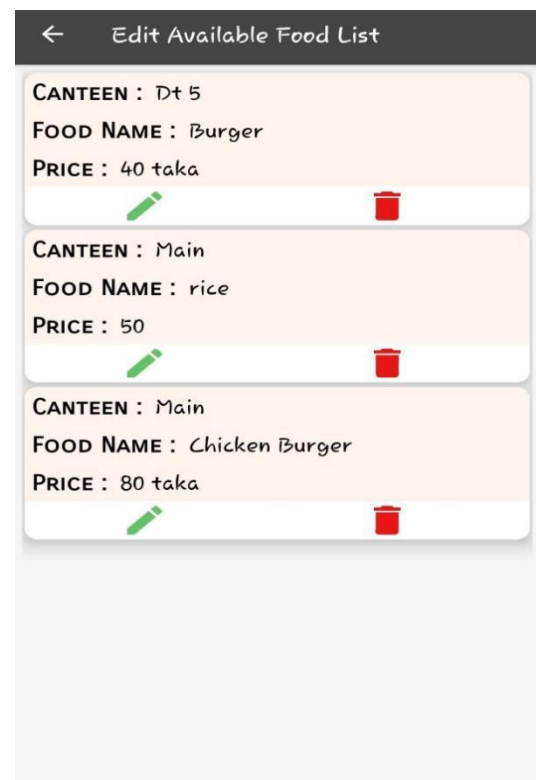


Fig 5.14: Admin Edit Section.

5.3 Testing Implementation

Testing is a system where an application can run in various steps, gaps, errors, or missing any kinds of requirement to the actual requirements.

Where tester test his application is known as testing Implementation. Using this we can easily know the strength and the error of our application. Besides, seeing this error we can easily solve the error and make the application fully functional.

5.3.1 Table

5.3.1 Table: Testing Implementation

Test Case	Expected Result	Acquired Result	Test Result(Pass/Fail)
Admin Login	Login.	Login Successfully.	Pass
User Login	Login.	Login Successfully.	Pass
User Edit	Feedback and Review.	Edit Feedback and Review Successfully.	Pass
User View	Picture, Regular Food, Today's Food, Offer Food.	View Picture, Regular Food, Today's Food, Offer Food Successfully.	Pass
Admin View	Feedback and Review.	View Feedback and Review Successfully.	Pass
Admin Edit	Picture, Regular Food, Today's Food, Offer Food.	View Picture, Regular Food, Today's Food, Offer Food Successfully.	Pass

5.4 Test Results and Reports

To make a test result in a formal way, main reason is here we find out the result in a very simple way. From the above test table we can surely say that, this application is working properly without any bad issues.

5.5 Principles of Testing

All the test should meet the customer requirements

- To make this application testing for third party.
- Complete testing is not possible, so here we test mainly some key and important part of this application.
- Before implementing the application, it needs to make a proper test plan.

Mainly depend upon testing we can easily decide how well our application is.

Chapter 6

Impact on Society, Environment and Sustainability

6.1 Impact on society

If we look around in our society, students in most of the educational institution suffer in time of getting food in the institution. This occurs problem in their study. So we thought of making this application where students can easily find the availability of food with the food details. And they can share their wishes also.

6.2 Ethical aspects

Ethics means which is morally good or bad. It can be said that morally right or wrong. In our society many kinds of work is done by us. If it is good, morally it is good, besides those work which is bad, it is morally bad work.

In this project the work which we did, from our side it is morally good, because using this, we can easily save time, reduce harassment and overall the canteen management which was manual, using this application it turns into an automated canteen. So it helps us to do our work efficiently. So it is morally a good work.

6.3 Sustainability plan

As we have tried to make a user friendly application it can be sustainable for a long time. And people will use android application for life time. In future there is no chance to extinct android application. So this application can be sustain for more users.

Chapter 7

Conclusion and Future Scope

In our project work this is the final chapter. Here we will discuss what we have managed and how can we make it more effective and essential.

7.1 Discussion and Conclusion

Finally, we managed build our own mobile application which feels like a dream come true. If this application can help our students to save some time and reduce harassment it will bring a new thing to their life. To make an application which can save time and reduce harassment to the students, teachers and stuffs in any situation is our first goal. To help them, this application will come with new versions and newer fetchers in future. Without the grace of all mighty Allah nothing is was and will be possible. We are very happy and satisfied to be in where we have manage to reach.

7.2 Scope for Further Developments

This application has a huge scope to carry on with the digitalized world. We can provide user with many more assistance.

- Create Web and IOS version for this application.
- Online food delivery for teachers and stuffs.
- Provide user with live chat with admin panel.
- Send notification to user when new food will update.
- Collect data from user for users taste.
- Proper maintenance and bug fixing.
- Create more user friendly and attractive UI in future.
- Keep upgrading this application time by time.

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