

**RAILWAY CATERING: AN ANDROID APPLICATION FOR FOOD DELIVERY IN  
TRAIN**

**BY**

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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**

**DHAKA, BANGLADESH**

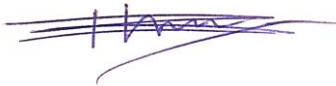
**MAY 2021**

## APPROVAL

This Project titled “**Railway Catering: An Android Application for Food Delivery in Train**”, submitted by Md. Mehedi Hasan Limon and Md. Ahasanul Habib 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 (BSc) and approved as to its style and contents. The presentation has been held on 3<sup>rd</sup> May 2021.

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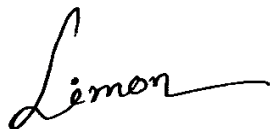
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## ABSTRACT

My project titled” **Railway Catering: An Android Application for Food Delivery in Train**” which focuses on how to food delivery of the easiest way in our train journey. The popularity of food delivery increasing day by day. In the modern day almost everyone trying in this online food. Otherwise in this pandemic the demand of online food delivery is sky scraping. So, I think how it see when we are going for travel in long distance with train, then if we can be trying healthy and delicious food form restaurant? In train journey we cannot get good quality of food or the food price is high. By using this android application traveler can fulfil their food demand. In this project their have three types of module like one application for traveler means customer, one application for riders means delivery man and another one is for restaurant authority. In this system customer can get good food, delivery man gets a job and restaurant can increase their profit. The application needs to be responsive as the application can be accessed through any devices with different size of screens. In this project I’m using firebase database and native android framework. Android studio application is used for writing code for main body of this application. The food delivery apps have simple and easy features. So, it is easy to use for everyone. The new take way system can make it easier and ensure that maintaining quality

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# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

Basically, the application sets to improve online food ordering system for train. The Online food ordering system is appearing to override the problem of trouble of delivery and payments method. Nowadays people are reaching on online business. From 2013, about 25% of people age between 18 to 50 are ordering online food from restaurant by using website or android application. For using the application set no knowledge are need. Almost every organization are trying to overcome category, order, food item list, delivery, payment etc. But every online food delivery system maintains different types of method. When Online food delivery system is starting for first time people are confused about their food quality. Many of people or customer worried about for food quality. But when the online food ordering system is popular day by day the customers are become tension free. Generally, people order food by reference of friend or nearest relative. We have such thoughts after thinking about everything. And customer can order by seeing restaurant menu book. If customer place the order than it shows in delivery man application, then the delivery man going restaurant for order customer's food and when restaurant making or packing this order then delivery man reach customer. Then customer gives payment to delivery man.

### 1.2 Motivation

Generally, I was motivated for these many reasons like – Last year I was going Sylhet for travel by train. But Their I cannot get fresh food. Otherwise the food was unhygienic. On the other hand, the food price is so high. Then I think about this online food delivery for train travelers.

- Firstly, we all choose train for going long-distance. But in this train, we cannot get fresh food or we cannot get the good quality of food. Otherwise, in train we get some fast food which are sell by high price.
- In during long distance journey if we can get fresh and good quality food in our journey time, the journey will become more satisfactory.
- After all, it will satisfy train travelers.

### 1.3 Objectives

- To introduce with a smart application for train traveler.
- To fulfilling the demand of good quality food for train traveler.
- To minimize the manual work for restaurant.
- To reduce time wasting for Customer.11To increase a job filed for rider.
- To save our money.
- To Increase Restaurant sales.

### 1.4 Expected Outcome

- Customer can get food easily and the food quality will be good from train food.
- By using this application customer can get food comfortably, delivery man can get a job and restaurant can increase their income.
- All android phone user can use the online delivery food application.
- Finally, we can reach our worship easily with our customer.

### **1.5 Report Layout**

In Chapter 1, all about this project is written here. Why I choose this project, how will this project have completed, Motivation, Objective, expected outcome and so on discussed briefly.

In Chapter 2, Discuss about Background of the project. Here related work for this project are briefly discuss. Also discuss about comparative studies, Scope of the problem and Challenges for this project.

In Chapter 3, Here we discuss about requirement of specification. Here also we discuss about Business Process Modelling, Requirement Collection and analysis, use case Modelling and description, Logical Data Model, Design Requirements in briefly.

In Chapter 4, Here Briefly discuss about front – end design, back – end design, Interaction design and UX, Implementation Requirements.

In Chapter 5, Here We discuss about the topic of Implementation of Database, Implementation of Front-end design, Implementation of interaction, Testing Implementation, Test results and report in briefly.

In Chapter 6, We discuss about Discussion and Conclusion, Scope for Further Developments.

## CHAPTER 2

### BACKGROUND

#### 2.1 Introduction

In this Chapter, I will discuss related works about food order system which is related to my work. In this first section we will discuss about previous related work., then in the second section we will discuss about comparative studies and then serially we will be knowing about Scope of the problems and Challenges.

#### 2.2 Related Works

In a project done by LEONG WAI HONG [1], Food Ordering System Using Mobile Phone. This project is mainly developing for computerized and mobilized system which can be used for ordering food system of food and beverage industry. In most food and beverage industry work by manually. Here done all work by man power, for this system it is need huge amount of paper work which is not effective. For these reasons here occur human error due to manual work. It is also reducing time, minimizing human error and provides good quality of food.

In a project done by MD. MUMINUR [2] Implementation of Responsive Online Food Ordering Application with Social Media Integration. In this project build an online application for restaurant which helps customer to ordering in online food. Customer can be access through any kind of device with different size of screen. Here Facebook API is attached to the application. So, customer can attractive by seeing their friend, relatives review on Facebook. For attaching Facebook API customer can login their Facebook account. It is a web based online application.

In a project done by Michael Yosep Ricky [3], Mobile Food Ordering Application using Android OS Platform. In this project mainly focus of New Order, Order History, Restaurant Profile, Order Status, Tracking Order, and Setting Profile features. This food ordering application based on Android for customer and delivery man, and website for restaurant authority and admin. It helps customer for easily order, giving information details for consumer, it helps restaurant to taking order, and help delivery man while doing delivery.

In this project done by Yang fan [4], Mobile food ordering Application. Here the application provides current food information like quality, price, categories, quantity and customer can order food with two platforms. The application is three modules: Background Management Platform, Website Foreground Public Page and Android Application. This is android based framework. The Background Management module in this android application was designed for the admin. The Admin will be able to handle food dishes, dish orders.

In this project done by Prof. Mr. S. R Lahane et al. [5] Digital Ordering System for Restaurant Using Android. In this project they focus on Digital food ordering system. This system increases quality and speed of service. Here an application of integration of hotel management systems by web services technology is presented. Digital Hotel Management integrates lots of systems of hotel industry such as Ordering System Kitchen Order Ticket (KOT), Billing System, Customer Relationship Management system (CRM) together.

#### 2.3 Comparative Studies

- Unrivalled database for Customer and restaurant.
- It helps customer/ traveler to food order online.
- Here no need of abiding for the healthy and good food at the train Hawker.

- No miscommunications between customer's and restaurants.
- It helps restaurants to enhance the quality of the service.
- Customer will have benefited by good food, Riders will have benefited by earn and restaurant benefit from the business.
- Fits for small businesses.

## 2.4 Scope of the problem

Mainly this project is more effective for train traveler. All people want to travel with comfortable. Our project is having that comfortable point for train travel. Scope of the problem is shown in table 2.1.

**Table 2.1: Scope of the problem**

SCOPE IN	SCOPE OUT
<ol style="list-style-type: none"> <li>1. Android application for Customer, Rider and Restaurant.</li> <li>2. Online Customer Management System.</li> <li>3. Food ordering system in Online by android application.</li> <li>4. Online ordering system for Train Travelers.</li> <li>5. It is also reducing manual work for restaurant.</li> </ol>	<ol style="list-style-type: none"> <li>1. It is an IoT based food ordering system.</li> <li>2. It is a Smart System for train travelers.</li> <li>3. It is an application for mobile.</li> </ol>

## 2.5 Challenges

In this project the main attenuation is internet connection. Without internet connection it will not operate. Because if a customer wants to order must need mobile data or Wi-Fi connection for send data in restaurant database.

In next, the application can be developing for IOS and blackberry user. Therefore, the user of blackberry and IOS operating system, they can use the application take order easily. And also, the segmentation of user will be wider.

In next development, this android application can be developing for payment method. Added mobile banking, Visa card, Master card for easily purchase restaurant charge by customer.

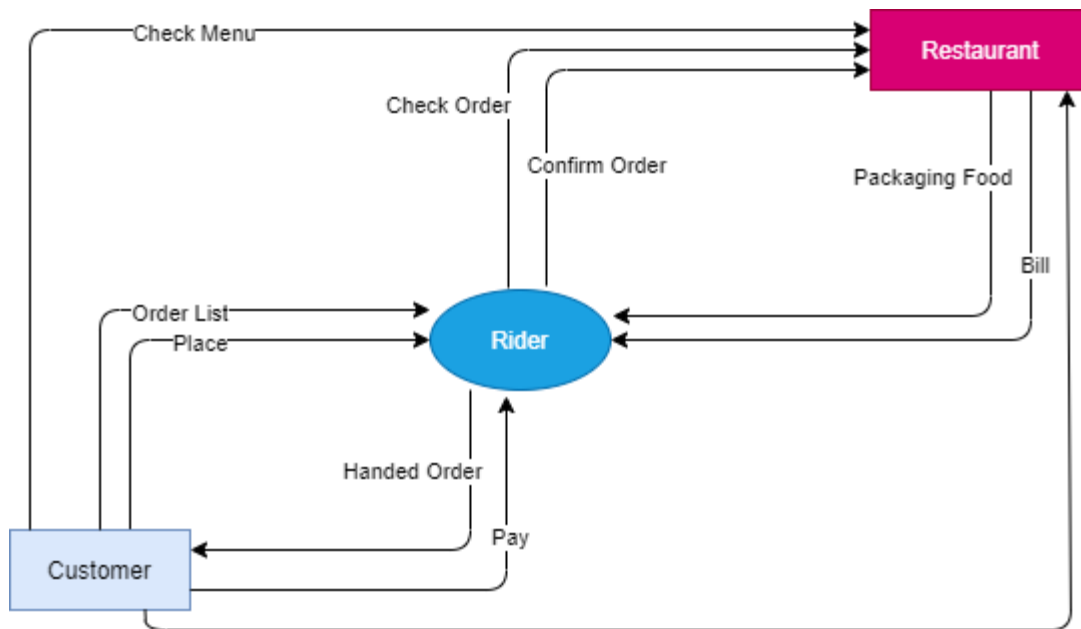
In next development, the android application will implement with social media like Facebook, twitter, Instagram, LinkedIn ETC for getting restaurant and food information.

## CHAPTER 3

### REQUIREMENT SPECIFICATION

#### 3.1 Business process modelling

In this figure, we can see the business process modelling for this application. Here a customer wants to order for a dish. When customer check the menu and confirm order it will send in rider application. If rider get notification for customer confirming order, then he accept the order and send the order in restaurant. After finishing every process in restaurant like taking order, cooking order and packaging order then again rider take the food from restaurant. Then rider provides the food to customer and customer make his payment for food and delivery charge. Business process model is shown in Figure 3.1.



**Figure 3.1: Business Process Model**

#### 3.2 Requirement Collection and Analysis

Requirement analysis is an important part for a project. We know there are two types of requirements such as Functional requirement and non-functional requirement. Functional Requirement is a process how the application perform and the non-functional requirement defines behavior and efficiency of the application.

##### *Functional Requirement*

- The android application must have signup and login option for user.
- The application must have added menu and edit menu option.
- The application must have login and signup with Gmail address and password.

- The android application must have shopping cart for online food ordering system.

### ***Non-functional Requirement***

- The android application must have user interface.
- The user interface must have mobile friendly.

### ***Hardware and software requirement***

#### **Hardware**

- Intel Core i3 Processor
- 4GB RAM
- 1TB hard disk drive
- Monitor
- USB port 3.0
- Wireless Connection

In this project, a computer with sufficient power is needed. For mobile application, database creation and modification, the computer is requiring for the developer to have project development such as coding. The Hardware requirement for computer which is shown in Table 3.1.

**Table 3.1: Hardware Requirement for computer**

<b>Description</b>	<b>Minimum Requirement</b>
Processor	1.1GHz or faster processor
RAM	512MB or more
Hard Drive	4GB of disk space available or more

Generally, we carry smart phone all time with us. For using the application in mobile phone some requirement is need which is shown in Table 3.2.

**Table 3.2: Hardware Requirement for Mobile**

<b>Description</b>	<b>Minimum Requirement</b>
Processor	500 MHz or more
RAM	512 MB or more
Storage	512MB or more
Internet Connection	Yes

#### **Software**

- **Front-End:** Android Studio Development kit.
- **Operating System:** Windows 8/ windows 10/ Android 7.0 or more
- **Programing Language:** JAVA, XML.

For using the application some requirements are need for software which is shown in Table 3.3.

**Table 3.3: Software Requirement**

<b>Description</b>	<b>Minimum Requirement</b>
Mobile Operating System	Android Version 7 or more
Windows Operating System	Windows 7 or more
Interface Design	Firebase

### 3.3 Use case Modelling and Description

In this use case model, we see that there were three actors in this application. Here the first actor is customer, one is railway rider and another is restaurant authority.

#### For Railway Rider Module

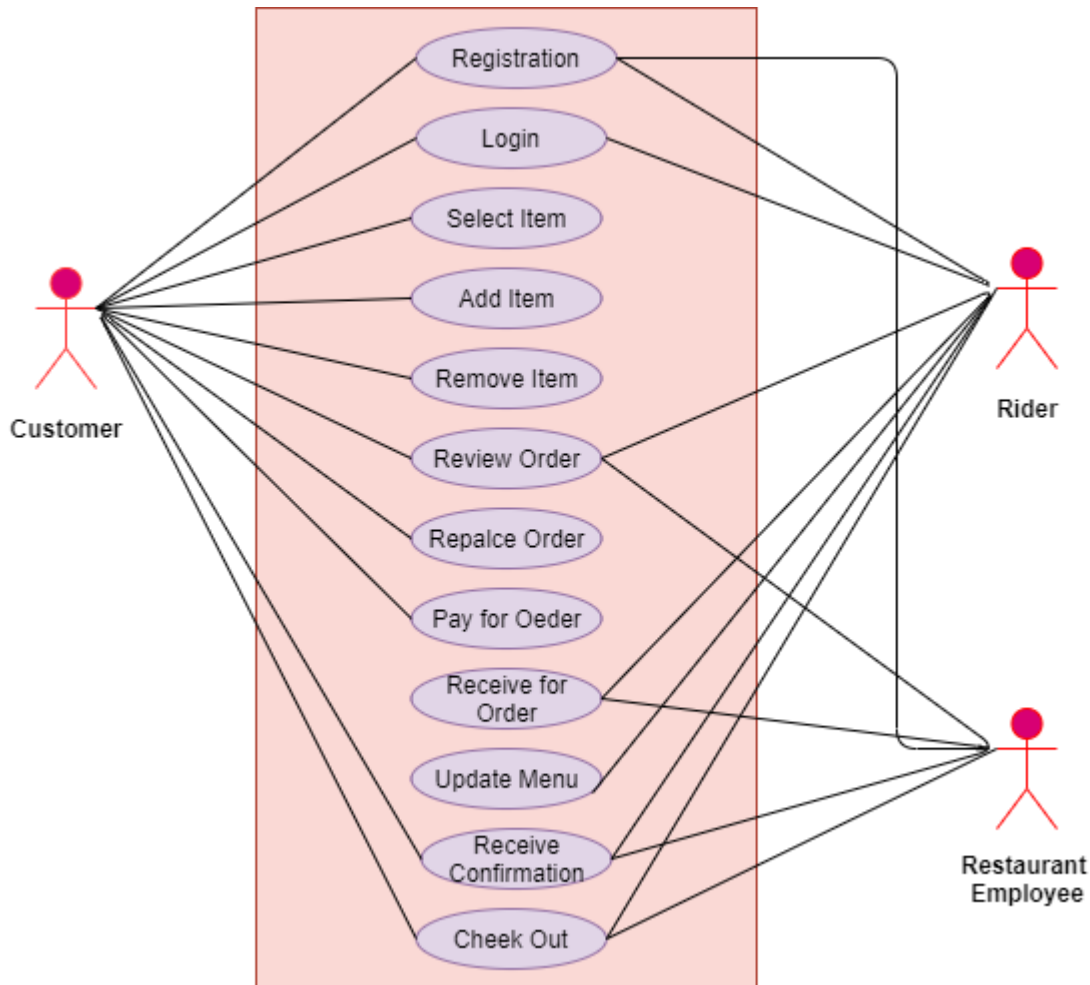
Login Properties:

- Email
- Password

When Rider connects the background platform URL, a login interface will display. The rider uses correct email address and password to log into the main interface. One rider can pre- set email and password for when the application is initially start.

Email: The first condition of log into the application valid email address is needed. It is unique address; it is not same to one to another.

Password: Also, without valid password we cannot enter main interface. Use case model is shown below the Figure 3.2.



**Figure 3.2: Use case modelling**

#### Sign Up Properties:

- Name
- Surname
- Mail address
- Phone Number
- Password
- Confirm Password

When a rider wants to sign up into the application, first he needs to register by clicking “sign Up” button to enter sign up page. Then he filing in Name, sur name, mail address, phone, password and confirm password. Then the rider registers it successful by clicking “Confirm” button. If the rider registers it successful, then a page will have displayed where he can inform customer. If sign up is not valid then a friendly message is notifying from Sign up page. such, the name already exists or the email already exists.



## **For Customer Module**

### ***Sign-Up***

When Customer wants to order dishes on the application, first he needs to sign up an account by clicking “Sign Up” button to permeate the sign-up page, and then the customer filling in name, surname, mail address, phone number, password, confirm password. If the customer signs up successful, a page will have displayed to in for customer, if there is a fault in register, such as user email is already existing or user name already exist then a friendly warning message will give from sign up page. In this sign-up function there is every information filed valid, then the sign up successful.

### ***Log In***

After Sign up, the customer can log in with the correct Email address and password to enter the application to create an order.

### ***View Dishes***

To click in Restaurant, name the customer view the current dishes according to categories. Ever dish item has two buttons: Order and Review. The Customer tap into Order button and here he can add quantity means how much dishes his needs, then here customer can see the item price. After confirm order then customer will have added to shopping cart.

### ***Shopping cart***

The dish items buy by the customer can be added to shopping cart. Then the actor can view the item which his buy, price, quantity and total price. Customer can update item and delete item.

## **For Restaurant module**

### ***Sign Up***

When Customer wants to order dishes on the application, first he needs to sign up an account by clicking “Sign Up” button to permeate the sign-up page, and then the customer filling in name, surname, mail address, phone number, password, confirm password. If the customer signs up successful, a page will have displayed to in for customer, if there is a fault in register, such as user email is already existing or user name already exist then a friendly warning message will give from sign up page. In this sign-up function there is every information filed valid, then the sign up successful.

### ***Login***

After Sign up, the customer can log in with the correct Email address and password to enter the application to create an order.

### ***Add Food list***

When a restaurant owner Click in Add food list and then will show a page where restaurant authority can add food dishes name, price and quantity. After press confirm button the item name is listed in this application and customer will see the food name.

## **3.4 Logical Data Model**

The logical data model is one kind of relational table. That is table with different entities. Here we have some relational table like Customer, restaurant, rider, order, menu, food item. The table has some attributes like customer id, name, number, password, food name, food id, menu name, menu id etc. The whole logical model is shown in the Figure 3.3.

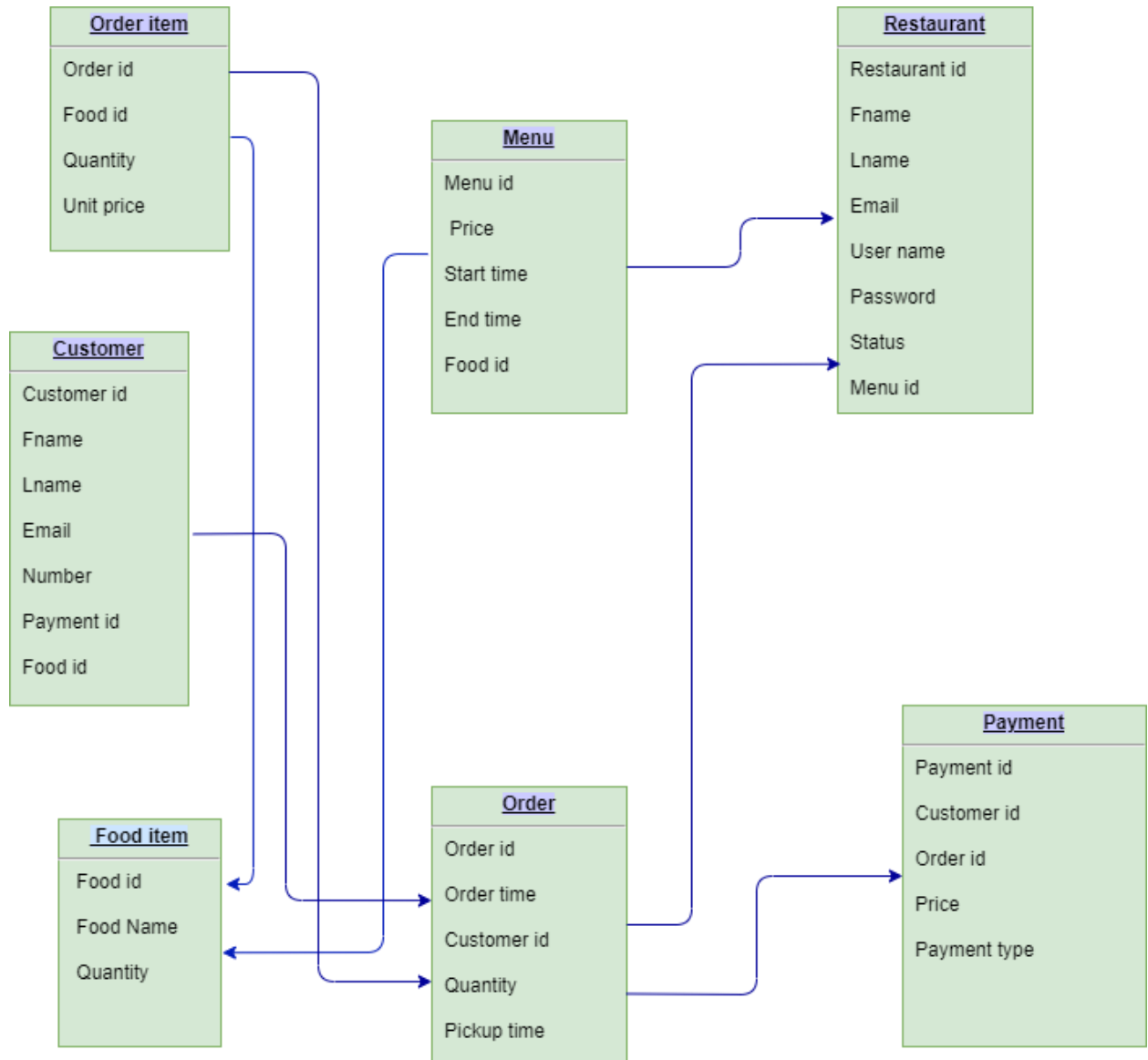


Figure 3.3: Logical Data Model

### 3.5 Design Requirements

Design Requirements is the functional characteristic which qualify to convert idea into design feature. In this part, I will describe the design requirement for of this application which is software requirements and hardware

requirements. For implementation main body of the application software requirements are most important. Also, hardware is important for design an application.

The software requirement list is given below:

***Software:***

- Front-End: Android Studio
- Operating System: Windows 8/ windows 10/ Android 7.0 or more
- Programing Language: JAVA, XML.

The second most important part is hardware requirements. The hardware requirements list is given below:

- Intel core i3
- 4GB RAM
- 1TB hard disk drive
- Monitor
- Internet Connectivity
- Android Smart Phone.

## CHAPTER 4

### DESIGN SPECIFICATION

#### 4.1 Front-end design

In our previous discussion we have discussed a list about the requirement of the application. Now, in this section we will discuss about the all requirements for our projects.

##### *Software Requirement*

**Android Studio:** Whereas our project is an android based application so we choose android studio for building the main structure code. By using android studio, we make an android application for collection data from user.

**Operating System:** An operating system is most important software for run a computer. Computer memory manage done by operating system. An operating system manages central processing unit for a computer.

**Programming Language:** Programming language is used for automate, assemble, maintain data and information. It is most useful and essential for building a software. By programing language an application or system will run and work.

##### *Hardware Requirement*

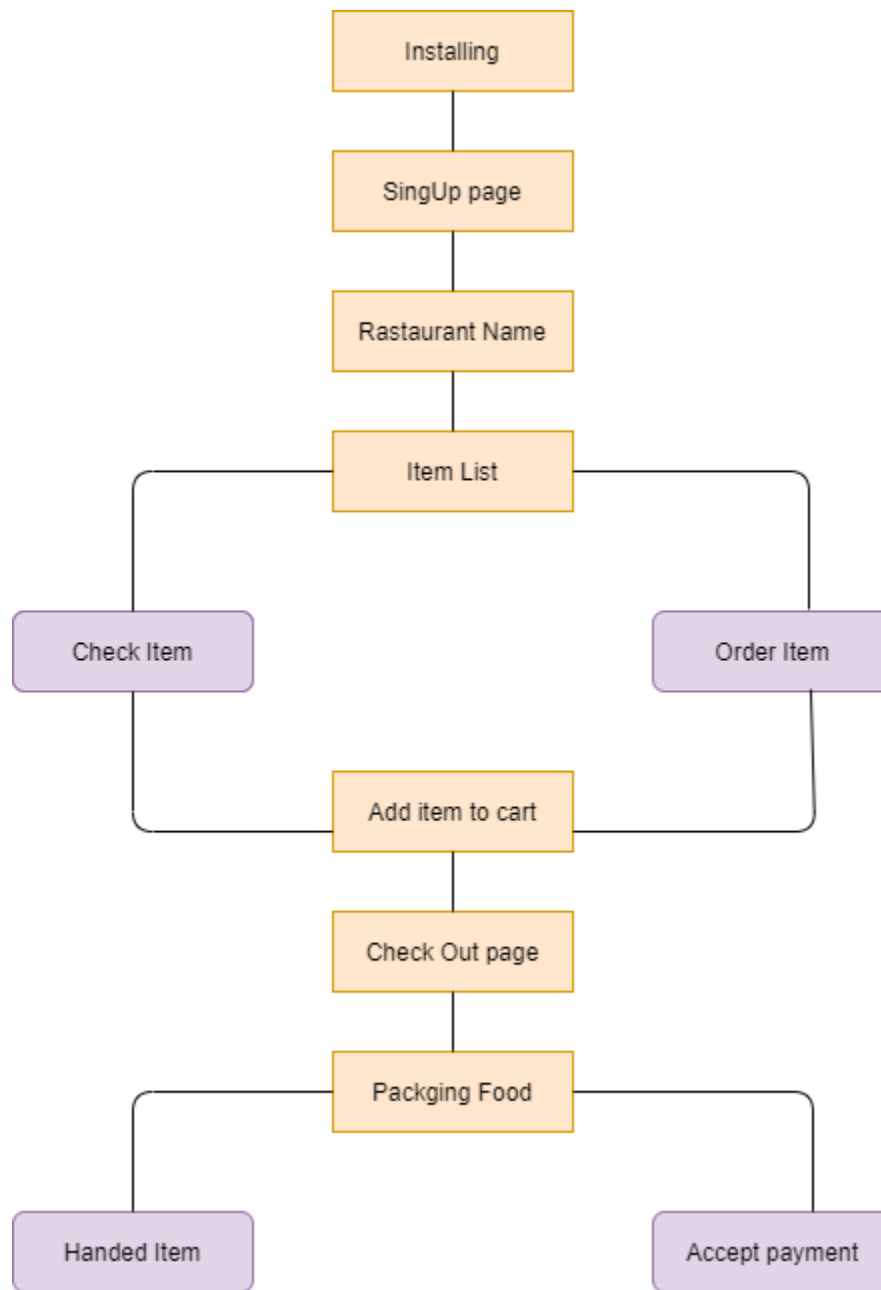
**Monitor:** When user signup for the application those data will store in firebase database. For writing and run our code of a project we need a computer. So, a monitor is need for our project.

**Internet Connectivity:** When User sign up and login the application internet connection must need. Because the information of the user store in firebase. Without internet connection customer cannot order food from this application.

**Android Smart Phone:** For installing the application an android smart phone is need. After installing the user can see a sign-up page. After successfully complete the sign-up user can use the application easily.

#### 4.2 Back-End design

In this discussion we are going to discuss about the back-end development for the project. We will discussion about the flowchart diagram of the project. The back-end design is shown in Figure 4.1.



**Figure 4.1: Back-end design for this application**

### 4.3 Interaction Design and UX

Interaction Design is a technique by using that developer are model their application and also system interface more user friendly. Interaction design have many types like Visual portrayal, Words, time and conduct. I'm trying my best to build the application with above interaction. Visual presentation is an important part for any application. I can try to build the application more user friendly. Basically, I use here firebase for database and android native framework which can make interface smooth. I design the application interface is very simply for user. My

application has three modules. Every module has Sign Up and login interface. By using sign up button every module user must save their information. After register in sign up then user can enter inside them module by using login option. Here also Logout button. By improve the application user can get better response from the application. UX or User Experience, it is also more essential part for any application. I was checking a survey in online and real life and get positive feedback from them whose are using these types of application which are made before. Then I run tests by some people. The application is faster and comfortable.

#### **4.4 Implementation Requirement**

In a previous discussion, I explained this project in an android based application. I need to use computer language, framework, database, and xml for design interface. I use here JAVA language for build the application architecture. I compose code by Android Studio. My full project is work by following this code. Here, I use android native framework for designing. Basically, for android application using firebase database. So, I also use firebase for smooth connectivity. For using this application must need internet connection. Although customer and delivery man can contact with their phone but customer create order by application so that internet connection is must. Hardware and software equipment combination and good arrangement will make the application smarter.

## **CHAPTER 5**

### **IMPLEMENTATION AND TESTING**

#### **5.1 Database implantation**

The application will need a database system to store huge amount of data for support in order system. Here, Firebase database is chosen is for proposed database because of firebase database is well known for android database management system. Otherwise firebase database system is provide easily understanding graphical interface for software developer with client program.

Developer can interact with the firebase database system user friendliness with client program. Above I explained about the database system. We also explained connection between one module to another module.

#### **5.2 Implementation of Front –End Design**

Here in this part I explain briefly about Front-end design of this application. The user interfaces creating with xml code.

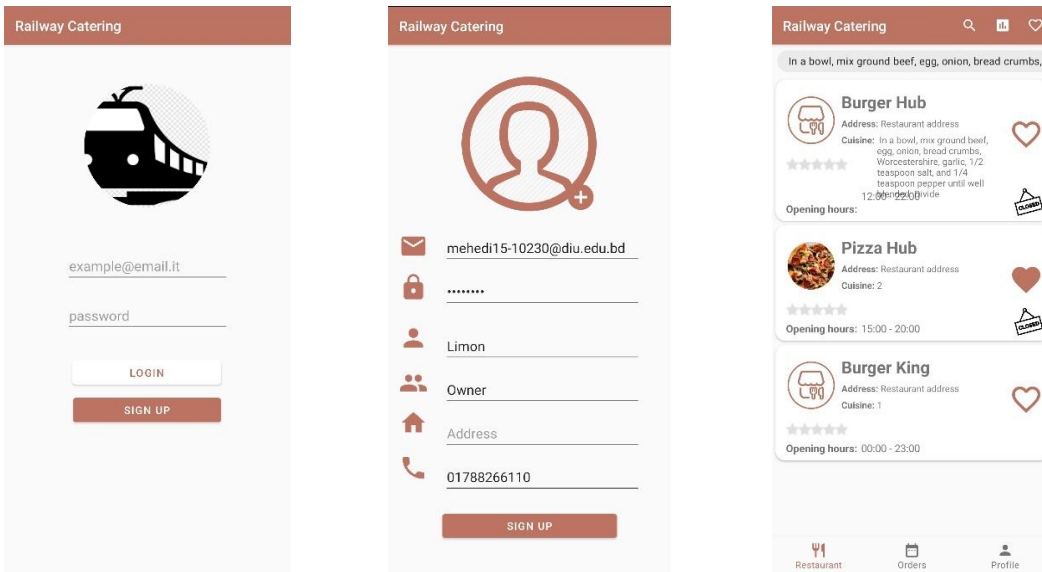
I'm using android application for demand of user. Because now a day most of people use android smart phone. For making my android application I use android studio and using JAVA language for as programming language to build our application.

In my application has three modules, one for customer, one for rider and another one for restaurant. Each module has sign up page. In the Sign-Up page user must add their information such as Email address, Phone number, address, Name, Surname, Password and confirm password. After complete the sign up successfully then user can login with email address and password. For customer module customer can see restaurant name and then check dishes name, add dishes quantity, customer can review for their food in this application. When customer add an order, it going on Railway Rider application. Rider check the order and then he confirm restaurant for making this order. After processing the step then restaurant authority packaging the food for customer and handed in Rider. After taking rider this food, he/she provides the food in customer. When customer get the ordered food then he/she make the payment of food and delivery to Rider.

#### **5.3 Implementation of interaction**

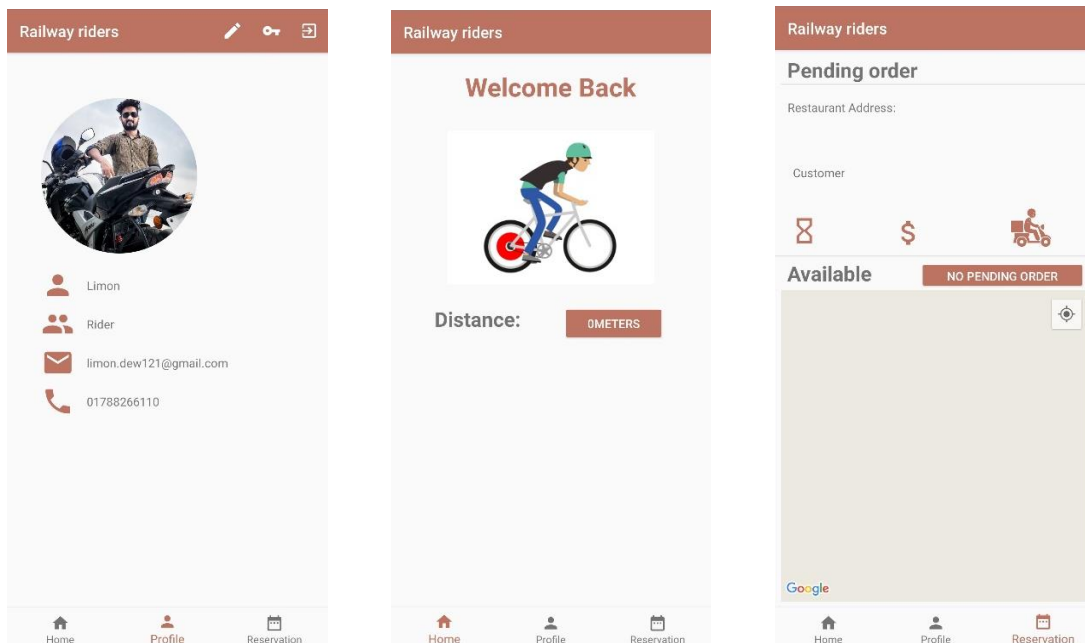
Interaction design of a system also one the most important ingredient. Interaction design is associated with apps or web site. It is applicable to anything that user can touch. Generally, interaction means a communication between two or more things. This communication can be a human to human or human to application or any system.

For customer module, Customer must need to fulfil sign up and login for registration this application. Then Customer can view restaurant name and check menu. Then customer can add his/her favorite item in cart. Interaction Design of customer is shown in Figure 5.1.



**Figure 5.1: Interaction for Customer**

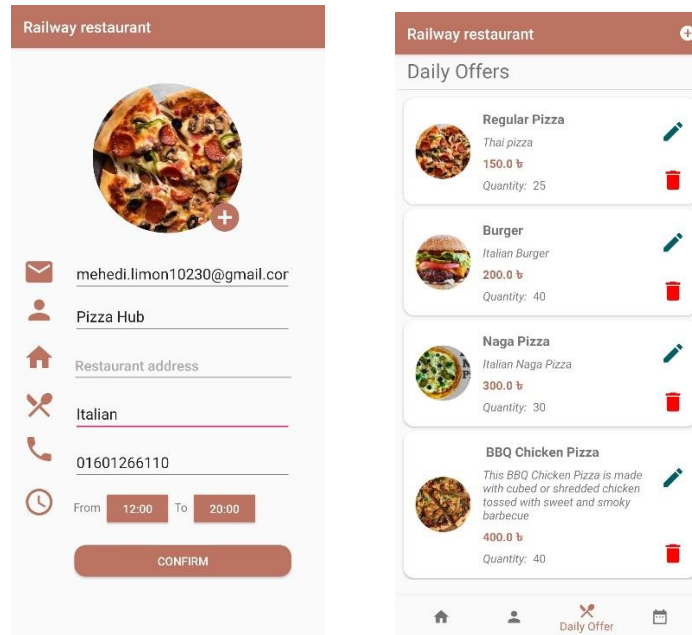
For Rider module, Rider also fulfil sign up and login page for registration. Rider can set here is distance or root. Then if customer send order request rider will confirm it. Then rider confirm the order in restaurant. After finishing all process in restaurant, Rider will hand the parcel in customer and take his payment. Interaction design for railway rider is shown in Figure 5.2.



**Figure 5.2: Interaction for Railway Rider**



For Restaurant module, Restaurant owner also must need to fulfil signup and login page for registration. Here restaurant owner can add daily offers for customer. From this application customer can know the price of food which he wants to order. Again, customer can see the quantity which amount of food are stock in the restaurant. The interaction design for Restaurant is shown in 5.3.



**Figure 5.3: Interaction for restaurant**

## 5.4 Test implementation

After the application is develop, it needs to system testing. The required application is need to install in appropriate device for testing phase.

### *Unit testing*

Unit testing is the first phase of testing any application or system. Developer are able to identify error and bug easily by doing unit testing. The system process and expected result needs to testing valid and invalid input. The unit testing for login system is shown in Table 5.1.

**Table 5.1: Unit testing for login System**

Event	Attribute	Expected result	Result
Verify that ID and password that enter by user and match the data in the database.	Login ID: valid ID Password: valid password	Login successfully	Pass
Verify the invalid ID and password that enter by user and match with the data that store in database.	Login ID: valid ID Password: invalid Password OR Login ID: invalid ID Password: valid Password	Login failed and prompt out the error message to user.	Pass

Verify the situation that user does not enter any value	Login ID: null Password: null	Login failed and prompt out the error	Pass
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### ***Functional Testing***

After complete unit testing, Functional testing will begin for testing the develop application. The system application function will be testing in functional testing. Functional testing is performed with whole perform task with expected results. The functional testing is shown in Table 5.2. Event Attribute and value Expected Result.

**Table 5.2: Functional testing for different user role**

<b>Event</b>	<b>Attribute</b>	<b>Expected result</b>	<b>Result</b>
Login as “Customer”	Login with customer information	Login successfully	Pass
Login as “Rider”	Login with rider information	Login successfully	Pass
Login as “Restaurant”	Login with restaurant information	Login successfully	Pass

### ***System Testing***

System testing is critical testing procedure. In system testing must be condiment by system developer before application released. System testing of software and hardware testing are condiment on a system which is complete. System testing is not only testing the design of application but also, it tests the behavior of application. It has expected result in order to solve error and bug.

## **5.5 Test Result and report**

In this section we will discuss about the test result and report for this application.

### ***Security of the system***

For an android application security is one of the most important part. As it is an android based online food ordering system here saves different types of personal information. Again, here needs location system for ordering food. For ensuring the security of the application different method are used. Laravel has been used for hashing function for password. Laravel handles all password encrypting and decrypting by automatically.

### ***Responsive User interface***

Any kind of device screen is responsive for user interface to the application. Android native Framework has been used for develop the user interface system. Mobile, tables laptop or desktop any kind of screen are enabled for the UI of the android application.

## CHAPTER 6

### CONCLUSION AND FUTURE SCOPE

#### 6.1 Discussion and Conclusion

The android application “Food Delivery Application for Train” has been effectively planned. This Project contains with three modules, Railway Catering, Railway Rider, Railway Restaurant. The three platform was implemented by firebase for database, xml for creating user interface design.

The native android framework has been user in the android application. This project was a typical combination between every module of the application. By this project restaurant owner, rider, customer everyone can benefitted.

The main function of this project has been implemented. It helps to improve the efficiency of restaurant management. Customer can view page of item name; customer can add quantity for their favorite dishes. It reduces the time consume for each transaction. After All it will be easier and comfortable for train traveler.

#### 6.2 Scope for Further Developments

##### *Debugging*

Some problems are notice after run the application for long time. The errors are small. But it helps to developer for improving their ability to finding bug.

##### *Internationalization*

In the future the application will improve different language for foreign tourist like Chinese, Arabic. After improve different language the foreign tourist can order their favorite dishes by them language.

##### *Payment method*

In the future the payment method for this online food ordering application is need to improve by developer. Here added Card system payment method and also Added mobile banking system payment method.

##### *IOS user*

Whereas the application develops for android system, IOS user cannot use the application. In future Developer can develop for the application for IOS user.

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## APPENDIX

### Appendix A: Project Reflection

During this project activates, I have faced some problem like which android frame I use in this application, which database I will use etc. First, I use here flutter android framework but I did not get ultimate result. Then I use React native framework for android frame work. This react native framework can reduce cost and development time for developers. Again, I have to collect some data from internet sources. After long time and hard work, I got succeed.

# Railway catering

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