GOVERNMENT POLYTECHNIC PUNE

(An Autonomous Institute of Government of Maharashtra)

DEPARTMENT OF COMPUTER ENGINEERING

ACADEMIC YEAR 2020-21

PROJECT REPORT ON

“Fine Dine - App for contactless Dine in”

SUBMITTED BY

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UNDER THE GUIDANCE

OF

Prof. T.P.Sharma

(COMPUTER ENGINEERING DEPARTMENT)

GOVERNMENT POLYTECHNIC PUNE

(An Autonomous Institute of Government of Maharashtra)

CERTIFICATE

This is to certify that

1826222 – Hemil Ruparel

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1826248 – Rohan Yadav

Of class Third Year (2019-20) have successfully completed project on **"Fine Dine - App for contactless Dine in"** under the guidance of "Mr. T.P.Sharma" in parallel fulfilment of requirement for the award of Diploma in Computer Engineering from Government Polytechnic, Pune.

Mr. T.P.Sharma	**Mr. U.V.Kokate**	**Dr.V.S.Bandal**
(Project Guide)	**(H.O.D)**	**(Principal)**

ACKNOWLEDGMENT

The success of any project depends largely on the encouragement and guidelines of many others.This research project would not have been possible without their support. We take this opportunity to express our gratitude to the people who have been instrumental in the successful completion of this project.

First and foremost, we wish to record our sincere gratitude to the Management of this college and to our Respected Principal Mr.V.S.Bandal, for his constant support and encouragement in the preparation of this report and for the availability of library facilities needed to prepare this report.

Our sincere thanks to Mr.U.V.Kokate, Head, Department of Computer, Govt. Polytechnic, Pune who was abundantly helpful and offered invaluable assistance, support and guidance.

We express our sincere gratitude to our Guide, Mr. T.P Sharma for guiding us in investigations of this project and in carrying out experimental work. Our numerous discussions were extremely helpful.We are highly indebted to him for his guidance and constant supervision as well as for providing necessary information regarding the project & also for his support in completing the project.We hold him in esteem for guidance, encouragement and inspiration received from him.

We wish to thank our parents for financing our studies and helping us throughout our life for achieving perfection and excellence. Their personal help in making this report and project worth presentation is gratefully acknowledged.Last but not the least we thank the Almighty for continous strength we were bestowed for completion of this project.

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Abstract

COVID-19 pandemic has inflicted a massive health and economic catastrophe which has resulted in multiple businesses losing their customers. One such sector that has been astronomically impacted is the food industry. Restaurants are opening up once again after the lockdown has been lifted but they still don’t procure as many customers as they earlier used to.

This is primarily because customers feel the risk of contracting the virus directly/indirectly by coming in contact with vendors/staff or go-betweens like delivery-boys. Thus, restaurants are in the need of a system which facilitates end-to-end (from ordering to paying the bill) contactless service to the customers. But such a system currently does not exist.

This is where Fine Dine comes into picture. We have developed a system that provides the complete go-to for a business. All the restaurant operators need to do is register themselves on to the Fine Dine website and set up their restaurant menu. A unique QR code is displayed on the website for every table that is created by the restaurant operators. This QR code needs to be downloaded by the restaurant operator, printed and placed on the table. Now they can manage their complete day-to-day activities from the panel; finely crafted by the developers of Fine Dine.

The customers will be able to place their orders from the Fine Dine application on their phone. All they need to do is scan the QR Code kept on their table. After scanning the QR code, restaurant menu will be loaded on the screen. The customer can then select food items and the respected quantity that he/she wishes to order and then click on the “Place Order” button. After the customer completes his meal, he can simply pay from the option provided inside the app itself, making it a seamless and contactless experience.

Chapter 1

Introduction

Fine Dine is a system that has been created to provide flawless management for all types of food businesses, and also to provide a safe and convenient experience to the customers visiting the restaurant in these times of COVID-19.Using the system is fairly simple. There are 2 main actors in this process:

1.1 Restaurant Owner/Operator

The restaurant operator first registers himself on the website of Fine Dine. The operator can then select from his existing registered restaurants on the Fine Dine or register a new restaurant. After filling up the basic information, the operator will be directed to the Manage Panel.

Here, a range of Tabs have been provided to the operator for the ease of his administration.

1. Manage Tables Tab: In this tab new Tables can be created with appropriate name of operator's choice. After creating the tables, a download QR Code option is made available which can be downloaded, printed and placed on the tables for the customer to scan.

2. Manage Menu Tab: This Tab simplifies and accelerates the process of creating the menu card digitally. Any item created here will be displayed to the user's screen on his phone while ordering. Manage Orders Tab here the operator has a complete view of new orders that arrive at the system, the served orders and the orders that have completed the payment. After a new order has been served, the operator can simply click on the checkbox to move the order from "New Orders to Served orders".

3. History Tab: It shows the complete history of the orders of the restaurant, along with its time and date, Table name, customer name and his respective bill.

4. Profile Tab: Lastly the restaurant operator can view, update his account details from the profile tab. A log out button has also been provided which will log out the operator from his account and redirect him to Sign in Page.

1.2 Customer/Visitor

The customer will have to download the Fine Dine app in his/her phone from the Play Store. Then he can Register/Sign in in the app by filling his basic details. When the customer visits the restaurant, occupies and settles down on the table of their choice as always, he will simply open the app, click on the scan button on the home page and scan the QR code kept on his table.

The Menu Card that has been created by the restaurant operator on the website will be loaded onto the screen of customer's phone. He can now actually view and select the menu items of his/her choice digitally, without coming in contact with any physical menu card/Manager! The customer can order whichever food item and its corresponding quantity and click on "Place Order" button. That's it! The order will now be visible on the restaurant operators panel and he will serve it to the customer's table. The customer can order numerous food items umpteen number of times from the app.

After the customer is concluded with his meal, he can click on the "Checkout" option which will show the summary of the food items ordered. He can then just click on the Pay option and then instantaneously pay from the app itself. The money will be directly transferred to the restaurant's account. After the payment is a success, he will be redirected back to the home page. Here the user can view all his previous orders in the recent orders tab.

In this way this whole process of having a meal at a restaurant is completed in a coherent, un-interrupted and a contactless manner.

Chapter 2

Project Plan

2.1 Software Model:

- The project was built using the Iterative Software Development Model.
- The iterative process starts with a simple implementation of a subset of the software requirements and iteratively enhances the evolving versions until the full system is implemented.
- At each iteration, design modifications are made and new functional capabilities are added. The basic idea behind this method is to develop a system through repeated cycles (iterative) and in smaller portions at a time (incremental).

2.2 Approach of Software Development:

- The project was built using the Incremental Approach of Software Development.
- Determines user needs and defines the overall architecture, but then delivers the system in a series of increments
- The first build incorporates a part of the total planned capabilities, the next build adds more capabilities, and so on, until the entire system is complete.

2.3 Goals:

- Software risks are documented for use in planning and tracking the software project.
- Software project activities and commitments are planned and documented.
- The project is scheduled and documented.
- Gives the desired output.

2.4 Project Scope:

“Fine-Dine” is an application developed for reducing Human Interaction during Dining-in in restaurants as much as possible in the time of Pandemic. The

Application for customers will be available for Android Operating Software, and Restaurant Owners can access management features using the Website. The project was completed by June 2021. Modules of the project consist of a mechanism to Order Food, Manage Previous Orders for Consumers and Manage Orders, Tables, Menu, and Restaurants for Restaurant Owners.

2.5 Project Deliverables:

- Progress Reports
- Issue Reports
- Android Application for Users
- Website for Restaurant Owners

2.6 Project Risks:

- Equipment Failure
- Late Delivery
- Technology Failure
- Changes in Requirements
- Integration Failure

Risk	**Probability**	**Impact**
1. Equipment Failure	70%	1
2. Late Delivery	20%	3
3. Technology Failure	30%	5
4. Changes in Requirements	50%	3
5. Integration Failure	10%	4

Risk Impacts:

Impact 1: Low Impact

Impact 2: Medium-Low Impact

Impact 3: Medium Impact

Impact 4: Medium-High Impact

Impact 5: High Impact

2.7 Project Schedule

Week/Month	Phase	Number of Days	Description
April - Week 3	Topic Selection	4	Finalized the Topic.
April - Week 3	Requirement Gathering	3	Requirement Details were Gathered.
April - Week 4	Requirement Analysis	2	Requirement and Feasibility Analysis was done.
April - Week 4	Designing DFD and Workflow Diagrams	2	Pictorial Representation was done.
April - Week 4	Team Formation	2	The formation was done and Distributed Work Modules.
May - Week 1, 2	Development of Android Application and API for Client-Server Communication.	15	Android Application for User was successfully developed and the alpha version was completed.
May - Week 3	Beta Version for User Application	7	Beta Version was completed.
May - Week 4	Integration Testing and Project Validation	7	The application was tested and Validated by Project Guide.
June - Week 1	Development of Restaurant Owner’s	7	Panel for Management of Restaurants was

	Website and API for Client-Server Communication.		developed.
June - Week 2	Website Testing	3	Bug and Error Fixes and Testing of the Website was done.
June - Week 2	Final Project Validation	3	Minor Changes and Final Project Validation, and Approval by Guide.

Chapter 3

Requirement Analysis

This chapter will explore the system requirement analysis (Functional and non-functional requirements) and requirement specifications.

3.1 Hardware Requirements:

1. Android Device with Camera (for user)
2. Personal Computer with any modern web browser (for manager)

3.2 Software Requirements:

1. Android Device:
    - Operating System: Android
    - Android Support: SDK 4.0+
2. Personal Computer:
    - Operating System: Windows/Linux/macOS
    - Web Browser: Google Chrome, Mozilla Firefox, etc.

3.3 Technology Stack:

1. Android Application Developement – Java
2. Webapp for Restaurant Owners - HTML, CSS, Javascript, Tailwind
3. API
    - Python (Flask)
    - MariaDB (Database)
    - Hosting Service – Heroku

3.4 Know the Technologies

1. Android:

Android is an open-source and Linux-based Operating System for mobile devices such as smartphones and tablet computers. Android offers a unified approach to application development for mobile devices which means

developers need only develop for Android, and their applications should be able to run on different devices powered by Android.

2. Python:

Python is a widely-used general-purpose, high-level programming language. It was created by Guido van Rossum in 1991 and further developed by the Python Software Foundation. It was designed with an emphasis on code readability, and its syntax allows programmers to express their concepts in fewer lines of code.

3. MariaDB:

MariaDB Server is one of the most popular database servers in the world. It’s made by the original developers of MySQL and guaranteed to stay open source. Notable users include Wikipedia, WordPress.com, and Google.

Chapter 4

System Design

4.1 Modules

The Proposed System is divided into two types of users – Customers and restaurant owners

Customer Modules

1. Login/Signup
2. Fetch Menu
3. Order Food
4. Recent Orders

Restaurant Owners Modules

1. Manage Restaurants
2. Manage Menu
3. Manage Tables
4. Manage Orders

4.2 Customers/General Users

Customers/General Users are the first type of users for the project. These Users can use this application when they'll visit Fine Dine Registered Restaurants, where they can use this application to reduce human contact as much as possible. The features provided for Users will be described in the next section.

1. Login/Signup: General Users can register themselves using Name, Email, and Password for authentication, also They can Log back into the application using their Email Address and Password. Users will be Logged In automatically every time unless and until they've not Logged Off from their phones.
2. Fetch Menu: After Log-In, Users can use the Scan to Order feature provided in the application to scan the QR Code provided at the table at the

restaurant. After Scanning the QR Code, a list of available dishes with Description, Price, and an Image for reference will be shown.

3. Order Food: After fetching the menu, Quantity can be selected from the same screen. After selecting quantity for One/Multiple Menu Items, the User can approve the selection, and then an order can be placed. Placed Order can be seen from Summary Option, with Details of Prices. Users can place orders multiple times before making the Payment. Users can proceed to Payment by pressing the Payment Button in Summary and will be redirected to PayTM for Online Payment.
4. Recent Orders: Users can monitor his/her recent orders from the Recent Orders Option at the Homepage after Logging In. This will display a list of Previous Orders made by him/her and a Complete Summary/Bill will be shown after clicking on a particular order.

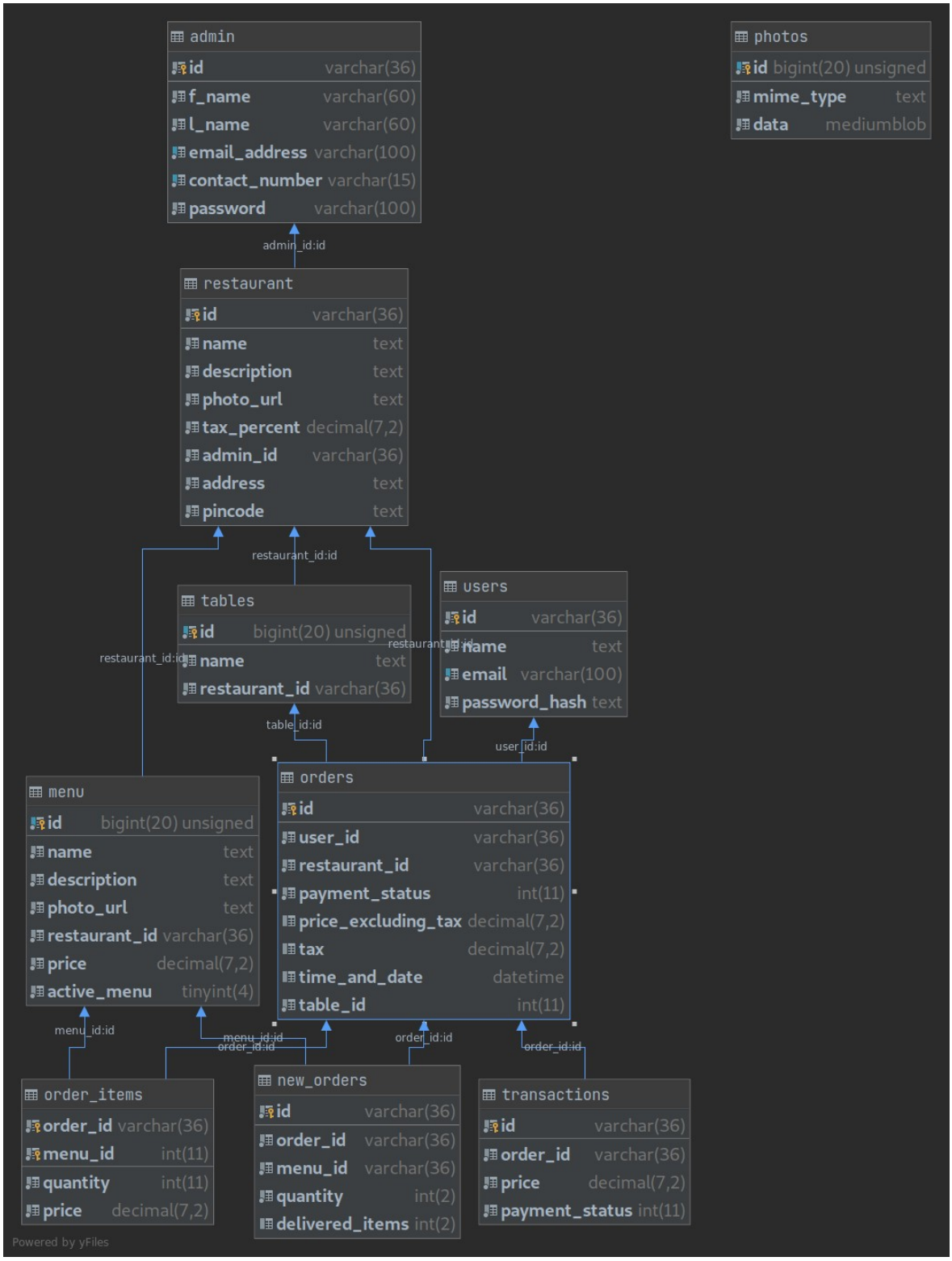
4.3 Restaurant Owners

The Restaurant Owner is the second type of user in this Project. These Users can register themselves as managers and can add multiple restaurants to manage. This Users can Manage everything about registered restaurants.

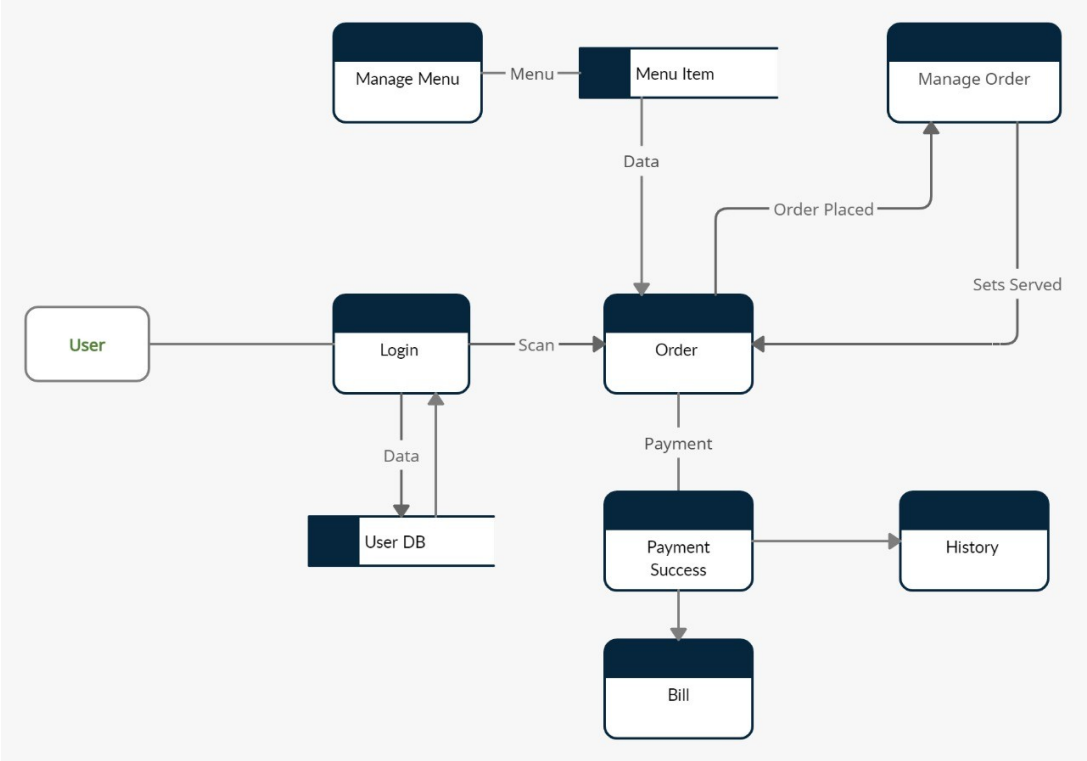
1. Manage Restaurants: After Logging In as Manager, Managers have to Choose a restaurant to manage. These users can also change details of registered restaurants like Names, Addresses, Images, etc. Also, They can add new Restaurants.
2. Manage Menu: After choosing Restaurant, Managers can Add/Delete a Menu for the Restaurant.
3. Manage Tables: After choosing Restaurant, Managers can Add/Delete Tables for the restaurant, also Managers can download QR Codes for the particular table to insert them on the actual table.
4. Manage Orders: After choosing the restaurant, Managers can Manage Orders. Managers can see all currently active orders for the restaurant according to the table. They can also mark the given orders as served which will move them to served orders pane
5. Order History: Shows every order with details which was ever made for the selected restaurant.

4.4 Diagrams

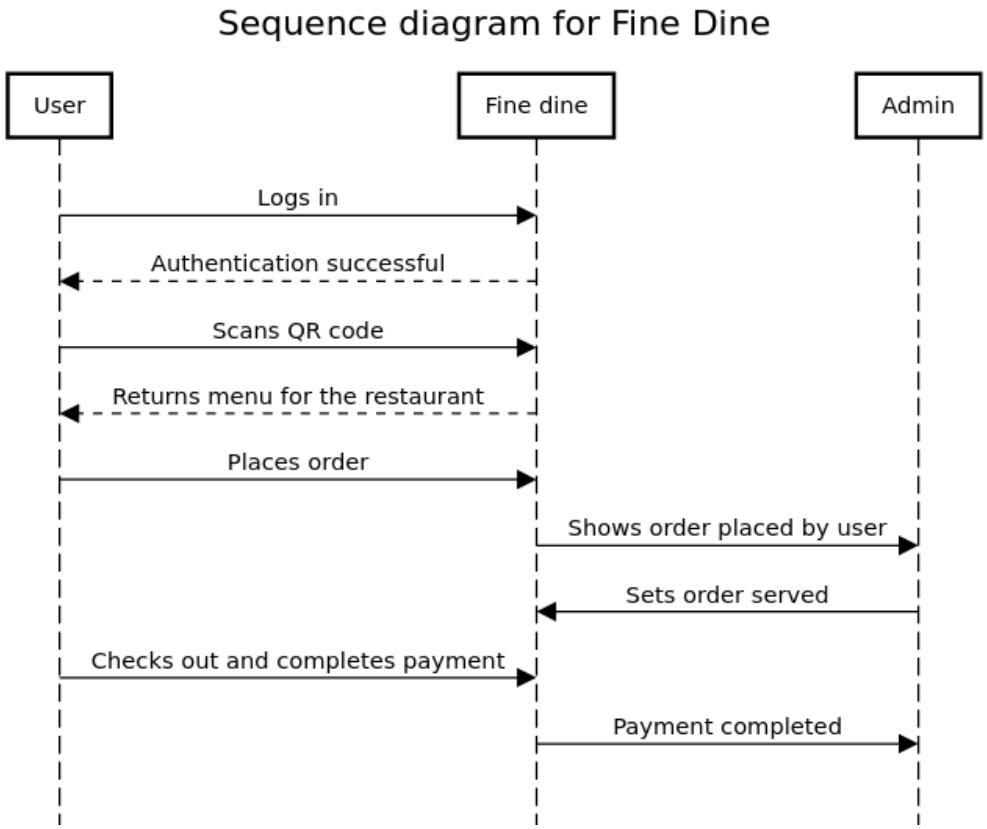
4.4.1 ER Diagram



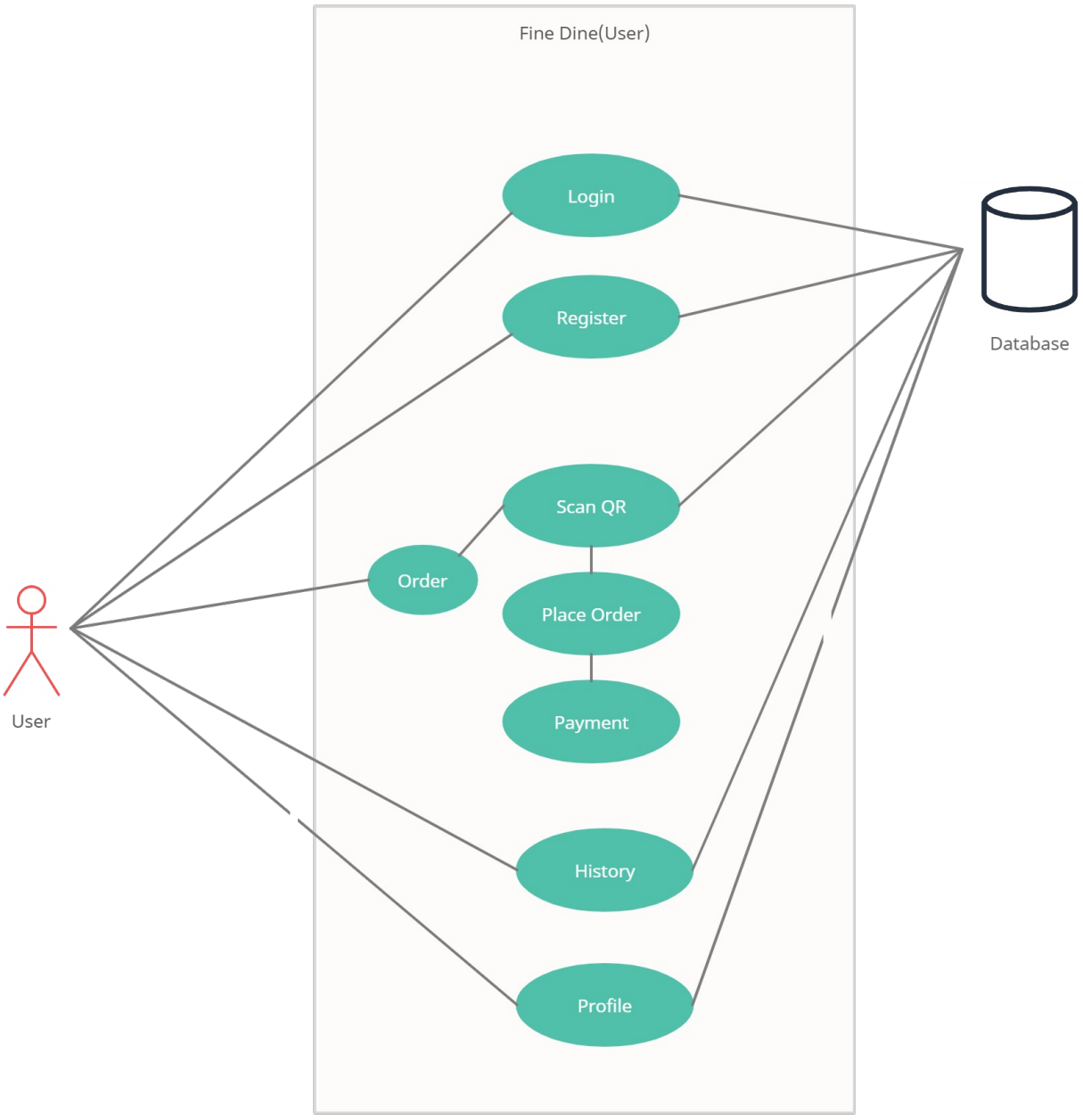
4.4.2 Data Flow Diagram (DFD)



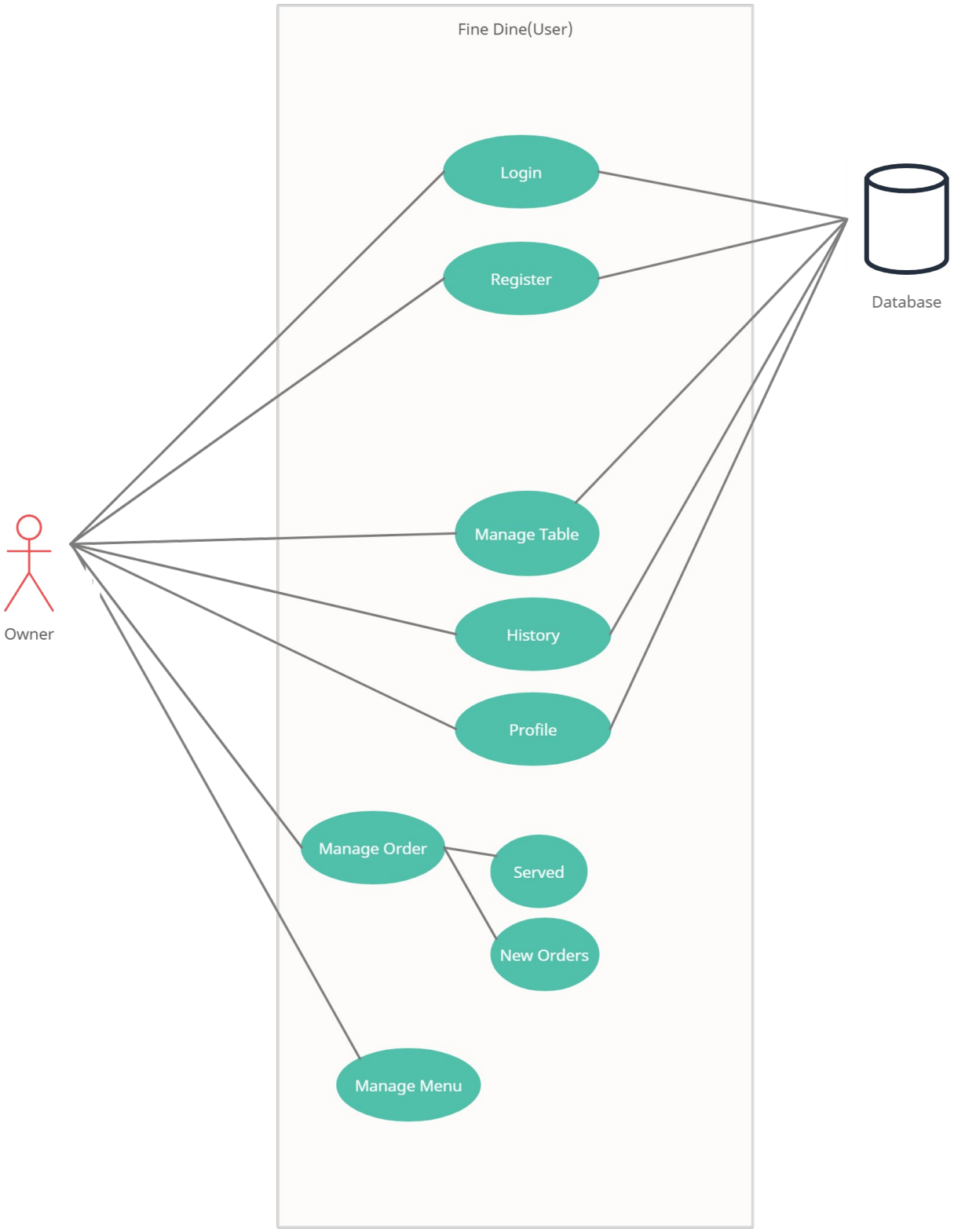
4.4.3 Sequence Diagram



4.4.4 User use case diagram



4.4.5 Manager use case diagram



4.4.6 Class Diagram

Chapter 5

Testing

5.1 App manual testing

5.1.1 Order Page

Project Name : Fine Dine
Module name : Order
Release Version :

Test Designed by : Hemil Ruparel
Test Designed date : 2021/06/09
Test Executed by : Hemil Ruparel
Test Execution date : 2021/06/09

Preconditions:

- App is installed on the phone
- The user is logged in

Dependencies:

Test priority : High

Test case id : O_003

Test title : Test Order

Requirement id : R012

Description : Check if user can order in the app

Test summary : The user was able to order in the app

Test steps:

1. Click on the [ ] icon on the home page
2. Scan the qr_code.png file given in the test data
3. You will be taken to the menu
4. Click + icon in front of Masala Dosa twice
5. Click + icon in front of Vada Pav once

6. Click place order -> order -> place my order
7. Click on summary -> pay
8. Select net banking -> hdfc bank -> success

Test data:

- qr_code.png

Expected results:

- You should see a dialog, “Payment completed successfully” and you will be redirected to home page

Post condition:

Actual results:

- “Payment completed successfully” dialog was shown and user was redirected to home page

Status **:** Pass

5.1.2 Recent Orders Page

Project Name **:** Fine Dine
Module name **:** Order
Release Version **:**

Test Designed by **:** Hemil Ruparel
Test Designed date **:** 2021/06/09
Test Executed by **:** Hemil Ruparel
Test Execution date : 2021/06/09

Preconditions:

- App is installed on the phone
- Log out of the app if you are already logged in

Dependencies:

Test priority **:** High

Test case id **:** RO_004

Test title **:** Test Recent Order

Requirement id **:** R013

Description **:** Check if user can see their recent orders

Test summary **:** The user was able to see their recent orders in the app

Test steps:

1. Create a new user in the app with dummy credentials
2. Order 3 times using the 3 qr codes given in the test data
3. Complete the payment successfully
4. On the home page, click on “Order” tab in bottom navigation bar
5. You should see 3 orders. Click on each of them to see their breakdown

Test data:

- qr1.png
- qr2.png
- qr3.png

Expected results:

- Orders page should have 3 cards each with the respective restaurant name and the price of the bill
- Clicking on each card should display the item and quantity of each item ordered along with their price
- Clicking on each card should also display the GST and the final price

Post condition:

Actual results:

- Orders page showed 3 cards with their respective names and price
- Clicking on each card displayed the item and quantity of each item ordered along with their price
- Clicking on each card displayed the GST and the final price

Status : Pass

5.2 Restaurant website manual testing

5.2.1 Manage Tables

Project Name : Fine Dine
Module name : Manage tables
Release Version :

Test Designed by : Hemil Ruparel
Test Designed date : 2021/06/09
Test Executed by : Hemil Ruparel
Test Execution date : 2021/06/09

Preconditions:

- User is logged in the website

Dependencies:

Test priority : High

Test case id : MT_001

Test title : Test Manage Tables

Requirement id : R001

Description : Check if restaurant manager can add and delete

Test summary : Manager was able to add and delete

Test steps:

1. Go to manage tables tab
2. Click on create new table
3. Enter the name of the table in the text field and click submit
4. New table will be created
5. Remove the table by clicking on remove button

Test data:

Expected results:

- A new table should initially be created and then deleted

Post condition:

Actual results:

- Table was created and then deleted

Status **:** Pass

5.2.2 Manage Orders

Project Name **:** Fine Dine
Module name **:** Manage Orders
Release Version **:**

Test Designed by **:** Hemil Ruparel
Test Designed date **:** 2021/06/09
Test Executed by **:** Hemil Ruparel
Test Execution date : 2021/06/09

Preconditions:

- User is logged in the website

Dependencies:

Test priority **:** High

Test case id **:** MO_002

Test title **:** Test Manage Orders

Requirement id **:** R009

Description **:** Check if restaurant manager see new orders and select served orders

Test summary **: M**anager was able to see new orders and select served orders

Test steps:

1. Go to manage orders tab
2. Use the phone to create an order
3. You will see the new order
4. Click on the check box to mark the order as selected

Test data:

Expected results:

- Order will initially be shown in new orders.
- After the checkbox was ticked, new orders will be empty and clicking on served orders will show the order

Post condition:

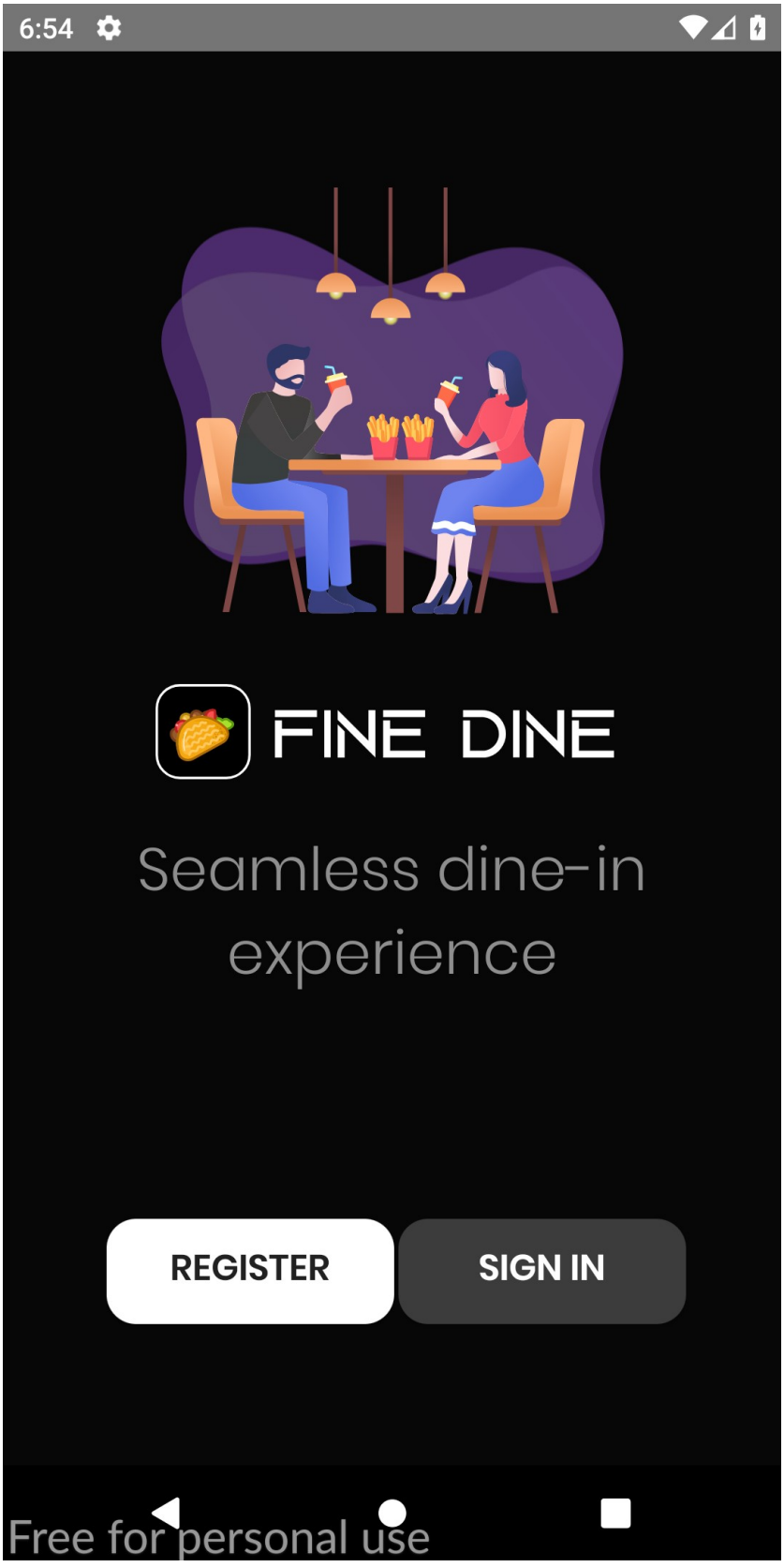
Actual results:

- New order was shown in new orders
- After checkbox was ticked, new orders became empty and clicking on served orders showed the order

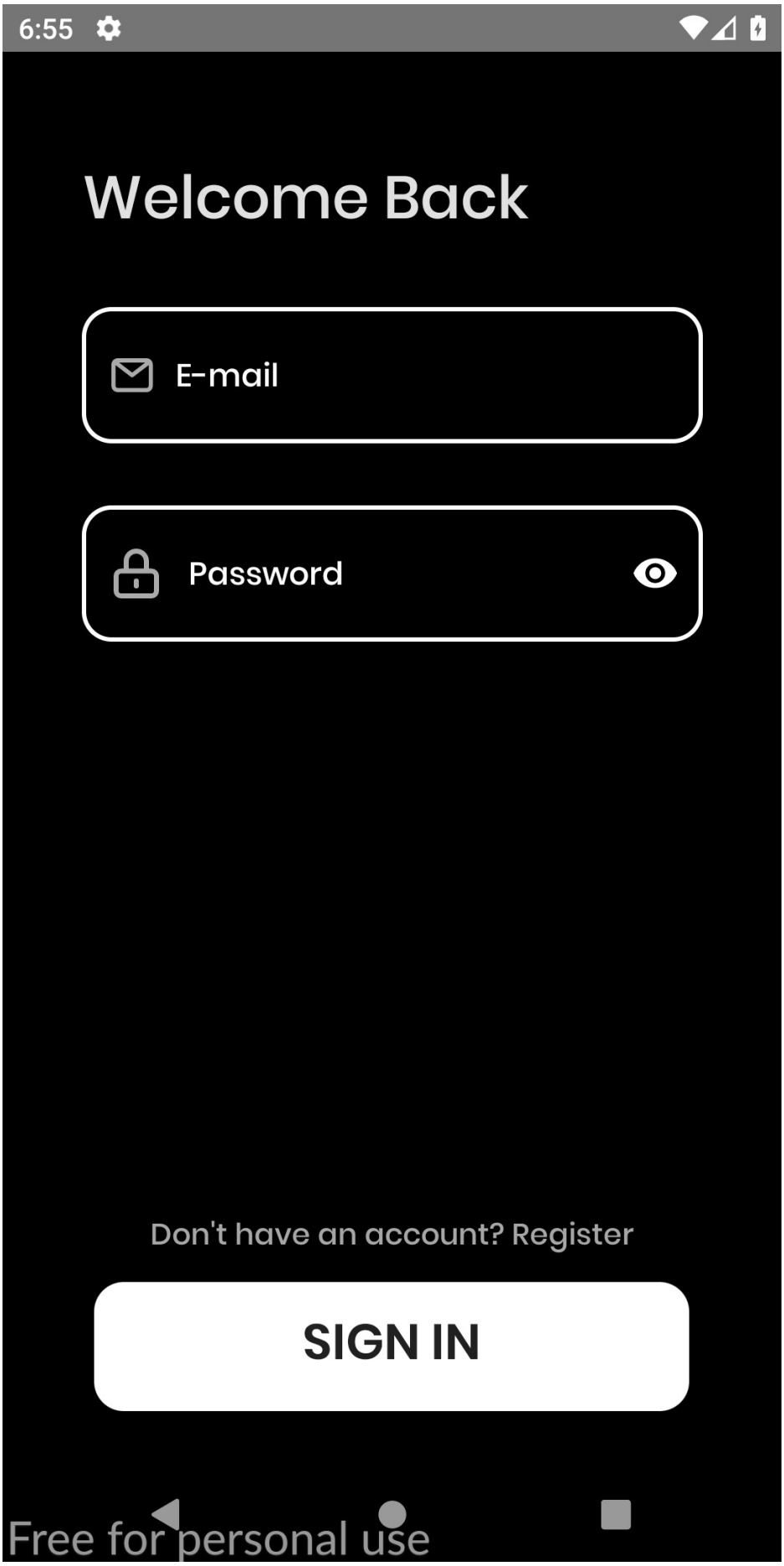
Status : Pass

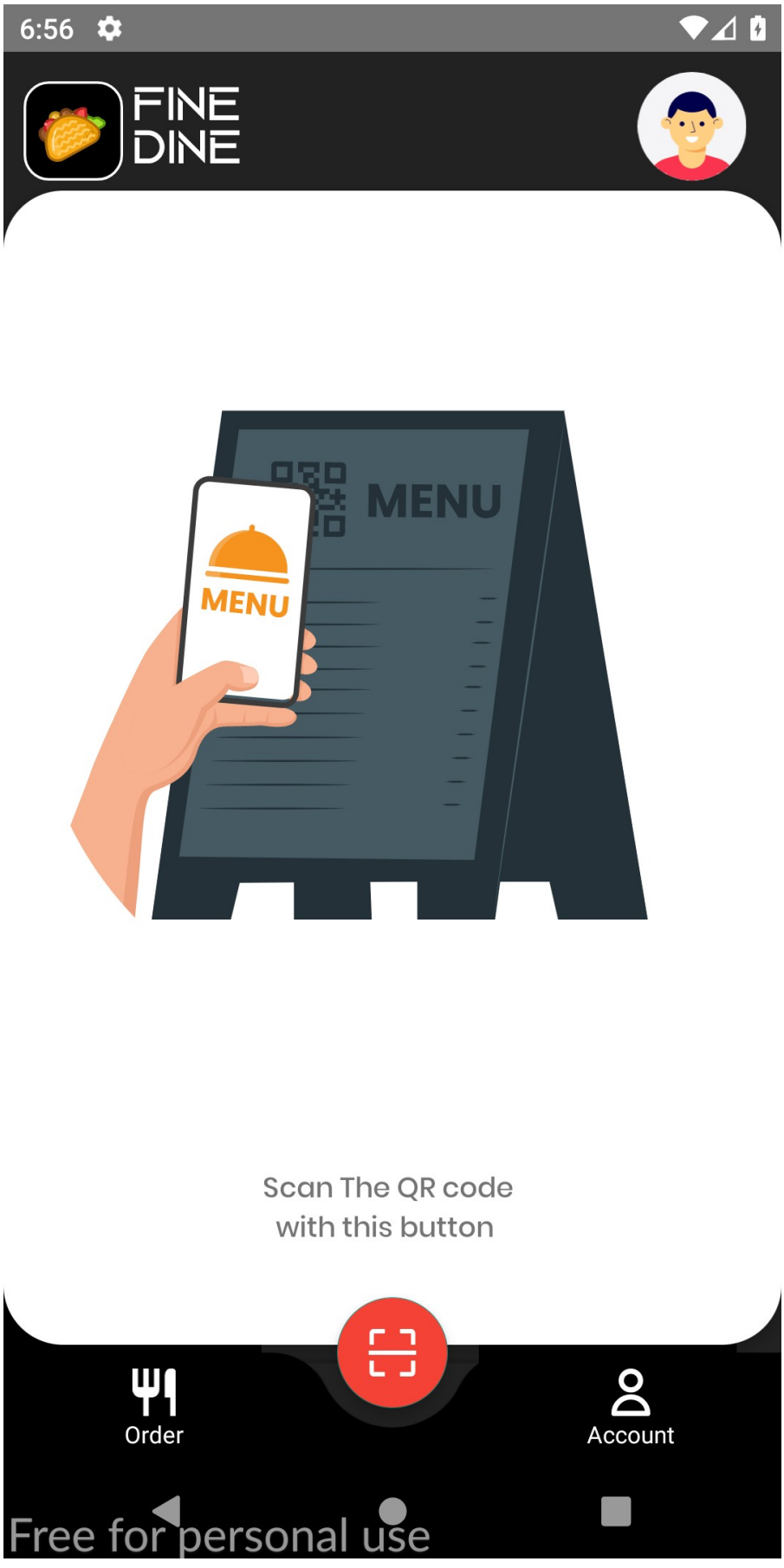
Chapter 6

6.1 User Manual for app




6:54
Get Started
Name
E-mail
Password
Already have an account? Login
SIGN UP
Free for personal use


6:55
Welcome Back
E-mail
Password
Don't have an account? Register
SIGN IN
Free for personal use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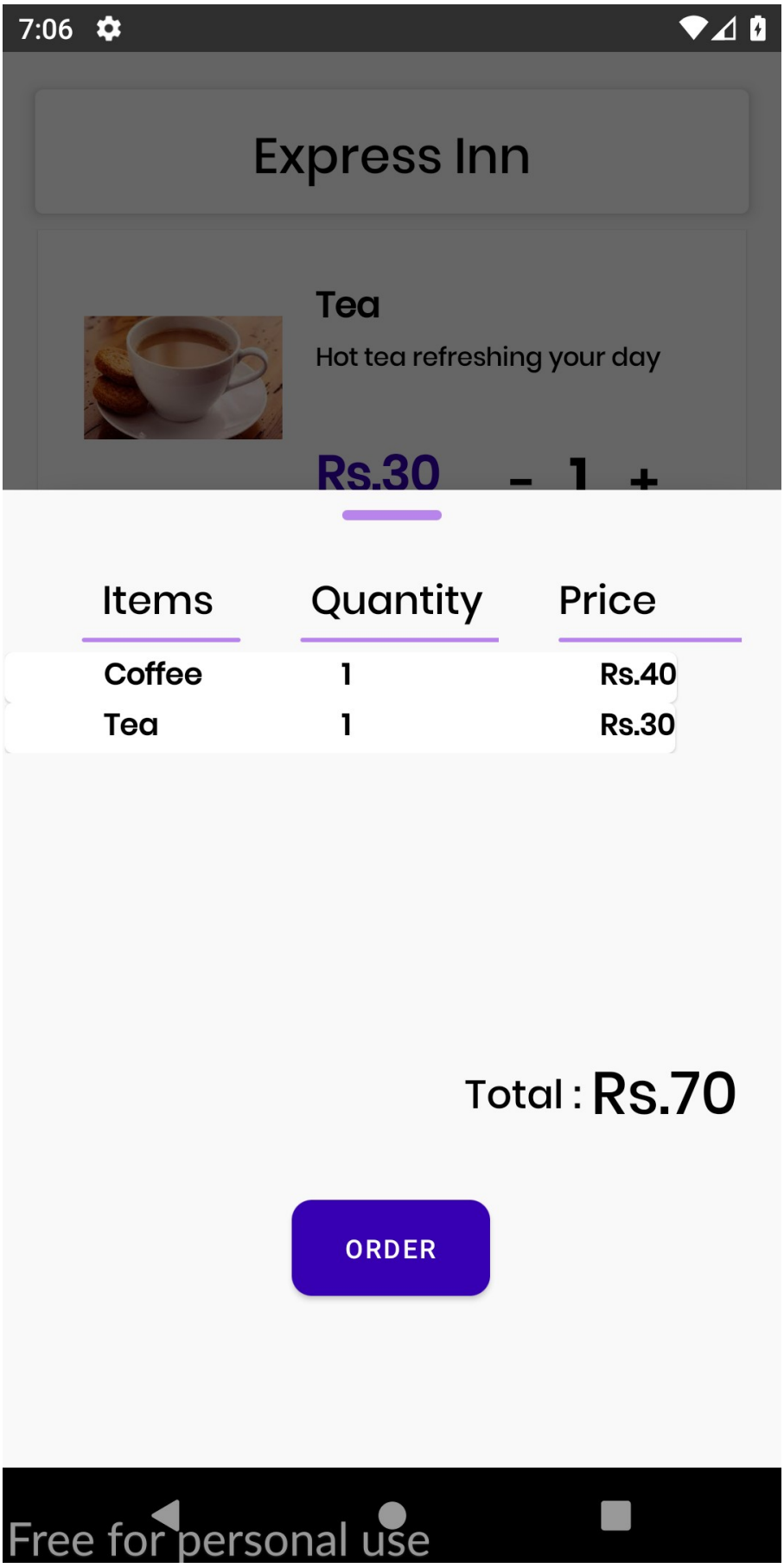
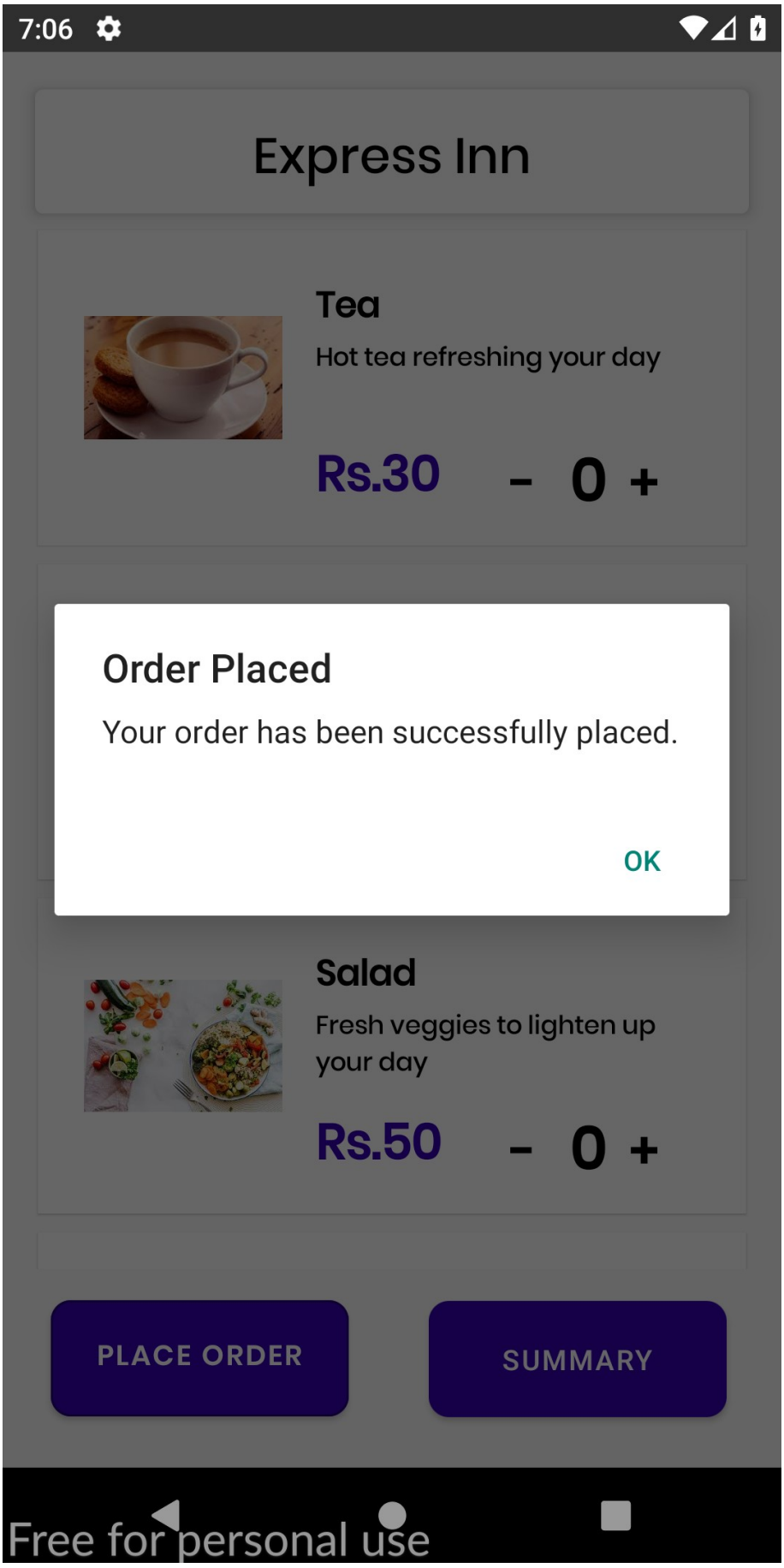
FINE
DINE
MENU
MENU
Scan The QR code
with this button
Order
Account
Free for personal use

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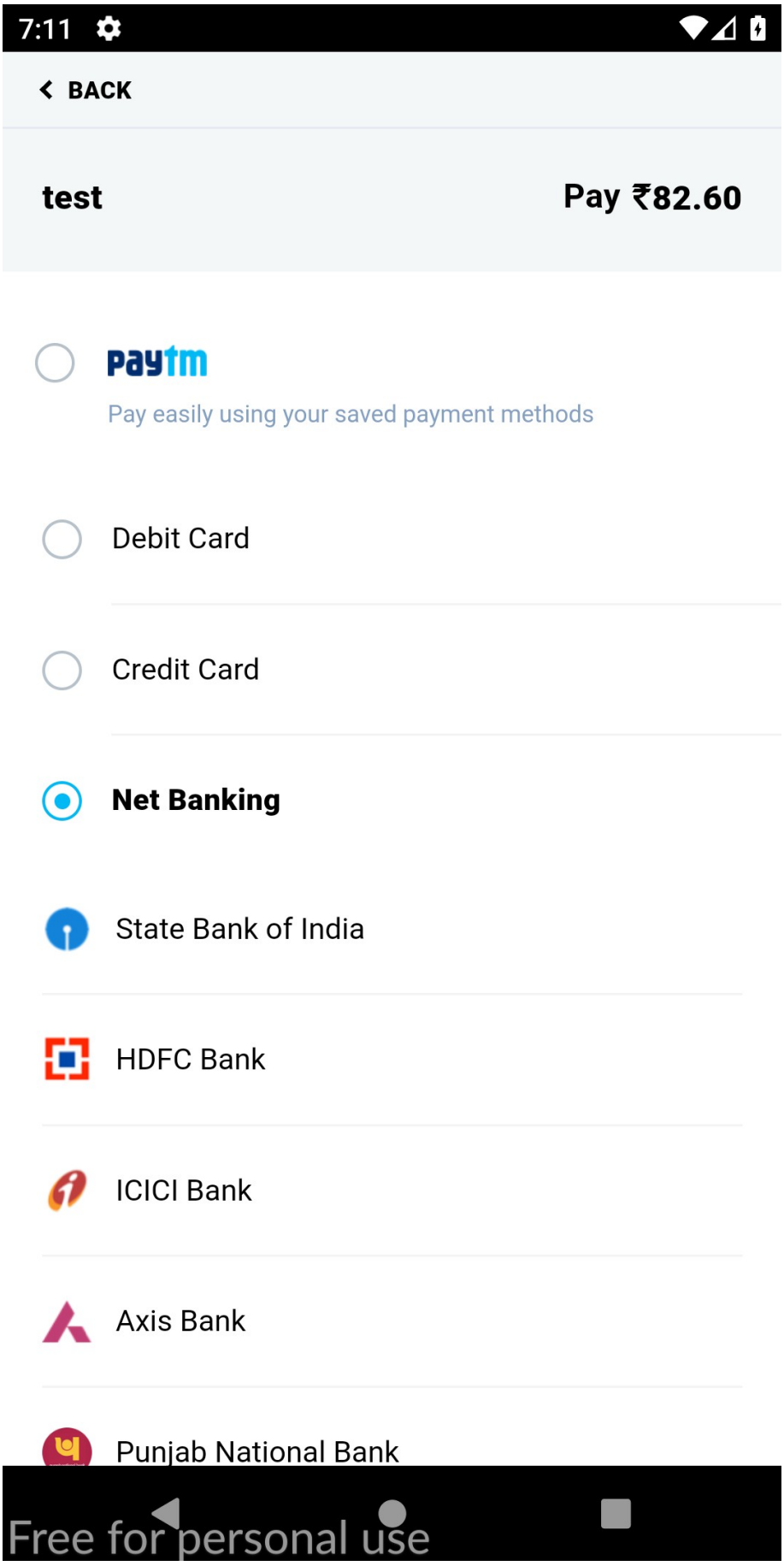
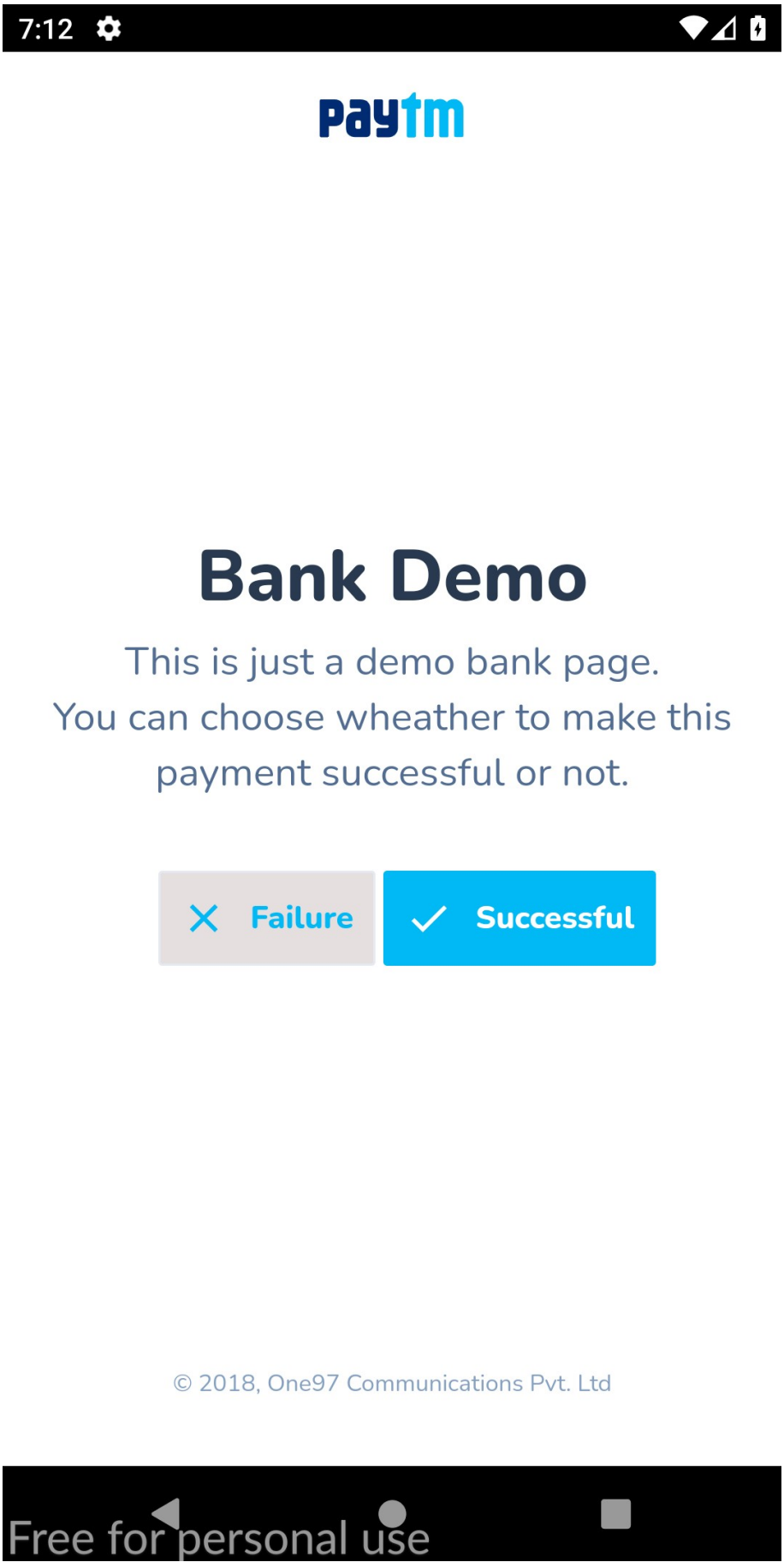
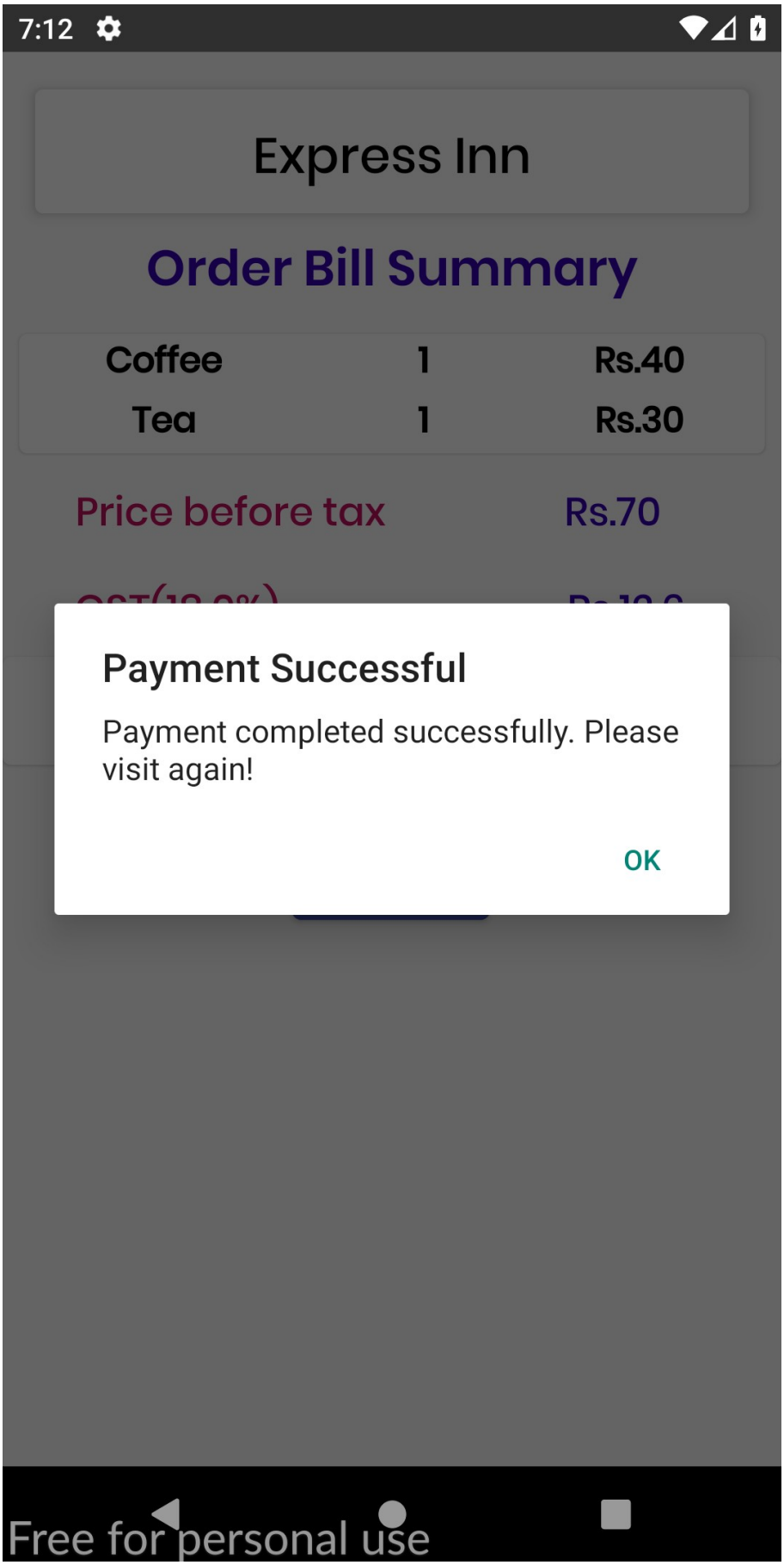
Express Inn
Tea
Hot tea refreshing your day
Rs.30
- 0 +
Order Placed
Your order has been successfully placed.
OK
Salad
Fresh veggies to lighten up your day
Rs.50
- 0 +
PLACE ORDER
SUMMARY
Free for personal use







7:12

FINE DINE

Recent Orders

Express Inn

Rs. 82.60

04:36 PM 20/06/2021

Express Inn

Rs. 118.00

12:21 PM 16/06/2021

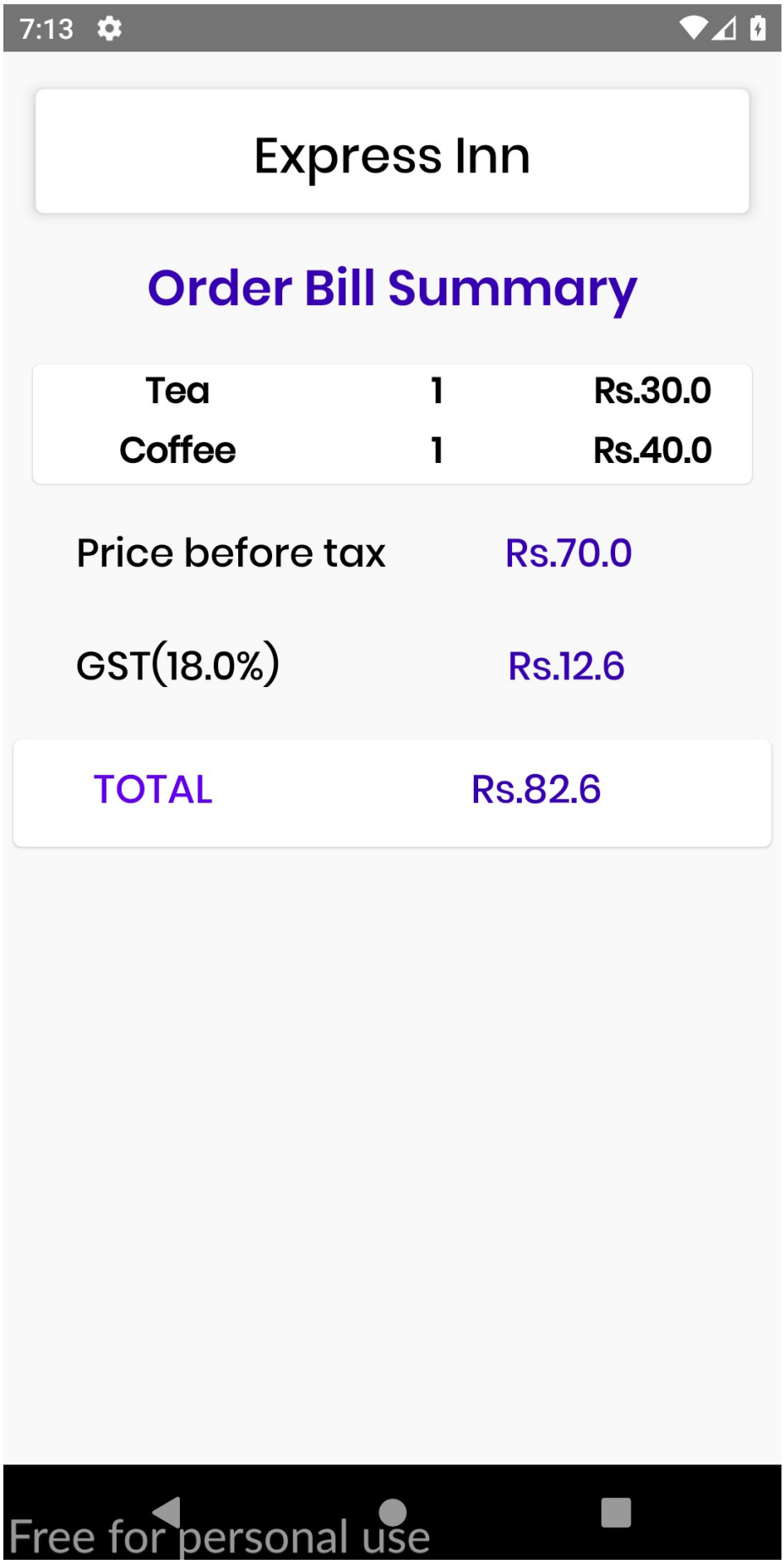
Express Inn

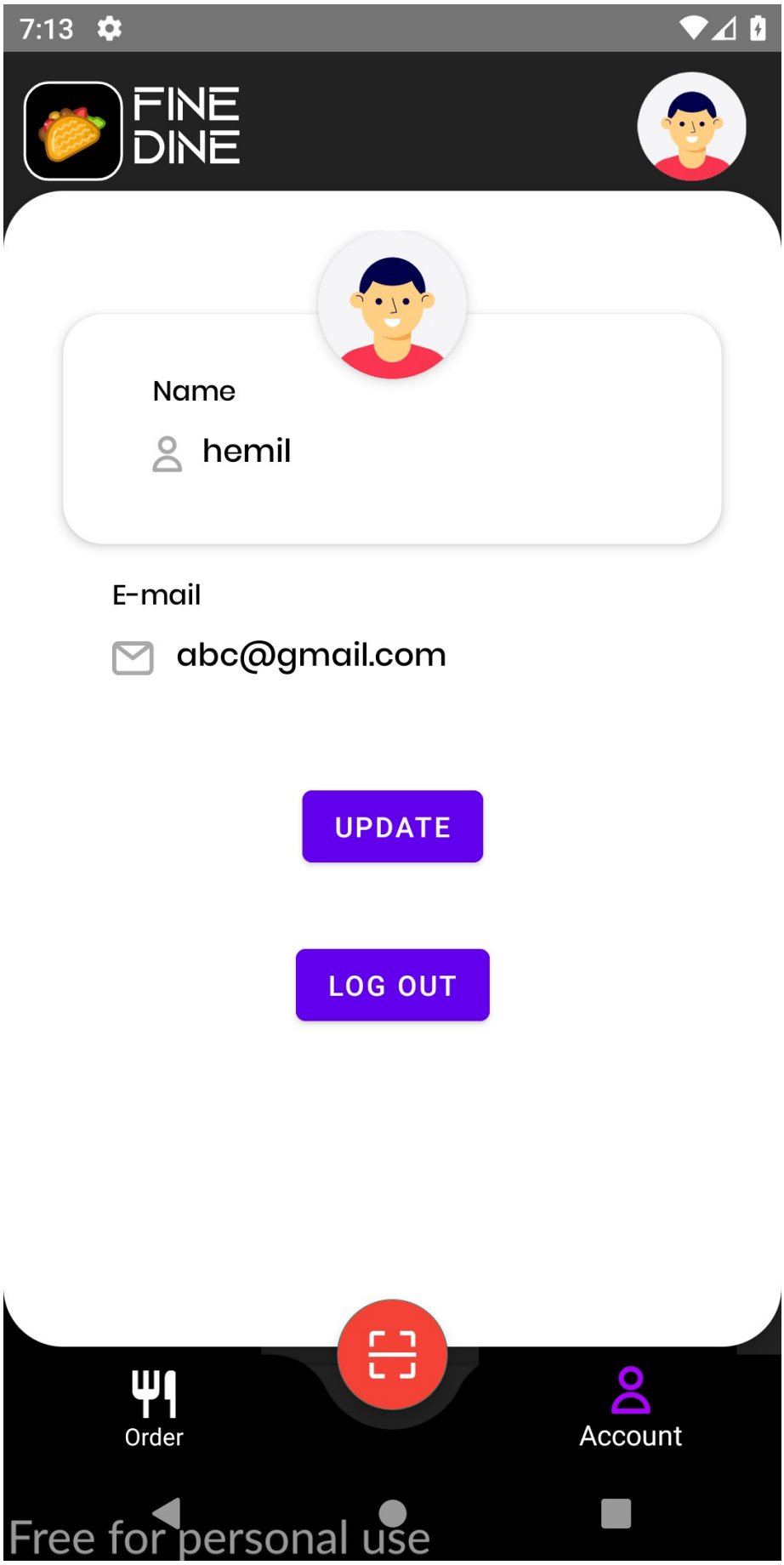
Rs. 306.80

02:12 PM 12/06/2021

Order

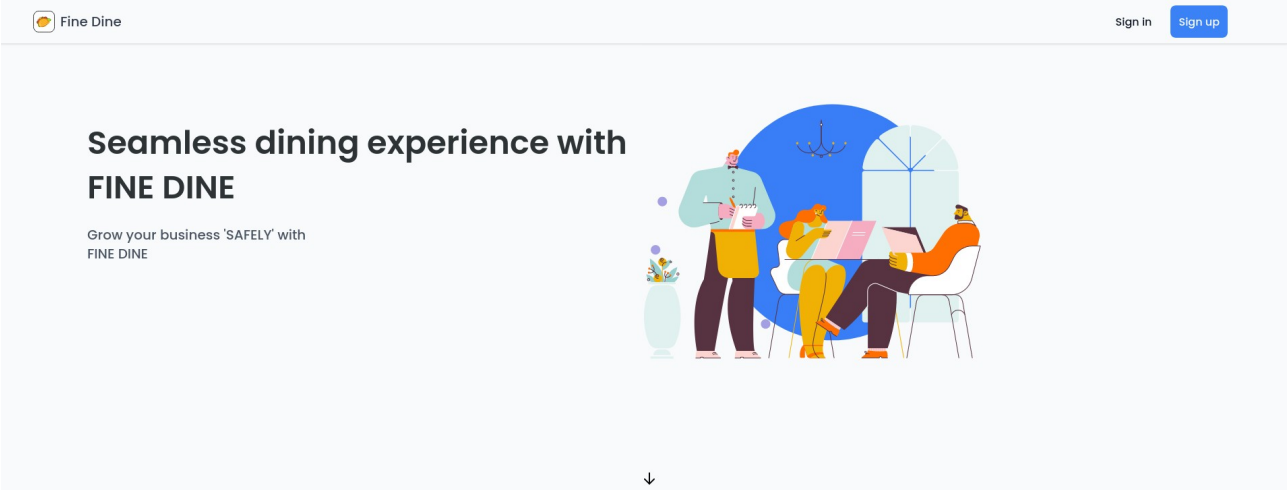
Account

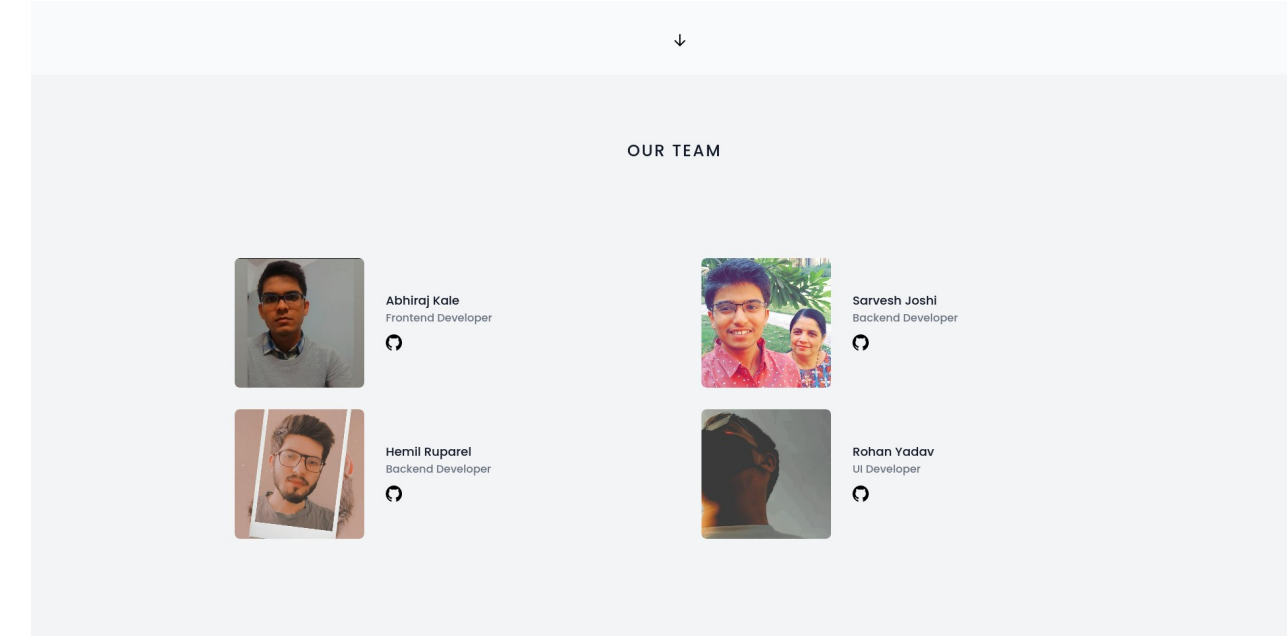



7:13
FINE
DINE
Name
hemil
E-mail
abc@gmail.com
UPDATE
LOG OUT
Order
Account
Free for personal use

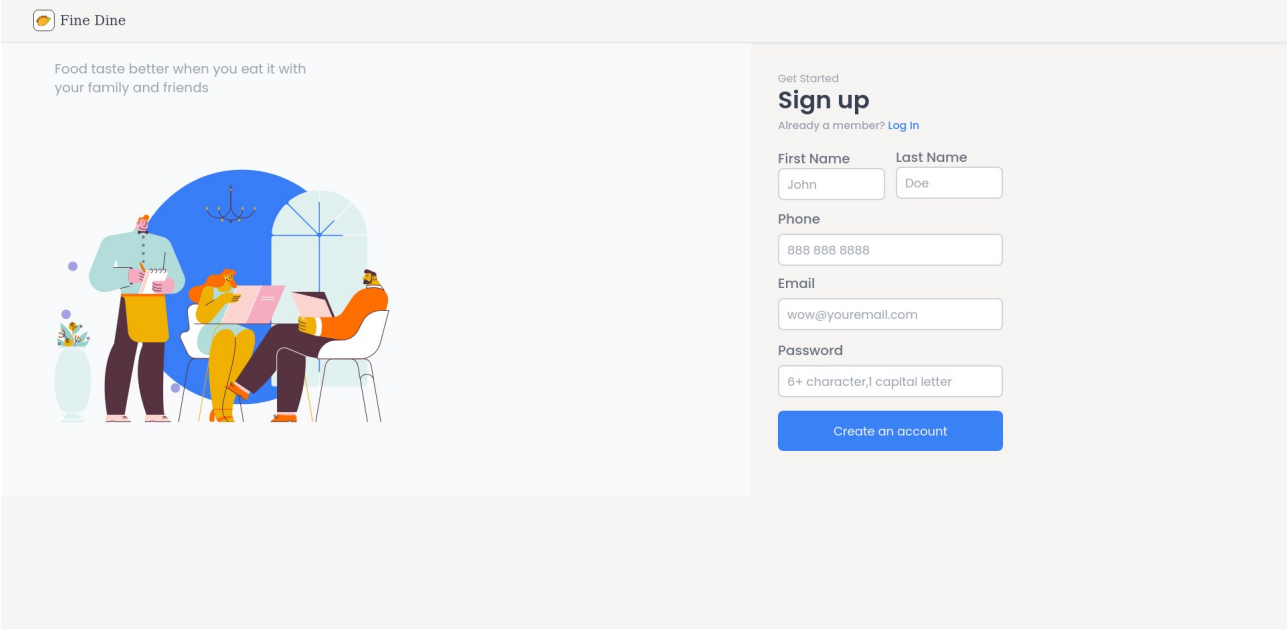
6.2 User Manual for admin website

Home screen

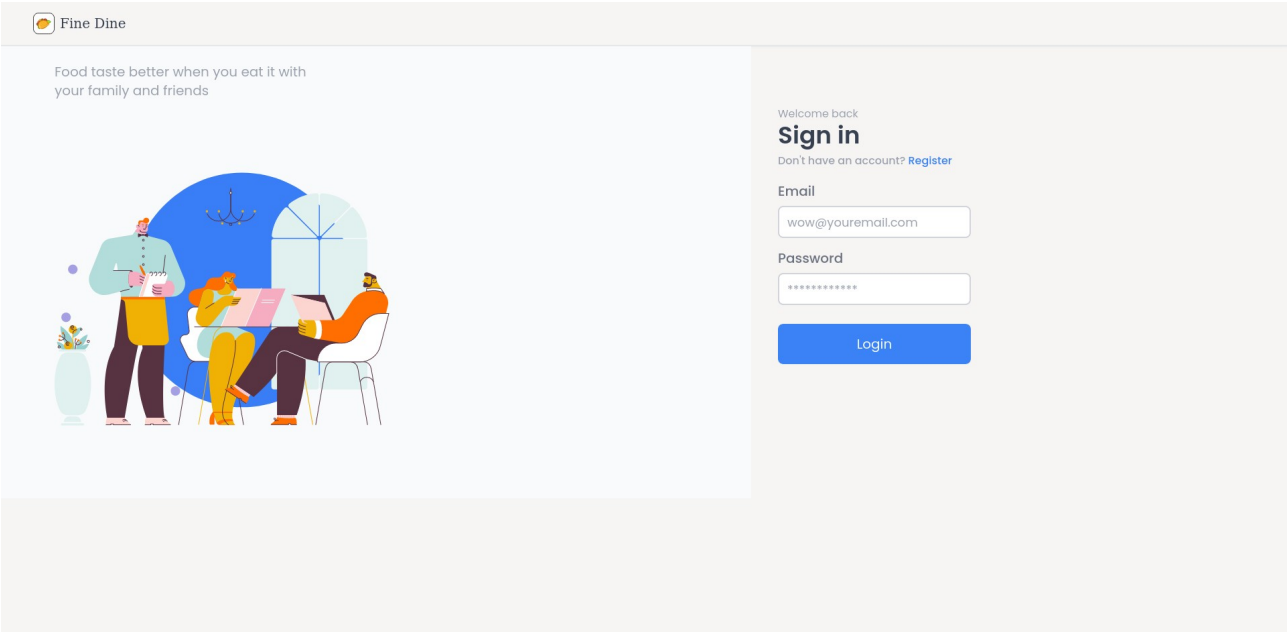




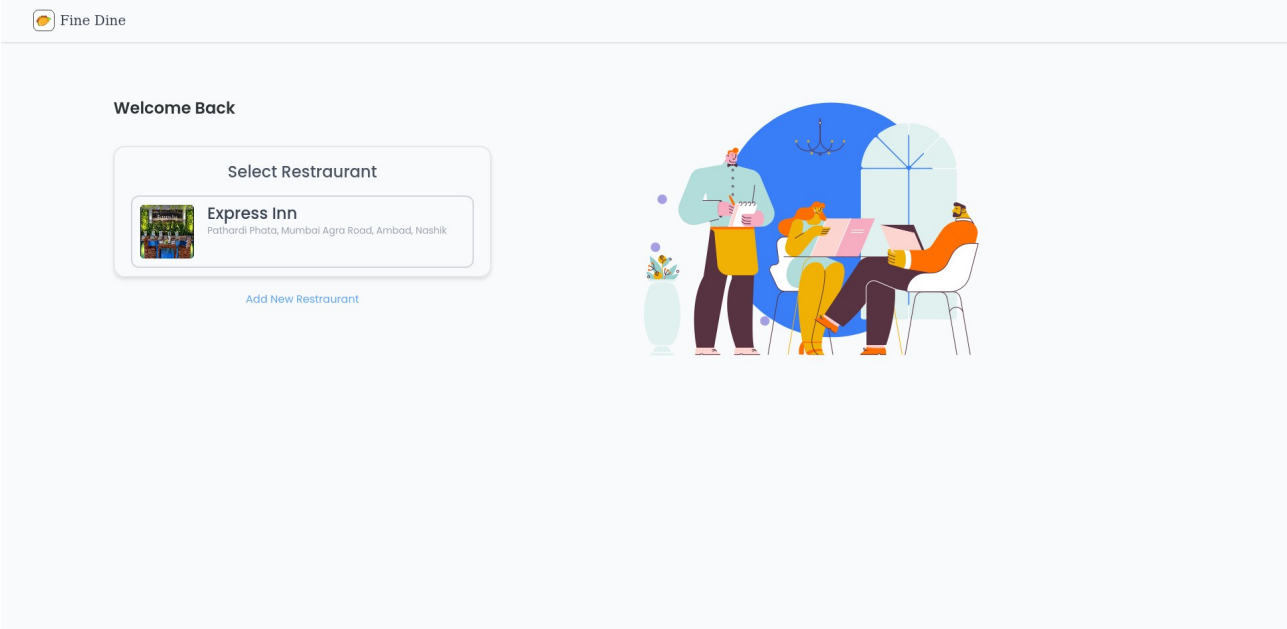
Sign up



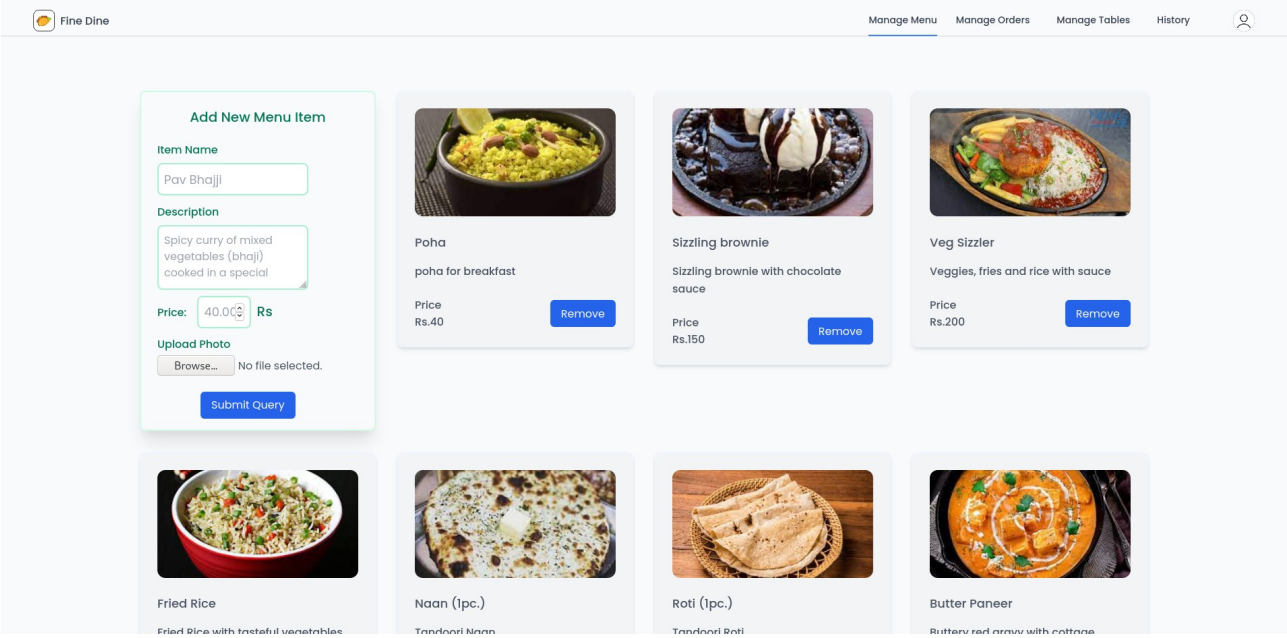
Sign in



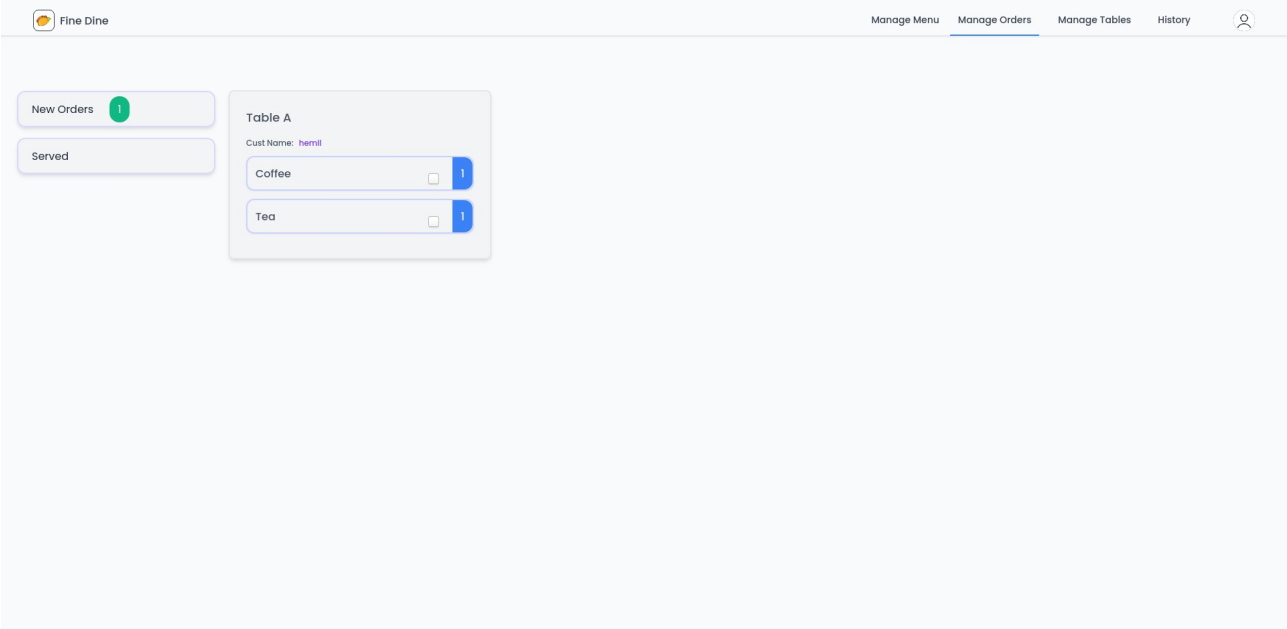
Select Restaurant



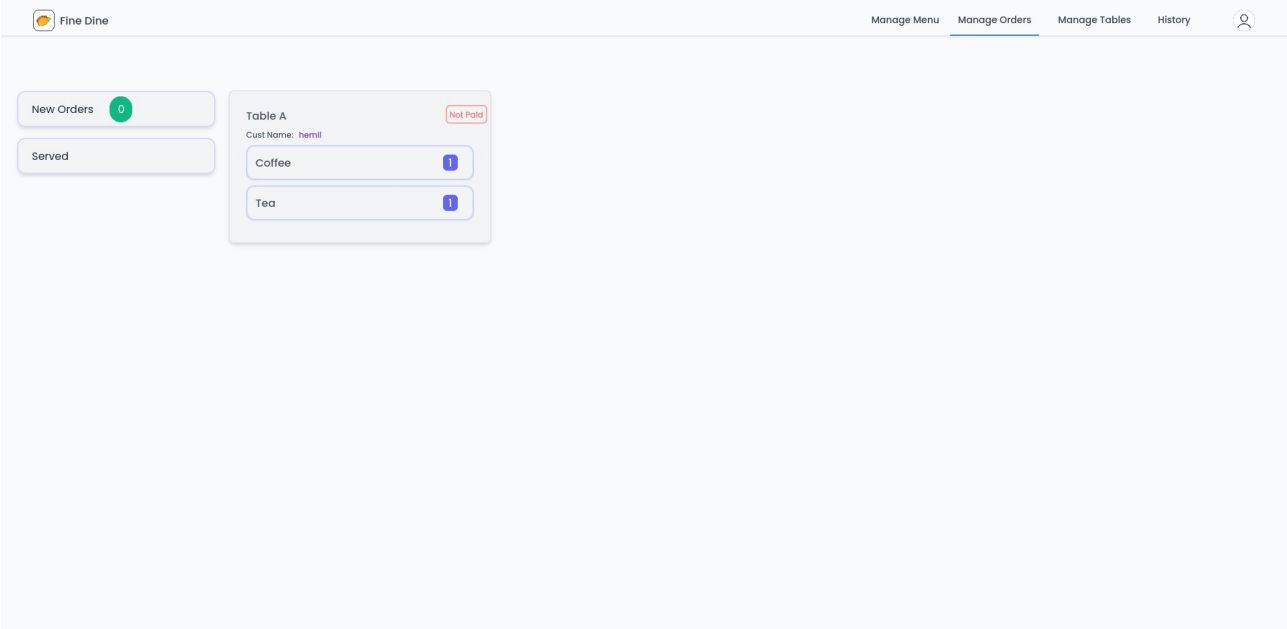
Manage Menu



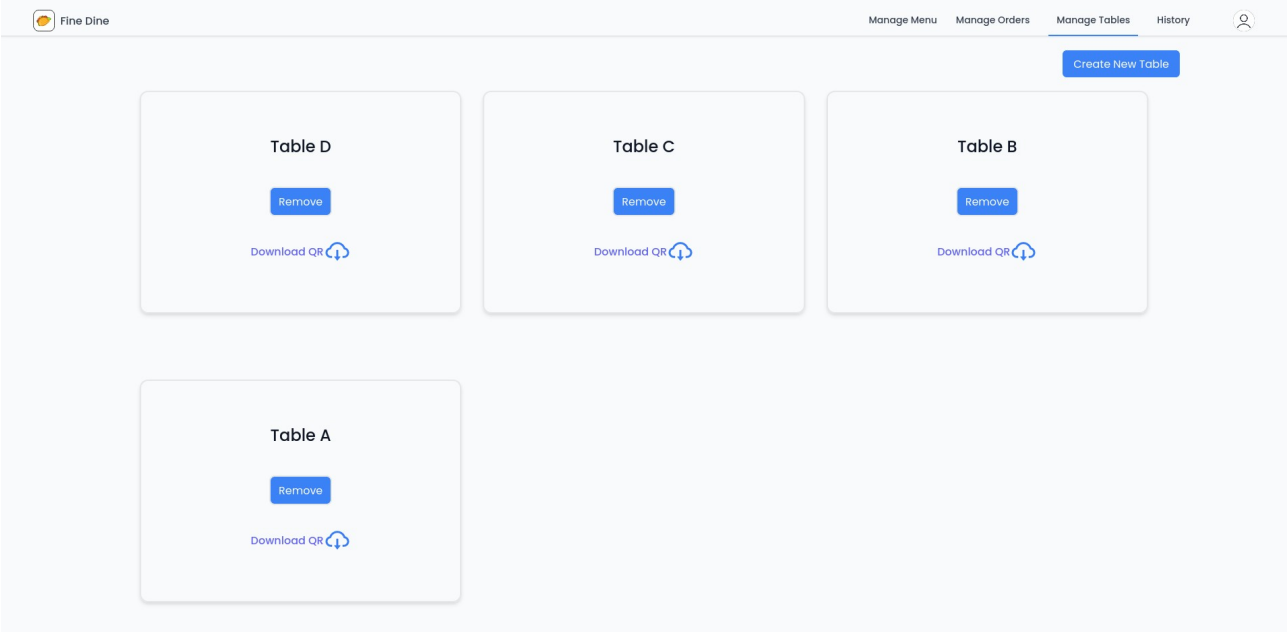
New orders



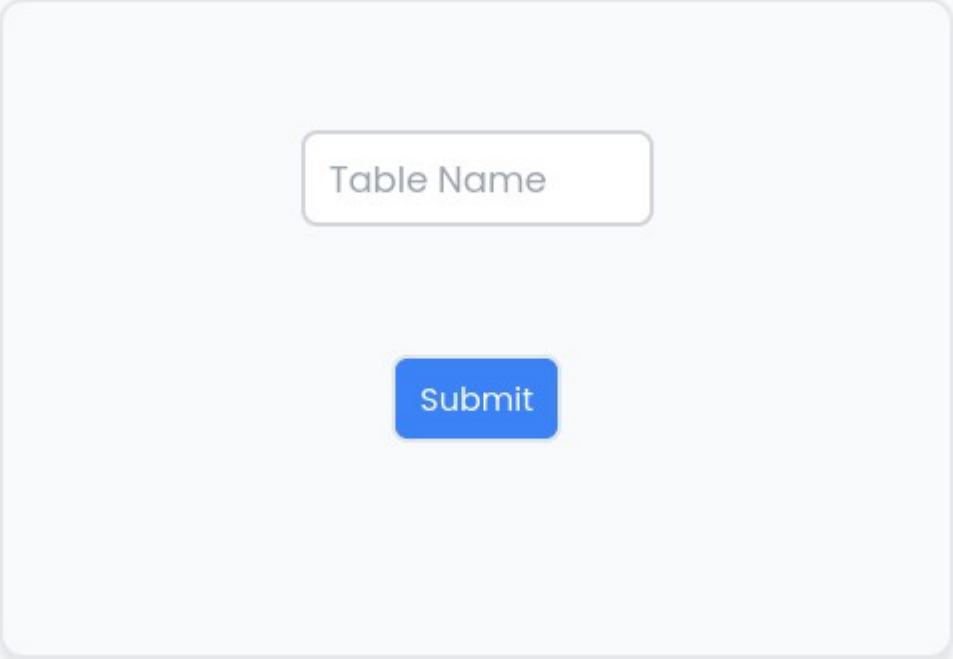
Served Orders



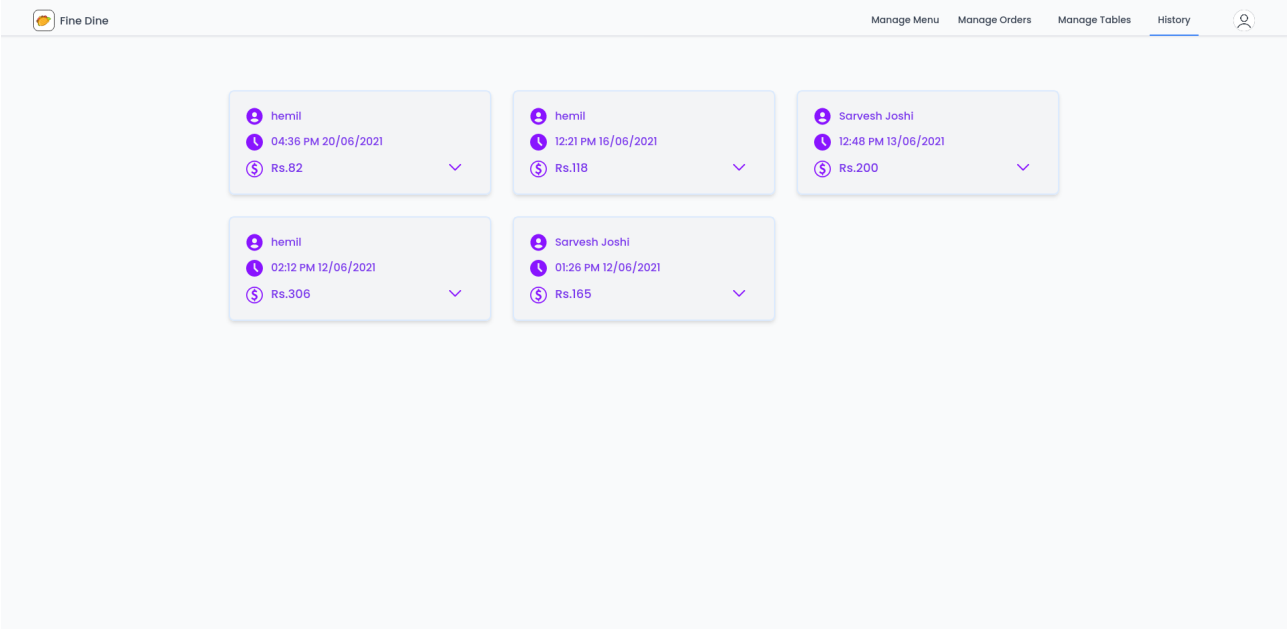
Manage Tables



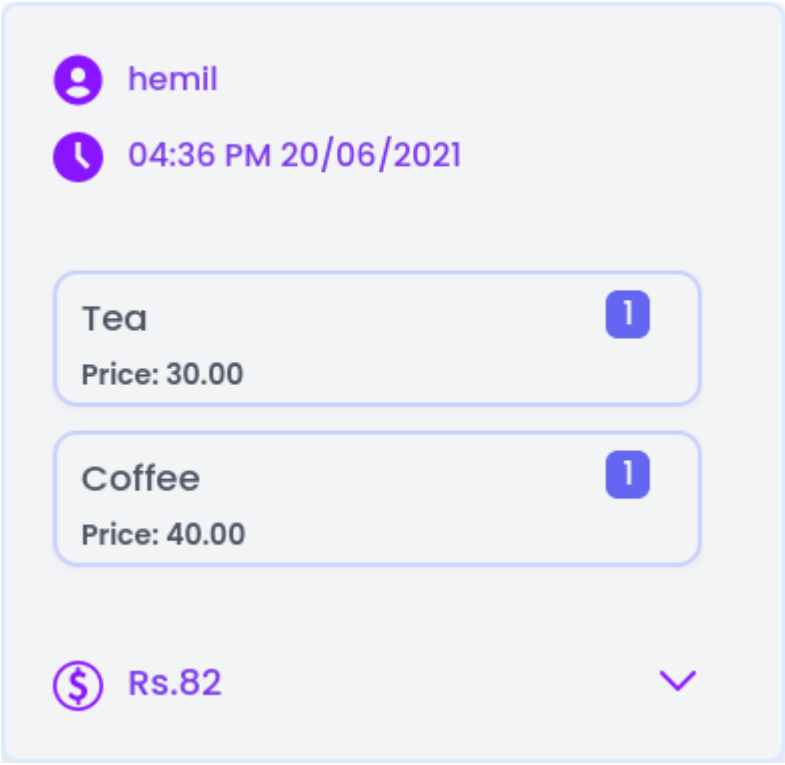
Add Tables



Order history



Detailed Order in order history



Chapter 6

Strengths

- Social distancing is maintained throughout.
- Physical menu card is not needed. The full menu appears on the screen just by scanning a QR code kept on table.
- The process is completely contactless; digital payment (Paytm) has been integrated into the app itself.
- Multiple orders quantities can be ordered by the customer.
- Customer can view his/her past orders in the recent orders tab on the home page of the app.
- Customer can manage his profile from the profile tab on the home page in the app.
- One restaurant owner can create multiple restaurants.
- It makes Restaurants very convenient to manage their daily go-abouts.
- Restaurant operator download a unique QR code for every table for the customer to be scanned when they enter.
- Restaurant operator can add, delete, update their menu from the panel.
- Restaurant owner can view all his order history in the panel.
- Customer bill amount will be directly transferred to the restaurant owner’s account.
- Restaurant operator can check the new order items received after they have been served.
- Restaurant operator can view the status of the order, Paid, Unpaid or Failure.
  Restaurant operator can manage his account from profile tab in his panel.

Limitations

1. Application can't recommend nearby restaurants bases on location.

2. Application can't recommend dishes based on recent orders.

3. Amount of Money earned in some period of time isn't shown to Restaurant Managers.

Chapter 7

Future Scope

1. Create an app for iOS
2. Add restaurant recommendation
3. Suggest Food Recommendation
4. Show trends to restaurant owners
5. Add Feedback system
6. Add Rating to restaurants
7. Add Report restaurants

Chapter 8

Conclusion

We have developed a complete solution for the dine in needs of both the restaurant and the customer. We have managed to accomplish this in a contact-less manner. The system is very easy to use for both the customer and the manager.