TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING

Kathmandu Engineering College
Department of Computer Engineering

Minor Project Report

On

RESTAURANT MANAGEMENT SYSTEM

[Code No: CT654]

By

Abishkar Jung Shah	- 73006
Basanta Niraula	- 73021
Ishan Shrestha	- 73037
Kiyas Piya	- 73042

Kathmandu, Nepal

2076

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PROJECT REPORT SUBMITTED TO

THE DEPARTMENT OF COMPUTER ENGINEERING

IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR

THE BACHELOR OF ENGINEERING

By

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CERTIFICATE

The undersigned certify that they have read and recommended to the Department of Computer Engineering, a minor project work entitled "RESTAURANT MANAGEMENT SYSTEM" submitted by Abishkar Jung Shah - 73006, Basanta Niraula – 73021, Ishan Shrestha – 73037, Kiyas Piya - 73042 in partial fulfillment of the requirements for the degree of Bachelor of Engineering.

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TABLE OF CONTENTS

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LIST OF FIGURES

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LIST OF ABBREVIATIONS

API	Application Program Interface
DBMS	Database Management
DFD	Data Flow Diagram
IDE	Integrated Development Environment
JDK	Java Development Kit
OS	Operating System
SDK	Software Development Kit
UI	User Interface

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CHAPTER 1: INTRODUCTION

1.1 Background Theory

JAVA based android applications are the ultimate way to take advantage of today's technology to enhance organizations productivity and efficiency. It gives us opportunity to access information from anywhere in the world at any time. It also facilitates us to save time and money and improve the interactivity with our customers. These applications are easy to use and can be implemented without interrupting our existing process. Because of these merits of android applications, various applications have been created which has made it possible to use the various features at our ease. Considering these things, we have decided to develop a JAVA based android application called Restaurant Management System(RMS).

In a fast-paced world where people no longer just rely on communication but demand increasingly more than it, the people are continuously busy at their works as they have less time to eat or maintain their health. People nowadays are quite busy with their work so they aren't having enough time to eat the foods or search about the nearby restaurant and their services as well as their dishes. As people use smart phones, they prefer internet to get quick access to information of the nearby restaurant around them. But it is quite difficult to go through each and every websites of a particular organization for information of foods which they are interested to eat. So in order to sort this problem to some extent, we have concluded to make a certain application which would collectively contain all the dishes of restaurant in a single platform.

Often participation in a restaurant is not because of the dishes or their services at all, but rather due to the efforts of organization to make the restaurant look good in appearance. For example, any individual hungry after work they will visit a nearby restaurant without knowing their service or dishes mainly from outward appeals conducted by the restaurant. Similarly, many organizations use large amount of money to a reputation of their restaurant in public eyes which makes the people to think they will provide good services and dishes causing the organization to get benefits. Some people visit the restaurant simply because they like the dishes. Some people participate because of others who are participating in a famous restaurant. Many people are engaging in high standard restaurant because organization makes

their dishes and service to make an impact so people visit them regularly. So, there are various reasons for the people to eat in a particular restaurant.

The restaurant around us may include new restaurant, cafes, hotels, restaurant having a music and concerts, old restaurant having cultural foods and so on. Getting information about these all restaurant and attending them might be difficult because of our busy schedule. So, getting updates about all these restaurants timely by just registering into application can save our time and we don't have to miss the interesting restaurant which we are interested to attend just by reserving the seats and pre-order the dishes in the restaurant.

This application is quite easy to use. With a device connected to the internet, user has open the application to know about the dishes and seats available in the restaurant which is shown in the main menu or food menu after clicking the nearby restaurant. Anyone can access the system from any location to get info of the dishes. If the user wants to know about the particular restaurant's dishes frequently then they can register an account through an email address notification once the dishes pre-order by them are going to be ready in 10 minutes. Similarly, organizers of different organizations can post their special dishes by making an account with organization name, email id and specific code provided by the admin of the application. Thus, this application not only notifies interested customer about the dishes but also assist in publicizing a particular organization about their different dishes prepared by them. So, for better flow of information among the public about foods that are nearby from their location. RMS may be an effective application.

We will be using Java Programming Language for coding segment as it is an object-oriented language and the SDK supports it. For the server-side, we will be using Firebase for the database. We selected Firebase because it is open-source and provides real-time hosting services. Integration with android application is even more easy with firebase.

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1.2 Problem Statement

Most restaurant owners manage menu, orders and employee details manually. Customers on the other hand don't know the menu of a restaurant beforehand. Ordering via call can be time consuming and person on the listening end might mishear. Due to the rapid advancement of technology and the pace of the modern world people often run out of time. That's why we decided to make this application.

With the help of this application, customers and restaurant owners will have ease to access and manage the restaurant respectively.

1.3 Objectives

- To improve restaurant management system and food ordering system.

1.4 Scope

The different areas where we can use this application are:
- Any individual who has access to internet and a smartphone.
- Any restaurant that has a home delivery service.

1.5 Applications

- To order and reserve food from the restaurant.
- To manage restaurant menu, track orders and customer details

CHAPTER 2: LITERATURE REVIEW

Today internet connections have altered the world and people's life. The world has been made a small place. Significance of mobile phones cannot be denied. In a short period of arrival of Smartphone, they have altered the meaning of phones completely. Mobile phones had only been used for phone calls and text messages. But with the advancement in the technology, a lot of changes have occurred in phones and their uses.

The invention of Smartphone has been astonishing. People are being very fond of this device. Almost everyone has access to a personal Smartphone. They have been helping us in our day to day life so much that we cannot think modern life without it. These days we can find an application for everything we can imagine. We have apps for communication and entertainment. With an application, all aspects of our lives can be simplified.

The project is developing because many restaurants have a lot difficult to manage the business such as customer ordering and reservation table. So, online restaurant management system will develop to help the restaurant administrator to manage restaurant management and for customer make their online ordering and reservation table. Other than that, this project is to upgrade the manual system and make the business easily to access and systematic. Many restaurants manage their business taking manual orders.

There are many android apps that help user to reserve seats or request home delivery from a restaurant. Some good examples are "Bhoj" and "Foodmandu". Both these apps are used for food delivery and seats reservation of restaurants. Most of the apps are focussed mainly on delivery of food with their staffs as a delivery person. They lack proper way of reservation of table and pre-ordering services and mainly management of restaurant itself. However, we are adding additional features in our RMS. Our project will allow the customers to order food and reserve seats as well as enable restaurant owners to manage restaurant resources and orders. We will include additional features such as tracking the location of the delivered food and also pre-ordering foods after reserving a table at a restaurant [1].

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CHAPTER 3 – METHODOLOGY

3.1 Methodology

The app will be developed using Android Studio platform with the implementation of Java and Android for front end. We will use integrated Firebase database with our android application. Firebase is used as database and data is fetched and stored using integrated codes in our android application.

3.2 Software Process Model:

Software Process Model is a simplified depiction of a software process that describes the sequence of phases for the entire lifetime of the product. Software Process Models often represent a networked sequence of activities, objects, transformation and events that embody strategies for accomplishing software evolution. Therefore, it is standardized format for planning, organizing and running on a development project.

3.2.1 Prototyping Model:

The prototyping Model is the model of software development life cycle where 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 [3].

In this model our team and client interact to establish the requirements of the software. Essence of prototyping is a quickly designed model that can undergo immediate evaluation. This is followed up by quick design in which visible elements of software, the input and the output are designed. The client then evaluates the prototype and provides its recommendations and suggestions to the analyst. The process continues in iterative manner until all the requirements are met.

Prototyping Model includes following steps

1. Requirements Analysis
2. Design
3. Building and prototyping
4. Evaluation by customer
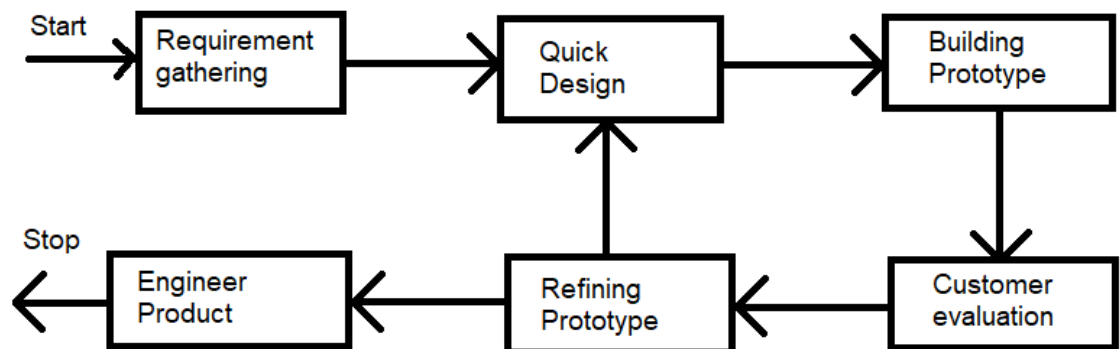5. Refining prototype
6. Deployment of final product

Figure 3.1: Prototyping model diagram

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3.3 Tools used

We used Android SDK to develop this application for Android platform which is implemented using Android Studio as an IDE.

3.3.1 Android Studio

Android Studio is the official integrated development environment (IDE) for Android Application development. It is based on the IntelliJ IDEA, a JAVA integrated development environment for software and incorporates its code editing and developer tools. To support application development within the android operating system, Android studio uses a Gradle-based build system, emulator, code templates, and Github integration, every project in Android Studio has one or more modalities with source code and resource files. These modalities include Android app modules, Library modules, and Google App Engine modules.

3.3.2 Android SDK

Android SDK is a set of development tools used to develop applications for Android Platform. The Android SDK includes the following:

- Required libraries
- Debugger
- An emulator
- Relevant documentation for the Android application program interfaces(APIs)
- Sample source code
- Tutorials for the Android OS

Every time Google releases a new version of Android a corresponding SDK is also released. Although the SDK can be used to write Android programs in the command prompt, the most common method is by using an integrated development environment(IDE) i.e. Android Studio.

3.3.3 Firebase

Firebase provides a real-time database and backend as a service. The service provides application developers an API that allows application data to be synchronized across clients and stored on Firebase's cloud. The company provides client libraries that enable integration with Android, iOS, JavaScript, Java, Objective-C, Swift and Node.js applications[4].
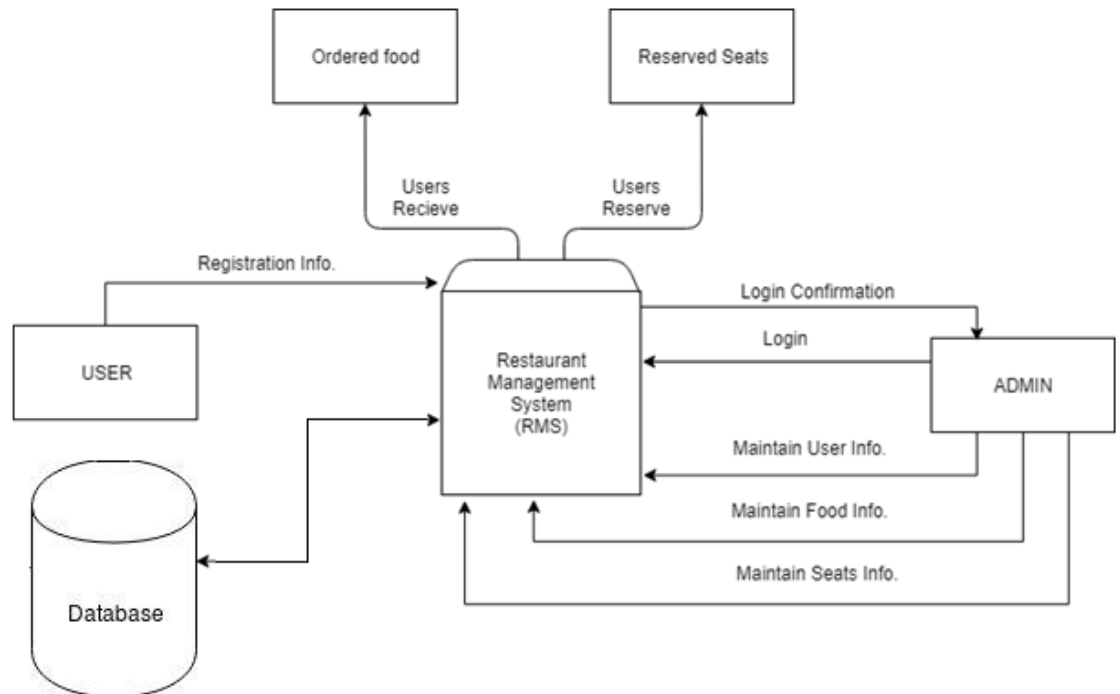
3.4 Block Diagram

Figure 3.2: Block diagram

The database of the app is the main hub of the system. The user enters their info into the database and the login/registration process is verified. The restaurant staff can manage the database using the PC application that we will provide. The app will be used to both order foods and reserve seats. The admin will facilitate and verify the system from the software provided.

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3.5 Algorithm

Step 1: Start

Step 2: Enter the login screen

Step 3: Did the user login? If yes go to step 6, else go to step 4

Step 4: Do you want to register? If yes go to step 5, else go to step 2

Step 5: Read the user name, email address and contact number and register the user's details in the database

Step 6: Enter the main user interface

Step 7: Navigate through the user interface and use the options as per the need. If the user selected "Order", go to step 8. If the user selected "Reserve seats", go to step 17

Step 8: Display the menu of the restaurant

Step 9: Read the food and the quantity

Step 10: Calculate cost of the food. Price= Food x Quantity

Step 11: Does the user want the order tracked? If yes go to step 12, else go to step 13

Step 12: Add additional cost. Price=Price + 20

Step 13: Proceed to the transaction as chosen by the user

Step 14: Is the transaction complete? If yes go to step 15, else go to step 13

Step 15: Notify the restaurant staff

Step 16: Notify the delivery staff and go to step 26

Step 17: Display the seats layout of the restaurant

Step 18: Read the required seat number from the user

Step 19: Is the requested seat free? If yes go to step 20, else go to step 18

Step 20: Does the user want to preorder foods? If yes go to step 21, else go to step 23

Step 21: Display the menu of the restaurant

Step 22: Read the food and the quantity

Step 23: Proceed to the transaction through online banking services

Step 24: Is the transaction complete? If yes go to step 25, else go to step 23

Step 25: Notify the restaurant staff

Step 26: Stop

3.6 Flowchart
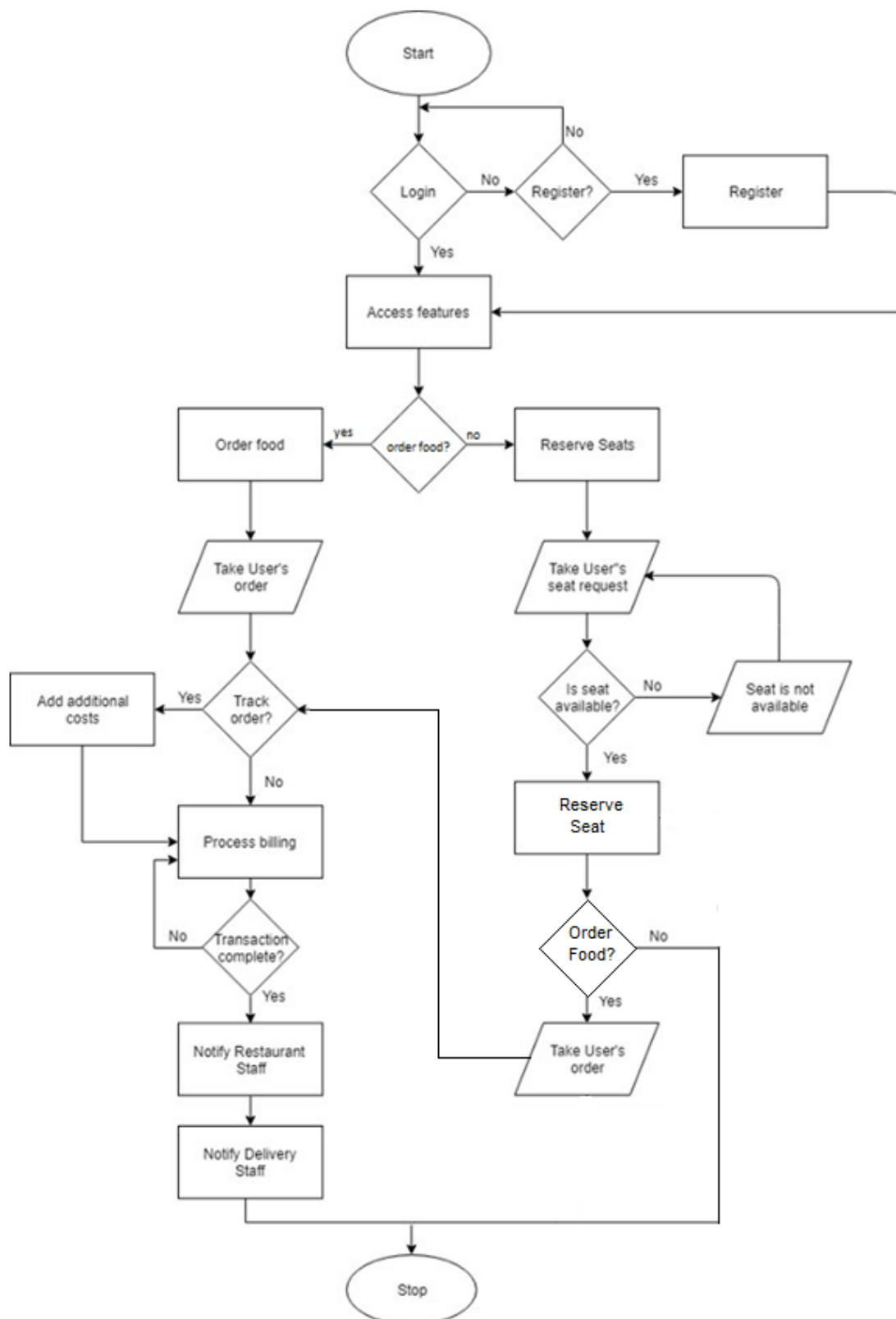
Figure 3.3: Flowchart

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3.7 Use Case Diagram
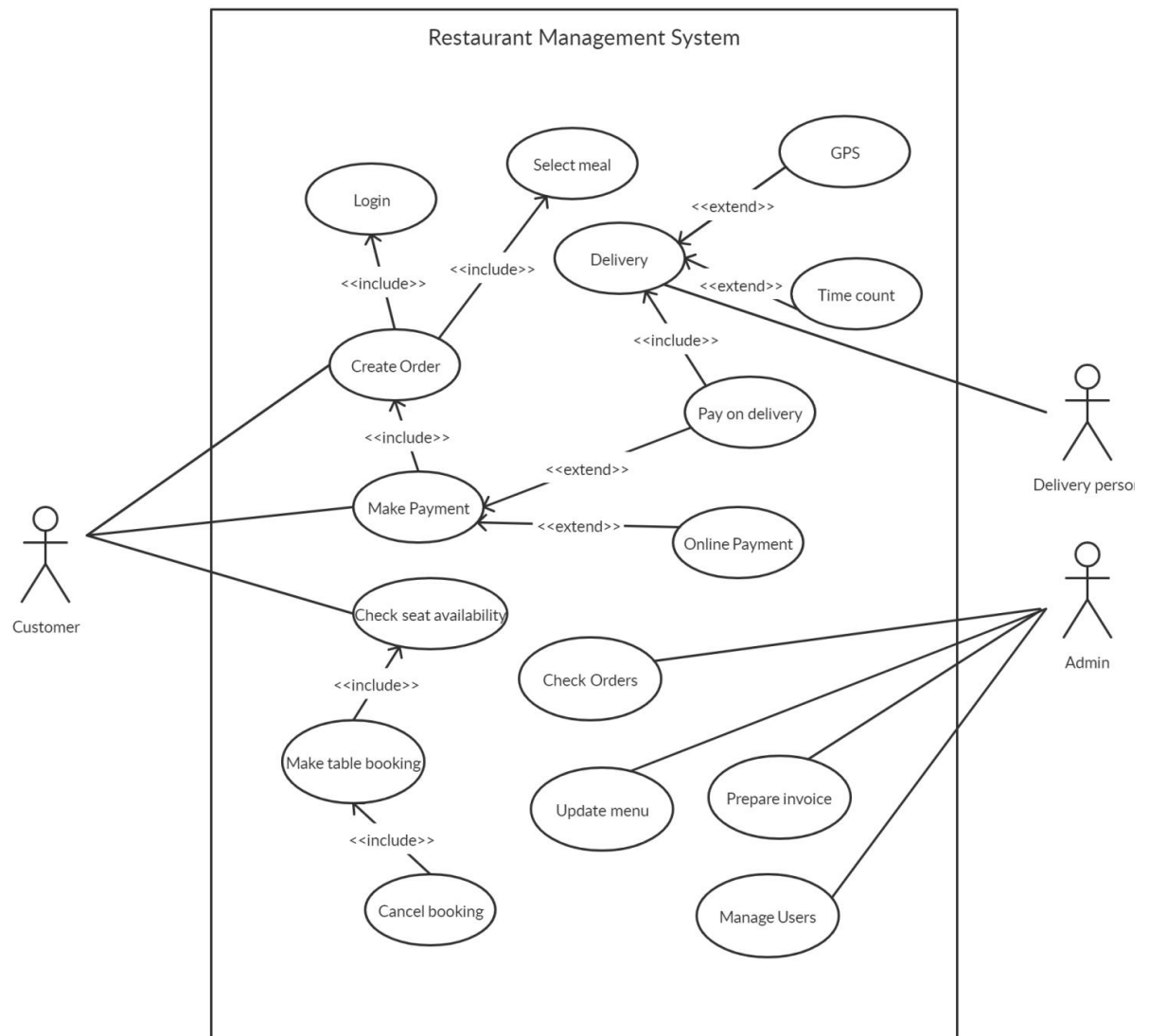
Figure 3.4: Use Case Diagram

3.8 UML Diagrams

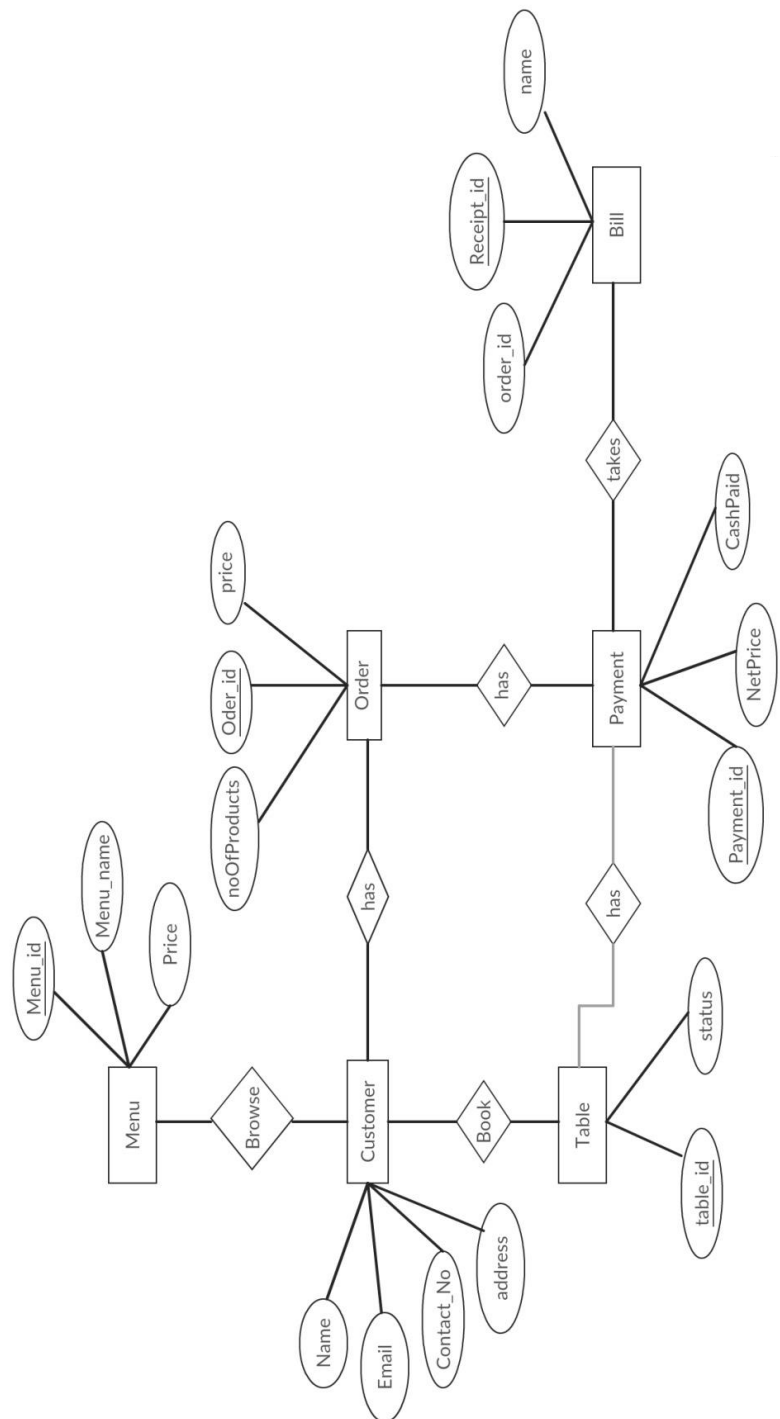## 3.8.1 ER Diagram

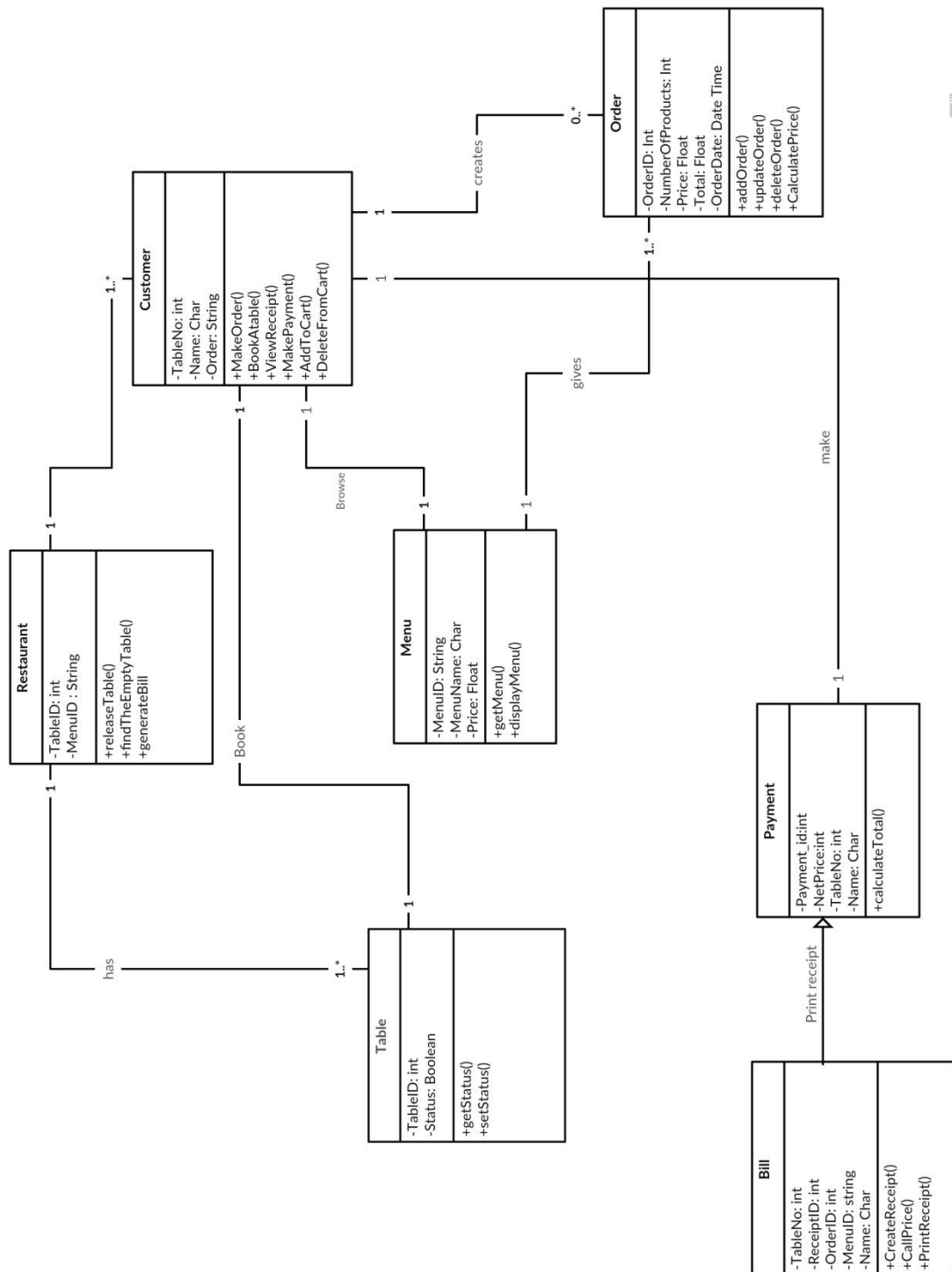Figure 3.5: ER Diagram

3.8.2 Class Diagram

Figure 3.6: Class Diagram
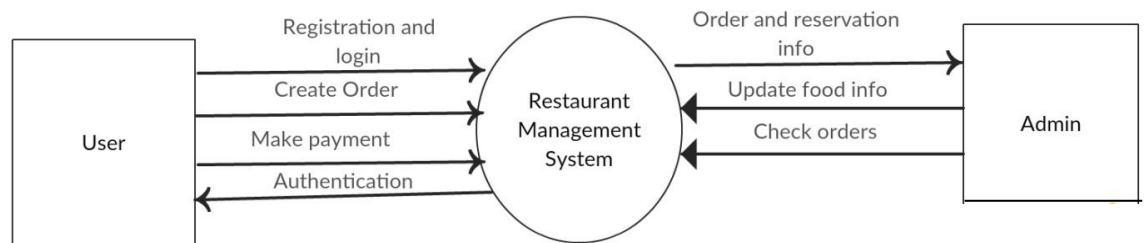
3.8.3 Data Flow Diagram (DFD 0)

Figure 3.7: DFD level-0

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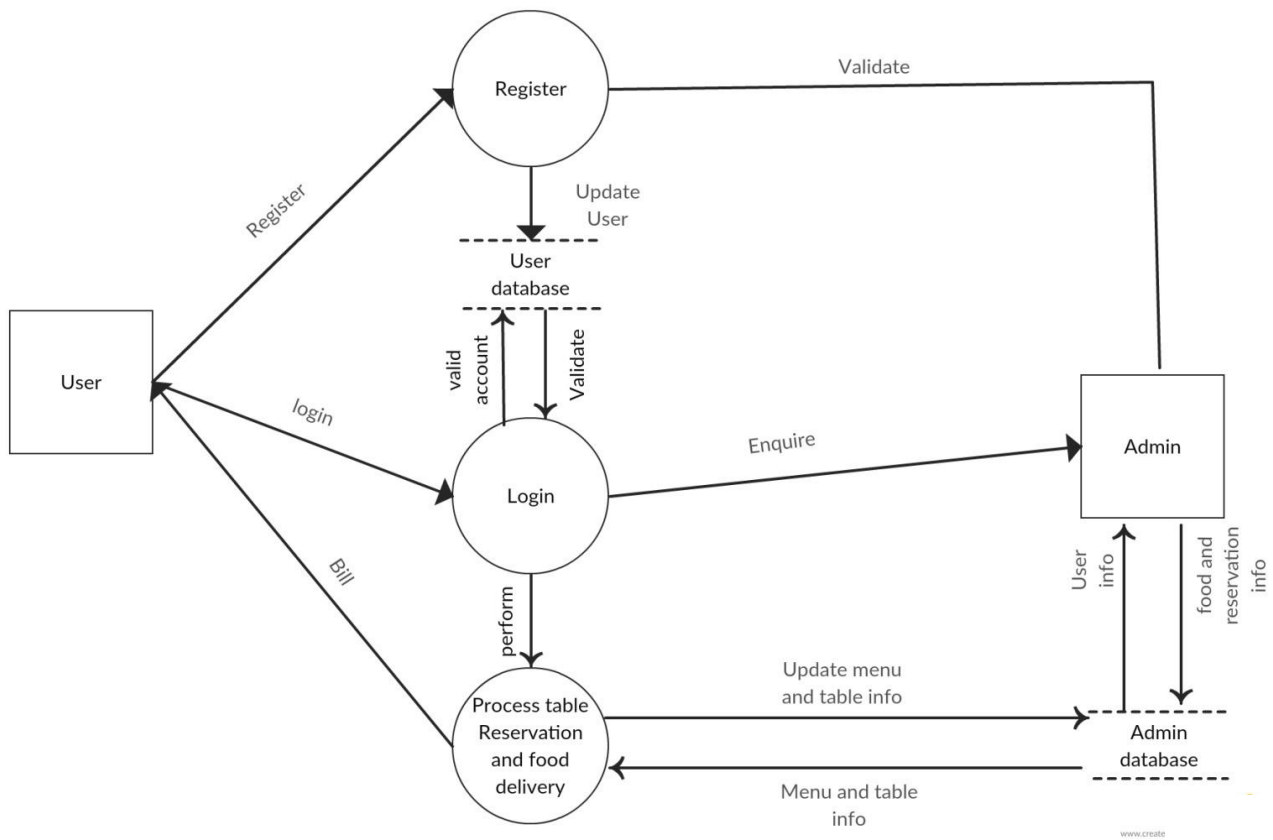### 3.8.4 Data Flow Diagram (DFD 1)

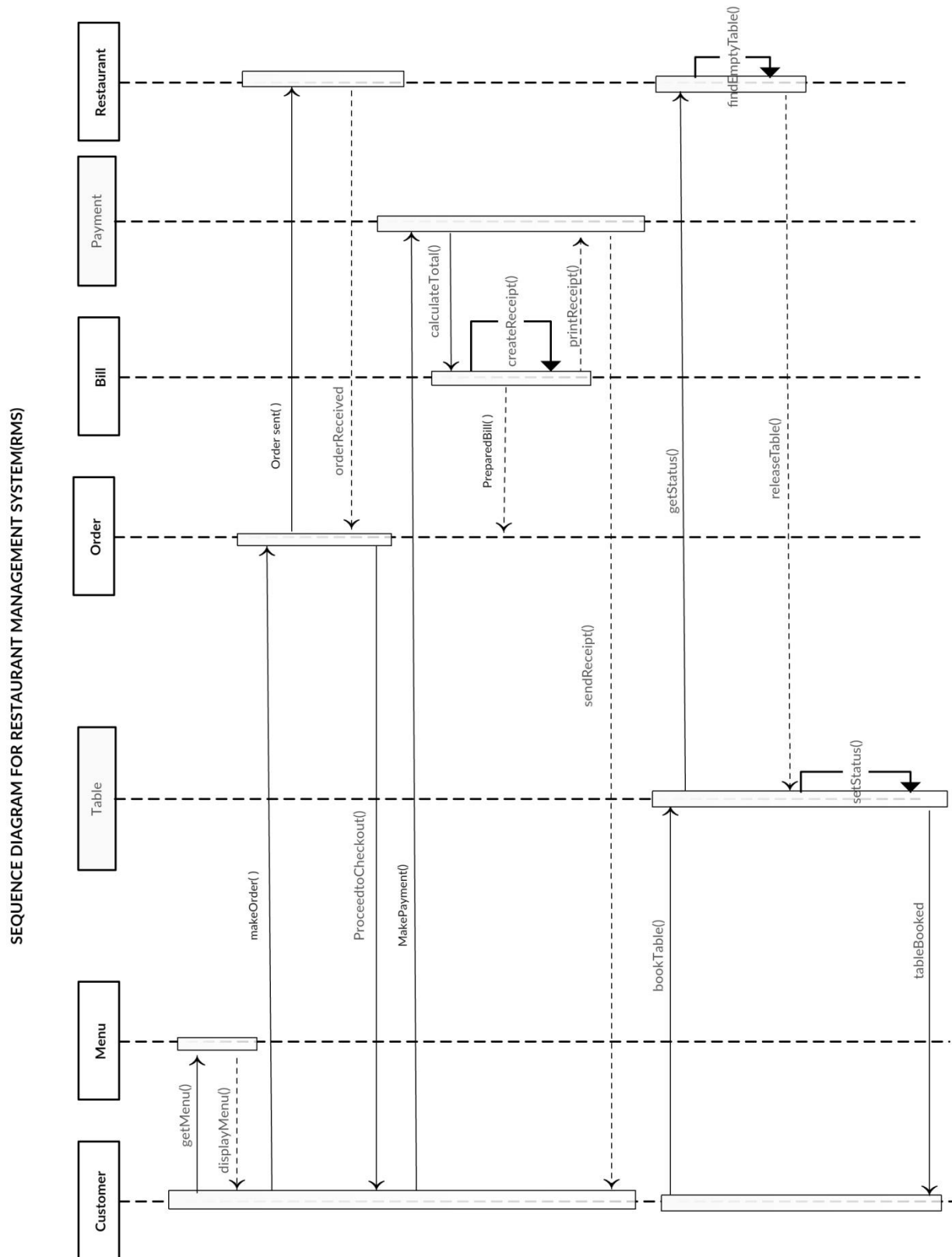Figure 3.8: DFD level-1

3.8.5 Sequence Diagram

Figure 3.9: Sequence Diagram

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CHAPTER 4: EPILOGUE

4.1 Discussion

Restaurant Management System therefore enables restaurant owners to keep track of their inventory, staffs, table status and menu. On the other hand it also enables customers to check the menu and pre order food along with the facility of home delivery system. With the implementation of payment system, users can pre pay for the food or go for cash on delivery.

4.2 Conclusion

Hence, the restaurant owners can manage their restaurants effectively and easily. Customers on the other hand can order their foods as desired easily using this online platform. In this way the system fulfills the objectives of our project.
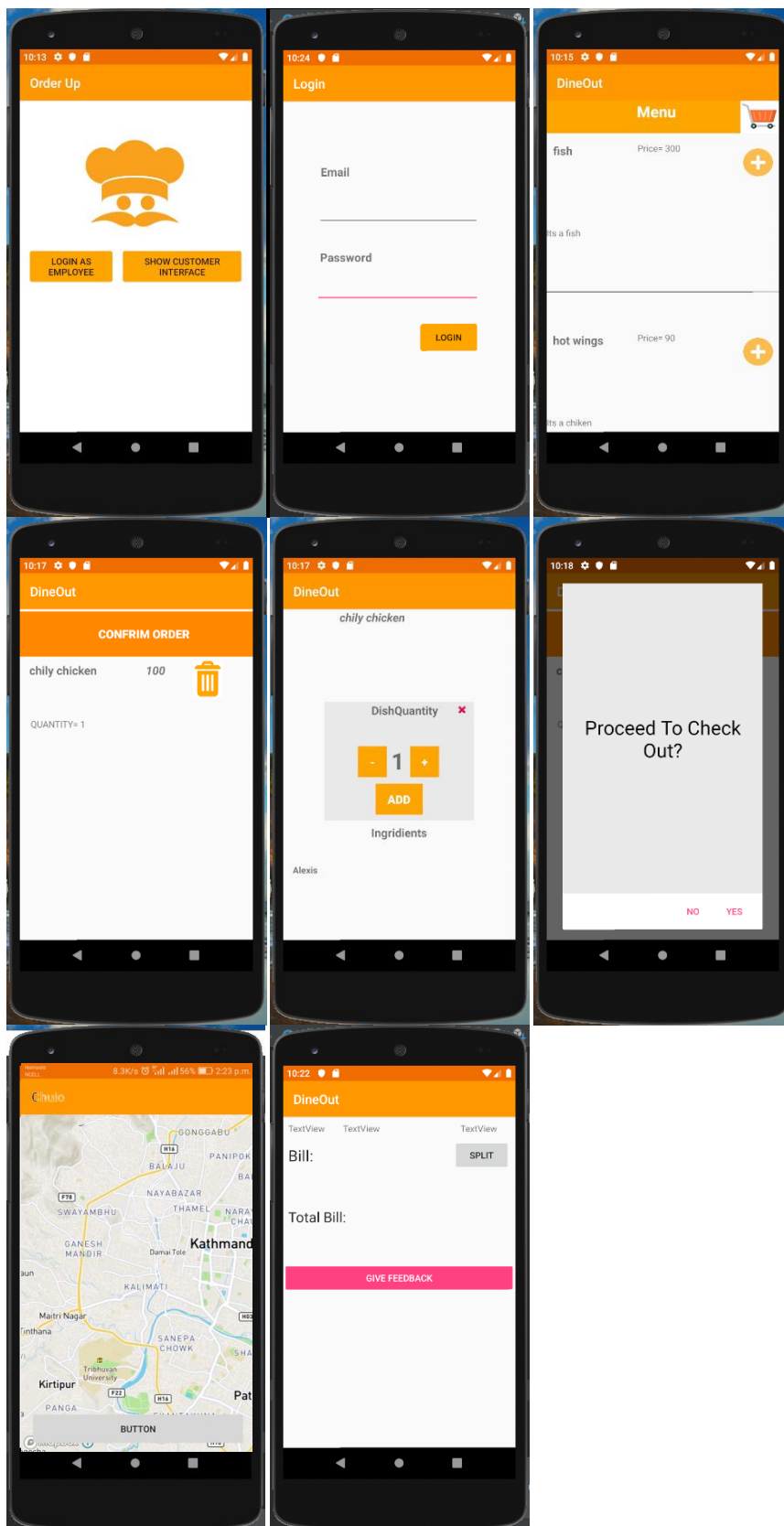
4.3 Future Enhancement

- Implement online payment services

4.4 Bibliography

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4.3 Screenshots

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