"Smart Restaurant Management System"- an android based mobile application

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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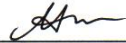**DHAKA, BANGLADESH**

MAY 2019

APPROVAL

This Project/internship titled **"Smart Restaurant Management System"**, submitted by Md.Rayhan Uddin HImel, ID No: 153-15-6385 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 4/5/2019.

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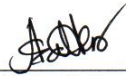Daffodil International University

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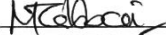**Dr. Mohammad Shorif Uddin**   External Examiner
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DECLARATION

I hereby declare that, this project has been done by me under the supervision of Mr. **Masud Rabbani, Lecturer, Department of CSE**Daffodil International University. I 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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Finally, I must acknowledge with due respect the constant support and patients of our parents.

ABSTRACT

Smart Restaurant Management System is an android application which aims to help the Restaurant Owner,Manager, Chef and mostly the Customers. This project is for easing to buy food and run restaurant business. There is having some application like my application. A few Restaurant management applications in play store. My application is needed for busy owner of restaurant who has not enough time to give the restaurant and the customers who can bye and order food from their phone. If any user enters my app, first see there are two option of this page customer or employee. Then he/she see the homepage and 4 modules in home page. Chapter, question bank, test and compiler. So this plus point for a user. He/she fully complete this whole course then he/she write code and solve basic problem. Smart restaurant management system application is really useful for advance world.

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INTRODUCTION

1.1 Introduction

Today's world is going fast and every technology is going fast. is most popular in present technology. Today's world time is so limited. Now a user gets everything which is really helpful for them. Previously they have to expense time and energy to by food and maintain restaurant business and human recourses also. There are many helpful app for ordering food but there no app has that owner can also handle his /her business with one same app. Owner can see business database that all data have inventory, sheaf, customer order . This app is really helpful to Owner and the customers. Both can save time money and energy also.

1.2 Motivation

Every People need to eat. So many people ordering food by going restaurant by going by own. For this they lose their time, energy and extra money also. On the other hand owner can maintain his business with this app that he can save his time and also by using this app.

 If the owner has many business or job he can't be always stand by in one business. Owner can see all the database of sell, inventory and employee. So he can monitor his business.

For this app menu will be in phone that's why we don't need any hard copy or book menu. We don't need water also cause now a day's robots r using for serving many restaurant.

If there is there automated then we need automated system also. Customer can order by this app and pay the bill with many ways without any cash. We know now currency is digital. So using this app everybody consume their time, money and energy and the app is need of time.
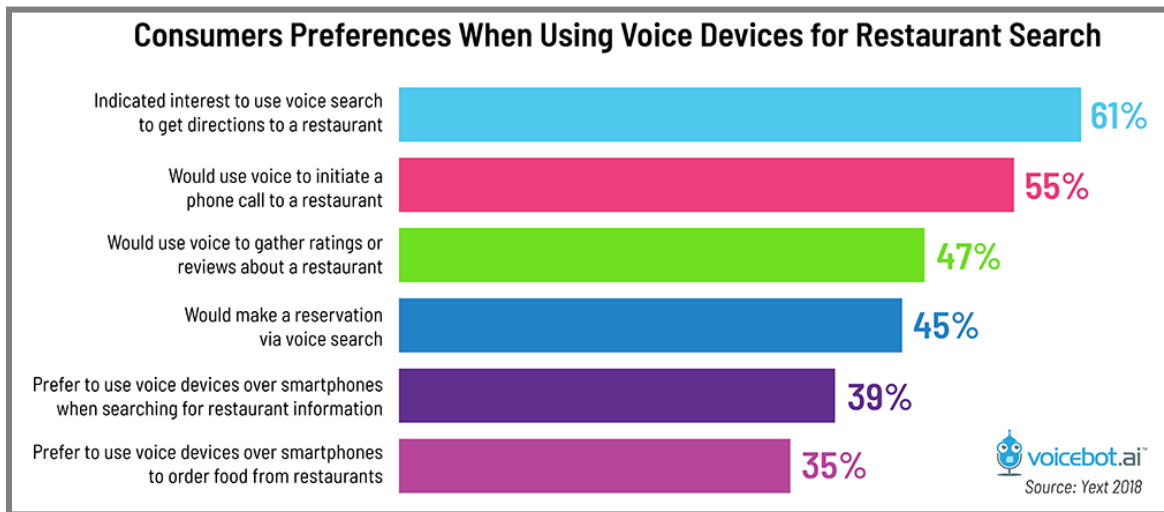
Figure 1.1: A Screenshot of Customer preference of restaurant search

Figure 1.1 is the search result of restaurant from people and its take from Google [2].

1.3 Objectives

Smart management system is the main motive. Everybody use android phone. Today's world android app is so popular because it's in people cell phone. At present everything's is in android app like controlling home accessories , flying drone ,finding Ubar, GPS tracker , ticket booking everything. Actually all of the world using android OS in their phone that is handy and developer make app for android for easiest life. That's why I try to build this app. Today's world is changing fast. Many restaurants serve their food with robot. So there need a smart system also .Because of world need I decide to build this app.

1.4 About my App

This is basically a restaurant management app. In App-store there bunch of restaurant management system app but there is a short amount of app that automated. By using this app many customer and owner save their time money energy. In my app few menu added. This application is for the whole wide world every can use this app by adding there database .In App store just few restaurant management system Application and that's not enough smart and automated.

Everyone want small device like phone it's also portable and easy to carry. So that the major concept in our application. We use Android studio to build this app. We design our app in xml file and code into java file. For data we use firebase database which works with json type data.

We try our level best to improve and automat this and this application is beneficial for all people customer and owner of restaurant. This application is easy and automated that's the main point.

1.5Scope of the Project

Basically this app based on automated the upcoming restaurant. So I think user will be happy and take this app. Because of easily touch the all concept. In my app every topics is very easy way to use. I use firebase database for store data. Everyone can order and get food by this app. Overall it will be unique automated smart restaurant management system.

CHAPTER2

BACKGROUND

2.1 Introduction

This part will provide an overview of the Smart Management System application. The primary functionality of the system as well its context will be explored in detail. It also describes unique sorts of stakeholders and user instructions related with the gadget and what functionality is available for each class. At last, the assumptions and dependencies for the gadget are presented.

2.2 Related Work

When we decided to build this app and website as our final year project, we looked through Play-store and found no such app that is like ours. However, there are apps which have one or two features like us but not like this, that's the main different concept of this app. But I try my best to improve something which really looks like different. I try to bring the concept in here. This basic concept improves the weak student for understanding. But our app is static not dynamic and there is no database in my app.

2.3 Product Perspective

Smart Management System app which not follow the traditional way ordering get the food . We create mobile software and we store our data in firebase database. The cell phone application will use for ordering food and the firebase data base will store all the menu food ingredients and make the queue for this food. Each for admin customer manager and chef admin and chef manager vacancy and report two available reserve tables customer will see the menu list and order the food and pay the bill and give a review. Customer also can see the price make the quantity what he need when customer order some food then it should be the pending orders in table in firebase database. Head Chef's interface will be such that he is notified of the pending order and he is capable to assign it to one the available queues of chefs who are then able to see the new order in their monitors or on a central display in kitchen. After every item/dish in an order is prepared, the order is marked completed through the Head Chef's interface, the hall supervisor gets notified thru his interface. Customer's interface has an option for asking

for the bill. Bill is printed thru the Manager's interface. Admin can exchange and regulate the Firebase database like add new menus or staff, edit modern-day inventory stock etc.
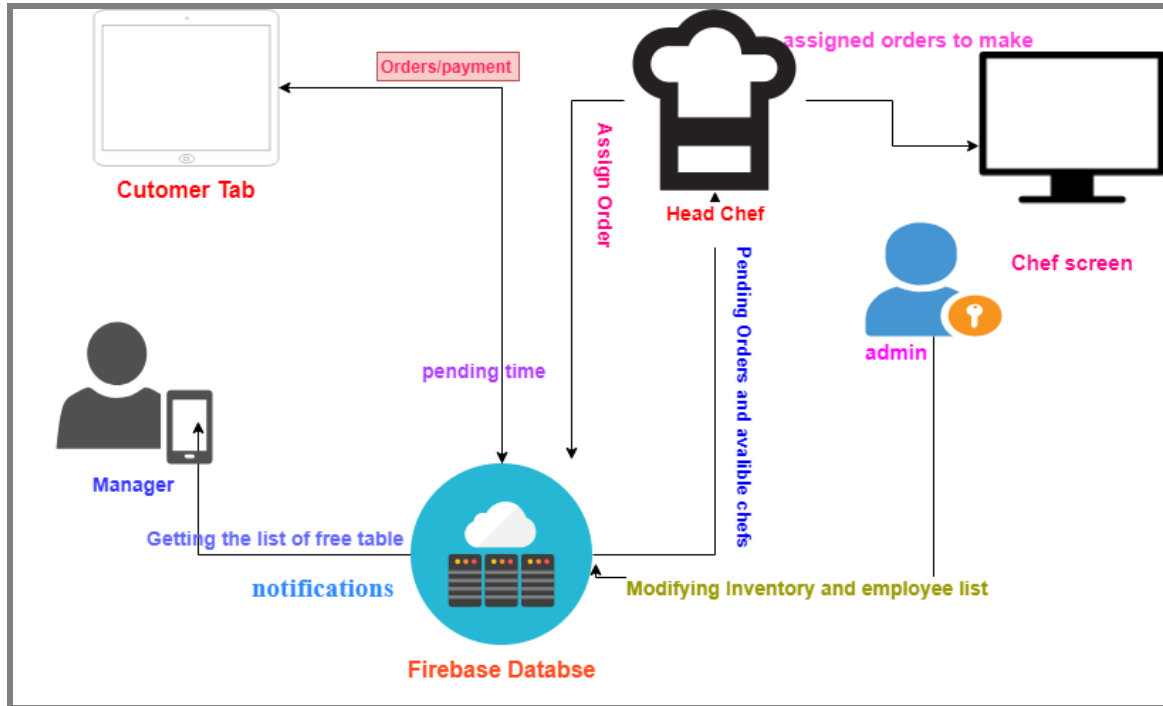
Figure 2.1: The system diagram of Smart Management System.

2.4 Our Project Work

We wanted to build an android application related automated management system for restaurant. With some extra useful features, of course which will useful the food lover, restraint owner and some employee. We wanted our application as a complete package. In our project we try to focus on how to easily order the food. In our project basically it's an android application that's why we use Java and XML programming language. Our fully front page made by XML. In our project we use firebase database part. This application is for all the people customer and owner. My project has some lacks in database we try our level best to improve this as well as possible. This is can be solved [4].

2.5 Comparative Studies

This android application has some limitation. They are mostly depends on database if the database is not fully workable then the application can't be run smoothly. User might have to install the application for ordering food. Our app is fully dependent on database so simple lack of data bases a big problem. Our application only for the mobile not for other platform we hope user can use it and enjoy it more. I know we will make it as a home delivery and something is a big project about our mind.

User cannot contact others because there is no community feature available in the applications. They cannot share their experience and feedback. They will not be able to help others and receive first hand help from others too.

Our application is just only for mobile device not for others. We hope that the user interface is user friendly enough so the users will enjoy using it. We hope they will enjoy using it because it is easy to handle and it will be helpful for the situation.

2.6 Challenges

The machine should be interactive, and the delays can't be acceptable. So, in every situation response of the system, there are no on the spot delays. In case of scrolling through the menu there ought to be a extend of no more than 2 second earlier than the internet web page of menu is shown in any other case our people's eating in journey is affected. The order needs to be placed in pending orders and be seen to the head chef/chefs in much less than 1 or 2 minutes to begin the preparation. Cancel Order/ updates can be made with little delay to avoid transport delay. Also, when connecting to the Firebase server to make a worthwhile connection have to be much less for remarkable real time communication.

CHAPTER3

REQUIREMENT SPECIFICATIONS

3.1 Business Process Model

Business process modeling (BPM) is the activity of representing the process of an enterprise so the current process can be improved, automated and analyzed. The term 'business model' is thus used in very familiar way and for a broad range of informal descriptions to represent core aspects of including purpose, structures, operational process and policies. The main characteristic of the methodology is based on diagram as 'Flow diagram'. Here we are trying to describe our projects business model using Data Flow Diagram. Normally, Data Flow Diagram [6] describes form Google and how data flow is processed though a system or project.

A DFD shows what kind of information will be input to and output from the system, how the data will advance through the system, and where the data will be stored. It does not show information about process timing or whether processes will operate in sequence or in parallel, unlike a traditional structure flowchart which focused on control flow, it's like as diagram. Which stay in all application because this is the main structure for an application and for understanding. By business model a user can realize how can it works and that's the main point. Where it uses and where its use-case. A developer always tries to invent his/her business model by his/her own way. Because every application is unique that's means dissimilar with each other. An UML activity workflow diagram, which presents both control and data, flows as a unified model.

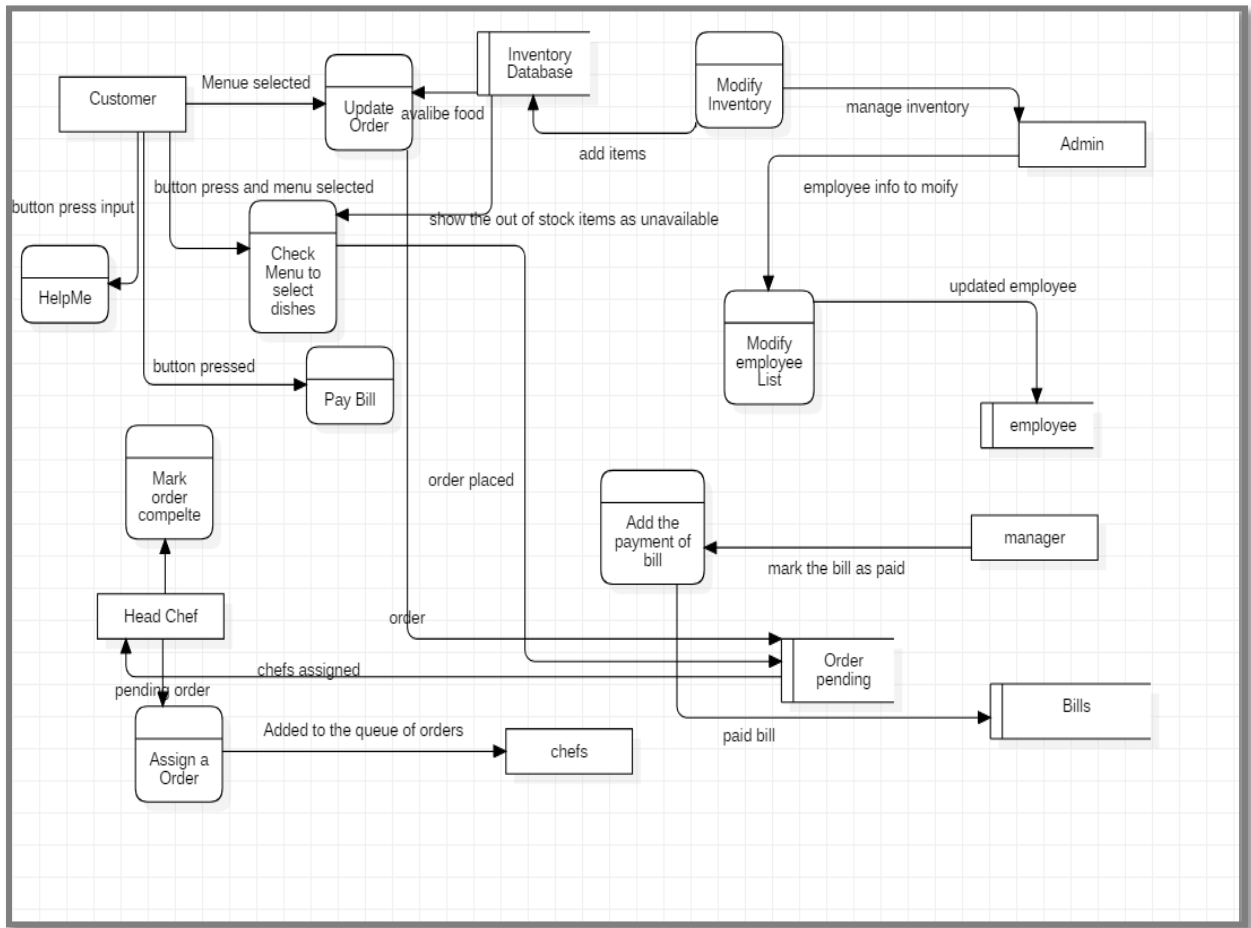Figure 3.1 shows the Data Flow Diagram of Smart management system.

Figure 3.1: The Business Process model of Smart Management System.

3.2 Requirement Analysis

Requirement analysis is also called as requirement engineering which is the process of determining user expectation for a new system. These features, called requirements, must be quantifiable, relevant and detailed. Requirements analysis involves frequent communication with system users to determine specific feature expectations. Resolution of conflict or ambiguity in requirements as demanded by the various users or groups of users, avoidance of feature creep and documentation of all aspects of the project development process from start to finish. For the project development process, there are two types of requirements. One is functional requirements and another is non-functional requirement.

3.3 Functional Requirement

1: User interface must have bunch of menu list. Each menu will have type of the dish. Below the dish it indicates the price in taka per and ingredients.

2: The application should exhibit all accessible and unavailable food to the Customer.

3: Tap on any of the shown menu will end result in a popup for extent and a green mark after extent has been selected.

4: The popup for extent enters will now not permit the consumer to enter letters, bad numbers or any invalid characters.

5: After finishing the order the application will display a timer "Time to serve the order" and it is the required time to serve the food. The food view the formerly queue. It also indicates a cancel order button.

6: Unavailable food should be displayed but their options need to be off.

3.4 Non-functional Requirement

The gadget should be interactive, and the delays involved must be less. So, in every action-response of the system, there are no instantaneous delays. In case of scrolling thru the menu there ought to be a lengthen of no more than 2 second before the subsequent web page of menu objects is displayed otherwise our people's dining ride is affected. The order must be positioned in pending orders and be visible to the head chef/chefs in less than 1 second to begin the preparation. Cancel Order/ updates need to be made with little delay to avoid shipping delay. Also, when connecting to the Firebase server the extend to make a profitable connection have to be less for high-quality actual time communication.

3.5 Use Case

Abuse cases a list of actions or event steps typically defining the interactions between a role and a system to achieve a goal. Use-case always use for user understanding and we try our level best for efficiency.
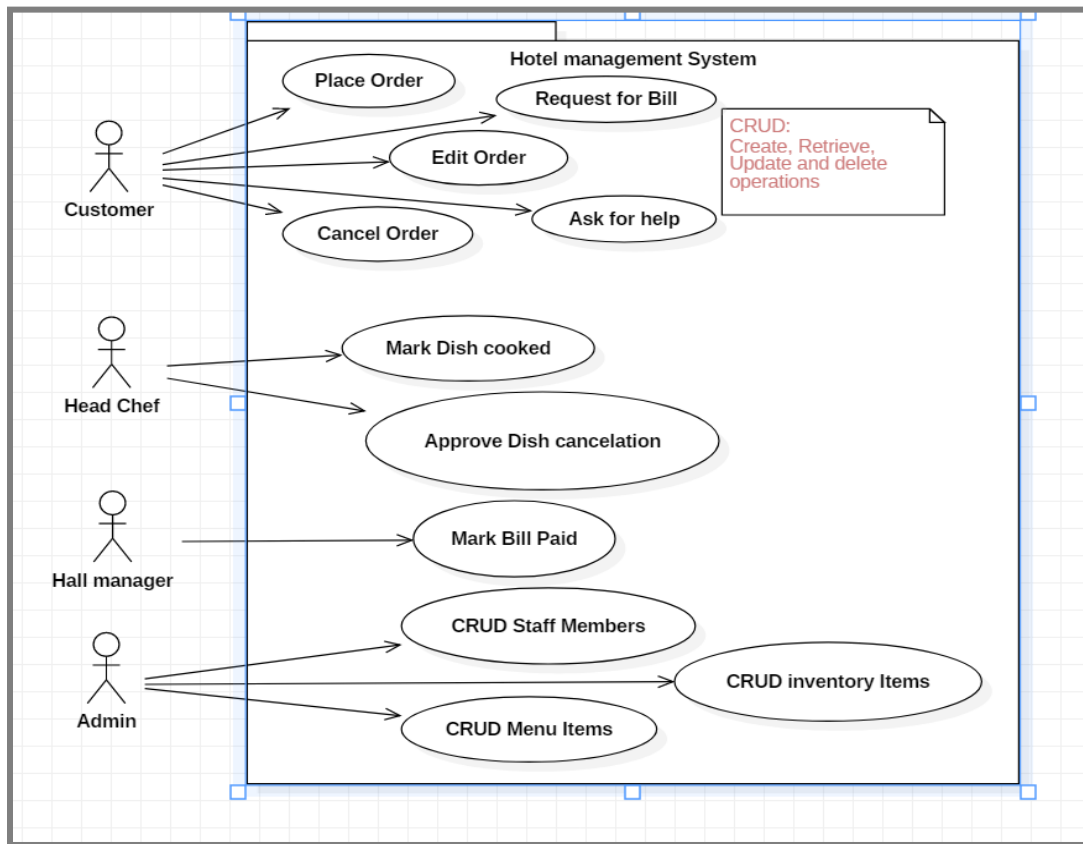
Figure 3.2: Use-case modeling of Smart management system

Here in figure 3.2[7] we show how to use this application and first homepage and then all. Here a customer come the restaurant and he can place the order then he can confirm the order he can edit order and cancel order. If he get into any problem then he ask for help. After all this things he can request for the bill. And the other hand the head-chef select food how much time you need the cook this and approved is this cancellation. Manager collect the bill give the receipt. Admin can create retrieved update and delete members inventory items menu items at table everything.

3.6 Logical Data Model

Logical data model [8] mainly consisted of few elements like, data entities, attributes and keys and relationship between the entities. By which the organization data and business rules is defined and govern the relationship between them. As a Back-end we use core object oriented and Front-end XML. In my application there firebase database section

and no SQLite as database server. Our application is a firebase and java application so that's why there is so much dependency on database.

3.7Design Requirements

1. In our system we have two parts of users One are admin and one of our customers we don't have any barrier in customers but we have a login ID and password for admin and employees [9].

2. I have design profile system that means display new name and password for admin and employees.

3. Design compiler system not use online compiler in app.

4. We design whole database and all important code design in the app.

5. Our app maintains a sequence. Customer has to maintain a sequence to order admin need to follow the sequence also.

6. We design a forum section where user can give a feed back to this.

7. Our app design is so independently. Everybody can understand the app option.

8. Design database so that's why use firebase database which is free and easy. This is so many dependences on database. So simple lack of database is a big deal.

We are trying to build our app as a complex free. We think about user when we design our application. Because of this reason, our android application is so user friendly. In app store there is no many automated system. So an application as an automated is so needed.

CHAPTER 4

DESIGN SPECIFICATION

4.1 Front-end Design

The front-end is everything involved with what the user sees, including design and some languages. The front-end design is the interface users see when he/she opens the app or website. That means to keep the users interested in the application and website, the most important part of a project is front-end designing. Usually most of the users expect a simple user interface or graphical user interface from the developer. If the front-end design is so complex, the application fails to attract of the user.

The front-end design of our project is as follows

Figure 4.1: A Screenshot of Home Page of Smart management system

Figure 4.1 show us, this is the homepage and all button in here which user like most. Press any button and enter this. User can be customer admin employee. Customer has the show customer interface button and admin employee chef can log in with their won email and password by clicking log in as employee button.
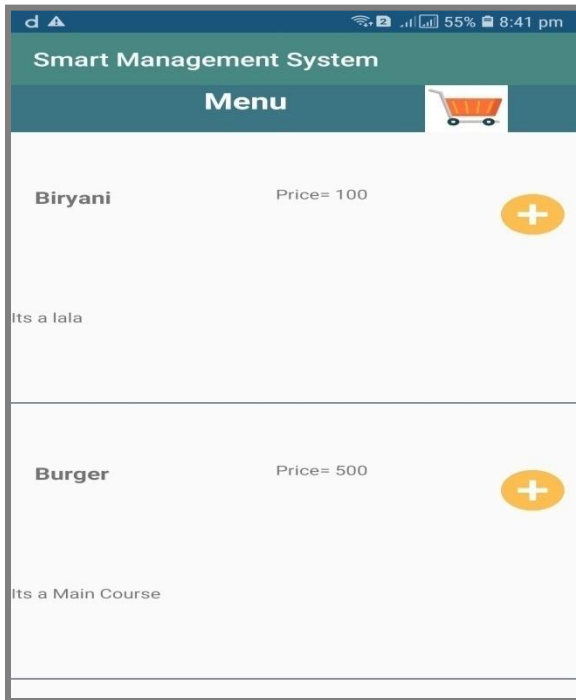
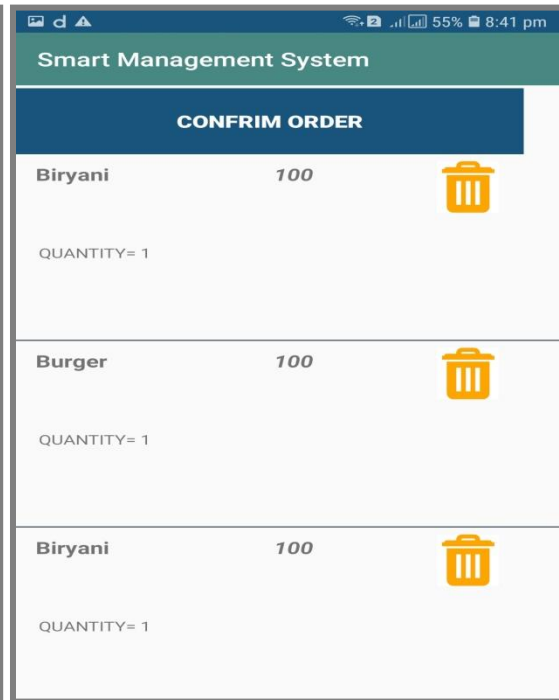Figure 4.3: A Screenshot of menu list smart management system.

Figure 4.4: A Screenshot of list of order Smart management system

Chapter 4.3 is the customer menu where customer can see the all list of foods and they can choose and order those foods by clicking add button then customer once order the food and the food will go to the chart and can be listed . In Figure 4.4 we can see the list of foods what customer ordered here customer can delete orders and add orders then customer can confirm orders by clicking the confirm button.
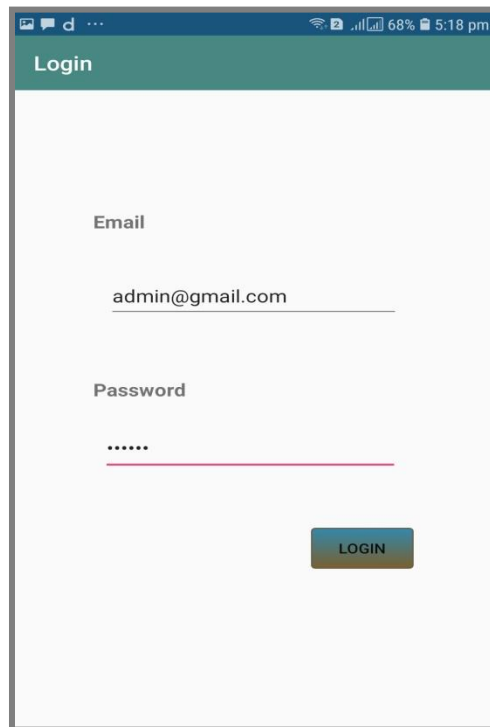
Figure 4.5: A Screenshot of log in page of Smart Management system.

Figure 4.5 is the login page of all admin employees like chef, manager, where they can put their own email and password and get into their own interface.
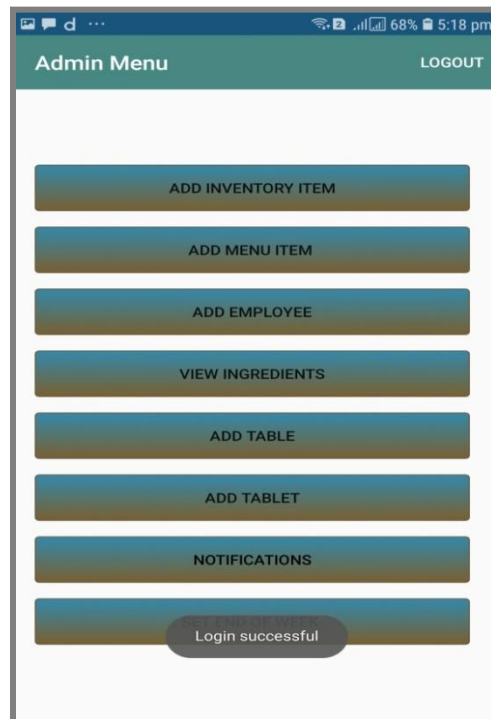
Figure 4.6: A Screenshot of Admin Panel of Smart Management system.

Figure 4.6 is the admin menu where admin can operate the whole system. He/she can add inventory item, add menu, add employee, see and add ingredients, add table and get notification and set the holidays. So we can say admin can operate all the system from his admin panel.

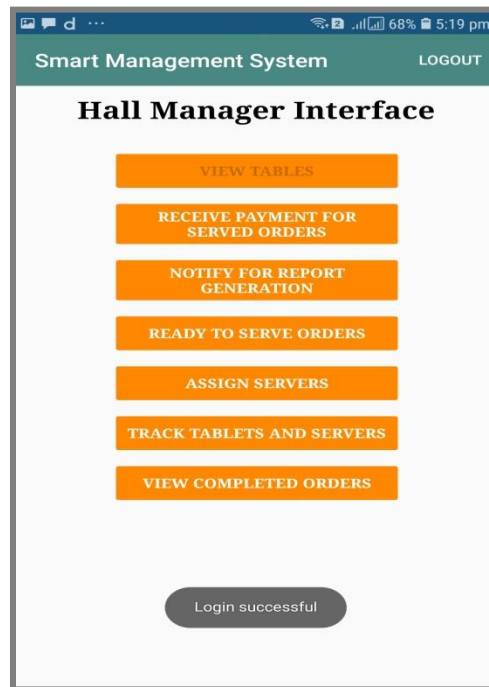Figure 4.7: A Screenshot of Hall manager interface of Smart Management system.

Figure 4.7 is the file manager interface. Manager can enter his own panel by putting his own personal Email and password and he can see view tables receive payments notify the post register assign service track tables view completed orders. He operates the orders and takes the bill from the customers and gives them a receipt.
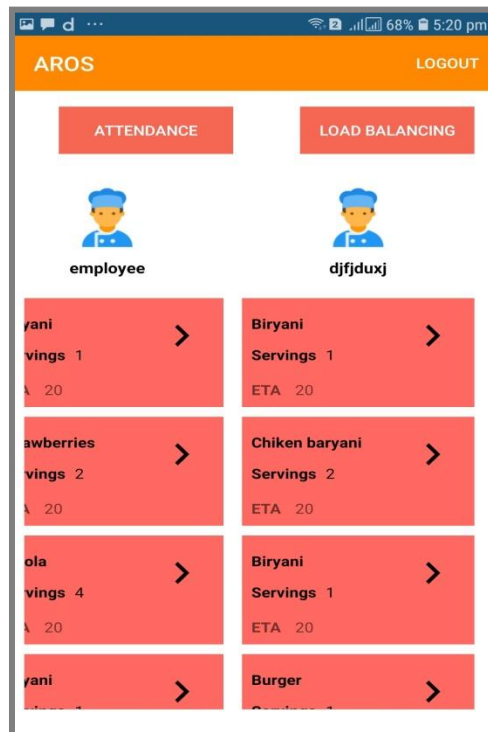
Figure 4.8: A Screenshot of chef of Smart Management system

Figure 4.8 is chef if interface where chef can take order what he have to cook and he can select the item give the cook state and serve state. With balancing button he can select priority of the menu. With attendance button can select the attendance of the chef.

4.2 Back-end Design

The back-end is also called the server side design. It controls the behavior of the site upon an action is taken. The back-end is the core portion of a website or application from where everything is being controlled whereas the front-end is the visual representation of the back-end. Back-end is the most important part. So the security, structure, content management of it is very much important. The back-end has basically three parts such as server, database and application. I use firebase database here because of firebase database can easily accessible and no need to pay only just using my email address and some stories Google provide me firebase database.
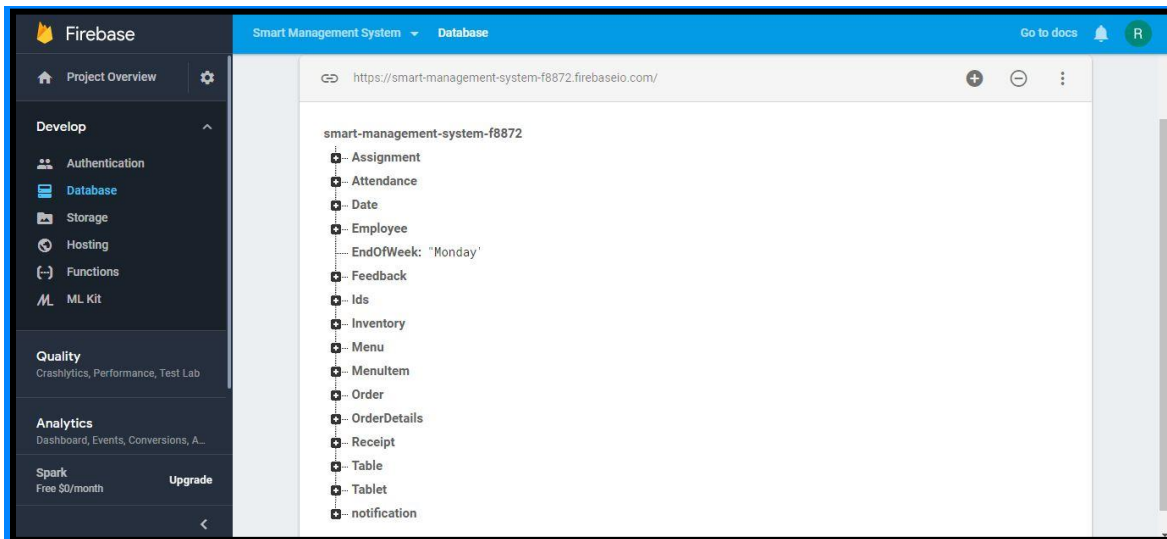
Figure 4.9: A Screenshot of firebase database of Smart Management system.

Figure 4.9 we can i use firebase database for my application we can store our data and every information in firebase database. It is easy to access and easy to get. Just using email address for using firebase database. Day by day we will improve our application.

As the application might contain sophisticated user information, details cannot be written here. The server is secured by goggle itself because we using firebase database.

4.3 Implementation Requirement

To build our application, we use different types of implementation tools, attributes and components. Making this application easily accessible and useful to people has become possible with the help of these tools. In this implementation requirement area, we discuss all those tools, attributes and components we used to develop this whole project. In our project we implement the core code that's means the Java and XML code. The special thing is in our application it is firebase database which is easy to access where admin don't need to expenses lot of money for database. Owner can add his email with the application and get all the data he wanted.

4.4 Mobile Application Version

Our application is for mobile use, for people who don't want the menu card. That's why we made a mobile application version of it. In this part, we will discuss the tools we used to develop the mobile application version [10]. It depends in many things like android studio, emulator, firebase database etc. Its fully depend on developer how can he made. Because different user uses different tools. That's the nature. Most of the time we use firebase, android SDK like this. It's to make the application.

4.5 Android Studio

Android studio [11] is the official integrated development environment(IDE) for Google Android operating system, built on Jet Brains Interlay IDEA software and Android SDK for both developing our android application and also testing our android application when need to run for seeing output.

4.6 Android Overview

Android is a comprehensive platform, which means it is a complete software stack for a mobile device. It provides the entire tools framework for developing mobile application simply, quickly and easily. We design our application with Extensible Markup Language (XML), connection with database server with Java Language in Android Studio. Android is also open source platform where developer can make any types of user interface which the developer needs to design his/her application. The developer can write any programming language for his/her application in android studio. So developer can easily develop different types of mobile application by use it for user interaction.

4.7 Android SDK

Android development starts with android SDK (Software Development Kit) [12]. Android SDK is a set of collection of development tools used to develop and build of any kind of android application for android platform. That means Android SDK is essential tools for both developing and building any android application. We use security to file uploads and downloads for your Firebase apps, regardless of network quality. You can use our SDKs to store images, audio, video, or other user-generated content. On the server, we can use Google Cloud Storage, to access the same files.

4.8 The Emulator

An emulator is an Android Virtual Device (AVD) [13] that represents a specific android device for emulating any types of android application or project. The developer can use an android emulator as a target platform to run and test his/her Android applications on his/her Personal Computer (PC). Bu Using Android emulators are optional. I run my application in both our personal device and Android emulator too. The emulator runs the same code base as actual device. The emulator is so pretty for emulating android projects. An Android emulator is installed by default during the RAD Studio installation. The installed Android emulator is name rsxe5_android, which uses the WVGA800 skin and Android 4.2.2. Before you create an Android emulator, you need to install an Android system image that your emulators can use. I Use mostly my device by adb manager.

4.9 Interaction Design and UX

Interaction Design is an important component within the giant umbrella of User Experience (UX) design. Interaction design is specifically a discipline which examiners the interaction between a system and its user via an interface and User experience (UX) design is the process of creating products that provide meaningful and personally relevant experiences. It may also incorporate design focused on how information should be presented within such a system to enable the user to best understand that information

thought this is often considered to be separate discipline of "information design" too. In our application, some feature can interact with the user and application. We added feedback option by which any customer can send feedback. If any user faces any problems, lacks or drawback, they can contact us for solving these kinds of problems. For User Experience (UX) design we have tried to give some fantastic and well experience by using our application. We keep our application too simple and also easily for better experience, feelings and performance for the user of using our application. Hope our systems information is secured and helpful for the user.

CHAPTER 5

IMPLEMENTATION AND TESTING

5.1 Implementation

First we open the app and then you will get two buttons in there. One is customer review and one is log in as employee. If we click and customer review then customer panel will come and if we click on login as employee then we have two text field which is our email ID and password. Admin, employee each have email id and password then they put in their own password and get into their own interface. Admin can set employee add table add ingredients add menu item and see all the database he wants and operate all the things owner help customer only can see the menu and order from there and the server manager today Take the bill.

5.2 TESTING

Testing is an important part in any app or any software. First of all, make an app and build the app. Build the app and then for testing any developer can debug and after debugging a developer can find the bug. After making any app or software have to test and for this have a tester in every company.

5.3 Implementation of Front-end Design

It's us really a good challenge to develop a gorgeous front-end design which will be attracted to user. Because, for developing a design for android devices, it is very though work to balance the design with android display size. Sometimes it can't fix with the display for many reasons. So, a developer needs to check several times of his/her android application by building or running within an android device. For interactive design we always try to think as a simple and easier in user interface design for creating user attraction to our android application. We also try some materials and tools design for

making and creating attraction to the user. On the other hand, the user can enjoy to using a very simple and easier interface. So it was really a good challenge to us when we were designed our android applications user interface. But most challenging part is to make our android application.

There are a lot of and many types of smart-phones that support android. But all of these are not same quality assurance. Some of them have very weak hardware component, in a little bit pressure those device getting hang and behave like weird. These reasons occur for different types of version. So we design the application which will be support to all the devices as like older to newer version and we insure that our android application is secure and will not create any extra pressure on devices. We attached our application front-end implemented design. This is the home page and clicking this any button enter the function

5.4 Implementation of firebase database

In our app we are using firebase database in database part. In here use software using database fire base is the best cause I don't need to expense lot of money for database here.
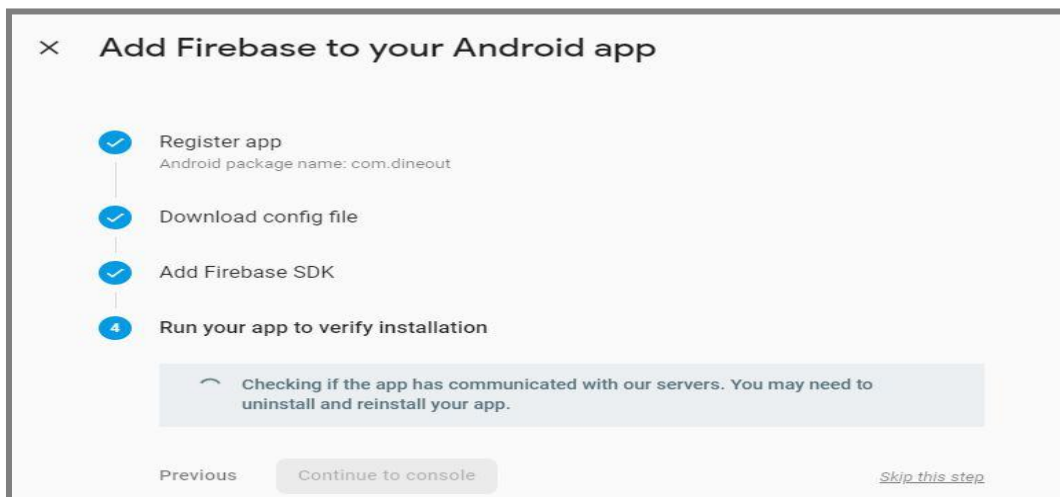

Figure 5.1: A Screenshot of Adding app in firebase of smart management system.

Figure 5.1 we can see the firebase database. We have to register our application create firebase database. When we see this page we need to register our app by package name. Second step we need to download the configuration json file and add our project. Then there is SDK and we have to add some code in our gradle file. Then we need to verify the installation and checking the communication with server and then we can run that app.

5.5 Implementation of Java and XML Code

We use android studio for our application user interface design with file and for java code to connect with the XML file, firebase real-time database server and apache server [14] [15].

In figure 6.2 of the appendix section, it shows screenshot of Java code.

We use android studio for our application design and connection with internet. Because, in android studio many types of language are supported. In Java code use class, object and some method. We use Jason parsing method for parsing data from online to user device. That means work was done in java code. In xml code, we take some text-view, button and image view for our application. By using in xml coding, we design out application. Figure 6.3 of appendix section we use the screenshot of the XML code.

5.6 Testing Implementation

Table 5.6: Test Case for Project on Smart Management System

Test Case	Test Input	Expected Output	Actual Output	Result	Tested On
1.Install Application	Tested on Various – 1. Jelly Bean (4,1-4.3.1) 2. Kit Kat (4.4-4.4.4) 3. Lollipop (5.5-5.0.2) 4. Marshmallow (6.0) 5. Nougat (7.0-7.1) 6. Oreo(8.1.0)	Successfully install all those versions.	Install successful	Passed	28/2/2019
2.Admin panel	Admin panel options adding and operation.	Add employee, table , menu etc.	Adding and operating all.	Passed	11/6/2018
Compile	Compile successfully all code.	Show the actual result.	Actual output.	Passed	11/6/2018

5.7 Test Results and Reports

Test report is needed to reflect the result of testing the application in a formal way, which gives an opportunity to estimate the result of testing quickly. It is a document that records data obtained from a determine experiment in an organization manner, describe the environment and operating system and shows the comparison of test result with objectives, which are so important for any types of application. In table 5.5, we shown test case, test input, expected output, actual output and finally we find our expected result for our application. The test result is quietly successful. The user satisfies to use our application. Our expectation will be that user can easily use and understand our application. Our expectation will be that user can easily use and understand our application as a better user interface.

CHAPTER 6

CONCLUSION AND FUTURE SCOPE

6.1 Conclusion

Our android based mobile application has been successfully implemented. For implementing our application, we tested the application with many types of smart phones, we saw that our application worked properly and it also gave the required data from our application. Some data steel not working and I am working on to solve it. This is an automated application that's why this is fully dependent on database. There is login part. Authentication is most needed for this application. So we need database to store the info of log in. Everyone can buy and sell food. In app store very few applications like this. Just one or two like this. All are written in English. So this will be the best for anyone and for understanding also.

The design is very user friendly. The user interface is so simple and not looking like as a complex view. User can easily handle our application. We tried our best to complete all requirements for our application. We hope that people will use our application and get proper service.

6.2 Limitation of our application

As like all application, our application has also some limitation. We will overcome those limitations in future. Here we want to mention that some of the main limitations of our application are given below:

1. The main limitation is our application is it's not useable without admin .
2. For using firebase database there are some mistake.
3. Firebase database has short of storage.
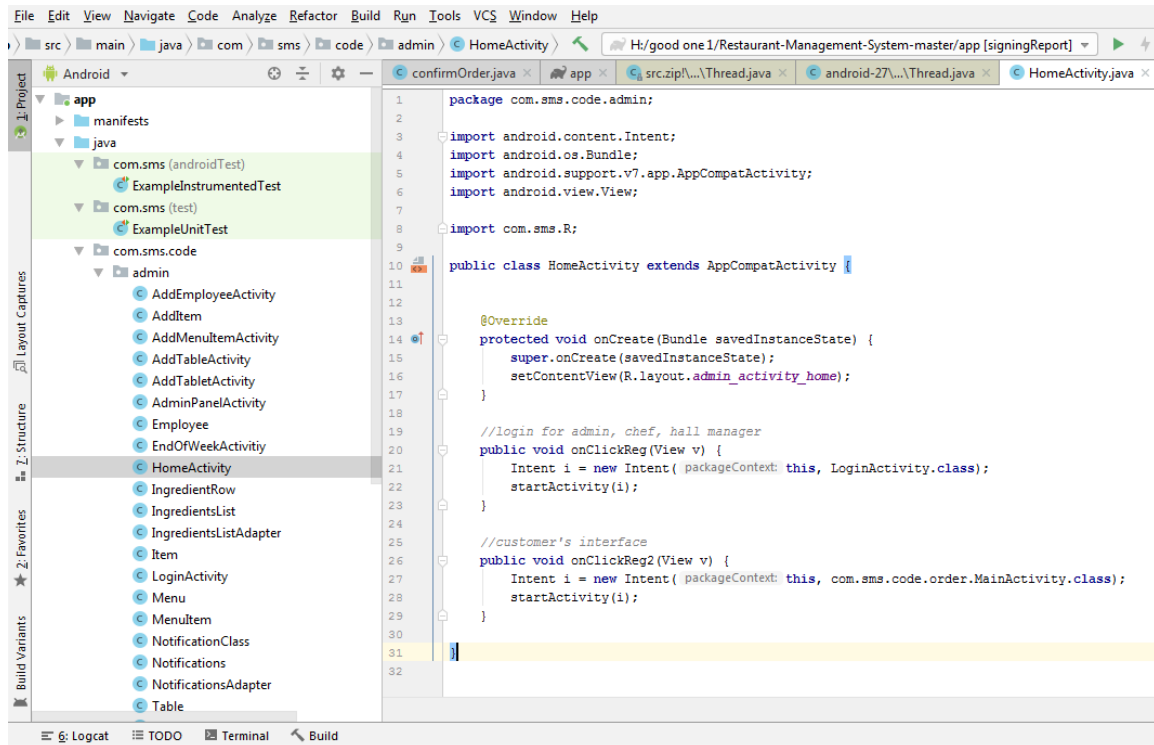4. There is steel some errors exist.

6.3 Future Scope

We try our best for developing our application in present time. If we find any scope for developing in future, we want to develop and change something of our application. Our future developments scopes are given below:

1. In future, we will try to develop offline and online both types of Android application.

2. Also try to develop this application for all types of mobile device operating systems.

3. In future, make it home delivery by ordering in home. maybe there will be adding some shipment option also.

4. Right now many restaurants serve their food by robot. With this concept I try to make this application.

APPENDIX

Java Code

Figure 6.1: A Screenshot of Java Code of Smart Management System

XML Code
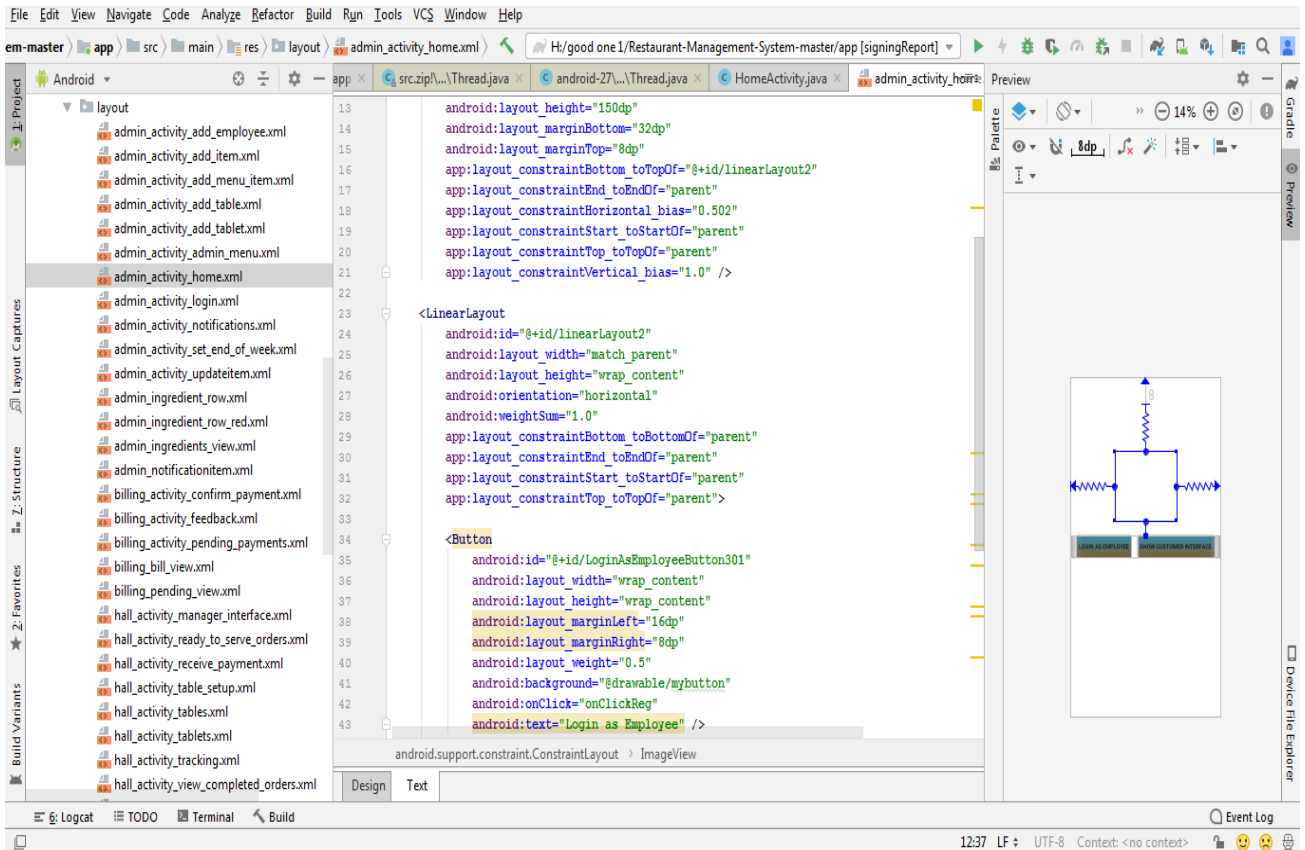
Figure 6.2: A Screenshot of XML Code of Smart Management System

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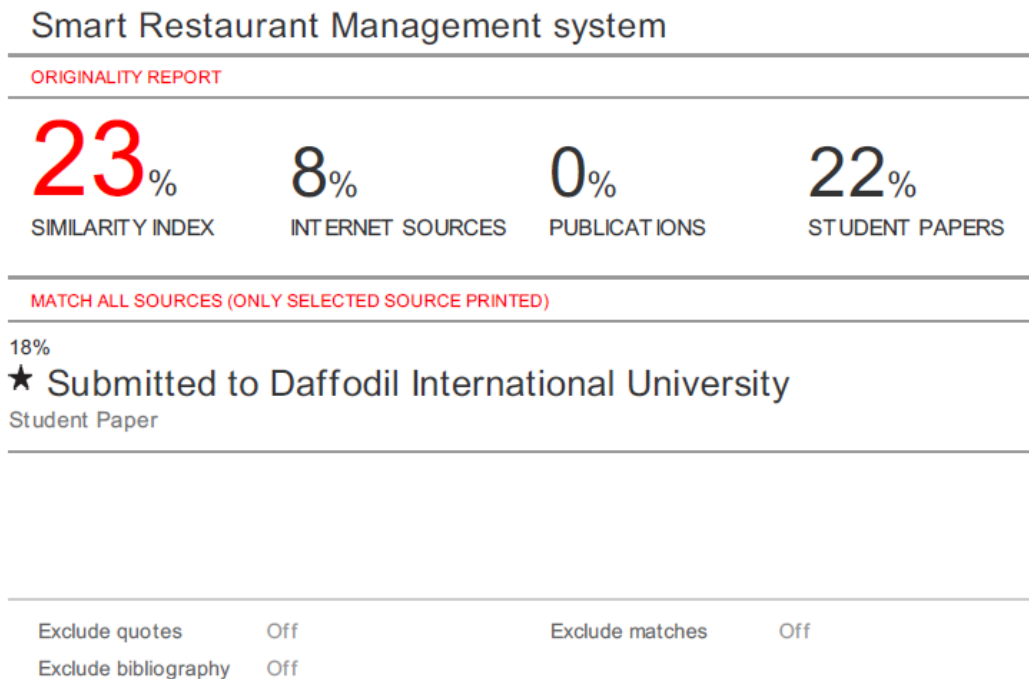| Exclude quotes	Off	Exclude matches	Off
Exclude bibliography	Off		

Figure 6.0: A Screenshot Plagiarism