

AMERICAN INTERNATIONAL UNIVERSITY-BANGLADESH (AIUB)



Restaurant Management System

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Overview

The "**Restaurant Management System**" is an application that will make running a restaurant's day-to-day operations considerably easier and less time consuming. The system is separated into many stages, which are as follows: Employee records and personal information are kept on file. The information about the employees can be changed. Information on what customers order and the status of their orders, such as the time of order, the time of service, the time of payment, and so on. Information about presently available stock, which is subject to change. Accounts information that is used to compute the restaurant's daily income and then added to the books. The administrator has complete authority over the system, since he or she may examine employee attendance, hire employees, and change employee information. The stock details may also be seen and modified by the admin. Accounts will be checked by the administrator. Finally, the administrator may see the progress of customer orders. This approach will make it much simpler for the administrator to keep an eye on what's going on in the restaurant without having to be personally present, which will be much more convenient.

1 Introduction

The "Restaurant Management System" is an application for restaurants, which will make the day to day work in a restaurant much easier as things will no longer need to be done manually. This application will keep a record of employee information, customer orders, when a customer's order is prepared, when it is served and its payment information and lastly it will also take orders from customers. This will increase convenience and also save a lot of time for the employees as they don't have to move around the restaurant to communicate with each other [1]. Also, the recent surveys show that seven out of 10 customers are willing to pay more for restaurants that try to protect the environment and this application eliminates the need for using menus or writing orders on paper, and thus saving paper.

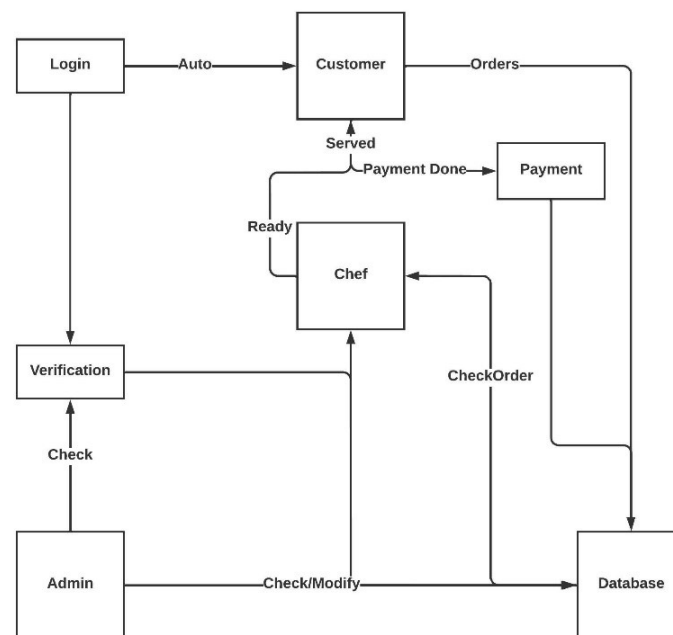


Figure 1: Context Diagram of Restaurant Management System

1.1 Purpose

The purpose of this document is to give a detailed description of the "Restaurant Management System" application. The document provides detailed information about the interfaces, constraints and interactions. This document can not only be used for project planning and progress assessment but can also be used as a reference to our primary audience which are the restaurant owners, to show how efficient and well-managed this application is for their restaurant.

1.2 Scope

The "Restaurant Management System" is a simple program that will make day-to-day operations at a restaurant easier, more convenient, and faster. The system will include a database that will help save all of the restaurant's information, allowing owners to examine day-to-day client orders, income, and so on, allowing them to always keep an eye on what's going on in the restaurant without physically being present there. Recycling, reusing, and lowering emissions are all crucial in today's world. The "Restaurant Management System" is an environmentally friendly application since it eliminates the need for paper menus and order forms. Restaurants must also suffer an increase in costs anytime the menu is updated [2]. This will also save

money on printing and updating menus because they can simply change the menu in the application without incurring any costs. It also helps to minimize manpower, which helps to cut maintenance costs. When a customer places an order in this program, the electronic order is saved in the application and can be seen by the chef, so the waiter does not have to physically travel to the chef to provide the order. In addition, when the chef has made the order, the chef will have the choice in the application to save the time when the dish is prepared. This information is visible to the customer. The admin may also monitor the progress of client orders on a regular basis to verify if the chef is functioning properly. The Admin may maintain information about all workers in the program and has the ability to add, amend, or delete employee information. The admin will also have the option of constantly checking stock to avoid scenarios when the restaurant runs out of ingredients. As a result, anytime there is a shortage of supply, the administrator can add fresh stock ahead of time [3]. As a result, this application will make it easier for all staff to do their jobs. Customers can file complaints, and administrators can review them and take appropriate action.

- The development of the Restaurant management system will make it easier for the users to get all the information about restaurant and dishes.
- This system makes the administrative work easy and hassle-free ordering process.
- Multiple opportunities in one system like ordering dishes and payment.

2 Product Perspective

The application will have several interfaces. Each for Login, Admin, Customer, Chef. In Login everyone will have a specific username and password where login will verify them, give them access to their part and the customer will have a default username and password which will be auto logged in by the restaurant employees. Admin have all the power of this system. Admin can add new staff, modify their information and also can fire them. Admin can see food served, stocks and complains. Customer's interface will consist of a menu listing items and their price. When the customer selects some dishes and place the order, it will be stored in a "pending orders" table in the database [4]. Chef's interface will be such that he is notified of the pending order and he will start preparing the dishes, when the dish prepared chef will select the order done button. Customer interface will be notified about the dish prepared and while ordering customer will do payment through Card, Cash or Internet Banking and will click payment done with Card/Cash/Internet Banking. Admin will manage accounts, check orders which are pending and check stocks.

3 User Characteristics

There are three types of users that interact with our system. Firstly, there is a Admin, then Customer and Chef. We'll provide an interface for Chefs as well through which they are looking at the status of their order queues, but they will not interact with our system.

3.1 Customer

Customers interact with our system directly in order to place order, modify order, give ratings and can give complain. We do not store any information related to customers in our system. The process of order taking starts from customers placing order and then the other series of events begin. A customer also can cancel the order. If any problem happens with this order customer can report a complaint or if a complain reports by mistake also can delete that report.

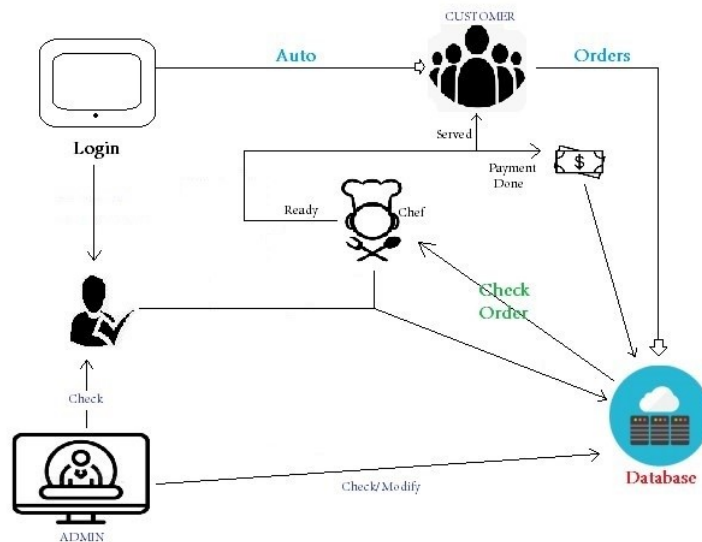


Figure 2: Block Diagram of Restaurant Management System

3.2 Chef

Chef can mark a dish as prepared when the chef finishes preparing the dish. He can approve the cancellation of an order whenever a customer edits or removes a dish from his order. Chef's name, address and specialty etc. are stored in the database. Chefs can interact with stocks for updating.

3.3 Admin

Admin's job is to manage the inventory and other information related to menu and chefs in the system. Admin can add employee, update employee and delete employee to manage the employee information. Admin can see order created or cancel notification form customer and order complete or cancel notification from chef to track specific order. Admin Also can add, update and delete item to get information of inventory. Admin can view complain form customer and take action to the chef according to that complain.

4 Design and Implementation Constraints

4.1 Operating System Constraint

Through it is a web base system so the system should be compatible and will smoothly work with any operating system.

4.2 Device Constraint

Restaurant management core system and its user interfaces should be compatible with tablets pc. However, running on android devices is not necessary.

5 Assumptions and Dependencies

One assumption about the software is that it will always be used on tablets/pc that have enough resources to run the application. If the tablet/pc does not have enough hardware resources available for the application, there may be scenarios where the application does not work as intended or not even at all. The application

uses a database for online storage of information like orders and menu items that need to be in working state. If the interface changes the application needs to be adjusted accordingly.

6 Interface Requirements

This section contains all the software requirements in detail so the designer can design the system to satisfy those requirements and testers to test the system and satisfy those requirements.

6.1 External Interfaces

External interface requirements specify hardware, software, and Communications interfaces. This section provides information to ensure that the system will communicate properly with external components.

6.2 Hardware Interfaces

There are three external hardware devices each related to a three different user interface. These devices are the computers for the admin the wireless tablets for kitchen and restaurant other staff and another wireless tablets for customers [4]. All three devices must be physically robust and immune to liquid damage and stains. All designs must have some good design because this are to be used in a normal restaurant table and will be in direct contact with customers. All devices should be capable computers that can use transfer data between the server and device. All order and transaction records should be stored on the server.

- **Required devices are:** As the application is web based, so it can be run in any tablets/pc which has latest any web browser.

6.3 Software Interfaces

The system should be able to communicate with the person. The software will connect with a Database that stores the information necessary for the software to operate. The database must be able to provide, on request and with low latency, data concerning the restaurant's menu, employees (and their passwords) and available dietary requirements. Additionally, it should take and archive data provided to it by the software. This data will include records of all orders and transactions. The database must store all data such that it can be used for accounting, as well as accountability.

6.4 Communications Interfaces

The RMS will interface with a Local Area Network to maintain communication with all its devices. It should use a reliable-type IP protocol such as TCP/IP or reliable UDP/IP for maximum compatibility and stability. All devices it will interface with should contain standard Ethernet compatible, software accessible LAN cards to maintain communication between the server and the surface computers, tablets, displays and the external payment system. Devices that are wireless should also use Ethernet compatible cards, using the IEEE 802.11b/g/n/ax standard and having support for WPA2-PSK encryption [4]. The use of IEEE 802.11n/ax transmission standard hardware is also acceptable if all other local hardware is conform-ant to the same standard.

6.5 Functional Interfaces

The system is decomposed into main three modules/components.

1. Client Side (User Application)
2. Admin Interface.
3. Kitchen's Interface.

6.6 Performance Requirements

All product will be based on network connectivity. Payment system will be fully secure through POS system. If there are no network issue then 95percent of the transactions shall be processed in less than 1 second. An operator shall not have to wait for the transaction to complete. The performance will depend upon hardware components. For example: 4 GB Ram of the tablet. Core i3 processor with 8GB ram desktop. Dedicated server for database for good performance.

6.7 Safety Requirements

The possible safety requirements of the system.

- **Server Crash/Failed/Overwhelmed:** Too many requests at one time might cause the server to be failed, the system should behave accordingly with the error.
- **Database Error:** The system should generate error, if error occurred.
- **Application might fail to respond:** Application update should be checked at monthly based, or the system should generate notification if there is any update about application.

The requirements that are concerned with possible loss, damage, or harm that could result from the use of the system.

6.8 Security Requirements

- Personal information will be secured.
- Encrypted data.
- Payment through credit cards will be safe and sound.

7 Change management process

Whether changing size, changing shape or changing direction, the key element for change within a business is human strategic resource. Without it, we would not be able to manage any transition and move forward with our business. Before going through the change management process, we must recognize where the change is going to be applied, and what that change looks like. Here at SRS, change management is cardinal. We fully believe in evaluating every step before any changes are made. This will allow for the smoothest possible transition at every step of the way for the business itself the individuals that help run it. Staying on track during the change management process is vital. Effective change management is key to make any endeavour worthwhile. // Mistakes during this process can be a disaster down the line for the business, so it is vital to find the best change management solution for the current and future of the business. While in the process of reviewing every member of staff, the idea of success lies in predicting of how well a certain individual will be able to perform under a specific role or task. That's the fundamental aspect behind change management system.

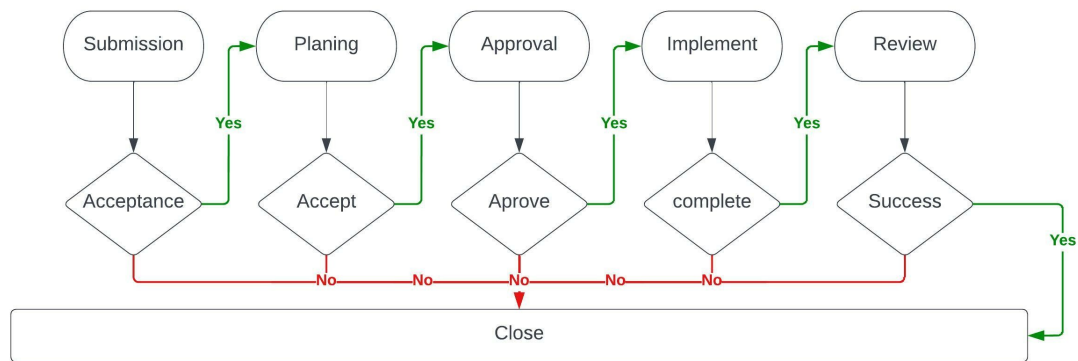


Figure 3: Caption

8 System Architecture

Architectural Design

8.1 Activity Diagram

- **Admin:**

Admin must login to the system to get access it. Admin can change password and request for change password if he cannot remember it. Admin can view current food menu, which is available for sell, can add food to the menu for new food sell, Update food menu for change information of food, Disable food form food menu that out-of-stock form now. Admin have access to Add employee for new recruit, Update information of employee to change the information, delete employee for those employees who let the job or fired. Admin also can operate stocks by add new item, update existing item and delete item that does not need now. Admin can only view of customers complain so that an action can be taken.

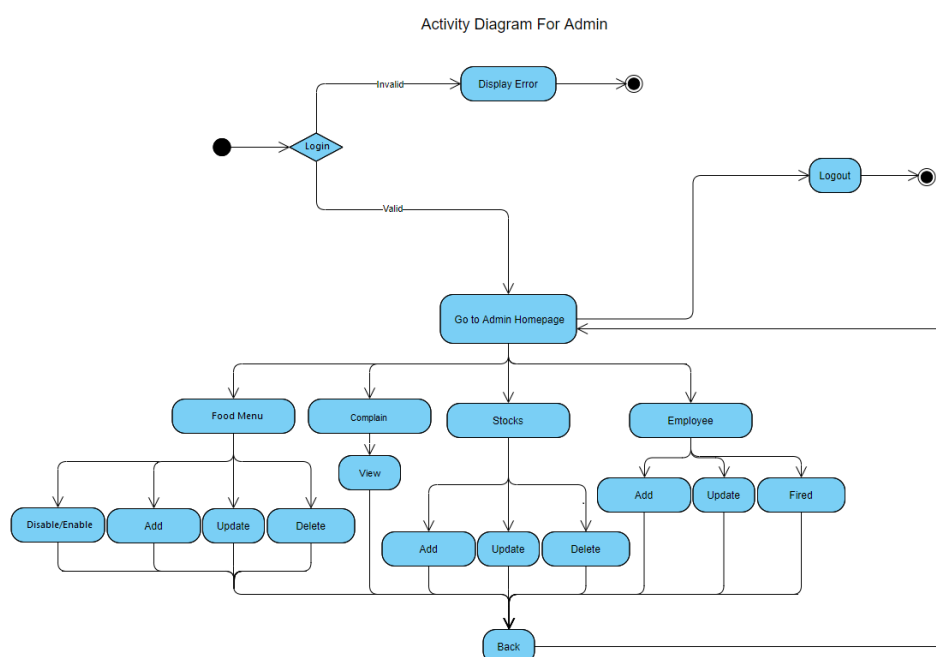


Figure 4: Activity Diagram For Admin

- **Chef:**

Chef must login to the system to get access it. Chef can change password and request for change password if he cannot remember it. Chef can view current stocks which is available for cook food, Chef can update stock after cook food so that it out of stock problem never occur. A chef can see the current order list that are pending for cook. Chef can accept the request of order and cook food or can cancel the order because of item shortage in inventory. After cook food he can send a complete message to customer to collect the order form reception.

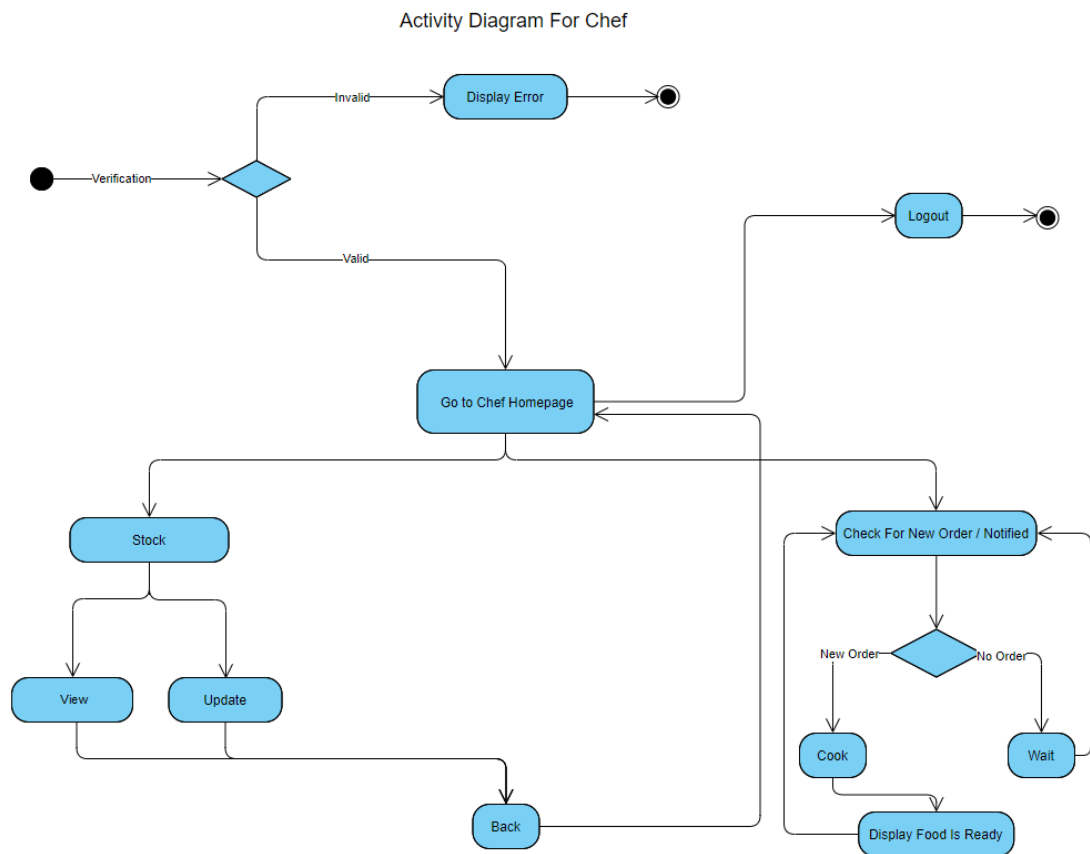


Figure 5: Activity Diagram For Chef

- **Customer:**

A Customer Can Select food form menu to the cart. He can see total price of the cart and place order. The order will be placed and after completing notify to the customer for payment. Customer can make payment via cash, card or internet banking. If the order is cancelled then he can reorder another item form the available food menu.

Activity Diagram For Customer

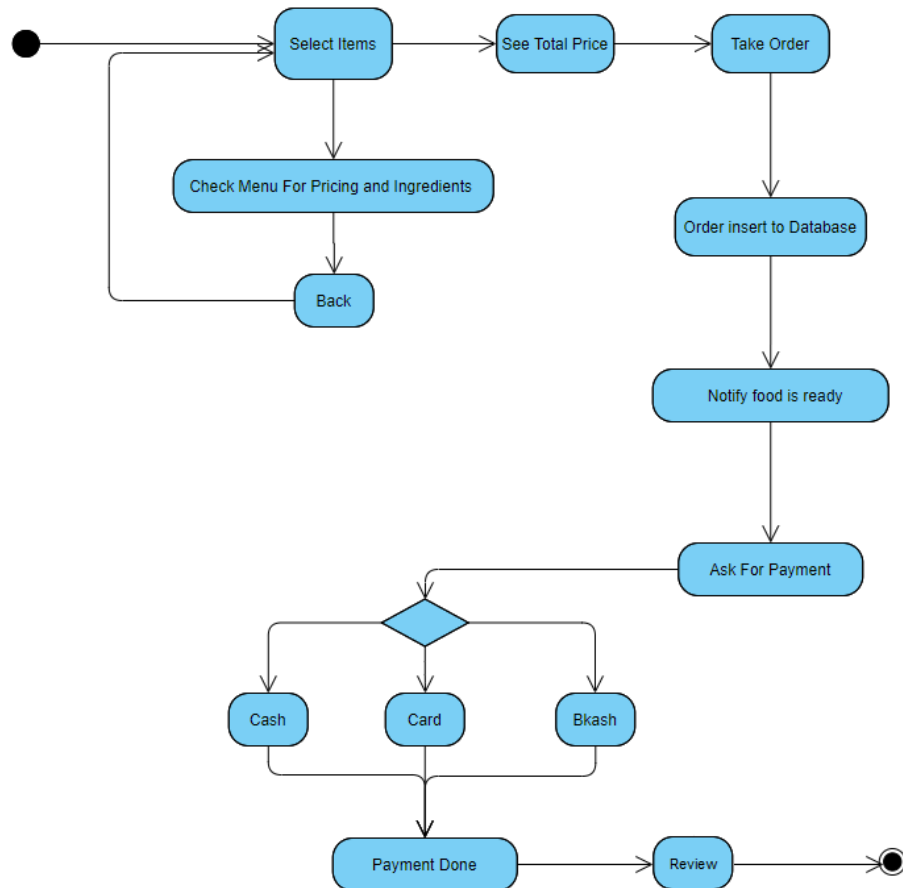


Figure 6: Activity Diagram For Customer

8.2 Class Diagram

There are three users in this system: Admin, Chef, and Customer. For Admin, a valid username and password are required for login; if either the username or password is invalid, an error message will be displayed. The database will be used to validate the login and password. Admin is sent to the Admin dashboard after verification. There will be four options on the admin dashboard. 1. Menu, 2. Stocks, 3. Employee, 4. Complaint for the Food menu, the administrator may add, edit, and delete food items, as well as disable or enable them. Employee admin may check employee data, add new employees, change employee information, and terminate an employee. Stock admin can add, update, and remove stock items. Finally, admin may examine consumer complaints. Chef, like admin, will require a valid username and password to login. Chef will be sent to his dashboard after verification, where he has two alternatives. 1. Check for new orders, 2. Inventory. In check for new orders, the chef will look for new orders; if the order is complete, the chef will tell the client; and in stock, the chef can inspect and change stock. Customers will be automatically logged in to their home page, where they can pick goods from the menu and view the pricing with ingredients, total price, and place order. When the purchase is complete, the client will be contacted and will have three payment options: cash, card, and online banking.

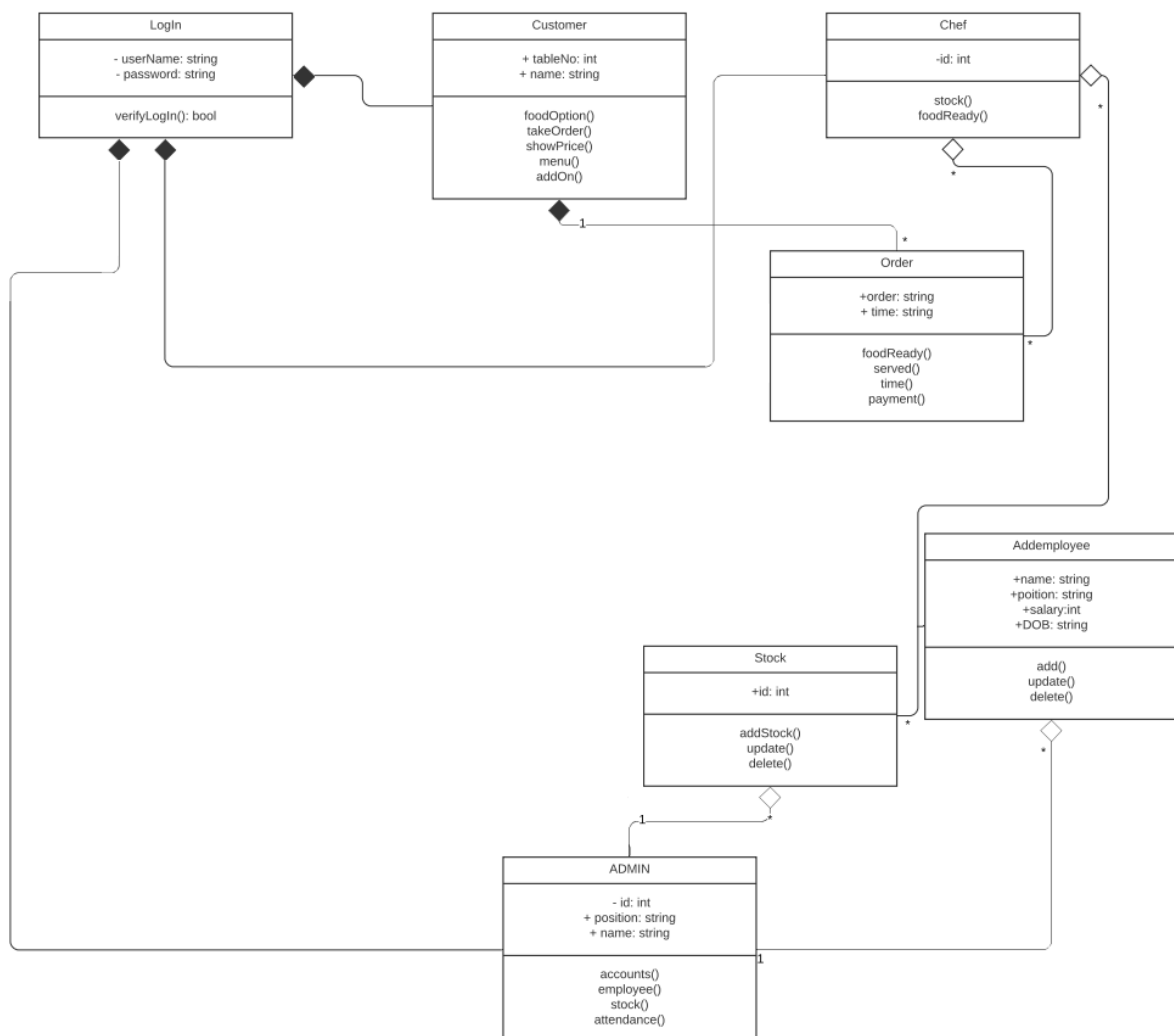


Figure 7: Class Diagram

8.3 Use Case Diagram

In this system there is total three users Admin, Chef, Customer. Here for Admin a valid username and password will need for login, if username or password is invalid then an error will be shown in the display. Verification of username and password will be verified from the database. After verification Admin redirect to Admin dashboard. In admin dashboard there will be four option 1. Food Menu, 2. Stocks, 3. Employee and 4. Complain. For Food menu admin can add food item, update item, delete item and can Disable or Enable food item. For Stock admin can add, update and delete stock items, For Employee admin can view Employee details, add new employee, update employee information and can also fire an employee. Lastly for complain admin can view customer complain. For Chef as like as admin a valid username and password will need for login. After verification chef will redirect to chef's dashboard where chef have two options 1. Check for new order, 2. Stock. In check for new order chef will see for new order, if order is complete chef will notify customer, and on stock chef can view stock and can update stock. For customer user, Customer will be auto logged in to their home page where customer will select items from the menu and can see the price with ingredients, can see total price then can place order when order is complete the customer will be notified and will have three type of payment option Cash, Card, Online Banking.

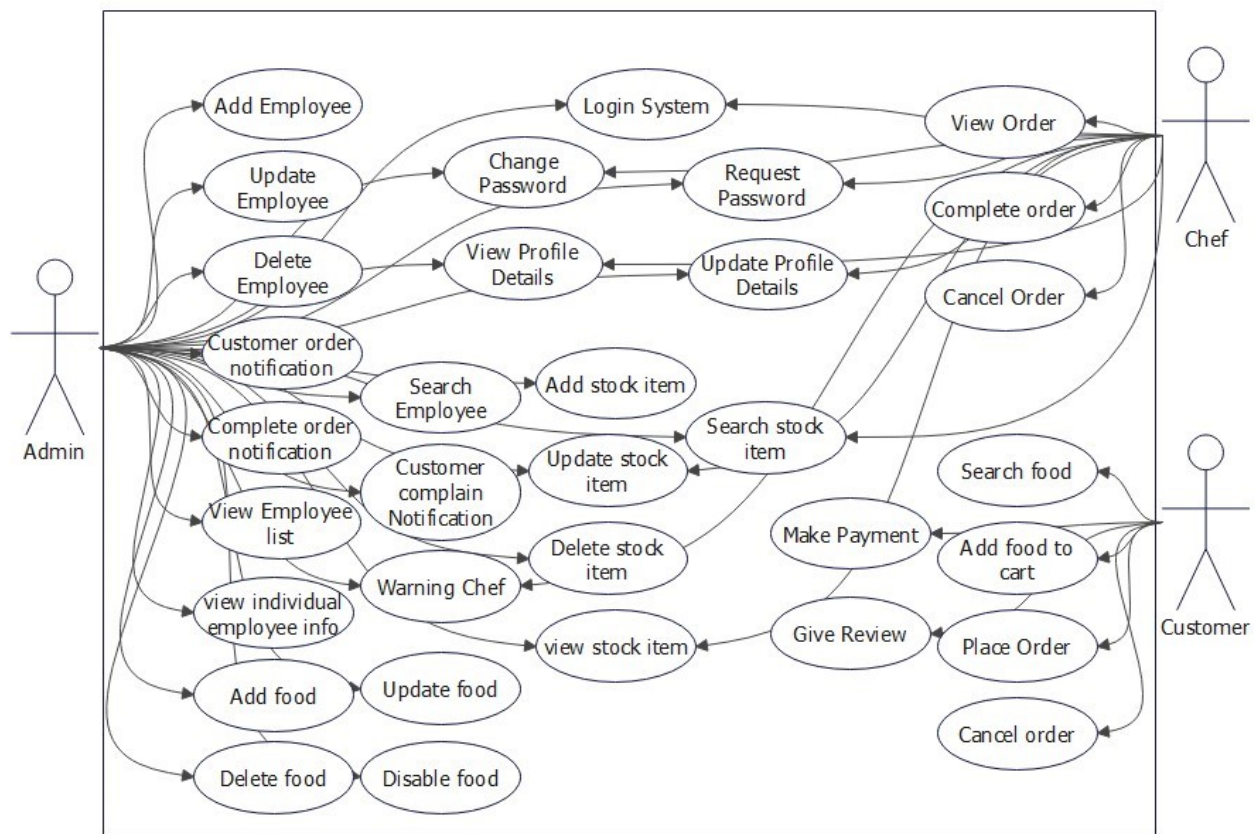


Figure 8: Use Case Diagram

8.4 Data Flow Diagram

- **Admin:**

Admin must go through the login system. After successfully login go to admin dashboard. In dashboard of admin, he has some access like manage food of menu, view complain of customer, manage stock inventory, manage employees.

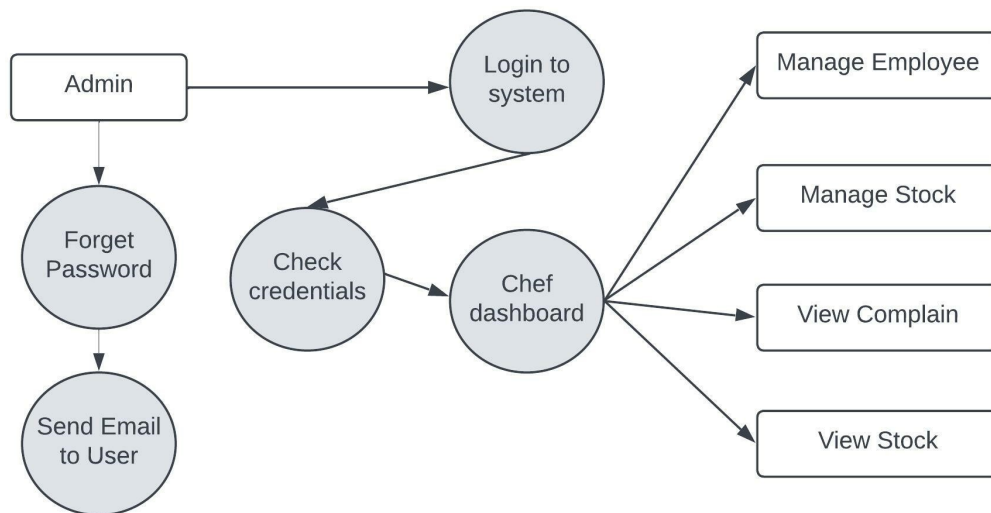


Figure 9: Admin Data Flow Diagram

- **Chef:**

A chef must go through the login system. After successfully login go to user dashboard. In dashboard he can find several tasks like manage stock. In manage stock he can only view and update stock. And he can manage order

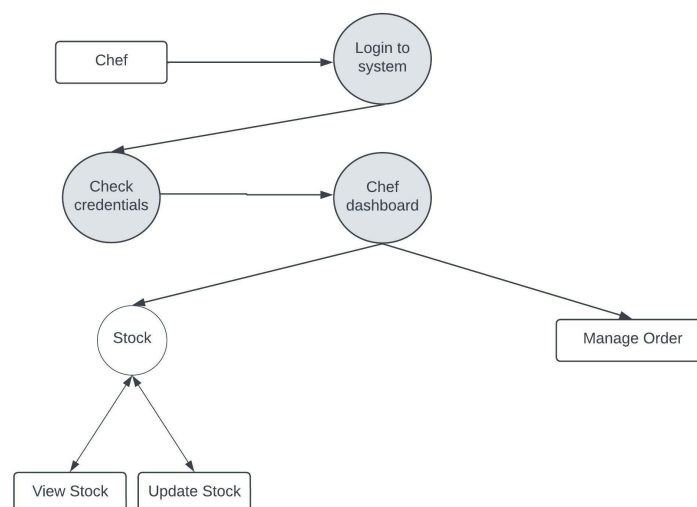


Figure 10: Chef Data Flow Diagram

- **Customer:**

A customer no longer needs to login he can directly go to the customer dashboard. In the dashboard he can see the food item and add them to the card or remove form card. He can find total price of the order before place the order. He can make payment of the order and give review of the services.

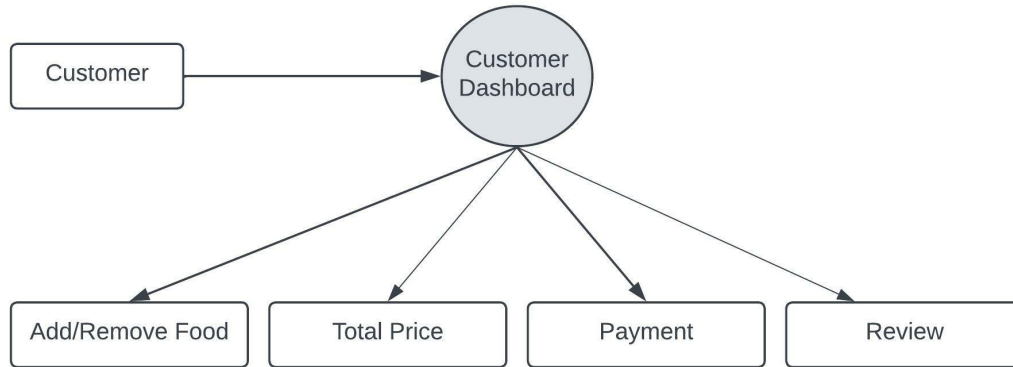


Figure 11: Customer Data Flow Diagram

9 Data Design

9.1 Data Description

In this system there are several databases can be used to serve data. But in our system, we use RDBMS. For this system we design three tables like Employee database to store all employee information, in stock database we store all information about inventory, in customer and order table we store the order details and know from which table the order come. In employee table a common column is id which is integer and auto incremented, Name which is string called varchar in database, Phone number is in integer format, Date of Birth is string, Gender string, Blood Group is string, Salary is integer, Picture is string, Password is string, Position is string, Email is string, Employee Identification Number is also string. In stock table a common column is id which is integer and auto incremented, and other column like item name, item weight, adding date and created date all are in string format data. In customer order table column id is integer and auto incremented, table no and price is in integer format and other columns are in string format.

9.2 Data Dictionary

Employee Database		Stock Database		Customer Order Database	
Column Name	Data Type	Column Name	Data Type	Column Name	Data Type
Id	int	ID	int	Id	int
Name	varchar(50)	Item_Name	varchar(50)	TableNo	int
Phone	int	Item_Weight	varchar(50)	TotalOrder	varchar(MAX)
DateOfBirth	varchar(50)	AddingDate	varchar(50)	OrderTime	varchar(50)
Gender	varchar(50)	UpdateDate	varchar(50)	ChefOrderDoneTime	varchar(50)
BloodGroup	varchar(50)			ChefOrderDone	varchar(50)
Salary	int			CustomerRecieved	varchar(50)
Picture	varchar(100)			Price	int
Password	varchar(50)			Date	varchar(50)
Position	varchar(50)			Payment	varchar(50)
Email	varchar(50)			Reference	varchar(50)
EmpID	varchar(50)				

Figure 12: Database

10 System Feature (Requirement)

10.1 Functional Requirement

- **Customer Management**

- Can electronically order and see the menu, which will include price and ingredients of the dish.
- Can see the total bill amount.
- Can pay. There will be three payment options available which are Online banking, cash and by credit card.
- Can able to give their feedback in review option.

- **Chef Management**

- Can check the customer order status and start preparing food when there is a new order immediately.
- Can press “food prepared” on the system and change the customer order status so that the customer can view and receive their order immediately.
- Can view and update stock.

- **Admin Management**

- Can view customer order.
- Can manage employee (add employee, fire employee and update employee details).
- Can manage stock details.
- Can search employees using their employee ID to view their details whenever needed.

10.2 Non-functional

10.2.1 Security

System's security requirements:

- User authentication is required to access the system.
- A client or user must be a registered user to login to use the features of the restaurant management system.
- Without proper authentication no one can login to the system or use the features.

10.2.2 Reliability

Sometimes little third-party software is tried to use to build up this software or project. Therefore, these are free components; most of them are indicated as open source. This software has used a strong database component named SQL Server Management for protecting strongly, for this reason, this software will not affect by others. Moreover, this software is not used other things that indicate illegal, so it is the most reliable software to use frankly.

10.2.3 Maintainability

OOP principles must be followed to make sure the system is maintainable and extendable.

10.2.4 Availability

System's availability requirements:

- User must have basic knowledge how to use computer or smart phone.
- Every device must have internet connection.
- The user must know English language for operate device properly, as the user interface will be provided in English.
- Every device must have enough hardware resource for run the software.

10.2.5 Usability

System's usability requirements:

- User can use in the computer or smart phone flexibly.
- Give save internet connection to use and work.
- The user can use it several times
- Every using device have enough hardware resource for run the software.

11 Verification and Validation Plan

This project's Software Project Management Plan must include the software project's verification and validation plan, as well as tools, methodologies, and responsibilities for the verification and validation work activities.[srs_2016] The verification and validation strategy will be kept separate from the rest of the document and will be updated as needed.

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