Software Engineering Lab 5
Restaurant Management System
Group 26

Question 1

Ambiguities and omissions

1. For multiple tickets will the user have to start from the beginning or is it possible in one go
2. In case of a power outage or system failure during the processing of a payment, the further course of action is ambiguous or unclear.
3. No mention of the senior citizen discount or the student pass
4. There is only one mode of payment(credit card)
5. There is ambiguity in the term ‘potential destination’ it does not specify the regions which it includes(in terms of the radius)
6. No mention of the various classes of railway coaches
7. The location of deployment of the system: on the station or over the internet.
8. Confirmation of successful ticket purchase is omitted
9. No provision of cancellation of the ticket
10. There is no mention of the starting point of the journey
11. No mention of the date, time, and duration of the journey
12. No clarity regarding the type of personal identifier required
13. No mention of how failure in payments or invalid input is solved
14. There is no provision for making reservations
15. Availability of tickets isn’t accounted for

Question 2

Functional Requirements

1. Login system required to differentiate between members(students and employees) and other people
2. Registration mechanism should be provided for new members
3. Provide issue/return functionality to the members
4. Provide admin access to the Librarian
5. Provide functionality of extending the return date to the end-user
6. Allow the users to search for the books

7. Issue the book to the first user in the queue if book is available
8. The librarian should be able to add and remove books from the database
9. Allow users to browse and search for books without logging into the system.

Non-Functional Requirements

1. The system should be scale well with the increasing size of users
2. The login credentials of the users should not be stored in plain text and should be encrypted
3. Access to the website should be limited to the LAN users
4. There should be no downtime
5. The system should be developed using HTML5.

Question 3

1. Stakeholders and Users

Stakeholders:

- Restaurant Owner
- Restaurant Manager
- Inventory Manager
- Waiter
- Kitchen Personnel

Users:

- Restaurant Manager
- Inventory Manager
- Waiter
- Kitchen Personnel
- Customer

2. Various Features exercised by each user of the system:

1. Waiter:

- Order Dishes:
  - This feature allows the waiter to order dishes according to the customers' wishes and preferences.
  - They can add/drop dishes on their tablet.

- Frequently ordered dishes:
    - This feature gives the waiter the ability to easily inform customers about the most frequently ordered and popular dishes of the restaurant.

- Feedback
    - This feature allows the waiter to take feedback from the customers if the customer wishes to give any feedback and reviews about the restaurant.
- Bill
    - The waiter should be able to provide the bill to the customer after their meals are done and they ask for the bill.

2. Inventory Manager:

- Manage Inventory
    - The inventory manager should be able to add and update the inventory database according to the availability of items in the restaurant.

- Update availability of dishes
    - The inventory Manager will have the sole access to update the dishes on the menu according to the availability of ingredients for that particular dish.

3. Manager:

- Feedback Analysis
    - This feature gives the manager the privilege to analyze the feedback.
    - The option of filtering will also be provided for the manager to filter the feedback according to various factors like ambiance, date, food quality, waiters, etc.

- Revenue Analysis
    - The manager will be able to view and analyze the total sales of the restaurant.

- Mark Attendance
    - The manager will be able to mark the attendance of waiters on his web application on a daily basis.

- Rush Prediction
    - This feature allows the manager to analyze and obtain the rush hour prediction for the following week.

- Add new waiter
    - This feature will allow the manager to add or remove waiters according to the restaurant's demand.

4. Kitchen Personnel:

    - Pending orders
        - Kitchen Personnel can use this feature to update the status of the ordered, prepared, and delivered dishes.

- System Requirements:

- Internet connection required at all times on both the mobile app and web applications.

3. Non-functional Requirements

1. Categorization of certain dishes into ‘frequently ordered’ for quicker lookup by the waiters.
2. Analysis and overview of waiters’ performance based on user feedback.
3. Analysis and overview of restaurant hygiene, waiting-time, average time spent by a customer at the restaurant, and ambiance based on user feedback and other records.
4. Using graphs for easy analysis and overview of weekly and monthly revenue records.
5. The system should be able to handle large volumes of data and requests in rush hours.
6. There should be a maximum delay of 30s between confirming an order and the same being displayed to the kitchen personnel.
7. Only the inventory manager should be allowed to read/write the inventory database and change the availability status of dishes.

8. The manager should have an option to filter the feedback according to various factors considered in the feedback.

9. Only the managers and owners should have access to revenue and feedback records.

10. The system should have minimal downtime.

4. Specify user interfaces for each user of the system.

Waiter:

- Login: The portal here will require authentication for proceeding further into the application. After logging in the following features would be accessible:

    1. Menu: The waiter will be able to search and select dishes from the menu as per the customer's choice and can later add/drop them as and when required.

    2. Confirm order: Final placing of the order takes place through this interface as the waiter selects the table number and places the order for the kitchen personnel's access.

    3. Billing: It shows the final list of orders that were placed and gives a sum total for payment.

    4. Feedback: Displays a form with questions that require the customer to rate on a scale for different categories such as service, food quality, hygiene, etc.

Inventory Manager:

- After logging in, the webpage interface will provide the following features:

    1. Manage Inventory: The manager would be able to view the availability of ingredients as well as update them.

    2. Menu access: Depending on the availability of ingredients, the manager can add/drop the dishes for a particular day's menu.

Manager:

- After the user authentication, the manager will have access to a Homepage which will display the following options to select and traverse to a different webpage:

1. Revenue Analysis: A summary of the revenue generated for that particular month.

2. Rush hour forecast: Analysis of customers' walk-in and leaving time for rush hour prediction.

3. Attendance: The manager can search up an employee through his ID and record his attendance for a particular working day as well as view his previous attendance records.

4. Feedback Analysis: All the feedback will be displayed here. Filters based on different categories can be used to gain a better understanding.

5. Add Waiter: In case a new employee joins, the manager can add his details and provide him with his new ID and authentication details.

Kitchen Personnel:

- This will be a simple and easy-to-use interface.

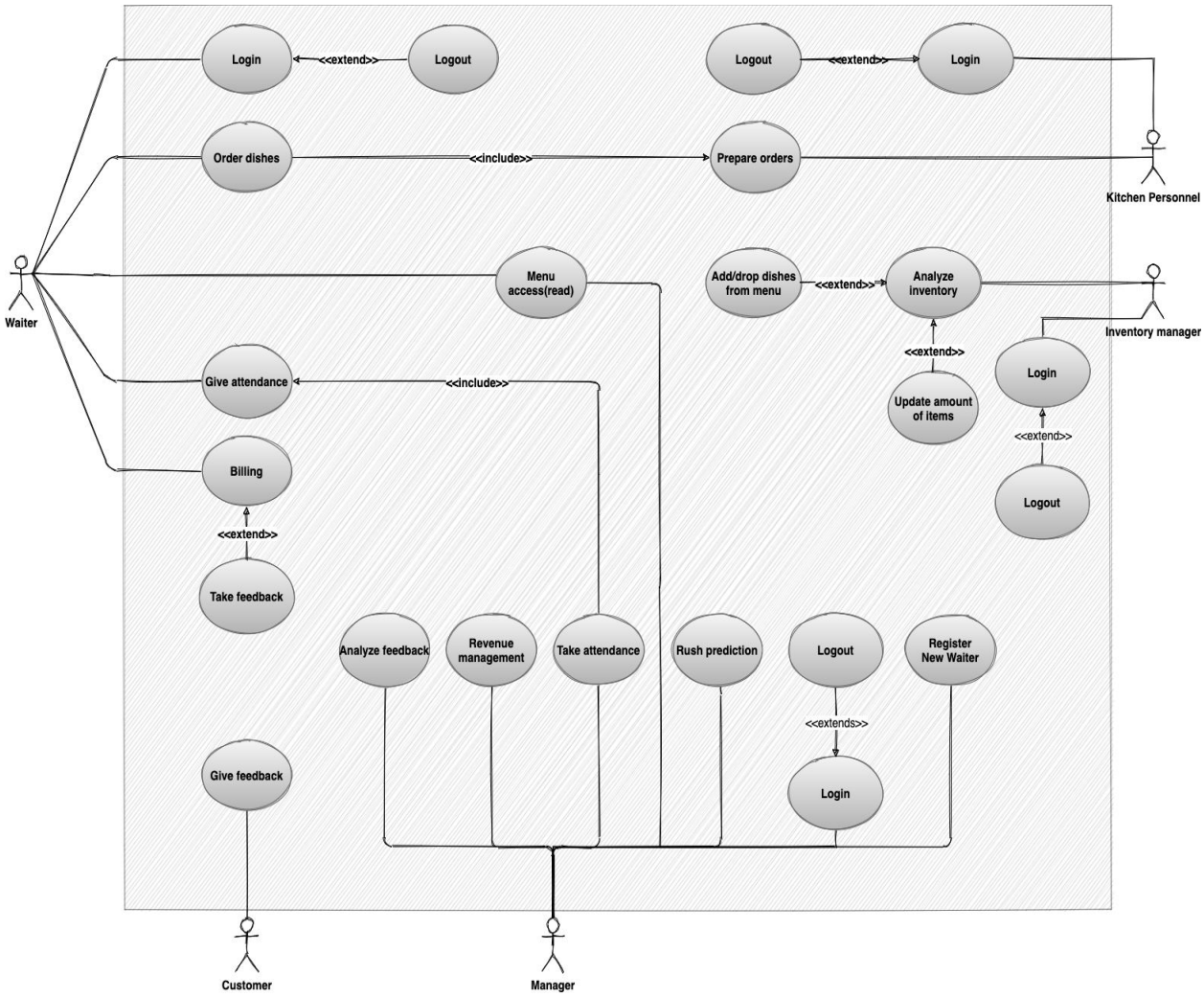
- The kitchen personnel will have access to the incoming order's list and can update its status to ready, delivered etc.

5. 'Open Issues'- issues that are identified but not taken care of.

1. Due to unforeseen software/hardware limitations, the system might observe increased latency while placing an order.

2. In the case of an internet outage, the kitchen staff, manager, and inventory manager may have trouble if they're relying on a wired connection for internet access.

6. Develop use case diagrams for your project



7. Write 2-3 paragraphs describing the requirements/needs/objectives of your project.

Restaurant management involves dozens of mundane tasks that could benefit from software automation. Everything from placing orders to revenue analysis can be achieved using a reliable management system. Our project is mainly targeted for the in-house usage that helps smoothen the working of a typical diner. The target audience for the same is waiters, managers, and kitchen personnel. All three user categories will require a different user interface with their catered functionalities.

> The interface being used by waiters would primarily establish an efficient and user-friendly platform to place orders. The kitchen staff would have their own interface too, guiding and helping them through the list of orders that is to be prepared. A separate interface for the admin usage would automate revenue and feedback analysis, as well as an ML model would be deployed for rush hour prediction. These aforementioned features would help increase the overall efficiency and productivity of the restaurant.