The work of student 19293556

CloudTables-Manager: a web interface for running on desktop or tablet computer for restaurant managers to manage their own restaurants.

TASK 2

Security and Privacy Protection

Authentication – The system should enforce a multi-factor authentication system to access manager accounts, this ensures that people with the right authority have access to sensitive manager data. The system would therefore require both password and a verification through an external device when requesting to login.

Data Encryption – All the data that is transferred and stored must be encrypted using AES-256, this would protect sensitive information from users that don't have authorisation. Network data exchanges use HTTPS or TLS and database data is encrypted at rest.

Role-Based Access Control – These controls must limit data access to the authorised user roles, for example from manager to employee, this would prevent unauthorised access to sensitive areas of the app. The different roles on the app should have customisation to the data with the user interface.

Data Anonymisation – Customer data that is used for analytics should be kept anonymous, this means that customer data is private and protected while giving data to analyse. Customer data that is identifiable should be stripped away from analytics.

Performance

Response time – The system should be responsive enough to provide a response time of under 2 seconds for all operations, this ensures a smooth and efficient experience for the managers using the app. The system consistently should meet the response time requirements under normal load situations.

Efficient Resource Utilisation – The application should maintain CPU and memory usage within reasonable limits, the utilisation should be under 70%, supporting high performance, system longevity and system efficiency. The system will remain responsive without performance bottleneck for a prolonged period of time.

Offline Mode – The basic functionality of the app should be available to the user online and offline, where the updates are made the system should sync when connected, this would mean the usability stays the same even when the system is offline. The users should be able to view the cached data and make local changes offline.

Reliability

Data Consistency and Recovery –
The database transactions should comply with ACID to maintain data consistency as this would ensure system reliability and security of sensitive data. The criteria for this would be that the transactions should be atomic, isolated, durable and consistent.

Error Handling –
The application should log when an error occurs and should send alerts when the system is at a critical state or issues. This would allow for a quick response to solve system issues and prevent them. Upon detection the system alerts should be sent to the admin when major issues occur.

Backup and Data Recovery –
The data should automatically be backed up at regular intervals with recovery mechanisms in place to ensure that the data is secure and reliable. This would ensure a backup version in case of system failure. Backup frequency and recovery mechanisms meet the agreed service level agreement.

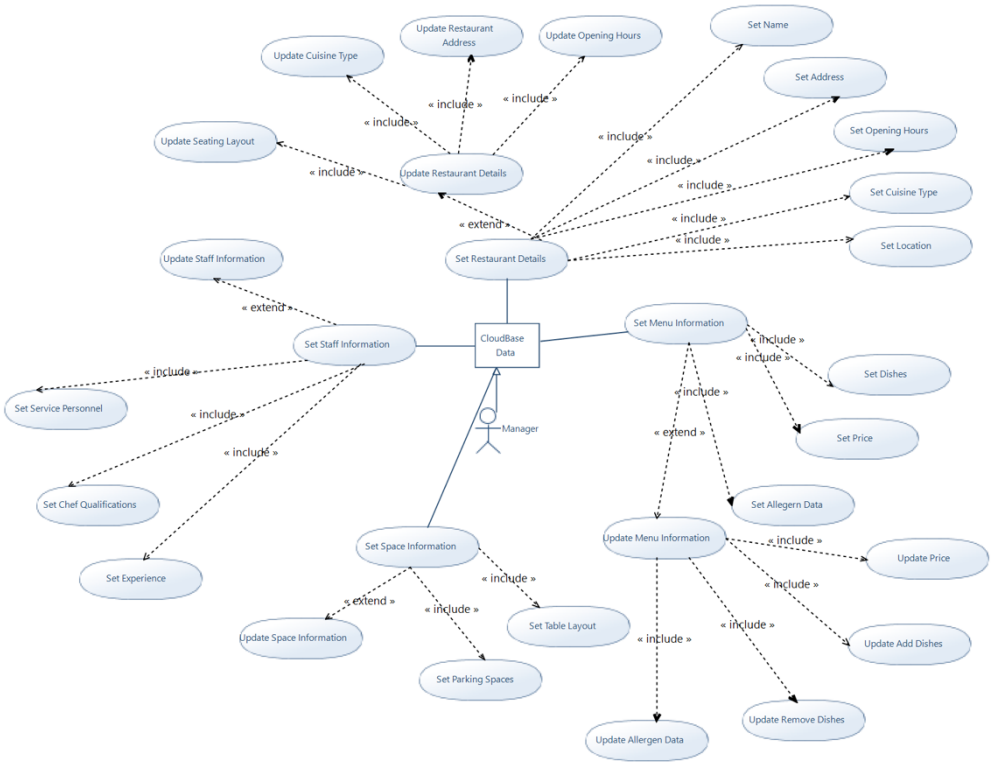
Scalability

Horizontal and vertical scalability –
The scalability of the system should allow support in both vertical and horizontal meaning more power and more instances to support the growth of the systems so that new users have a smooth experience. This would allow the system growth and have more people on the system without performance issues. Therefore, the system performance does not degrade when adding additional resources.

Database Scalability –
The database should support scaling, sharding and partitioning for high traffic and high data volume. This is as it prevents bottleneck as the data volume grows, in terms of acceptance criteria the database performance meets standards when higher loads are due to optimize structure and indexing.

Load Balancing –
The application should have load balancing capabilities to distribute the traffic load across the servers, this promotes availability and reliability. The system traffic distribution should maintain low latency and evenly distribute loads during high intensity and high traffic periods.

TASK 3a



TASK 3b

Activity Model

Actors: Manager

Theory: The manager chooses to update the restaurant's information within the subsystem to ensure that all the data is accurate and up to date.

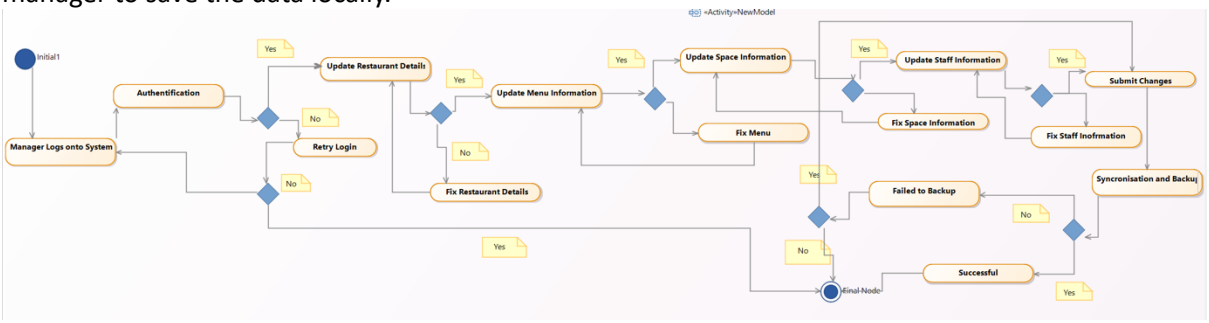
Entry Condition: The manager logs on to the system.

Exit Condition: The manager has successfully submitted updates to the CloudBase and makes modifications which are then backed up.

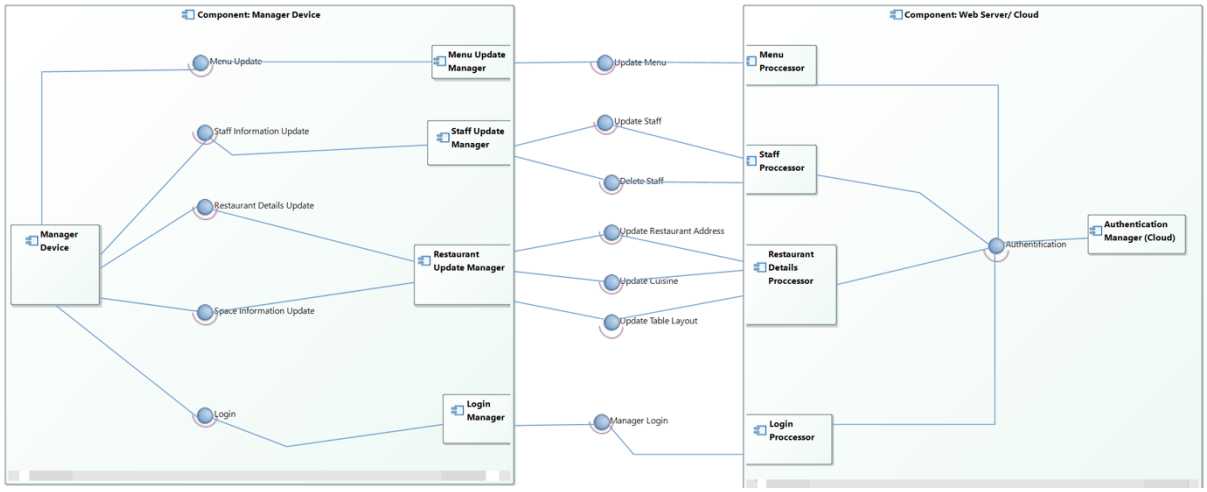
Flow of Events:

1. The manager logs onto the system, authenticates their identity.
2. They then select to update the restaurant information; they select this option.
3. The manager then decides to update the Data such as restaurant name, address, opening hours and cuisine type.
4. The manager updates the menu, types of cuisine, price and the allergen information for the food.
5. The manager then decides to update the space information such as the number of tables.
6. They then update the staff information which includes chefs qualifications and service personnel.
7. They then submit the changes to the system.
8. The system then updates the cloud and creates a back up.

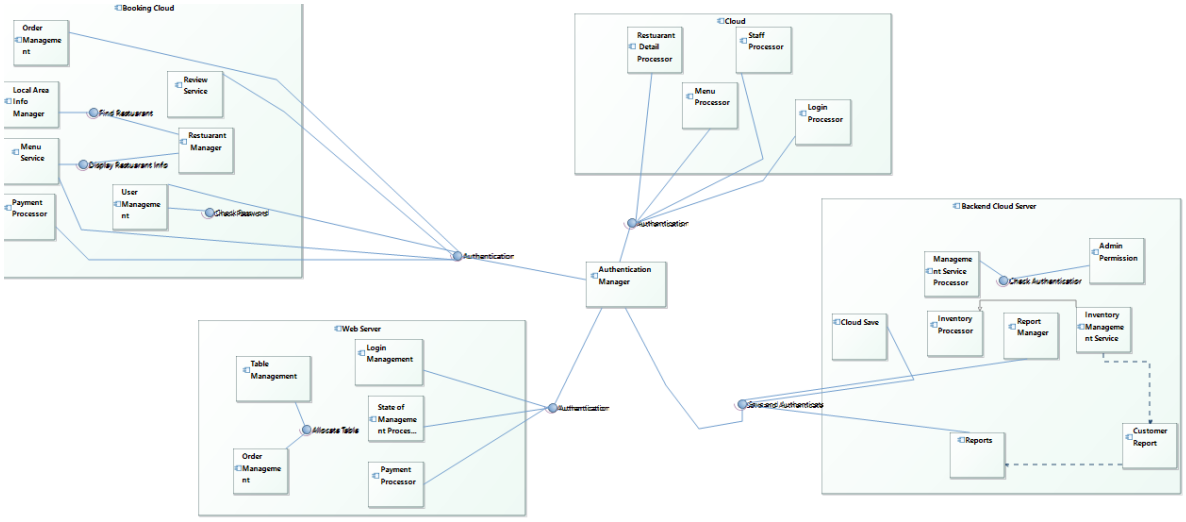
The exception scenarios are if the authentication fails, the login would fail so the system would provide a prompt to retry login. Another exception would be invalid data, so if the details, menu, space or staff have invalid inputs, the manager would be asked to fix the issues before proceeding, the final exception would be that if the update fails while saving the data, the system offers the manager to save the data locally.



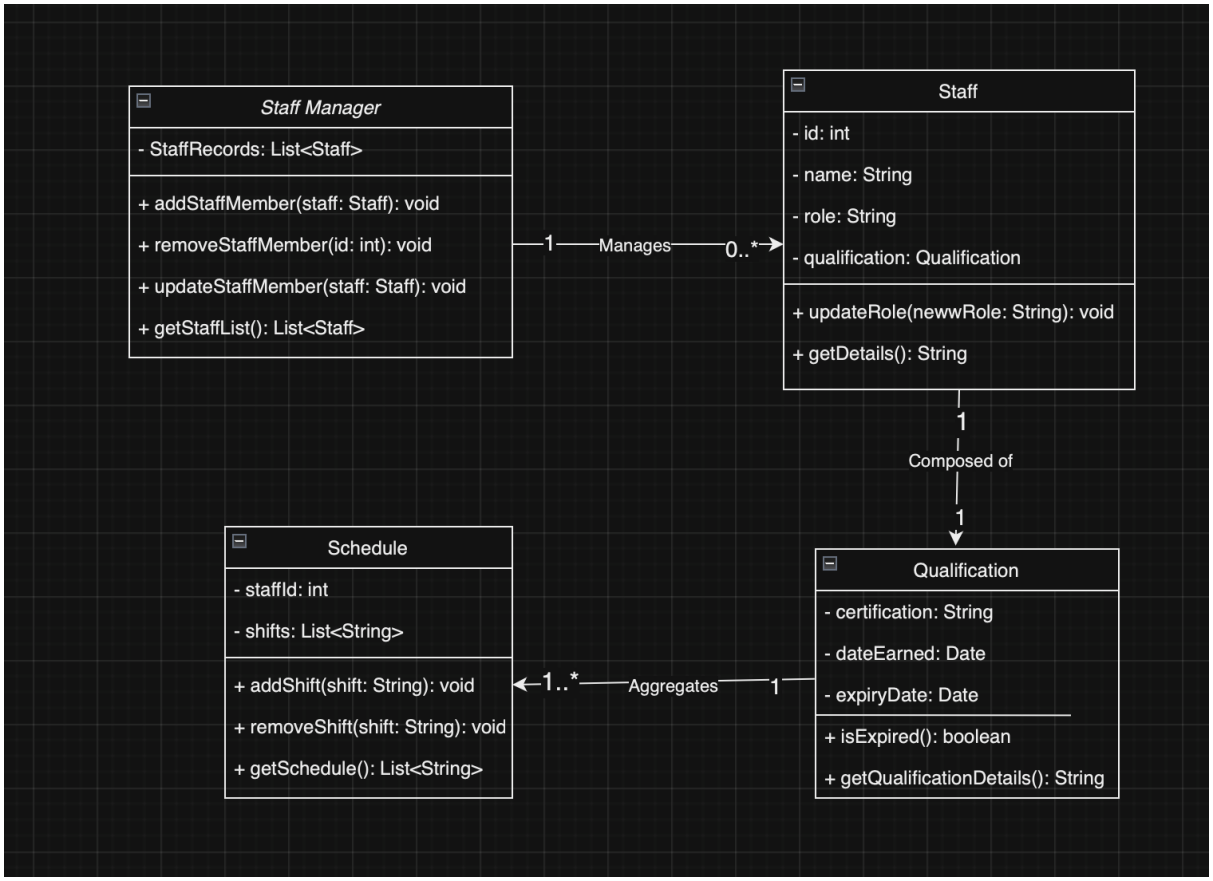
TASK 4a



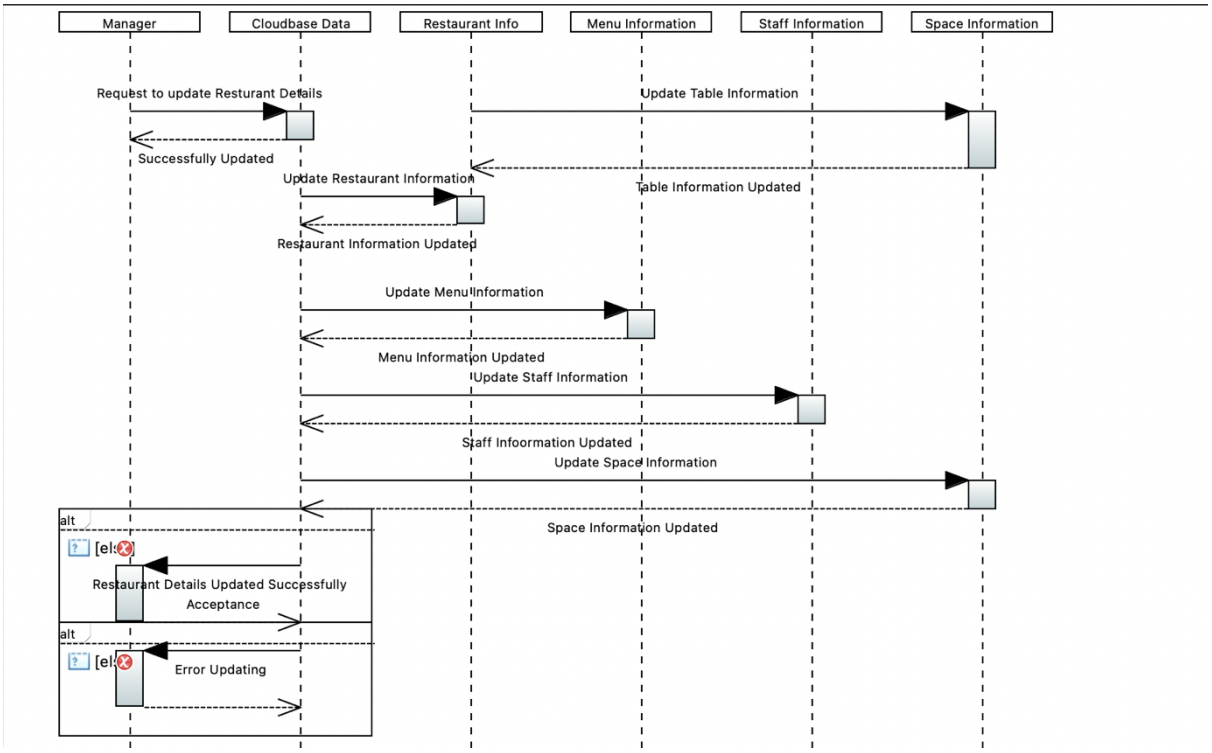
TASK 4b



TASK 5a



TASK 5b


Manager
Cloudbase Data
Restaurant Info
Menu Information
Staff Information
Space Information
Request to update Resturant Details
Update Table Information
Successfully Updated
Update Restaurant Information
Table Information Updated
Restaurant Information Updated
Update Menu Information
Menu Information Updated
Update Staff Information
Staff Infoormation Updated
Update Space Information
Space Information Updated
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Restaurant Details Updated Successfully
Acceptance
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Error Updating