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

Task 2: Analysis and Specify Software Quality Requirements

The CloudTables-Manager subsystem is intended to offer restaurant managers a safe, efficient, and user-friendly interface for controlling restaurant operations from desktop or tablet devices.

The system will use strong measures to preserve security and privacy, such as role-based access control (RBAC) with multi-factor authentication (MFA) and secure password storage utilising algorithms like bcrypt or Argon2. Data will be encrypted both at rest (using AES-256) and in transit (using TLS 1.3 or above). The solution will verify compliance with data protection standards such as GDPR and CCPA, offer options for deleting customer data, and keep tamper-proof audit records for accountability.

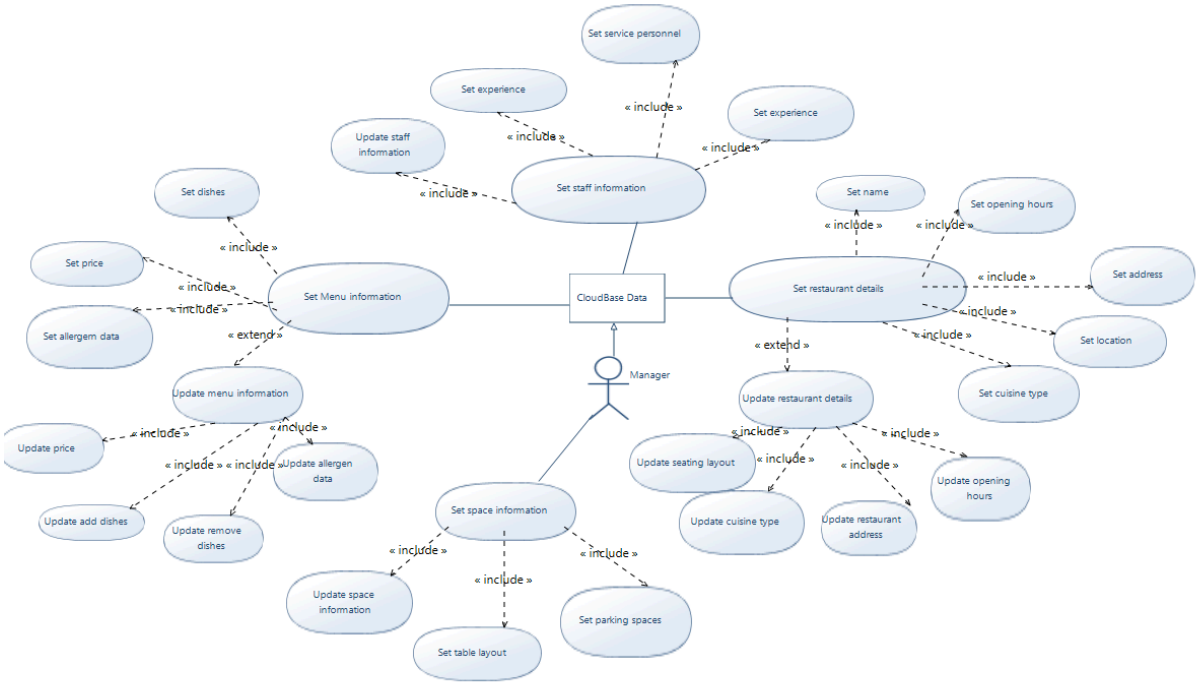
In terms of performance, the application will ensure that pages and operations load in 2 seconds or less under normal conditions, and database queries execute in 200 milliseconds. Resource utilisation will be optimised to keep it below 75% under ordinary loads, and minimal offline functionality will be offered to minimise internet outages.

The subsystem's reliability will be maintained with a target uptime of 99.9%, limiting downtime to no more than 8.76 hours per year. Robust error handling will guarantee that unforeseen errors are logged and handled graciously, with user-friendly error messages to guide recovery. ACID compliance will ensure data integrity for transactional activities, while daily backups will be kept for at least 30 days and recoverable with a single click in 5 minutes.

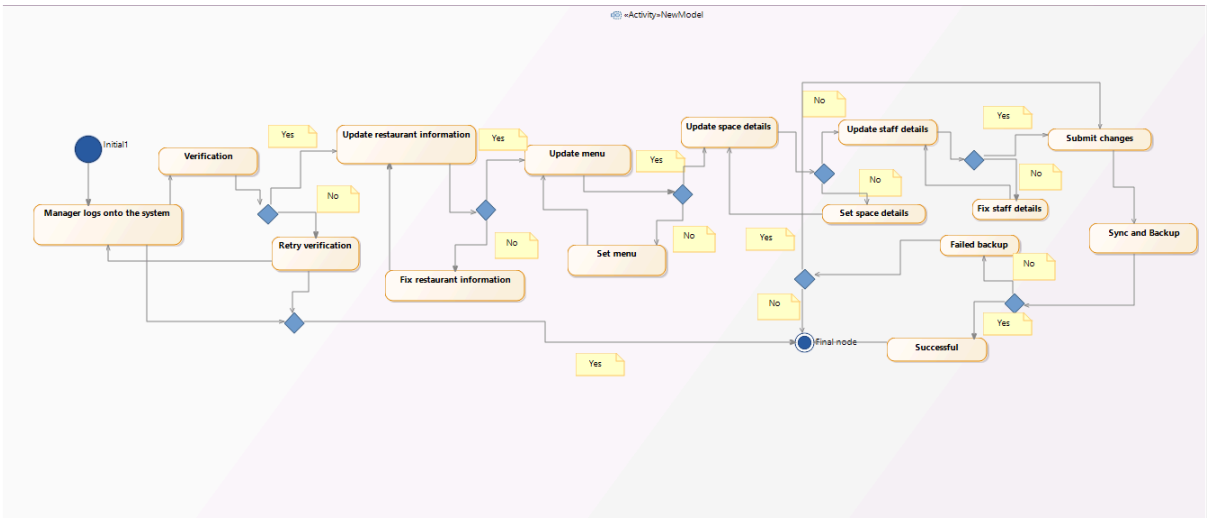
To facilitate growth, the subsystem will prioritise scalability. It will provide horizontal scalability, allowing up to 500 concurrent users per manager without performance degradation, as well as efficiently managing data quantities of up to 1TB initially, with a scalable limit of 10TB. Under double the expected demand, the design will maintain at least 80% of peak performance while also providing scalable API endpoints for third-party integrations like payment gateways and analytics tools.

These quality requirements ensure that CloudTables-Manager is a safe, high-performing, dependable, and scalable solution that successfully satisfies restaurant managers' goals while providing an excellent user experience.

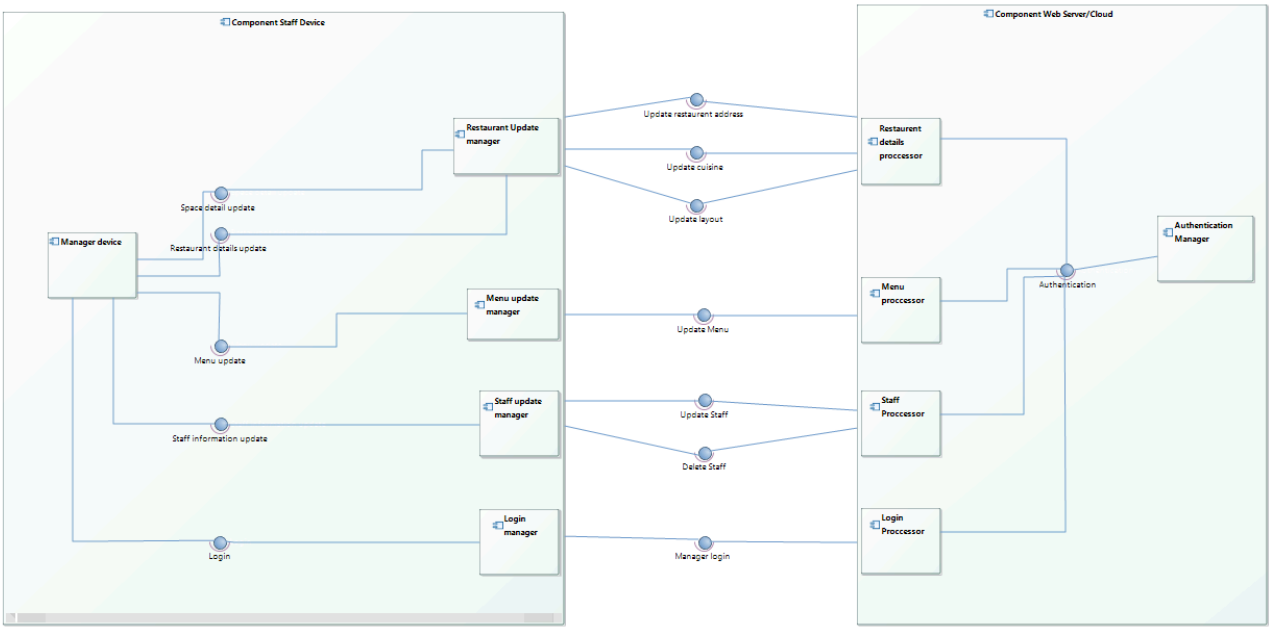
3a)


Set service personnel
Set experience
Set experience
Update staff information
Set staff information
Set dishes
Set price
Set allergem data
Set Menu information
CloudBase Data
Set name
Set opening hours
Set address
Set location
Set cuisine type
Set restaurant details
Manager
Update menu information
Update price
Update allergen data
Update add dishes
Update remove dishes
Update restaurant details
Update seating layout
Update cuisine type
Update restaurant address
Update opening hours
Set space information
Update space information
Set table layout
Set parking spaces
« include »
« extend »

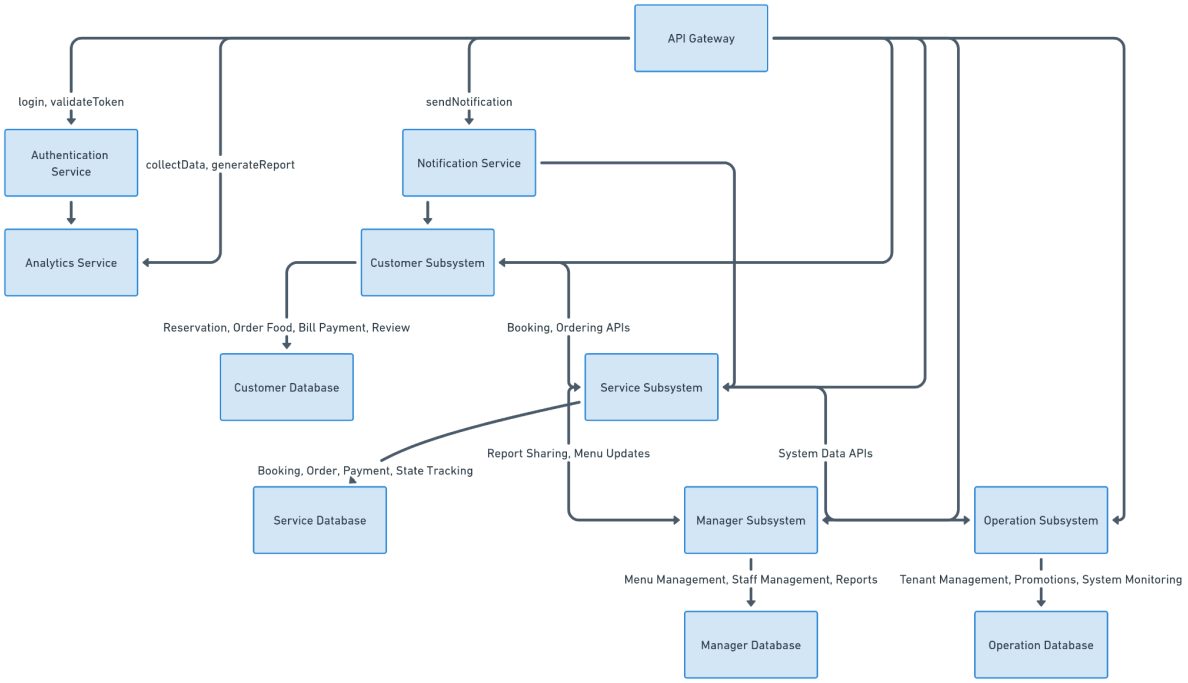
3b)


«Activity»NewModel
Initial1
Manager logs onto the system
Verification
Retry verification
Update restaurant information
Fix restaurant information
Update menu
Set menu
Update space details
Set space details
Update staff details
Fix staff details
Submit changes
Sync and Backup
Failed backup
Final node
Successful
Yes
No

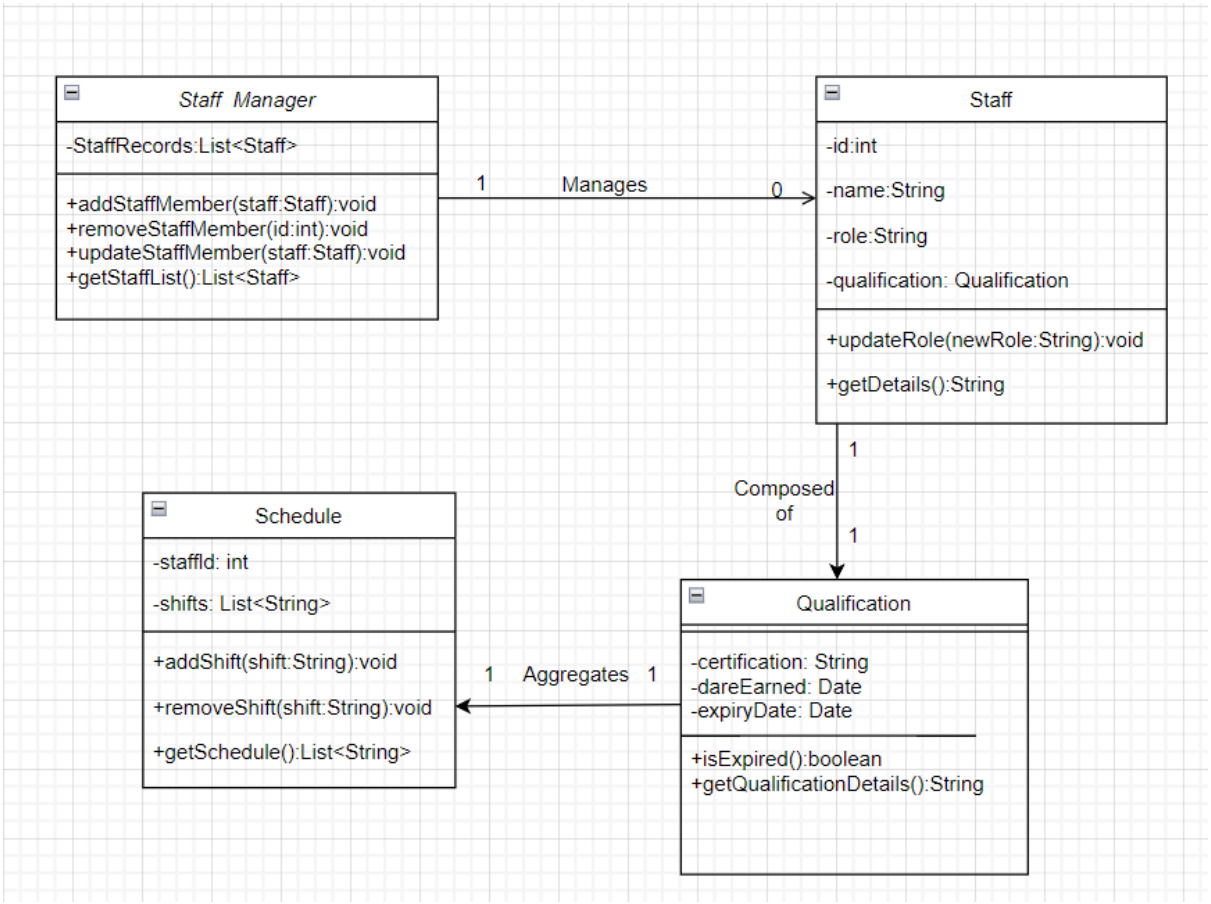
4a)


Component Staff Device
Component Web Server/Cloud
Restaurant Update manager
Update restaurant address
Update cuisine
Update layout
Restaurent details proccessor
Space detail update
Restaurant details update
Manager device
Authentication Manager
Authentication
Menu update manager
Update Menu
Menu proccessor
Menu update
Staff update manager
Update Staff
Staff Proccessor
Staff information update
Delete Staff
Login manager
Login Proccessor
Login
Manager login

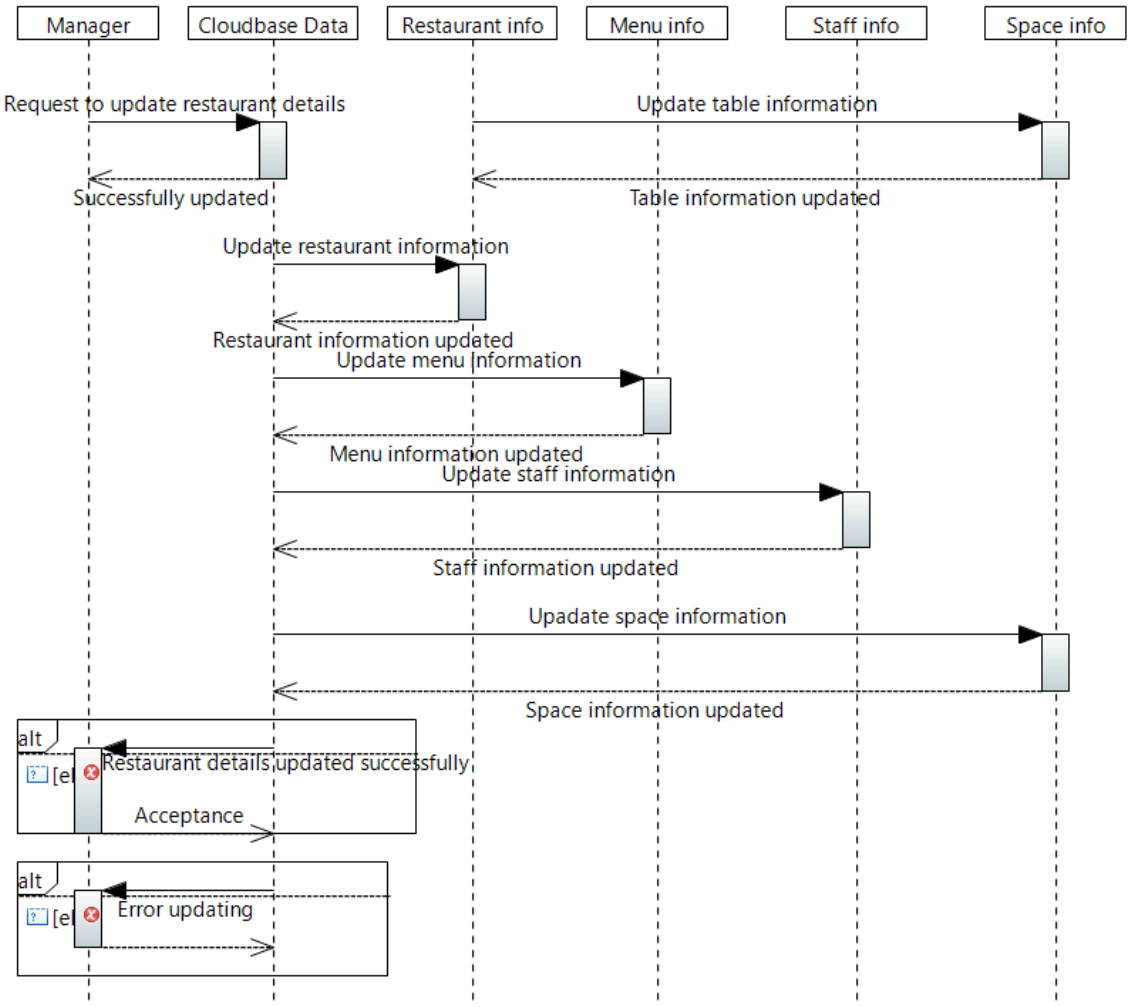
4b)


API Gateway
login, validateToken
sendNotification
Authentication Service
collectData, generateReport
Notification Service
Analytics Service
Customer Subsystem
Reservation, Order Food, Bill Payment, Review
Booking, Ordering APIs
Customer Database
Service Subsystem
Report Sharing, Menu Updates
System Data APIs
Booking, Order, Payment, State Tracking
Service Database
Manager Subsystem
Operation Subsystem
Menu Management, Staff Management, Reports
Tenant Management, Promotions, System Monitoring
Manager Database
Operation Database

5a)


Staff Manager
-StaffRecords:List<Staff>
+addStaffMember(staff:Staff):void
+removeStaffMember(id:int):void
+updateStaffMember(staff:Staff):void
+getStaffList():List<Staff>
1
Manages
0
Staff
-id:int
-name:String
-role:String
-qualification: Qualification
+updateRole(newRole:String):void
+getDetails():String
1
Composed of
1
Schedule
-staffId: int
-shifts: List<String>
+addShift(shift:String):void
+removeShift(shift:String):void
+getSchedule():List<String>
1
Aggregates
1
Qualification
-certification: String
-dareEarned: Date
-expiryDate: Date
+isExpired():boolean
+getQualificationDetails():String

5b)


Manager
Cloudbase Data
Restaurant info
Menu info
Staff info
Space info
Request to update restaurant details
Update table information
Successfully updated
Table information updated
Update restaurant information
Restaurant information updated
Update menu information
Menu information updated
Update staff information
Staff information updated
Upadate space information
Space information updated
alt
[e
Restaurant details updated successfully
Acceptance
alt
[e
Error updating