

Hotel Management System

HOTEL TRANSYLVANIA



----- MAY 2025 -----

Hotel Management System

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1. Executive Summary

1.1 Project Overview

Hotel Transylvania has a goal to create an all-inclusive software program that will automate and streamline a variety of hotel functions, hence boosting guest satisfaction, staff productivity, and overall efficiency. The system would combine important features including housekeeping, billing, reservations, front desk operations, and reporting onto a single platform, giving hotels an effective management tool. Hotels nowadays are focusing on maximizing their revenues as all other businesses do and the main reason for that is the ever-increasing competition. The online world has made it difficult for hotels and resorts to compete by providing guests a plenty of choices including Homestay, Hostel with bunk beds or even a modular option. Therefore, there is an increasing demand for best hotel management system to facilitate the management of hotel operations and functions. Operating a successful hotel business today is a challenge. A hotelier must manage various of proposals such as operations, staff and maintenance, meanwhile keeping costs under control and balances as it is one of the most important and critical issues for a hotel business to increase their revenues and to compete with other hotels. To improve the efficiency of this process, a good hotel management system which uses the modernizing techniques must be provided. The key to reaping the benefits of an effective hotel management software system is to select the right one for your property. It's critical that you know exactly what this hotel management technology is, and why it is important for you to implement it at your hotel. These days every person can find different options of the hotel reservation software free on the internet, however one must judge the solution with the quantum of features and quality that it is providing. There should be a complete functionality as a hotel management system can be both basic and advanced based on the pricing options that are available as well. Also, we can say that the developers are making such software as per the pocket of the business and this is one of the main reasons why we have so many different options in the online world. Hotel management is a key element for a very important branch of economy, which is tourism. Knowing this, two members of our group were familiar with different types of management software, and they had analysed the deficiencies that they have and decided to make this project based on the improvement of these deficiencies. Our software aims to have all the features that a hotel needs to adapt to the management structure of the business, and by making practical and effective use of these features every hotelier's work life will be much easier than they have ever imagined by using this product.

2. Product/Service Description

Hotels nowadays differ in size, culture and management structure. So, the perfect Software provided, needs to be adapted to specific business which will implement and use it. Hotel Management System is a web application which aims to facilitate the management system of a hotel. It will keep track of hotel reservations, rooms to be cleaned and so much more.

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2.1 Product Context

With the use of this technology, hotel owners and operators may increase both short- and long-term bookings while streamlining administrative work with the help of Hotel Transylvania. Hotel Transylvania is a crucial component of the entire visitor experience, not only for daily operations. The hotel management system must improve the customer experience with the brand from the start of the guests' online booking process to the end of their stay and their feedback after they return home. The goal of this solution is to unite all potential Hotel stakeholders while providing flexibility and streamlining the management process. The primary goals of the product are reliability and ease of use.

2.2 User Characteristics and their Goals

User	Characteristics	Goals
Admin	Administrator of the hotel.	<ul style="list-style-type: none">- See booked rooms.- Add/Remove users.- Observe statistics and inventory.
Receptionist	Handles guest check-ins, check-outs, and phone calls.	<ul style="list-style-type: none">- View rooms to be cleaned.- View available rooms for customers.- Handle check-ins/check-outs.- Make and view reservations.- Access notifications.
Guest	Users interested in making reservations at the hotel.	<ul style="list-style-type: none">- Make bookings.- View if room is ready for stay.- Modify booking details (dates, times).- Edit credentials.
Housekeeping	Employees responsible for cleaning rooms.	<ul style="list-style-type: none">- See rooms to be cleaned.- Update room cleaning status (e.g., ready or not).
Manager	Person responsible for operational aspects of the hotel.	<ul style="list-style-type: none">- View performance metrics and reports.- Integrate marketing channels.
Accounting	Responsible for invoicing and billing.	<ul style="list-style-type: none">- Manage invoicing and billing processes.
Staff Sponsored	Users with special privileges and access rights for administrative actions.	<ul style="list-style-type: none">- Perform administrative tasks.- Approve certain transactions.

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Concierge	<p>Service-focused hotel staff Assists guests with non-room services (e.g., local reservations, transportation) Uses the system to handle guest service requests</p>	<p>Manage and log guest service requests (tours, transport, etc.) View guest preferences or VIP details Communicate with external service providers through the system</p>
Tax Authority	<p>Government or regulatory body Accesses financial and transaction data via reporting API or exports</p>	<p>Receive accurate tax and financial reports Verify compliance with local tax regulations Review audit trails related to billing and payments</p>
Finance	<p>Handles budgeting, accounting, financial reporting Works closely with POS, Audit, and Tax Authority</p>	<p>Track income, expenses, and profits Generate financial reports for management Integrate with invoicing and billing modules</p>
Valet Staff	<p>Manages guest vehicle handling and parking May log vehicle data in system</p>	<p>Log and track vehicle check-in/out Notify guests of vehicle readiness Coordinate with reception for timing</p>
Spa Staff	<p>Provides wellness services (e.g., massage, treatments) Schedules and manages bookings via HMS</p>	<p>View and manage spa appointment schedule Update service completion status Access guest preferences and profiles</p>
Restaurant & Coffee Staff	<p>Handles food and beverage orders Uses POS and kitchen display systems</p>	<p>Place and process food/beverage orders</p>

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		Track order status and completion Print or sync receipts with guest room charges
Suppliers	Third-party vendors providing goods/services	- Interact with the system for procurement, stock management, and service delivery.
Bartender	Works in the hotel's bar area Inputs drink orders and updates order status Uses POS system to manage sales and inventory for beverages	Place and manage drink orders Process payments or charge to guest rooms Update stock usage and request restocking if needed
Server	Provides food and beverage service in restaurant or café Interacts with POS or order management module Coordinates with kitchen and billing systems	Take and process guest orders via POS system Assign orders to specific tables or rooms Update order delivery status and manage special requests

2.3 Assumptions

1. All users' needs to have basic knowledge in English language and can know other languages;
2. All users have basic knowledge in computer and smartphone usage;
3. Stakeholders of the hotel have basic knowledge on how to use the system due to previous experiences with other systems;
4. Hotel is equipped with PC/Laptop/Tablet, printer, mobile phone;
5. Hotel must have internet connection all the time;
6. It is assumed that the Hotel provides Credit Card and Cash payments.

2.4 Constraints and Dependencies

1. All users must be logged in to use the product and to access the information
2. The system must follow all Albanian and international legal restrictions, regarding aviation regulations set by certain institutions.

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3. Requirements

Requirements are the conditions or capabilities that a software system must have to satisfy the needs of its users, stakeholders, and the business. They define what the system should do and how it should perform, providing a clear framework for design, development, and testing. Requirements are essential for guiding the entire development process and ensuring the software meets its intended purpose.

3.1 Functional Requirements

REQ#	Requirement	Function	Priority	SME Approved
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BR_LR_01	Login Constraint & Role-based Views	Restricts access and shows content based on user role.	1	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_02	Add/Remove Users	Allows admin to create or delete user accounts.	1	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_03	User Account Creation	Lets users register by providing credentials.	1	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_04	Secure Guest Verification	Verifies guest identity at check-in.	1	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_05	Digital Key Access	Grants access using mobile device as key.	2	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_06	Emergency Alerts	Sends alerts to all users in emergency.	1	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_07	Notification Handling	Handles guest notifications and complaints.	2	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_08	Managing Suppliers	Manages supplier relations and inventory flow.	2	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_09	Table Reservations	Lets guests book dining tables.	2	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_10	Restaurant and Coffee Bar Management	Lets guests order room service from system.	1	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli

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BR_LR_11	View Booked Rooms	Displays reservation and timing details.	1	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_12	Reservation Modification	Allows changes to booking details.	1	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_13	Cancellation Request	Enables guests to cancel bookings before due.	1	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_14	Room Availability	Lets staff check current room status.	1	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_15	Assignment of Room	Allocates specific rooms to guests.	2	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_16	Block Dates for Specific Rooms	Prevents bookings for rooms marked unavailable.	1	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_17	Schedule Maintenance	Lets staff schedule maintenance for items.	2	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_18	Mobile Check-in and Check-out	Lets guests check in/out via mobile.	1	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_19	Lost and Found Management	Logs and tracks lost item reports.	3	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_20	Loyalty Program Management	Tracks points and applies loyalty discounts.	2	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli

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BR_LR_21	Guest Profile Management	Stores guest preferences for reuse.	2	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_22	Managing Concierge Service Requests	Handles guest special requests and bookings.	2	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_23	Print Invoice	Generates and prints invoice documents.	1	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_24	Feedback Submission	Stores feedback from guests post-stay.	3	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_25	View Payments	Displays invoice/payment info to accounting.	1	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_26	Refund Management	Processes and tracks refunds.	1	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_27	TAX/VAT Calculation	Calculates taxes and applies them on services.	1	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_28	Track Income per Department	Shows revenue earned per department.	1	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_29	Track Expenses	Shows spending per department.	1	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_30	Generate Consolidated Financial Reports	Creates combined financial summary reports.	1	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli

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BR_LR_31	View Menu	Displays food/service options.	2	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_32	Place Food and Drink Order	Takes orders for kitchen/bar service.	1	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_33	Generate and Process Order Bills	Calculates and issues bills during checkout.	1	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_34	Update Food/Beverage Inventory	Keeps food/beverage stock updated.	2	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_35	Book Spa Appointments	Schedules spa services.	2	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_36	Assign Therapist to Guest	Links therapists with scheduled guests.	2	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_37	Cancel or Reschedule Appointments	Allows guests to update their service bookings.	2	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_38	Track Spa Inventory	Monitors availability of spa supplies.	2	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_39	Process Spa Payments	Handles billing for spa services.	1	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_40	Valet Handle Vehicle Registration	Logs and manages vehicle check-in/out.	2	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli

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BR_LR_41	Forecast Revenue	Estimates revenue using historical data.	2	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Alimadhi,Arsildo Veliu,Brikena Papadhopuli
BR_LR_42	Reporting	Gives managers access to different types of reports.	2	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Alimadhi,Arsildo Veliu,Brikena Papadhopuli
BR_LR_43	Monitor Occupancy and Revenue	Shows occupancy rates and revenue trends.	1	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Alimadhi,Arsildo Veliu,Brikena Papadhopuli
BR_LR_44	Performance Metrics	Visualizes staff performance data.	2	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Alimadhi,Arsildo Veliu,Brikena Papadhopuli
BR_LR_45	Export Financial Data to CSV/Excel or Accounting Tools	Converts financial records for use in external tools.	2	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Alimadhi,Arsildo Veliu,Brikena Papadhopuli
BR_LR_46	Generate Profit/Loss Reports	Creates detailed profit/loss statements.	1	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Alimadhi,Arsildo Veliu,Brikena Papadhopuli
BR_LR_47	Market Segmentation	Categorizes guests by preferences.	2	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Alimadhi,Arsildo Veliu,Brikena Papadhopuli
BR_LR_48	Manage Guest Order	Tracks and processes guest orders.	1	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Alimadhi,Arsildo Veliu,Brikena Papadhopuli
BR_LR_49	Serve Drinks	Records and manages drink orders.	3	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Alimadhi,Arsildo Veliu,Brikena Papadhopuli
BR_LR_50	Record Financial Transaction	Logs transactions for financial tracking.	2	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Alimadhi,Arsildo Veliu,Brikena Papadhopuli

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BR_LR_51	Sponsorship Agreements	Manages contracts and terms with sponsors for financial or promotional support.	2	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_52	Define or Update Hotel Policy	Allows updates to hotel operational rules.	3	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_53	Manage Property Settings	Adjusts key settings for hotel operations.	3	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_54	Notify Guest On Room Status	Sends room readiness or update alerts to guests.	2	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli
BR_LR_55	Booking of Room	Allows guests to reserve rooms.	1	Erta Llenga, Esta Cekrezi, Artemisa Hasalami, Ester Pashtranjaku, Megi Alimadhi, Arsildo Veliu, Brikena Papadhopuli

3.2 Non-Functional Requirements

3.2.1 Product Requirements

3.2.1.1 Core Product Non-Functional Requirements

Category	Requirement
UI Responsiveness	95% of UI actions (page loads, modal displays) shall complete in <1 second on standard client hardware.
UI Consistency	Consistent application of the Transylvania Design System across desktop, tablet, and mobile interfaces, using ≥ 10 standardized UI patterns.

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Navigation Efficiency	Any core function (e.g., booking, check-in, reporting) accessible within a maximum of 3 clicks.
Discoverability	Primary commands for each interface type visible within the main viewport without scrolling on standard screen resolutions.
Task Completion Rate	New users shall achieve a $\geq 95\%$ task completion rate for common operations (e.g., booking, check-in) within 3 attempts during usability tests.
Time to Learn	New users shall complete basic system tutorials and perform core tasks within 30 minutes of first access using provided guides.
Platform Compatibility	System shall support the latest two major versions of Chrome, Firefox, Safari, and Edge; Windows 10+/macOS 11+.
Configuration	All runtime settings shall be externally configurable via JSON or YAML files and reloadable on-demand without service restart.
Localization Support	UI strings and date/currency formats shall be externalized; support dynamic switching among English, Spanish, French, and German.

3.2.1.2 Performance Requirements

Category	Requirement
Transaction Processing Time	95% of booking transactions shall be processed in less than 500 milliseconds during normal workload conditions. 90% of booking transactions shall be processed in less than 800 milliseconds during peak workload conditions.
Task Handling Capacity	System shall handle up to 1,000 check-in and check-out tasks per hour during normal workload conditions. System shall handle up to 2,000 check-in and check-out tasks per hour during peak workload conditions.
Data Processing Volume	System shall process up to 5 GB of data per day under normal workload conditions. System shall process up to 10 GB of data per day under peak workload conditions.
Report Response Time	95% of standard reports (e.g., daily occupancy report) shall be generated in less than 5 seconds. 90% of complex reports (e.g., annual financial report) shall be generated in less than 30 seconds.

3.2.1.3 Dependability Requirements

Category	Requirement
Availability	System shall maintain 99.99% uptime (maximum 52.6 minutes). System shall be available 24/7 with scheduled maintenance windows not exceeding 30 minutes per month.
Browser Downtime	System downtime due to browser compatibility issues shall not exceed 0.01% per month (4.32 minutes).
Mean Time Between Failures	MTBF shall be at least 720 hours (30 days).
Recovery Time	Error handling routines and self-healing processes shall restore service within 30 seconds for recoverable errors.
Monitoring	Real-time monitoring with automated alerts shall detect performance degradation or errors within 60 seconds. All system events shall be logged with timestamps and user IDs; administrators shall receive critical error notifications within 60 seconds.

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3.2.1.4 Advanced Product Requirements

Category	Requirement
Scalability	System shall support horizontal scaling (adding more servers) to handle a 300% increase in concurrent users. System shall support vertical scaling (upgrading existing hardware) with performance gains proportional to resource increases.
Maintainability	80% of minor enhancements shall be implemented and deployed within 2 weeks. Code shall adhere to the Transylvania Hotel System Development Guidelines v1.0 with ≥80% automated test coverage. CI/CD pipelines shall complete builds and deployments in under 15 minutes. Technical debt shall be reduced by 10% each quarter.
Extensibility	Modular architecture allowing new modules to be deployed without downtime. API endpoints shall be versioned for backward compatibility.
Continuous Delivery	System shall support monthly feature releases incorporating feedback through a defined sprint process.
Disaster Recovery	RTO ≤15 minutes; RPO ≤5 minutes. Automated backups every 6 hours with 90-day off-site retention. Quarterly disaster recovery tests with documented results.
Interoperability	Standard REST APIs and SOAP web services with JSON/XML schemas. External integrations shall require ≤8 developer-hours and ensure data consistency within 5 seconds.
Accessibility	Compliance with WCAG 2.1 Level AA. Support for internationalization: English, Spanish, French, German; USD, EUR, GBP; date formats YYYY-MM-DD and DD/MM/YYYY.
Energy Efficiency	Server utilization targeted at 60–80% during normal load to optimize energy consumption. Cloud-native services to reduce power usage by 20% vs. Baseline. Core algorithms shall exhibit O(1) or O(log n) performance complexity for critical operations.

3.2.1.5 Security Requirements

Category	Requirement
Access Control	Robust RBAC with identity verification; MFA for admin accounts; 30-minute session timeout for inactive users.
Data Encryption	AES-256 encryption at rest; TLS 1.3+ in transit; automated key rotation every 90 days.
Validation & Audits	Strong data validation at all entry points; OWASP Top 10 mitigations. Monthly automated security scans; quarterly penetration tests. Detailed audit trails for all transactions, including user actions and before/after values.
Compliance	PCI DSS Level 1 compliance; GDPR compliance; CCPA compliance; breach notifications within 72 hours. Support for Data Subject Access Request (DSAR) workflows.

3.2.2 Organizational Requirements

Category	Requirement
Environmental Requirements	Minimum bandwidth: 10 Mbps LAN; 5 Mbps WAN per user. Compatibility with Linux/Windows Server 2019+; client support for Windows 10+/macOS 11+.

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Operational Requirements	Automate 60% of manual check-in/check-out processes in initial release. Align with Standard Operating Procedures (SOPs); document workflows and automation points.
Support & Maintenance	SLAs: Critical—4-hour response/24-hour resolution; High—8-hour response/72-hour resolution; Medium—24-hour response/168-hour resolution; Low—48-hour response/336-hour resolution. Tiered support structure: Level 1 helpdesk, Level 2 technical support, Level 3 escalation.
Documentation	Comprehensive user manuals, technical guides, API references, and role-specific quick-start guides. Maintain documentation in version control with changelogs; ≥95% feature coverage before release.

3.2.3 External Requirements

3.2.3.1 Regulatory and Legal Requirements

Category	Requirement
Compliance	See Section 3.2.1.5 Security Requirements for PCI DSS Level 1, GDPR, CCPA, and DSAR support requirements.

3.2.3.2 Ethical Requirements

Category	Requirement
Data Privacy	Apply data minimization principles; provide transparent privacy notices; implement consent management systems.
Transparency	Clear privacy notices; guests shall be able to view data usage and sharing practices; consent-based tracking mechanisms.
Non-discrimination	Ensure fair access without bias; algorithmic decisions shall be auditable for fairness and non-discrimination.

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4. User Scenarios

(Focus on the "how" and "why" from the user's perspective, often describing a sequence of events a user goes through to accomplish a goal. This is linked with User Characteristics table.)

Scenario 1: Admin Accesses Dashboard and Reviews Daily Operations

Actor: Admin

Goal: Securely access the administrative dashboard to review daily KPIs, monitor system performance, and oversee hotel operations.

Preconditions: Admin has a valid, active account with administrative privileges and is on the login page.

Main Flow:

1. Admin navigates to the Transylvania Hotel System login page
2. System displays the login form with username/password fields and MFA option
3. Admin enters username/email and password
4. System prompts for MFA verification (if enabled)
5. Admin enters MFA code from authenticator app
6. Admin clicks "Login"
7. System validates credentials and MFA
8. On success, system loads personalized dashboard with daily KPIs (occupancy rate, revenue, pending tasks)
9. Admin reviews key metrics and navigates to specific management modules

Success Outcome: Admin is authenticated with full administrative access; dashboard displays current operational status.

Alternate Flows:

- 1a. Invalid Credentials: System displays "Invalid username or password." Admin retries or initiates password reset
- 1b. Account Locked: After 5 failed attempts, system locks account for 30 minutes and prompts to contact support
- 1c. Forgotten Password: Admin clicks "Forgot Password?", enters email, receives reset link with 24-hour expiry

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- 1d. MFA Failed: System prompts to re-enter MFA code, allows 3 attempts before temporary lockout

Postconditions: Admin session is active with 30-minute timeout; comprehensive audit log records login timestamp, IP address, and user ID.

Scenario 2: Guest Makes a Room Reservation Online

Actor: Hotel Guest

Goal: Search for available rooms, compare options, and complete a booking with payment.

Preconditions: Guest is on the hotel website booking page with internet connectivity.

Main Flow:

1. Guest selects check-in and check-out dates using date picker
2. Guest specifies number of adults and children
3. System searches availability and displays room types with photos, amenities, and pricing
4. Guest selects preferred room type and clicks "Book Now"
5. System displays booking summary with total cost breakdown (room rate, taxes, fees)
6. Guest creates account or proceeds as guest user
7. Guest enters personal details (name, email, phone, address)
8. Guest selects payment method and enters payment information
9. Guest reviews terms and conditions, then clicks "Confirm Booking"
10. System processes payment through secure gateway
11. System generates confirmation number and displays confirmation page
12. System sends confirmation email with booking details and policies

Success Outcome: Reservation is confirmed with unique booking reference; guest receives confirmation email.

Alternate Flows:

- 2a. No Availability: System displays "No rooms available for selected dates" and suggests alternative dates
- 2b. Payment Failure: System shows specific payment error and prompts to retry or use alternate payment method
- 2c. Room Unavailable During Booking: System notifies that room was just booked and offers similar alternatives
- 2d. Validation Error: System highlights missing or invalid fields (email format, phone number, etc.)

Postconditions: Room marked as reserved in system; payment processed and recorded; confirmation email sent; inventory updated; audit log records complete transaction.

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Scenario 3: Receptionist Processes Guest Check-In

Actor: Receptionist

Goal: Efficiently check in arriving guests, verify reservation details, and provide room access.

Preconditions: Receptionist is logged in to front desk system; guest has arrived with valid reservation.

Main Flow:

1. Receptionist searches for reservation using confirmation number, guest name, or phone
2. System displays reservation details (dates, room type, guest information, special requests)
3. Receptionist verifies guest identity using photo ID
4. System checks room readiness status from housekeeping
5. Receptionist confirms guest details and updates any changes
6. System generates room key cards and assigns room number
7. Receptionist collects security deposit or pre-authorization on credit card
8. System prints registration form and welcome packet
9. Receptionist explains hotel amenities, WiFi password, and checkout procedures
10. System updates guest status to "Checked In" and notifies relevant departments

Success Outcome: Guest is successfully checked in with room access; all departments notified of arrival.

Alternate Flows:

- 3a. No Reservation Found: Receptionist searches alternative spellings or creates walk-in reservation
- 3b. Room Not Ready: System suggests available ready rooms or offers early bag storage with room ready notification
- 3c. Payment Issue: System prompts for alternative payment method or manager authorization
- 3d. Guest Information Mismatch: Receptionist updates guest details with proper verification
- 3e. Special Requests: System flags VIP status, accessibility needs, or other special accommodations

Postconditions: Guest checked in with active room access; housekeeping notified; billing account activated; guest preferences recorded for future stays.

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Scenario 4: Receptionist Processes Guest Check-Out

Actor: Receptionist

Goal: Complete guest departure process, finalize billing, and prepare room for next guest.

Preconditions: Guest is ready to depart; receptionist has access to front desk system.

Main Flow:

1. Guest approaches front desk requesting checkout
2. Receptionist retrieves guest folio using room number or name
3. System displays complete stay charges (room, taxes, incidentals, services)
4. Receptionist reviews charges with guest and addresses any questions
5. Guest approves final bill or disputes specific charges
6. System processes final payment using method on file or guest provides new payment
7. Receptionist collects room key cards and confirms no items left behind
8. System generates receipt and checkout summary
9. Receptionist thanks guest and requests feedback or reviews
10. System updates room status to "Checkout" and notifies housekeeping

Success Outcome: Guest checkout completed with final payment processed; room ready for housekeeping.

Alternate Flows:

- 4a. Disputed Charges: Manager reviews and adjusts charges if valid; system logs dispute resolution
- 4b. Payment Declined: Receptionist requests alternative payment method or processes partial payment with follow-up
- 4c. Express Checkout: Guest uses mobile app or in-room TV for self-checkout with emailed receipt
- 4d. Late Checkout: System applies late fees according to hotel policy or manager override

Postconditions: Final bill processed and archived; room status updated; housekeeping work order created; guest stay record completed with satisfaction survey sent.

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Scenario 5: Guest Sends Message to Hotel Staff

Actor: Hotel Guest

Goal: Communicate with hotel staff for assistance, requests, or inquiries during stay.

Preconditions: Guest is either authenticated (current guest) or has provided valid contact information.

Main Flow:

1. Guest navigates to "Contact Us" section or opens chat interface
2. System displays message form with category options (housekeeping, concierge, maintenance, billing)
3. Guest selects appropriate category and urgency level
4. Guest composes message describing request or question
5. Guest adds room number (if applicable) and contact preference
6. Guest clicks "Send Message"
7. System validates required fields and message content
8. System routes message to appropriate department queue based on category
9. System displays "Message Sent" confirmation with ticket number
10. System notifies designated staff member via dashboard alert or mobile notification

Success Outcome: Message delivered to appropriate staff with tracking number; guest receives confirmation.

Alternate Flows:

- 5a. Validation Error: System highlights missing required fields (room number, contact info) with clear error messages
- 5b. Emergency Request: System immediately alerts on-duty manager and security for urgent issues
- 5c. System Maintenance: System displays maintenance notice with alternative contact methods (phone, email)
- 5d. Outside Business Hours: System queues message and provides expected response time

Postconditions: Message stored in ticketing system with timestamp; staff notification generated; response SLA timer activated; guest communication log updated.

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Scenario 6: Housekeeping Staff Updates Room Status

Actor: Housekeeping Staff

Goal: Update room cleaning status and report maintenance issues to maintain accurate room inventory.

Preconditions: Housekeeper is authenticated and assigned to specific room list for the day.

Main Flow:

1. Housekeeper opens mobile housekeeping app or accesses desktop terminal
2. System displays assigned room list with current status (checkout, occupied, maintenance)
3. Housekeeper selects room to be cleaned and begins work
4. After cleaning, housekeeper inspects room and selects status: "Clean" or "Maintenance Required"
5. If maintenance required, housekeeper selects issue type (plumbing, electrical, furniture, amenities)
6. Housekeeper adds photos and detailed description of any issues
7. Housekeeper confirms room status update
8. System immediately notifies front desk of room availability or maintenance needs
9. System updates housekeeping progress dashboard for supervisors

Success Outcome: Room status accurately reflects current condition; front desk has real-time availability information.

Alternate Flows:

- 6a. Maintenance Issue Found: System creates work order and notifies maintenance department with priority level
- 6b. Network Connectivity Issue: System caches updates locally and syncs automatically when connection restored
- 6c. Damaged Items: Housekeeper photographs damage and system generates incident report for management
- 6d. Lost and Found Items: System creates lost property record with guest information and item description

Postconditions: Room status updated in property management system; front desk availability updated; maintenance work orders created as needed; housekeeping productivity metrics recorded.

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Scenario 7: Manager Generates Occupancy Report

Actor: Hotel Manager

Goal: Generate and analyze daily/weekly/monthly occupancy reports for operational decision-making.

Preconditions: Manager is logged in with reporting privileges; sufficient data exists for requested period.

Main Flow:

1. Manager navigates to Reports section in management dashboard
2. System displays report categories (occupancy, revenue, guest satisfaction, operational)
3. Manager selects "Occupancy Report" and specifies date range
4. Manager chooses report format (summary, detailed, comparative) and output type (PDF, Excel, dashboard view)
5. System processes request and displays loading indicator
6. System generates report with key metrics (occupancy percentage, ADR, RevPAR, trends)
7. Manager reviews data and can drill down into specific dates or room types
8. Manager exports report or schedules automatic delivery to stakeholders

Success Outcome: Comprehensive occupancy report generated with actionable insights for management decisions.

Alternate Flows:

- 7a. Insufficient Data: System notifies manager of data limitations and suggests alternative date ranges
- 7b. Report Generation Timeout: System processes report in background and emails when complete
- 7c. Custom Filters: Manager applies additional filters (room type, rate code, guest type) for targeted analysis
- 7d. Comparative Analysis: System generates year-over-year or period-over-period comparisons

Postconditions: Report generated and archived; user access logged; scheduled reports updated if configured; data exported in requested format.

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Scenario 8: Staff Member Responds to Guest Message

Actor: Hotel Staff (Concierge/Receptionist/Manager)

Goal: Provide timely and helpful response to guest inquiries to ensure high service satisfaction.

Preconditions: Staff member is logged in with message response privileges; guest message exists in queue.

Main Flow:

1. System displays new message notification to appropriate staff member
2. Staff member clicks notification to view message thread with guest information and stay details
3. System shows message priority, category, and response SLA timer
4. Staff member reviews guest request and accesses relevant information (reservation, preferences, history)
5. Staff member composes response addressing guest's specific needs
6. Staff member adds internal notes if follow-up actions required
7. Staff member sends response and marks issue as resolved or escalates if needed
8. System delivers message to guest via preferred communication method
9. System logs response time and updates service metrics

Success Outcome: Guest receives timely, relevant response; service request resolved or properly escalated.

Alternate Flows:

- 8a. Escalation Required: Staff member forwards to supervisor/manager with context and urgency level
- 8b. External Vendor Needed: System creates work order and coordinates with third-party services
- 8c. Guest Unavailable: System attempts multiple delivery methods and logs attempts
- 8d. Follow-up Required: System sets reminder for staff to check resolution status

Postconditions: Guest communication logged with resolution status; service metrics updated; follow-up tasks created if needed; guest satisfaction tracking updated.

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Scenario 9: Admin Manages User Accounts

Actor: Admin

Goal: Create, modify, or deactivate user accounts while maintaining security and proper access controls.

Preconditions: Administrator has system admin privileges and is logged into admin console.

Main Flow:

1. Administrator navigates to User Management section
2. System displays current user list with roles, status, and last login information
3. Administrator selects action: Create New User, Modify Existing, or Deactivate
4. For new user: Administrator enters employee details, assigns role, and sets initial permissions
5. System generates temporary password and sends welcome email with setup instructions
6. Administrator reviews and confirms user configuration
7. System creates audit log entry and activates account
8. Administrator verifies account creation and notifies relevant department manager

Success Outcome: User account properly configured with appropriate access levels; new user can successfully log in.

Alternate Flows:

- 9a. Duplicate Account: System detects existing user and prompts to modify existing account instead
- 9b. Invalid Role Assignment: System validates role permissions and prompts correction
- 9c. Bulk User Import: Administrator uploads CSV file with user data for mass account creation
- 9d. Account Deactivation: System safely disables access while preserving audit history

Postconditions: User account database updated; security groups modified; audit trail recorded; relevant notifications sent to affected users and managers.

Scenario 10: Guest Modifies Existing Reservation

Actor: Hotel Guest

Goal: Change reservation dates, room type, or guest details for an upcoming stay.

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Preconditions: Guest has existing confirmed reservation and is within modification policy timeframe.

Main Flow:

1. Guest accesses "Manage Booking" section using confirmation number and email
2. System displays current reservation details with modification options
3. Guest selects what to modify (dates, room type, guest count, special requests)
4. System checks availability for requested changes and displays price difference
5. Guest reviews modification summary including any fees or savings
6. System processes payment adjustment if applicable
7. Guest confirms changes and receives updated confirmation
8. System sends modification confirmation email with new details

Success Outcome: Reservation successfully modified with updated confirmation; guest receives new booking details.

Alternate Flows:

- 10a. Requested Changes Unavailable: System suggests alternative dates or room types
- 10b. Modification Fees Apply: System clearly displays fees and requires guest acceptance
- 10c. Outside Modification Window: System explains policy and offers to connect with reservations
- 10d. Cancellation Instead: Guest chooses to cancel and system processes according to cancellation policy

Postconditions: Original reservation canceled; new reservation created; inventory updated; payment adjusted; confirmation email sent; audit log records modification details.

Scenario 11: Marketing Staff Creates Promotional Campaign

Actor: Marketing Staff

Goal: Create and launch targeted promotional campaigns to increase bookings and revenue during specific periods.

Preconditions: Marketing staff is logged in with campaign management privileges; access to guest data and booking analytics.

Main Flow:

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1. Marketing staff navigates to Marketing Dashboard
2. System displays campaign management tools and current promotional activities
3. Staff analyzes booking trends and identifies low-occupancy periods
4. Staff creates new campaign with target demographics, dates, and discount parameters
5. System validates campaign rules and calculates potential revenue impact
6. Staff designs promotional materials and sets distribution channels (email, social media, website)
7. Staff schedules campaign launch and sets performance tracking metrics
8. System activates campaign and begins monitoring booking responses
9. Staff reviews real-time campaign performance and adjusts as needed

Success Outcome: Promotional campaign successfully launched with tracking metrics active; bookings increase for targeted periods.

Alternate Flows:

- 11a. Conflicting Campaigns: System alerts about overlapping promotions and suggests modifications
- 11b. Budget Constraints: System calculates discount impact and requests management approval
- 11c. Technical Issues: System queues campaign for later deployment and notifies IT support
- 11d. Poor Performance: Staff receives automated alerts and can modify campaign parameters

Postconditions: Campaign active in system; booking engine updated with promotional rates; performance tracking initiated; marketing analytics updated.

Scenario 12: Accounting Staff Processes Monthly Financial Reports

Actor: Accounting/Finance Staff

Goal: Generate comprehensive monthly financial reports including revenue, expenses, and profit analysis.

Preconditions: Accounting staff has financial reporting access; month-end data is complete and reconciled.

Main Flow:

1. Accounting staff accesses Financial Reporting module
2. System displays available report types and date ranges
3. Staff selects monthly financial report and specifies reporting period
4. System aggregates data from all revenue sources (rooms, restaurant, services, events)

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5. Staff reviews preliminary report and validates key figures
6. System calculates taxes, fees, and generates profit/loss statements
7. Staff adds management commentary and explanatory notes
8. System formats final report for distribution to stakeholders
9. Staff schedules automatic delivery to hotel owner, managers, and board members

Success Outcome: Comprehensive monthly financial report generated and distributed; financial data archived for audit purposes.

Alternate Flows:

- 12a. Data Discrepancies: System flags inconsistencies and staff investigates before finalizing
- 12b. Missing Transactions: Staff receives alerts about unrecorded transactions and follows up
- 12c. Audit Requirements: System generates additional detail reports for compliance purposes
- 12d. Performance Analysis: Staff creates comparative reports showing trends and variances

Postconditions: Financial reports archived; stakeholders notified; audit trail updated; accounting period officially closed.

Scenario 13: Maintenance Staff Completes Repair Work Order

Actor: Maintenance Staff

Goal: Complete assigned maintenance tasks efficiently and update system with work completion details.

Preconditions: Maintenance staff has active work orders assigned; necessary tools and materials available.

Main Flow:

1. Maintenance staff accesses mobile maintenance app
2. System displays assigned work orders prioritized by urgency and room status
3. Staff selects work order and reviews problem description and guest impact
4. Staff performs diagnostic assessment and determines repair approach
5. Staff completes repair work and tests functionality
6. Staff updates work order with completion details, time spent, and materials used
7. System notifies housekeeping that room is ready for cleaning
8. Staff captures before/after photos and uploads to work order

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9. System updates room status and notifies front desk of availability

Success Outcome: Maintenance issue resolved; room returned to service; accurate records maintained for cost tracking.

Alternate Flows:

- 13a. Parts Needed: Staff orders required parts and schedules follow-up completion
- 13b. Contractor Required: Staff escalates to external vendor and coordinates scheduling
- 13c. Safety Concerns: Staff flags room as unsafe and notifies management immediately
- 13d. Additional Issues Found: Staff creates new work orders for discovered problems

Postconditions: Work order closed; room status updated; maintenance costs recorded; preventive maintenance schedule updated if applicable.

Scenario 14: Restaurant Staff Processes Dining Order

Actor: Restaurant Staff (Server/Bartender)

Goal: Take guest orders, coordinate with kitchen, and provide excellent dining service.

Preconditions: Restaurant staff is on duty; guest is seated and ready to order; POS system is operational.

Main Flow:

1. Server approaches guest table and presents menu options
2. Guest places food and beverage order
3. Server enters order details into POS system including special requests
4. System sends order to kitchen and bar based on item categories
5. Kitchen and bar staff prepare items according to order specifications
6. Server monitors order status and coordinates timing for table service
7. Server delivers completed order to guest table
8. System tracks service times and updates guest satisfaction metrics
9. Server processes payment or charges to room account

Success Outcome: Guest receives ordered items promptly; payment processed; service metrics recorded.

Alternate Flows:

- 14a. Item Unavailable: Server offers alternatives and updates order accordingly

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- 14b. Special Dietary Needs: Kitchen staff modifies preparation to accommodate allergies/preferences
- 14c. Order Delays: Server communicates with guests and offers compensation if appropriate
- 14d. Quality Issues: Server coordinates with kitchen for order correction or replacement

Postconditions: Order completed and paid; guest satisfaction recorded; inventory updated; staff performance metrics logged.

Scenario 15: Hotel Owner Reviews Business Performance

Actor: Hotel Owner

Goal: Review comprehensive business performance including financial results, operational metrics, and strategic initiatives.

Preconditions: Hotel owner has executive access to all system reports and dashboards.

Main Flow:

1. Hotel owner accesses executive dashboard
2. System displays high-level performance summary with key business indicators
3. Owner reviews financial performance including revenue, profit margins, and cost analysis
4. System presents operational metrics such as occupancy rates, guest satisfaction, and efficiency measures
5. Owner analyzes market positioning and competitive performance
6. System provides strategic recommendations based on data trends
7. Owner reviews staff performance and departmental effectiveness
8. Owner sets new performance targets and policy adjustments
9. System documents strategic decisions and distributes to management team

Success Outcome: Business performance thoroughly reviewed; strategic decisions made and communicated; performance targets updated.

Alternate Flows:

- 15a. Performance Issues: Owner initiates corrective action plans and assigns responsibility

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- 15b. Growth Opportunities: System highlights expansion possibilities and market opportunities
- 15c. Cost Concerns: Owner implements cost reduction strategies and efficiency improvements
- 15d. Investment Decisions: Owner evaluates capital expenditure proposals and ROI projections

Postconditions: Strategic decisions documented; management team notified of new directives; performance monitoring updated with new targets.

4.2 USE CASES

(a more formal technique to describe how an actor uses a system to achieve a goal.)

Arsildo Veliu

UC1: Login Constraint & Role-based Views

UC Name:	Login Constraint & Role-based Views
Summary	Authenticates users and presents dashboards based on their role.
Dependency	Authentication Service
Actors	Guest, Receptionist, Admin, Housekeeping Staff
Preconditions	User has a valid account and access to login page.

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Description of the Main Sequence	1. User enters credentials. 2. System validates credentials. 3. Identifies role. 4. Displays respective dashboard.
Description of the Alternative Sequence	- Invalid credentials → Show error message and retry login.
Non-functional requirements	Secure HTTPS login, response time < 2s, role isolation.
Postconditions	User is logged in and redirected to their role-specific view.

UC2: Add/Remove Users

UC Name	Add / Remove Users
Summary	Admin adds or removes users from the system.
Dependency	Login Constraint & Role-based Views
Actors	Admin

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Preconditions	Admin is authenticated and has permission to modify users.
Description of the Main Sequence	<ol style="list-style-type: none"> 1. Admin chooses add/remove. 2. Submits action. 3. System validates input. 4. Executes add/remove operation. 5. Logs activity.
Description of the Alternative Sequence	<ul style="list-style-type: none"> - Invalid input → Show error message and prompt correction. - Admin cancels delete operation → Confirm cancellation and return to user list. - User deletion conflicts with active sessions → Force logout user first.
Non-functional requirements	All actions logged; update within 3s.
Postconditions	User added or removed and changes saved.

UC3: User Account Creation

UC Name	User Account Creation
Summary	Guest creates a new account for login access.
Dependency	None

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Actors	Guest
Preconditions	Guest accesses registration page.
Description of the Main Sequence	<ol style="list-style-type: none"> 1. Guest fills form. 2. System validates inputs. 3. Checks for duplicate email. 4. Creates account. 5. Sends confirmation.
Description of the Alternative Sequence	<ul style="list-style-type: none"> - Email already exists → User asked to try another. - Invalid data → Prompt correction.
Non-functional requirements	Email check in real-time, confirmation email < 5s.
Postconditions	Account stored in system; email confirmation sent.

UC4: Secure Guest Verification

UC Name	Secure Guest Verification
Summary	Verifies guest identity through ID and booking data.

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Dependency	User Account Creation
Actors	Guest, Receptionist
Preconditions	Guest is logged in and has a booking.
Description of the Main Sequence	<ol style="list-style-type: none"> 1. Upload ID. 2. Extract personal info via OCR (name, ID number, photo, expiration date). 3. Match booking data. 4. Approve verification.
Description of the Alternative Sequence	<ul style="list-style-type: none"> - OCR fails → Retry. - Booking mismatch → Notify failure.
Non-functional requirements	OCR processing < 3s; secure image handling.
Postconditions	Guest is verified or flagged for manual review.

UC 5:Digital Key access

UC Name	Digital Key Access
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Summary	Guests unlock their room via mobile application.
Dependency	Secure Guest Verification
Actors	Guest
Preconditions	Guest is verified and has active booking.
Description of the Main Sequence	<ol style="list-style-type: none">1. Tap digital key.2. Validate session.3. Generate unlock token.4. Communicate with door lock.5. Log access.
Description of the Alternative Sequence	<ul style="list-style-type: none">- Not logged in → Redirect to login.- Unlock failure → Show error.
Non-functional requirements	Unlock < 1s, hardware integration, audit log.
Postconditions	Door unlocks or failure is handled gracefully.

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UC 6: Emergency Alert

UC Name	Emergency Alert
Summary	Sends an emergency broadcast to all staff and guests.
Dependency	Notification Handling
Actors	Staff
Preconditions	Trigger initiated by system or authorized staff.
Description of the Main Sequence	<ol style="list-style-type: none">1. Alert triggered.2. Compose message.3. Dispatch to guests & staff.4. Log message.
Description of the Alternative Sequence	- If a channel fails → Retry sending or escalate.
Non-functional requirements	99% delivery rate, < 2s dispatch, reliable channels.
Postconditions	Emergency message delivered and logged.

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UC7: Notify Guest On Room Status

UC Name	Notify Guest on Room Status
Summary	System notifies the guest about changes in their room status (e.g., ready for check-in, being cleaned, unavailable).
Dependency	- Guest reservation must exist - Room status tracking system must be operational
Actors	- Hotel Management System - Guest - Housekeeping Staff
Preconditions	- Guest must have an active reservation - System must track room statuses
Main Sequence	1. Room status changes (e.g., cleaned, ready) 2. Housekeeping updates system 3. System detects status update 4. Sends notification to guest (email/SMS/app) 5. System logs notification sent
Alternative Sequence	- Notification fails → Retry and log persistent failure - Room unavailable → Notify guest with apology and offer alternatives - Guest contact info invalid → Flag for manual notification by front desk
Non-functional Requirements	- Notify within 1 minute of status update - Secure and reliable delivery - 95% delivery success rate
Postconditions	- Guest is informed of room status change - Notification is logged in system

Hotel Management System

Artemisa Hasalami

UC8: Notification Handling

UC Name	Notification Handling
Summary	The Hotel Management System generates and sends notifications to users based on system events.
Dependency	Notification service must be integrated and operational
Actors	Hotel Management System
Preconditions	Triggering events (e.g., room status change, booking confirmation, payment received) must occur
Main Sequence	1. Event occurs in the system 2. System determines notification type 3. Composes notification 4. Sends to appropriate recipient (guest/staff) 5. Logs the notification
Alternative Sequence	- Delivery fails → Retry or log failure - Invalid contact info → Skip and log issue
Non-functional Requirements	- Notify within 1 minute of event - High delivery reliability - Confidentiality ensured
Postconditions	- Notification delivered and logged - Recipient informed

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UC9: Managing Suppliers

UC Name	Managing Suppliers
Summary	Enables suppliers to log in, view or update orders, and check inventory levels.
Dependency	authentication service, order management system, inventory system
Actors	Supplier, Hotel Management System
Preconditions	Supplier account exists; system is online; supplier has valid login credentials.
Description of the Main Sequence	<ol style="list-style-type: none">Supplier logs in.System authenticates credentials.If valid, orders and inventory are displayed.Supplier chooses to view or update.Based on action:<ul style="list-style-type: none">If update: Process order update → Update orders table → Notify procurement.If view: Fetch inventory levels → Query inventory table.Show confirmation.
Description of the Alternative Sequence	If authentication fails, show login error and allow retry.
Non-functional requirements	<ul style="list-style-type: none">- Secure authentication- Real-time data updates- User-friendly interface- Notification reliability- Data integrity
Postconditions	Orders and/or inventory levels are updated/viewed successfully; procurement is notified if applicable.

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UC10: Table Reservations

UC Name	Table Reservation
Summary	Allows customers to reserve a table at the restaurant or coffee bar via an online system or staff assistance.
Dependency	Requires access to customer database and current table availability status.
Actors	Guest, Bartender, Server, System
Preconditions	- System is operational- Customer is logged in or provides required details- Tables are available at the requested time
Description of the Main Sequence	1. Customer initiates reservation2. System shows available tables/time slots. Customer selects preferred time/table4. System verifies availability5. Customer submits details and any requests6. System confirms reservation and stores data7. System sends confirmation to customer
Description of the Alternative Sequence	- If no tables are available, system suggests other times- If customer cancels, the process is aborted- If system is offline, receptionist records manually and enters it later
Non-functional Requirements	- Fast response time (within 2s)- Immediate confirmation- Mobile and desktop compatible- Data security and privacy ensured
Postconditions	- Reservation stored in the system- Table marked as reserved- Confirmation sent to customer

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UC11: Restaurant and Coffee Bar Management

UC Name	Restaurant and Coffee Bar Management
Summary	Oversees all operations including staff coordination, inventory, reservations, order tracking, billing, and reporting.
Dependency	Reservation system, inventory management system, staff scheduling system.
Actors	Manager, System, Staff (Receptionist, Waiter, Kitchen, Barista)
Preconditions	- All subsystems must be functional- Staff must be assigned roles- Inventory levels updated
Description of the Main Sequence	1. Manager logs in to system2. System displays dashboard with operations overview3. Manager reviews reservations, orders, and staff assignments4. Manager monitors inventory and makes adjustments5. Manager reviews reports and handles exceptions6. System logs all actions and updates records
Description of the Alternative Sequence	- If inventory is low, system alerts manager- If staff is absent, system notifies manager to reschedule- If system is offline, operations proceed manually until online
Non-functional Requirements	- High availability (99.9%)- Secure staff access control- Real-time data synchronization- User-friendly admin interface
Postconditions	- Operational data updated- Inventory and schedules adjusted- Reports generated and stored

Hotel Management System

UC 12: View Booked Rooms

Field	Description
UC Name	View Booked Rooms and Check-in/Check-out Date
Summary	Guests can view their booked rooms and related check-in/check-out dates via receptionist.
Dependency	Reservation system
Actors	Guest, Receptionist
Preconditions	Guest has an existing reservation
Description of the Main Sequence	1. Guest requests booking details 2. Receptionist locates reservation 3. Booking details displayed including dates
Description of the Alternative Sequence	- No booking found → Notify guest- Wrong ID provided → Request correction
Non-functional requirements	Booking lookup \leq 3 seconds
Postconditions	Guest receives booking and date information

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UC 13: Reservation Modification

UC Name	Reservation Modification
Summary	Guests can request changes to their reservation through the receptionist.
Dependency	Valid existing reservation,reservation system
Actors	Guest, Receptionist
Preconditions	Guest has a reservation and requests change before check-in.
Description of the Main Sequence	1. Guest requests modification.2. Receptionist verifies reservation.3. Receptionist checks room/date availability.4. Reservation is updated.5. Guest receives confirmation.
Description of the Alternative Sequence	- Dates unavailable → Offer alternatives. - Reservation not found → Notify guest.
Non-functional requirements	Update processed < 10 seconds.
Postconditions	Reservation status updated or guest informed of failure.

Hotel Management System

UC 14: Cancellation Request

UC Name	Cancellation Request
Summary	Guests may request to cancel an existing reservation.
Dependency	Active reservation record,reservation system
Actors	Guest, Receptionist
Preconditions	Guest has a valid reservation within the cancellation policy period.
Description of the Main Sequence	1. Guest initiates cancellation request.2. Receptionist verifies reservation and policy.3. Cancellation is processed.4. Guest receives confirmation.
Description of the Alternative Sequence	- Not eligible for cancellation → Notify guest.- Invalid reservation → Request correct information.
Non-functional requirements	Cancellation action < 5 seconds.
Postconditions	Reservation marked as cancelled and guest notified.

Hotel Management System

UC 15: Room Availability

UC Name	Room Availability
Summary	Guest inquires about room availability for specific dates.
Dependency	Room inventory system
Actors	Guest, Receptionist
Preconditions	Guest is interested in booking.
Description of the Main Sequence	1. Guest requests information about available rooms.2. Receptionist checks system for available rooms.3. Receptionist provides availability details.
Description of the Alternative Sequence	- No availability → Notify guest.- Specific room type unavailable → Suggest alternatives.
Non-functional requirements	Availability lookup < 3 seconds.
Postconditions	Guest receives information about available rooms.

Hotel Management System

Brikena Papadhopuli

UC 16: Assignment of Room

UC Name	Assignment of Room
Summary	Receptionist assigns rooms to guests based on reservation and availability.
Dependency	Active reservation, room availability
Actors	Receptionist
Preconditions	Guest has confirmed reservation and assigned the room.
Description of the Main Sequence	1. Receptionist checks room availability.2. Receptionist assigns appropriate room.3. System updates booking record.4. Receptionist confirms assignment to guest.
Description of the Alternative Sequence	- No suitable room available → Notify receptionist and guest. - Assignment error → Retry or escalate.
Non-functional requirements	Room assignment update < 5 seconds.
Postconditions	Guest assigned a room and booking updated.

Hotel Management System

UC 17: Block Dates for Specific Rooms

UC Name	Block Dates for Specific Rooms
Summary	Receptionist blocks specific rooms for unavailable dates or events.
Dependency	Room status management system
Actors	Receptionist
Preconditions	Receptionist logged in and authorized
Description of the Main Sequence	1. Receptionist selects room and dates to block.2. System checks for conflicts.3. System blocks room for those dates.4. System confirms blocking.
Description of the Alternative Sequence	- Conflicts with bookings → Notify and suggest alternatives. - Invalid dates → Prompt correction.
Non-functional requirements	Blocking action < 5 seconds.

Hotel Management System

Postconditions	Room blocked and unavailable for booking on selected dates.
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UC 18: Schedule Maintenance

UC Name	Schedule Maintenance
Summary	Receptionist schedules maintenance for rooms; maintenance staff acknowledges.
Dependency	Room availability and maintenance system
Actors	Receptionist, Maintenance Staff
Preconditions	Receptionist logged in; room identified
Description of the Main Sequence	1. Receptionist selects room and maintenance dates.2. Checks for booking conflicts.3. Logs maintenance request.4. Maintenance staff receives and confirms schedule.
Description of the Alternative Sequence	- Conflict exists → Notify receptionist.- Maintenance staff unavailable → Reschedule.

Hotel Management System

Non-functional requirements	Scheduling process < 5 seconds.
Postconditions	Maintenance scheduled and confirmed.

UC19: Booking of Room

UC Name	Booking of Room
Summary	Facilitates the process of booking a hotel room by the guest through interaction with the receptionist.
Dependency	- Room inventory system - Booking management system
Actors	- Guest - Receptionist
Preconditions	- Guest initiates a room booking request - Booking system is online - Receptionist is available
Main Sequence	1. Guest requests room booking 2. Receptionist receives booking request 3. Receptionist checks room availability 4. If available, assign room 5. Confirm booking details with guest 6. Guest receives response
Alternative Sequence	If no rooms are available: – Receptionist informs guest: “No room available.” – Booking ends

Hotel Management System

Non-functional Requirements	- Real-time room availability check - Minimal response time - Accurate assignment logic - User-friendly interaction
Postconditions	- Guest is informed of booking confirmation or unavailability

UC 20: Mobile Check-in and Check-out

UC Name	Mobile Check-in and Check-out
Summary	Guests can check in and out using their mobile devices without visiting the front desk.
Dependency	Reservation must exist.
Actors	Guest
Preconditions	Guest has a confirmed reservation.
Description of the Main Sequence	<ol style="list-style-type: none">1. Guest accesses mobile app and selects check-in/check-out.2. System verifies reservation and identity.3. Room access is enabled (for check-in).

Hotel Management System

	<p>4. System updates room and billing status.</p> <p>5. Confirmation is sent to guest.</p>
Description of the Alternative Sequence	<ul style="list-style-type: none">– Identity mismatch → Manual verification required.– Billing issues → Redirect to payment screen.
Non-functional requirements	<p>Process completed within 60 seconds.</p> <p>Encrypted data transmission required.</p>
Postconditions	<p>Room marked as occupied or vacated.</p> <p>Billing is finalized.</p>

UC 21: Lost and Found Management

UC Name:	Lost and Found Management
Summary	Tracks and manages guest-reported or found items.
Dependency	Stay record or item report must exist.
Actors	Guest, Receptionist, Housekeeping Staff
Preconditions	Guest or staff must report lost or found item.

Hotel Management System

Description of the Main Sequence	<ol style="list-style-type: none">1. Guest or staff reports a lost/found item.2. Receptionist logs item details into the system.3. Item is stored and tagged.4. Guest is notified (if applicable).5. Item is returned or stored for a designated period.
Description of the Alternative Sequence	<ul style="list-style-type: none">– Unclaimed item → Stored in lost property for 30 days.– Item owner unverified → ID check required.
Non-functional requirements	Item entry within 2 minutes. Data retention for 90 days.
Postconditions	Item is returned or archived. Record is updated.

UC 22:Loyalty Program Management

UC Name:	Loyalty Program Management
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Hotel Management System

Summary	Guests can enroll, earn, and redeem loyalty points.
Dependency	Guest profile must exist.
Actors	Guest
Preconditions	Guest must be registered or logged in.
Description of the Main Sequence	<ol style="list-style-type: none"> 1. Guest accesses loyalty portal. 2. Enrolls or logs into account. 3. System tracks eligible transactions. 4. Guest redeems rewards. 5. Points and status are updated.
Description of the Alternative Sequence	<ul style="list-style-type: none"> – Guest account inactive → Prompt to re-activate. – Insufficient points → Inform guest of balance.
Non-functional requirements	Points updated within 5 seconds of transaction.
Postconditions	Points ledger updated. Rewards issued if redeemed.

UC 23: Guest Profile Management

UC Name:	Guest Profile Management
Summary	Allows guest and staff to update or view guest preferences and info.
Dependency	Guest profile must exist.
Actors	Guest, Receptionist
Preconditions	Guest must be logged in or identified.
Description of the Main Sequence	<ol style="list-style-type: none"> 1. Guest/receptionist opens profile screen. 2. Updates contact info, preferences, or notes. 3. System validates and saves changes.
Description of the Alternative Sequence	<ul style="list-style-type: none"> – Invalid input → Prompt to re-enter. – Duplicate profile → Merge or alert admin.
Non-functional requirements	Changes saved within 3 seconds.
Postconditions	Profile is updated and synced across system.

Hotel Management System

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UC24: Managing Concierge Service Requests

UC Name	Managing Concierge Service Request
Summary	Guest places a service request (e.g., transportation, reservations), and concierge processes and updates it.
Dependency	- Guest profile exists - Concierge system is operational
Actors	- Guest - Concierge
Preconditions	- Guest must be checked-in or have an active reservation
Main Sequence	1. Guest submits request via app or in-person 2. Concierge reviews request 3. Arranges requested service 4. Updates request status 5. Notifies guest of completion
Alternative Sequence	- Service unavailable → Notify guest and suggest alternatives - Guest cancels request → Mark as cancelled
Non-functional Requirements	- Response within 10 minutes - Update status in real time
Postconditions	- Request fulfilled or closed - Guest notified - Log entry created

Hotel Management System

UC25: Feedback Submission

UC Name	Feedback Submission
Summary	Guests submit feedback regarding their stay, service, or facilities.
Dependency	Guest must have a stay history or valid reservation
Actors	- Guest - System
Preconditions	Guest must be logged in or verified through reservation
Main Sequence	1. Guest accesses feedback form 2. Enters rating/comments 3. Submits feedback 4. System stores feedback 5. Confirmation shown
Alternative Sequence	- Feedback not submitted → Prompt retry - Empty fields → Show error
Non-functional Requirements	- Submit within 5 seconds - Stored securely - Viewable by management only
Postconditions	Feedback stored and associated with guest profile/reservation

Hotel Management System

UC 26: Print Invoice

UC name	Print Invoices (Daily/Monthly/Annually)
Summary	Allows authorized staff to generate and print/export invoices for a selected date range (daily, monthly, annually) in PDF or printable format.
Actors	- Primary: Accounting Staff – Secondary (Optional): Front Desk Staff
Preconditions	- User is authenticated - User has permission to view invoices - Invoice data exists for the selected period
Dependencies	- Authentication System - Invoice Database - PDF/Report Generator - Export/Print Module - Date Filter UI
Description of the Main Sequence	<ol style="list-style-type: none"> 1. User logs in 2. Navigates to "Invoices" section 3. Selects time period (daily/monthly/annually) 4. System fetches invoices 5. User previews the report 6. User prints or exports to PDF 7. System logs action 8. Report is printed or saved
Description of the alternative sequence	<ul style="list-style-type: none"> - 3A. No invoices found → System shows: "No data available." - 6A. Export/Print fails → Error shown, retry option available - 2A. Unauthorized access → Access denied message
Postconditions	- Report is printed/exported - Action is logged - No invoice data is altered
Non-Functional Requirements	<ul style="list-style-type: none"> - Report generated in ≤ 5 seconds (≤ 1000 invoices)- PDF export must follow standard format - 99.9% availability - Role-based access only. - Export must show user ID & timestamp. - All actions logged

Hotel Management System

UC 27: View Payments

UC name	UC :View Payments (Accounting Only)
Summary	Allows accounting staff to view and search guest payment transactions for financial reporting, auditing, and reconciliation.
Actors	- Primary: Accounting Staff
Preconditions	<ul style="list-style-type: none"> - User is authenticated - User has accounting role - Payment records exist in the system
Dependencies	<ul style="list-style-type: none"> - Authentication System - Payment Processing System - Payments Database - Access Control - Audit Logging System
Description of the Main Sequence	<ol style="list-style-type: none"> 1. User logs in 2. Navigates to "Payments" section 3. Applies filters (e.g., date, guest, payment method) 4. System retrieves records 5. User views payment list 6. User can view details or export report (optional)
Description of the Alternative Sequence	<ul style="list-style-type: none"> - 3A. No records found → Message: "No payments found for selected filters." - 2A. Unauthorized user → Access denied message
Postconditions	<ul style="list-style-type: none"> - Payment data is displayed or exported - User activity is logged - No payment records are modified
Non-Functional Requirements	<ul style="list-style-type: none"> - Data loads within 2 seconds - 99.9% availability - Role-based access control (Accounting only) - Export includes watermark/user info - All views(exports) logged - Support up to 100 concurrent users

Hotel Management System

UC 28: Refund Management

Field	UC:Refund Management
Summary	Allows authorized staff to initiate, review, approve, or reject refund requests for guests based on reservation status, payment method, and policy.
Actors	<ul style="list-style-type: none"> - Primary: Accounting Staff - Secondary: Reservation/Front Desk Staff
Preconditions	<ul style="list-style-type: none"> - User is authenticated and authorized - Valid payment exists - Refund reason and reservation details are provided
Dependencies	<ul style="list-style-type: none"> - Authentication System - Payment Processing System - Reservation System - Refund Policy Rules Engine - Audit Logging System
Description of the Main Sequence	<ol style="list-style-type: none"> 1. User logs in 2. Navigates to “Refund Management” 3. Selects reservation and reviews payment 4. Enters refund reason and amount 5. System checks eligibility 6. User confirms and submits 7. System processes refund 8. Confirmation is shown and logged
Description of the Alternative Sequence	<ul style="list-style-type: none"> - 5A. Refund not allowed → System shows reason (e.g. policy violation, expired period) - 7A. Refund fails → Show error and retry option
Postconditions	<ul style="list-style-type: none"> - Refund is processed or rejected - Refund status is recorded - Guest is notified - Action is logged for auditing
Non-Functional Requirements	<ul style="list-style-type: none"> - Refund eligibility check \leq 3 seconds - 99.9% availability - Secure, role-based access - All actions logged - Confirmation email/SMS to guest within 1 minute

Hotel Management System

UC 29: TAX/VAT calculation

Field	UC: Tax/VAT Calculation and Application
Summary	Automatically calculates and applies appropriate Tax or VAT to bookings, services, and invoices based on local tax rules and guest category (domestic/international).
Actors	<ul style="list-style-type: none"> - System (automated calculation) - Accounting Staff (review) - Front Desk/Reservation Staff (view and include in invoice)
Preconditions	<ul style="list-style-type: none"> - Tax rules are defined and configured in the system - A booking or service charge is present - Guest type/location is known
Dependencies	<ul style="list-style-type: none"> - Tax Rules Engine - Booking/Invoice System - Guest Profile System - Payment System
Description of the Main Sequence	<ol style="list-style-type: none"> 1. Booking or service charge is created or modified 2. System identifies applicable Tax/VAT rate 3. Calculates tax amount 4. Adds tax to total charge 5. Displays updated invoice/summary to user
Description of the Alternative Sequence	<ul style="list-style-type: none"> - 2A. No matching tax rule → System shows default or alerts for missing configuration - 4A. Rounding error → Apply standardized rounding
Postconditions	<ul style="list-style-type: none"> - Tax/VAT is correctly added to final invoice - Amount is recorded for accounting - Guest sees accurate tax breakdown
Non-Functional Requirements	<ul style="list-style-type: none"> - Tax calculation must occur in < 1 second - System must support multiple tax configurations by region - 100% accuracy required in rounding and totals - Only authorized users can edit tax settings - Tax/VAT changes must be logged and versioned

Hotel Management System

UC 30: Track Income per Department

Field	UC: Track Income per Department
Summary	Enables authorized users to view and analyze income generated by different hotel departments (e.g., Rooms, Restaurant, Spa) over a selected period.
Actors	<ul style="list-style-type: none"> - Primary: Accounting Staff - Secondary: Department Managers (view only)
Preconditions	<ul style="list-style-type: none"> - User is logged in and has financial access - Departmental income data is recorded and categorized correctly
Dependencies	<ul style="list-style-type: none"> - Revenue/Transaction System - Department Management Module - Report Generator - Authentication and Role Management
Description of the Main Sequence	<ol style="list-style-type: none"> 1. User logs in 2. Navigates to “Department Income Report” 3. Selects time period and departments 4. System retrieves income data 5. System displays summary and breakdown by department 6. User can export or print report
Description of the Alternative Sequence	<ul style="list-style-type: none"> - 3A. No income recorded → System displays “No data available for selected period” - 4A. System error → Show retry or support message
Postconditions	<ul style="list-style-type: none"> - Income report is viewed/exported - No data is modified - Action is logged for auditing
Non-Functional Requirements	<ul style="list-style-type: none"> - Report generation \leq 3 seconds - Must support daily, monthly, and yearly views - Role-based data access per department - Report must include timestamp and user ID - Export options (PDF, Excel) - Support drill-down by service or transaction type

Hotel Management System

Esta Çekrezi

UC 31: Track Expenses

UC Name	Track Expenses
Summary	Allows authorized staff to record, view and manage all hotel-related expenses such as utilities, payroll, supplies and maintenance.
Dependency	Financial System, Tax/VAT Calculation Module, Report System, Authentication System
Actors	Accounting, Finance
Preconditions	-System is online and accessible. -User is authenticated and has financial access. -Department expenses are recorded and categorized correctly.
Description of the Main Sequence	1. User logs into or opens the HMS interface. 2. User navigates to the “Department Expenses” section from the main dashboard. 3. User selects time range and department(s). 4. System retrieves the expense data. 5. System displays the categorized expense summary. 6. User may export or print report.
Description of the Alternative Sequence	No expense data found: If expense data is not available, the system displays an error: “No expense found for the selected time period.”
Non-functional Requirements	Performance: Expense report generated within 3 seconds. Usability: - Support filtering by category, department and time. -PDF/Excel export support. Security: Only authorized users can access or export data. Data Integrity: Must include totals, breakdowns and date stamps. Auditability: All actions must be logged for audit purposes.
Postconditions	-Expense report is generated and optionally exported. -Data remains unchanged.

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UC 32: Generate Consolidated Financial reports

UC Name	Generate Consolidated Financial Reports
Summary	Enables accounting staff to generate a comprehensive report combining income, expenses, taxes, refunds, and profit/loss data for the entire hotel over a set period.
Dependency	Financial System, Tax/VAT Calculation Module, Authentication System, Report System, Audit Trail System
Actors	Accounting, Finance
Preconditions	<ul style="list-style-type: none"> - User is authenticated and has financial access - All financial data (income, expenses, taxes, etc.) is available and categorized
Description of the Main Sequence	<ol style="list-style-type: none"> 1. User logs in 2. Navigates to “Financial Reports” section 3. Selects date range and report type (e.g., monthly, annual) 4. System retrieves data from multiple modules 5. Report is generated with full breakdowns 6. User can preview, export (PDF/Excel), or print the report
Description of the Alternative Sequence	<p>Incomplete data: System shows a warning “Missing modules/data”</p> <p>Report generation fails: Show error and offer to try again</p>
Non-Functional Requirements	<p>Performance: Full report generation \leq 10 seconds</p> <p>Usability: Export in PDF and Excel with visual summaries (tables, charts)</p> <p>Security: Only accessible by authorized finance roles</p> <p>Data Integrity: Data must be accurate and aligned across all sources</p> <p>Auditability: System must maintain an audit trail of each report generation/export</p>
Postconditions	<ul style="list-style-type: none"> - Consolidated report is displayed/exported - Report is logged for auditing - No underlying data is modified

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UC 33: View Menu

UC Name	View Menu
Summary	Allows hotel guests or staff to view the restaurant and spa menus through the HMS interface.
Dependency	Menu Module, User Interface (UI) Module
Actors	User (Guest, Server, Bartender, Kitchen Staff, Spa Staff)
Preconditions	<ul style="list-style-type: none">-The system is online and accessible.-Menus must already be uploaded and stored in the system.
Description of the Main Sequence	<ol style="list-style-type: none">1. User logs into or opens the HMS interface.2. User navigates to the “Menu” section from the main dashboard..3. User selects the menu type: “Restaurant” or “Spa”.4. System retrieves the selected menu from the database.5. System displays the menu, including items, descriptions, prices and images.
Description of the Alternative Sequence	Menu Data Not Available: If menu data is not available, the system displays an error: “Menu currently unavailable.”
Non-functional Requirements	Usability: Interface must be mobile-friendly. Readability: Menu must be clearly readable (clear fonts, high-quality images). Availability: System must support real-time updates to reflect menu changes instantly.
Postconditions	Menu is displayed to the user. The system remains available for additional navigation or actions.

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UC 34: Place Food and Drink Order from Hotel Room

UC Name	Place Food and Drink Orders from Hotel Room
Summary	Enables a guest to place an order for food and drinks from the restaurant/bar to their room.
Dependency	Menu Module, Order System, Inventory System, Room Service System, Authentication System
Actors	Guest, Staff(Server, Kitchen Staff, Bartender)
Preconditions	<ul style="list-style-type: none">- The guest has access to the ordering interface.- Menu items are loaded and available.
Description of the Main Sequence	<ol style="list-style-type: none">1. Guest opens the ordering interface.2. Menu is displayed.3. Guest selects food and drink items.4. Guest confirms the order.5. System records the order and sends it to the kitchen/bar.6. A confirmation is shown to the user.
Description of the Alternative Sequence	<ol style="list-style-type: none">1. If an item is out of stock: System notifies the guest and suggests alternatives.2. If order details are incomplete: System prompts for completion before submission.
Non-functional Requirements	Performance: Orders should be processed fast. Usability: Menu should support images and item descriptions. Reliability: Reliable synchronization with kitchen/bar terminals. Availability: High availability during service hours.
Postconditions	Order is stored in the system and transmitted to the kitchen/bar. User sees a confirmation screen or message.

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UC 35: Generate and Process Order Bills

UC Name	Generate and Process Order Bills
Summary	This use case describes how restaurant or spa staff generate and process bills for customer orders, including service charges and taxes.
Dependency	Order System, Payment Processing System, Tax/VAT Calculation Module, Billing System, Authentication System
Actors	Restaurant & Coffee Staff, Spa Staff, Guest
Preconditions	<ul style="list-style-type: none">- Order has been placed by a guest- Services/items have been delivered- Staff is logged into the system
Description of the Main Sequence	<ol style="list-style-type: none">1. Staff selects the completed order in the system.2. System retrieves order details (items/services, quantities, prices).3. System calculates subtotal, taxes, and service charges.4. System generates an itemized bill.5. Staff reviews and confirms the bill.6. Guest pays via selected payment method.7. System records the payment and updates the order status to “Completed”.
Description of the Alternative Sequence	<ul style="list-style-type: none">- If system fails to retrieve order: Staff is prompted to manually enter order details.- If payment fails: Staff is prompted to retry or select alternate payment method.
Non-functional Requirements	Performance: Response time for bill generation should be less than 5 seconds. Security: Must support secure payment methods (PCI-DSS compliance). Maintainability: System must maintain billing records for at least 1 year.

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Postconditions	<ul style="list-style-type: none"> - Bill is successfully generated and stored in the system - Payment is processed - Order is marked as completed and closed
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UC 36: Update Food/Beverage Inventory

UC Name	Update Food/Beverage Inventory
Summary	This use case handles the addition, removal, or modification of inventory items (e.g., food, drinks) based on deliveries, usage, or spoilage.
Dependency	Inventory System, Order System, Supplier System, Authentication System
Actors	Restaurant & Coffee Staff
Preconditions	<ul style="list-style-type: none"> -Staff is authenticated and authorized to manage inventory -Inventory module is functional and connected to database
Description of the Main Sequence	<ol style="list-style-type: none"> 1. Staff logs into the inventory system. 2. Staff selects “Update Inventory” function. 3. System displays current inventory list. 4. Staff searches or selects item(s) to update. 5. Staff inputs updated quantities, reason (e.g., received, used, spoiled), and date. 6. System validates data and updates the inventory. 7. System logs the transaction with timestamp and staff ID.
Description of the Alternative Sequence	<ul style="list-style-type: none"> - If invalid quantity is entered: System prompts for correction. - If item not found: Staff can choose to create a new inventory item (if permitted).
Non-functional Requirements	Availability: System must support real-time updates Concurrency: Must ensure concurrent handling to avoid stock

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	miscounts Security: Access must be role-based with audit trails enabled
Postconditions	<ul style="list-style-type: none"> - Inventory record is updated - Transaction log is created - Any alerts for low or high stock levels are triggered if thresholds are affected

UC 37: Book Spa Appointments

UC Name	Book Spa Appointments
Summary	This use case allows customers to book spa appointments, selecting services and times based on availability. The system checks for available time slots, confirms the booking, and updates the system accordingly.
Dependency	Spa System, Booking System, Customer Profile Management, Notification System, Authentication System
Actors	Guest, Spa Staff
Preconditions	<ul style="list-style-type: none"> - Spa services are available and listed in the system - Guest is logged in or providing necessary details for booking - Spa staff has access to the system for confirming appointments
Description of the Main Sequence	<ol style="list-style-type: none"> 1. Guest selects a spa service from available options. 2. Guest chooses an available time slot. 3. System checks if the selected time slot is available. 4. If the slot is available, the system confirms the booking. 5. Guest verifies the details and confirms the appointment. 6. The system updates the calendar and guest profile with the appointment details.
Description of the Alternative Sequence	<ul style="list-style-type: none"> - If the selected slot is unavailable: System prompts customer to choose a different time.

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Non-functional Requirements	Performance: The system must respond fast to check availability. Usability: The booking interface must be mobile-friendly and accessible. Reliability: Booking confirmations should be sent via email or SMS.
Postconditions	<ul style="list-style-type: none"> - Appointment is successfully booked and stored in the system. - Confirmation sent to the customer (via email/SMS). - Booking calendar is updated.

UC 38: Assign Therapist to Guest

UC Name	Assign Therapist to Guest
Summary	Allows the spa receptionist to assign qualified and available therapists to a guest's booking.
Dependency	Spa System, Authentication System, Booking System, Notification System
Actors	Receptionist, Spa Staff (therapist)
Preconditions	<ul style="list-style-type: none"> -Guest has booked a spa service. -Therapist's schedules are available in the system. -User is authenticated as staff.
Description of the Main Sequence	<ol style="list-style-type: none"> 1. User(staff) logs into the system. 2. User navigates to guest's spa booking. 3. User views available therapists. 4. User selects a therapist. 5. User assigns therapist to booking. 6. System confirms assignment and notifies therapist.
Description of the Alternative Sequence	<ul style="list-style-type: none"> - No therapist available: System notifies staff and suggests alternative times.

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Non-Functional requirements	Usability: Interface should be fast and easy to assign therapist. Availability: System must update therapist's availability in real time. Security: Only authorized spa staff can assign therapists.
Postconditions	Therapist is assigned to guest's booking. Both therapist and guest are notified. Assignment record is stored in the system.

Ester Pashtranjaku

UC 39: Cancel or Reschedule Appointments

UC Name	UC: Cancel or Reschedule Appointments
Summary	Allows guests to cancel or change their spa appointment via the spa reception.
Dependency	Appointment scheduling system; guest records; availability data.
Actors	Guest, Receptionist
Preconditions	1. Appointment exists in the system. 2. Guest identity is verified.
Description of the Main Sequence	1. Guest requests to cancel or reschedule. 2. Receptionist searches for the appointment.

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	<p>3. System validates appointment.</p> <p>4. System updates or removes appointment</p>
Description of the Alternative Sequence	<ul style="list-style-type: none"> - No appointment found: system informs guest. - Update fails system prompts retry or error.
Non-Functional requirements	<ul style="list-style-type: none"> - Usability: Easy reschedule interface. - Real-time: Updates reflected immediately. - Security: Only authenticated changes allowed.
Postconditions	<ol style="list-style-type: none"> 1. Appointment is rescheduled or canceled. 2. Confirmation is sent to the guest.

UC 40: Track Spa Inventory

UC Name	UC: Track Spa Inventory
Summary	Enables staff to monitor and manage the inventory of spa products and supplies.
Dependency	Inventory database; staff access permissions.
Actors	Spa Staff, Inventory
Preconditions	<ol style="list-style-type: none"> 1. Staff is logged in. 2. Inventory system is online.

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Description of the Main Sequence	1. Staff logs in. 2. Views stock levels. 3. System flags low stock items. 4. Staff can generate restocking report.
Description of the Alternative Sequence	- System failure: Staff is notified. - No internet: Staff retry later.
Non-Functional Requirements	- Usability: Simple UI for monitoring. - Real-time: Updates stock instantly. - Security: Role-based access.
Postconditions	1. Inventory report generated. 2. Low stock items flagged for reorder.

UC 41: Process Spa Payments

UC Name	UC: Process Spa Payments
Summary	Facilitates payment for spa services using various methods.
Dependency	Billing module; payment gateway; guest booking data.

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Actors	Guest, Spa Receptionist
Preconditions	1. Guest has completed a service. 2. System generates bill.
Description of the Main Sequence	1. Guest requests to pay. 2. Spa Reception generates invoice. 3. Guest selects payment method. 4. Payment is processed. 5. Receipt is issued.
Description of the Alternative Sequence	- Payment fails system prompts retry or alternate method.
Non-Functional requirements	- Security: Payment must be encrypted. - Usability: Interface should support multiple payment types. - Performance: Payment process should be quick.
Postconditions	1. Payment is confirmed. 2. Transaction is recorded.

UC 42: Valet Handle Vehicle Registration and Retrieval

UC Name	UC: Valet Vehicle Registration and Retrieval
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Hotel Management System

Summary	Manages check-in and return of guest vehicles through valet service.
Dependency	Valet system; guest records; ticketing system.
Actors	Guest, Valet Staff
Preconditions	1. Guest vehicle is dropped off. 2. System is functional.
Description of the Main Sequence	1. Valet registers vehicle info. 2. System issues ticket. 3. Guest presents ticket later. 4. Vehicle is retrieved. 5. Vehicle returned to guest.
Description of the Alternative Sequence	- Ticket lost: Guest must verify ID for release. - System error: Manual log used.
Non-Functional Requirements	- Usability: Quick registration interface. - Security: Protect guest vehicle data. - Reliability: System works under load.
Postconditions	1. Vehicle returned. 2. Valet record updated.

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UC 43: Forecast Revenue Based on historical Data

UC Name	UC: Forecast Revenue Based on Historical Data
Summary	Allows managers to generate revenue predictions using past performance data.
Dependency	Historical revenue database; analytics engine.
Actors	Manager
Preconditions	<ol style="list-style-type: none">1. Sufficient historical data exists.2. Manager has access.
Description of the Main Sequence	<ol style="list-style-type: none">1. Manager requests forecast.2. System loads past data.3. Prediction algorithm runs.4. Report is generated.
Description of the Alternative Sequence	<ul style="list-style-type: none">- Data insufficient: System notifies manager.- Algorithm fails: System logs error.
Non-Functional requirements	<ul style="list-style-type: none">- Accuracy: Forecast must be reasonable.- Speed: Report generated quickly.- Security: Only authorized users can access.
Postconditions	<ol style="list-style-type: none">1. Revenue forecast report is available for viewing.

Hotel Management System

UC 44: Reporting

UC Name	Reporting
Summary	Managers generate or export reports.
Dependency	Provide Statistics
Actors	Manager, Accountant
Preconditions	Logged in and has access to Reports module.
Description of the Main Sequence	<ol style="list-style-type: none">1. Select report type.2. Validate inputs.3. Generate preview.4. Export PDF/Excel.
Description of the Alternative Sequence	- Input error → Highlight and correct.
Non-functional requirements	Export ≤ 5s, formatting accuracy.
Postconditions	Report downloaded or displayed.

Hotel Management System

UC 45: Performance Metrics

UC Name	Performance Metrics
Summary	Monitors staff and department performance.
Dependency	Provide Statistics
Actors	Manager
Preconditions	Manager logged in.
Description of the Main Sequence	<ol style="list-style-type: none">1. Choose KPIs.2. Select timeframe.3. Render performance dashboard.
Description of the Alternative Sequence	- Wrong date range → Show error.
Non-functional requirements	Visualization accuracy, refresh rate \leq 3s.
Postconditions	Metrics displayed for analysis.

Hotel Management System

UC 46: Monitor Occupancy and Revenue

UC Name	Monitor Occupancy and Revenue
Summary	Displays live occupancy rates and income.
Dependency	Provide Statistics
Actors	Manager, Accountant
Preconditions	Access to Occupancy & Revenue module.
Description of the Main Sequence	<ol style="list-style-type: none">1. Select range.2. System pulls booking & payment data.3. Render charts.
Description of the Alternative Sequence	- Invalid filters → Prompt user.
Non-functional requirements	Data accuracy $\pm 0.5\%$, response time $\leq 3\text{s}$.
Postconditions	Data shown or filters adjusted.

Hotel Management System

Megi Almadhi

UC 47: Export Financial Data to CSV/Excel or Accounting Tools

UC Name	Export Financial Data to CSV/Excel or Accounting Tools
Summary	Accountant exports financial data in various formats or sends to external accounting systems.
Dependency	Reporting module, Financial database access
Actors	Accountant, Manager
Preconditions	User logged in with export permissions; Financial data exists for selected period
Description of the Main Sequence	<ol style="list-style-type: none">1. Select export type (CSV/Excel/Accounting API)2. Choose date range and data categories3. System validates permissions and date range4. System generates export file or API payload5. User downloads file or system sends to accounting tool6. System logs export activity
Description of the Alternative Sequence	<ul style="list-style-type: none">- Invalid date range → Show error and prompt correction- Export format error → Retry with different format- API connection fails → Save locally and prompt manual upload- File too large → Prompt to reduce date range or split export
Non-functional Requirements	File size ≤ 10MB; Export time < 30s for standard reports; Support QuickBooks, Xero APIs
Postconditions	Financial data exported successfully; Export activity logged with timestamp and user

Hotel Management System

UC 48: Generate Profit/loss Reports

UC Name	Generate Profit/Loss Reports
Summary	Generates and optionally exports profit/loss analysis.
Dependency	Reporting
Actors	Manager, Accountant
Preconditions	Date range selected.
Description of the Main Sequence	<ol style="list-style-type: none">1. Select reporting period (daily/weekly/monthly/quarterly)2. Choose departments to include (rooms, restaurant, spa, etc.)3. System calculates total revenue from all sources4. System calculates total expenses (operational, staff, utilities, supplies)5. System computes net profit/loss and margins6. Generate detailed P&L report with breakdowns

Hotel Management System

	7. Display report with charts and export option if needed
Description of the Alternative Sequence	- Wrong filters → Prompt correction.
Non-functional requirements	Load within 5s, precision ±0.5%.
Postconditions	P/L data displayed or exported.

UC 49 : Market Segmentation

UC Name	Market Segmentation
Summary	Analyzes guest types and markets based on history.
Dependency	Provide Statistics
Actors	Marketing Staff

Hotel Management System

Preconditions	Analyst logged in and in segmentation module.
Description of the Main Sequence	<ol style="list-style-type: none"> 1. Select segmentation criteria (demographics, booking patterns, spending, frequency) 2. Set analysis parameters (date range, minimum stay threshold) 3. System runs segmentation algorithm on guest history 4. System categorizes guests (Business, Leisure, Group, VIP, etc.) 5. Display segment analysis with statistics and trends 6. Generate exportable guest segment lists if requested
Description of the Alternative Sequence	<ul style="list-style-type: none"> - Insufficient data for analysis → Notify analyst and suggest broader date range - Segmentation criteria conflict → Prompt for clarification - Analysis timeout → Offer to run in background and notify when complete
Non-functional requirements	Process \leq 5s for 100k guests.
Postconditions	Segments displayed or exported.

Hotel Management System

UC50: Manage Guest Orders

UC Name	Manage Guest Orders
Summary	Server takes a food/beverage order from a guest, enters it into the system, and submits it to the kitchen and bartender.
Dependencies	Menu catalog; Kitchen order-processing module; Bar order queue
Actors	Server; Kitchen Staff; Bartender
Preconditions	Guest is seated; Menu catalog is loaded in system
Description of the Main Sequence	1. Server greets guest.2. Server selects table.3. Server browses menu on POS.4. Server enters selected items.5. System checks availability.6. Server confirms with guest.7. System routes food items to kitchen queue and drinks to bartender queue.8. System displays order confirmation.
Description of the Alternative Sequence	- A1: If an item is out of stock, system flags item and suggests alternatives.- A2: If network error occurs, server retries submission or switches to manual ticket entry.
Non-functional Requirements	<ul style="list-style-type: none">• Order-entry response time < 1 s.• System uptime ≥ 99.9% during service hours.

Hotel Management System

Postconditions	Order appears in kitchen/bar queues; Table status = “Pending”
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UC 51: Serve Drinks

UC Name	Serve Drinks
Summary	Bartender retrieves pending drink orders, prepares drinks, and marks them as served.
Dependencies	Bar inventory module; POS order queue
Actors	Bartender, Server
Preconditions	At least one drink order in queue; sufficient stock available
Description of the Main Sequence	1. Bartender logs into bar console.2. System lists pending drink orders.3. Bartender selects an order.4. Bartender verifies ingredient availability.5. Bartender prepares the drink.6. Bartender marks order “Completed.”7. System notifies Server that drink is ready.
Description of the Alternative Sequence	- B1: If stock is insufficient, system raises low-stock alert and suggests substitutions.- B2: If Server modifies order mid-prep, bartender updates and re-prepares drink.
Non-functional Requirements	• Order-status update < 500 ms. • Inventory scan accuracy ≥ 98%.
Postconditions	Inventory decremented; Order status = “Served.”

Hotel Management System

UC 52: Record Financial Transaction

UC Name	Record Financial Transaction
Summary	Bookkeeper records guest payments to folios and issues receipts.
Dependencies	Guest folio module; Payment-gateway integration
Actors	Bookkeeper, Receptionist
Preconditions	Guest folio has outstanding charges; Payment gateway online
Description of the Main Sequence	1. Bookkeeper retrieves guest folio.2. System displays pending charges.3. Bookkeeper enters payment method and amount.4. System validates payment details.5. System processes transaction via gateway.6. System updates folio balance.7. System issues/prints/emails receipt.
Description of the Alternative Sequence	- C1: If payment is declined, system prompts for alternate method.- C2: If gateway is unavailable, bookkeeper records transaction manually and marks “Pending Reconciliation.”
Non-functional Requirements	<ul style="list-style-type: none">• Authorization response < 2 s.• PCI-DSS compliance for stored data.
Postconditions	Folio balance updated; Receipt delivered to guest.

UC 53: Sponsorship Agreements

Hotel Management System

UC Name	Manage Sponsorship Agreements
Summary	Marketing Staff or Hotel Owner initiates, negotiates, finalizes, and monitors sponsorship agreements with External Partners for hotel events and services.
Dependency	- External Partner database - Contract management system - Legal framework for agreements
Actors	- Marketing Staff - Hotel Owner - External Partner
Preconditions	- Marketing Staff logged in - Potential External Partner identified or sponsorship inquiry received
Main Sequence	1. Initiate new sponsorship proposal or receive inquiry 2. Enter partner details and sponsorship scope 3. Negotiate terms (financials, benefits, duration, deliverables) 4. Draft formal agreement 5. Submit to Hotel Owner for approval 6. Owner reviews and approves 7. Mark sponsorship as "Active" 8. Set up performance monitoring 9. Track deliverables and compliance
Alternative Sequence	- Negotiation fails → Record reason and decline opportunity - Owner disapproves → Request revisions or terminate - Performance issues → Schedule review or renegotiate - Partner cancels → Update status and assess financial impact
Non-functional Requirements	- Agreement finalized within 5 business days - Performance data accessible in 24 hours - Secure document storage - Audit trail for changes
Postconditions	- Sponsorship Agreement created and marked "Active" - External Partner linked in system - Performance tracking started - Contract stored securely

Hotel Management System

UC 54: Define or Update Hotel Policy

UC Name	Define or Update Hotel Policy
Summary	Policy Admin creates or modifies hotel policies (e.g., cancellation, pet fees).
Dependencies	Policy repository; Role-based access control
Actors	Policy Admin, Hotel Owner
Preconditions	Policy Admin is authenticated with Admin privileges
Description of the Main Sequence	1. Admin opens Policy Management screen.2. System displays existing policies.3. Admin selects “New Policy” or chooses an existing one.4. Admin enters or edits title, description, effective date.5. Admin submits changes.6. System validates date ranges and dependencies.7. System publishes policy across the system.
Description of the Alternative Sequence	- D1: If date conflicts with another policy, system alerts and requests resolution.- D2: If unauthorized user attempts access, system denies request and logs the attempt.
Non-functional Requirements	• Only Admins can access (RBAC enforced).• All changes audited with timestamp and user ID.
Postconditions	Policy effective as of specified date; Audit log entry created

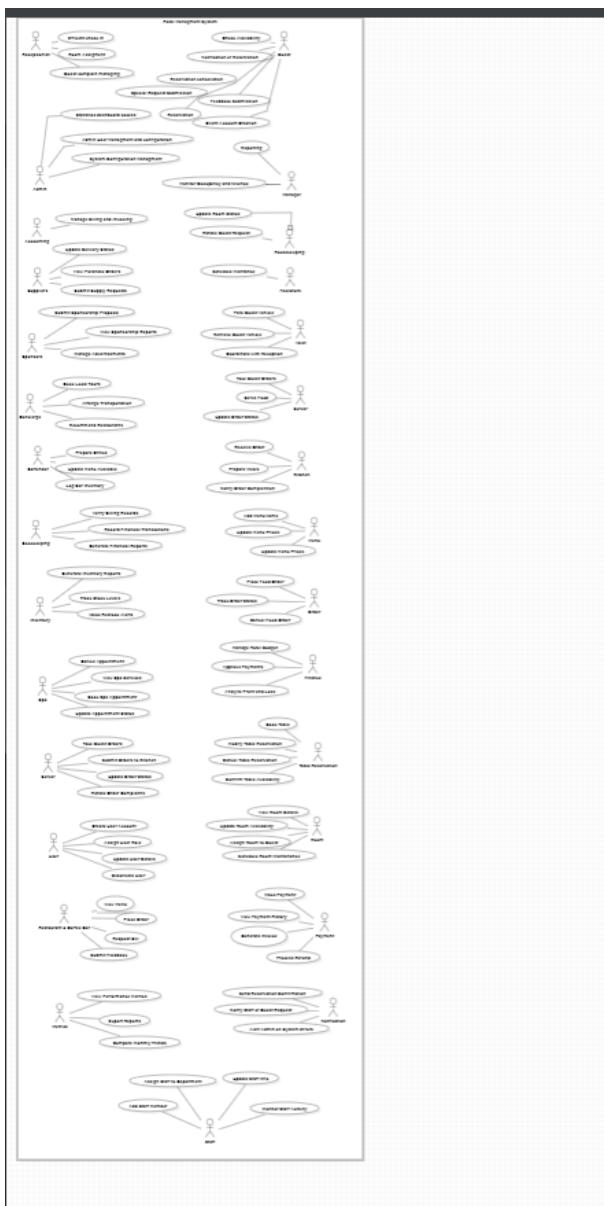
Hotel Management System

UC 55: Manage Property Settings

UC Name	Manage Property Settings
Summary	Hotel Owner configures hotel-wide settings: room types, base rates, seasonal adjustments.
Dependencies	Rate management module; Room-inventory module
Actors	Hotel Owner, Admin
Preconditions	Hotel Owner is logged in with Owner privileges
Description of the Main Sequence	1. Owner navigates to Settings → Property Configuration.2. System displays current room types and rates.3. Owner edits room categories, rates, seasonal factors.4. Owner saves changes.5. System recalculates availability and rate plans.6. System confirms update to Owner.
Description of the Alternative Sequence	- E1: If new rates overlap blackout periods, system rejects and highlights conflict.- E2: If recalculation error occurs, system rolls back and alerts support.
Non-functional Requirements	<ul style="list-style-type: none">• Rate recalculation complete within 5 s.• All changes logged with timestamp.
Postconditions	System uses updated settings for all new reservations and availability checks.

Hotel Management System

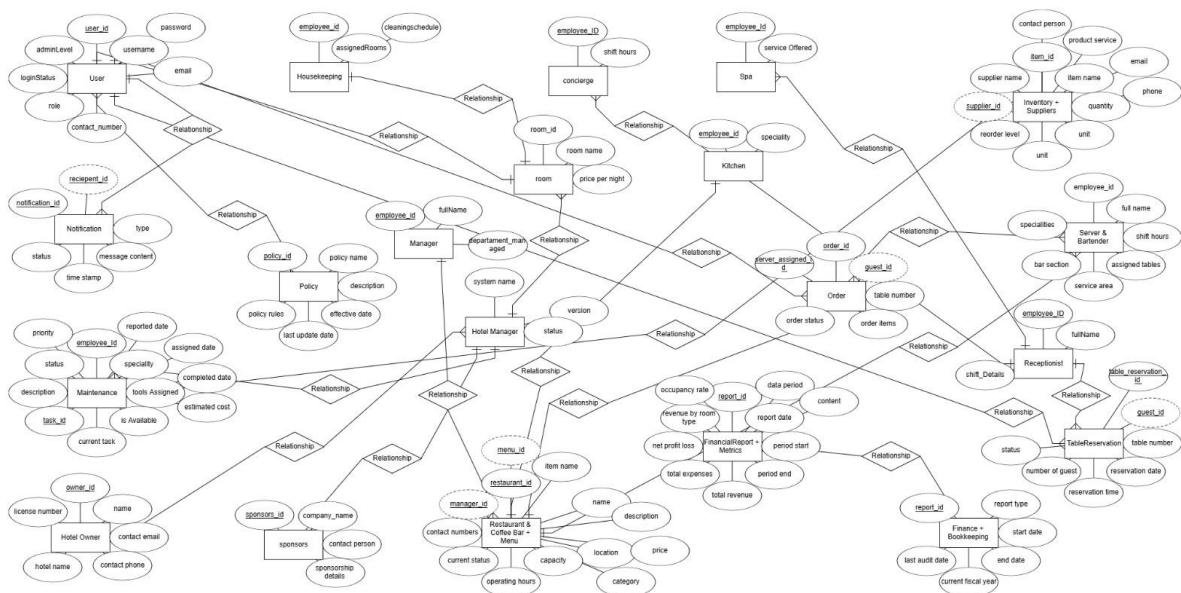
4.3 USE CASE DIAGRAM



Hotel Management System

5. Diagram

5.1 ERD Diagram

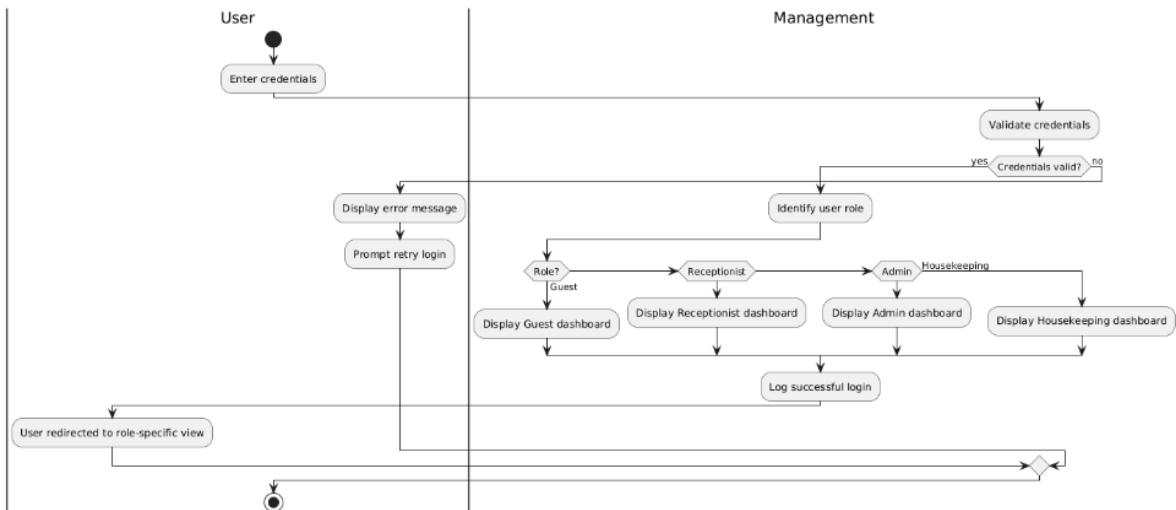


5.2 Activity Diagrams

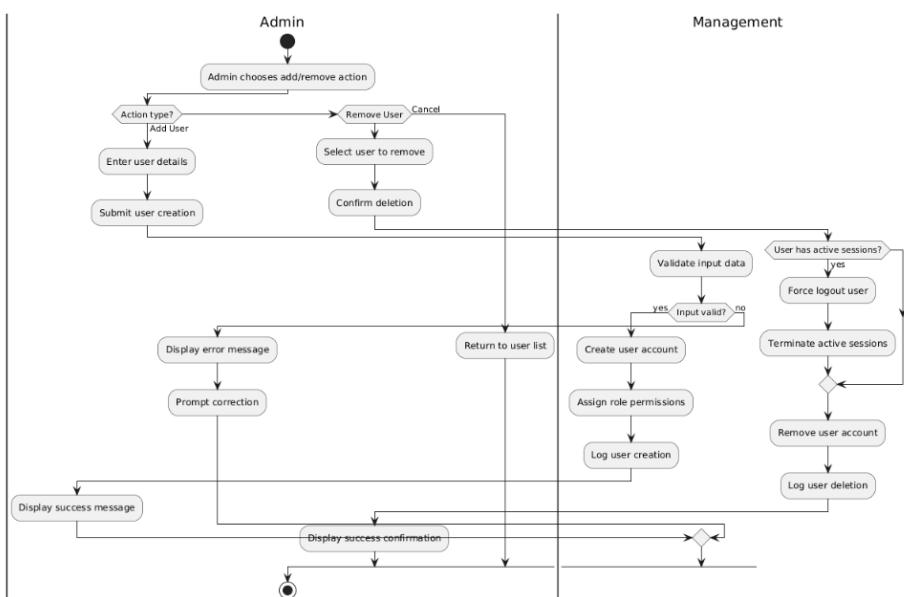
Arsildo Veliu

Hotel Management System

AC1: Login Constraint, Different views for different controllers

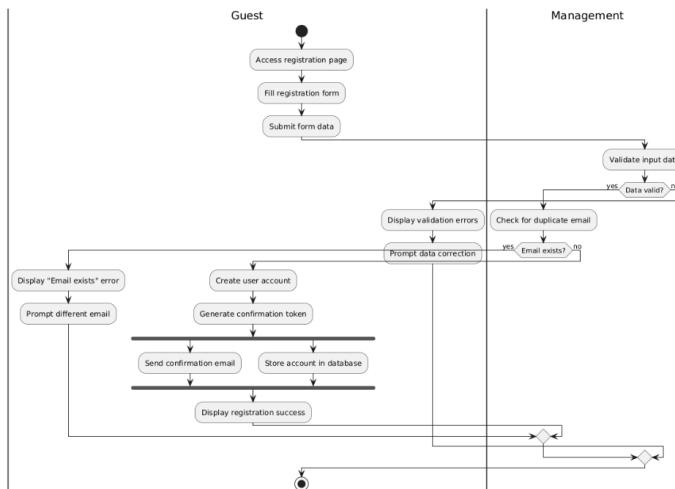


AC2: Add/Remove User

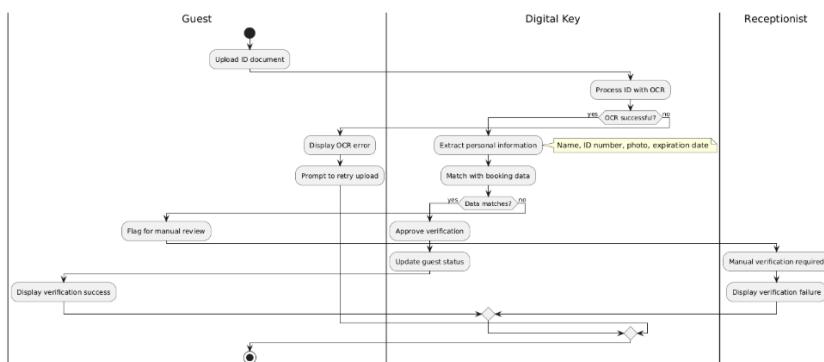


AC3: User Account Creation

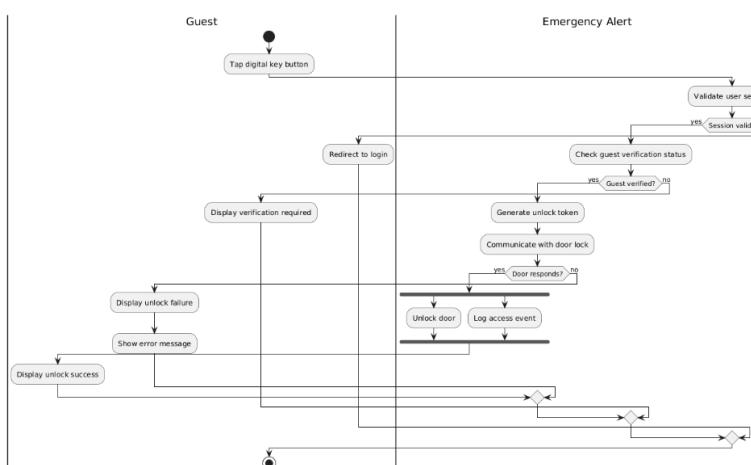
Hotel Management System



AC4: Secure Guest Verification

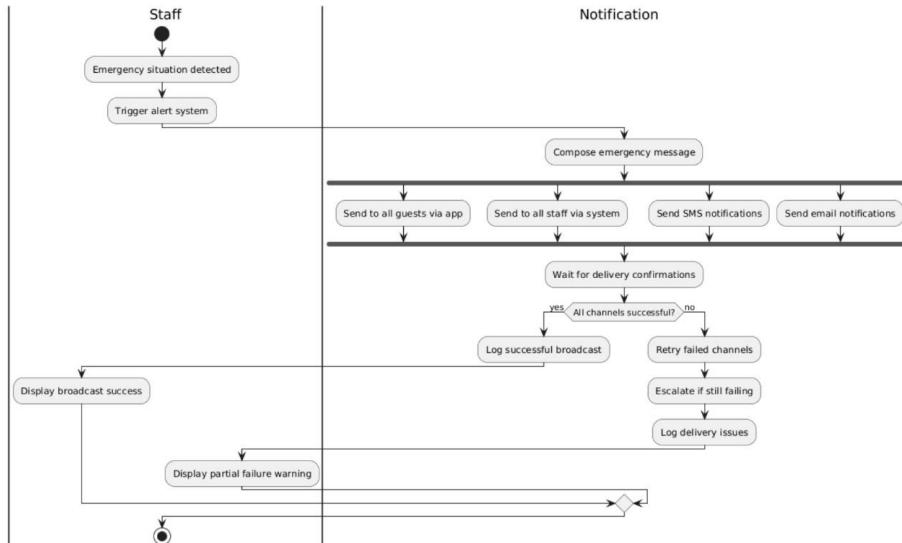


AC 5:Digital Key Access

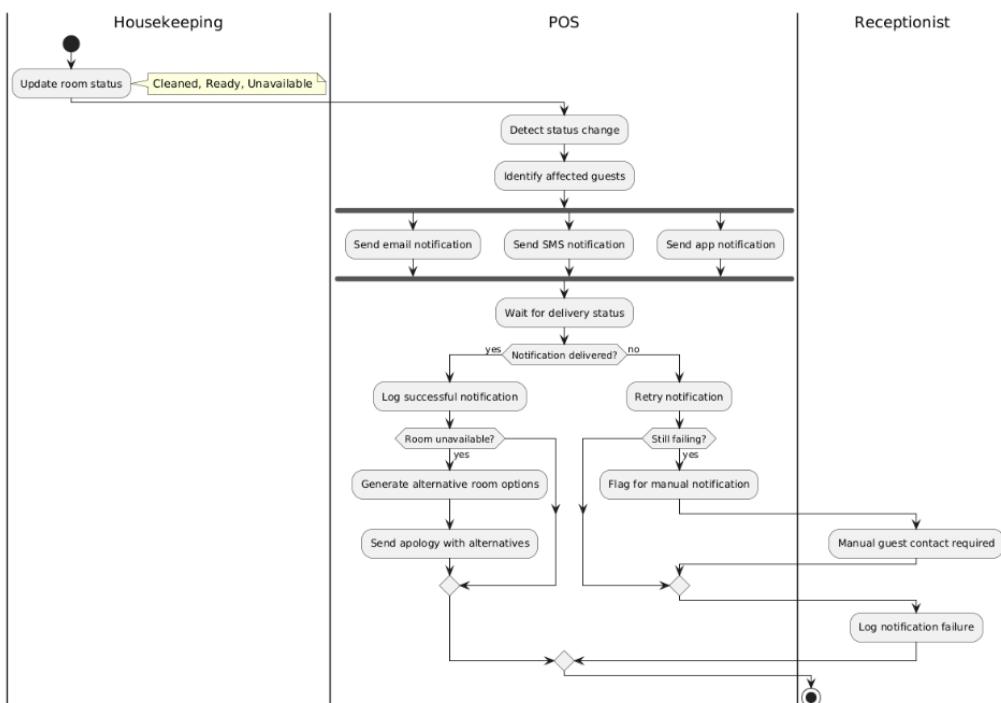


Hotel Management System

AC 6:Emergency Alert



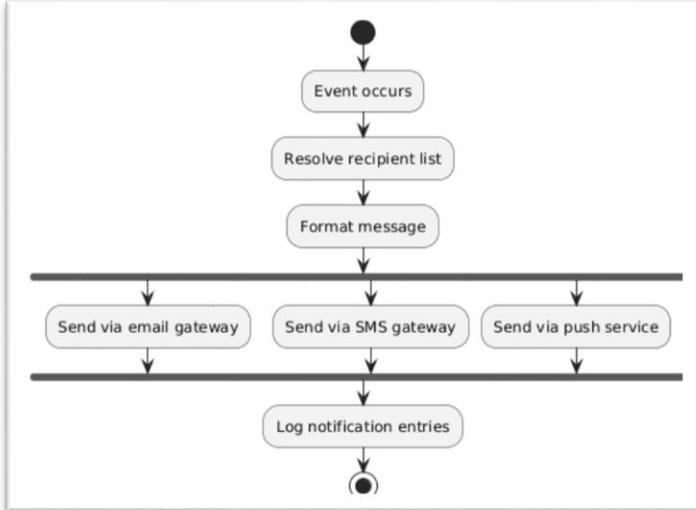
AC 7: Notify guest on Room Status



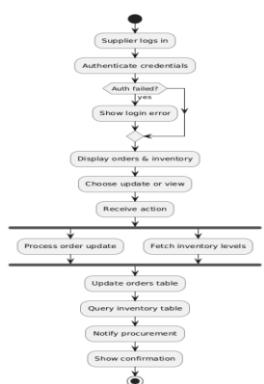
Artemisa Hasalami

Hotel Management System

AC 8: Notification Handling

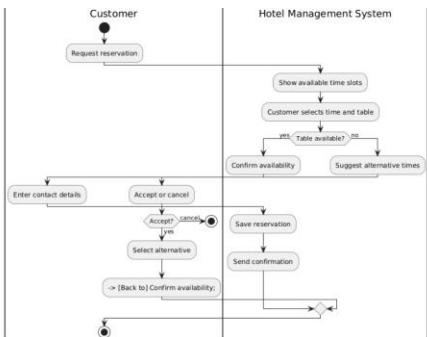


AC 9: Managing Suppliers

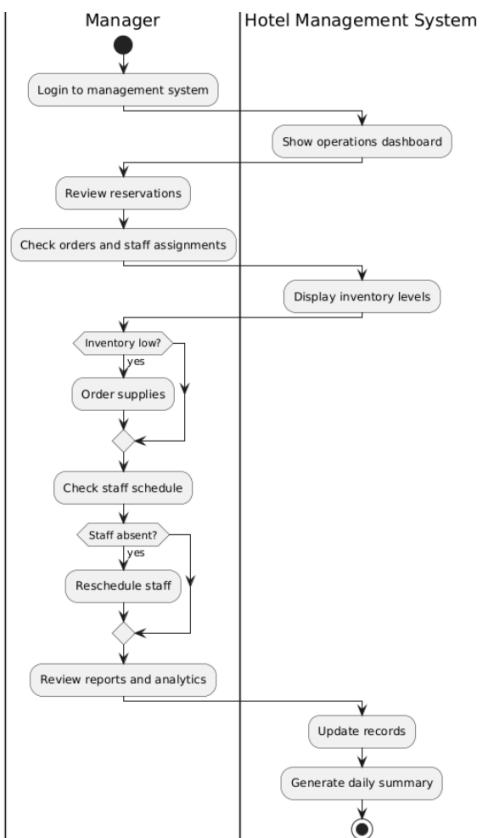


AC 10: Table Reservations

Hotel Management System

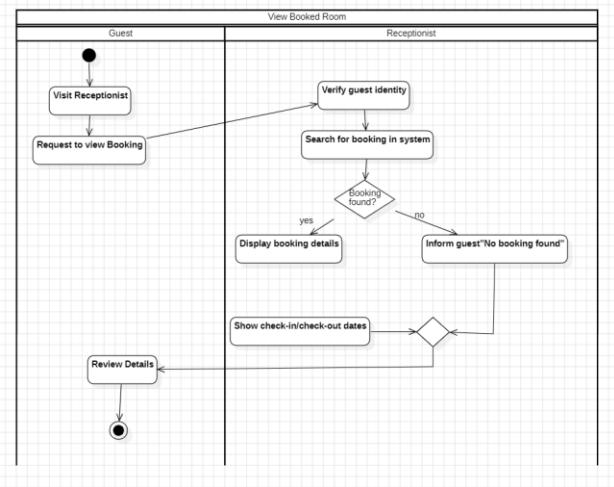


AC 11:Restaurant And Coffee Bar Management

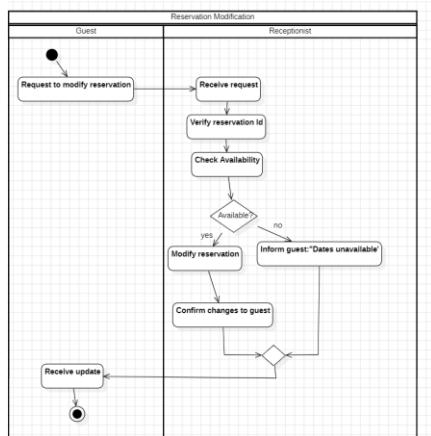


Hotel Management System

AC 12: View Booked rooms and Check-in/Check-out

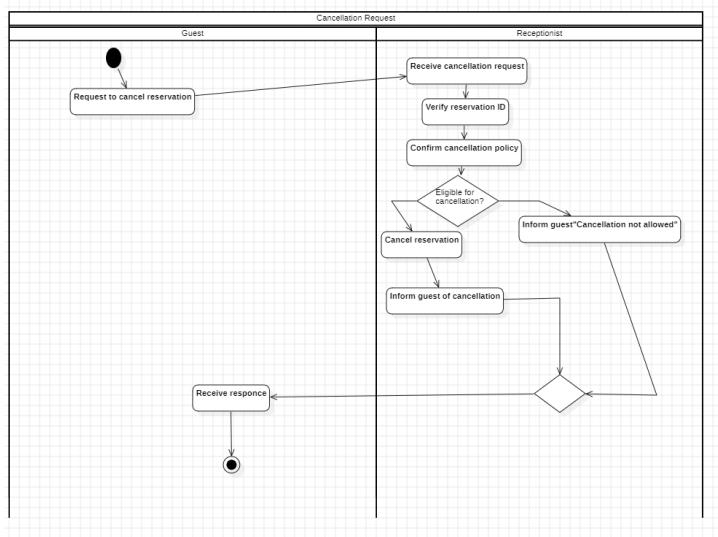


AC 13: Reservation Modification

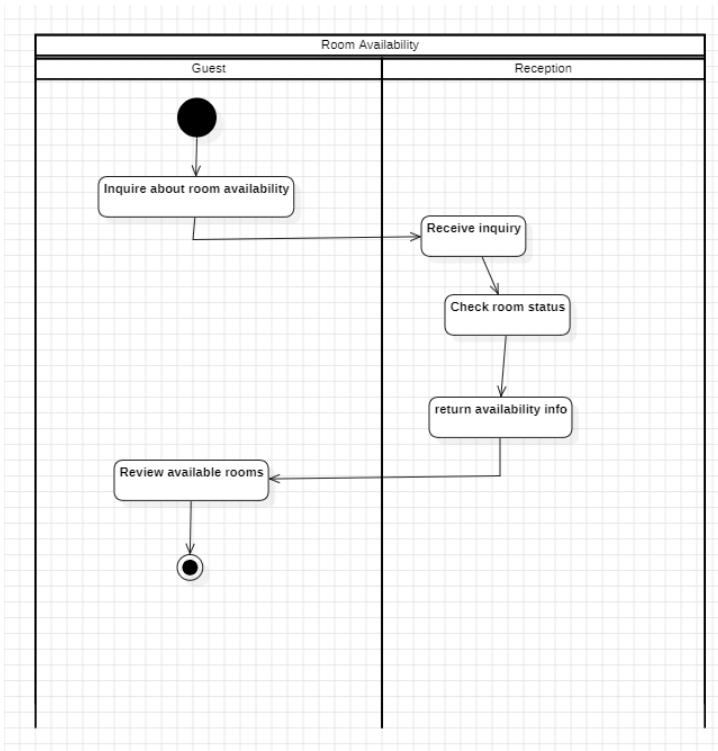


Hotel Management System

AC 14: Cancellation Request



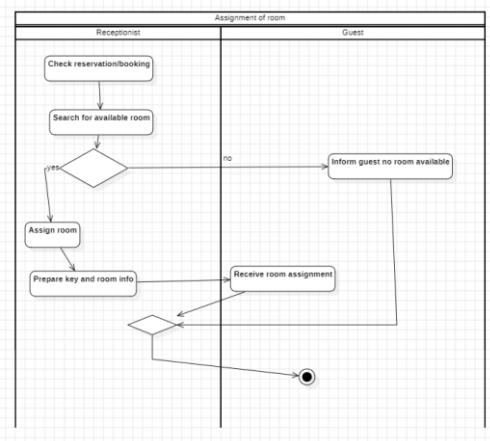
AC 15: Room Availability



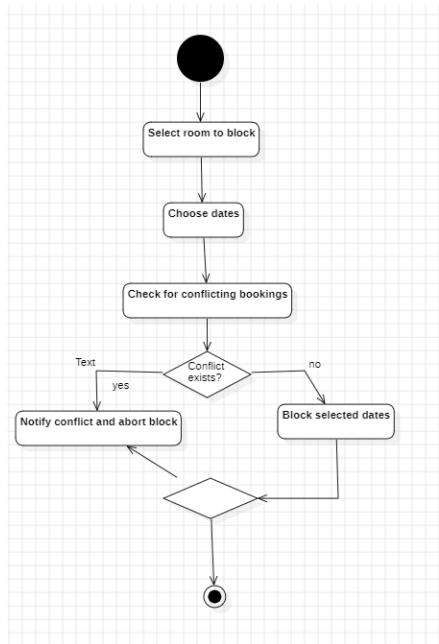
Hotel Management System

Brikena Papadhopuli

AC 16: Assignment of Room

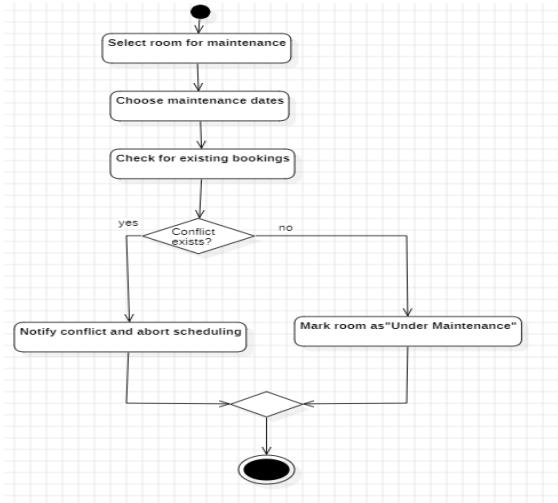


AC 17: Block dates for Specific Rooms

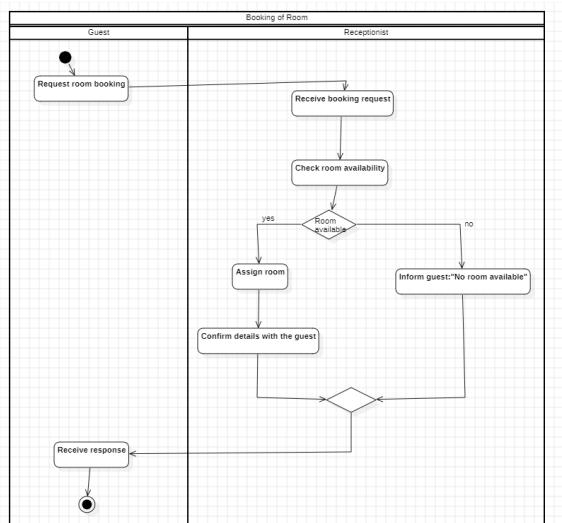


Hotel Management System

AC 18: Schedule Maintenance

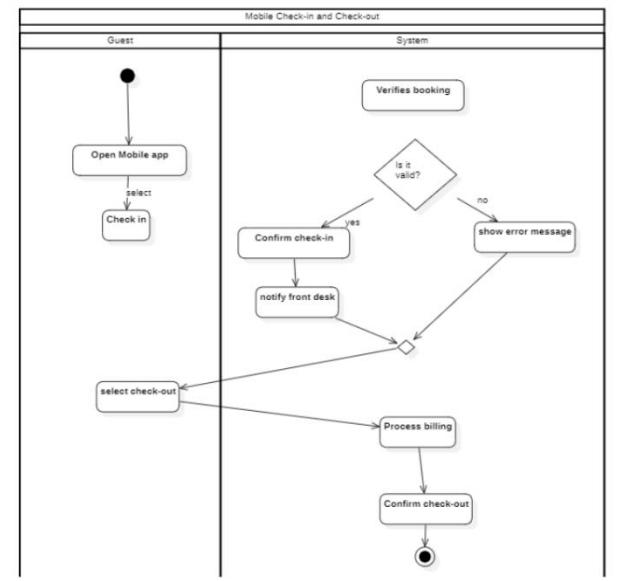


AC 19: Booking of a room

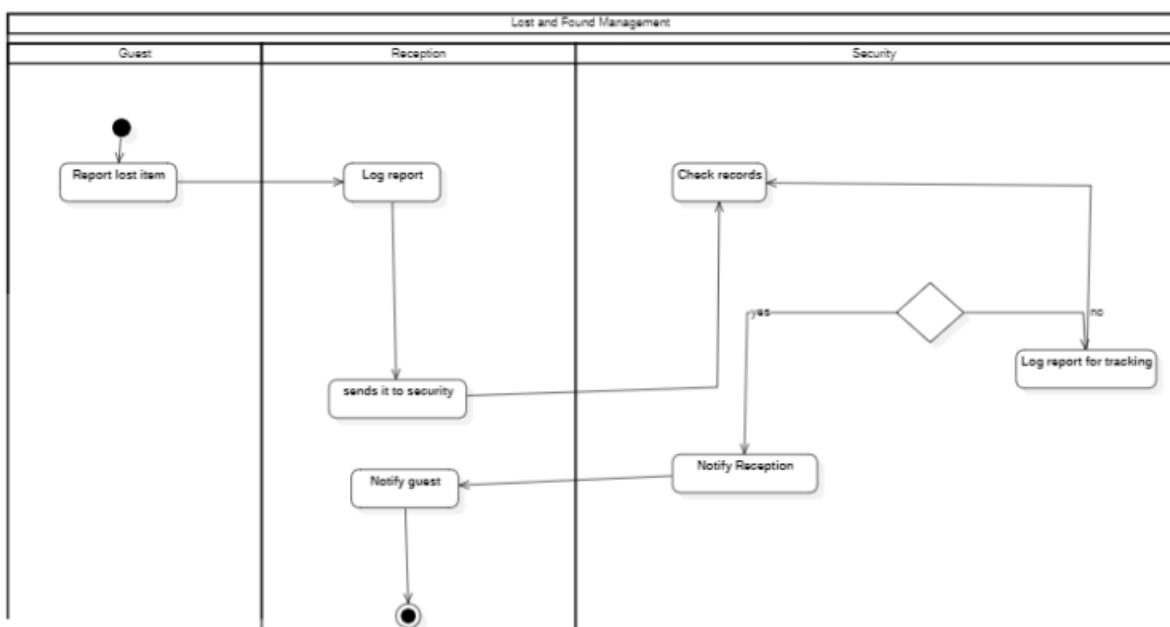


Hotel Management System

AC 20: Mobile Check-in and Check-out

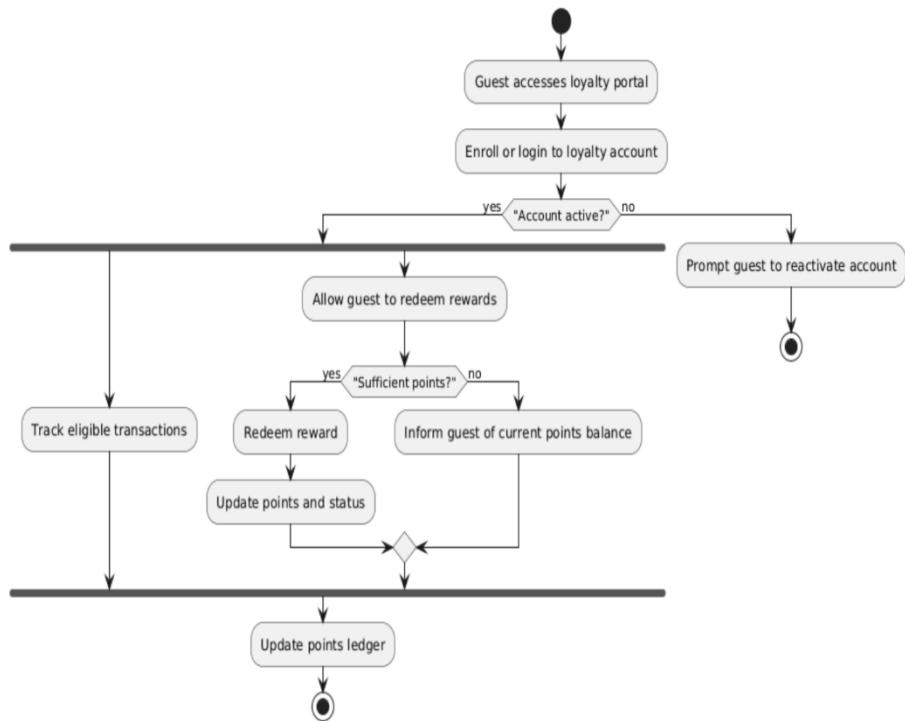


AC 21: Lost and Found Management

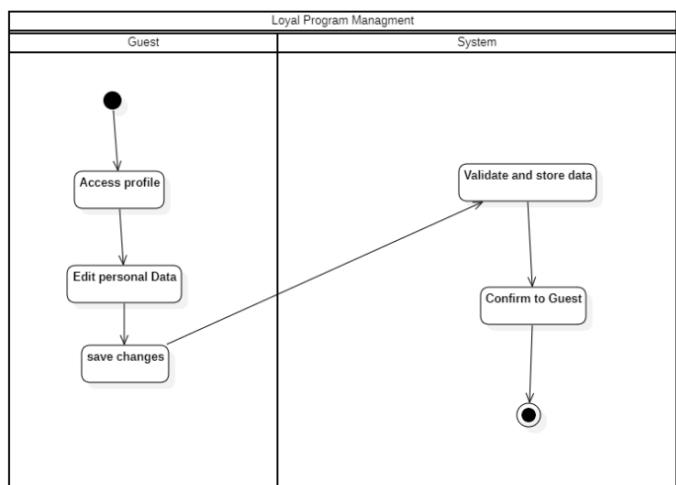


AC 22:Loyalty Program Management

Hotel Management System



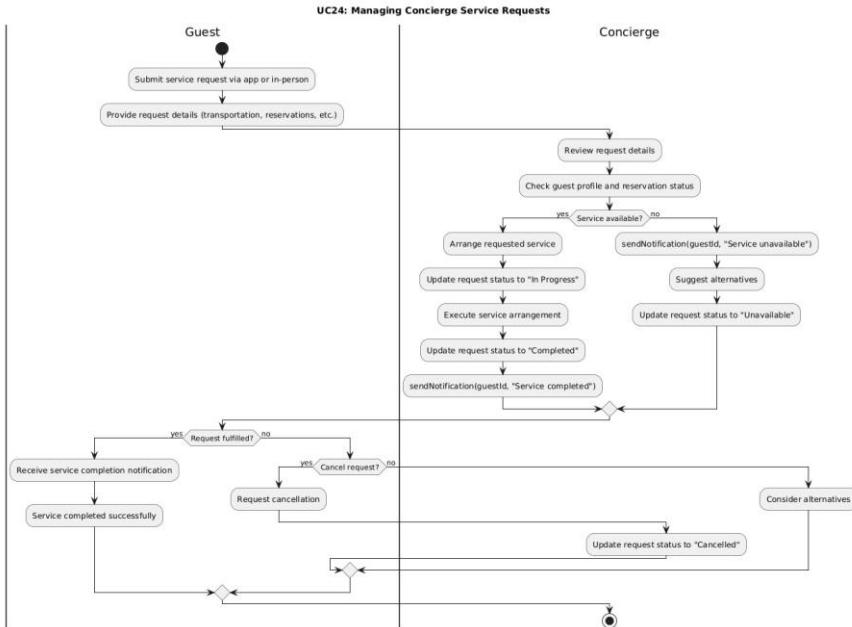
AC 23: Guest Profile Management



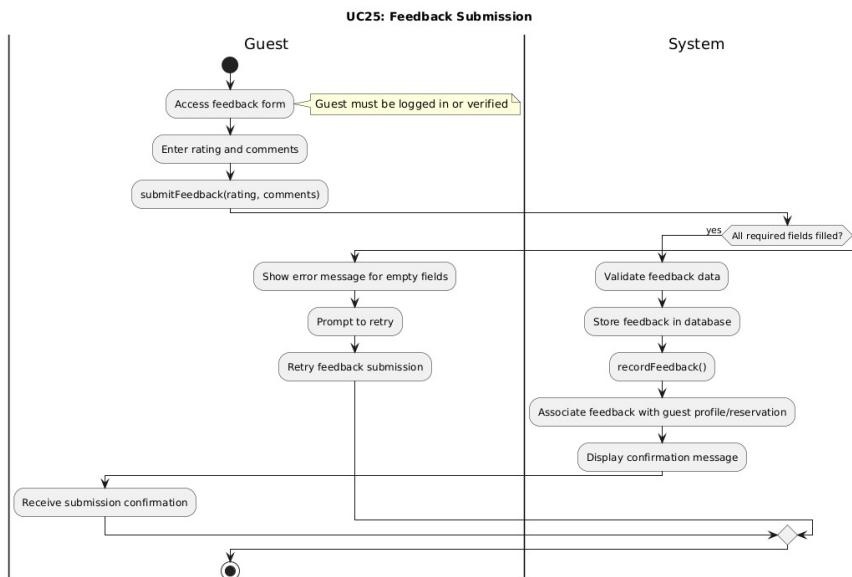
Hotel Management System

Erta Llenga

AC 24: Concierge Manage Service Request

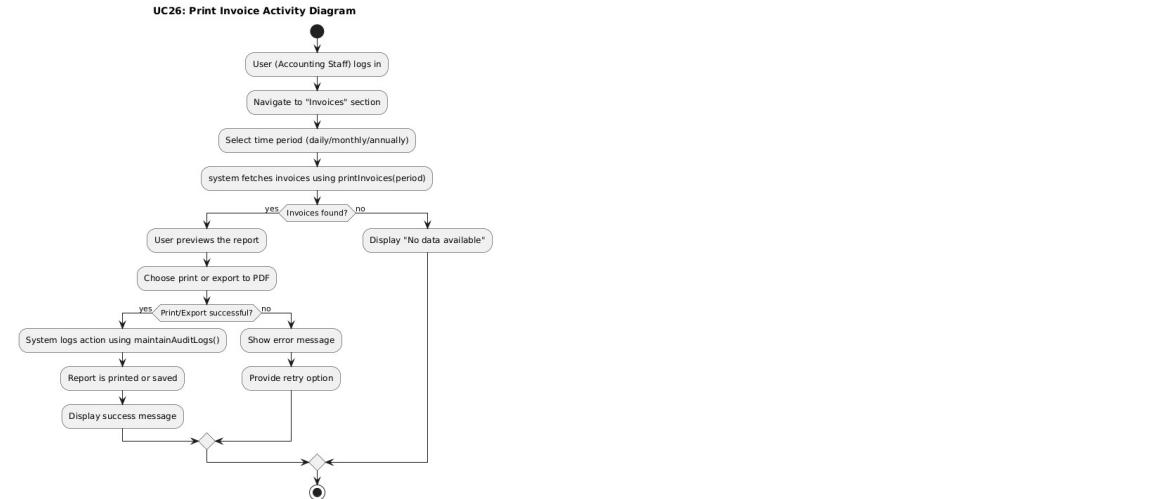


AC 25: Feedback Submission

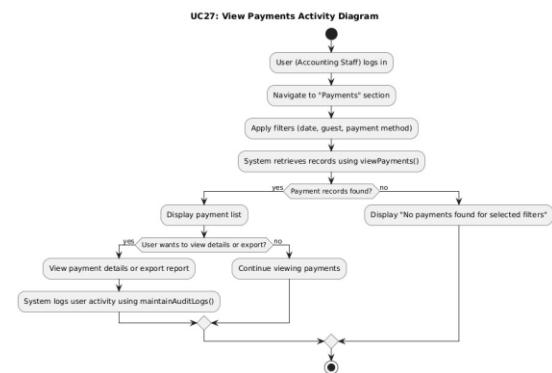


Hotel Management System

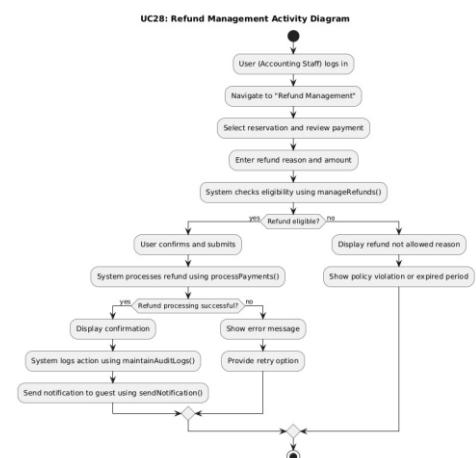
AC 26:Print Invoice



AC 27: View Payments

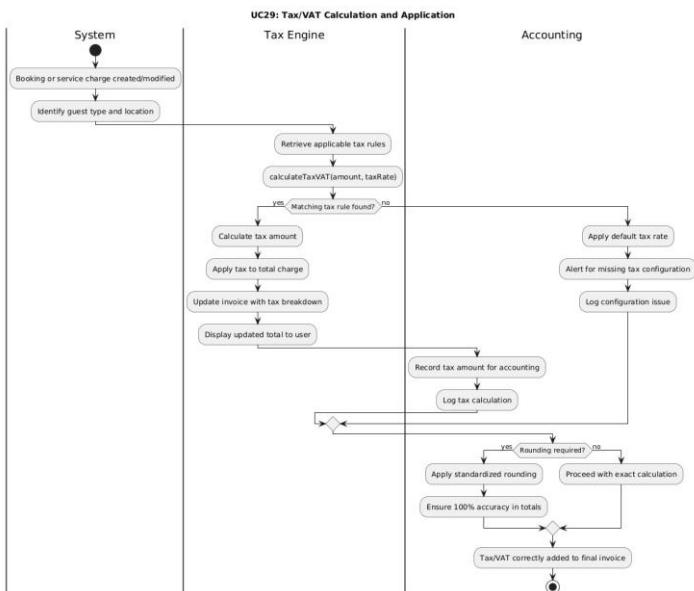


AC 28:Refund Management

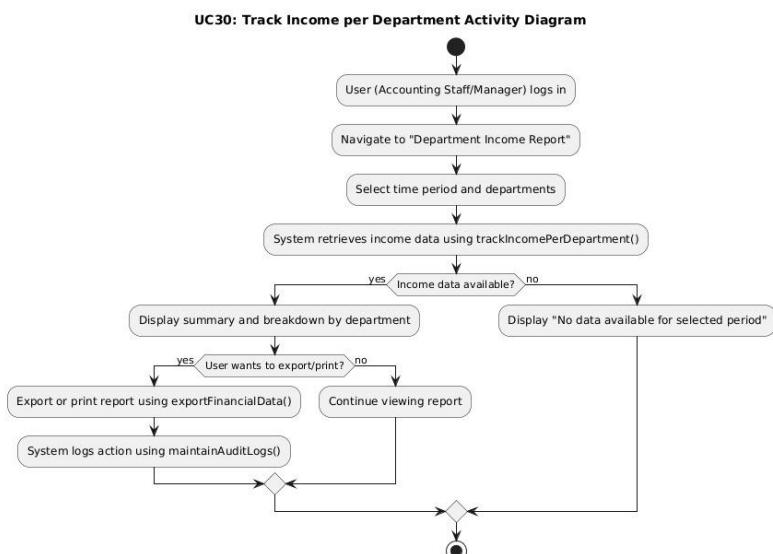


Hotel Management System

AC 29:TAX/VAT Calculation and Application



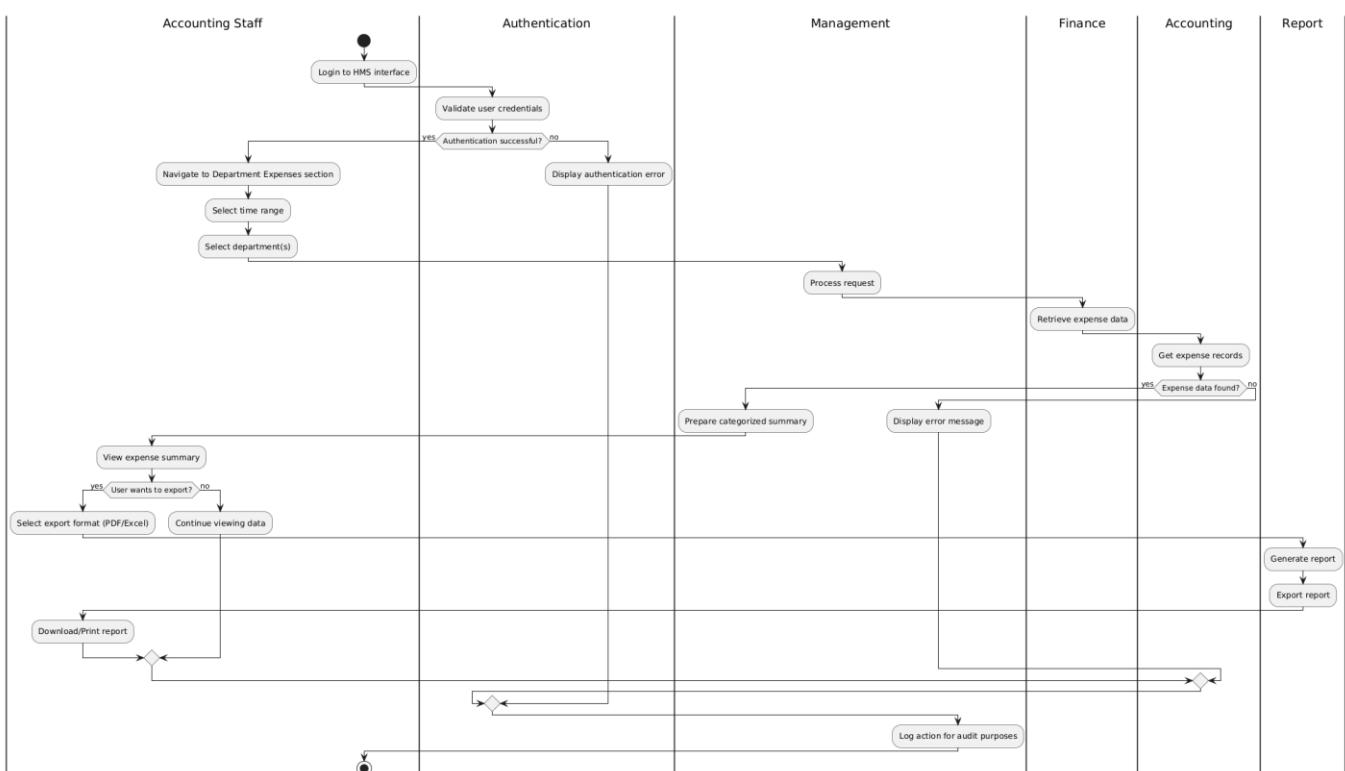
AC 30: Track Income per Department



Hotel Management System

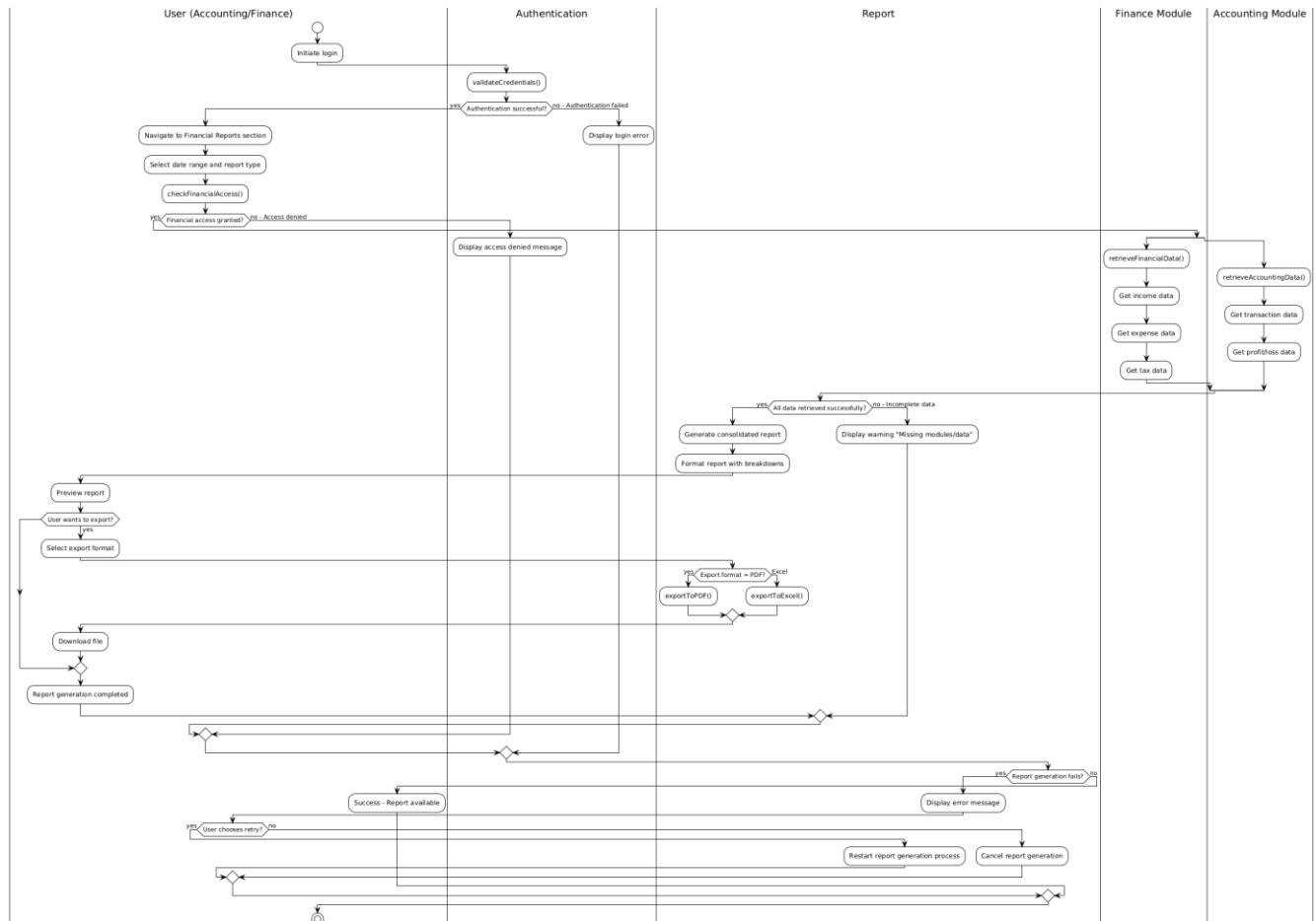
Esta Çekrezi

AC 31: Track Expenses by Department



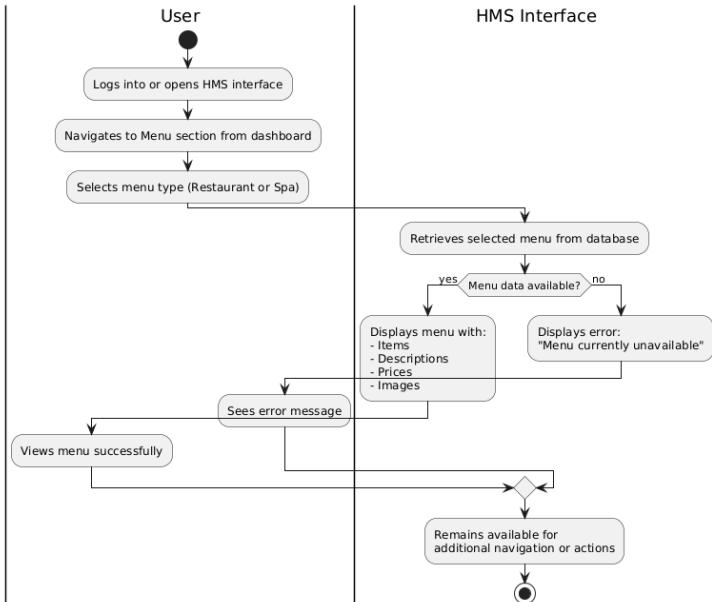
Hotel Management System

AC 32: Generate Consolidate Financial Reports

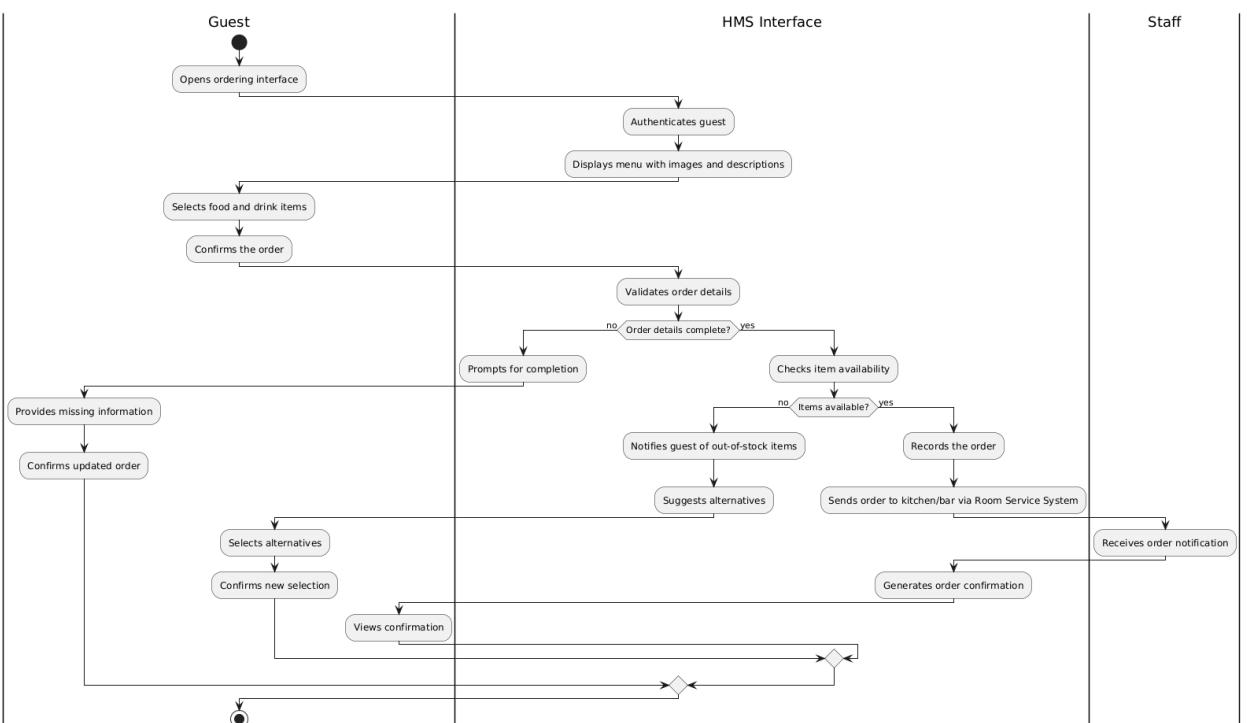


AC 33: View Menu

Hotel Management System

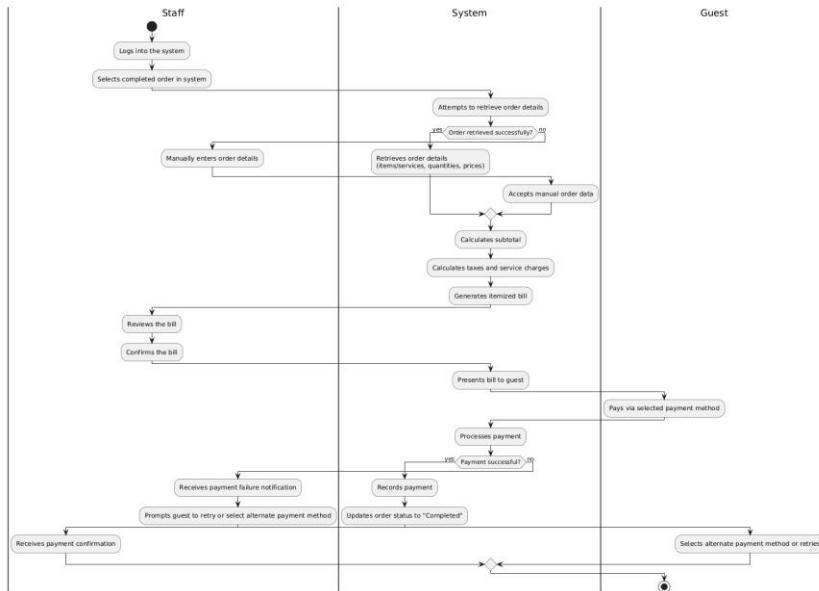


AC 34: Place Food and Drink Order from Hotel Room

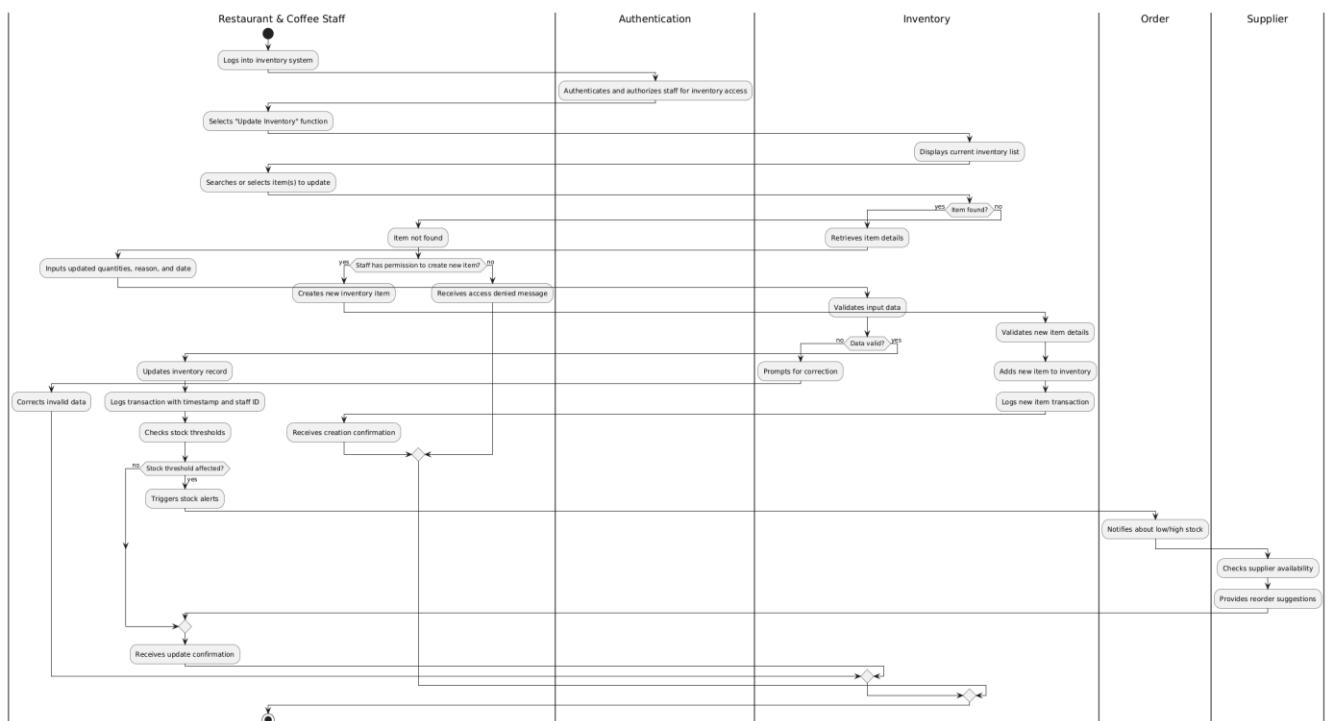


AC 35: Generate & Process Order Bills

Hotel Management System

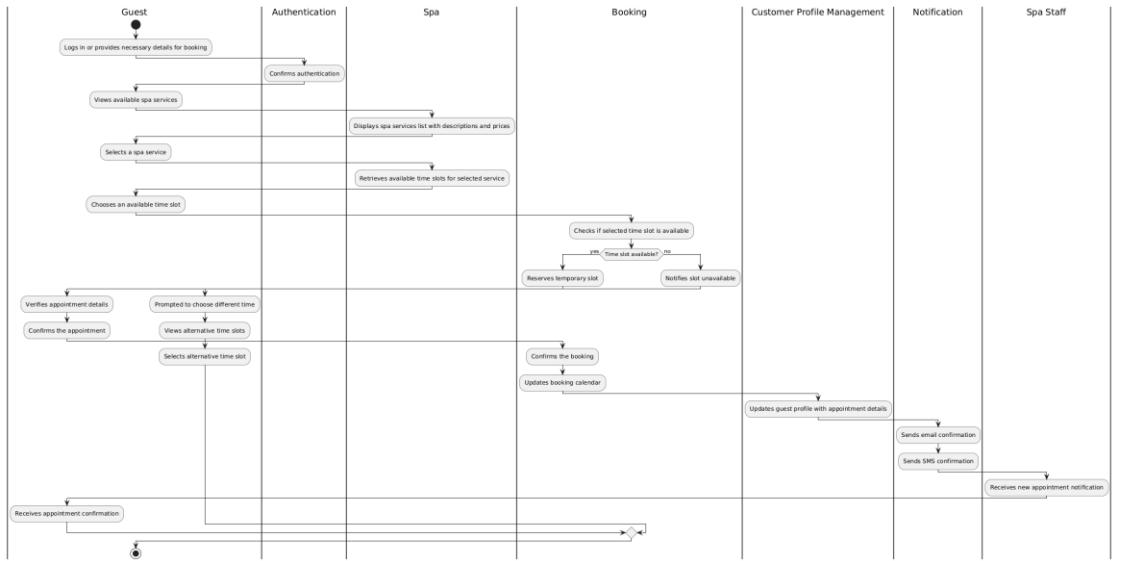


AC 36: Update Food/Beverage Inventory

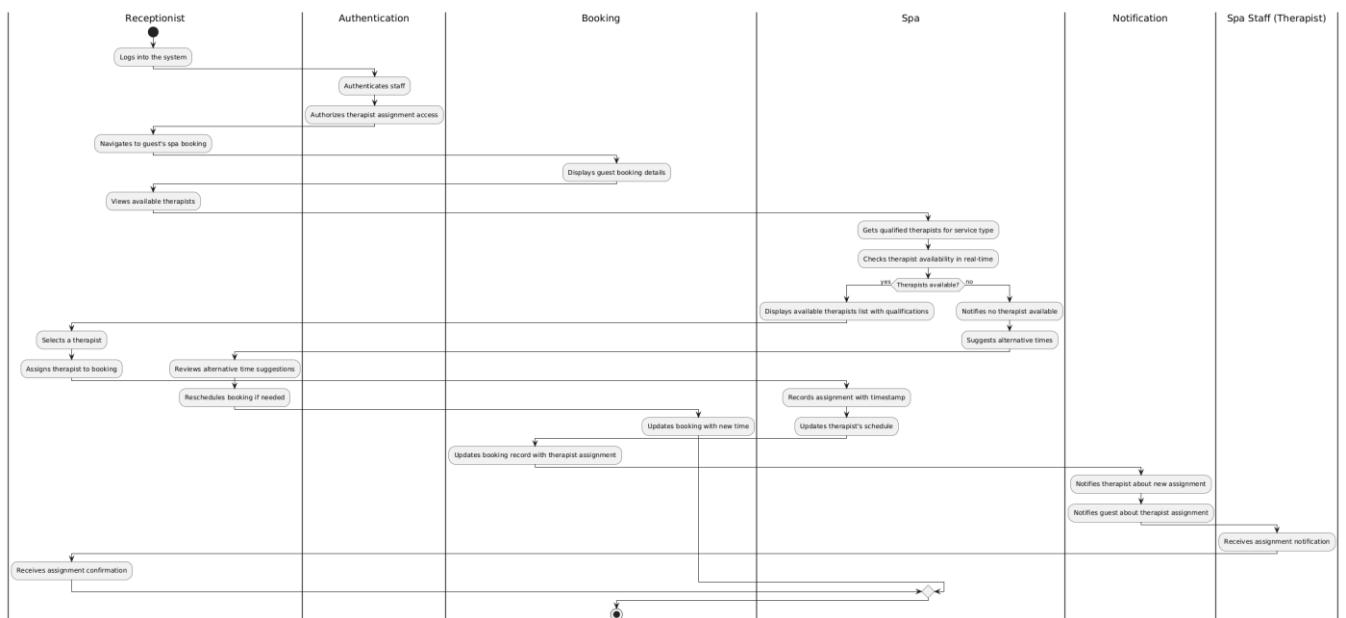


AC 37: Book Spa Appointment

Hotel Management System



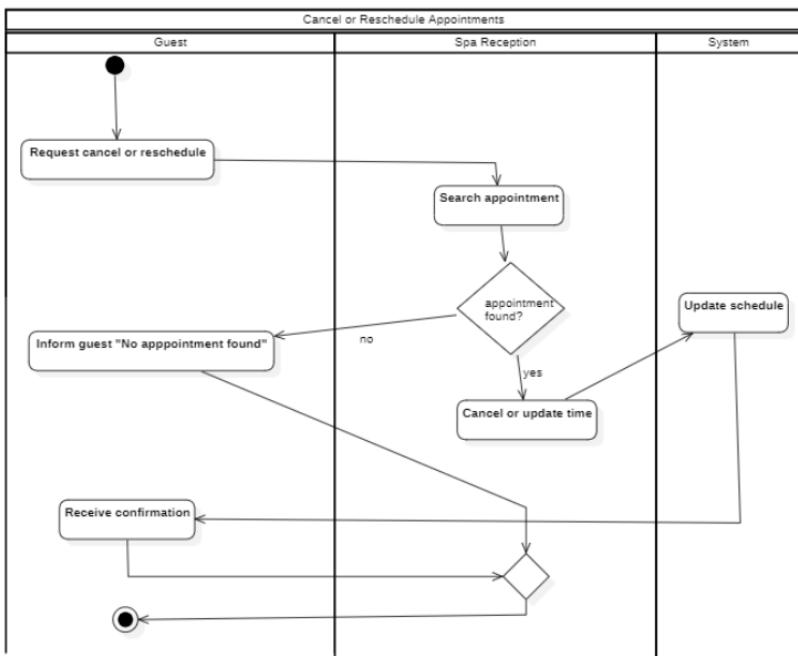
AC 38:Assign Therapist to Guest



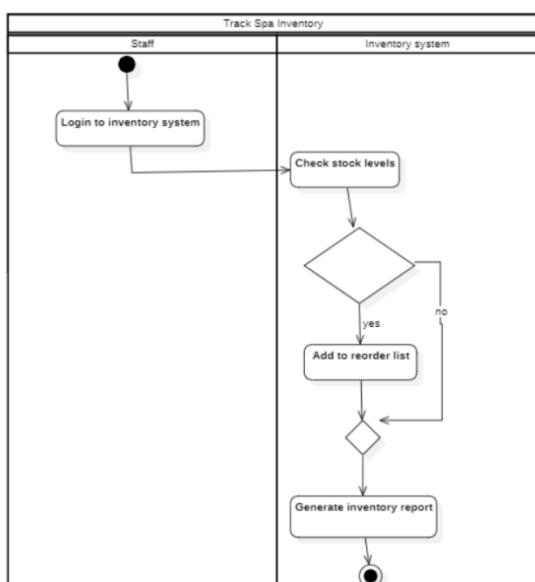
Ester Pashtranjaku

AC 39:Cancel Or Reschedule Appointment

Hotel Management System

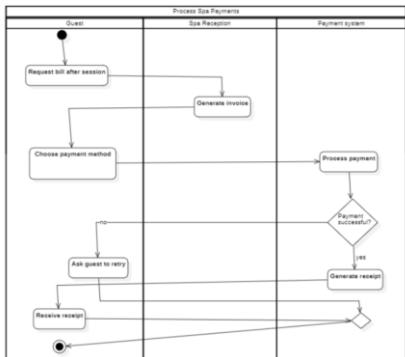


AC 40: Track Spa Inventory

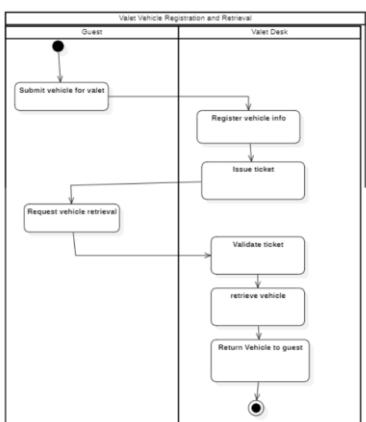


Hotel Management System

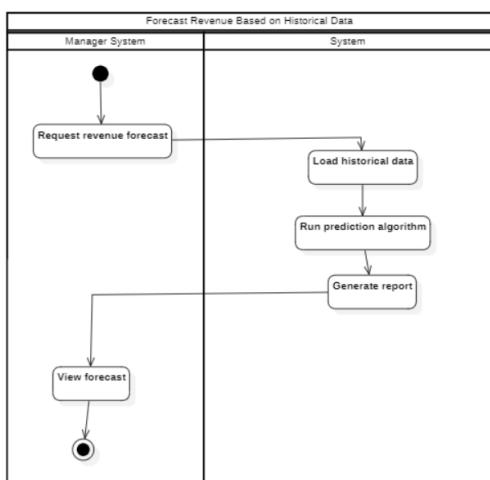
AC 41:Process Spa Payments



AC 42:Valet Vehicle Registration and Retrieval

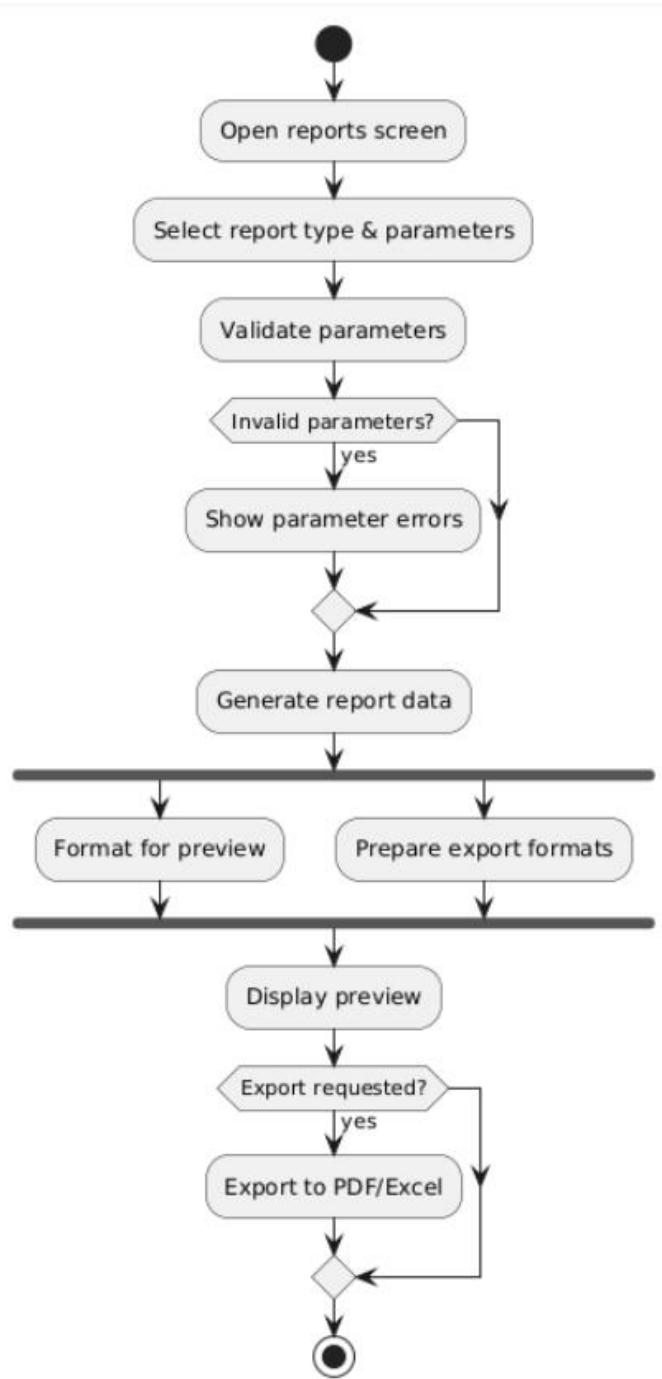


AC 43: Forecast Revenue based on Historical Data



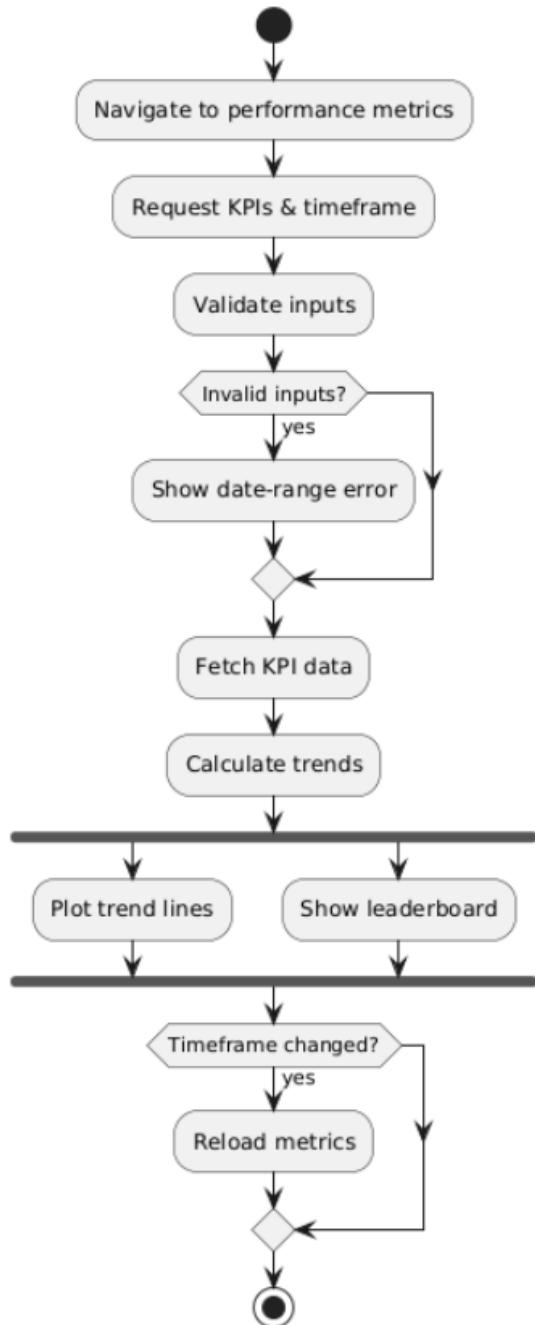
Hotel Management System

AC 44:Reporting



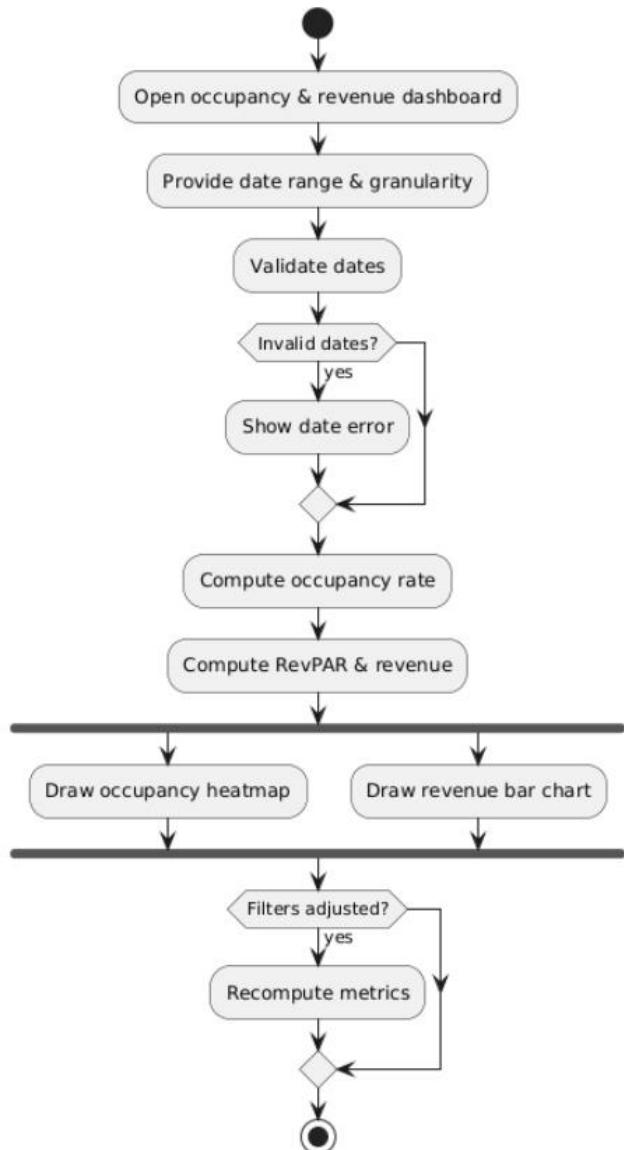
Hotel Management System

AC 45:Performance Metrics



Hotel Management System

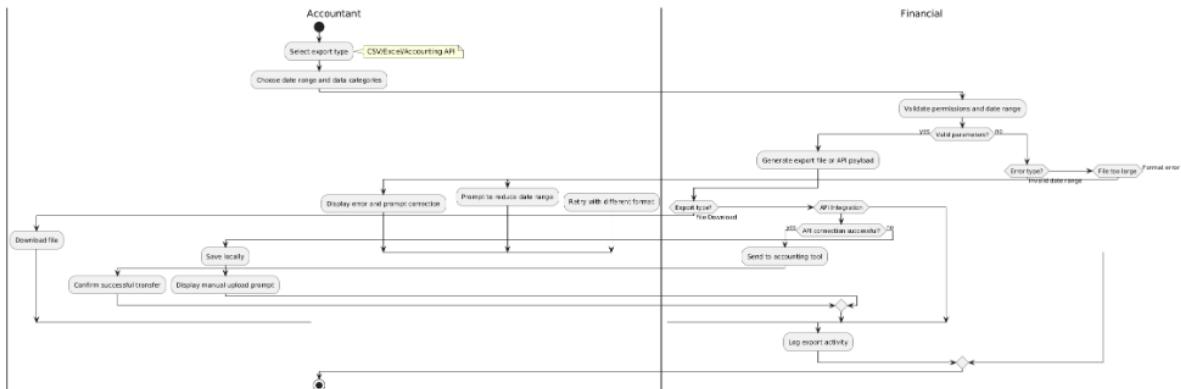
AC 46:Monitor Occupancy & Revenue



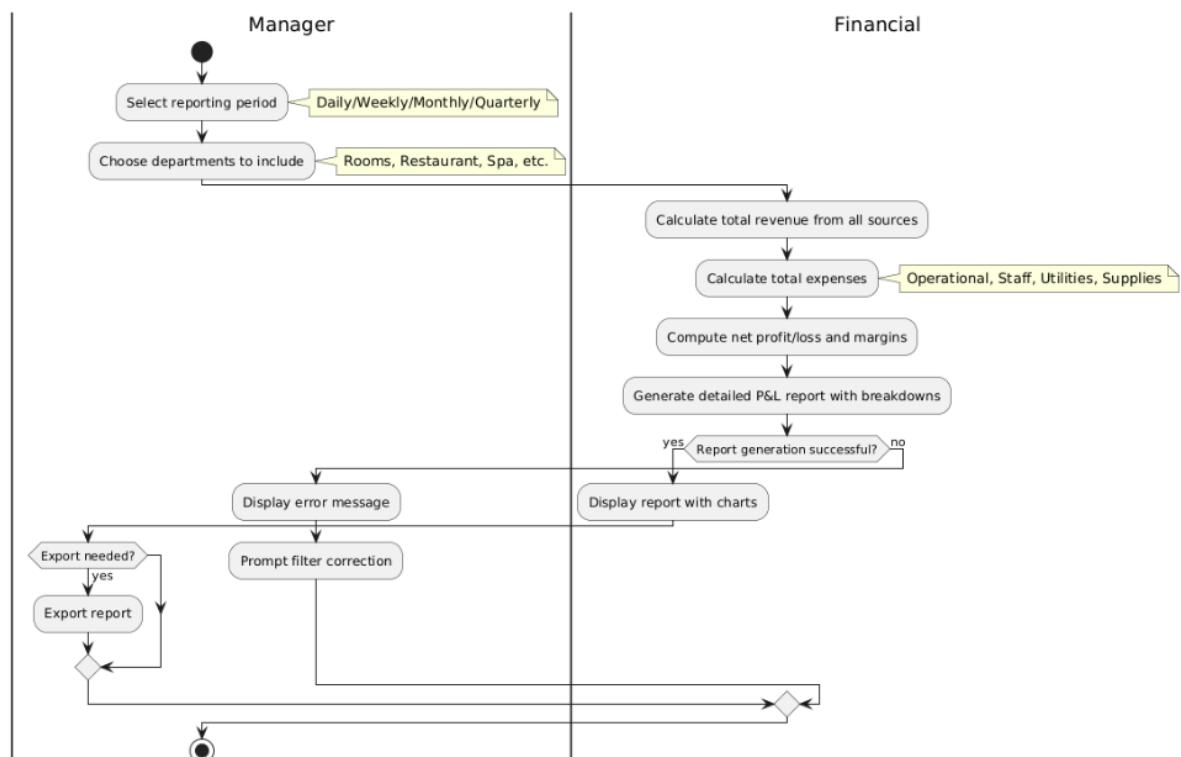
Hotel Management System

Megi Almadhi

AC 47: Export Financial Data to CSV/EXCEL or accounting tools

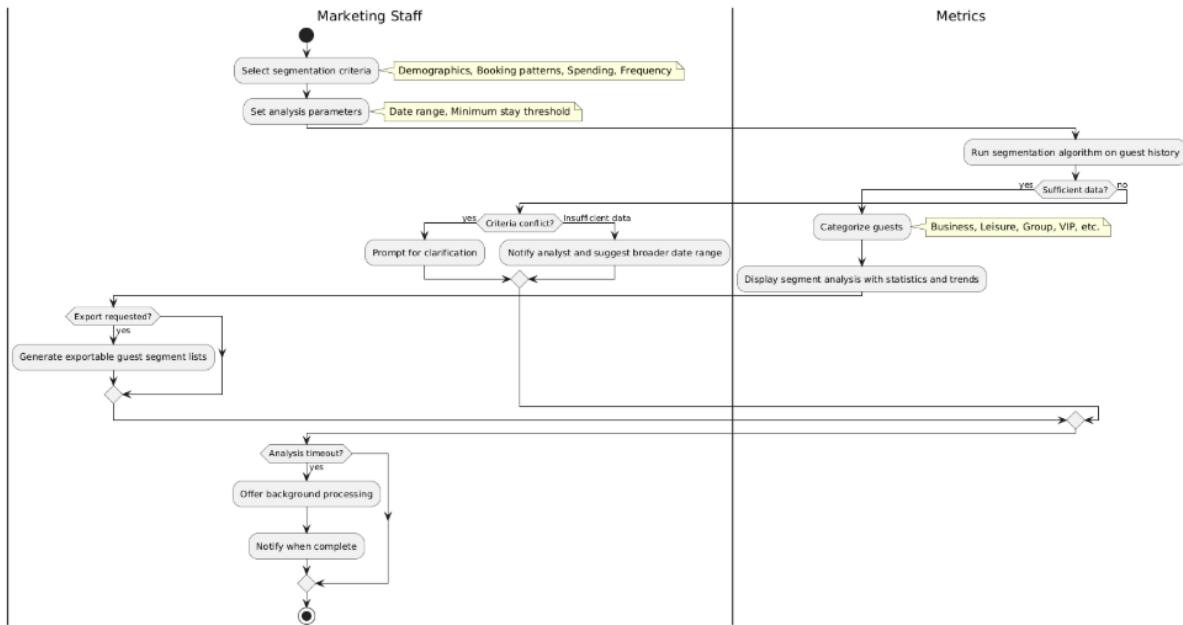


AC 48:Sponsorship Agreement

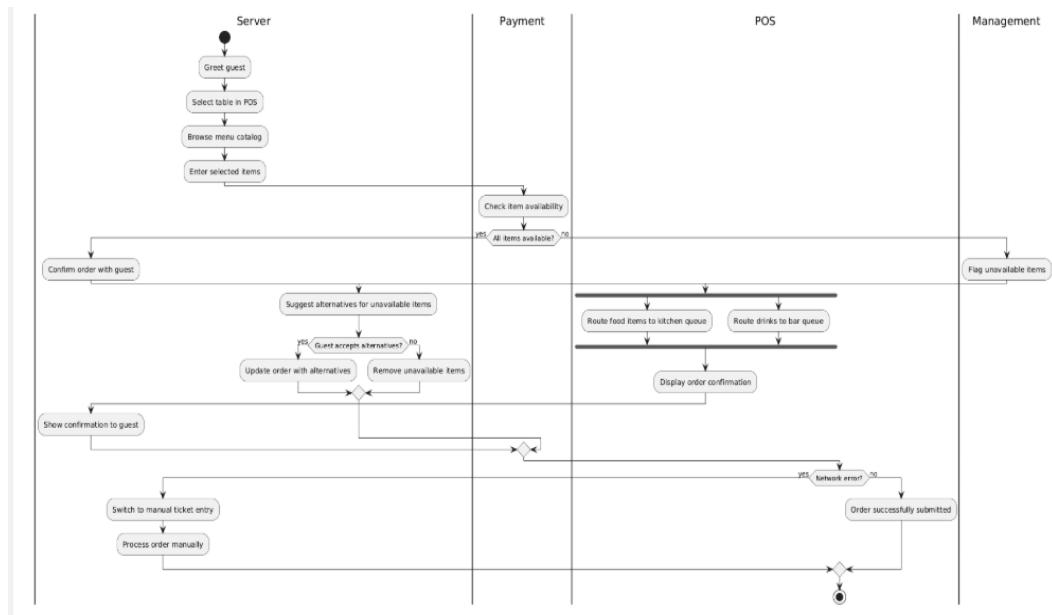


AC 49:

Hotel Management System

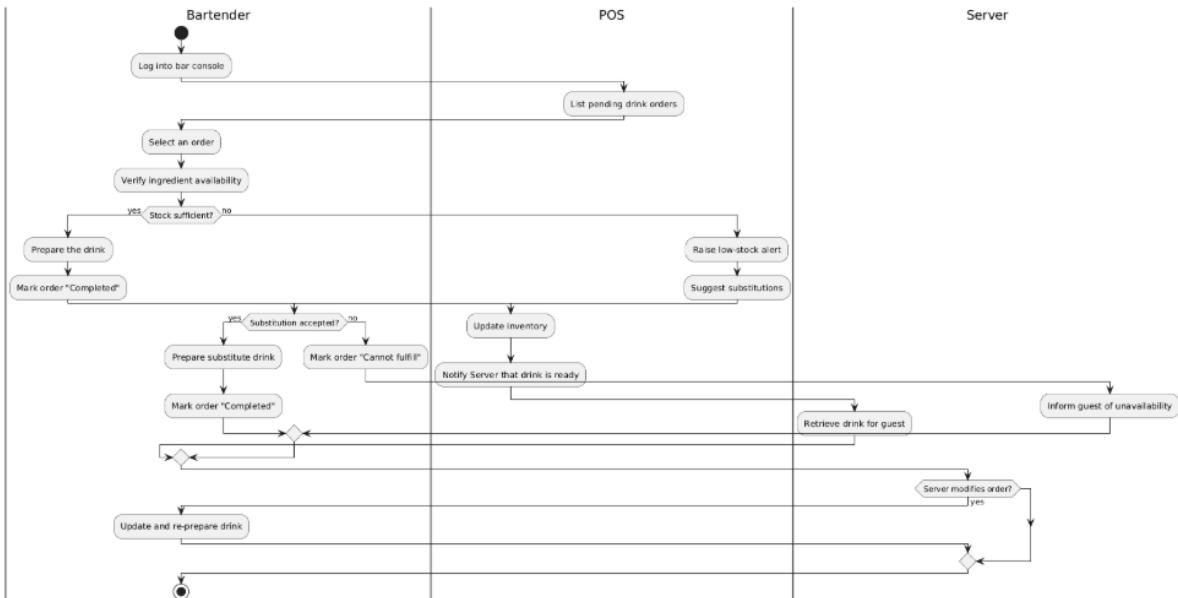


AC 50: Generate Profit/Loss Profit

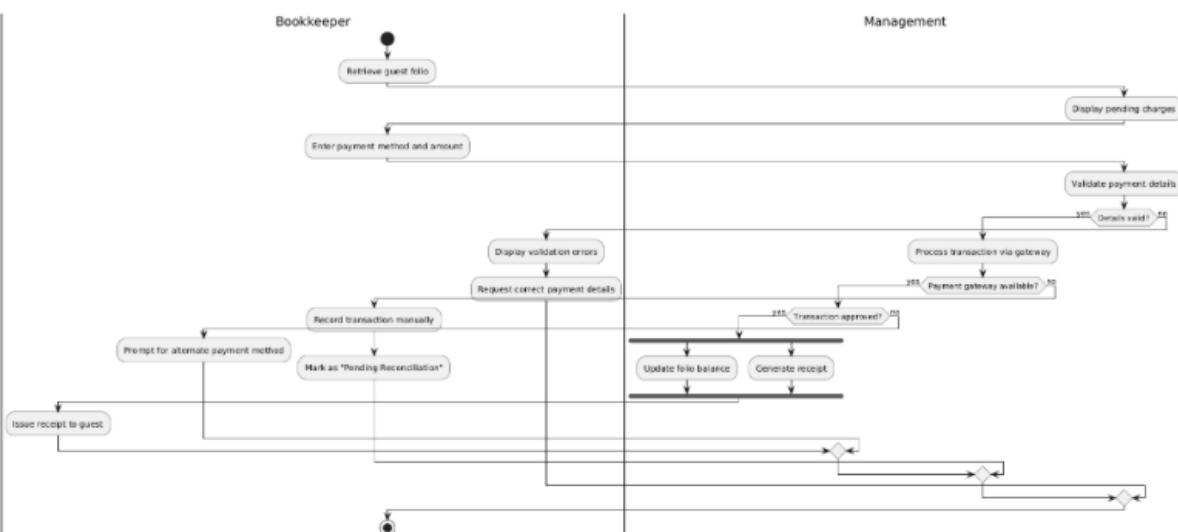


AC 51: Serve Drinks

Hotel Management System

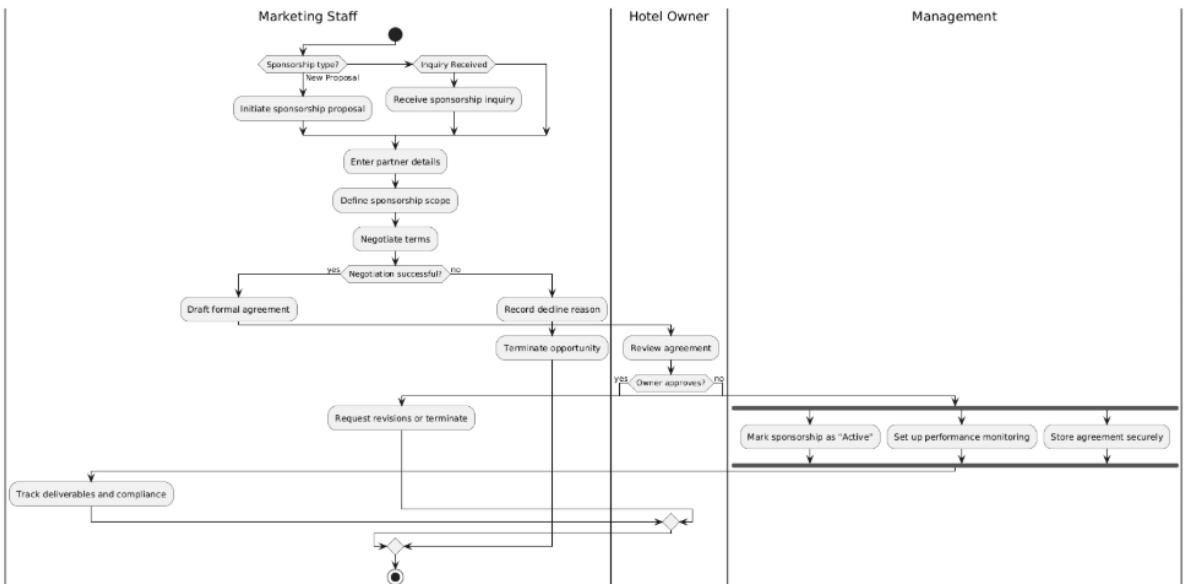


AC 52: Record Financial Transaction

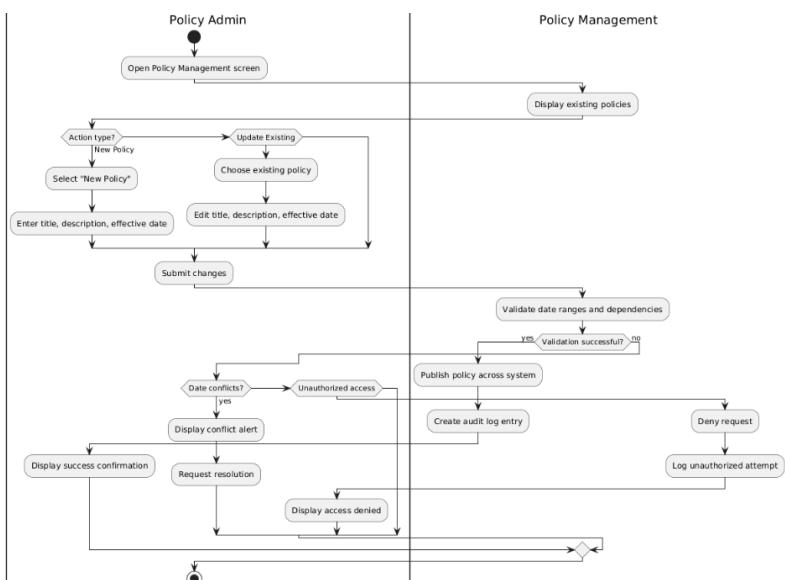


AC 53: Sponsorship Agreements

Hotel Management System

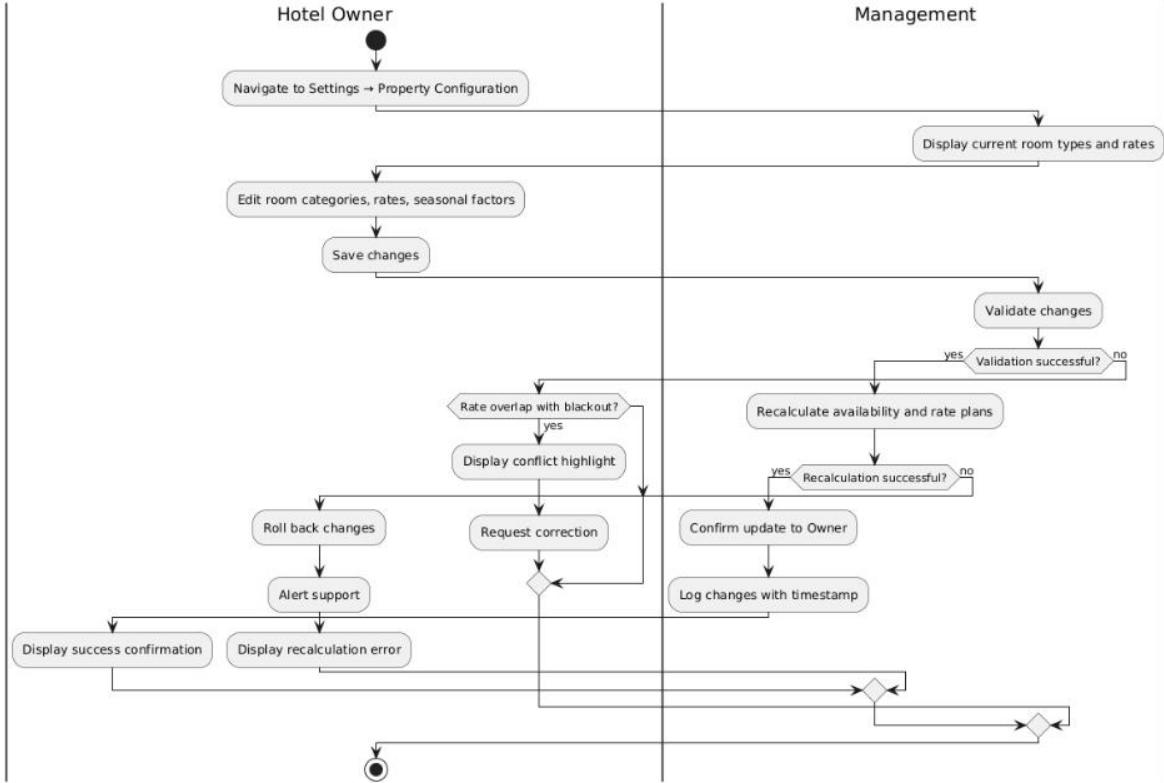


AC 54: Define or Update Hotel Policy



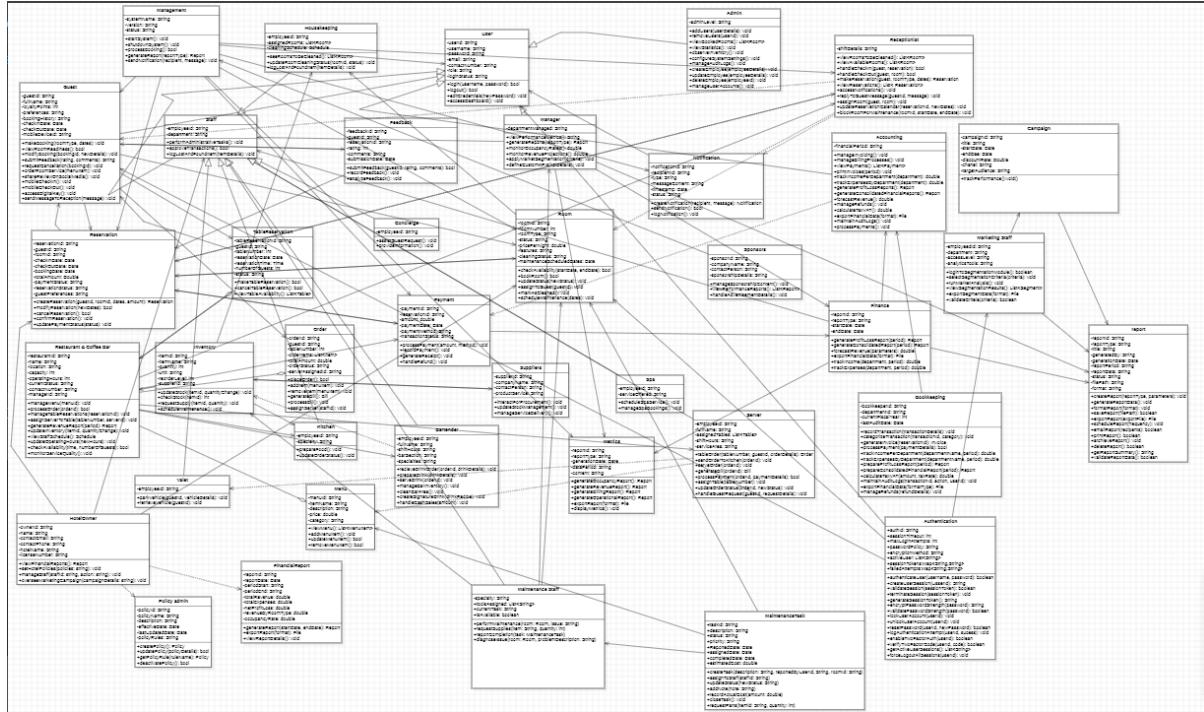
Hotel Management System

AC 55: Manage Property Settings



5.3 Class Diagram

Hotel Management System

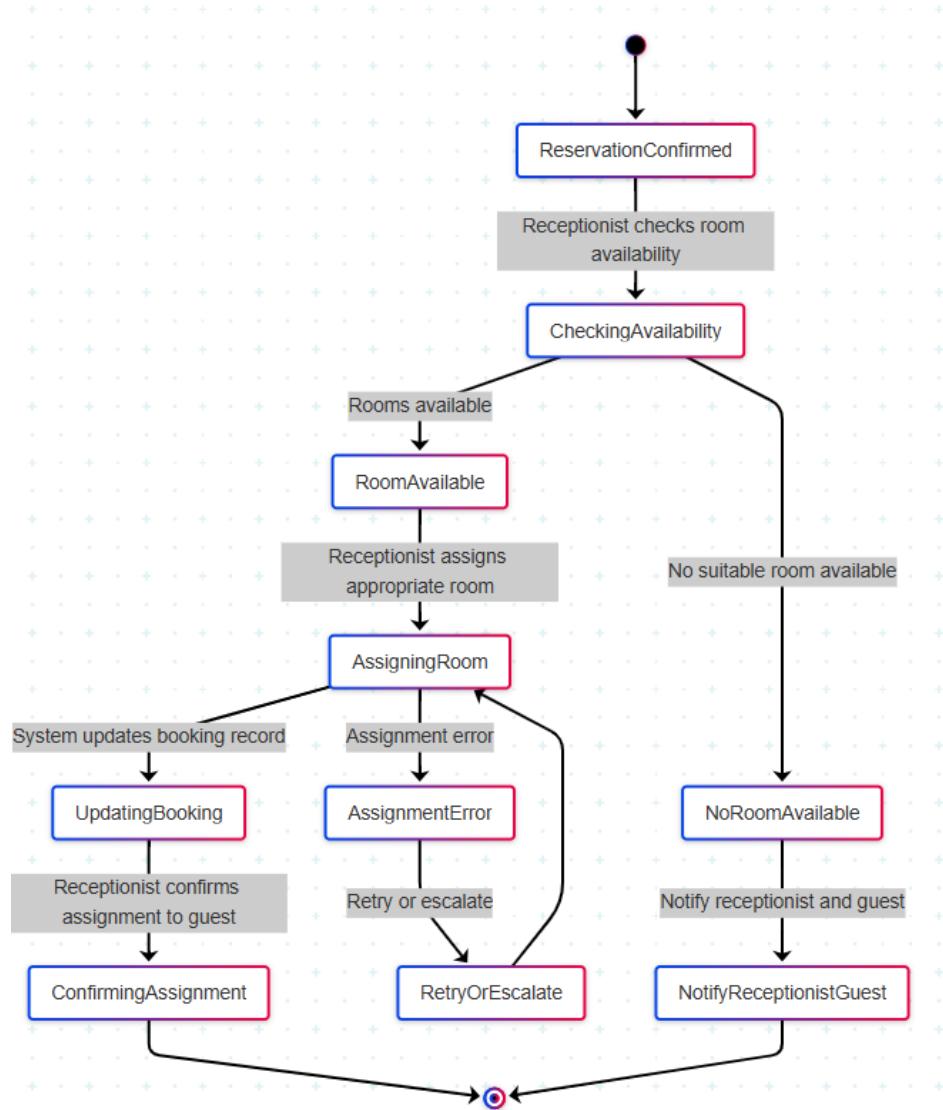


5.4 State Diagrams

(based on basic hotel system services)

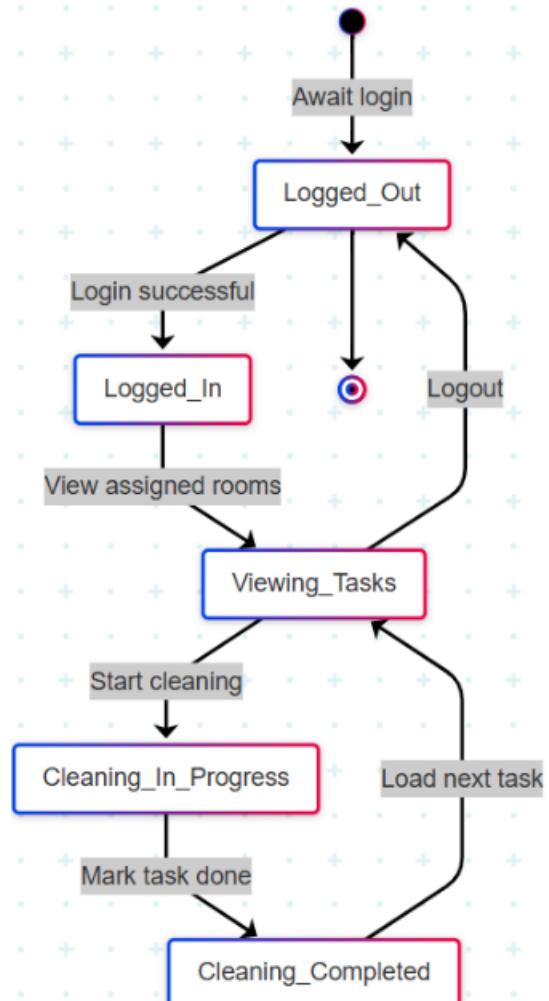
Hotel Management System

Reservation



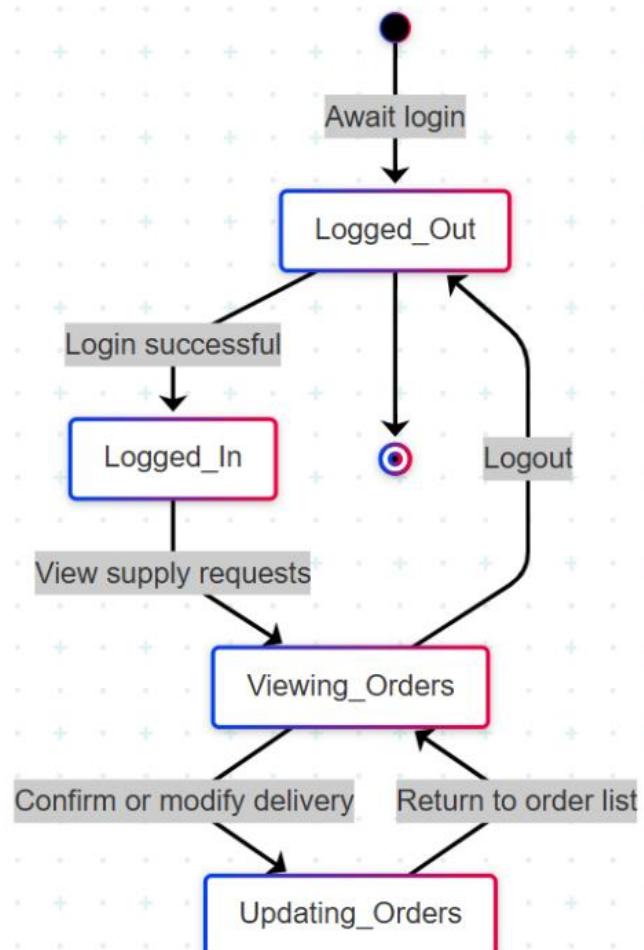
Hotel Management System

Housekeeping



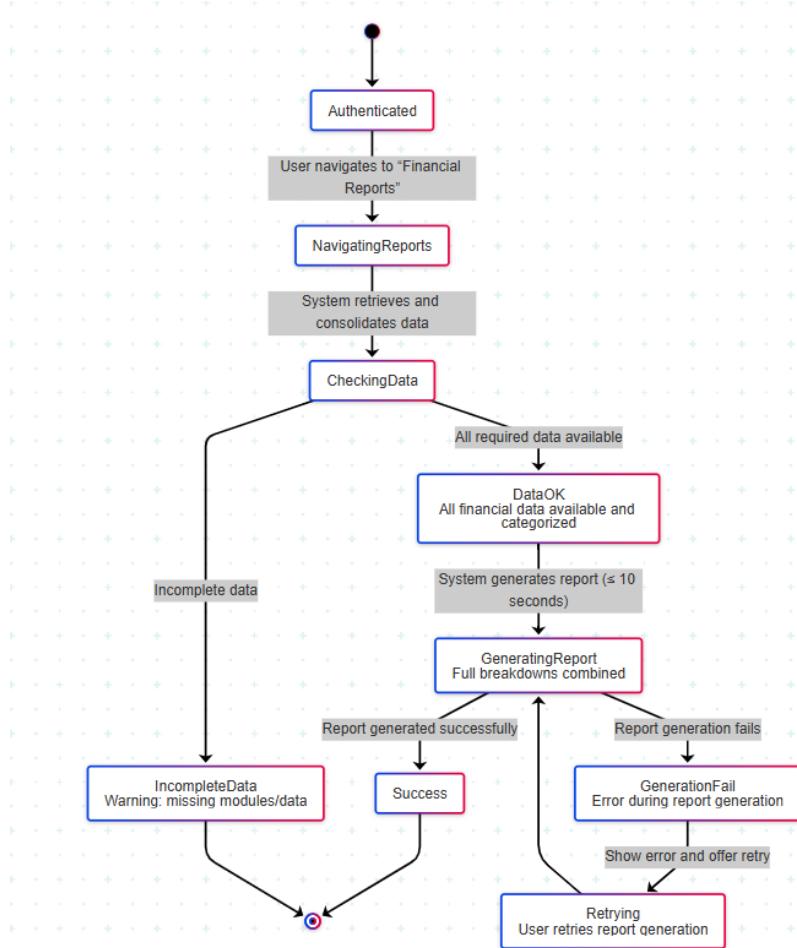
Hotel Management System

Suppliers



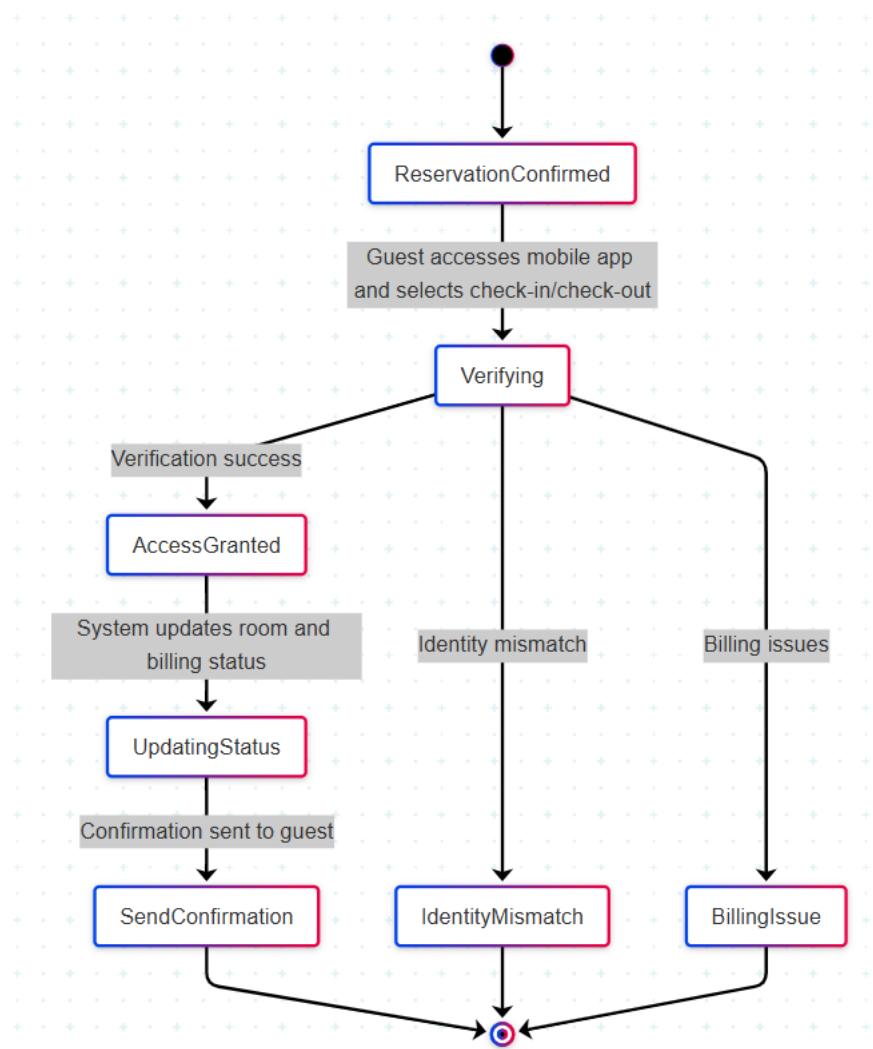
Hotel Management System

Generating Reports



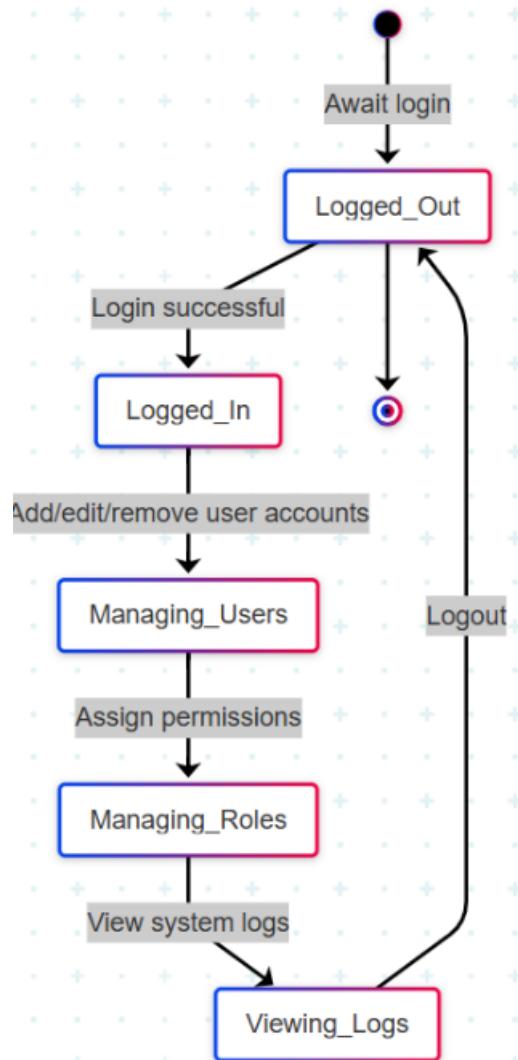
Hotel Management System

Mobile Check-in and Check-out



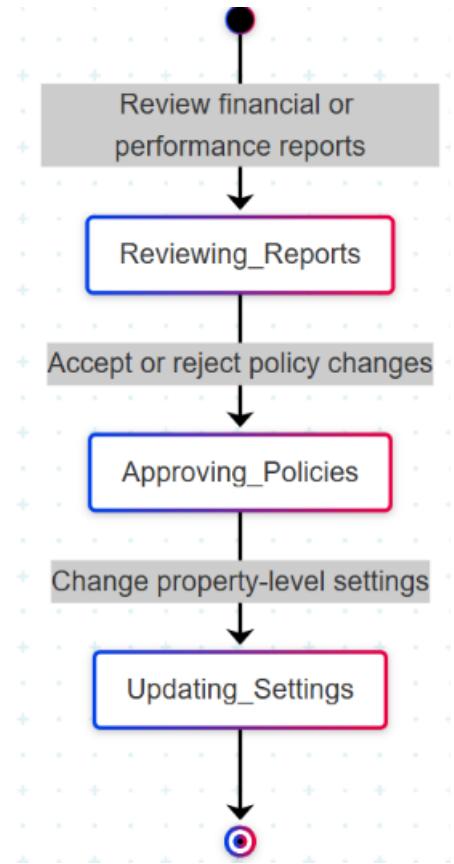
Hotel Management System

Admin



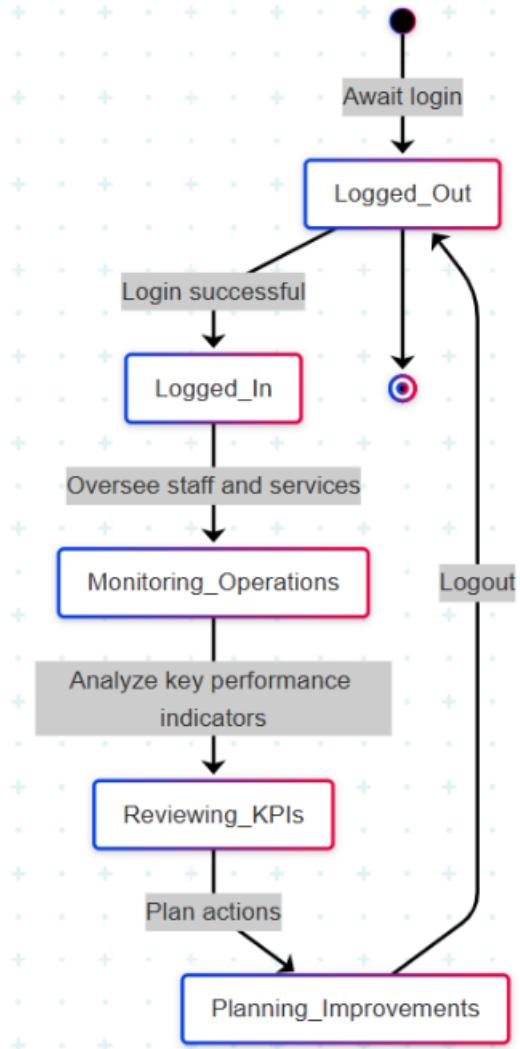
Hotel Management System

Owner



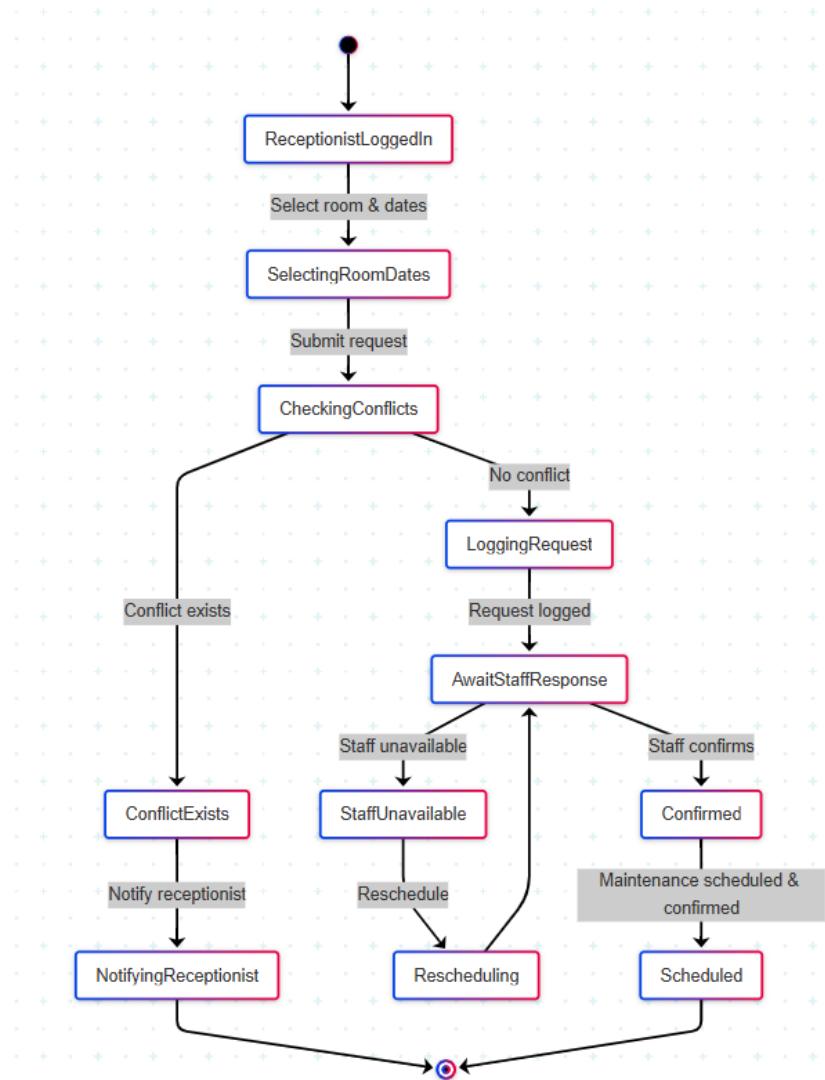
Hotel Management System

Manager



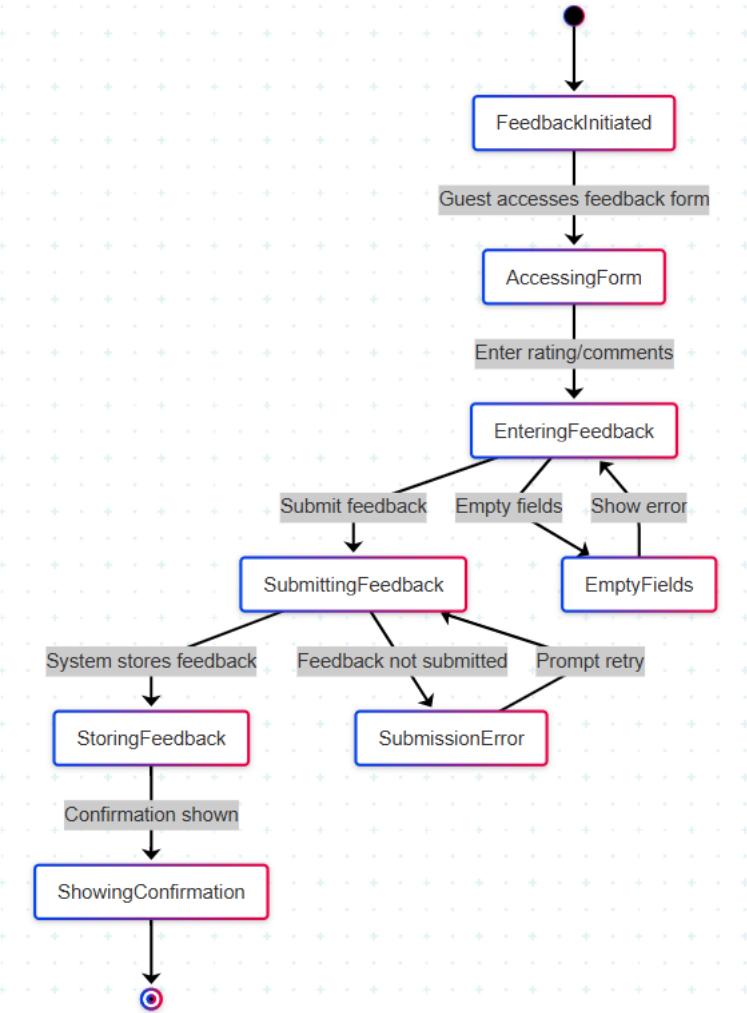
Hotel Management System

Scheduling Maintenance



Hotel Management System

Feedback

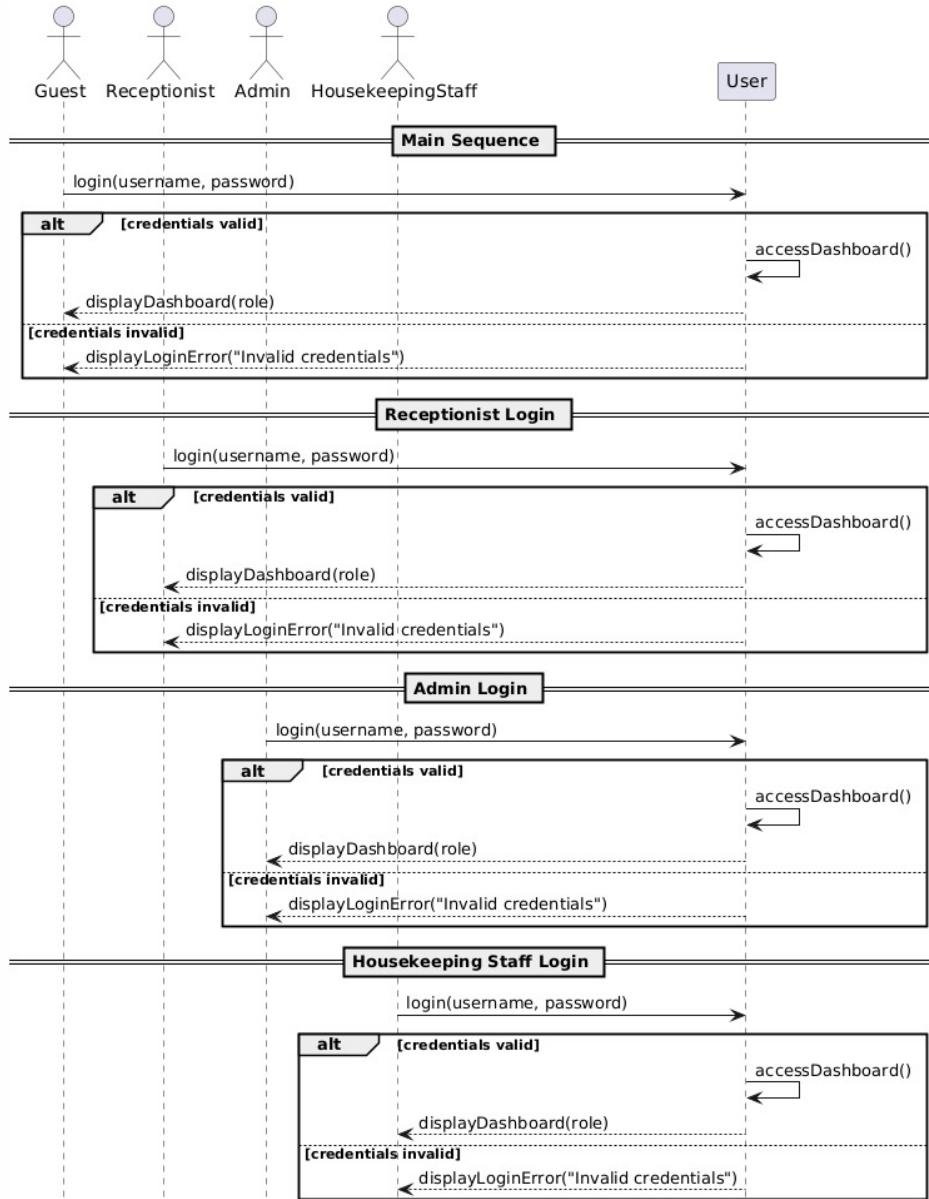


Hotel Management System

5.5 Sequence Diagrams

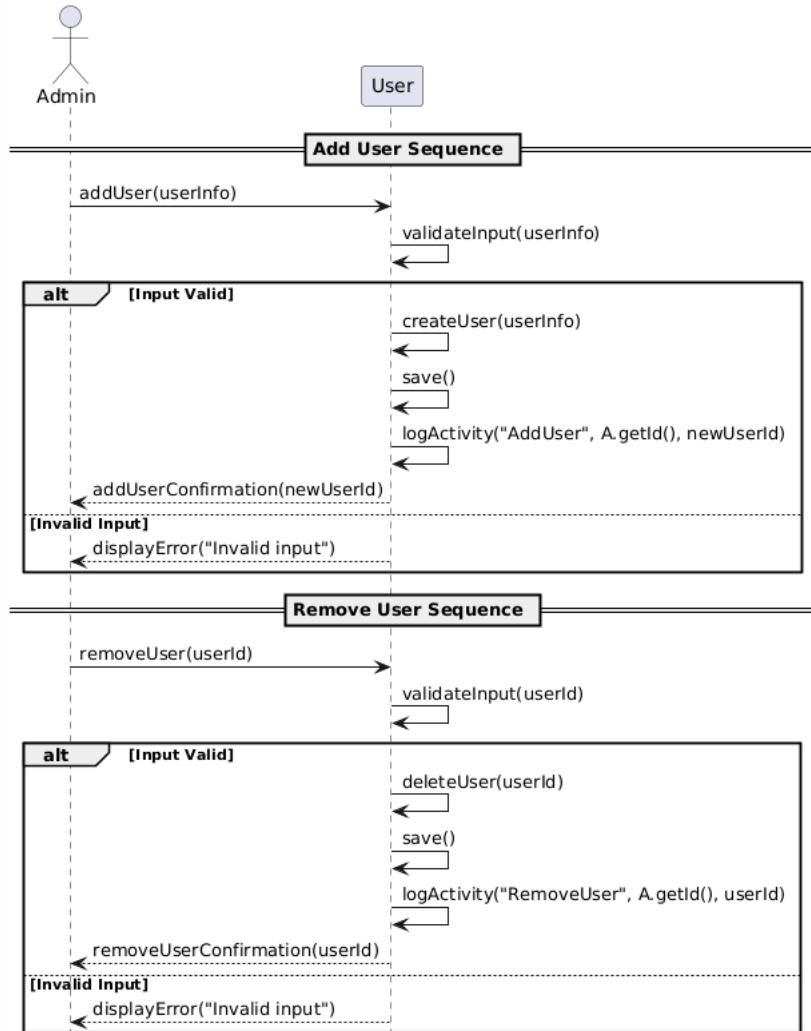
Arsildo Veliu

UC 01: Login Constraint & Role-based view



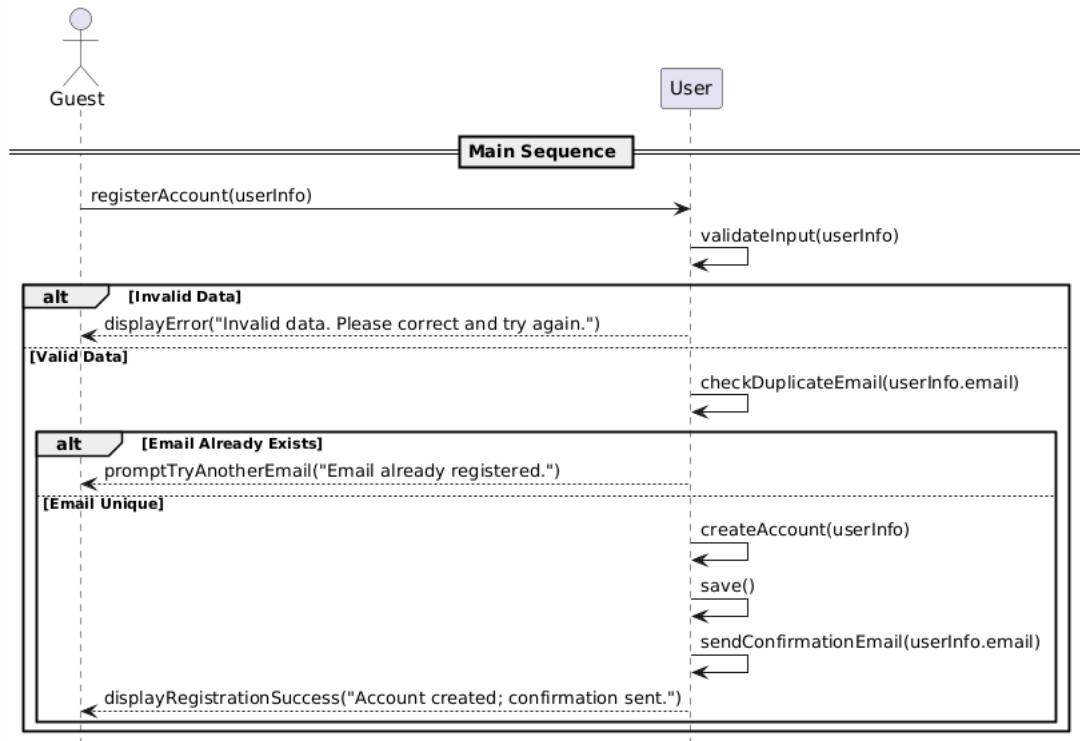
Hotel Management System

UC 02: Add Remove/Users



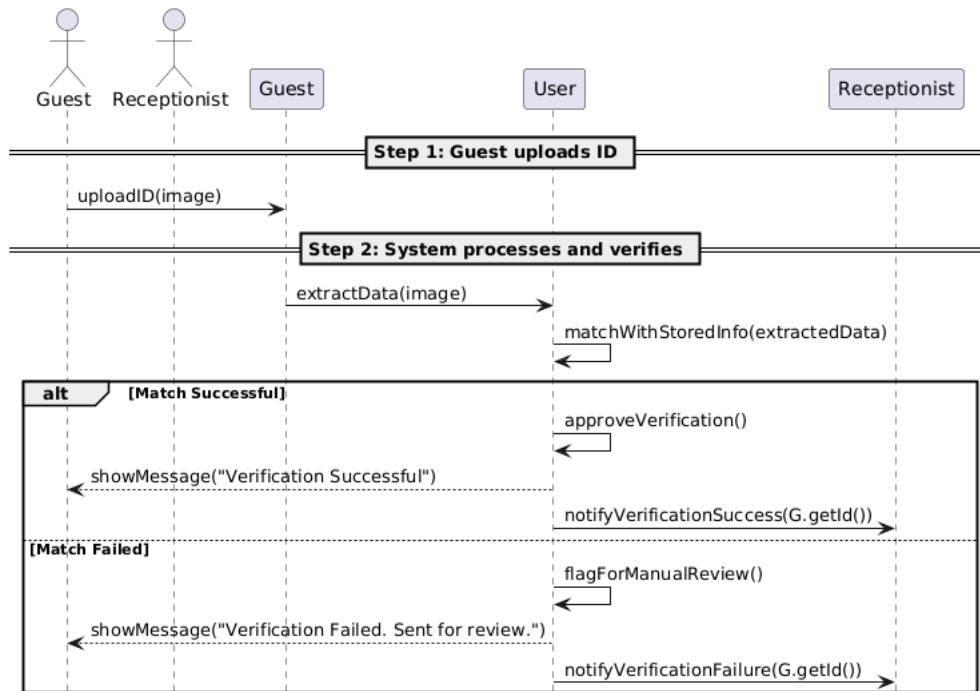
Hotel Management System

UC 03: User Account Creation



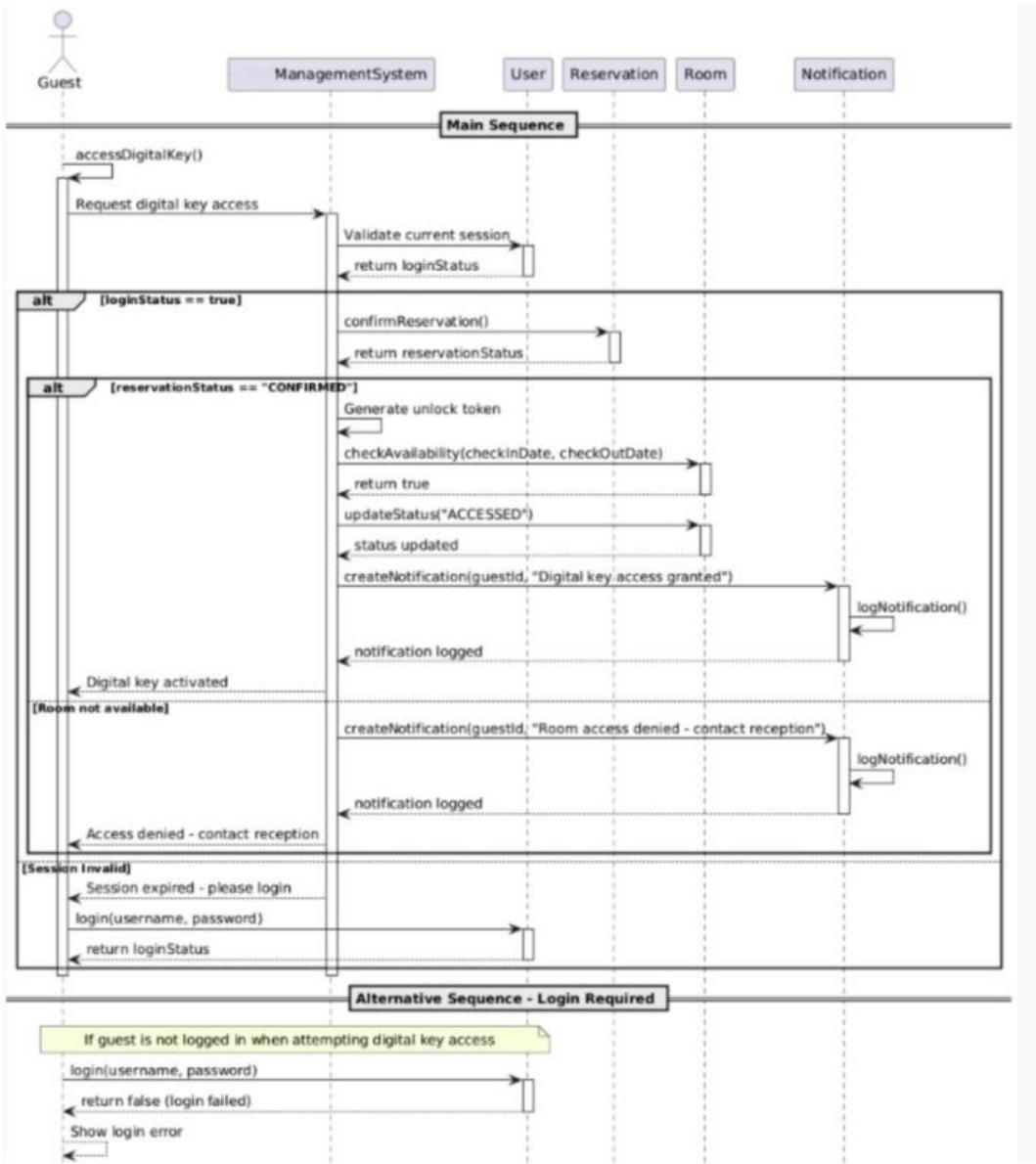
Hotel Management System

UC4: Secure Guest Notification



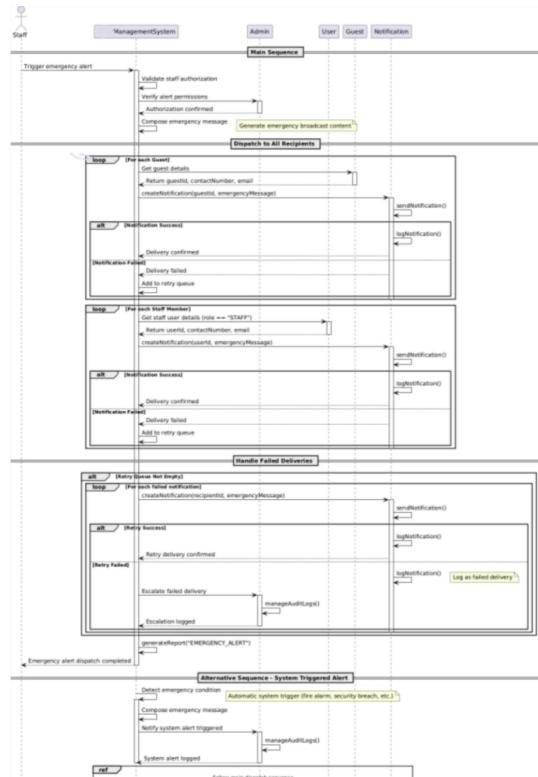
Hotel Management System

UC5: Digital Key Access

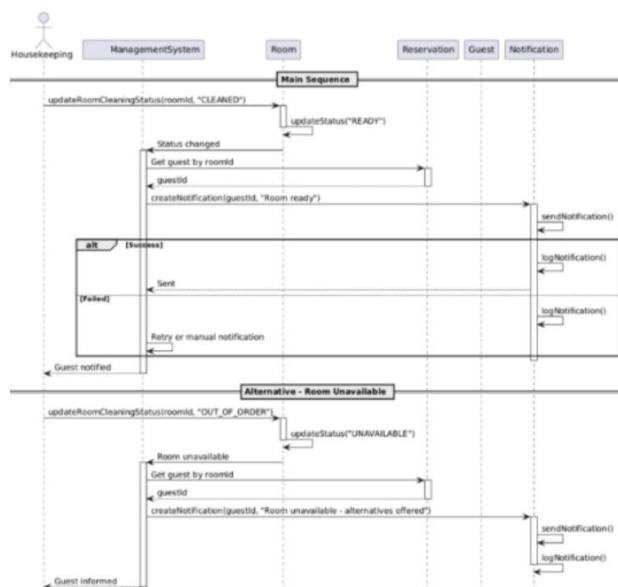


Hotel Management System

UC6: Emergency Alert



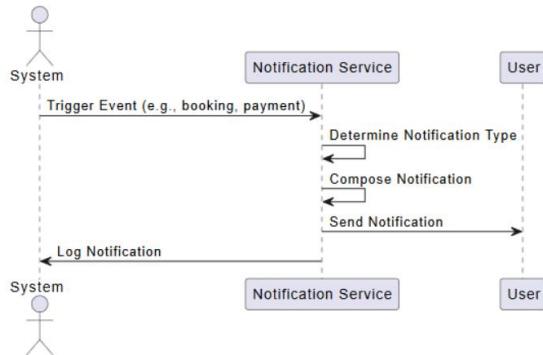
UC7: Notify Guest on Room Status



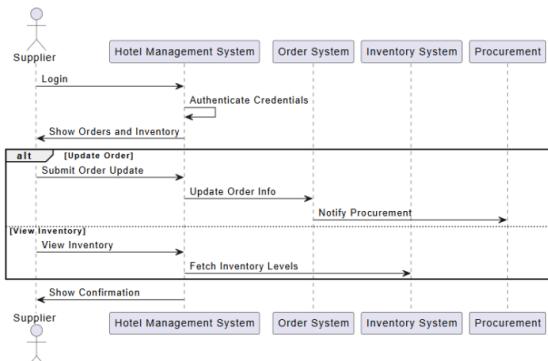
Hotel Management System

Artemisa Hasalami

UC8: Notification Handling

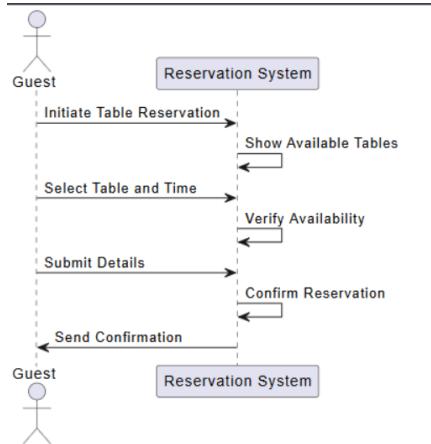


UC9 :Managing Suppliers

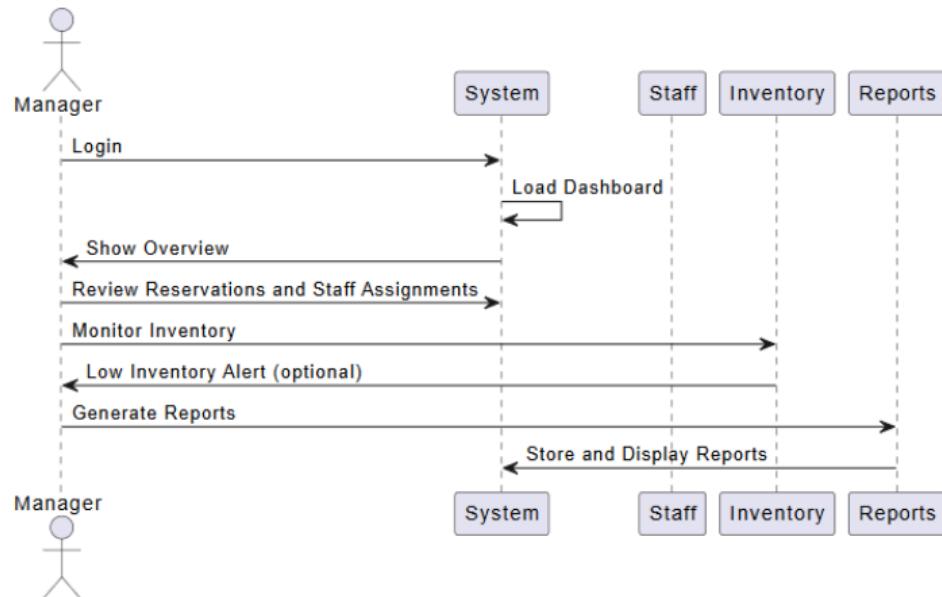


UC10: Table Reservation

Hotel Management System

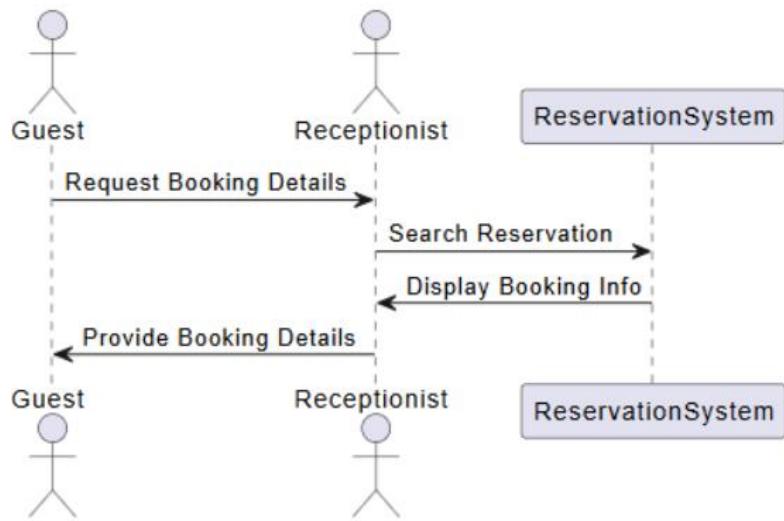


UC11 :Restaurant and Coffee Bar Management

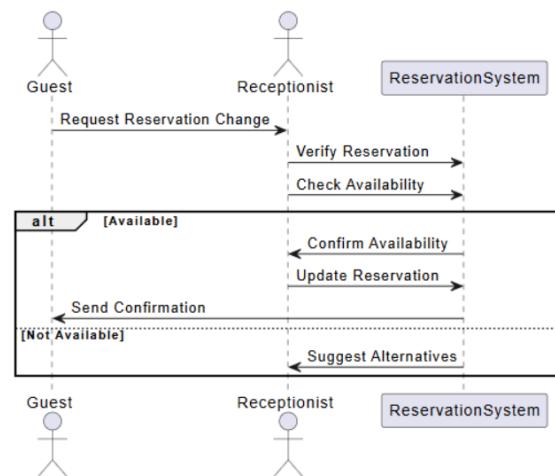


UC12: View Booked Rooms

Hotel Management System

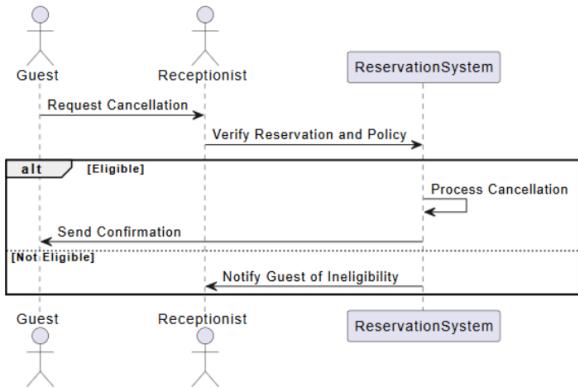


UC13: Reservation Modification

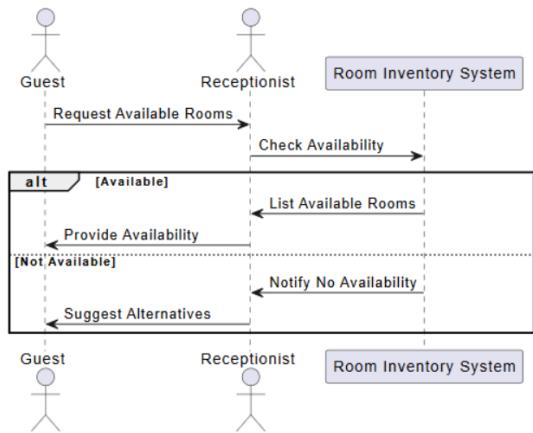


UC14 Cancellation Request:

Hotel Management System



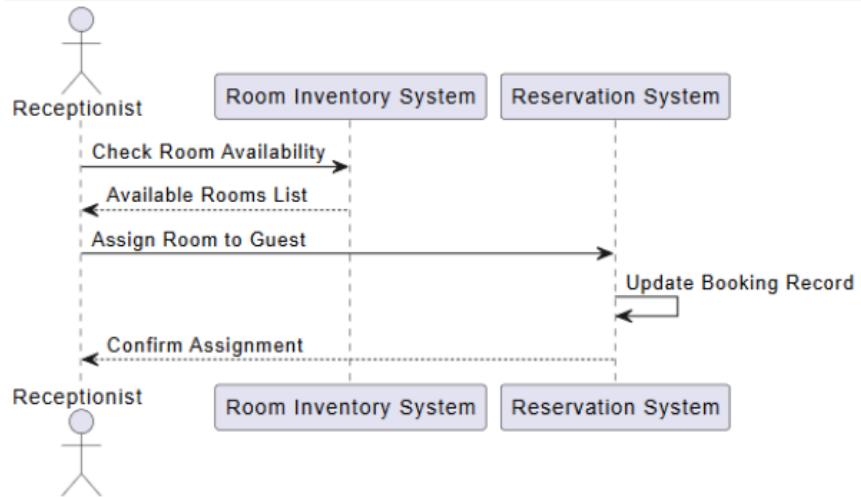
UC15 Room Availability:



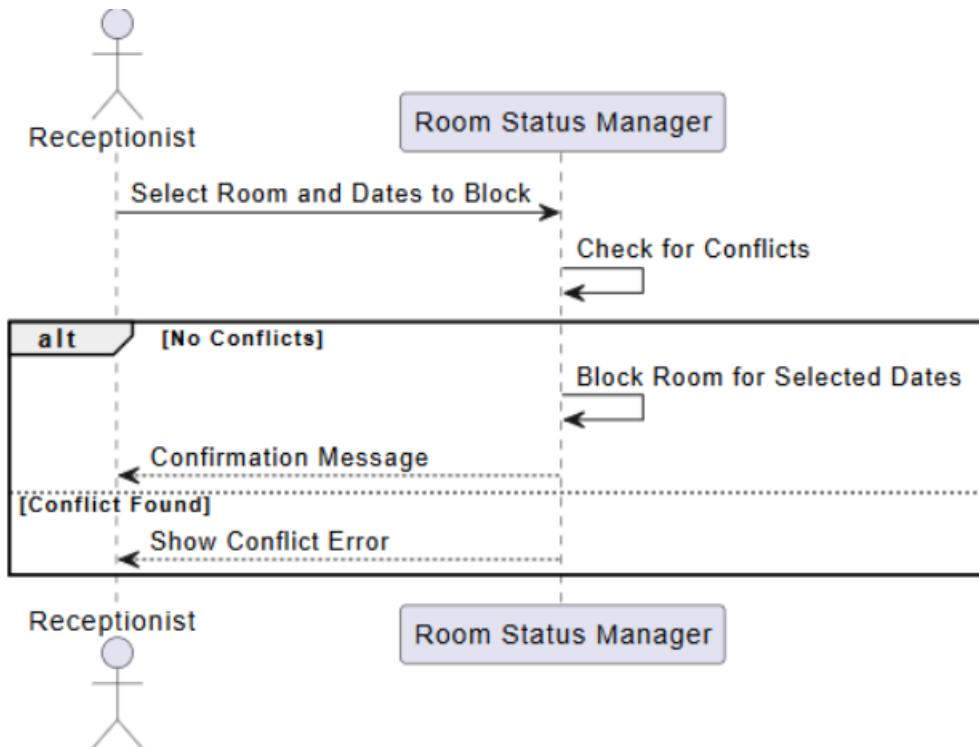
Brikena Papadhopuli

Hotel Management System

UC16: Assignment of room

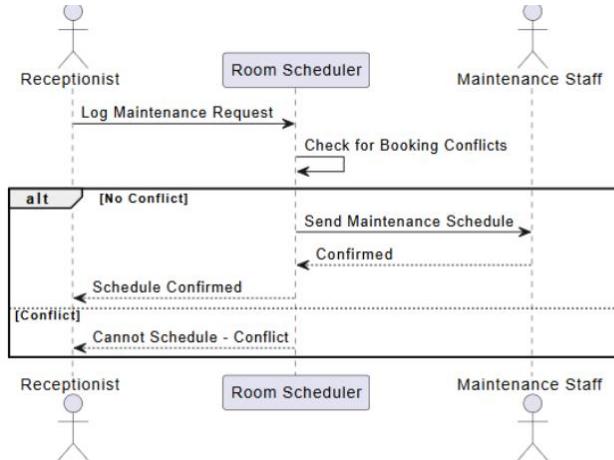


UC17: Book Dates for Specific Rooms

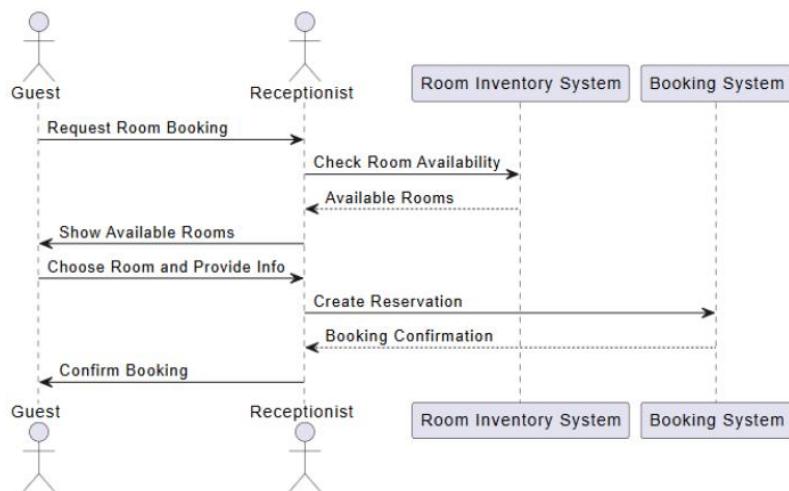


Hotel Management System

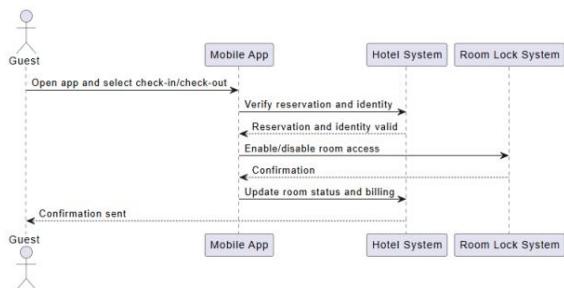
UC18 :Schedule Maintenance



UC19: Booking of Room

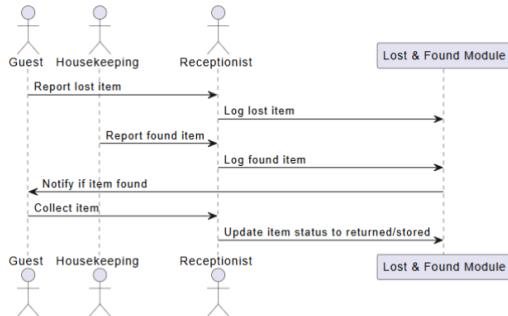


UC20: Mobile Check-in and Check-out

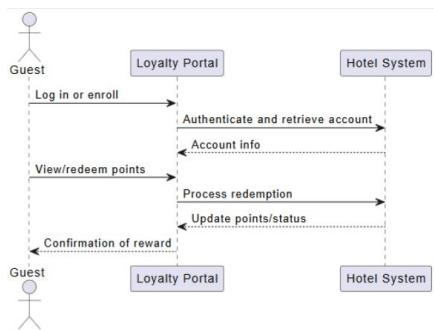


UC21:Lost and Found Management

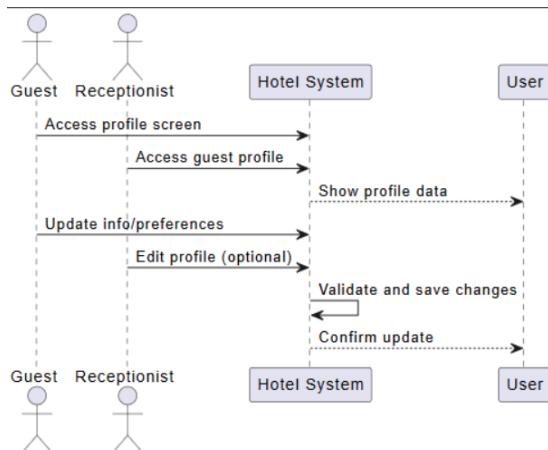
Hotel Management System



UC22 :Loyalty Program Management



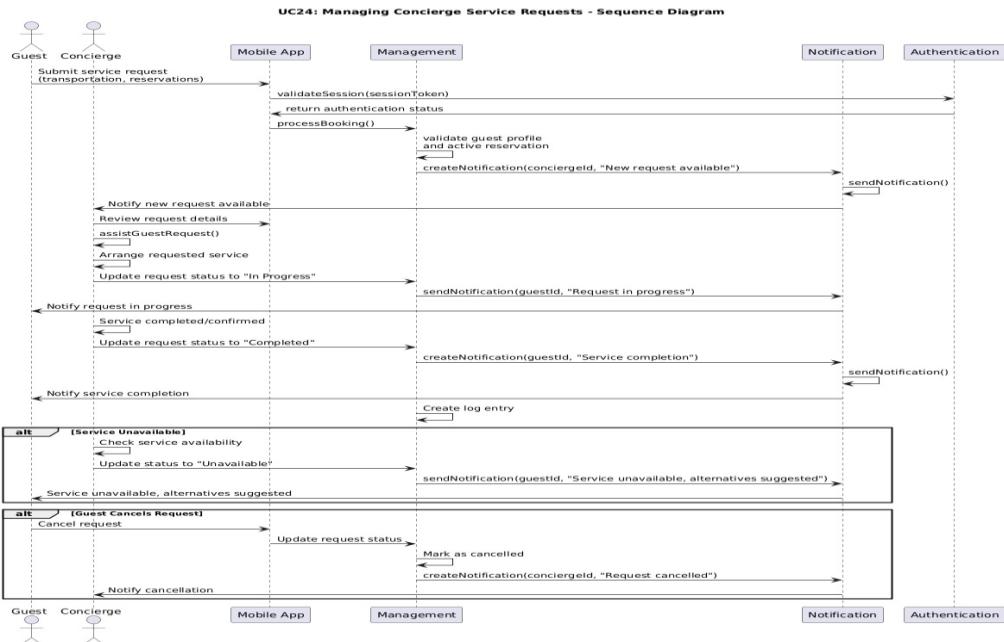
UC23 Guest Profile Management:



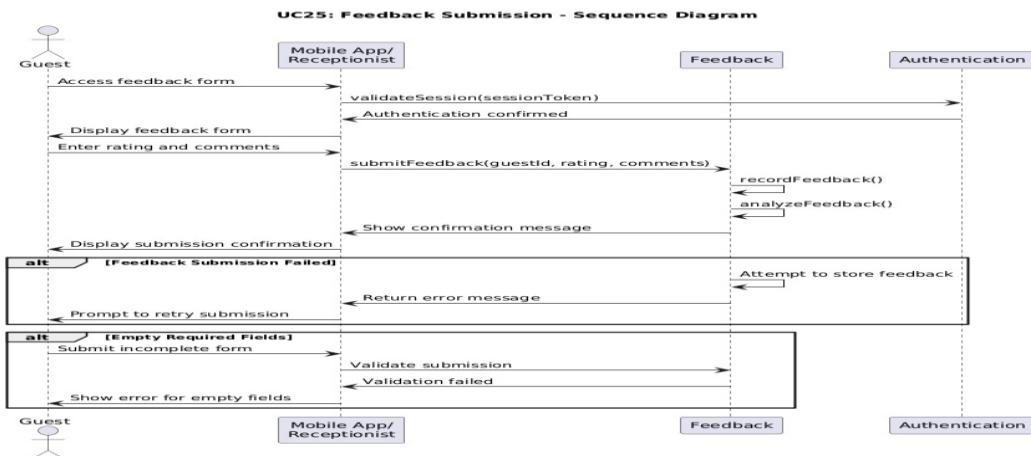
Erta Llenga

Hotel Management System

UC24 : Managing Concierge Service Request

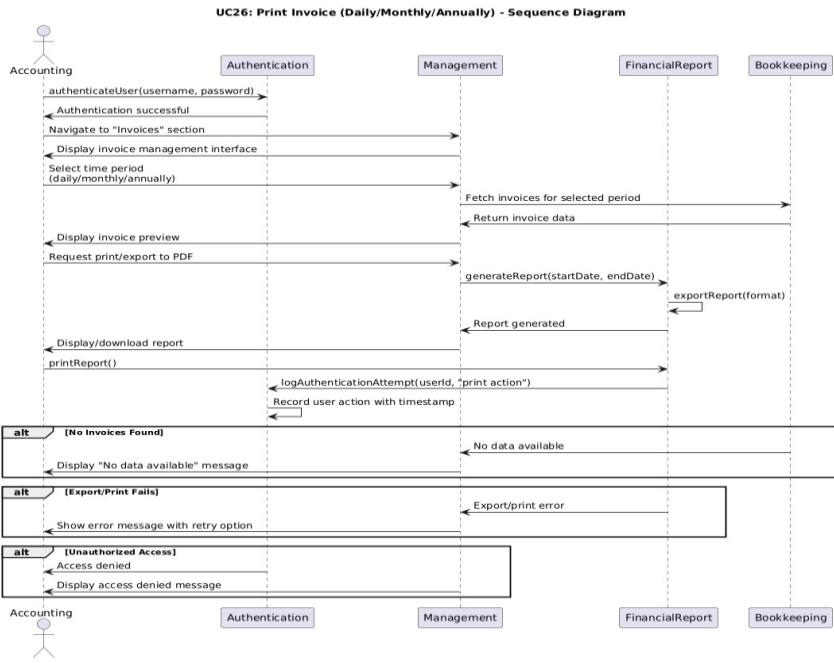


UC25 : Feedback Submission

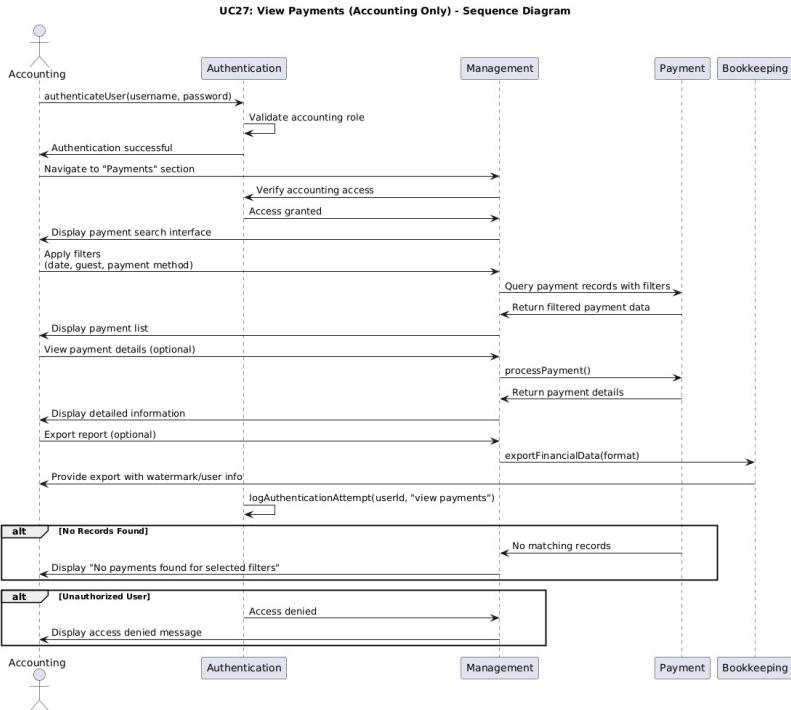


UC26: Print Invoice

Hotel Management System

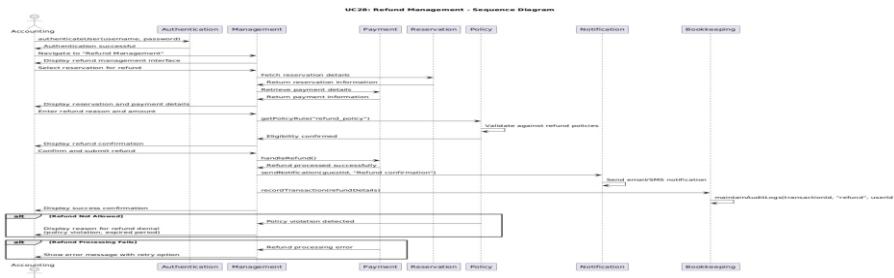


UC27 View Payment:

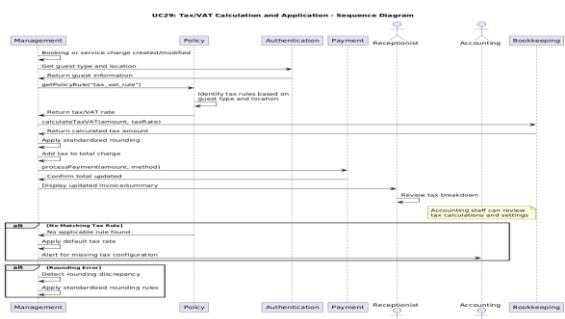


Hotel Management System

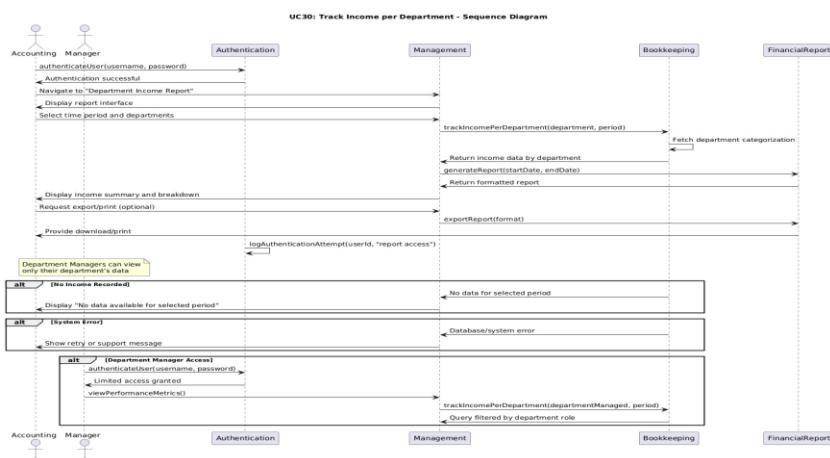
UC28 Refund Management:



UC29 TAX/VAT Calculation:

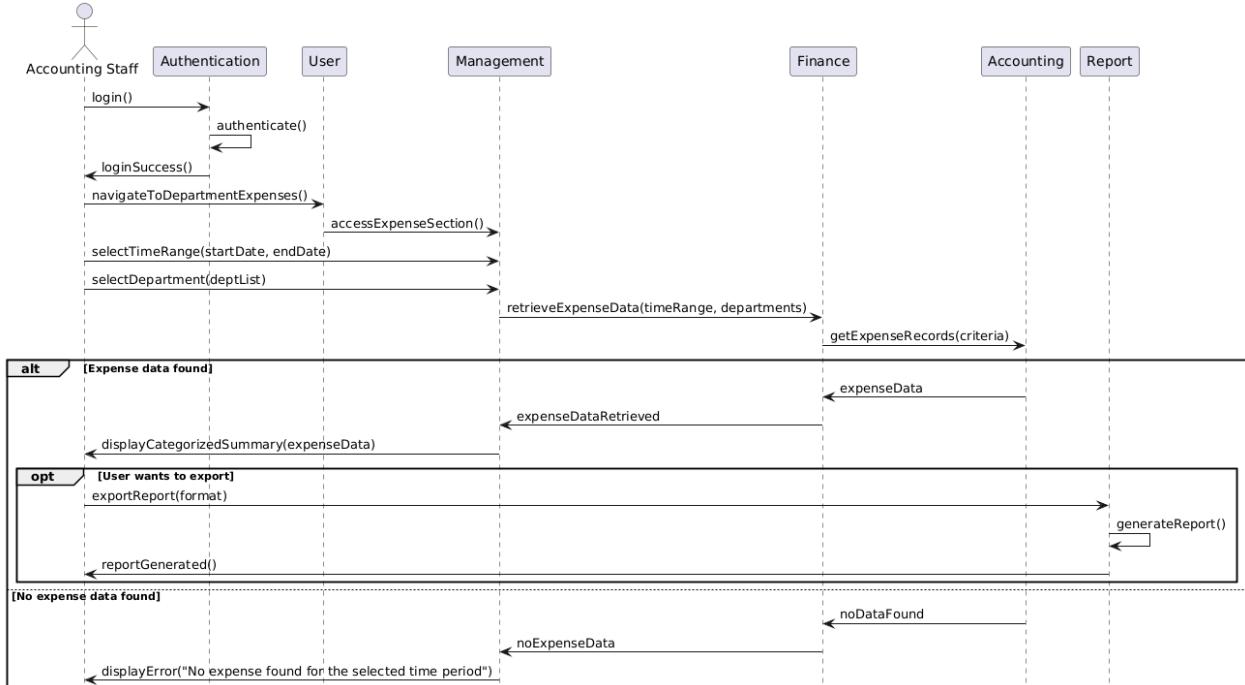


UC30 Track Income per Department:

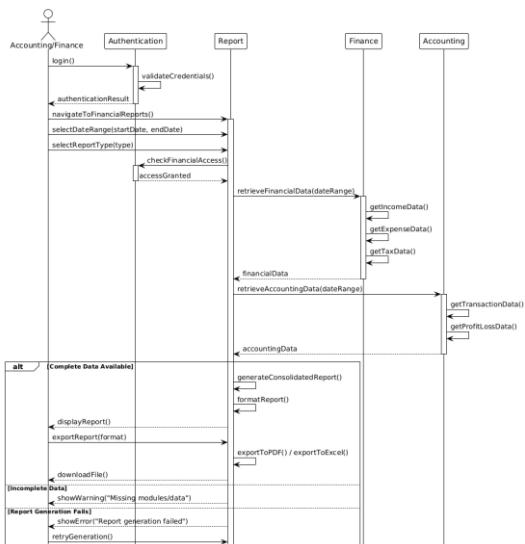


Hotel Management System

UC 31: Track Expenses

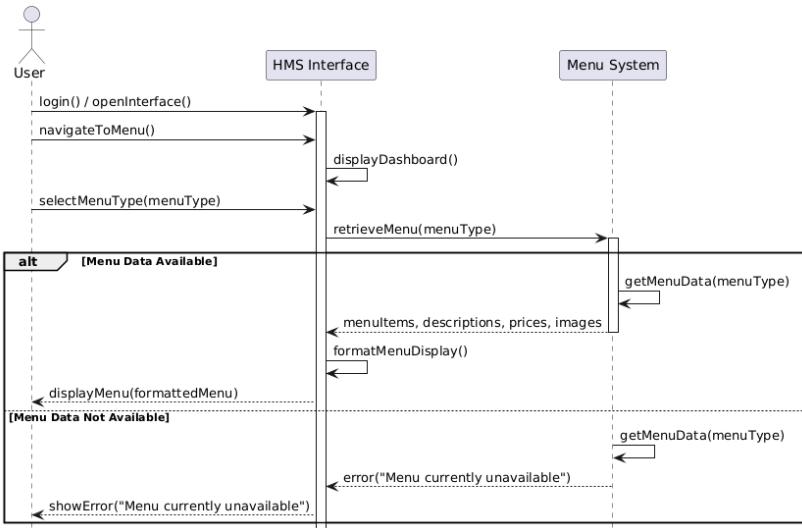


UC 32: Generate Consolidated Financial Reports

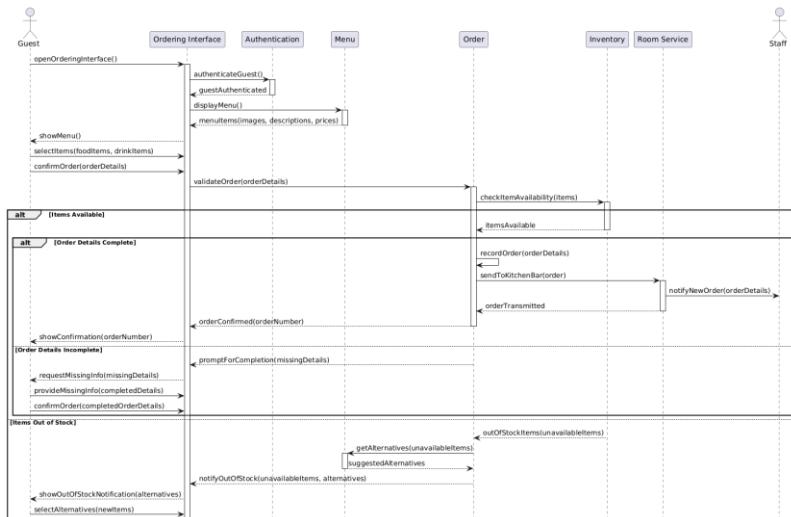


UC 33: View Menu

Hotel Management System

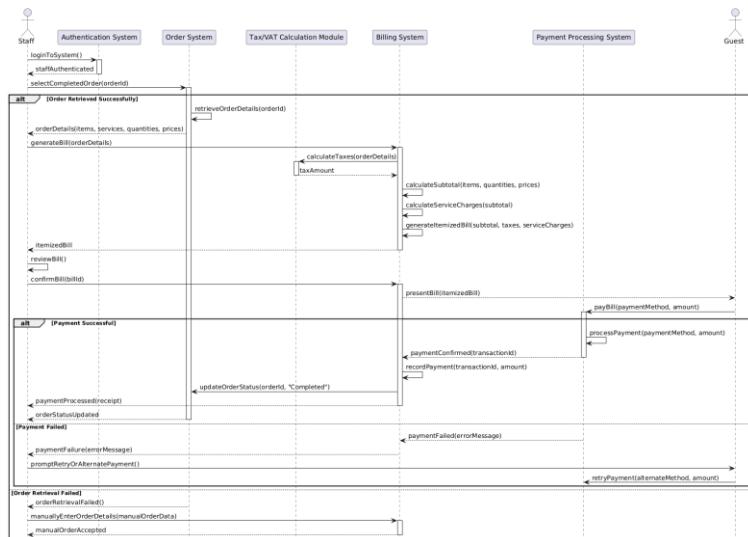


UC 34: Place Food and Drink Order from Hotel Room

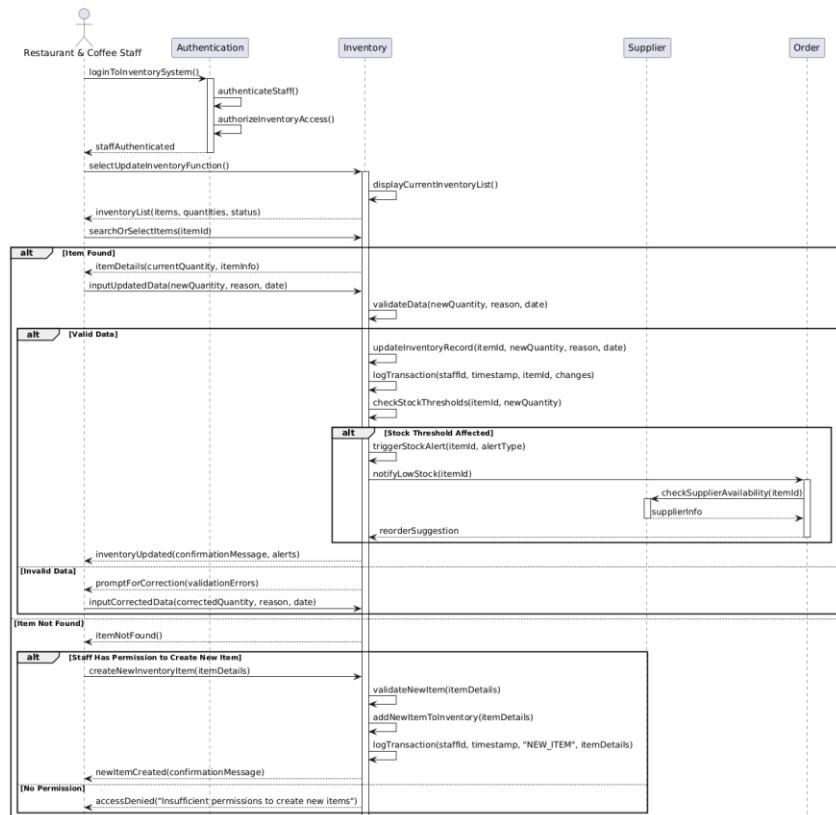


UC 35: Generate and Process Order Bills

Hotel Management System

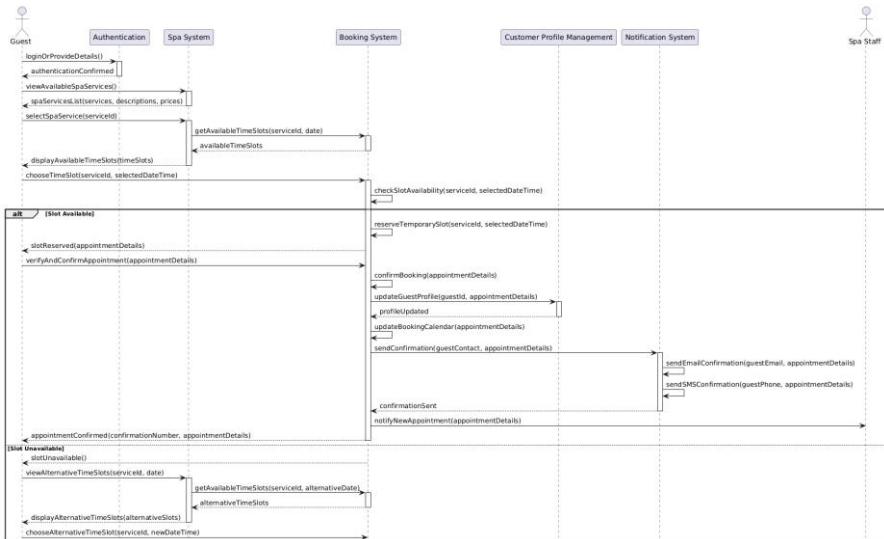


UC 36: Update Food/Beverage Inventory

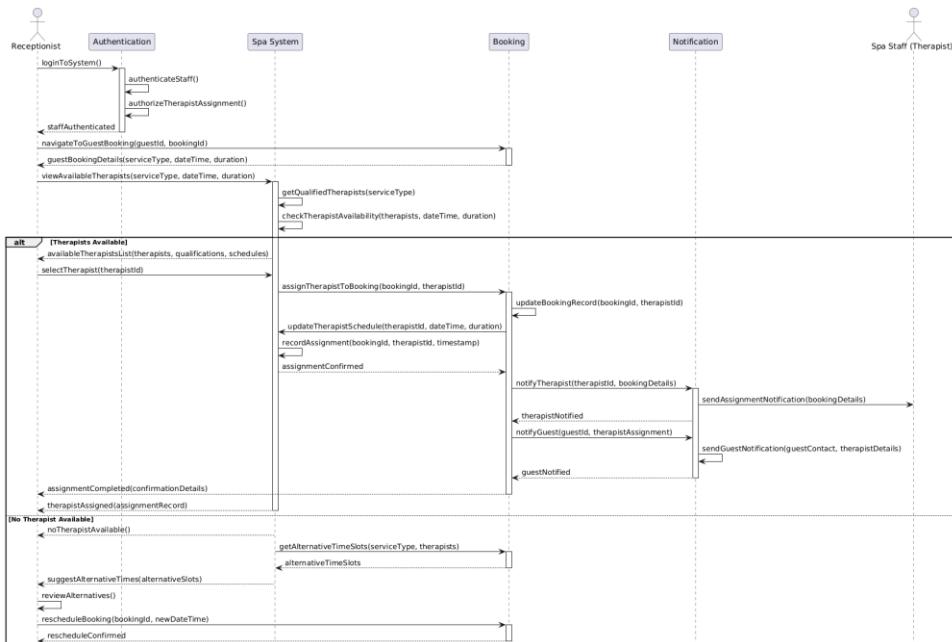


Hotel Management System

UC 37: Book Spa Appointments



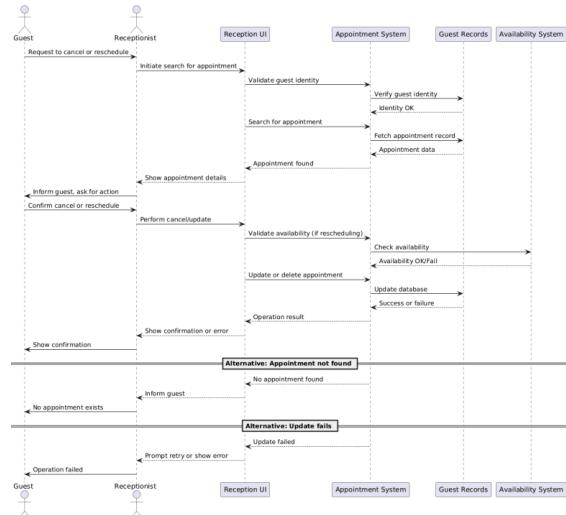
UC 38: Assign Therapist to Guest



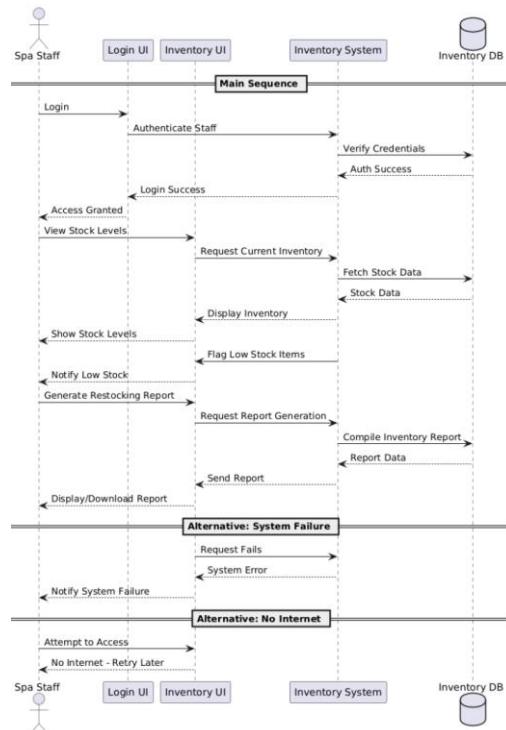
Hotel Management System

Ester Pashtranjaku

UC39:Cancel or Reschedule Appointment

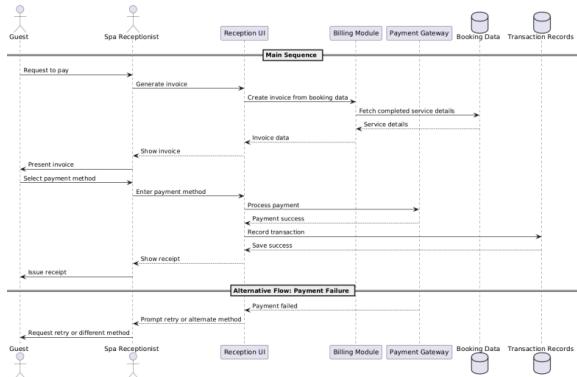


UC40:Track Spa Inventory

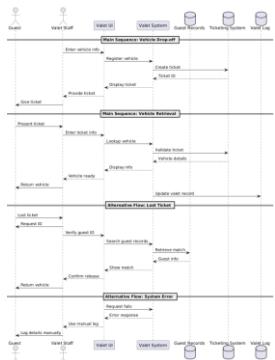


Hotel Management System

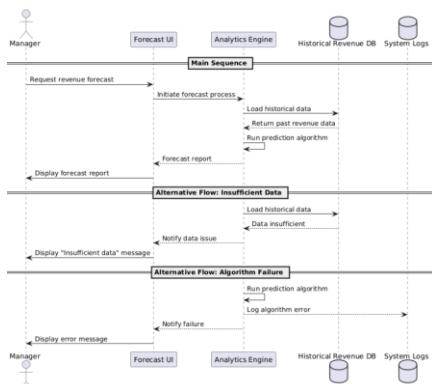
UC41:Process Spa Payments



UC42:Valet Handle Vehicle Registration and Retrieval

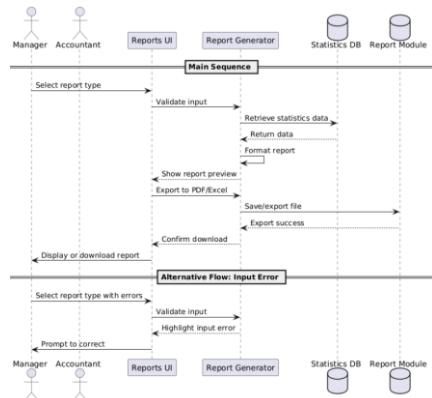


UC43:Forecast Revenue Based on Historical Data

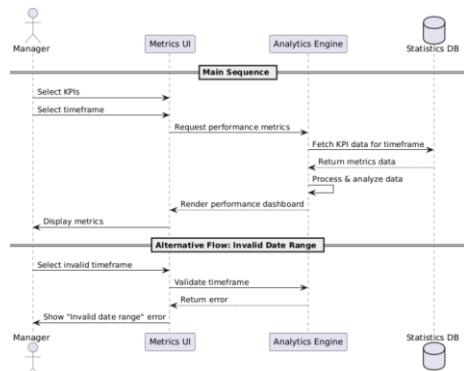


Hotel Management System

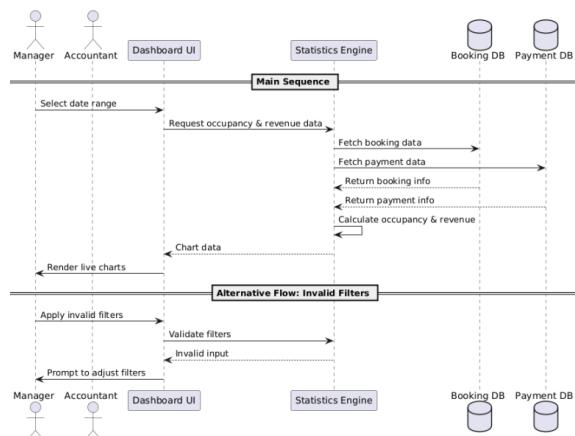
UC44: Reporting



UC45: Performance Metrics



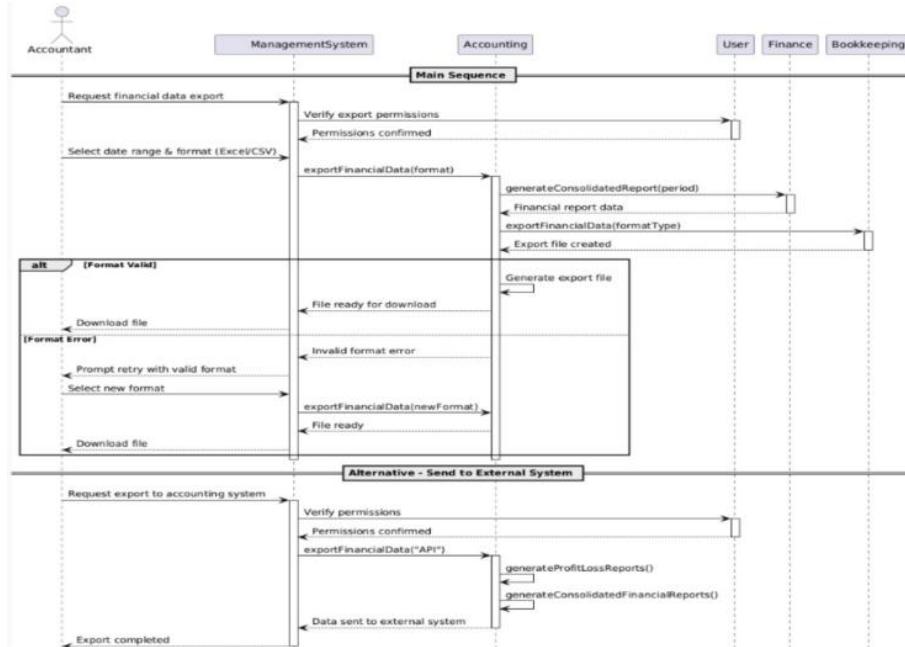
UC46: Monitor Occupancy and Revenue



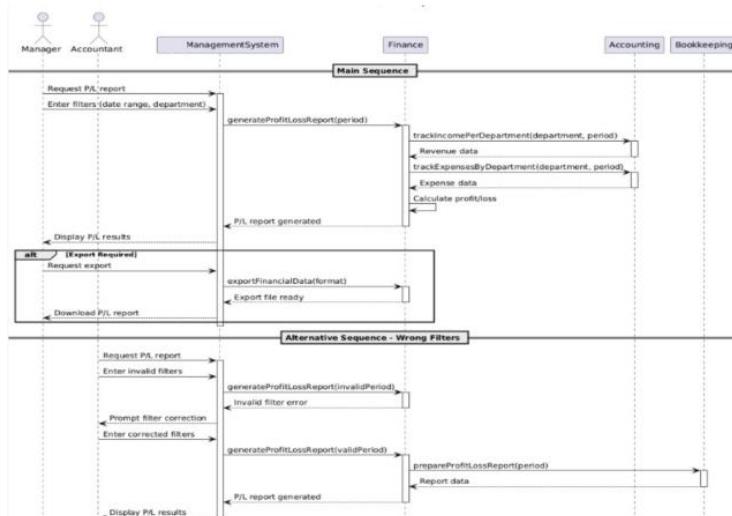
Hotel Management System

Megi Almadhi

UC 47: Export Financial Data to CSV/Excel or Accounting Tools

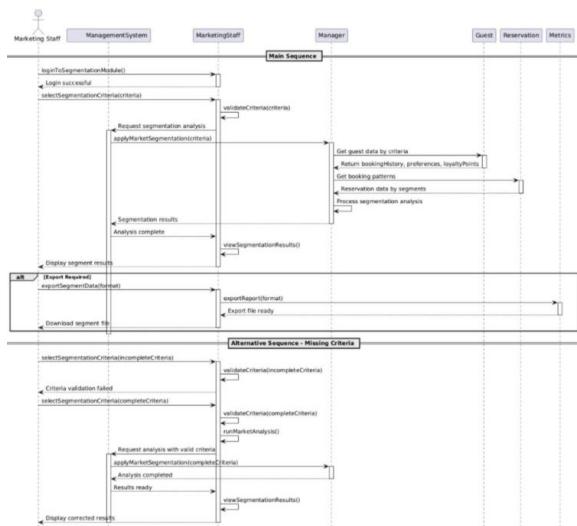


UC48: Generate Profit/Loss Reports

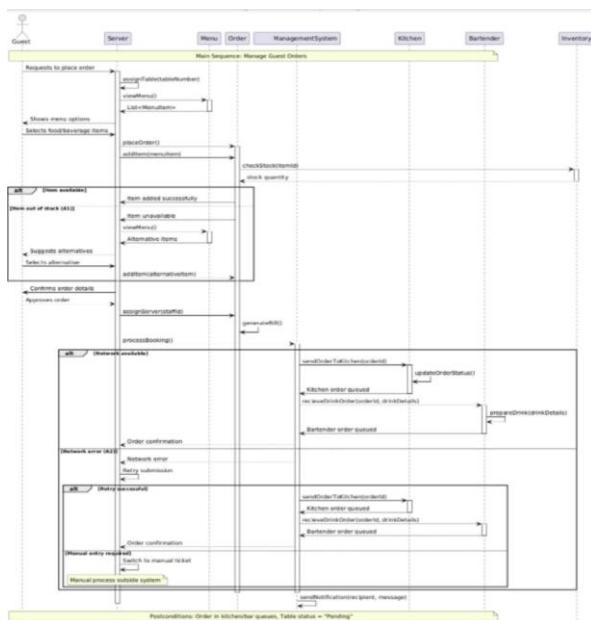


UC49: Market Segmentation

Hotel Management System

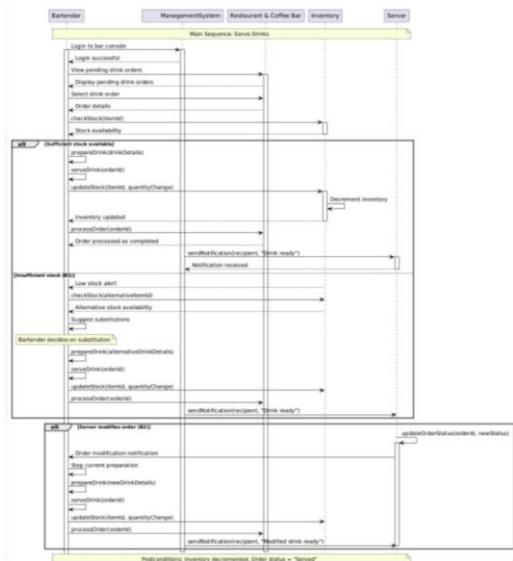


UC50: Manage Guest Orders

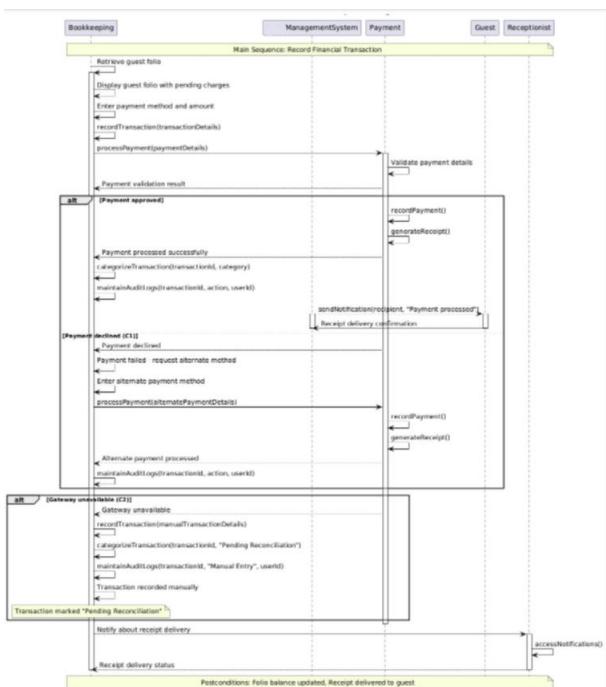


UC51: Serve Drinks

Hotel Management System

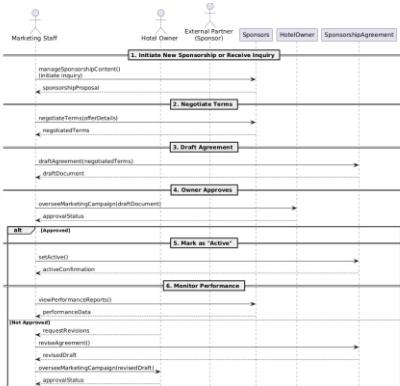


UC52: Record Financial Transaction

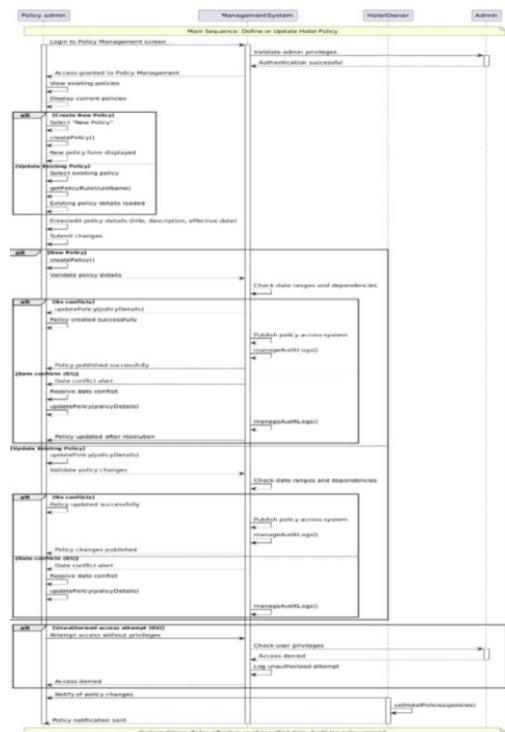


UC53: Manage Sponsorship Agreements

Hotel Management System

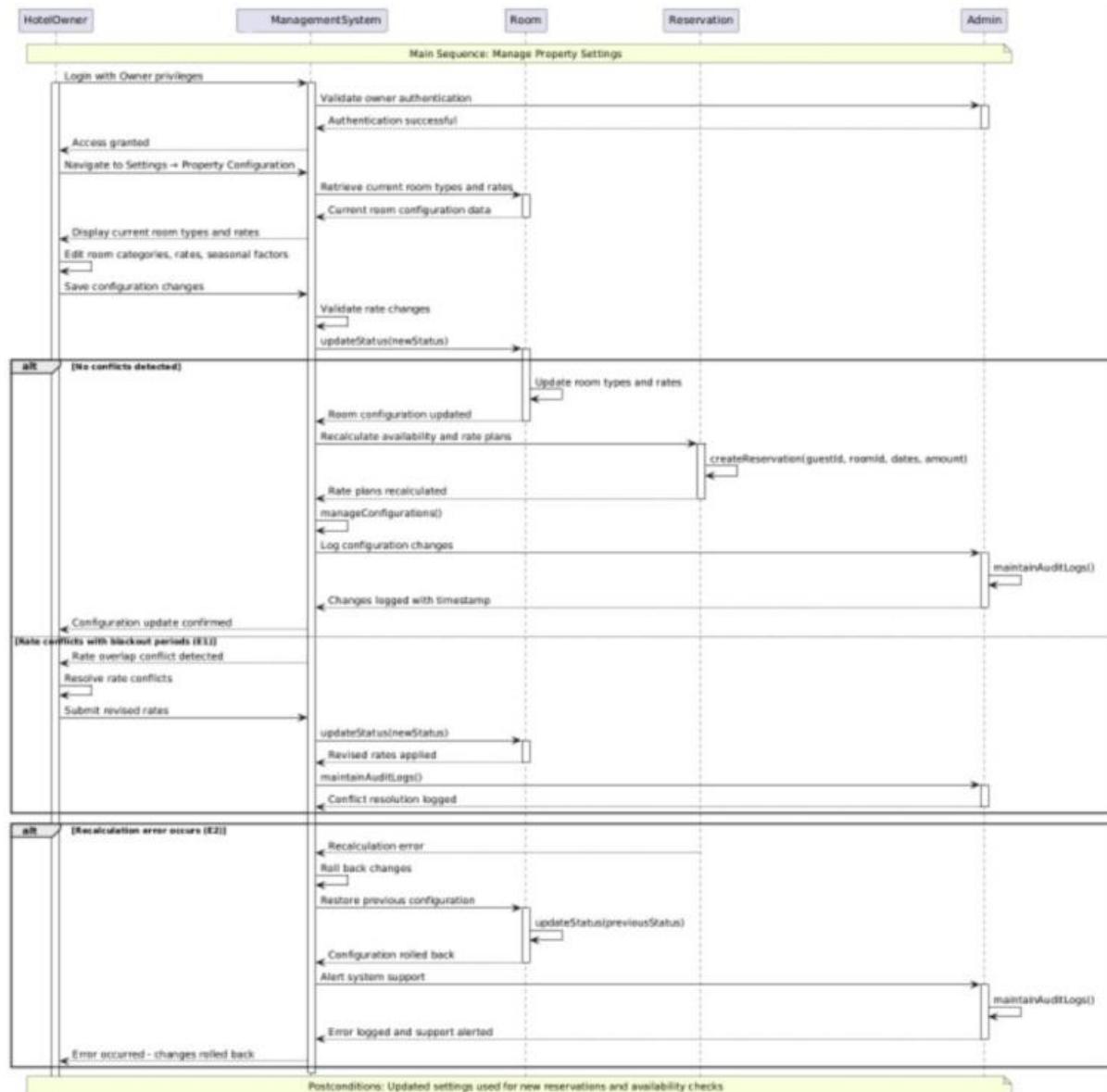


UC54: Define or Update Hotel Policy



UC55:Manage Property Setting

Hotel Management System

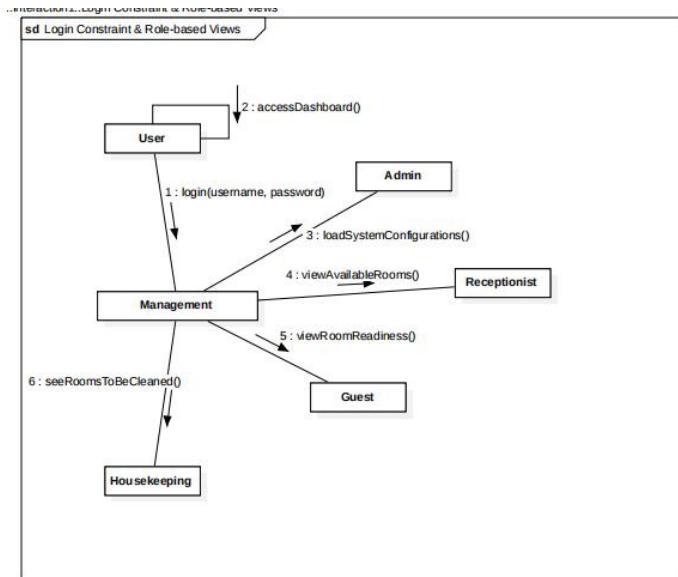


5.6 Collaboration Diagrams

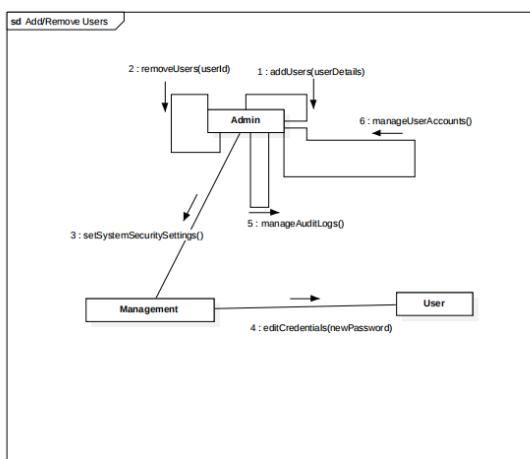
Arsildo Velju

UC 01 : Login Constraint & Role-based Views

Hotel Management System

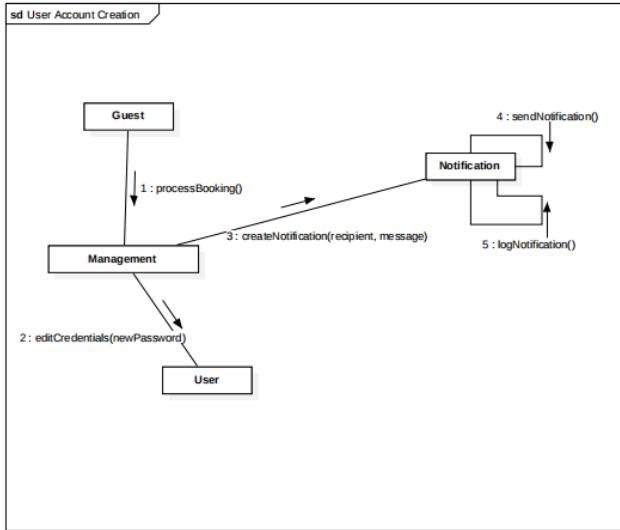


UC 02: Add/Remove Users

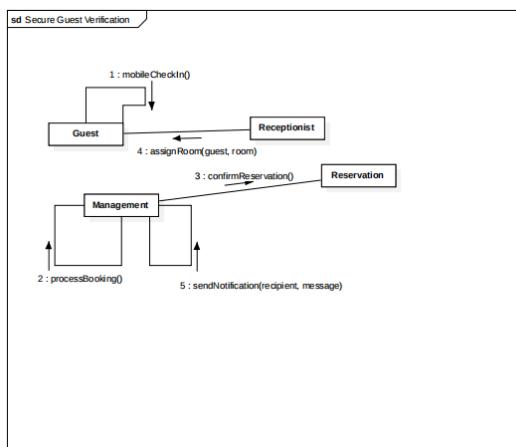


UC 03: User Account Creation

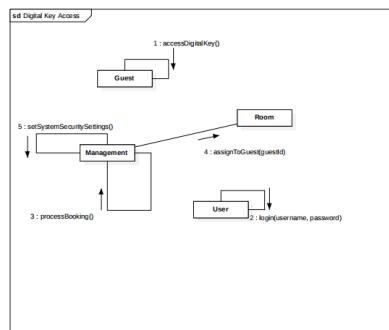
Hotel Management System



UC 04: Secure Guest Notification

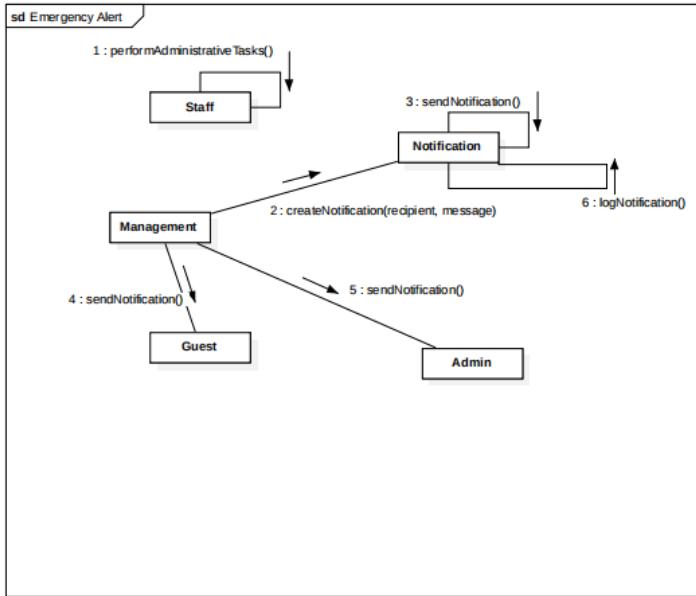


UC 05: Digital Key Access

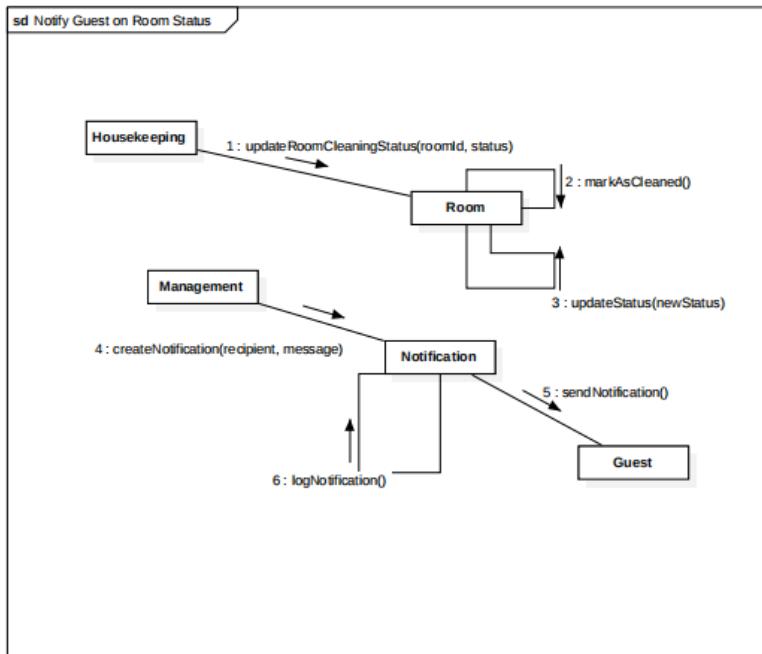


UC 06: Emergency Alert

Hotel Management System



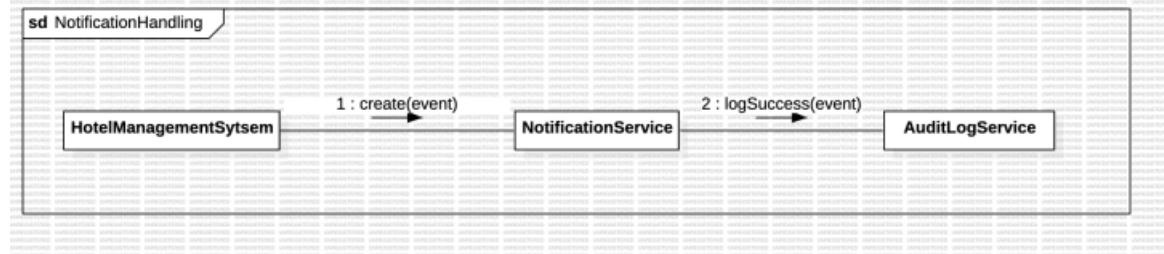
UC 07: Notify Guest On Room Status



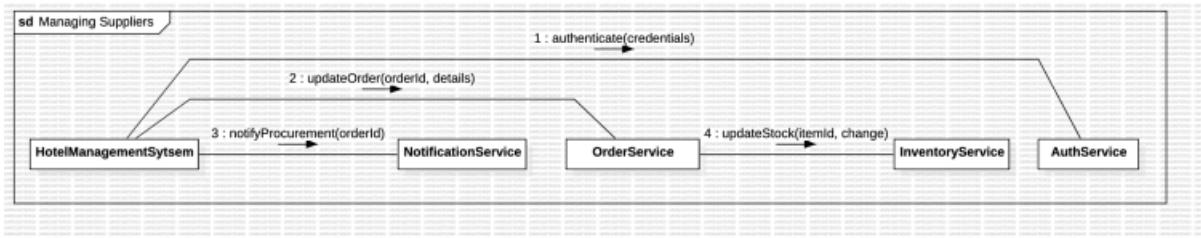
Artemisa Hasalami

Hotel Management System

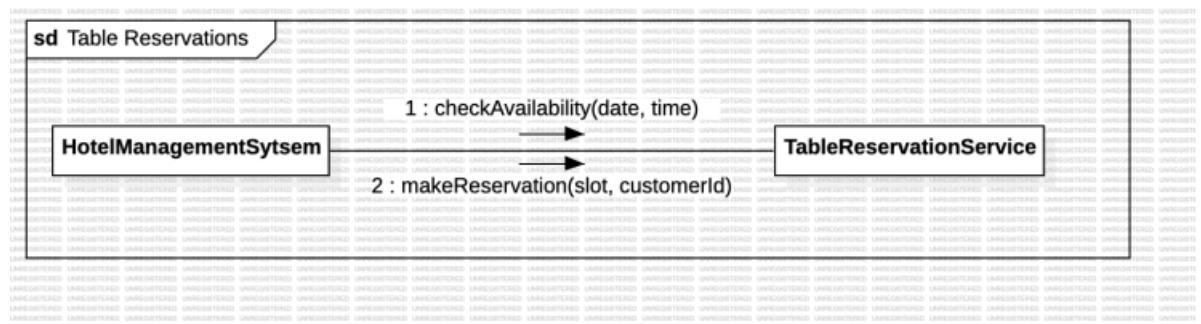
UC 08: Notification Handling



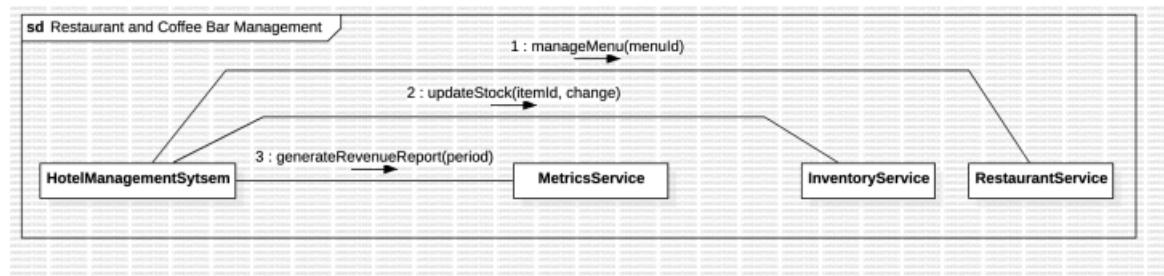
UC 09: Managing Suppliers



UC 10: Table Reservation

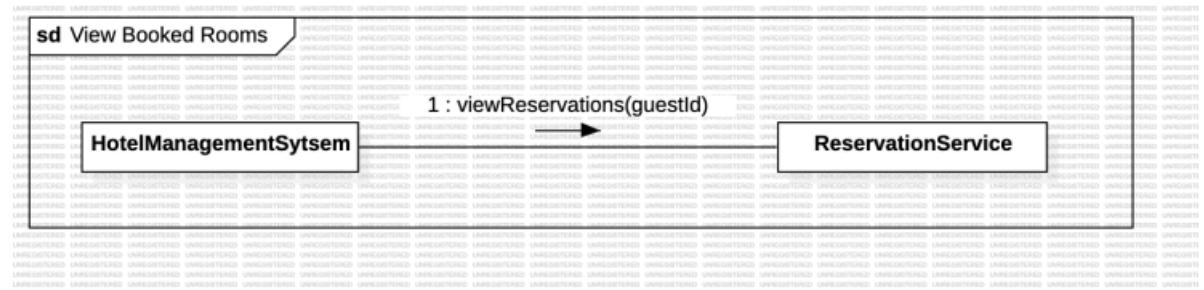


UC11: Restaurant and Coffee Bar Management



UC 12: View Booked Rooms

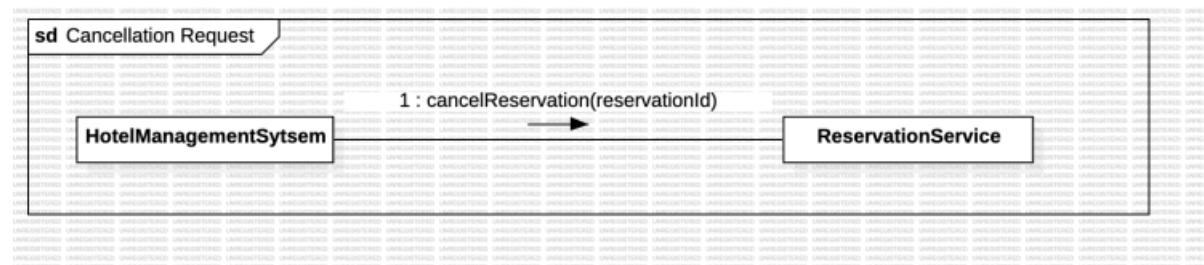
Hotel Management System



UC 13: Reservation Modification



UC 14: Cancellation Request



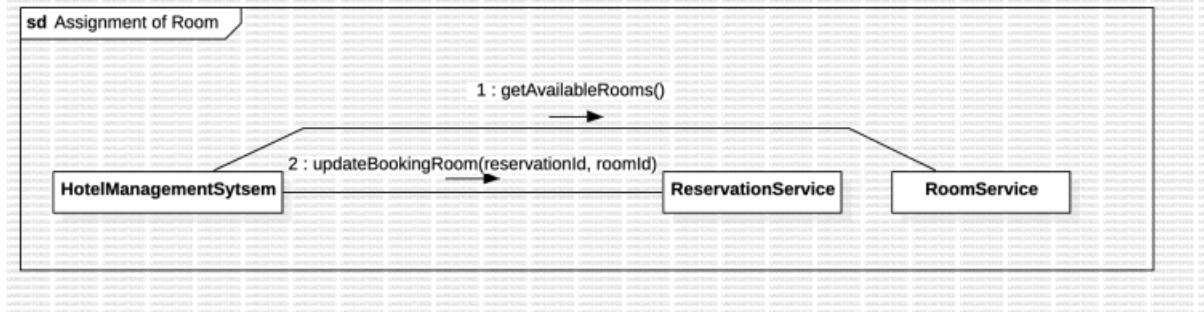
UC 15: Room Availability



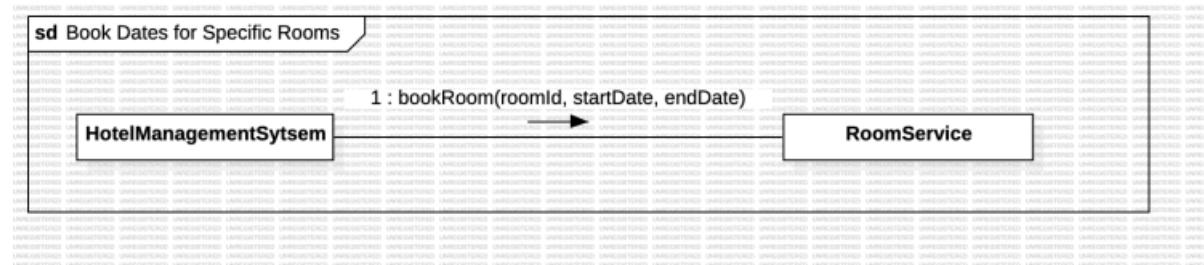
Brikena Papadhopuli

Hotel Management System

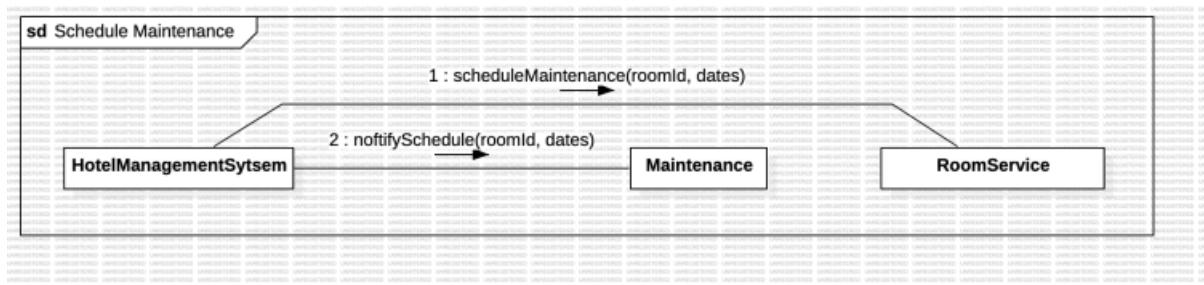
UC 16: Assignment of Room



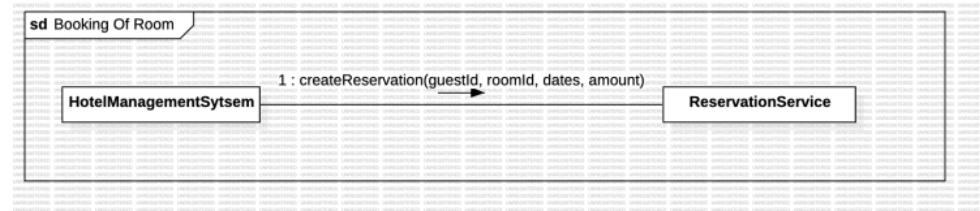
UC 17: Book Dates for Specific Rooms



UC18: Schedule Maintenance

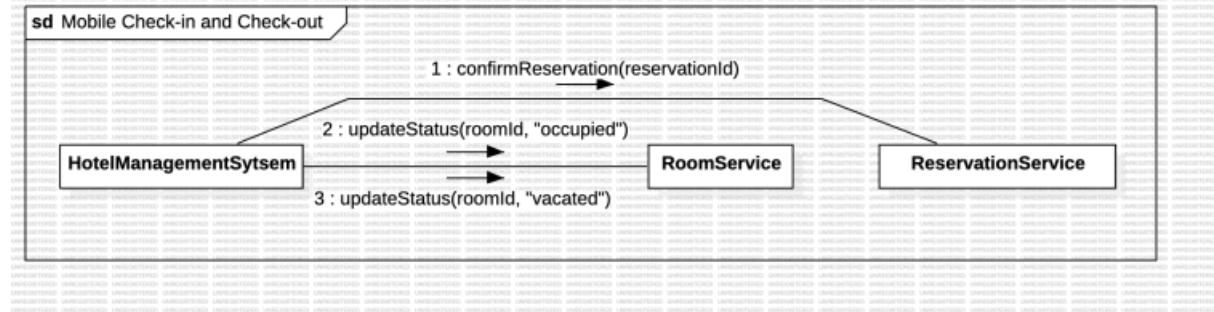


UC 19: Booking of Room

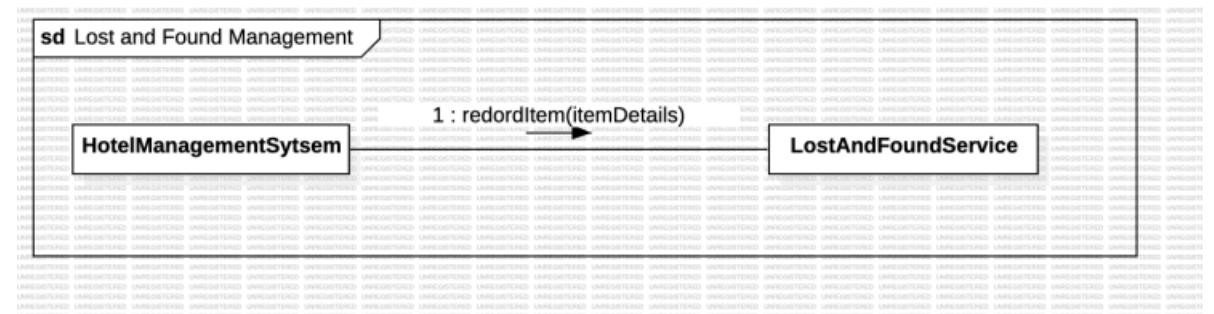


Hotel Management System

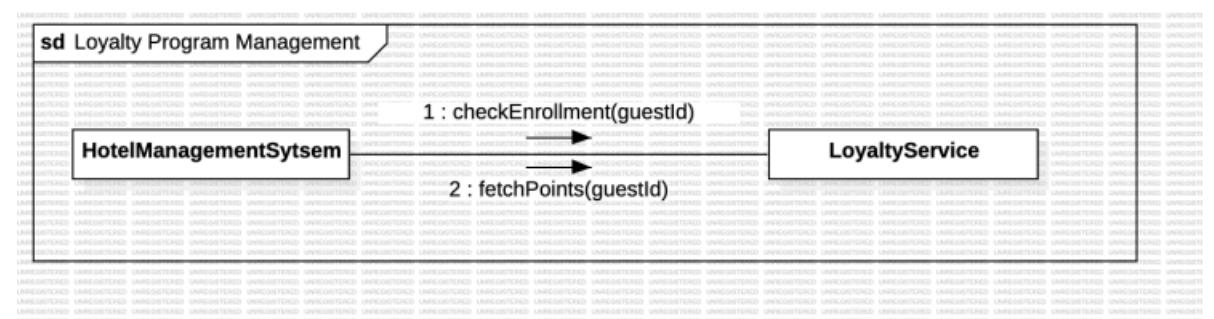
UC 20: Mobile Check-in and Check-out



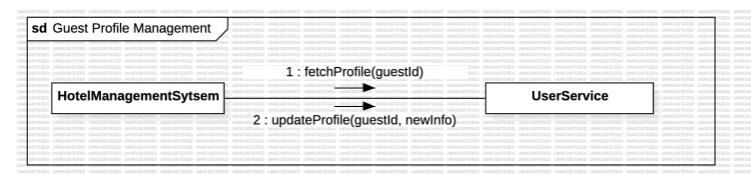
UC 21: Lost and Found Management



UC 22: Loyalty Program Management



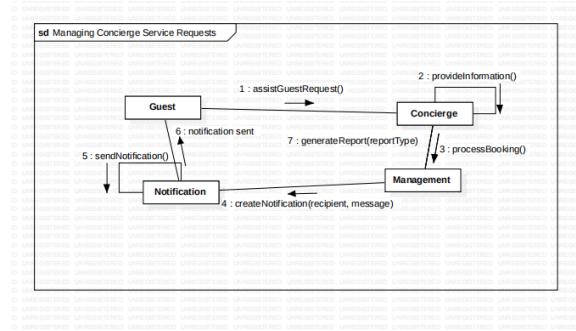
UC 23: Guest Profile Management



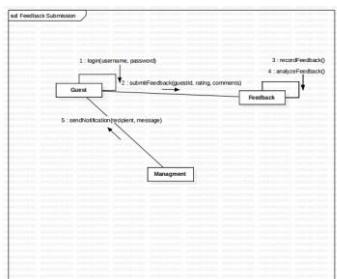
Hotel Management System

Erta LLenga

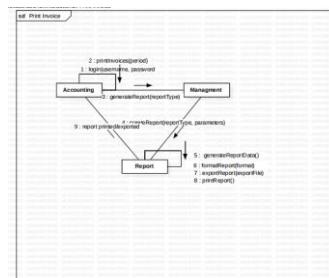
UC 24: Managing Concierge Service Requests



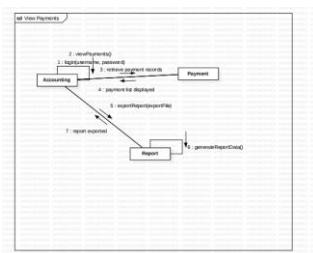
UC 25: Feedback Submission



UC 26: Print Invoice

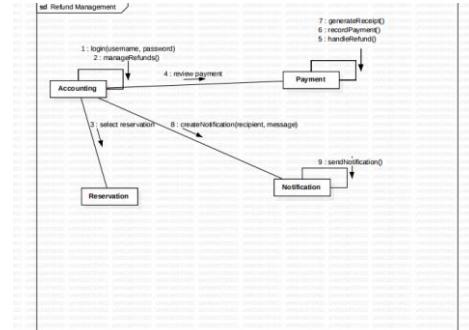


UC 27: View Payments

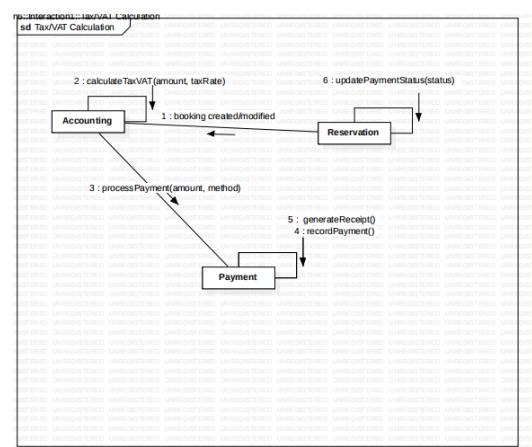


Hotel Management System

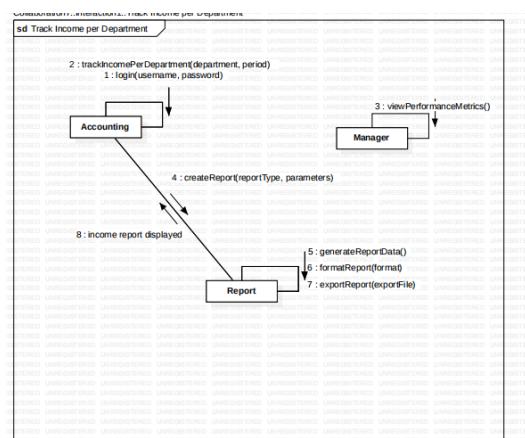
UC 28: Refund Management



UC 29: TAX/VAT calculation



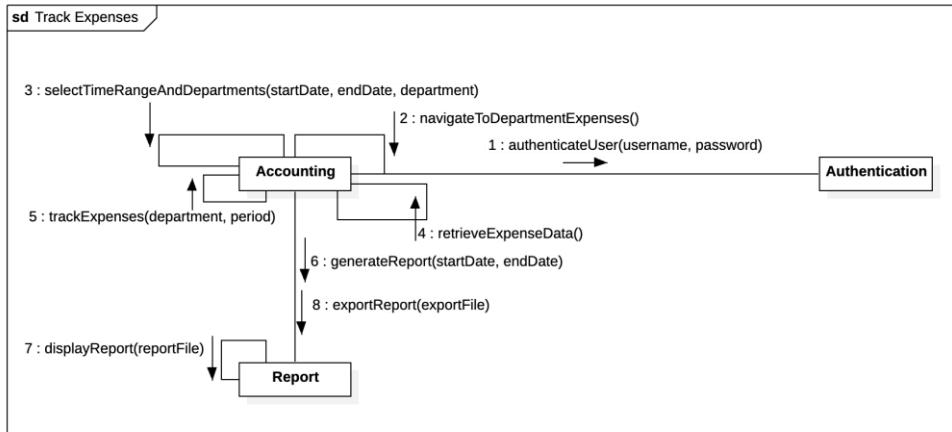
UC 30: Track Income per Department



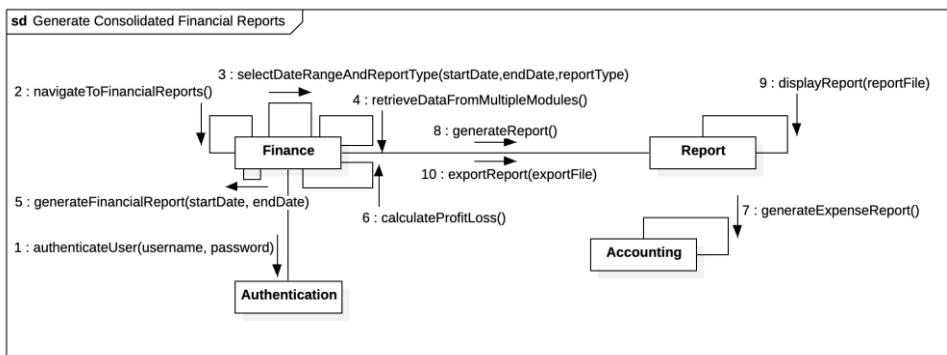
Hotel Management System

Esta Çekrezi

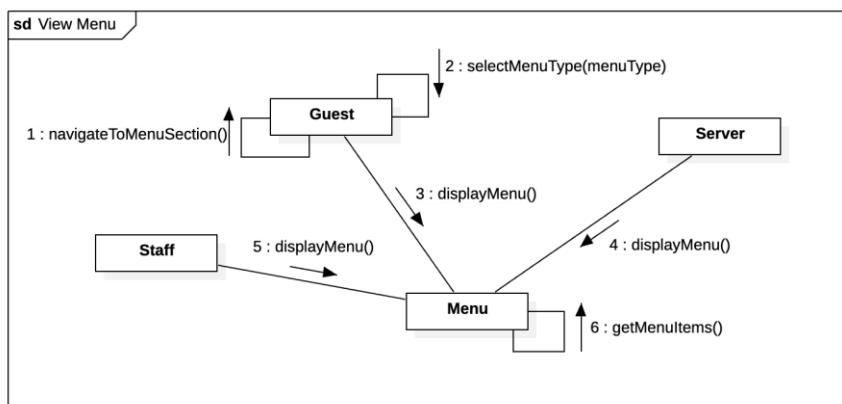
UC 31: Track Expenses



UC 32: Generate Consolidated Financial Reports

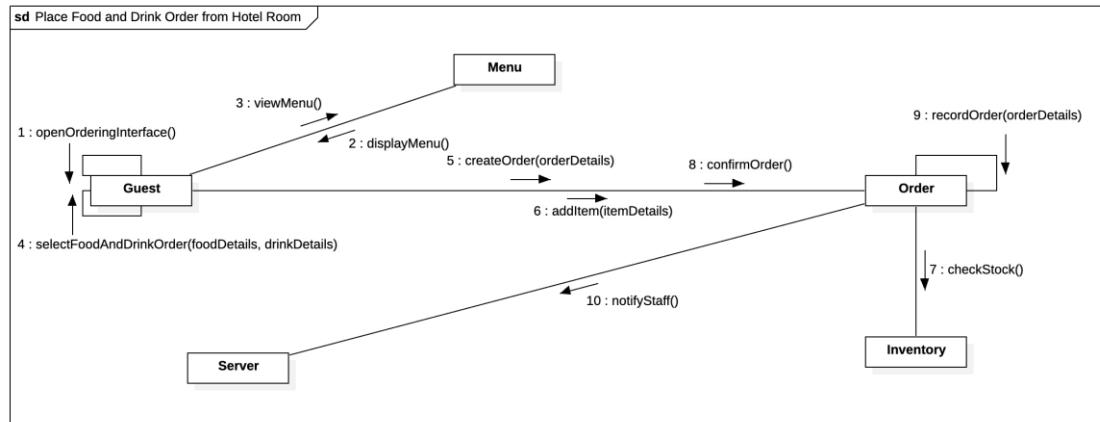


UC 33: View Menu

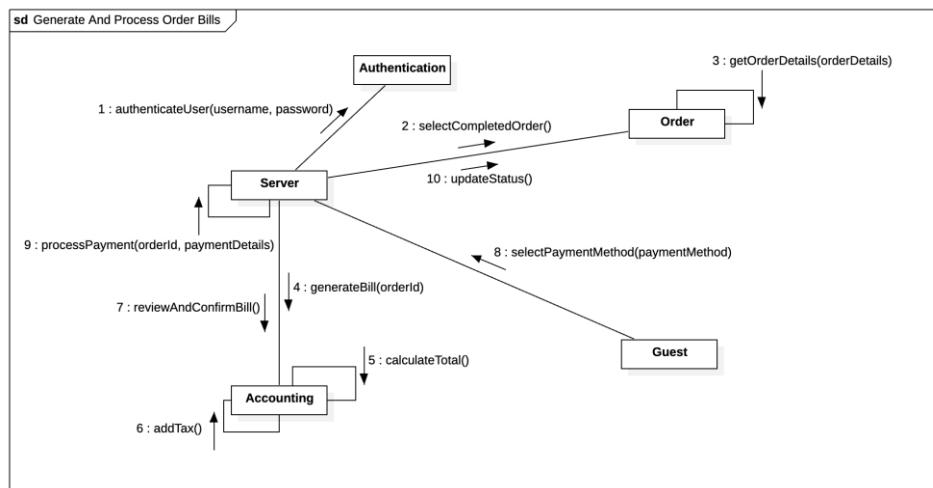


Hotel Management System

UC 34: Place Food and Drink Order from Hotel Room

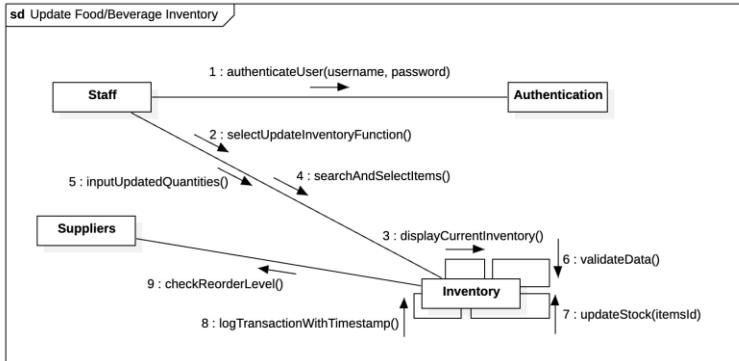


UC 35: Generate and Process Order Bills

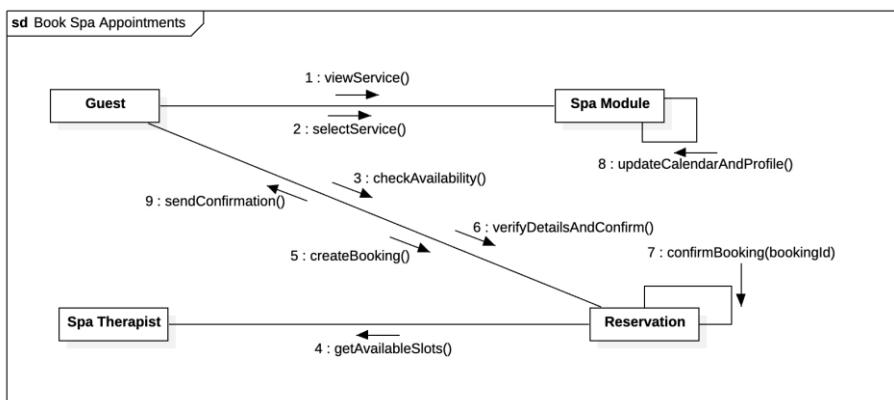


UC 36: Update Food/Beverage Inventory

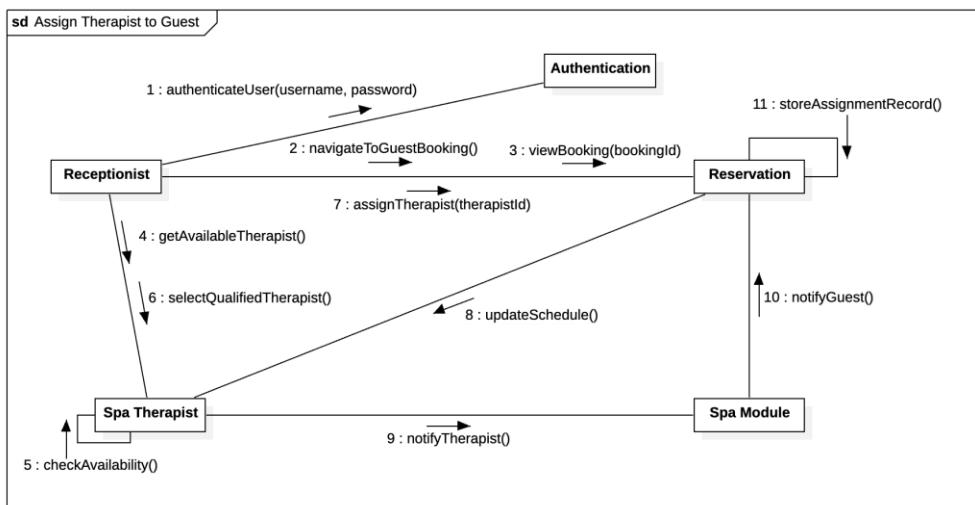
Hotel Management System



UC 37: Book Spa Appointments



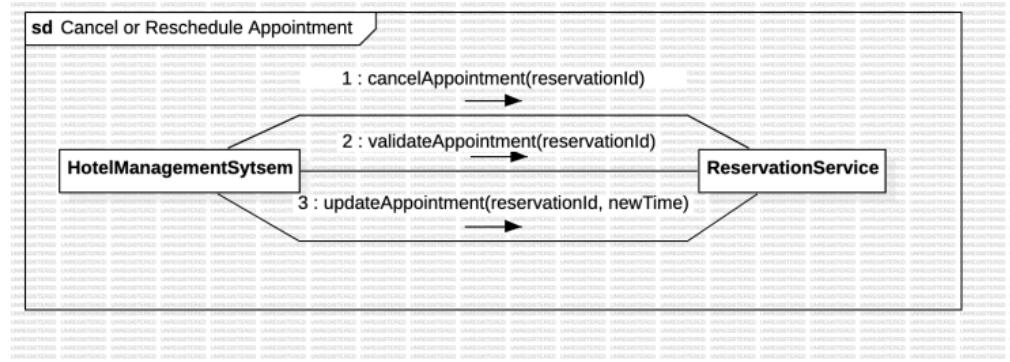
UC 38: Assign Therapist to Guest



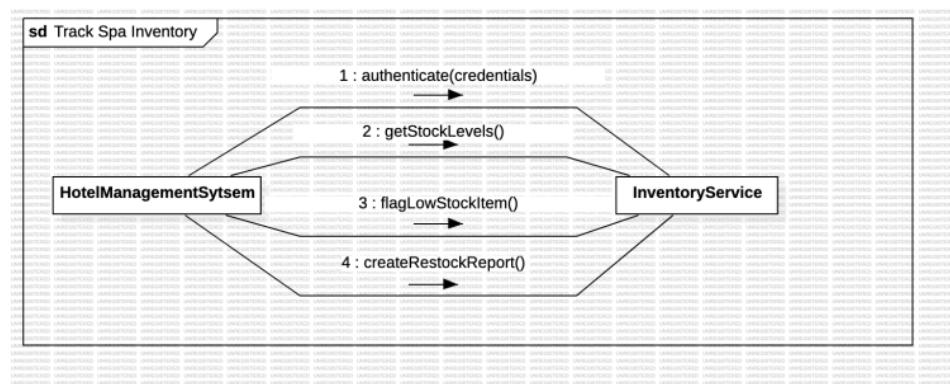
Hotel Management System

Ester Pashtranjaku

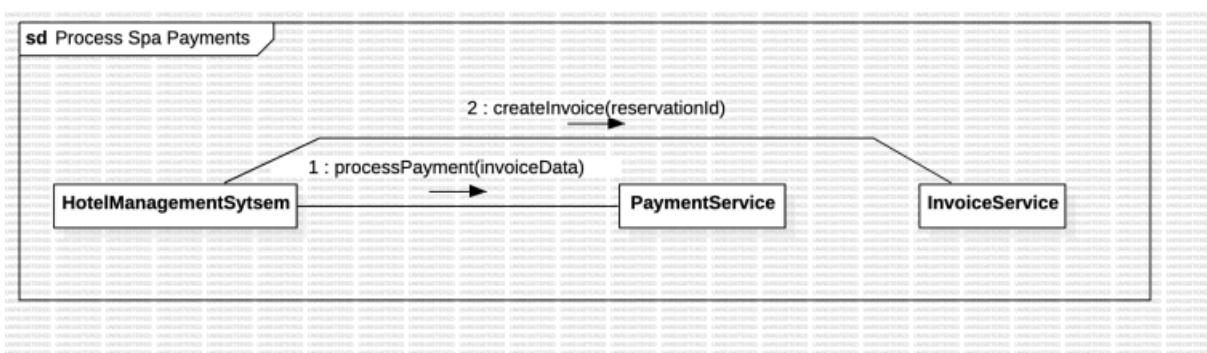
UC 39: Cancel or Reschedule Appointment



UC 40: Track Spa Inventory

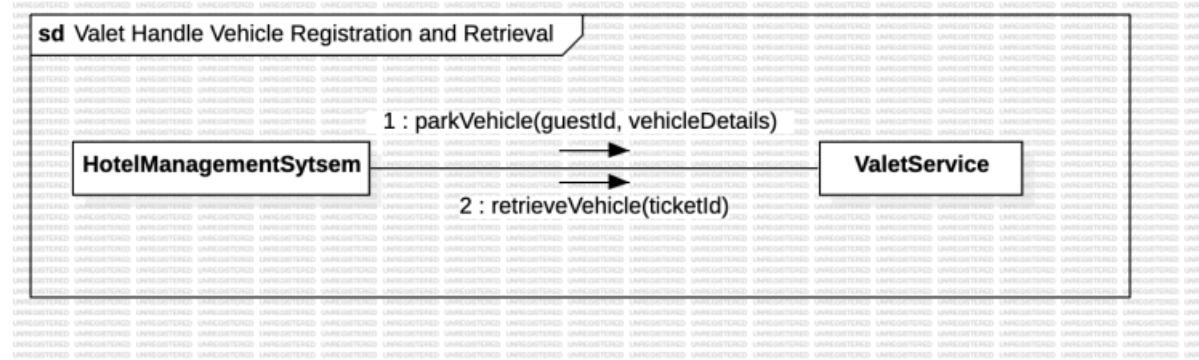


UC 41: Process Spa Payments

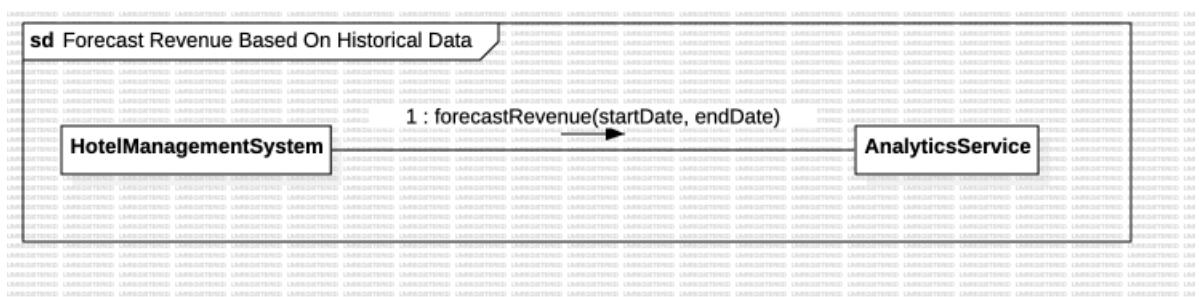


UC 42: Valet Handle Vehicle Registration and Retrieval

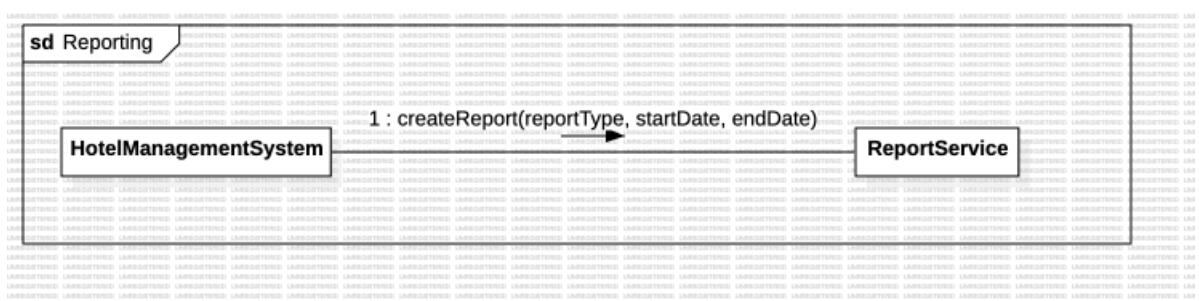
Hotel Management System



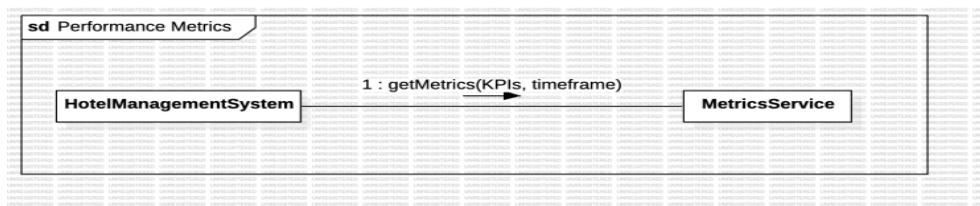
UC 43: Forecast Revenue Based on Historical Data



UC44: Reporting

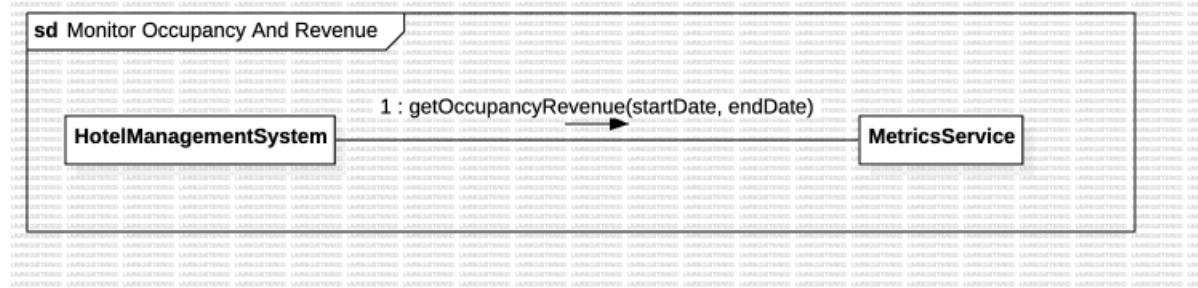


UC45 :Performance Metrics



UC46: Monitor Occupancy and Revenue

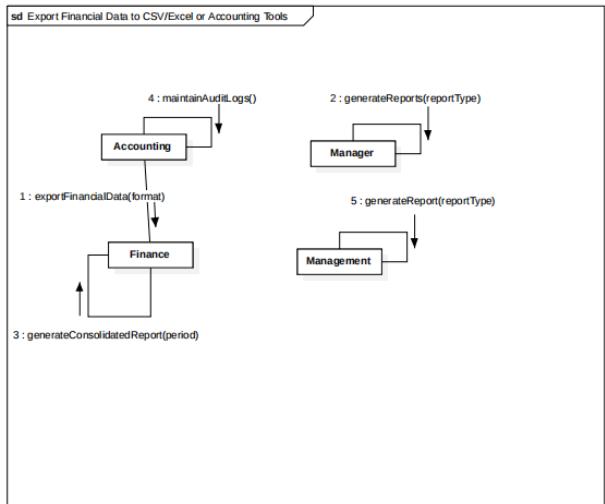
Hotel Management System



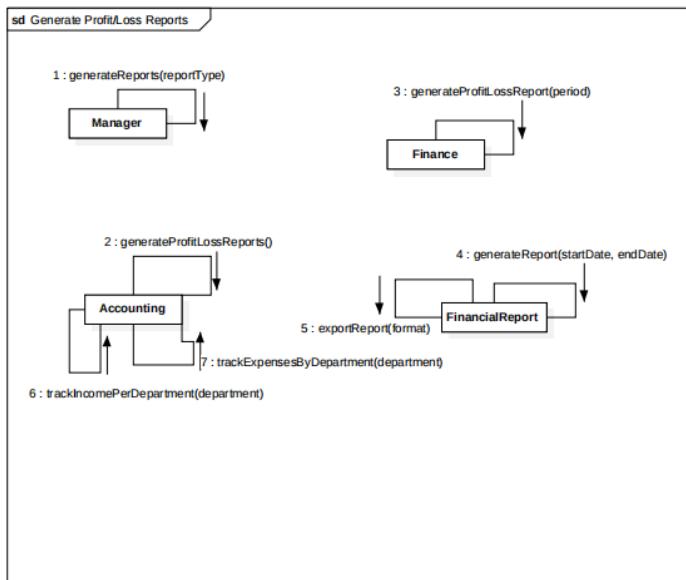
Megi Almadhi

UC47: Export Financial Data to CSV/Excel or Accounting Tools

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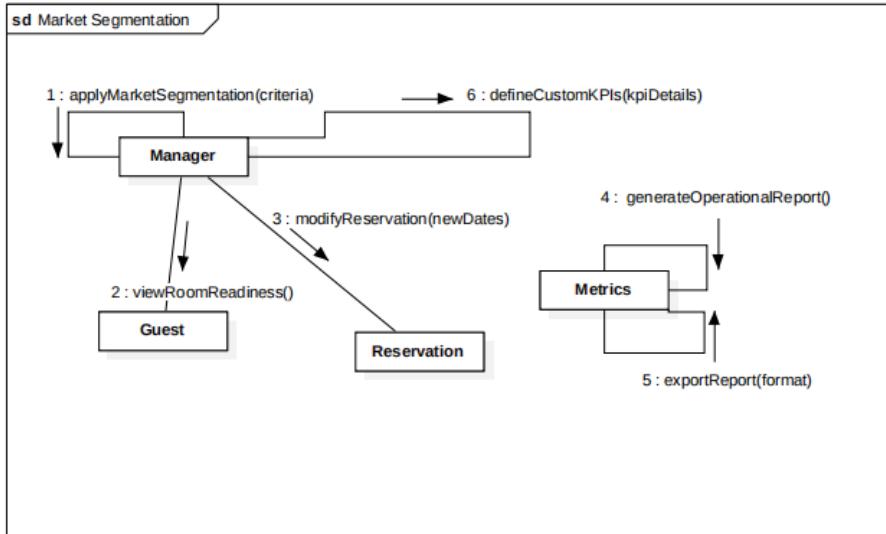


UC48: Generate Profit/Loss Report

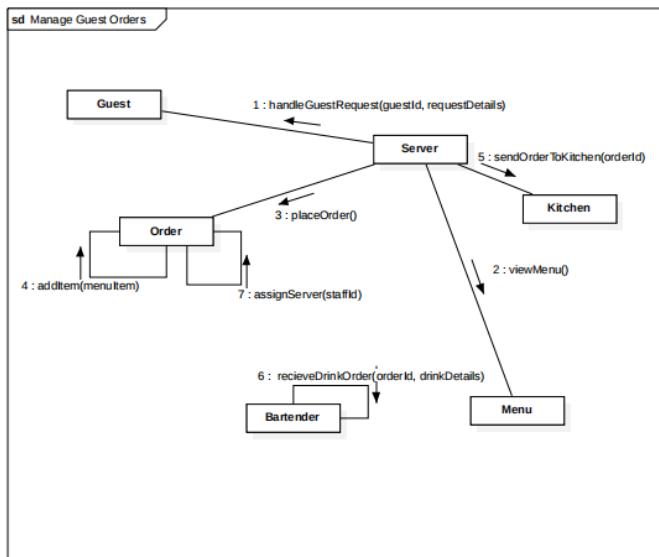


UC49: Market Segmentation

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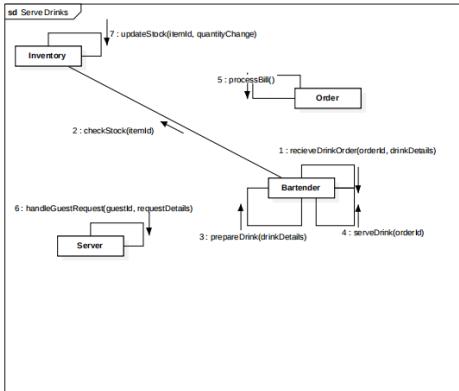


UC50: Guest Order

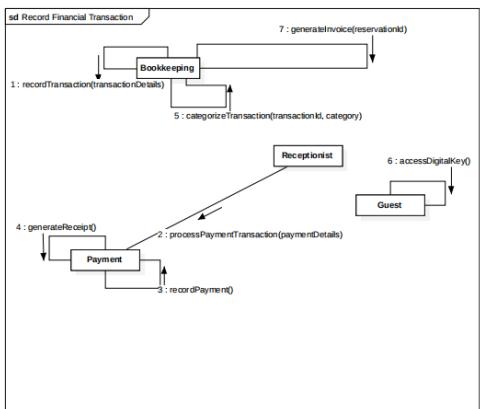


UC51: Serve Drinks

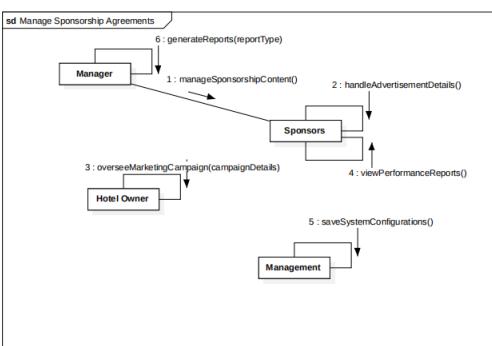
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UC52: Record Financial Transaction

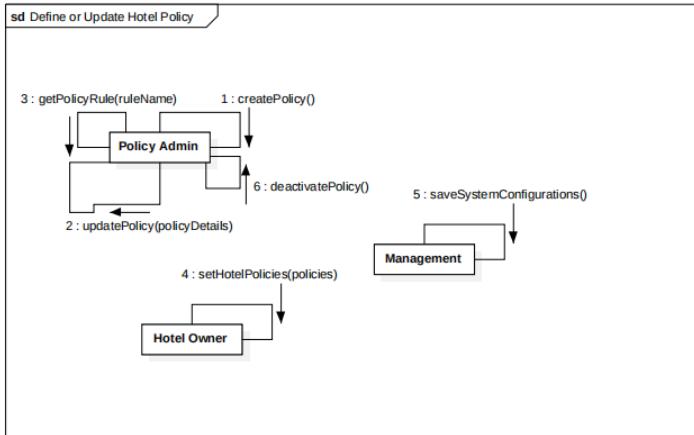


UC53: Sponsorship Agreements

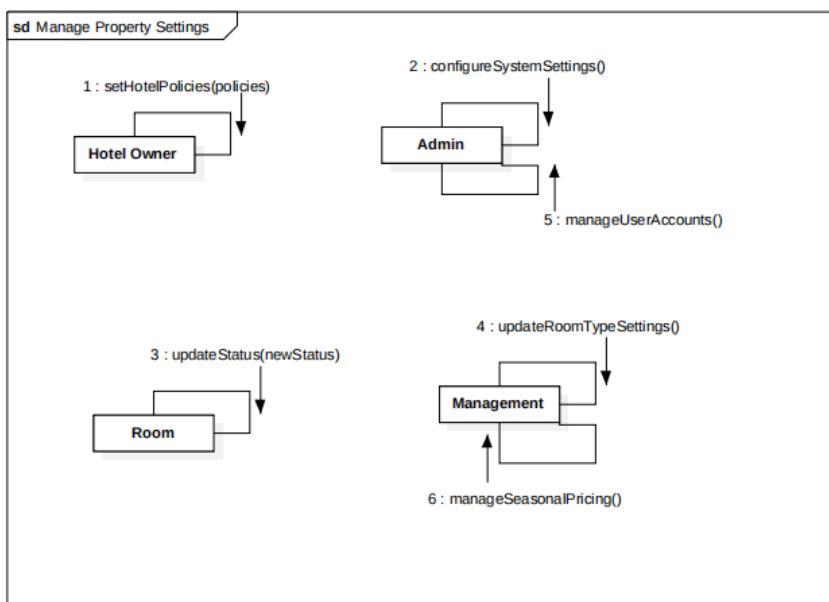


UC54: Define or Update Hotel Policy

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UC55:Manage Property Settings



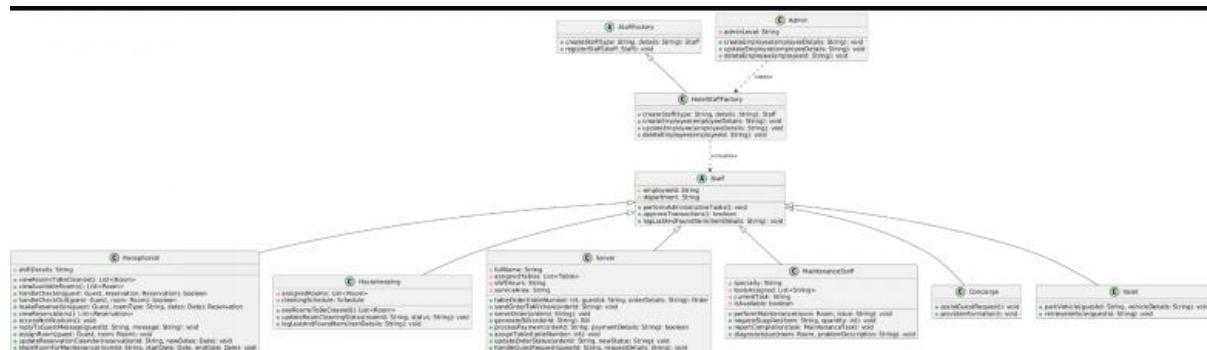
Design Patterns

Factory (Arsildo Veliu,Megi Almadhi)

The Factory Pattern in this hotel management system provides a centralized and flexible way to create different types of staff objects (Receptionist, Housekeeping, Server, MaintenanceStaff, Concierge, and Valet) without exposing the complex instantiation logic to client code. The HotelStaffFactory acts as a single point of creation where one can request a

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specific type of staff member by passing a type string and details, and it handles all the construction complexities behind the scenes. This design promotes loose coupling between the staff creation process and the rest of the system, making it easier to add new staff types in the future, modify existing staff creation logic, or change how staff objects are initialized without affecting the Admin class or other parts of the system that need to create staff members. The pattern also enables consistent staff registration and management through the factory's registerStaff() method, ensuring all created staff members are properly integrated into the hotel management system.

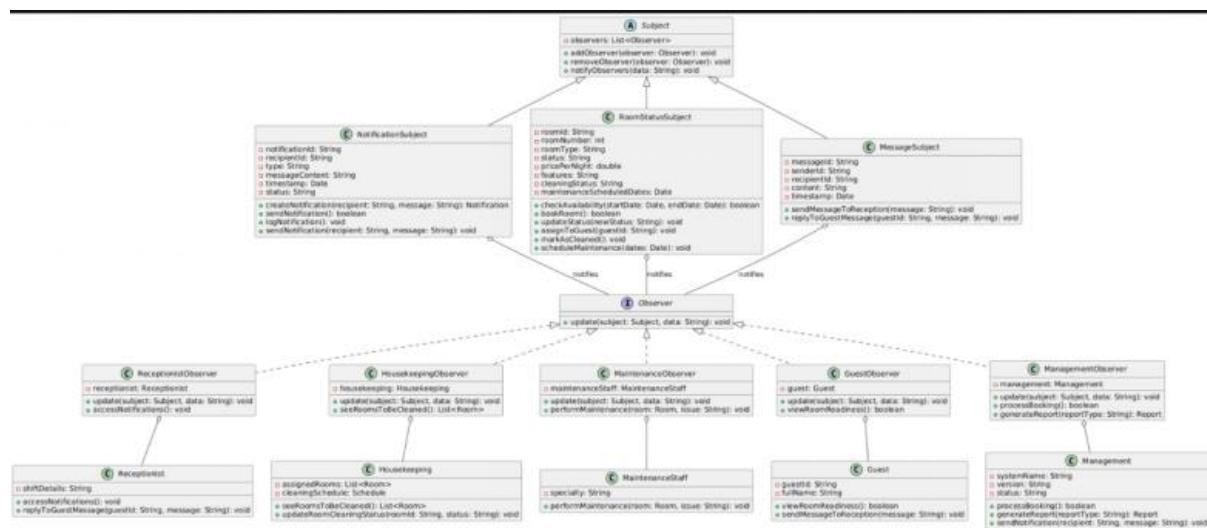


Observer (Arsildo Veliu,Megi Almadhi)

The Observer Pattern in this hotel management system establishes a publish-subscribe mechanism that enables automatic communication and coordination between different hotel departments and stakeholders when important events occur. The pattern uses three main subjects (`NotificationSubject`, `RoomStatusSubject`, and `MessageSubject`) that maintain lists of observers and automatically notify them when state changes happen, such as when room status updates, new messages arrive, or notifications are created. Each observer type (`ReceptionistObserver`, `HousekeepingObserver`, `MaintenanceObserver`, `GuestObserver`, and `ManagementObserver`) represents a different stakeholder in the hotel system that needs to be informed about specific changes - for example, when a room's cleaning status changes, the `HousekeepingObserver` is automatically notified so housekeeping staff can see updated

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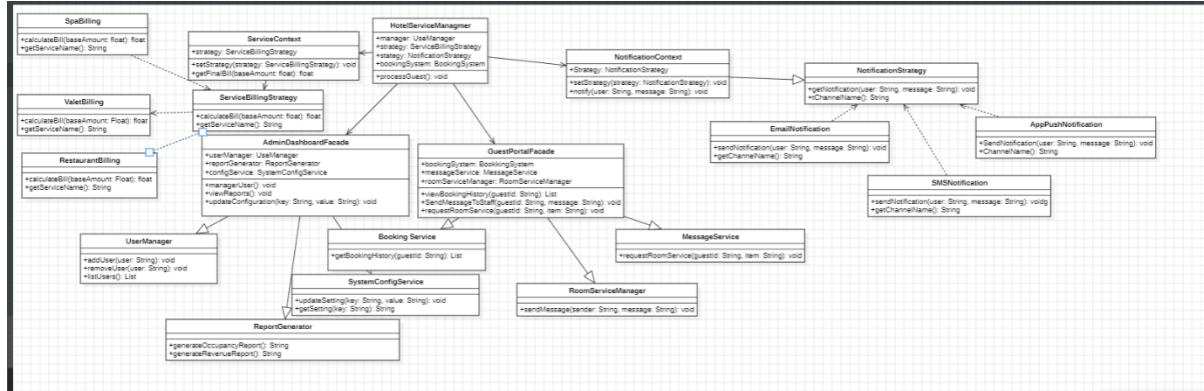
room lists, while the ReceptionistObserver gets notified about new guest messages so reception can respond promptly. This pattern eliminates the need for constant polling or manual checking of status changes, ensures real-time updates across all hotel departments, and maintains loose coupling between different parts of the system since subjects don't need to know the specific details of who is listening to them.



Strategy (Artemisa Hasalami,Brikena Papadhopuli,Ester Pashtranjaku)

In this hotel management system, the Strategy pattern is applied to support dynamic and interchangeable behaviors such as billing, payment, and room assignment. Each behavior is represented by an interface (e.g., **BillingStrategy**, **PaymentStrategy**), and multiple concrete classes implement these interfaces to provide specific algorithms (e.g., **PremiumBilling**, **CashPayment**, **VIPRoomAssignment**). These strategy objects are used through context classes that hold them via aggregation, allowing the system to switch behaviors at runtime without modifying the context logic. This approach follows object-oriented principles such as the Open/Closed Principle and improves flexibility, scalability, and testability of the system.

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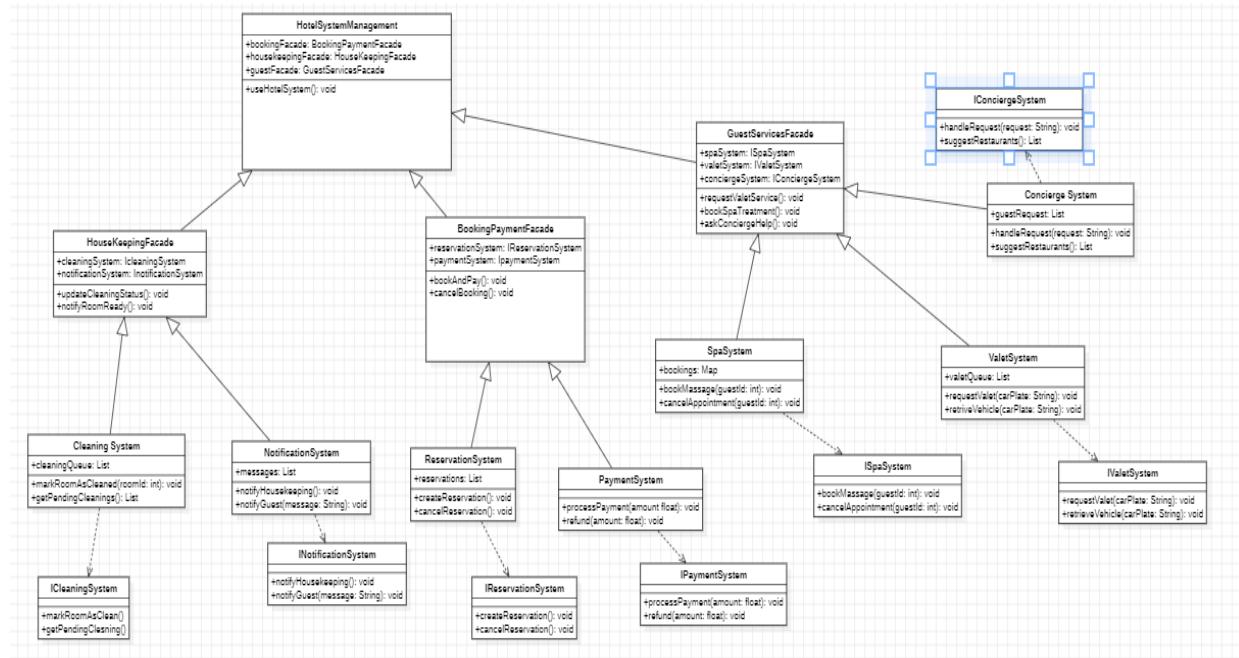


Facade (Artemisa Hasalami,Brikena Papadhopuli,Ester Pashtranjaku)

The Facade pattern is used to simplify and organize access to complex hotel subsystems such as reservation, payment, cleaning, valet, spa, and concierge services. Instead of exposing these subsystems directly to higher-level classes, the system introduces facades like BookingPaymentFacade, HousekeepingFacade, and GuestServicesFacade. Each facade composes its related subsystems using composition, meaning the subsystems are fully managed and encapsulated within the facade. Additionally, interfaces are defined for both subsystems and facades to support abstraction and dependency injection, allowing easy testing and future

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extensions. This design reduces coupling between components, promotes clean architecture, and improves maintainability by hiding internal complexity.



Singleton (Erta Llenga, Esta Çekrezi)

The Singleton design pattern is implemented for three critical services in the hotel management system: SharedConfiguration, StatsDashboard, and Logging. This pattern ensures that each of these classes has only one instance throughout the application's lifecycle, accessed through a static `getInstance()` method while preventing direct instantiation via private constructors. SharedConfiguration manages system-wide settings like hotel policies, authentication parameters, and operating hours that must remain consistent across all system components. StatsDashboard provides centralized statistics and reporting capabilities, ensuring all users see the same real-time occupancy rates, revenue projections, and performance metrics. Logging centralizes all system activities, audit trails, and user actions into a single, consistent log system. This pattern is ideal for these services because they represent shared system resources that require global consistency, prevent resource

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duplication, maintain data integrity, and provide centralized control - ensuring that when a Manager checks occupancy rates, an Admin configures system settings, or any user action gets logged, they all interact with the same unified instances rather than conflicting separate objects.

