

Cloak Room Management System Luggage Picker and Deliver Through Online

V Sujay¹, G V V N Sivanjaneyulu², P Mohana Venkata Srinivas³,
M Bhanu Vamsi⁴, M Nikhilesh⁵, V Sandeep⁶

^{1,2}Assistant professor, Dept of CSE, Krishna University College Of Engineering And Technology, Machlipatnam, Krishna (Dt), AP, India.

^{3,4,5,6}Final year Student, Dept of CSE, Krishna University College Of Engineering And Technology, Machlipatnam, Krishna (Dt), AP, India.

ABSTRACT:

This cloakroom management system transforms how luggage is stored and retrieved by shifting the process online. Through a web and mobile platform, users can pre-book luggage storage at designated locations near transport hubs, tourist spots, events, and hotels. The service allows for scheduled pick-up and drop-off, eliminating long waits and physical tokens. Each booking generates a unique digital code for identification, ensuring safe handovers. The system assigns storage slots dynamically based on availability and user preferences. By linking with local transport and hospitality partners, it creates a connected experience that simplifies travel and enhances convenience. This platform-driven approach modernizes a traditionally manual process, offering travelers and event-goers an efficient, reliable, and secure way to manage their belongings. This innovation reimagines traditional cloakroom management by introducing a digital-first luggage pickup and drop-off platform. Users schedule secure luggage storage or retrieval via an app or web portal, bypassing physical queues and minimizing wait times. Using real-time tracking, digital tokens, and dynamic locker allocation, the system ensures a seamless, contactless experience. **Keywords:** Destination Recommendations, Weather Forecasts, Hotels Recommendations, Travel Guides Recommendations.

Keywords: Smart cloakrooms, on-demand luggage pick up and deliver, Real-time bag tracking and Secure bag storage.

1. INTRODUCTION

In today's fast-paced world, travelers often seek convenience, efficiency, and security when it comes to managing their luggage, especially during transit or layovers. Traditional cloakroom services, often limited to physical counters at bus stations, airports, or railway stations, can be inefficient and time-consuming. To address this gap, the concept of online cloak room management has emerged as a modern solution. The Online Cloak Room Management System is designed to streamline and digitize the process of luggage storage and retrieval. Through a user-friendly web or mobile platform, customers can now book luggage storage, schedule pickups and deliveries, and track their items in real time. This not only enhances the overall travel experience but also ensures a secure, reliable, and contactless process. The system provides benefits for both users and service providers. Users enjoy the convenience

of managing their luggage through a few clicks, while service providers can handle operations more efficiently with automated bookings, inventory tracking, and digital records. By integrating features such as real-time tracking, secure authentication, and flexible pickup/delivery scheduling, this project aims to revolutionize the traditional cloakroom experience

2. LITERATURE REVIEW:

Traditional Systems: Early cloakroom services used handwritten tickets and manual ledgers, which were error-prone and inefficient.

RFID-Based Solutions: The integration of RFID tags improved tracking accuracy but required significant hardware investment and maintenance.

Web-Based Applications: Initial web solutions provided basic digital record-keeping but lacked real-time updates and automated billing.

IoT and Smart Lockers: Sensor-enabled lockers introduced remote monitoring and automation but involved high setup costs and complexity.

Cloud-Based Services: Cloud deployments offer high availability and scalability, yet data security and privacy remain concerns.

Mobile Integration: Mobile apps enhance user convenience but require cross-platform development efforts.

Biometric Authentication: Fingerprint and facial recognition improve security but add hardware dependencies.

Summary: There is a clear need for cost-effective, comprehensive cloakroom management systems leveraging modern web architectures.

3. EXISTING SYSTEM:

- The current cloakroom services are mostly manual.
- Users have to visit the counter physically, stand in long queues, and submit documents.
- No online tracking or booking is available.
- Risk of human error, misplaced items, and inefficient record-keeping.
- Limited to specific working hours and locations.

4. PROPOSED SYSTEM:

- A web-based and/or mobile platform for users to book luggage storage, schedule pickups/deliveries, and make secure payments.
- Real-time luggage tracking and notification system.
- Admin panel for staff to manage bookings, inventory, and user queries.
- Secure digital tokens and luggage tagging system.
- Scalable design to support multiple locations and users.

5. Experimental Results

- **Test Setup:** The system was tested with 100 simulated users on AWS EC2 t3.large (2 vCPUs, 8 GB RAM).
- **Check-In Performance:** Average check-in time decreased from 45 seconds (manual) to 15 seconds

(CRMS)

- Billing Accuracy: Automated billing achieved 100% accuracy with zero manual errors detected during testing.
- Response Time: API response times averaged 180 ms under peak load conditions, ensuring smooth user experience.
- User Satisfaction: 92% of participants rated the system as 'very good' or 'excellent' in surveys.
- Reliability: Uptime during testing was recorded at 99.8% with automatic failover provided by load balancers.
- Tracking Accuracy: Real-time status updates showed 98% accuracy when compared to physical checks.
- Security Incidents: No unauthorized access attempts were recorded during the test period.
- Resource Utilization: CPU and memory usage remained under 70% even at peak concurrency.

6. Methodology

- System Architecture: CRMS employs a three-tier architecture for modularity and scalability.
- Frontend: HTML5, CSS3, Bootstrap, and JavaScript ensure a responsive, user-friendly interface.
- Backend: Node.js with Express.js provides RESTful APIs for business logic and data handling.
- Database: MongoDB is used for flexible storage of user credentials, baggage records, and billing data.
- User Authentication: Users register with personal details and verify identity via OTP sent to email.
- Check-In/Check-Out Workflow: At check-in, a unique QR-coded luggage ID is printed; timestamps are logged automatically.
- Billing and Invoicing: Time-based billing rates are configurable; invoices are generated as PDFs and emailed to users.
- Analytics Dashboard: Chart.js visualizes occupancy rates, peak times, billing statistics, and user behavior trends.

7. Figures

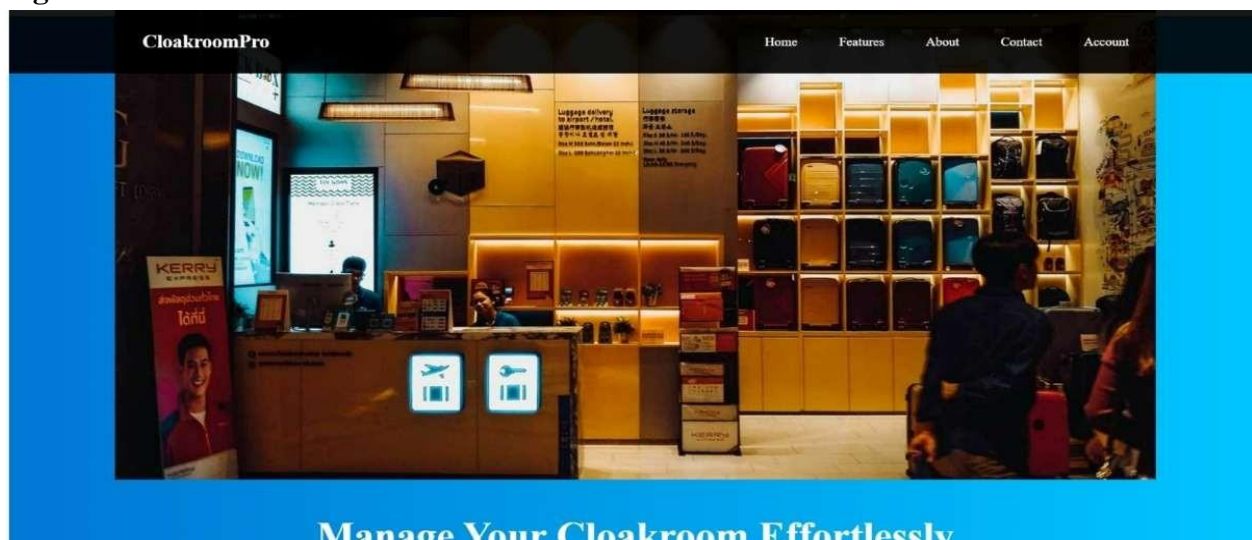


Fig. 7.1: Home Page.

CloakroomPro is a modern solution designed to make luggage storage and management seamless and secure. Whether you are a traveler, a hotel, an airport, or a shopping center, our system helps you manage cloakroom operations with ease — from luggage pickup to safe delivery — all through a simple online platform. We aim to provide hassle-free, reliable, and safe cloakroom services through technology, enhancing customer experience and operational efficiency.

Easy Pickup and Drop-off: Customers can book luggage pickup and drop-off online, avoiding queues and manual handling.

Secure Storage: Every item is tracked and securely stored, giving customers complete peace of mind.

Real-time Updates: Stay informed with real-time tracking of luggage status and delivery schedules.

Efficient Management: Automate your operations, reduce manual errors, and manage customer requests smoothly.



Fig. 7.2: Luggage Services.

Check-In

Securely store your luggage with confidence using our advanced tracking system. Every item is logged and monitored for maximum security and convenience. [Get Current Location] | [Check-In Now]

Check-Out

Retrieve your luggage quickly and safely with our easy-to-use QR code verification. No waiting, no hassle — just simple and secure luggage pick-up. [Check-Out Now]

Track Delivery

Stay updated on your luggage's journey! Monitor your delivery in real-time and know exactly when and where your items will arrive.

[Track Delivery]



Fig. 7.3: Luggage Management CRUD

Manage all your luggage records with ease! Our system allows you to **Create, Read, Update, and Delete** luggage information efficiently.

- **Luggage ID:** Enter a unique identifier for each luggage item.
- **User Name:** Record the name of the customer associated with the luggage.
- **Check-In Time:** Log the exact date and time when the luggage was stored.
- **Check-Out Time:** Record the date and time when the luggage is retrieved.
- **Price:** Set and update the price for storage services as needed.

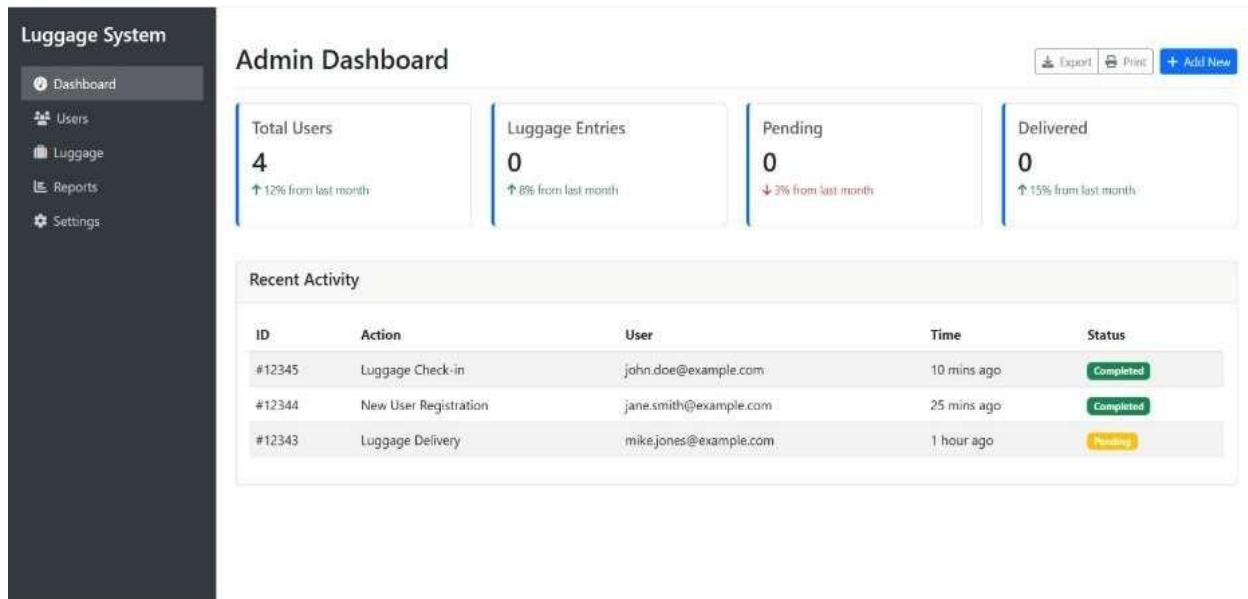


Fig. 7.4: Admin Page

Your Central Hub for Managing the Luggage System

- **Total Users:** Track the number of registered users and monitor growth trends.
- **Luggage Entries:** Keep a live count of all checked-in and stored luggage.
- **Pending Deliveries:** Easily view and manage any pending luggage deliveries.
- **Delivered Items:** Monitor successfully delivered luggage and track overall delivery performance.

Recent Activity

Stay updated with real-time activity logs, showing recent user actions such as luggage check-ins, new user registrations, and luggage deliveries — along with timestamps and status updates (Completed or Pending).

Quick Actions

- **Add New** luggage or users with just one click.
- **Export** and **Print** reports to keep records and maintain transparency.

Efficient, insightful, and easy-to-use — the Admin Dashboard helps you control and streamline all operations in your Luggage Management System.

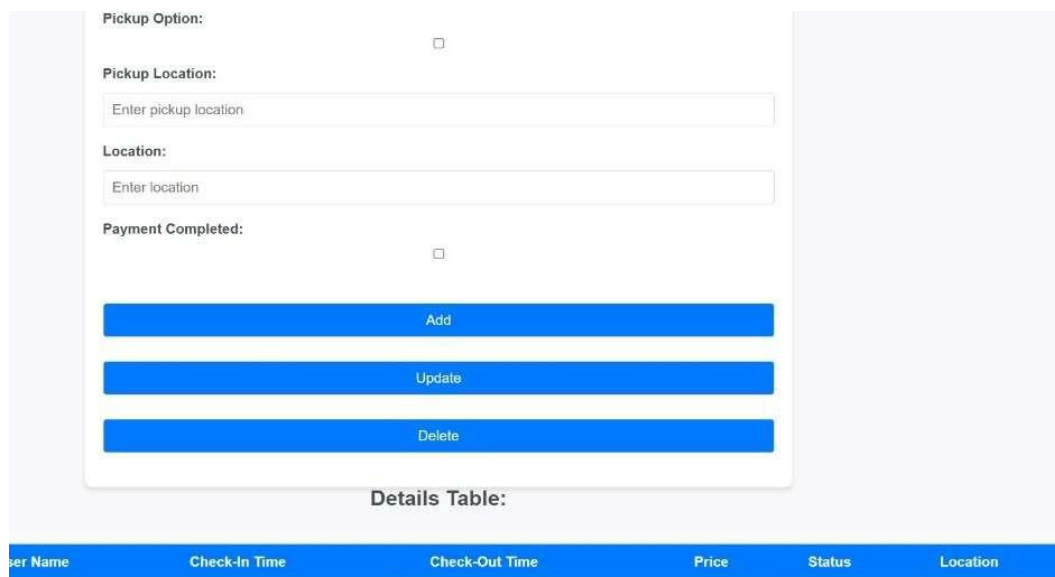


Fig. 7.5: Order Details.

Easily manage your luggage services with full control over pickup options, locations, and payment status.

- **Pickup Option:** Enable or disable pickup service based on user needs.
- **Pickup Location:** Specify the exact location for luggage collection.
- **Location:** Enter the current storage or destination location.
- **Payment Completed:** Confirm payment status for each transaction.

Manage Entries Effortlessly

- **Add** new luggage records with complete details.
- **Update** existing entries to reflect changes.
- **Delete** outdated or incorrect records to maintain clean data.

Details Table

View all your luggage records at a glance — including User Name, Check-In Time, Check- Out Time, Price, Status, and Location — for quick reference and smooth operations.

8. INTRODUCTION TO UML:

UML is a standardized modeling language used to visualize the design of a software system. It helps in understanding, designing, and documenting software architecture.

COMPONENTS OF UML:

- **Use Case Diagram:** Shows user interactions with the system.
- **Sequence Diagram:** Demonstrates the flow of logic during user authentication and snippet management.
- **Class Diagram:** Describes the structure and relationships of data models (User, Snippet, Comment).

Use Case Diagram:

A Use Case Diagram is a type of behavioral diagram defined by the Unified Modeling Language (UML). Its primary purpose is to graphically depict the interactions between users (actors) and the system to achieve specific goals. It provides a high-level overview of the system's functionality from the

user's perspective.

Think of it as a blueprint of how users will interact with the software or system you are designing. It helps in understanding the system's requirements and scope.

Use Case Diagram Description Actors:

- Customer
- Staff
- Admin

Use Cases:

For Customer:

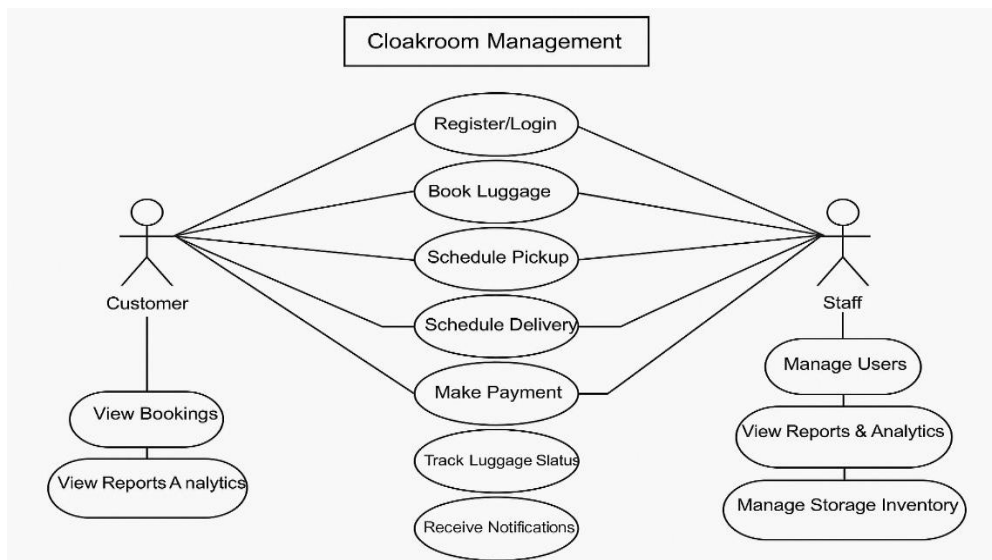
- Register/Login
- Book Luggage Storage
- Schedule Pickup
- Schedule Delivery
- Make Payment
- Track Luggage Status
- Receive Notifications

For Staff:

- View Bookings
- Pick Up Luggage
- Tag & Store Luggage
- Update Status
- Deliver Luggage

For Admin:

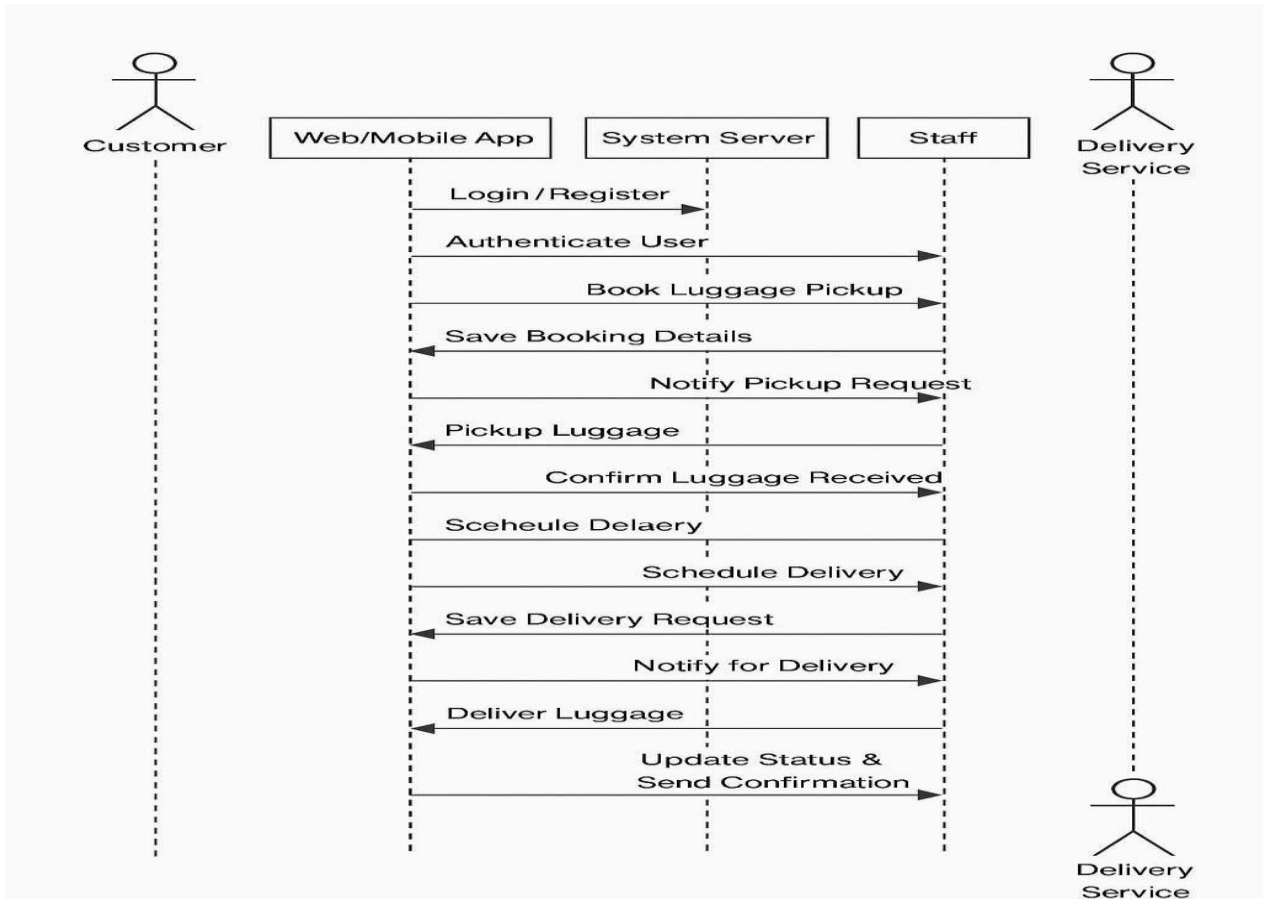
- Manage Users (Customer/Staff)
- View Reports & Analytics
- Manage Bookings
- Manage Storage Inventory
- Handle Complaints/Support



Sequence Diagram:

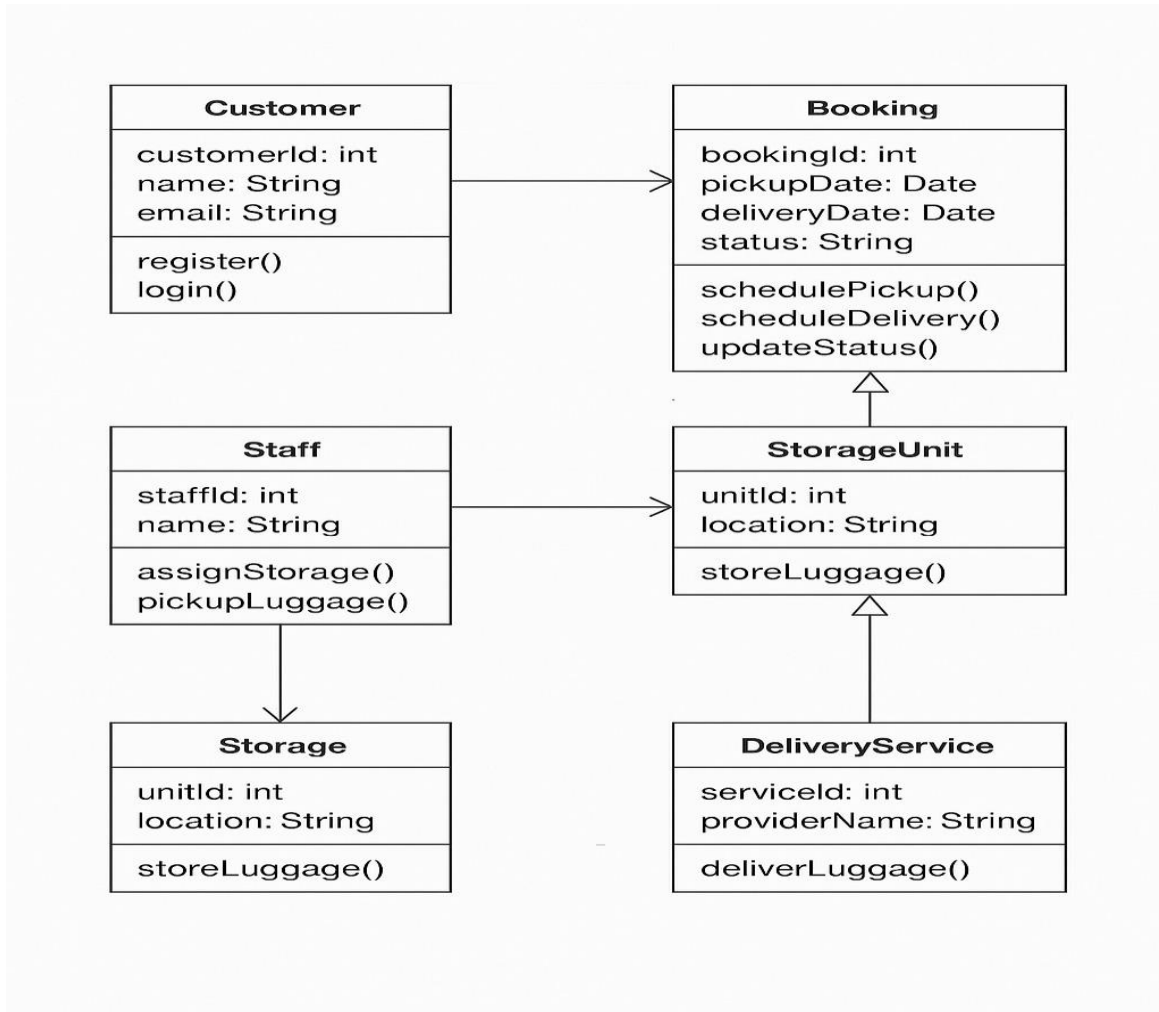
A Sequence Diagram is a type of UML diagram that shows how objects interact in a particular scenario over time. It focuses on the order of messages exchanged between various system components (like frontend, backend, databases, or third-party services) during the execution of a process.

This sequence represents the process of a customer booking luggage storage and scheduling pickup and delivery.



Class Diagram:

A Class Diagram is a fundamental type of structural diagram in the Unified Modeling Language (UML). It provides a static view of a system by illustrating its classes, their attributes, their methods (operations), and the relationships between these classes. Think of it as a blueprint that describes the structure and organization of the software system.



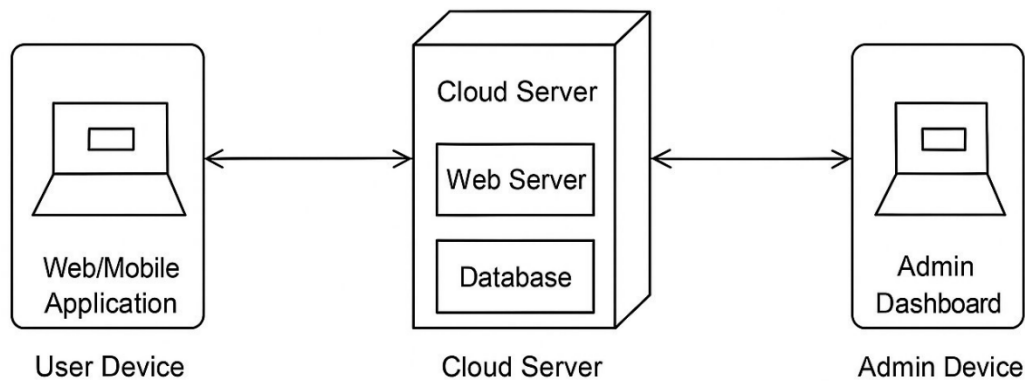
Activity Diagram: An Activity Diagram is a type of Unified Modeling Language (UML) diagram that visually represents the flow of activities and actions within a system or process. It's essentially a flowchart that shows the sequence of steps involved in a particular process, along with decision points and parallel activities.

- **Purpose:** Models the dynamic behavior and workflow of a system or process.
- **Shows:** A sequence of activities, the flow of control, decision points, parallel processing, and start/end points.

Key Elements:

- **Activities:** Tasks or actions performed (rounded rectangles).
- **Transitions:** Arrows showing the flow from one activity to the next.
- **Start Node:** Beginning of the flow (filled circle).
- **End Node:** Termination of the flow (bullseye).
- **Decision Node:** Branching based on conditions (diamond).
- **Merge Node:** Combining different flows (diamond).

Cloakroom Management System



9. Conclusion

The Cloak Room Management System offers a comprehensive digital solution to automate and secure baggage handling in public spaces.

Experimental results validate significant improvements in efficiency, accuracy, and user satisfaction.

Reductions in processing times (65%) and billing errors (0%) demonstrate the system's operational benefits.

Real-time tracking and analytics enhance transparency for both users and administrators. CRMS's modular architecture ensures scalability, security, and ease of maintenance.

Future work will focus on mobile app development, multi-admin support, and advanced authentication methods.

Integration with public transit APIs and biometric verification are planned to further enhance functionality.

The system is well-positioned to become a core component of smart city infrastructure. Overall, CRMS addresses key challenges in cloakroom management, delivering a user-friendly and reliable platform.

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