CASE STUDY: Corporate Equipment Allocation and Tracking System

---

1. Database Schema

Employee

```
CREATE TABLE employees (
  employee_id   INT AUTO_INCREMENT PRIMARY KEY,
  name          VARCHAR(100) NOT NULL,
  department    VARCHAR(100) NOT NULL,
  email         VARCHAR(150) NOT NULL UNIQUE
);
```

Sample data

```
{
  "name": "Reception-Staff",
  "email": "recereceptionstaff@yopmail.com",
  "department": "Reception"
}
```

User

```
CREATE TABLE users (
  user_id      BIGINT AUTO_INCREMENT PRIMARY KEY,
  employee_id  INT NOT NULL,
  passwordhash VARCHAR(150),
  role         ENUM('SYSTEM_ADMIN', 'RECEPTION_STAFF', 'INVENTORY_STAFF',
'MAINTENANCE_STAFF') NOT NULL,
  is_active    BOOLEAN DEFAULT TRUE,
  created_at   TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
  FOREIGN KEY (employee_id) REFERENCES employees(employee_id)
);
```

Sample Data

```
{
  "userId": 1,
  "employeeId": 1,
```

```
 "passwordHash": "$2a$10$VPwqtVUVKQpS168zD3RdSuqpXbD6hyUoRy/pzADacIdejLDmUG7Ru",
 "role": "SYSTEM_ADMIN",
 "isActive": true,
 "createdAt": "2025-11-18T12:27:33Z"
}
```


Equipment Master

Equipment Types

```
CREATE TABLE equipment_types (
 type_id    INT AUTO_INCREMENT PRIMARY KEY,
 type_name  VARCHAR(50) NOT NULL UNIQUE
);
```

Sample data


```
{
   "typeId": 1,
   "typeName": "Laptop"
 }
```


Equipment Items

```
CREATE TABLE equipment_items (
 equipment_id   INT AUTO_INCREMENT PRIMARY KEY,
 serial_number  VARCHAR(100) NOT NULL UNIQUE,
 type_id        INT NOT NULL,
 status         ENUM('AVAILABLE', 'ALLOCATED', 'UNDER_MAINTENANCE') NOT NULL
DEFAULT 'AVAILABLE',
 created_at     DATETIME NOT NULL DEFAULT CURRENT_TIMESTAMP,
 FOREIGN KEY (type_id) REFERENCES equipment_types(type_id)
);
```

Sample Data


```
{
 "equipmentId": 21,
 "serialNumber": "LAP-001",
 "typeId": 1,
 "status": "AVAILABLE",
 "createdAt": "2025-11-19T09:57:24Z"
}
```

Equipment Allocation

```
CREATE TABLE equipment_allocations (
  allocation_id       INT AUTO_INCREMENT PRIMARY KEY,
  equipment_id        INT NOT NULL,
  employee_id         INT NOT NULL,
  allocated_at        DATETIME NOT NULL DEFAULT CURRENT_TIMESTAMP,
  expected_return_at  DATETIME NOT NULL,
  returned_at         DATETIME DEFAULT NULL,
  condition_on_return ENUM('GOOD', 'DAMAGED') DEFAULT NULL,
  FOREIGN KEY (equipment_id) REFERENCES equipment_items(equipment_id),
  FOREIGN KEY (employee_id) REFERENCES employees(employee_id)
);
```

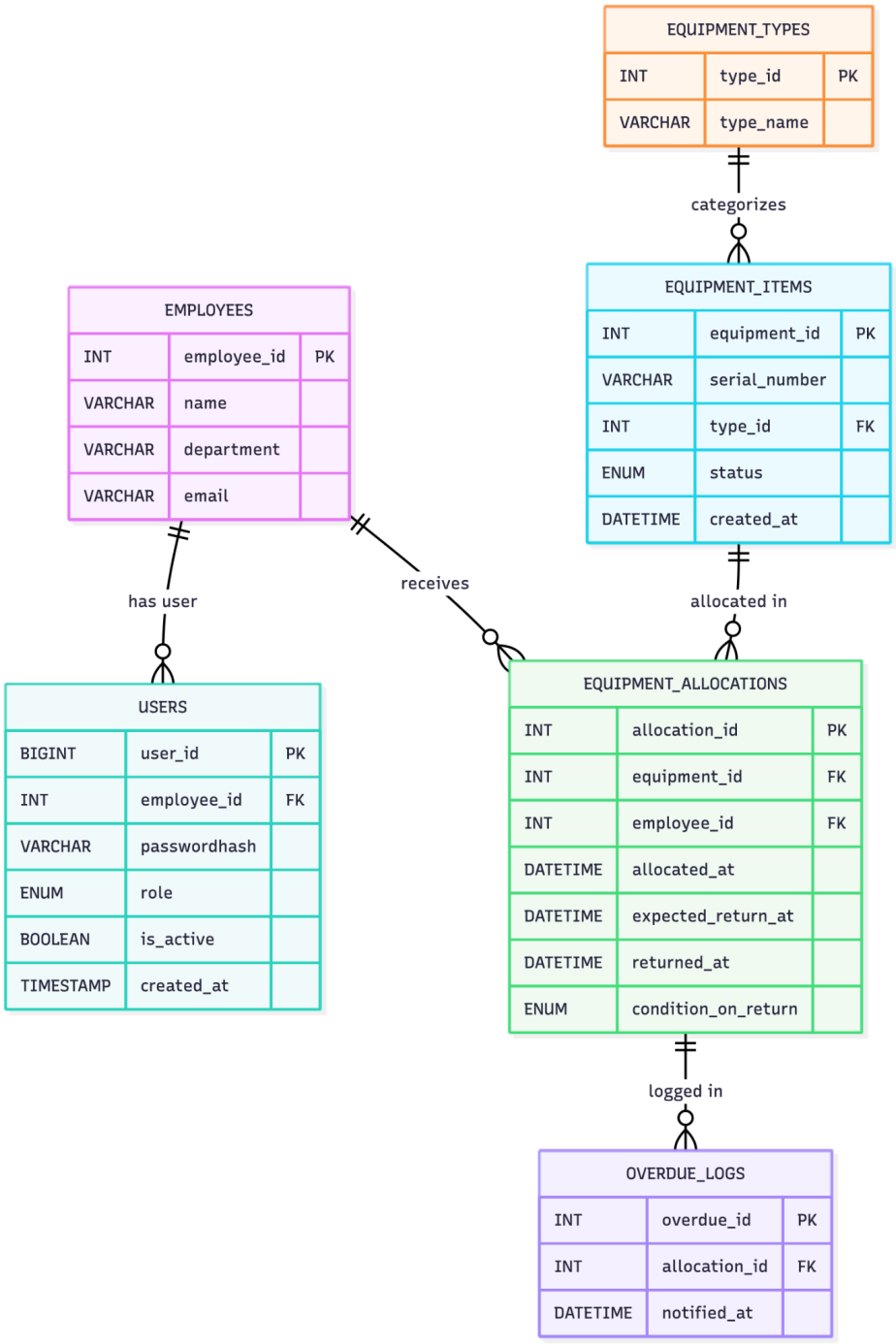
Sample data


```
{
  "allocationId": 1,
  "equipmentId": 21,
  "employeeId": 3,
  "allocatedAt": "2025-11-22T09:43:51Z",
  "expectedReturnAt": "2025-11-23T10:30:00Z",
  "returnedAt": "2025-11-22T10:01:24Z",
  "conditionOnReturn": "GOOD"
}
```


Logs

```
CREATE TABLE overdue_logs (
  overdue_id     INT AUTO_INCREMENT PRIMARY KEY,
  allocation_id  INT NOT NULL,
  notified_at    DATETIME NOT NULL DEFAULT CURRENT_TIMESTAMP,
  lastRemainderAt DATETIME DEFAULT NULL,
  FOREIGN KEY (allocation_id) REFERENCES equipment_allocations(allocation_id)
);
```

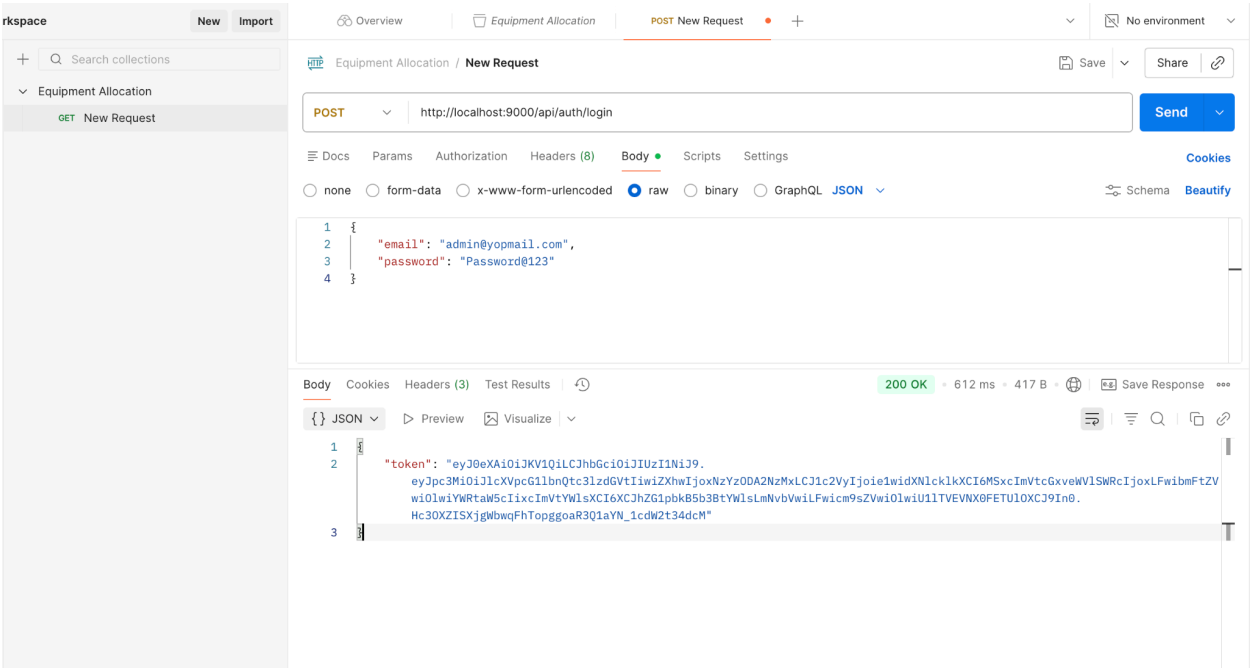
2. ER Diagram


EQUIPMENT_TYPES
INT type_id PK
VARCHAR type_name
categorizes
EQUIPMENT_ITEMS
INT equipment_id PK
VARCHAR serial_number
INT type_id FK
ENUM status
DATETIME created_at
EMPLOYEES
INT employee_id PK
VARCHAR name
VARCHAR department
VARCHAR email
has user
receives
allocated in
USERS
BIGINT user_id PK
INT employee_id FK
VARCHAR passwordhash
ENUM role
BOOLEAN is_active
TIMESTAMP created_at
EQUIPMENT_ALLOCATIONS
INT allocation_id PK
INT equipment_id FK
INT employee_id FK
DATETIME allocated_at
DATETIME expected_return_at
DATETIME returned_at
ENUM condition_on_return
logged in
OVERDUE_LOGS
INT overdue_id PK
INT allocation_id FK
DATETIME notified_at

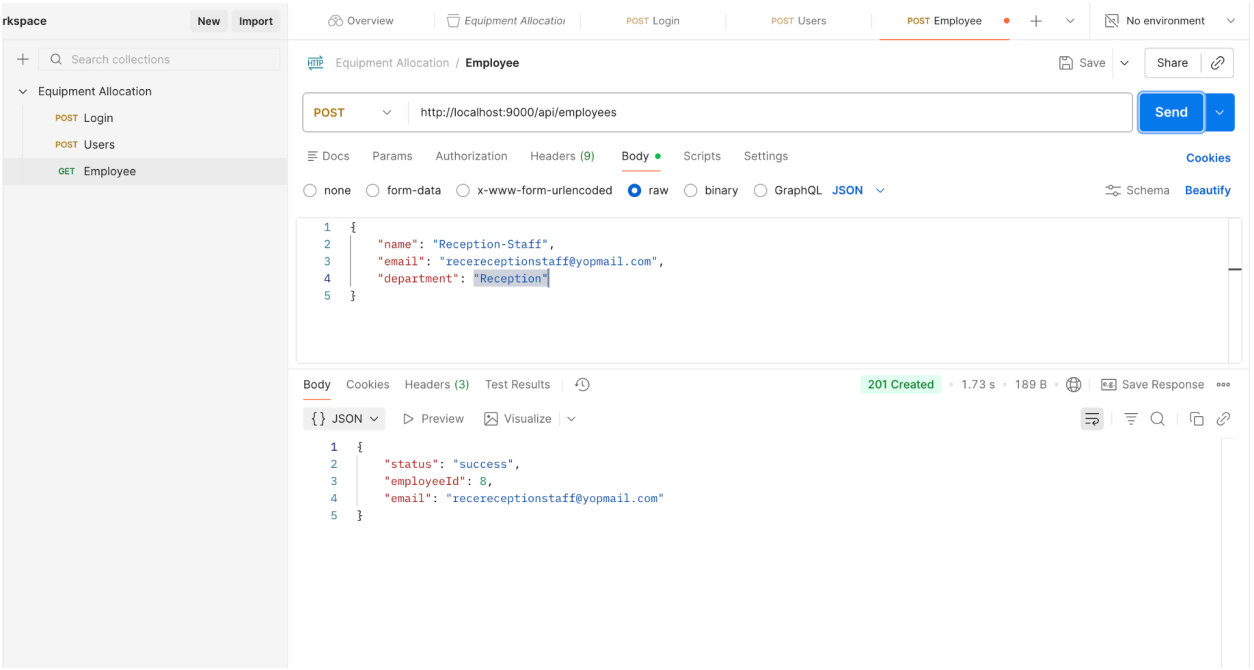
3. Output screenshots

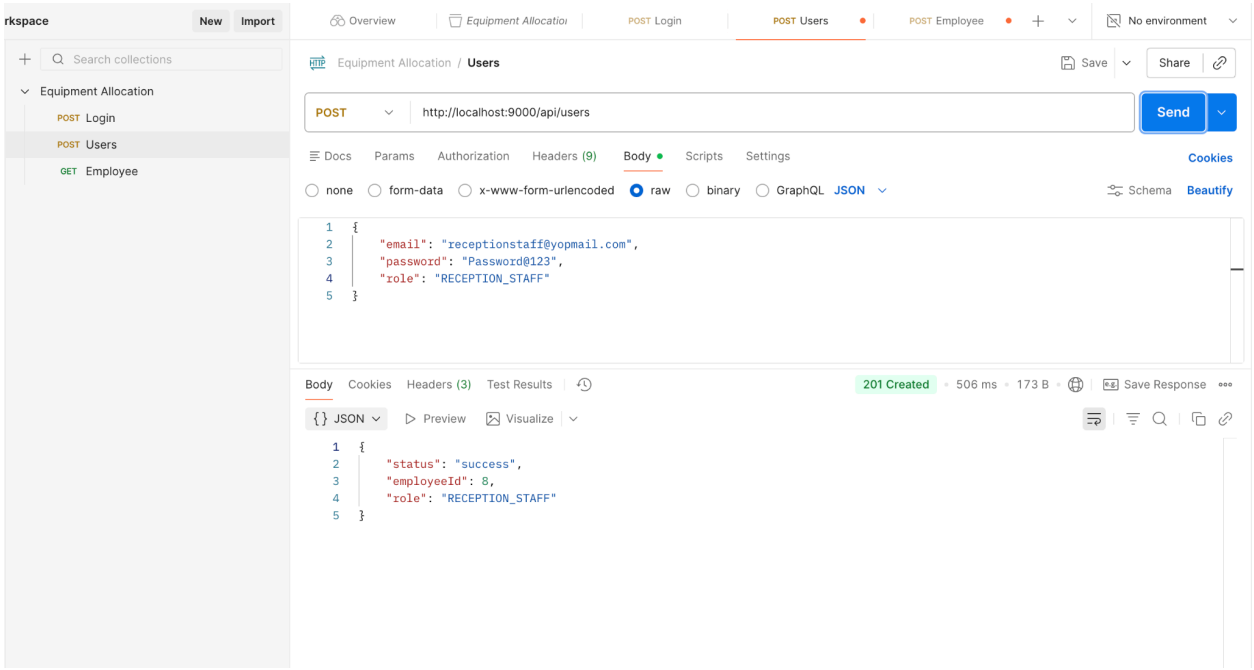
3.1 Login and staff registration

3.1.1 Login as System Admin

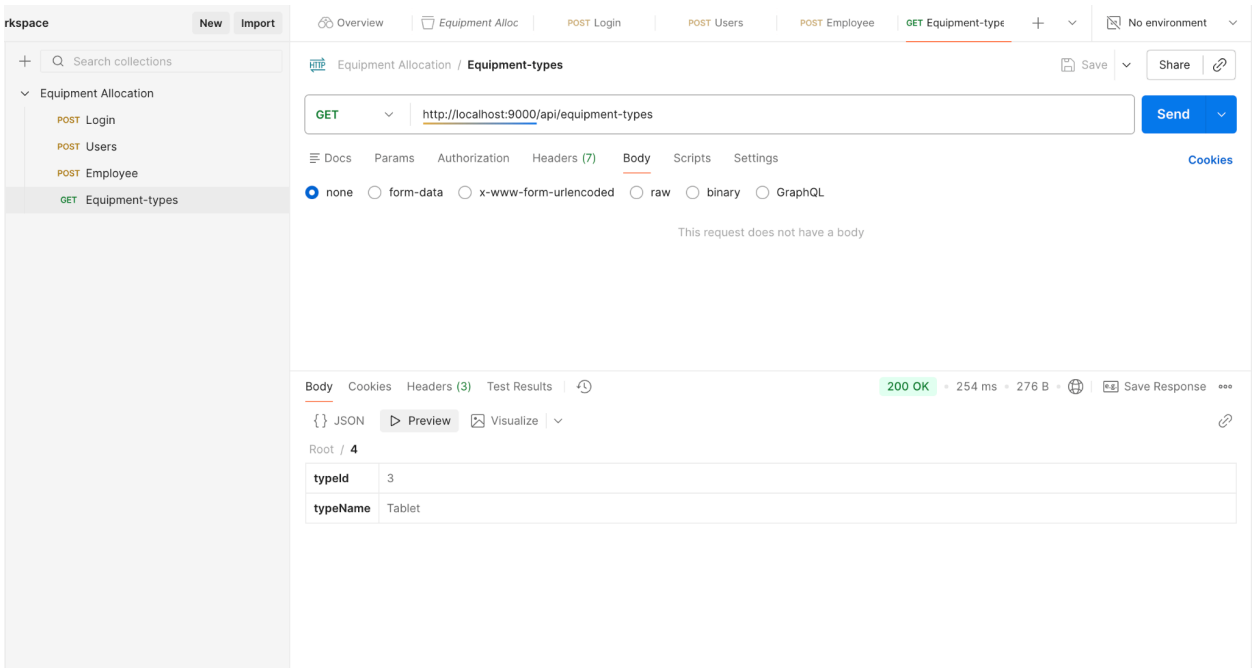


3.1.2 Create and Register Reception Staff

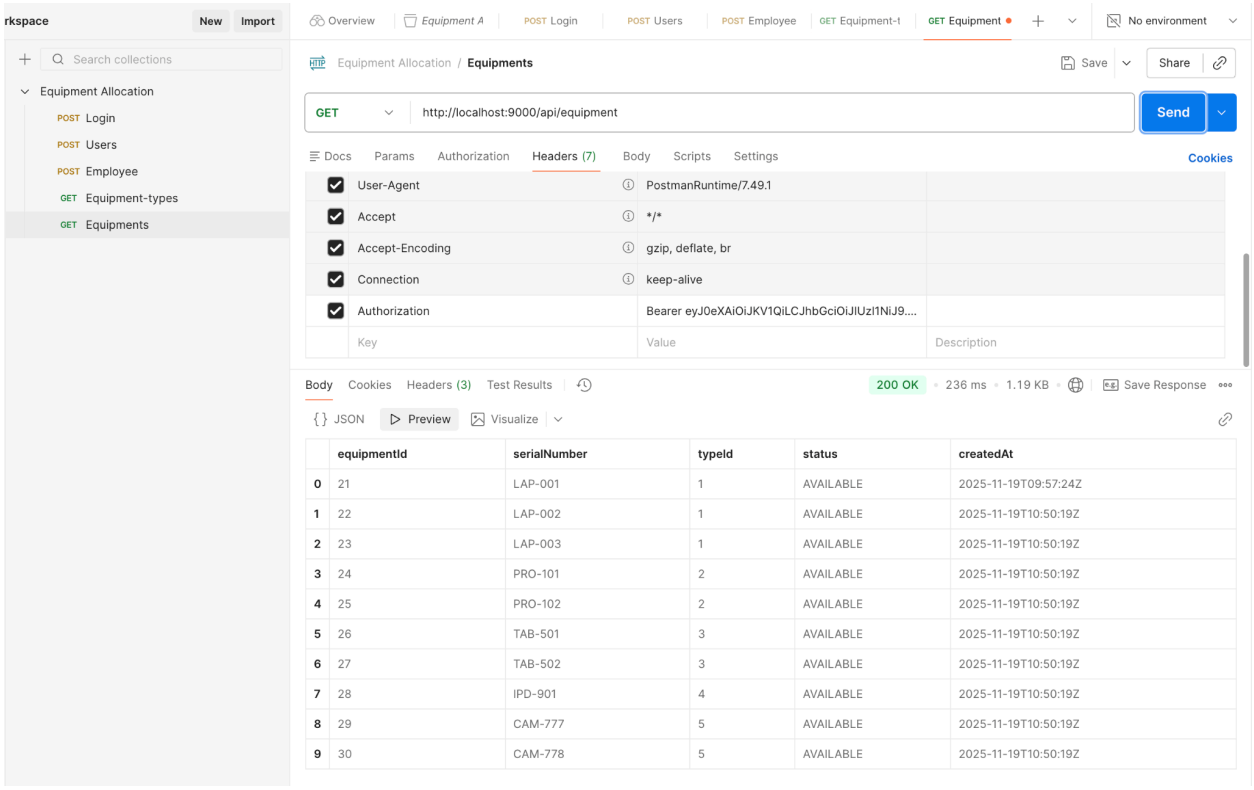




3.2 Equipment Types

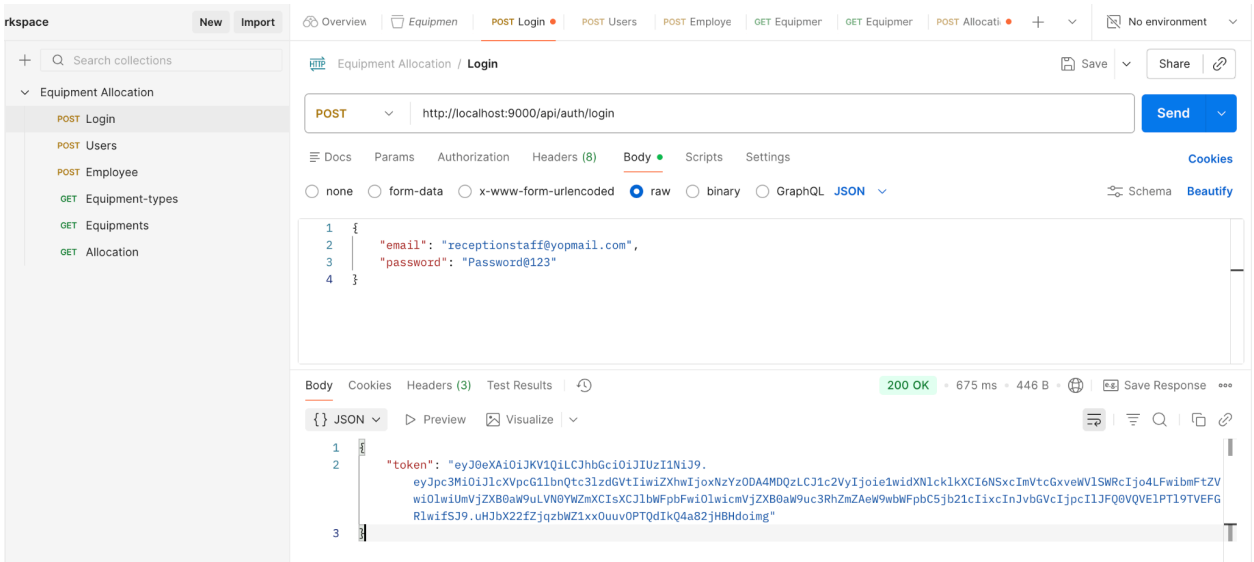


3.3 Equipments

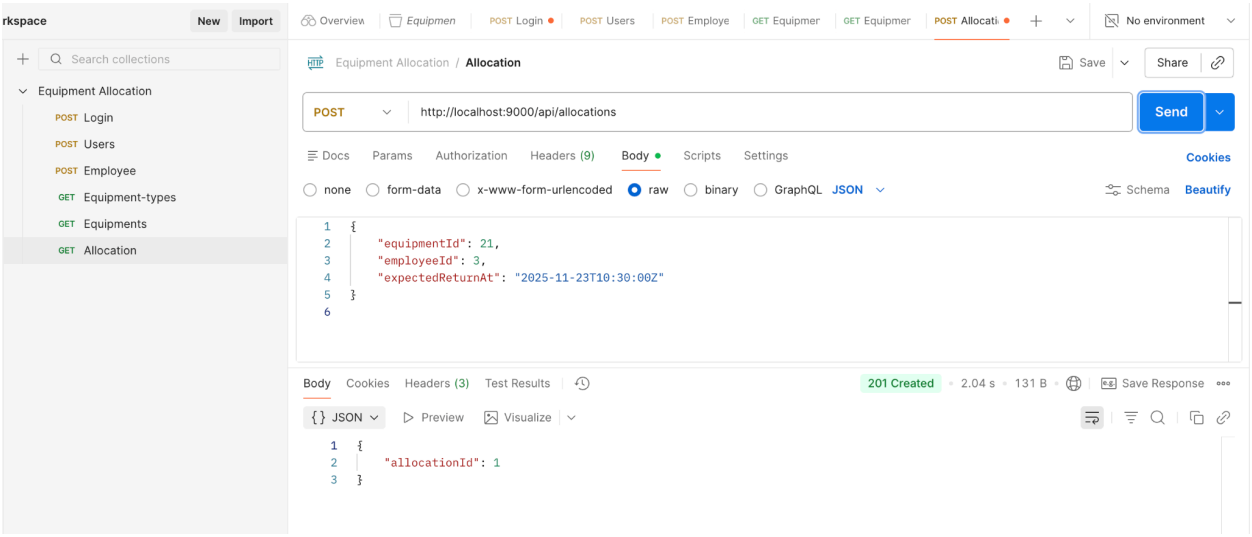


3.4 Create allocation

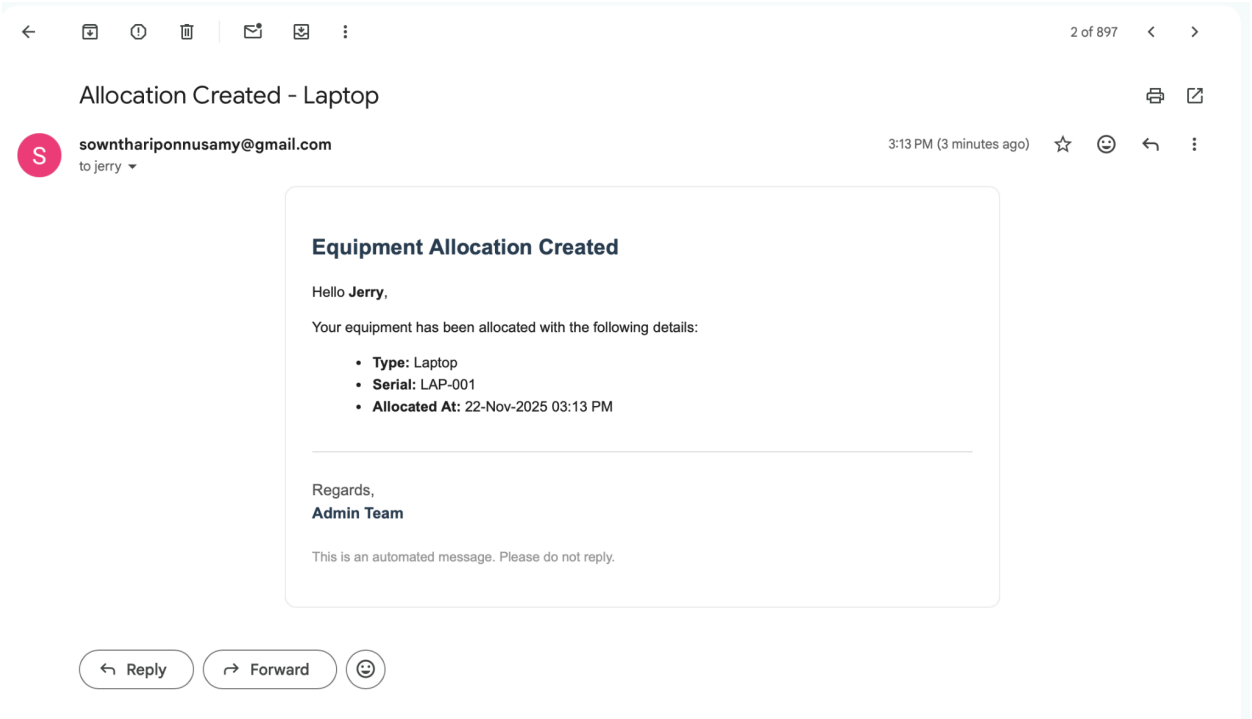
3.4.1 Login as Reception Staff

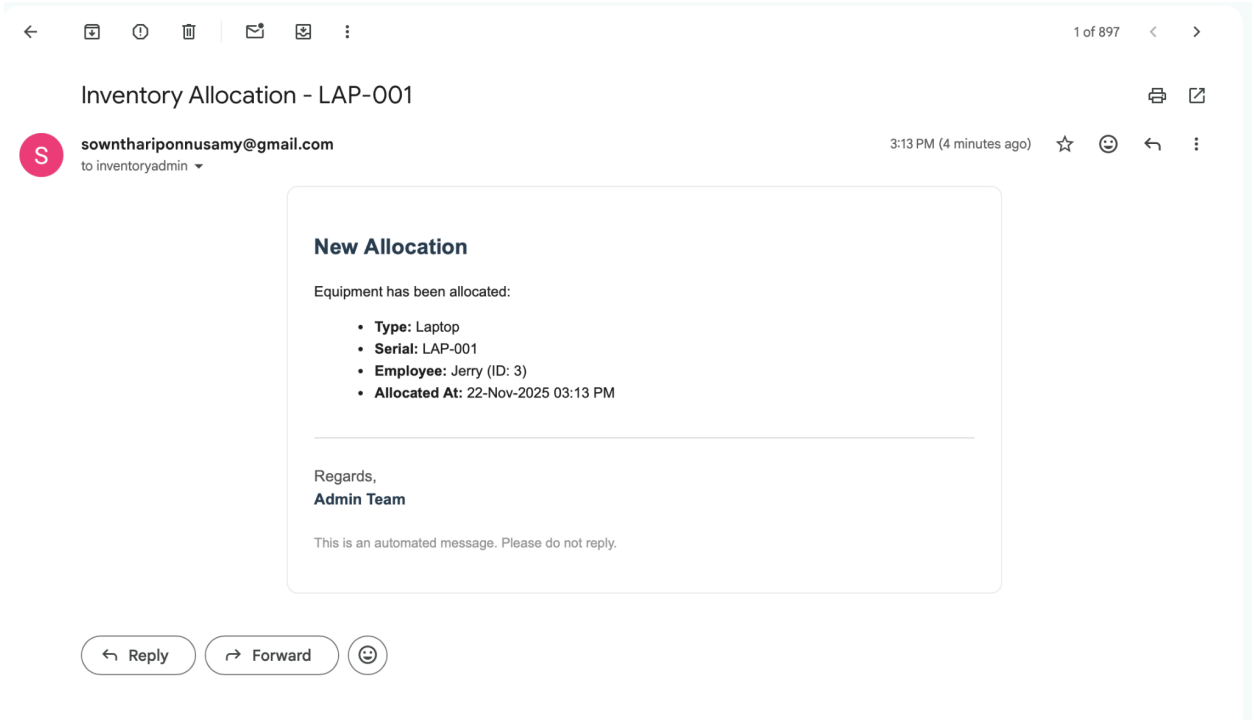


3.4.2 Create equipment allocation requests, recording employee id along with the expected return date.



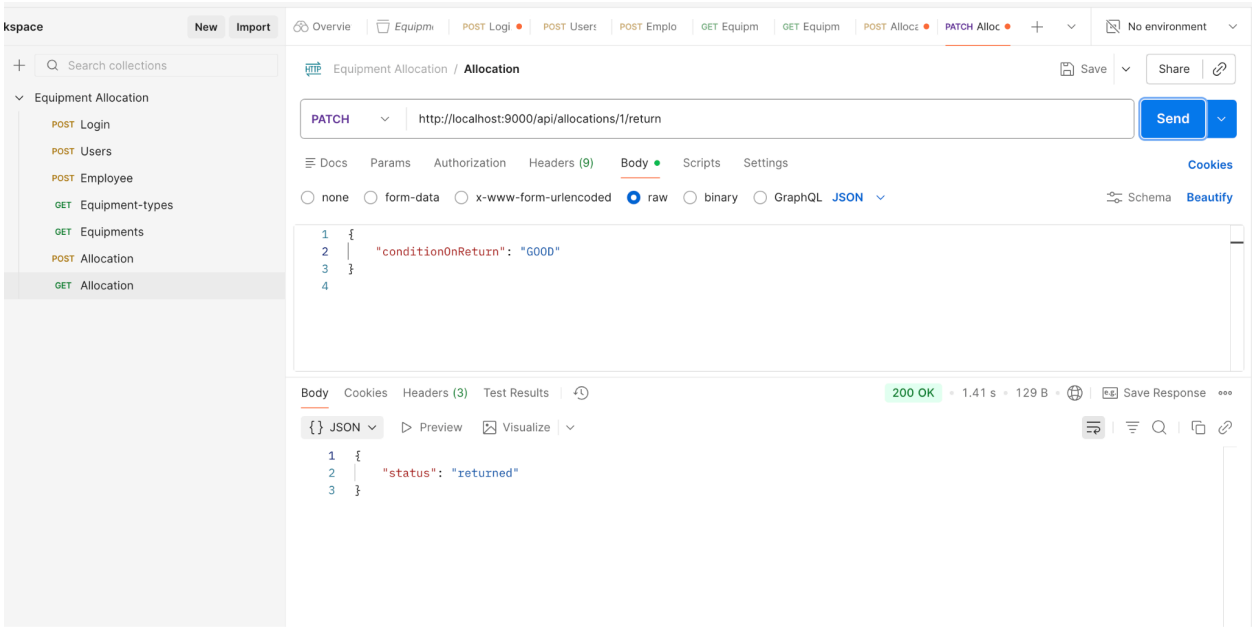
3.4.3 Mail notification to employee and inventory about allocation

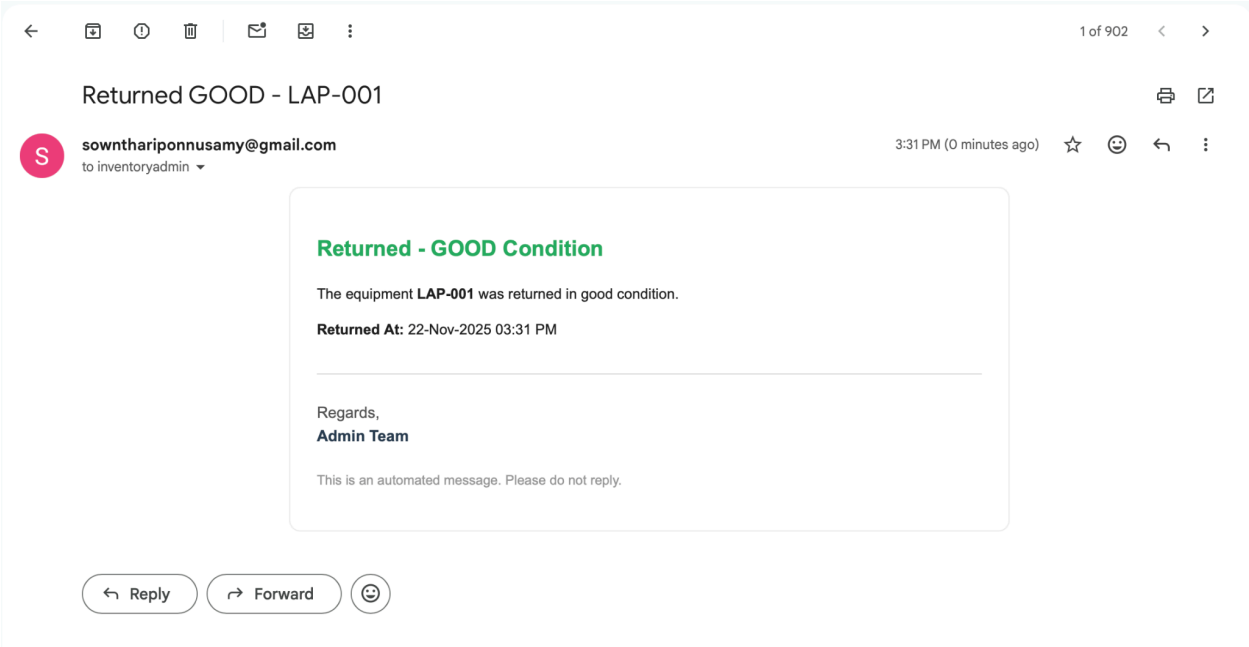




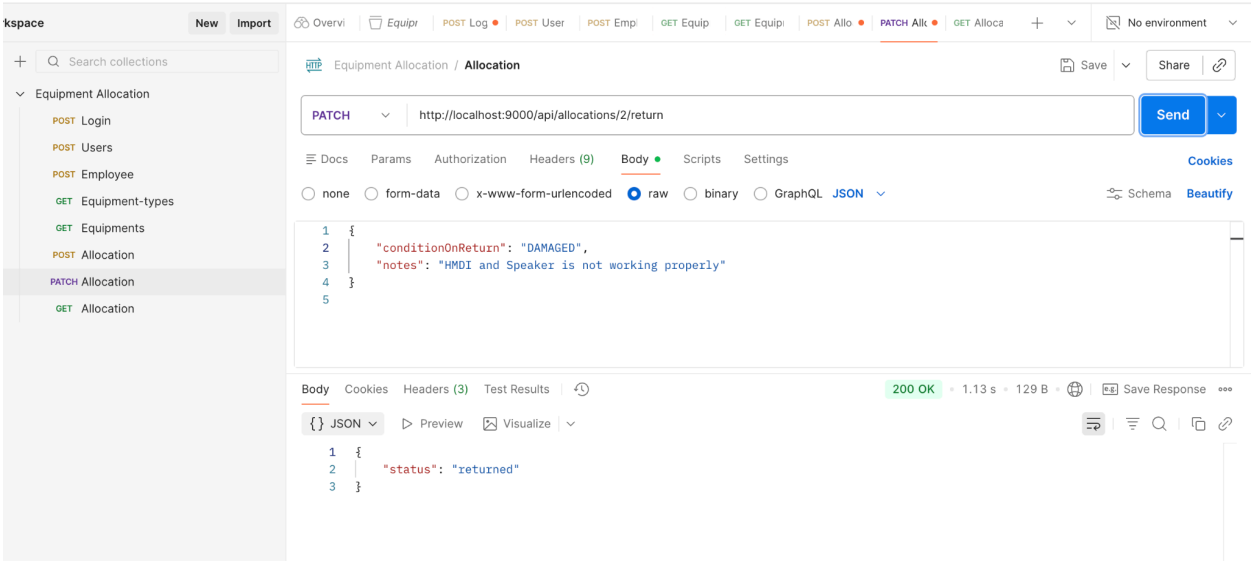
3.5 Equipment Return

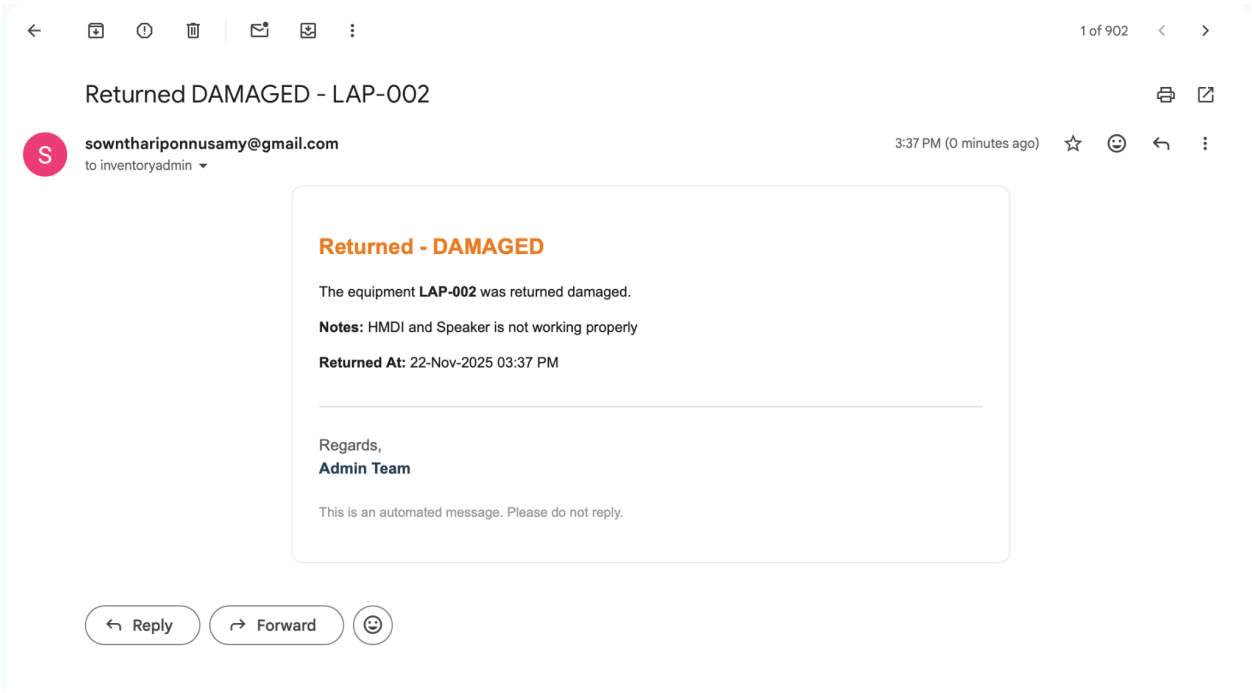
3.5.1 Equipment return with condition as “GOOD”, automated notification to inventory team





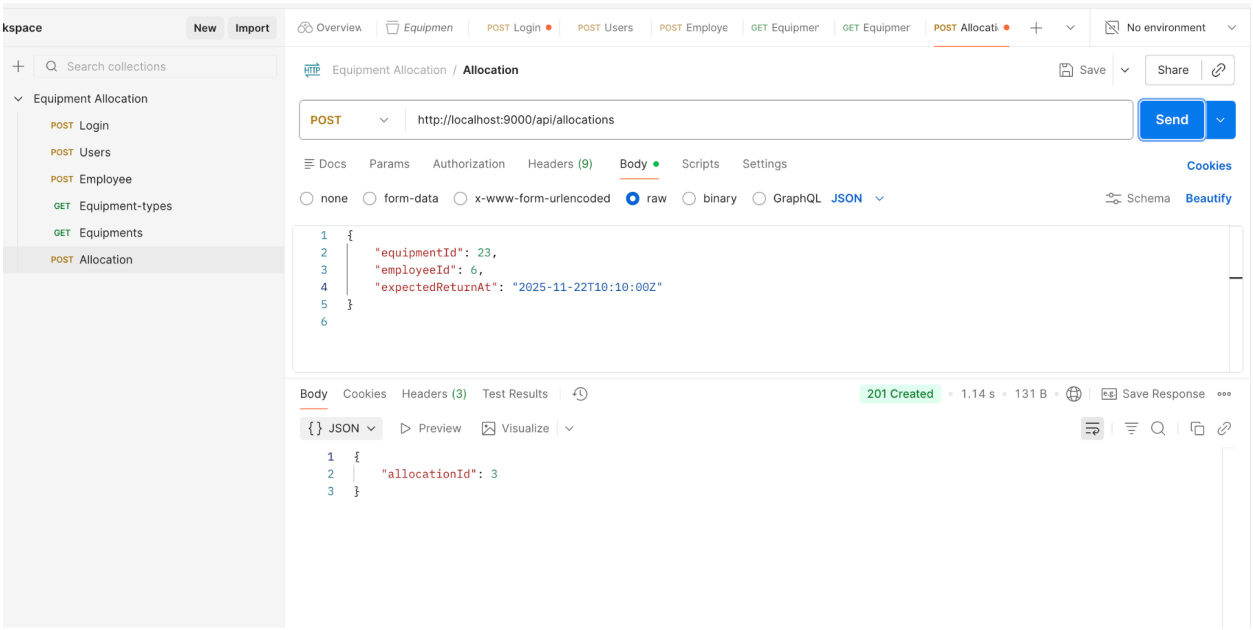
3.5.2 Equipment return as “DAMAGED”, automated notification to Maintenance team and Equipment status as “UNDER MAINTENANCE” and inventory also gets notified

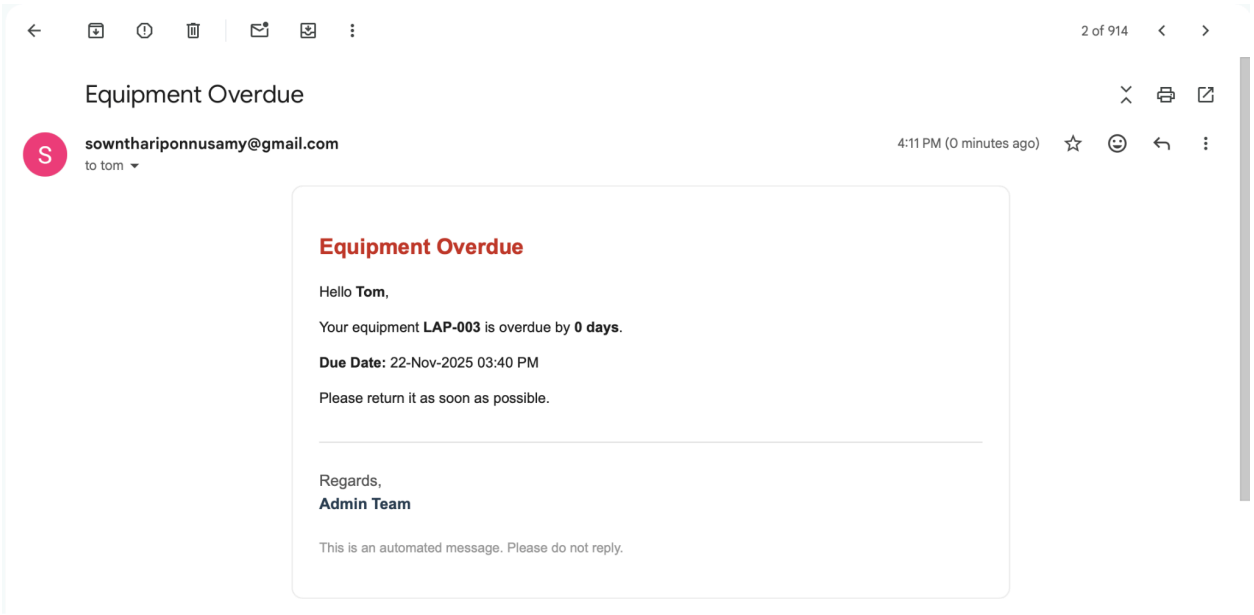




3.6 Overdue Notification

3.6.1 Equipment return on 22.11.2025 3.40PM





3.7 Kafka Consumer logs