

Hospital Equipment Maintenance Monitoring System (HEMMS)

1. Project Idea

The **Hospital Equipment Maintenance Monitoring System (HEMMS)** is a digital solution designed to **track, manage, and maintain hospital equipment efficiently**. Hospitals often rely on manual or paper-based methods, causing challenges like:

- Missed equipment maintenance schedules
- Lack of accountability and tracking
- Longer downtime of critical medical equipment
- Poor decision-making due to limited data
- Higher operational costs

HEMMS solves these problems by providing a centralized system that records equipment information, tracks maintenance history, schedules repairs, assigns technicians, and generates alerts before any maintenance is due. This ensures **efficiency, safety, and better decision-making** in hospital operations.

Target Users:

- Hospital Technicians
- Hospital Administrators
- Maintenance Supervisors
- IT/Database Officers

2. Planned Database Schema

The database will be built using **Oracle Database with PL/SQL procedures, triggers, and functions** for validation, alerts, automation, and data integrity.

Main Database Tables

Table Name	Purpose
Equipment	Store hospital equipment information
Departments	Organize hospital sections and associate equipment
Technicians	Store technician information and specialties
Users	Authentication & user access control
Maintenance	Records all planned maintenance activities
Maintenance_History	Track completed maintenance for reporting & BI
Alerts	System-generated alerts for upcoming maintenance

Example Field Structures

Equipment Table

- EquipmentID (PK)
- Name

- Category
- PurchaseDate
- WarrantyExpiry
- Status
- DepartmentID (FK)

Departments Table

- DeptID (PK)
- DeptName
- Location
- HeadOfDept

Maintenance Table

- MaintenanceID (PK)
- EquipmentID (FK)
- TechnicianID (FK)
- MaintenanceDate
- Cost
- Description

Maintenance_History Table

- HistoryID (PK)
- EquipmentID (FK)
- TechnicianID (FK)
- ActionTaken
- DateFixed
- Cost

Technicians Table

- TechID (PK)
- FullName
- Contact
- Specialty

Alerts Table

- AlertID (PK)
- EquipmentID (FK)
- IssueDescription
- DateReported
- Status

3. Innovation / Improvement

The HEMMS system introduces modern and innovative features:

- ✓ Real-time monitoring of equipment status
 - ✓ Automatic alerts before maintenance deadlines
 - ✓ Digital tracking of repair and maintenance history
 - ✓ Accountability through logs and reports
 - ✓ Data analytics for decision-making (BI)
 - ✓ Use of Oracle PL/SQL for automation & logic control
-

4. Conclusion

The Hospital Equipment Maintenance Monitoring System (HEMMS) will **digitally transform hospital maintenance operations**, making them more efficient, reliable, and sustainable. By reducing equipment downtime, improving tracking, and enabling BI analytics, it will **enhance patient care** and promote technological advancement in Rwandan hospitals.