

# PROJECT REPORT – HRMS & ATTENDANCE MANAGEMENT SYSTEM

## 1. Project Overview

This system is a **Complete Human Resource Management Solution** designed to automate Employee Management, Attendance Tracking, Leave & Permission Workflows, Salary Advance & Loan Processing, and Payroll Generation.

The application supports **four user roles**:

Role	Description
Super Admin	Full system control: configuration, salary rules, departments, HRs & HODs
HR	Manages employees, approvals, payroll processing
HOD	Manages employees under their department, approves requests
Employee	Applies for leaves, permissions, salary advance, views attendance & payslip

The system integrates data from:

- **Biometric Scan Logs (Thumb Machine / MS SQL)**
- **AI-based Face Recognition Logs (Camera Streams → MongoDB)**

Attendance calculations and payroll use **both datasets**.

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## 2. Key Features

### Core HR Management

- Create Departments, Roles, and Employees
- Assign HRs and HODs to Departments
- Maintain Employee Profile & Job Details

### Attendance System

- Real-time biometric attendance sync
- **Future Upgrade:** Camera-based AI attendance (face recognition)
- Hours worked calculation per day/month
- Attendance dashboard for HOD, HR, and employee

### Leave & Permission Workflow

Configurable multi-level approval workflow:

Employee/HOD Apply → HOD Approval → HR Approval → (Optional) Super Admin Final Approval

Leave types include:

- Casual Leave
- Sick Leave
- Paid Leave
- Unpaid Leave

Leave type affects monthly payroll.

## Salary Advance Workflow

Employee/HOD Apply → HOD Approves → HR Approves → Super Admin Grants Payment

Advance amount auto-deducted **next month**.

## Employee Loan Workflow

Employee/HOD Applies → HOD Approves → HR Approves → Super Admin Defines EMI  
→ Monthly Salary Deduction until cleared

## Payroll Management

- Super Admin sets salary structure rules:
  - **Fixed salary**
  - Basic, DA/VDA, HRA, PF, ESI
  - Allowances (Fixed/Percentage)
  - Deductions (Fixed/Percentage)
  - Shifts & working hours rules
- Payroll auto-calculated based on attendance & salary configuration.

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## 3. System Modules & Role Wise Permissions

### 3.1 User & Organization Setup Module

Role	Actions
Super Admin	Create departments, Assign HR & HOD, Create policies
HR	View & manage employee records
HOD/Employee	No access

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### **3.2 Employee Module**

Role	Actions
Super Admin	View/Add/Edit/Assign roles
HR	Add/Update employee data
HOD	Add employee in their department
Employee	View own profile

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### **3.3 Attendance Module**

Role	Actions
Employee	View attendance & hours worked
HOD	View team attendance dashboard
HR	Monitor attendance, override corrections
Super Admin	Configure attendance rules & shift timings

#### **Key Calculation Logic:**

Daily Working Hours = Logout Time - Login Time  
Monthly Hours = Sum of daily hours

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### **3.4 Leave & Permission Module**

Workflow depends on **system setting**:

Config Value	Final Approval Done By
“HR Final”	HR approves, request closes
“Super Admin Final”	Super Admin makes final approval

HOD & HR can apply leave on behalf of employee.

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### **3.5 Salary Advance Module**

Stage	Action
Employee/HOD	Apply with reason & amount
HOD	First approval
HR	Second approval
Super Admin	Final grant → Payment released
Payroll	Deduct next month salary automatically

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### **3.6 Loan Module**

Same approval chain, but **Super Admin selects EMI amount/time** → monthly auto-deduction.

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### **3.7 Payroll Module**

**Super Admin Configures:**

- Shift rules
- Allowances (fixed/percentage)
- Deductions (fixed/percentage)
- Employee type wise rules

**Payroll Engine Automatically:**

Takes: Salary Structure + Attendance + Advance/Loan  
Outputs: Net Salary + Payslip

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## **4. Internal Processing Engines**

<b>Engine</b>	<b>Function</b>
Attendance Aggregator	Combines biometric + camera logs, determines IN/OUT timestamps
Payroll Calculation Engine	Applies earnings, allowances, deductions, advances, loan EMI
Leave Policy Engine	Enforces leave rule approval based on company configuration
Face Recognition Engine (Separate App)	Detects employee presence in cameras based on face embeddings

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## **5. Camera-Based Attendance Module (Separate Application)**

**Workflow:**

IP Camera Streams → Face Detection → Face Recognition AI → Appearance Logs  
Stored in MongoDB → Attendance Aggregator merges with Biometric Logs

- Each face appearance is time-stamped and mapped to camera location.
- First appearance = Login time
- Last appearance = Logout time
- Integrated in monthly attendance dashboard

## **Data Storage Structure:**

<b>Data Type</b>	<b>Database</b>
Employee Records, Salary, Leave, Payroll	<b>MS SQL</b>
Camera Detection Logs + Recognition Metadata, Salary, Leave, Payroll	<b>MongoDB</b>

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## **End Result**

A robust, modular HRMS platform capable of:

- Multi-role HR operations
- Accurate attendance tracking
- Automated payroll with rule-based configuration
- AI-based expansion-ready architecture