Project Proposal

On

Employee Management System

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Course Code : ITPR	**Course Code :** ITPR

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1. Title of the Project

Employee Management & Payroll System

2. Introduction

The **Employee Management & Payroll System** is designed to automate and streamline the tasks related to employee information, attendance, salary calculation, payroll processing, leave management, and departmental structure.
This system reduces manual work, minimizes calculation errors, centralizes data, and increases organizational efficiency.

The project is built using:

- **Java** for application logic
- **JDBC** for database connectivity
- **MySQL** for database management
- **Maven** for dependency management and project structure

3. Objectives

- To maintain centralized records of employees, departments, and payroll.
- To automate monthly salary calculations based on attendance and leaves.
- To reduce human errors in payroll computation.
- To generate payslips, daily attendance reports, and salary reports.
- To provide secure CRUD operations for HR/Admin users.
- To build a scalable, modular, Maven-based Java application.

4. Project Category

Database Management System (DBMS)
Tech Stack: *Java + JDBC + MySQL + Maven*

This project is categorized under DBMS-based application development because it integrates Java, JDBC, and MySQL to store, process, and retrieve structured data efficiently.

5. Analysis

5.1 Modules and Description

1. Employee Management Module

The Employee Management Module handles the complete lifecycle of an employee within the organization. It is the core module responsible for storing and managing employee information such as personal details, contact data, designation, joining date, department mapping, and salary structure.

The module supports CRUD operations (Create, Read, Update, Delete) and ensures that all employee-related data remains accurate and updated. Any changes made here reflect across attendance, leave, and payroll modules since employee_id acts as a key reference.

Key Features:

- Add new employee records
- Update or delete existing employee details
- Manage designation, salary, and employment status
- Link employee to department
- Maintain secure and structured employee database

2. Department Management Module

The Department Management Module organizes employees into structured units such as HR, IT, Accounts, Operations, etc. It ensures that each employee belongs to an appropriate department and allows administrators to maintain departmental hierarchy.

Key Features:

- Create and manage departments
- Assign department heads or managers
- Map employees to departments
- Retrieve department-wise employee lists
- Maintain hierarchical organization structure

3. Attendance Management Module

This module records daily attendance of employees and is crucial for payroll calculation. It stores attendance parameters like in-time, out-time, presence status, and daily attendance validation. It ensures accurate tracking, prevents duplicate entries, and generates monthly attendance summaries for payroll processing.

Key Features:

- Mark daily attendance (present/absent/half-day)
- Validate duplicate entries for the same day
- Capture in-time and out-time
- Maintain attendance logs in the database
- Generate monthly attendance reports
- Provide attendance data to payroll module

4. Leave Management Module

The Leave Management Module enables employees to request different types of leaves such as Sick Leave, Casual Leave, Earned Leave, or Unpaid Leave. Managers/Admins can review these requests and approve or reject them. The leave status directly affects attendance and payroll (LWP calculation).

Key Features:

- Submit leave applications
- Manager/Admin approval workflow
- Track leave history and leave balances
- Update attendance automatically for approved leaves
- Handle LWP (Leave Without Pay) cases
- Integrate with payroll for deductions

5. Payroll Calculation Module

This module is the financial engine of the system. It computes the monthly salary of each employee based on attendance, leave records, and the defined salary structure. It calculates earnings (Basic, HRA, Allowances) and deductions (PF, Tax, Professional Tax, LWP), and generates net salary. Payslips are produced and stored in the payroll database.

Key Features:

- Analyze attendance to compute working and absent days
- Calculate gross earnings
- Apply statutory deductions (PF, Tax, PT)
- Compute LWP-based deductions
- Generate net salary
- Store payroll records for each month
- Generate downloadable payslips

6. Admin/Authentication Module

This module acts as the security and control layer of the system. It manages user authentication and role-based access. Admins have full control over employees, departments, and payroll, while Managers and Employees have limited functionalities based on their roles.

Key Features:

- Secure login with credentials
- Role-based access control (Admin, Manager, Employee)
- Maintain user accounts and permissions
- Manage activity logs through audit tracking
- Prevent unauthorized access
- Connects every module to authenticated user sessions

7. Report Generation Module

The Report Generation Module provides analytical and administrative insights by generating various reports based on employees, attendance, payroll, and departments. These reports assist the management in decision-making and auditing.

Key Features:

- Attendance reports (daily/monthly)
- Employee-wise payroll reports
- Department-wise salary expenditure reports
- Leave summary reports
- Export reports in PDF/CSV formats
- Fetch real-time data from multiple modules

5.2 Database Design

1) DEPARTMENT

Column	**Datatype**	**Key / Constraint**
dept_id	INT	Primary Key (PK), Auto Increment
dept_name	VARCHAR(100)	Unique, Not Null
manager_emp_id	INT	Foreign Key (FK) → employee(emp_id), Nullable

2) EMPLOYEE

Column	Datatype	Key / Constraint
emp_id	INT	Primary Key (PK), Auto Increment
emp_code	VARCHAR(20)	Unique, Not Null
first_name	VARCHAR(80)	Not Null
last_name	VARCHAR(80)	Nullable
email	VARCHAR(150)	Unique, Not Null
Column	Datatype	Key / Constraint
mobile	VARCHAR(20)	Nullable
dept_id	INT	Foreign Key (FK) → department(dept_id)
designation	VARCHAR(80)	Not Null
date_of_join	DATE	Not Null
basic_salary	DECIMAL(12,2)	Not Null
status	ENUM('ACTIVE','INACTIVE','TERMINATED')	Default: ACTIVE
created_at	DATETIME	Not Null
updated_at	DATETIME	Nullable

3) USERS

Column	Datatype	Key / Constraint
user_id	INT	Primary Key (PK), Auto Increment
username	VARCHAR(80)	Unique, Not Null
password_hash	VARCHAR(255)	Not Null
emp_id	INT	Foreign Key (FK) → employee(emp_id)
role	ENUM('ADMIN','HR','USER')	Default: USER
last_login	DATETIME	Nullable

4) ATTENDANCE

Column	Datatype	Key / Constraint
attendance_id	INT	Primary Key (PK), Auto Increment
emp_id	INT	Foreign Key (FK) → employee(emp_id)
attendance_date	DATE	Not Null
status	ENUM('P','A','L','WO')	Not Null
Column	Datatype	Key / Constraint
in_time	TIME	Nullable
out_time	TIME	Nullable
hours_worked	DECIMAL(5,2)	Nullable
unique_record	emp_id + attendance_date	Unique

5) LEAVE_DETAILS

Column	Datatype	Key / Constraint
leave_id	INT	Primary Key (PK), Auto Increment
emp_id	INT	Foreign Key (FK) → employee(emp_id)
leave_type	VARCHAR(50)	Not Null
start_date	DATE	Not Null
end_date	DATE	Not Null
num_days	DECIMAL(5,2)	Not Null
status	ENUM('APPLIED','APPROVED','REJECTED')	Default: APPLIED
applied_on	DATETIME	Not Null
approved_by	INT	Foreign Key (FK) → users(user_id)

6) PAYROLL

Column	Datatype	Key / Constraint
payroll_id	INT	Primary Key (PK), Auto Increment
emp_id	INT	Foreign Key (FK) → employee(emp_id)
year	YEAR	Not Null
month	TINYINT	Not Null (1–12)
basic	DECIMAL(12,2)	Not Null
Column	Datatype	Key / Constraint
total_allowances	DECIMAL(12,2)	Not Null
total_deductions	DECIMAL(12,2)	Not Null

gross_salary	DECIMAL(12,2)	Computed / Stored
net_salary	DECIMAL(12,2)	Not Null
generated_on	DATETIME	Not Null
unique_record	emp_id + year + month	Unique

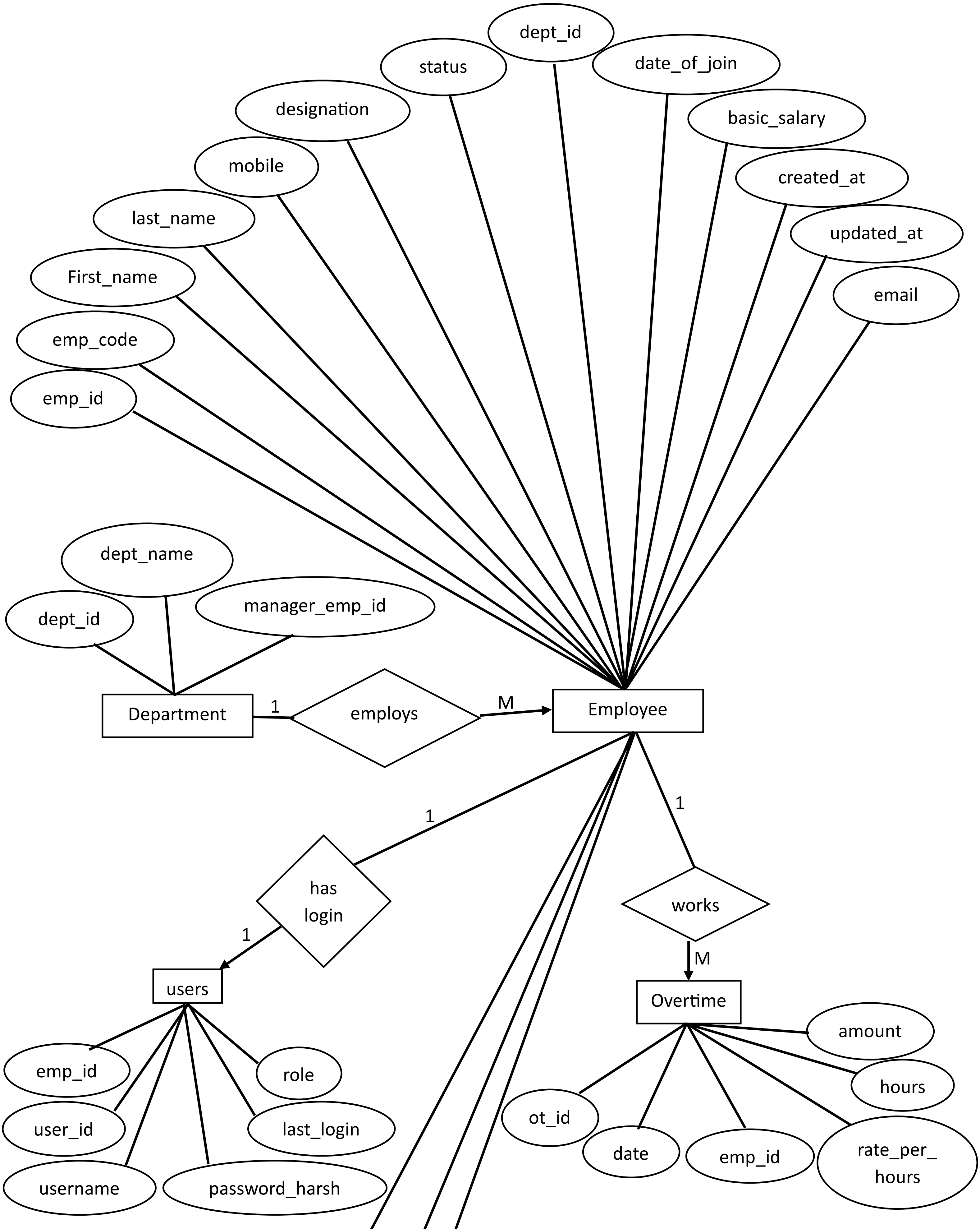
7) PAYROLL_COMPONENTS

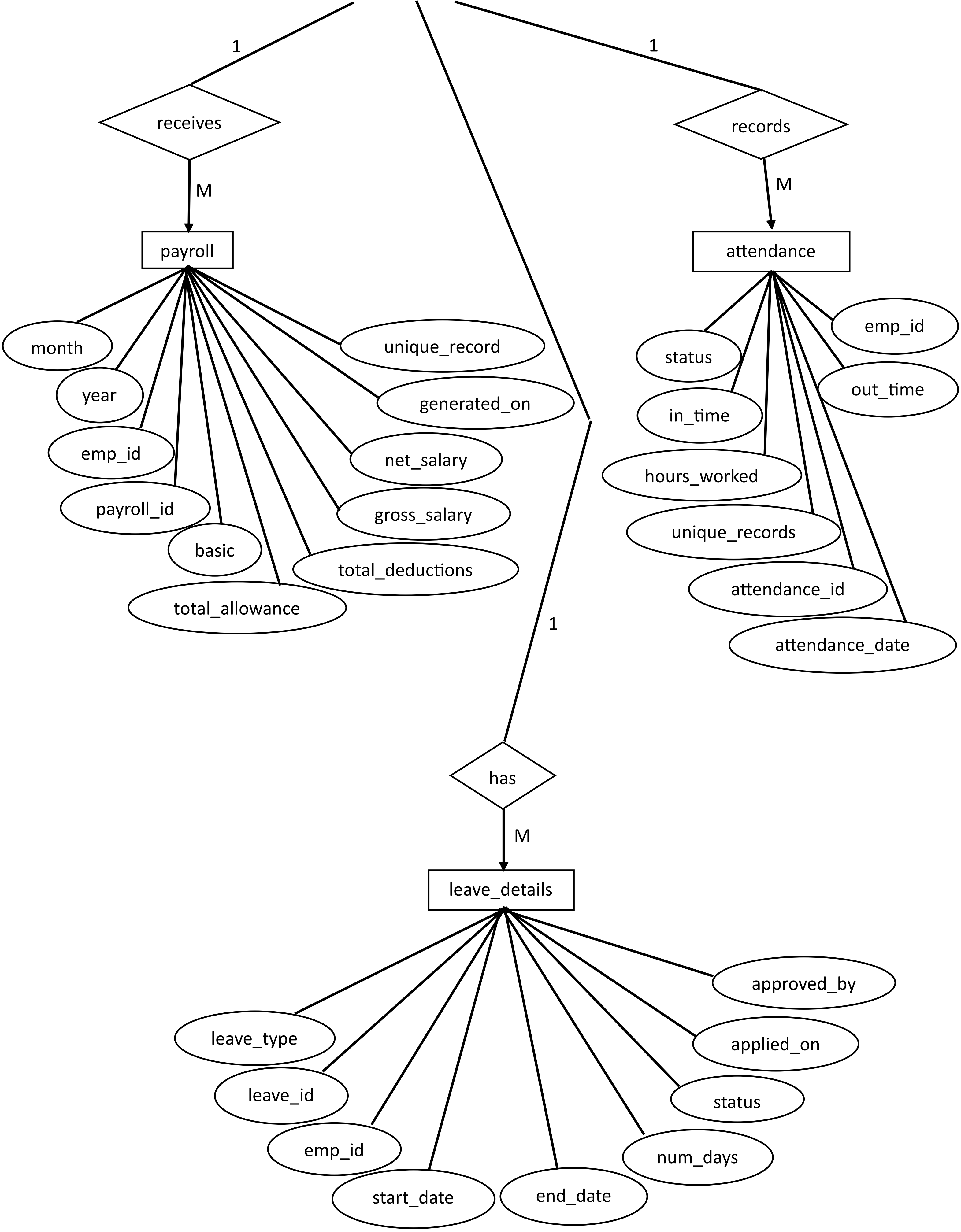
Column	Datatype	Key / Constraint
component_id	INT	Primary Key (PK), Auto Increment
payroll_id	INT	Foreign Key (FK) → payroll(payroll_id)
component_type	ENUM('ALLOWANCE','DEDUCTION')	Not Null
component_name	VARCHAR(100)	Not Null
amount	DECIMAL(12,2)	Not Null

8) OVERTIME

Column	Datatype	Key / Constraint
ot_id	INT	Primary Key (PK), Auto Increment
emp_id	INT	Foreign Key (FK) → employee(emp_id)
date	DATE	Not Null
hours	DECIMAL(5,2)	Not Null
rate_per_hour	DECIMAL(10,2)	Not Null
amount	DECIMAL(12,2)	Computed

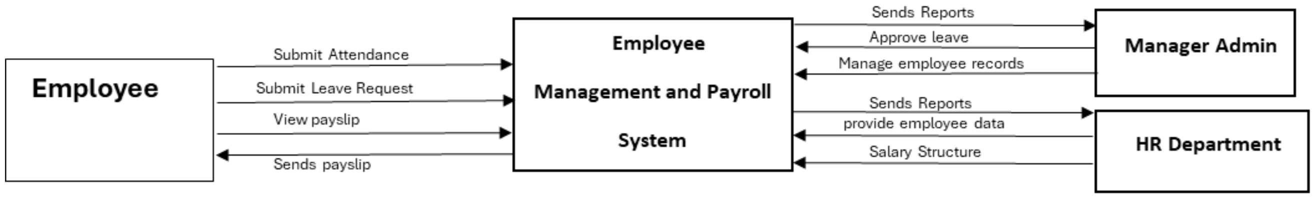
5.3 ER Diagram



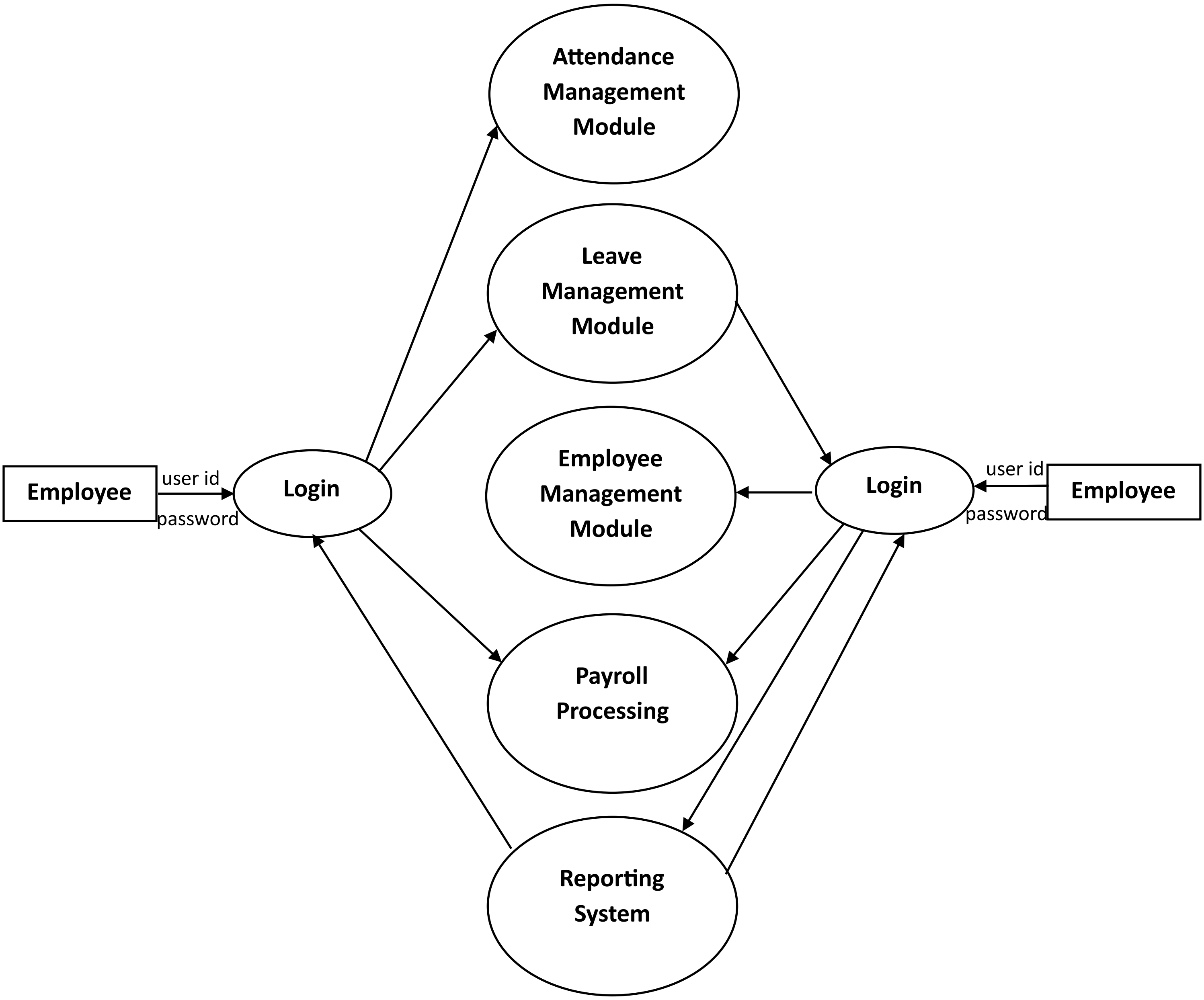

1
1
receives
records
M
M
payroll
attendance
month
year
emp_id
payroll_id
basic
total_allowance
total_deductions
gross_salary
net_salary
generated_on
unique_record
status
in_time
hours_worked
unique_records
attendance_id
attendance_date
emp_id
out_time
1
has
M
leave_details
leave_type
leave_id
emp_id
start_date
end_date
num_days
status
applied_on
approved_by

5.4 Data Flow Diagram (DFD)

Level 0 DFD



Level 1 DFD



6. Complete Structure

Process Logical Diagram

Login → Dashboard

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Employee Management → Add/Update/Delete Employees

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Attendance Management → Mark Attendance

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Payroll Management → Calculate Salary → Generate Payslip

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Reports → View/Print Reports

7. Platform Used

Hardware Requirements

- Processor: Intel i5
- RAM: 16GB
- Storage: 1GB free

Software Requirements

- Windows
- JDK 17+
- MySQL Server
- MySQL Workbench
- Maven
- IDE: Eclipse

8. Future Scope

- Biometric attendance integration
- Web-based or mobile-friendly version
- Auto email delivery of salary slip
- PF/ESI automation
- Cloud database connectivity
- Integration with HR analytics tools

9. Bibliography

- Oracle Java Documentation
- MySQL Reference Manual
- Maven Official Documentation
- JDBC API Documentation
- GeeksforGeeks