Review 1

Payroll Management System: Entity Relationship Diagram Report

Introduction:

The Payroll Management System (PMS) is designed to automate and streamline salary calculations, tax deductions, employee attendance, leave management, and other payroll-related operations within an organization. This system efficiently handles employee records, salary distribution, tax calculations, deductions, and bonuses. The Entity Relationship Diagram (ERD) provides a structural representation of the entities involved in payroll management and their relationships.

Problem Statement:

Managing payroll manually is a complex and time-consuming task that can lead to errors in salary calculations, incorrect tax deductions, and inefficient leave management. Organizations often struggle with:

- Maintaining accurate employee records, including bank details, salary structure, and tax information.
-Managing attendance records and leave requests efficiently.
- Automating payroll processing to ensure timely payments and compliance with tax regulations.
-Ensuring security and confidentiality of payroll data.

A Payroll Management System aims to address these challenges by automating payroll operations, improving accuracy, and ensuring seamless financial management for employees and employers alike.

Entities and Attributes

Employees

- Stores details of employees working in the organization.
- - Employee_ID (Primary Key)
- - Employee_Name ● - Employee_Address

- - Employee_Phone No.
- - Employee_DOB

Department

- Represents different departments within the organization.
- - Department_ID (Primary Key)
- - Department_Name
- - Department_Location

Attendance

- Records the check-in and check-out times of employees.
- - Attendance_ID (Primary Key)
- - Employee_ID (Foreign Key)
- - Check-in, Check-out

Bank Details

- Contains employee bank account details for salary transactions.
- - Bank_ID (Primary Key)
- - Employee_ID (Foreign Key)
- - Account_No

Salary

- Stores salary details of employees.

Salary_employeeID (Primary Key)

- - Salary_Final Amount
- - Salary_Desc

Tax

- Holds tax-related details applicable to employee salaries.
- - Tax_ID (Primary Key)
- - Tax_Percentage
- - Tax_Amount

Employer

- Maintains details of the employer handling payroll management.
- - Employer_ID (Primary Key)
- - Employer_Name
- - Employer_Phone No.
- - Yearly_package

Deductions

- Tracks salary deductions such as taxes or penalties.
- - Deduction_ID (Primary Key)
- - Amount
- - Reason

Payroll

- Manages payroll processing for employees.
- - Pyrl_ID (Primary Key)
- - Pyrl_Type
- - Pyrl_Final Amount

Bonus

- Stores details of bonuses given to employees.

- - Bonus_ID (Primary Key)

  Employee_ID (Foreign Key)
- - Amount

Shift

- Records employee shift schedules.
- - Shift_ID (Primary Key)
- - Employee_ID (Foreign Key)
- - Shift_Type (Morning/Evening/Night)

Leave Details

- Contains information about employee leave records.
- - Leave_ID (Primary Key)
- - Employee_ID (Foreign Key)
- - Leave_Type
- - Leave_Desc

Payment

- Manages salary payments and transactions.
- - Payment_ID (Primary Key)
- - Transaction_ID
- - Payment_Mode

User

- Represents system users who manage payroll operations.
- - User_ID (Primary Key)
- - User_Name
- - User_Mobile

Login

- Stores login credentials and history of system users.
- - User_ID (Primary Key, Foreign Key)
- - Password

Login History

Relationships:

1. **Employee - Department (Many-to-One)**

- Many employees belong to one department.

2. **Employee - Attendance (One-to-Many)**

- An employee has multiple attendance records (daily check-in/check-out).

3. **Employee - Bank Details (One-to-One)**

- Each employee has one bank account linked for salary transactions.

4. **Employee - Salary (One-to-One)**

- Each employee has a fixed salary record.

5. **Employee - Tax (One-to-One)**

- Each employee has a tax deduction record based on salary.

6. **Employer - Payroll (One-to-Many)**

- An employer manages payroll for multiple employees.

7. **Employee - Bonus (One-to-Many)**

- An employee can receive multiple bonuses.

8. **Employee - Shift (One-to-Many)**

- An employee can work in different shifts (morning, evening, night).

9. **Employee - Leave Details (One-to-Many)**

- An employee can have multiple leave records.

10. Employee - Payment (One-to-One)

- Each employee has a unique payment transaction for salary processing.

11. User - Login (One-to-One)

- Each user (employee/employer) has a unique login ID and credentials.

12. Payroll - Deductions (One-to-Many)

- A payroll entry may have multiple deductions (tax, penalties, etc.).

13. Payroll - Payment (One-to-One)

- Each payroll entry results in a single payment transaction.

14. Payroll - Bonus (One-to-Many)

- Payroll can include multiple bonuses for different employees.

15. Employee - Payroll (One-to-Many)

- One employee can have multiple payroll records (monthly salary, overtime, etc.).

Generalization and Specialization:

Generalization:

- **User** is a generalized entity that includes both **Employees** and **Employers** since both interact with the system.
- **Employee** is a generalized entity for all staff members, including **Shift Employees, Salary-Based Employees, and Contract-Based Employees** as they share common attributes like Employee ID, Name, and Department.

Specialization:

- **Employee** specializes into:
  - **Shift Employees** (working in different shifts: morning, evening, night)
  - **Salary-Based Employees** (fixed monthly salary) ○ **Contract-Based Employees** (paid per project or work duration)
- **Payroll** specializes into:
  - **Regular Payroll** (fixed salary distribution) ○ **Bonus Payroll** (additional payments for performance) ○ **Deductions** (for tax, penalties, or other salary cuts)