Employee Attendance Management System

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1 Introduction

The purpose of the Employee Attendance Management System is to automate and simplify the process of tracking employee attendance in an organization. The goal of this thorough examination of the project specifications is to create a strong foundation for the domain and open the door for efficient database architecture.

A visual depiction of the relationships between entities in a system is called an entity-relationship (ER) diagram. Making an ER diagram for an Employee Attendance Management System (EAMS) is an essential first step in figuring out the links and structure of the database. This diagram acts as a guide for building a reliable and effective database that precisely records all of the many facets of tracking employee attendance.

2 Overview

An essential part of human resource management is the employee attendance management system, which is made to automate and simplify the tracking of workers' attendance inside a company. This system helps decision-making processes pertaining to employee attendance, improves effective workforce management, and assures accurate record-keeping.

3 Relevance

In the modern workplace, where organizations are increasingly adopting flexible work arrangements, remote work, and diverse attendance policies, an efficient attendance management system becomes essential. The system provides benefits such as:

- By automating attendance tracking, inaccuracies in capturing attendance data are minimized and manual labor is reduced.
- Enables adherence to labor rules and regulations by precisely recording attendance.

- Gives managers the information they need to decide how best to distribute their workers and maximize output.
- An open attendance policy encourages responsibility and confidence among staff members.
- Sturdy reporting tools help with strategic workforce planning by offering insightful information about attendance trends.

4 Requirement Analysis

4.1 Stakeholders

1. **Employees**: Require easy and convenient attendance marking methods and access to personal attendance records.
2. **Managers**: Need tools to monitor team attendance, analyze patterns, and make informed decisions.
3. **Administrators**: Responsible for system configuration, ensuring security, and generating organizational insights through reporting.

4.2 Requirements

1. **User Authentication and Authorization**: Secure login for different user roles.
   Role-based access control for administrators, managers, and employees.
2. **Attendance Tracking**: Multiple methods for attendance marking (biometric, mobile app, etc.).
   Automated recording of attendance based on defined rules.
3. **Leave Management**: Request and approval of leaves with integration into attendance calculations.
4. **Reporting and Analytics**: Generate individual and team attendance reports.
   Customizable reports for date ranges, departments, etc.
5. **Employee Information Management**: Central repository for employee details.
   Consistent data across the system.

5 Entities

5.1 Employee

Information on the organization's personnel is kept in the "Employee" database. Each row in this table represents a distinct employee and contains information

on that employee, including name, date of birth, employee ID, address, and contact data.

5.1.1 Attributes

Employee_Id:

- Type: varchar
- Description: A unique identifier is assigned to each employee. This serves as the primary key of the table.
- The constraint is that the primary key is not null.

Employee_Firstname:

- Type: varchar
- Description: This field stores the first name of the employee.

Employee_Lastname:

- Type: varchar
- Description: This field stores the last name of the employee.

DOB:

- Type: timestamp
- Description: This field stores the date of birth of each employee.

Email:

- Type: varchar
- Description: This field stores the email address of employees for communication purposes.

Phone_Number:

- Type: integer
- Description: This field stores the phone number of each employee for communication purposes.

Address:

- Type: varchar
- Description: This field stores the address of each employee.

5.2 Department

Information pertaining to the many departments inside the company is kept in the "Department" table. With the help of a department ID and other information, each record in this table represents a distinct department and contains information such the department name.

5.2.1 Attributes

Dept_Id:

- Type: varchar
- Description: A unique identifier assigned to each department. This serves as the primary key for the table, ensuring the uniqueness of each department record.

Dept_Name:

- Type: varchar
- Description: This field stores the official name or designation of the department within the organization.

5.3 Job Title

Information on different job titles or roles inside the company is captured in the "JobTitle" database. This table's records each correspond to a distinct job title, denoted by a job ID. The records also contain information about the position, including its name, department ID, and employee ID.

5.3.1 Attributes

Job_Id:

- Type: varchar
- Description: A unique identifier assigned to each job title. This serves as the primary key for the table.

Employee_Id:

- Type: varchar
- Description: The identifier of the employee holding the specified job title. This field serves as a foreign key referencing the Employee table.

Job_Name:

- Type: varchar

- Description: The name or designation of the job title. This field stores the official title or position name associated with the job.

Dept_Id:

- Type: varchar
- Description: The identifier of the department to which the job title belongs. This field serves as a foreign key referencing the Department table.

5.4 Attendance

Data on employee attendance is entered into and maintained by the "Attendance" table. With the use of a punch ID, each record in this table signifies a distinct attendance entry. Information such as the employee ID, check-in and check-out timestamps, and the length of the attendance are all included.

5.4.1 Attributes

Punch_Id:

- Type: varchar
- Description: A unique identifier assigned to each attendance entry. This serves as the primary key for the table.

Employee_Id:

- Type: varchar
- Description: The identifier of the employee associated with the attendance entry. This field serves as a foreign key referencing the Employee table.

Check_In:

- Type: timestamp
- Description: The timestamp when the employee checked in for attendance. This field captures the exact time the employee began the workday.

Check_Out:

- Type: timestamp
- Description: The timestamp when the employee checked out at the end of the workday. This field captures the exact time the employee finished work.

Duration:

- Type: timestamp
- Description: The total duration of the employee's attendance, calculated as the difference between check-out and check-in timestamps.

5.5 Attendance Report

Condensed data about staff attendance and performance is intended to be stored in the "Attendance_Report" table. With the use of a report ID, each row in this table represents a distinct attendance report that contains information about the employee, including their ID, total number of hours worked, number of leaves taken, and associated remuneration.

5.5.1 Attributes

Report_Id:

- Type: varchar
- Description: A unique identifier assigned to each attendance report. This serves as the primary key for the table, ensuring the uniqueness of each record.

Employee_Id:

- Type: varchar
- Description: The identifier of the employee associated with the attendance report. This field serves as a foreign key referencing the Employee table.

Total_Labor:

- Type: Integer
- Description: The total number of labor hours worked by the employee. This field represents the cumulative hours of attendance recorded during a specific reporting period.

NoOf_Leaves:

- Type: integer
- Description: The number of leaves taken by the employee during the reporting period. This field provides insights into the employee's leave utilization.

Salary:

- Type: integer
- Description: The calculated salary for the employee based on attendance and leave data. This field represents the financial compensation corresponding to the total labor hours.

Month:

- Type: integer

- Description: This field represent the month in which a particular report is generated.

Year:

- Type: integer
- Description: This field represent the year in which a particular report is generated.

5.6 Check Type

Information regarding the different kinds of checks or events connected to attendance records is intended to be stored in the "CheckType" table. With the help of a check type ID, each record in this database represents a distinct check type and contains information about it, such as its name or designation and the punch ID that goes along with it.

5.6.1 Attributes

CheckType_Id:

- Type: varchar
- Description: A unique identifier assigned to each check type. This serves as the primary key for the table.

Punch_Id:

- Type: varchar
- Description: The identifier of the attendance punch associated with the check type. This field serves as a foreign key referencing the Attendance table.

CheckType_Name:

- Type: varchar
- Description: The name or designation of the check type. This field stores information about the specific type of check, such as "Check-In" or "Check-Out."

5.7 On Duty

The purpose of the "OnDuty" database is to record data about employees' on-duty assignments, including the length and dates of on-duty periods. The employee ID, the length of the on-duty period, and the date of the on-duty entry are among the characteristics that are included in each record in this table, which is uniquely recognized by an on-duty ID.

5.7.1 Attributes

OnDuty_Id:

- Type: varchar
- Description: A unique identifier assigned to each on-duty entry. This serves as the primary key for the table, ensuring the uniqueness of each record.

Employee_Id:

- Type: varchar
- Description: The identifier of the employee associated with the on-duty entry. This field serves as a foreign key referencing the Employee table.

OnDuty_Duration:

- Type: timestamp
- Description: The duration of the on-duty assignment. This field represents the time spent on duty by the employee during a specific on-duty period.

OnDuty_Date:

- Type: timestamp
- Description: The date of the on-duty assignment. This field captures the specific date on which the on-duty activity took place.

5.8 Leave

The "Leave" table is intended to hold data pertaining to workers' requests for leaves of absence, keeping note of the employee ID, leave ID, and leave date. The employee ID requesting the leave and the precise date for which the leave is sought are among the details included in each record in this table, which represents a unique leave entry denoted by a leave ID.

5.8.1 Attributes

Leave_Id:

- Type: varchar
- Description: A unique identifier assigned to each leave entry. This serves as the primary key for the table, ensuring the uniqueness of each record.

Employee_Id:

- Type: varchar

- Description: The identifier of the employee requesting the leave. This field serves as a foreign key referencing the Employee table.

Leave_Date:

- Type: timestamp
- Description: The date for which the leave is requested. This field captures the specific date on which the employee plans to be on leave.

6 ER Diagram

These tables below provide the complete database table details such as Field Name, data types, and character lengths. Each of these tables represents the characteristics and the attributes of data storage.

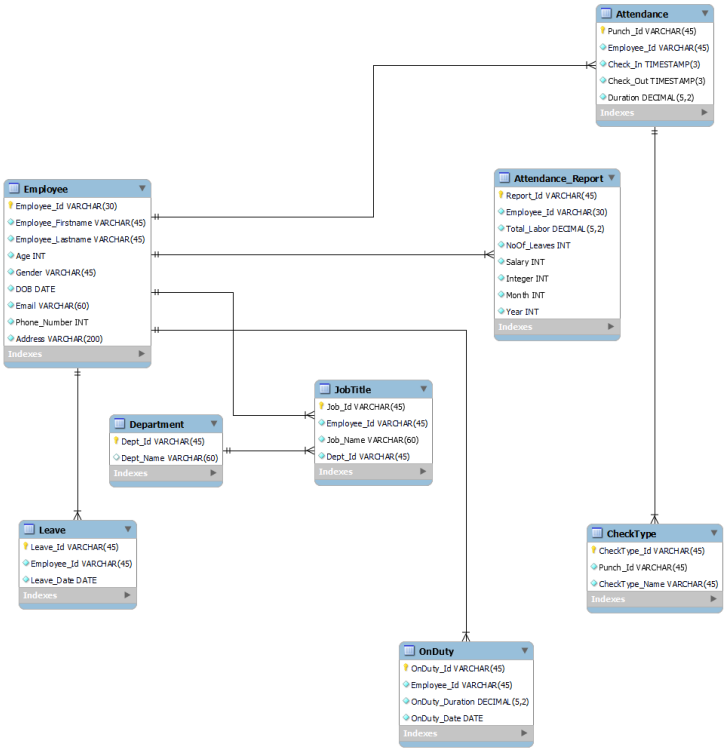

Figure 1: ER Diagram of Employee Attendance Management System