National University
of computer and emerging sciences

Foundation of Advancement
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Employee Attendance Management System

PROJECT REPORT

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Database Systems (CS-2005)

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- Project Background

In the dynamic world of corporate operations, efficient management of employee attendance is crucial for an organization's success. The genesis of this project lies in the challenges many companies face in effectively tracking and monitoring employee attendance, which often leads to issues such as absenteeism, decreased productivity, and lack of transparency. The need for a comprehensive and user-friendly system has led to the development of the Employee Attendance Management System. This platform aims to streamline the process of recording, supervising, and analyzing employee attendance, thereby fostering a disciplined and productive work environment.

- Project Scope

The Employee Attendance Management System project is focused on developing an online platform that optimizes the process of attendance tracking within an organization. The key functionalities encompass attendance recording, absence tracking, rectification of incorrect entries, user authentication, and database management. The system is designed to provide a comprehensive solution that enables authorized personnel to manage attendance effectively, fostering responsibility and timely adherence to work schedules. The system will intentionally omit any features that are not directly associated with attendance management.

- Schema

Unormalized Form

database_record {
  id,
  manager_name,
  manager_email,
  manager_password,
  employee_name,
  employee_email,
  employee_password,
  employee_salary,
  employee_address,
  job_id,
  job_title,
  department_id,
  department_name,
  attendance_in_time,
  attendance_date,
  attendance_status,
  leave_id,
  leave_start_date,
  leave_end_date,
  leave_reason,
  leave_status
}

Normalized form

managers {
  id (PK), // primary key
  name,
  email,
  password
}

employees {
  id (PK), // primary key
  name,
  email,
  password,
  salary,
  address,
  job_id (FK), // foreign key
  department_id (FK) // foreign key
}

attendance {
  employee_id (FK), // foreign key
  in_time,
  attendance_date,
  status
}

departments {
  id (PK), // primary key
  name,
  manager_id (FK) // foreign key
}

jobs {
  id (PK), // primary key
  title
}

leaves {
  id (PK), // primary key
  employee_id (FK), // foreign key
  start_date,
  end_date,
  reason,
  status
}

First Normal Form (1NF): A relation is in 1NF if it contains an atomic value for each attribute in a record. It should also contain a primary key.

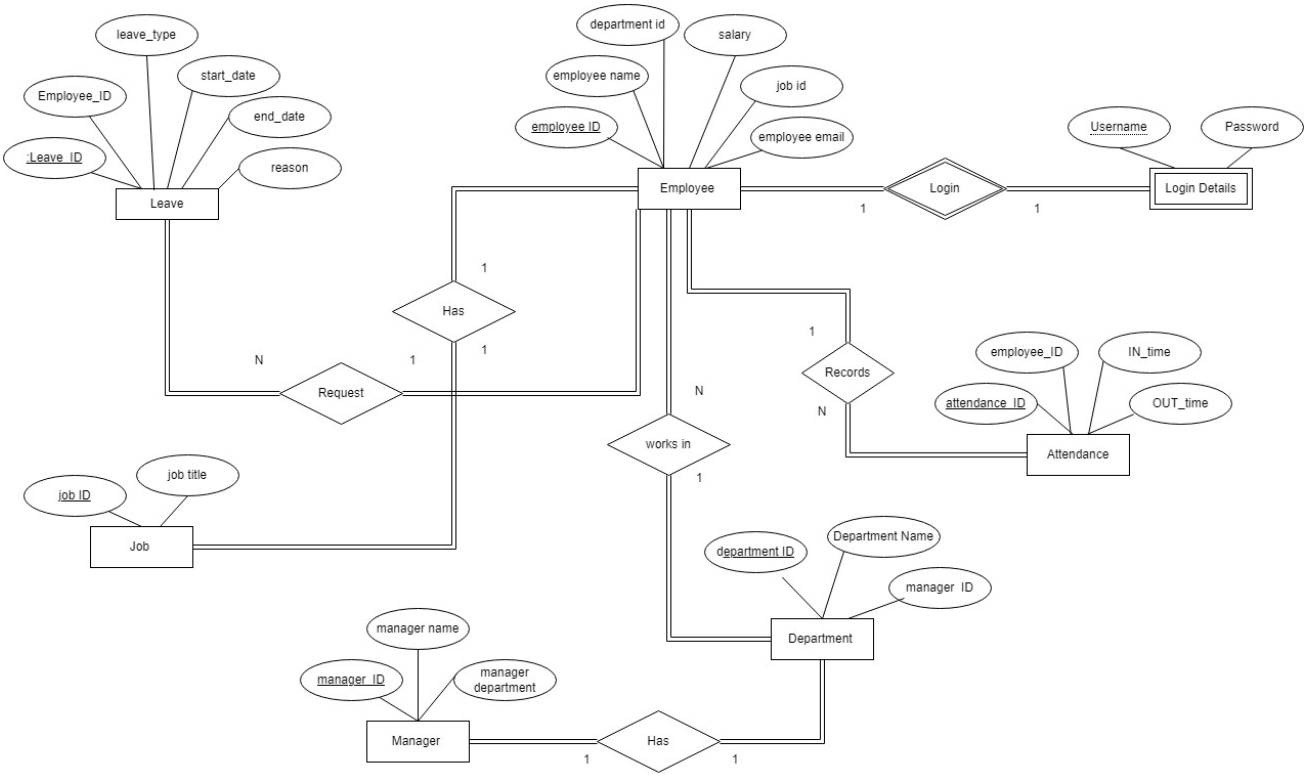
Second Normal Form (2NF): A relation is in 2NF if it is in 1NF and every non-prime attribute of the relation is dependent on the whole of a candidate key.

The tables are already in 2NF as there is no partial dependency.

Third Normal Form (3NF): A relation is in 3NF if it is in 2NF and no non-prime attribute of the relation is transitively dependent on the primary key.

The tables are already in 3NF as there is no transitive dependency.

ER Diagram



- Project Working

The Employee Attendance Management System is a robust online platform designed to facilitate efficient tracking and management of employee attendance within an organization. The system is structured around several key tables, each serving a unique function:

- **Managers**: This table stores essential information about the managers in the organization, including their unique ID, name, email, and password. This data is crucial for system access and management tasks.

- **Employees**: This table holds comprehensive details about the employees, such as their unique ID, name, email, password, salary, address, job ID, and department ID. This information is vital for attendance tracking and payroll calculations.

- **Attendance**: This table logs the attendance details of each employee, including their ID, check-in time, date of attendance, and status. This data is critical for monitoring employee punctuality and productivity.

- **Departments**: This table contains information about the various departments within the organization, including their unique ID, name, and the ID of the manager in charge. This data helps in organizing the workforce and assigning responsibilities.

- **Jobs**: This table captures data about the different job roles in the organization, each with a unique ID and title. This information is important for defining roles and responsibilities within the organization.

- **Leaves**: This table tracks leave requests made by employees, including the unique ID of the request, the ID of the employee making the request, the start and end dates of the leave, the reason for the leave, and the status of the request. This data is essential for managing employee leaves and ensuring smooth operations.

- Functional Hierarchy

For the Employee Attendance Management System project, the restructured functional hierarchy is:

• User Authentication

  – Sign In

  – Sign Out

• Attendance Tracking

  – Record Attendance

  – Review Attendance

  – Approve Absence

  – Modify Attendance Entry

  – Remove Attendance Entry

• Employee Directory (for managers)

  – Register Employee

  – Add Employee

  – Browse Employee Records

  – Update Employee Information

  – Terminate Employee Record

- Attendance Reporting (for managers)
  - Generate Attendance Report
  - Access Attendance History
  - Edit Attendance Report
  - Discard Attendance Report
- Employee Interface
  - Access Personal Profile
  - Check Attendance Status
  - Confirm Attendance

This hierarchy outlines the primary operations of the Employee Attendance Management System and its organizational structure.

One of the standout features of this system is the attendance request functionality. When an employee makes a request, the time and date of the request are sent to the manager for approval. The manager has the authority to approve or disapprove the request, promoting accountability and transparency.

Similarly, the system follows the same process for leave requests. Managers are empowered with the ability to update, delete, and add new employees, ensuring that the organization's records are always current and accurate.

By focusing solely on features directly associated with attendance management, the system maintains its efficiency and effectiveness. The Employee Attendance Management System aims to foster a disciplined, transparent, and productive work environment, thereby contributing to the overall success of the organization.

- Software Interfaces

The system engages with the subsequent software elements:

- **MySQL Database (Version 8.2.0):** The Employee Attendance Management System utilizes MySQL for its database needs, encompassing data storage, access, and administration. The MySQL database is integrated via the XAMPP server.

- **Express.js (Node.js Framework):** The system's backend infrastructure is constructed with Express, a Node.js framework, which manages API calls, user authentication, and database ex changes.

- **React.js (Version 18):** The system's frontend is crafted using React, ensuring a lively and adapt able user interface for the Employee Attendance Management System.

- **Node.js (Version 18.16.1):** Node.js operates as the server-side JavaScript environment, executing server tasks and enabling interaction between the frontend and the database.

Data Items or Messages Exchanged:

- Between Frontend and Backend: The system utilizes JSON data formats to convey attendance records, verify user credentials, and deliver system feedback.

- Between Backend and Database: The communication involves SQL commands and their corresponding outcomes to execute database tasks.

Communications Interfaces:

The system adheres to established web communication standards, which include:

- **HTTP/HTTPS Protocols:** Utilized for data exchange between the client-side (web browser) and the server-side (Node.js/Express backend), with HTTPS ensuring encrypted and secure datatransfer.

- **RESTful API:** The backend offers RESTful API routes to streamline interactions between the frontend and backend, covering functionalities such as attendance management, user verification, and more.

- **Communication Security:** The implementation of SSL or TLS protocols will be in place to safeguard data integrity during transmission.

- **Data Transfer Rates:** While dependent on the user's internet speed, the system will be optimized for swift data transfer to enhance performance.

- **Synchronization Mechanisms:** Asynchronous communication will be employed to enable non disruptive interactions, ensuring a smooth user experience.

- Conclusion

In conclusion, the Employee Attendance Management System is a comprehensive solution designed to address the challenges of managing employee attendance in an organization. By leveraging a user-friendly online platform, the system simplifies the process of recording, tracking, and analyzing employee attendance.

The system's robust structure, which includes tables for managers, employees, attendance, departments, jobs, and leaves, ensures that all necessary data is captured and managed effectively. The system's standout features, such as the attendance and leave request functionalities, promote transparency and accountability within the organization.

Moreover, the system empowers managers with the ability to update, delete, and add new employees, ensuring that the organization's records are always current and accurate. By focusing solely on features directly associated with attendance management, the system maintains its efficiency and effectiveness.

Overall, the Employee Attendance Management System is a significant step towards fostering a disciplined, transparent, and productive work environment. It not only streamlines administrative tasks but also contributes to the overall success and prosperity of the organization. This project is a testament to the power of technology in transforming traditional business operations and setting the stage for future innovations in the corporate landscape.