QR Attendance System

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Abstract: Effective attendance management is an essential part of organizational operations because it ensures the accurate tracking of employee presence, punctuality, and working hours. However, many organizations still rely on manual record-keeping methods, which may lead to inaccurate attendance records, difficulties in monitoring real-time workforce activities, and delays in preparing reports. This project presents the development of a QR Attendance System to improve the management of workforce tracking and daily operations. The system is designed to record employee and department information systematically, scan QR codes for attendance tracking, monitor real-time presence (such as Present Today, Late Today, Early Leave, Overtime, and Absent), maintain attendance history records, and generate daily and monthly reports accurately. In addition, the system allows administrators to manage departments, employee records, and user accounts securely. By replacing manual processes with a computerized system, the QR Attendance System improves the accuracy of attendance rates and records, reduces human errors, saves time in daily operations, and provides faster access to comprehensive attendance overview information. The system also supports better decision-making by providing accurate and up-to-date workforce performance data. Overall, the QR Attendance System contributes to the efficient workforce management and enhances the quality of administrative operations within the organization.

Keywords: QR Attendance System, employee attendance, QR code scanning, check-in, check-out, working hours, attendance reports, employee management, web-based application.

INTRODUCTION

With the rapid development of information technology, organizations are increasingly adopting computerized systems to improve operational efficiency, data accuracy, and service quality. Attendance and workforce administration is an important organizational process because employee information, check-in and check-out logs, leave requests, work shifts, overtime, and daily presence records must be maintained accurately. Traditional manual attendance processes may require considerable time and can result in tracking errors, duplicated records, misplaced documents, and difficulties in retrieving historical attendance or payroll-related information. The QR Attendance System was designed to provide a centralized solution for managing employee attendance and workforce-related information. The system supports employee registration, department management, shift scheduling, QR-based attendance recording, leave records, daily and monthly reports, and payroll or payslip processing. The main objectives are to reduce manual work, improve attendance accuracy, organize employee records, save processing time, and support efficient workforce administration. The project also

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demonstrates practical applications of system analysis, database design, user interface design, and web application development.

PROBLEM

Manual attendance and workforce management can cause tracking mistakes, inconsistent employee records, delays in payroll processing, and difficulties in monitoring attendance and leave information. Managing employee details, departments, working shifts, attendance check-ins, holidays, leave periods, and salary-related components using paper-based or disconnected records can make daily operations inefficient. It may also be difficult to verify an employee's working history or retrieve previous attendance logs and payslips when records are not stored in a centralized database. Therefore, a computerized QR Attendance System is needed to reduce manual work, improve data accuracy, organize employee information, simplify attendance tracking and payroll processing, and provide faster access to reliable records. The system can also help administrators monitor employee attendance, leave, shifts, and related information systematically.

APPROACH

The QR Attendance System is developed using a web-based approach to provide a centralized and efficient process for employee and attendance administration. The system uses a relational database structure to connect employee information with departments, positions, shift assignments, attendance, holidays, leave records, payroll periods, and payslips. The main database entities include user, department, position, employee, shift_assign, shift_assign_detail, attendance_record, holiday, leave_record, payroll, and payslip. The shift_assign table stores general shift information, while shift_assign_detail associates employees with specific assigned dates and working hours. The development process follows requirements analysis, system and database design, implementation, testing, and deployment. This structured approach is intended to reduce attendance and payroll errors, improve record consistency, and make workforce operations more efficient.

Figure 1(a),(b) illustrates the main workflow of the QR Attendance System for both administrators and employees. The system requires users to log in with valid credentials before accessing the available functions. Employees can view their profile, change their password, scan QR codes to record attendance, download their QR code, and view their attendance history. Administrators can manage employee and department information, generate QR codes, scan QR codes to record attendance, view attendance history, and generate daily and monthly attendance reports. The system also allows attendance reports to be exported in PDF or Excel format. Finally, users can log out of the system securely after completing their tasks, ensuring that attendance records are managed accurately and systematically.

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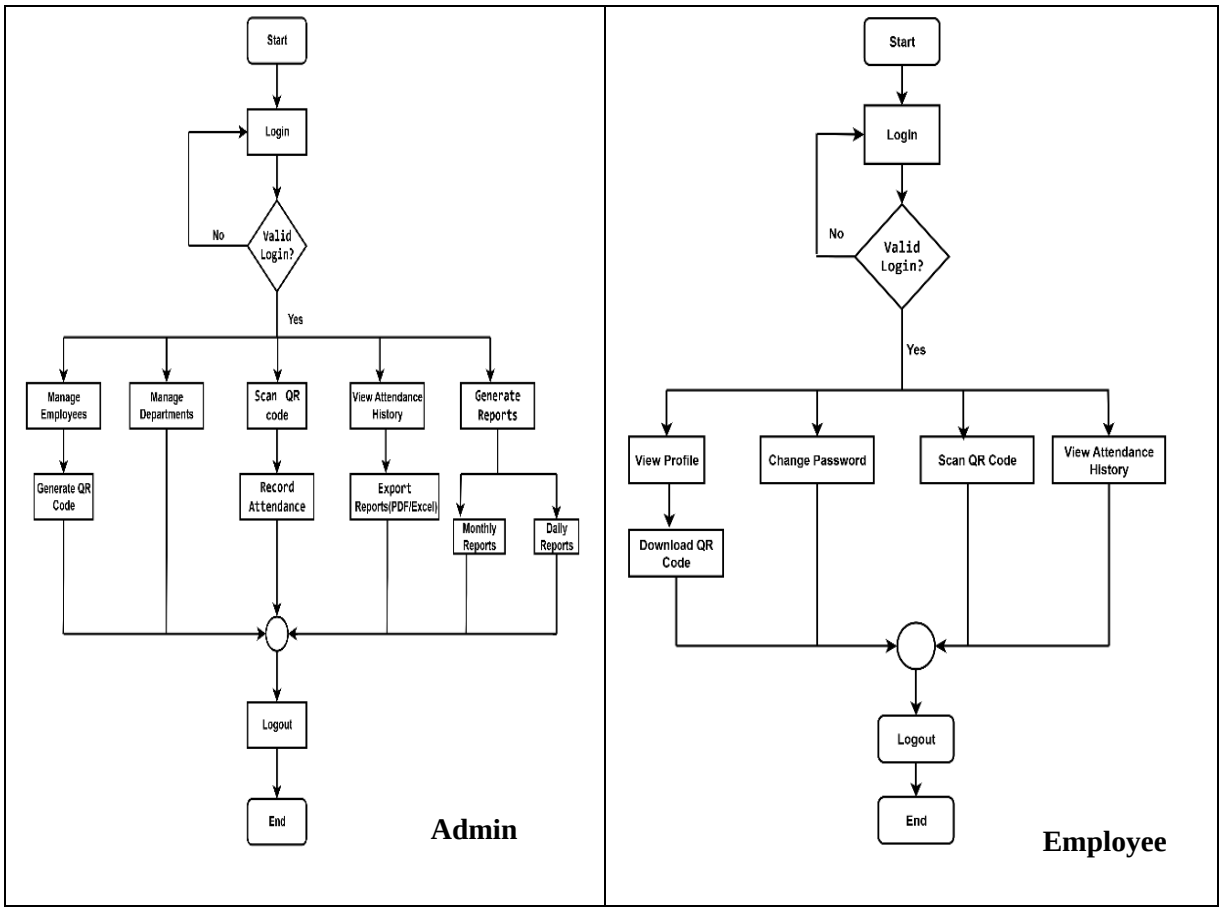


Figure 1(a). System Flow Diagram for Admin

Figure 1(b). System Flow Diagram for Employee

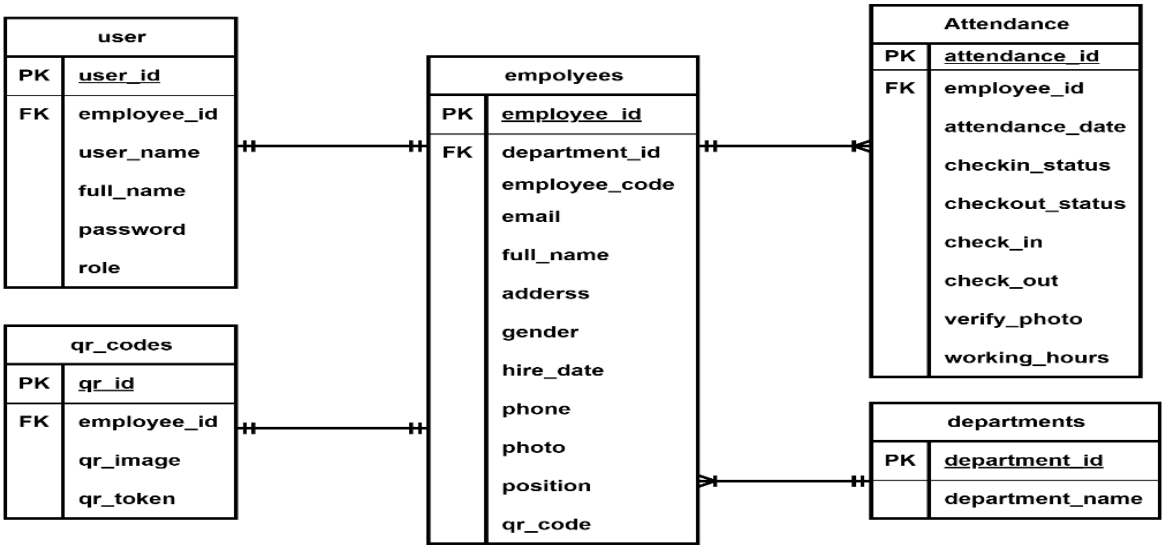


Figure 2. Database Architecture

Figure 2 presents the Entity Relationship Diagram (ERD) for the Employee Attendance Management System. The diagram illustrates the structure of the main database tables and their relationships within the system. It provides a clear representation of data organization by defining primary keys, foreign keys, and relationships between entities to ensure data consistency, integrity, and efficient data management.

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The ERD consists of the core tables required for employee management, attendance tracking, QR-based attendance verification, department management, and user access control. These tables support the daily attendance process and are managed by authorized users such as administrators and system users. The main tables include:

- users stores system login accounts and user information for accessing the application.
- employees stores employee profile information, including employee details and assigned department.
- departments stores department information used to organize employees based on their working sections.
- attendance stores employee attendance records, including check-in/check-out information, attendance date, and attendance status.
- qr_codes stores QR code information used for employee attendance verification and scanning processes.

RESULTS

The QR Attendance System provides organized functions for managing employee and attendance operations. Employee information such as employee code, name, gender, phone, email, address, department, position, joining date, and employment status can be maintained in a centralized database. Department and position information can be managed separately and connected to employee records through foreign keys. Shift management supports general shift definitions and detailed employee assignments, including assignment date, start hour, end hour, type, creator, and creation date. Attendance records store employee attendance dates, check-in and check-out times via QR code scanning, holiday references, and attendance status. Leave records store leave type, start date, end date, reason, and approval status. Attendance summary records maintain daily and monthly tracking status. These functions help reduce repetitive manual work, improve record organization, and support more reliable QR-based attendance tracking and workforce management.

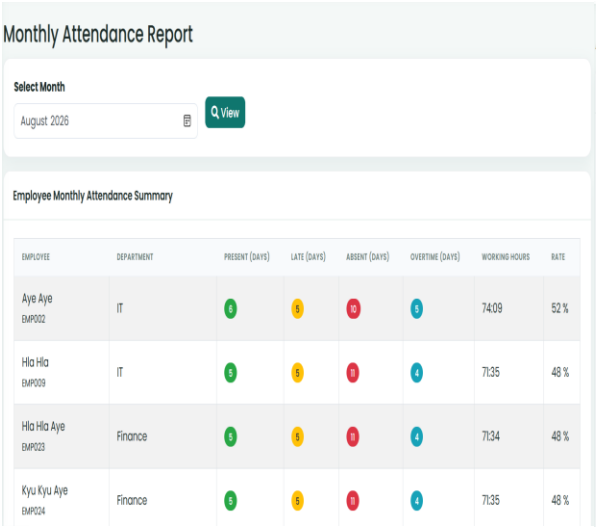


Figure 3(a) Monthly Attendance Report

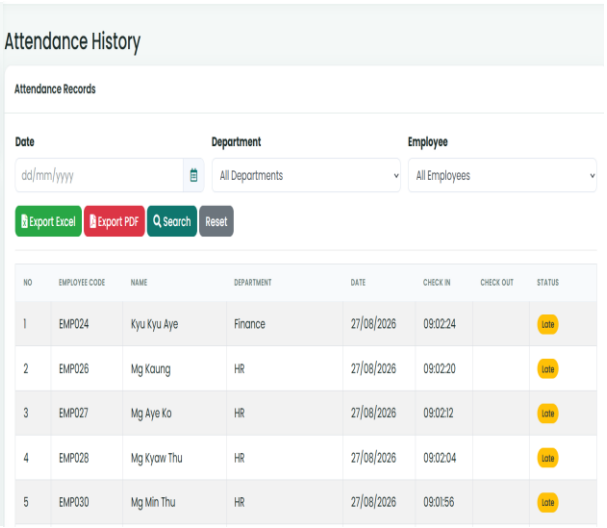


Figure 3(b) Attendance History

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Figures 3(a) and 3(b) represent the Monthly Attendance Report and Attendance History pages of the QR Attendance System. The Monthly Attendance Report allows the administrator to review employees' monthly attendance information, including present days, late arrivals, absences, early leave, overtime, and working hours. The administrator can select the required month and generate or export the report for future reference. The Attendance History page displays detailed check-in and check-out records together with attendance dates, times, and status. These pages help the administrator monitor attendance records, review employee performance, and prepare accurate reports efficiently.

CONCLUSION

The QR Attendance System was developed to improve employee attendance management within an IT company. The system provides an efficient and systematic approach for managing employees, departments, QR codes, check-in and check-out records, attendance history, and daily and monthly reports. By replacing manual attendance recording with a computerized QR code-based system, the project reduces paperwork, minimizes human errors, and improves the accuracy of attendance information. The system also allows administrators to search, update, monitor, and retrieve attendance records quickly, while employees can conveniently view their personal attendance information. Overall, the QR Attendance System provides a practical and reliable solution for employee attendance management and supports effective administrative decision-making through accurate and timely information.

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