CHAPTER: 1

INTRODUCTION

Introduction

Welcome to Attendify:

Our web application revolutionizes attendance management with QR Code tracking technology. In today's dynamic workforce environment, our solution provides a seamless, modern approach to tracking employee attendance.

This method uses QR codes to streamline the process of checking in and recording attendance, typically through a mobile app or web platform that scans the codes.

Attendify plays a crucial role in educational institutions, workplaces, and other organizations where monitoring the presence of individuals is essential for operational efficiency.

Traditional methods of attendance tracking, such as manual registers or punch-in cards, are time-consuming, error-prone, and can be susceptible to fraudulent activities. With the advent of mobile technology and QR codes, the process of recording and managing attendance has been significantly streamlined.

This project introduces a web application that revolutionizes attendance management using QR Code tracking technology. The application enables seamless and quick check-ins, eliminating human errors and reducing administrative work.

Users can scan a QR code with a mobile device or scan it through a web platform, ensuring that attendance is recorded accurately and instantly. This system offers convenience, efficiency, and security for both the user and the administrator.

Existing System:

Currently, many organizations still rely on traditional methods of attendance tracking. Some of the common systems in use include:

- **Manual Attendance Registers**: Employees or students physically mark their attendance on paper, which is prone to errors, delays in data collection, and is difficult to track for larger groups.
- **Biometric Systems**: Some organizations use biometric devices (fingerprint, facial recognition) to record attendance. While these systems reduce some errors, they often come with high costs, maintenance issues, and require physical devices for each user.
- **RFID (Radio Frequency Identification)**: Some systems use RFID cards that employees or students scan to register their presence. These systems require individuals to carry a card at all times, and the infrastructure can be expensive.
- Organizations rely on traditional methods like manual attendance registers, which are time-consuming and prone to errors.
- Some organizations use electronic systems that still require significant manual input and are not fully adaptable to modern workplace needs.
- Current systems often face difficulties such as slow data entry, errors, and lack of real-time tracking, which leads to inefficiencies.

Despite their advantages, these systems are still subject to problems such as errors, fraud, delayed data entry, and high costs of hardware and maintenance. They do not offer the flexibility and convenience that modern-day solutions like QR code-based systems can provide.

Need of System:

The need for an automated, efficient, and error-free attendance management system has become paramount in various sectors. Some of the key reasons for the implementation of a QR code-based attendance management system include:

- **Efficiency**: Traditional systems involve manual processes or require additional hardware for biometric and RFID solutions, which can be cumbersome. QR code-based systems eliminate these barriers by leveraging smartphones and web platforms.
- **Accuracy**: Manual systems often suffer from human errors, and fraud can occur when users falsify attendance. QR codes ensure that only authorized individuals can mark their presence, improving the accuracy of attendance tracking.
- **Cost-Effective**: Unlike biometric and RFID systems that require expensive hardware, QR code tracking is a cost-effective solution that only requires a smartphone or web platform with camera functionality.
- **Real-Time Tracking**: Traditional systems often result in delays in recording attendance. With QR code scanning, attendance is recorded in real-time, providing immediate access to up-to-date records.
- **Scalability**: QR code-based systems can easily handle large volumes of users without requiring significant hardware infrastructure.

Objective of the System:

The primary objectives of the system are:

- **To simplify the process of attendance management** by automating the attendance recording through QR code scanning.
- **To reduce administrative work** by minimizing the time spent on manually tracking attendance, and eliminating the errors associated with traditional systems.
- **To provide accurate, real-time attendance data** that can be accessed by administrators instantly.
- **To ensure security and prevent fraud** through the use of encrypted QR codes and user authentication protocols.
- **To offer a scalable solution** that can be adopted by educational institutions, workplaces, or any other organization that requires regular attendance monitoring.

Scope of Work:

The QR code attendance system will cover the following areas:

- **System Design**: This includes the design of the user interface (for both mobile and web platforms) and the backend infrastructure (QR code generation, database management, etc.).
- **Attendance Tracking**: The core functionality of the system, where users can scan QR codes to mark attendance and administrators can view records.
- **Data Management**: The system will store attendance data securely in a database, allowing for easy retrieval and analysis by administrators.
- **Reporting**: Administrators will be able to generate reports based on attendance data, including summary reports, time-based reports, and more.
- **Security**: Ensuring that the system is secure, both in terms of data protection and preventing unauthorized access to QR codes.
- **Testing and Deployment**: After development, the system will undergo rigorous testing to ensure all functionalities are working as intended, followed by the deployment of the application.

Module Specification:

QR Code Generation Module

- **Function**: Allows administrators to generate unique QR codes for each session, meeting, or event.
- **Inputs**: Date, time, session ID, location, etc.
- **Outputs**: A unique QR code image linked to the event/session.
- **Features**: QR codes will be encrypted for security and can only be used for the designated session.

Attendance Scanning Module

- **Function**: Allows users to scan QR codes via mobile app or web interface.
- **Inputs**: QR code scan.
- **Outputs**: Recorded attendance data (time, date, user ID).
- **Features**: The system will validate the QR code, authenticate the user, and record the attendance in real time.

Dashboard Module (Administrator View)

- **Function**: Allows administrators to monitor attendance, generate reports, and manage sessions.
- **Inputs**: User login, attendance data.
- **Outputs**: Visual display of attendance records, session data, and reports.
- **Features**: Graphical representation of attendance trends, options to export reports, and alerts/notifications.

Security and Authentication Module

- **Function**: Ensures that only authorized users can scan QR codes and access attendance data.
- **Inputs**: User credentials, QR code data.
- **Outputs**: Authentication status (approved/denied).
- **Features**: User authentication via credentials (username, password, etc.), QR code encryption, and access control for administrators.

Notification and Alert Module

- **Function**: Sends notifications to users and administrators regarding attendance status.
- **Inputs**: Event triggers (attendance recorded, session started, etc.).
- **Outputs**: SMS/email notifications.
- **Features**: Real-time notifications and reminders for both users and administrators.

Technology used:

- **Front end:**

  HTML, CSS, Java Script, and Bootstrap

- **Back end:**

  Python and Django Web Framework

- **Database:**

  SQLite

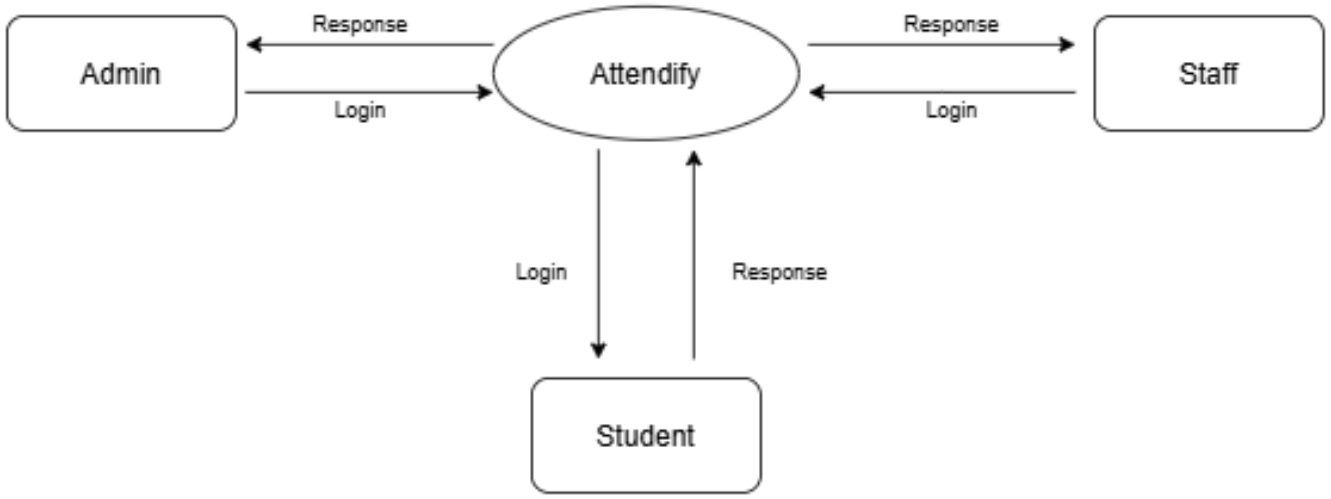
Software Requirements:

- **OS : Windows XP**
- **PHP Triad (PHP, MySQL, Apache, and PHPMyAdmin)**

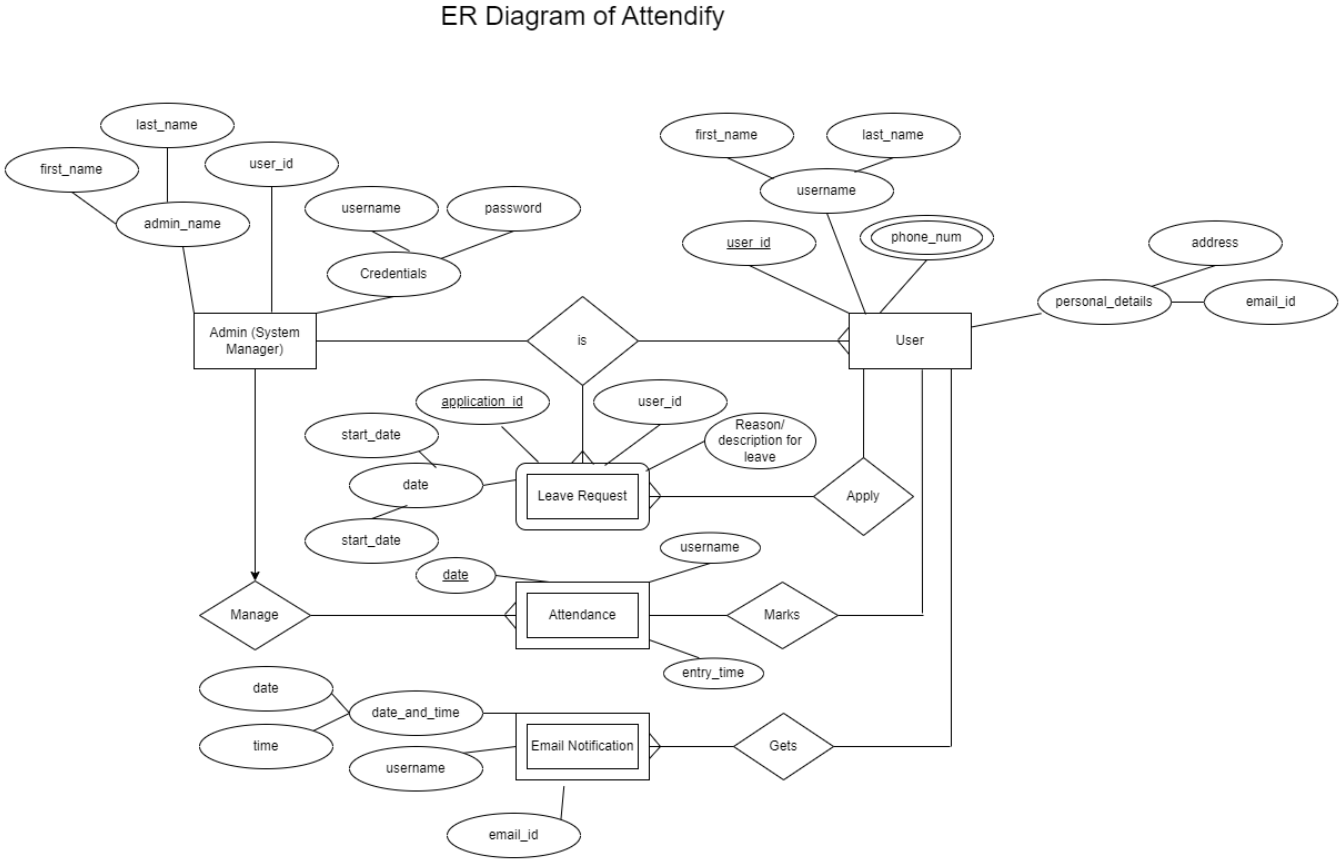
CHAPTER: 2

ANALYSIS & DESIGN

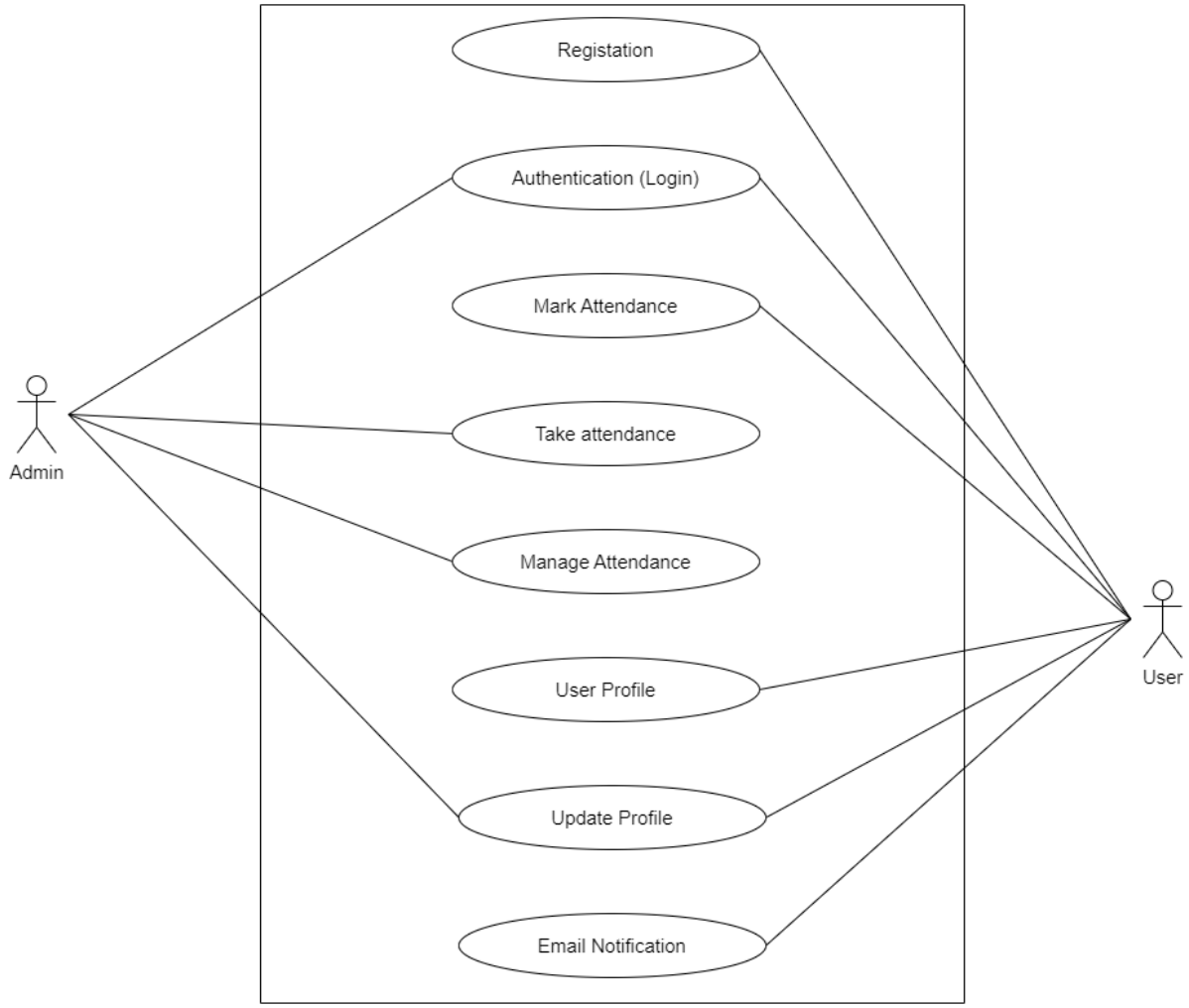
1. DFD Diagram:



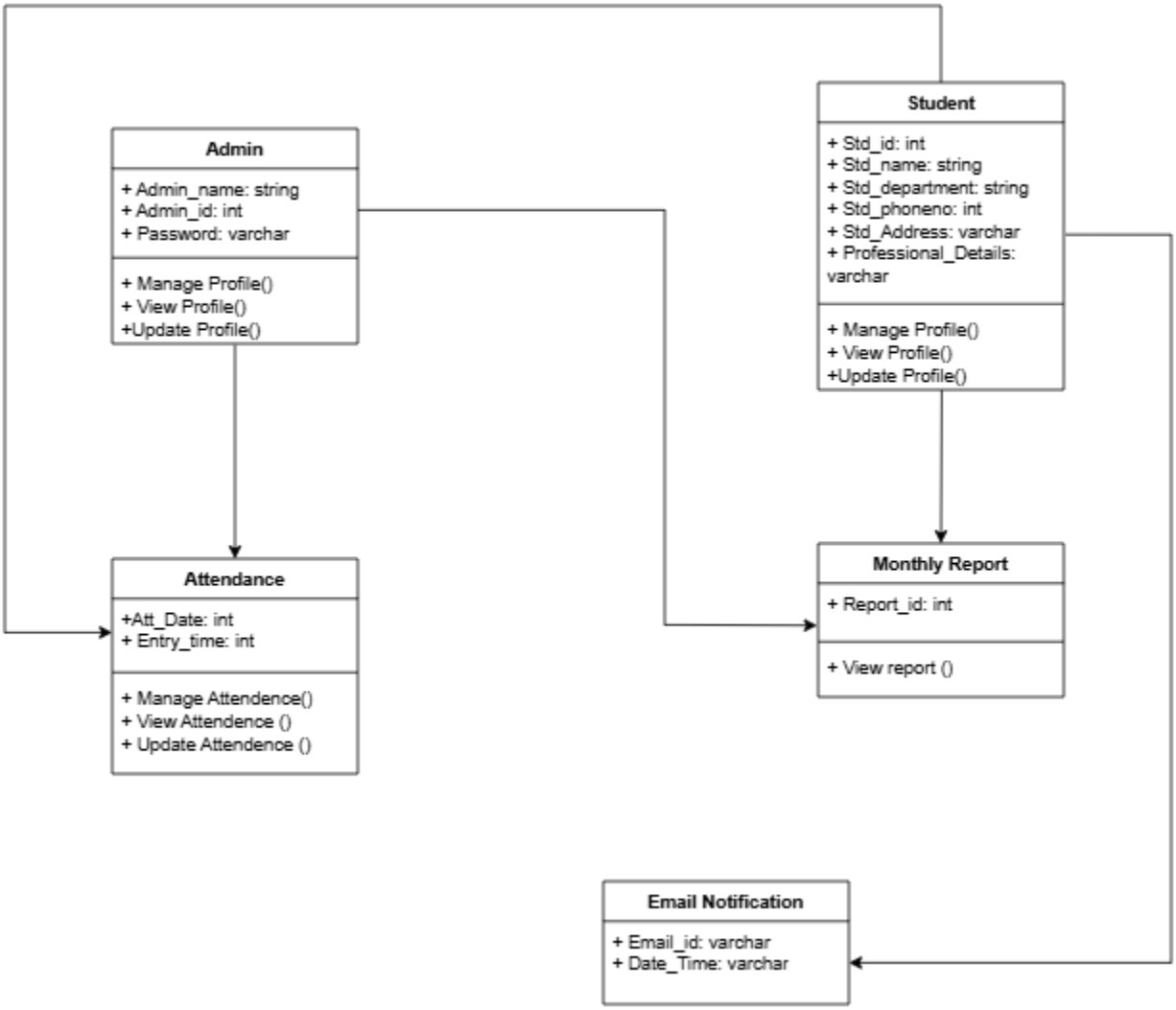
2. E-R diagram:


ER Diagram of Attendify
last_name
first_name
user_id
admin_name
username
password
Credentials
Admin (System Manager)
is
first_name
last_name
username
user_id
phone_num
address
personal_details
email_id
User
application_id
user_id
start_date
Reason/ description for leave
date
Leave Request
Apply
start_date
username
date
Manage
Attendance
Marks
entry_time
date
date_and_time
time
username
Email Notification
Gets
email_id

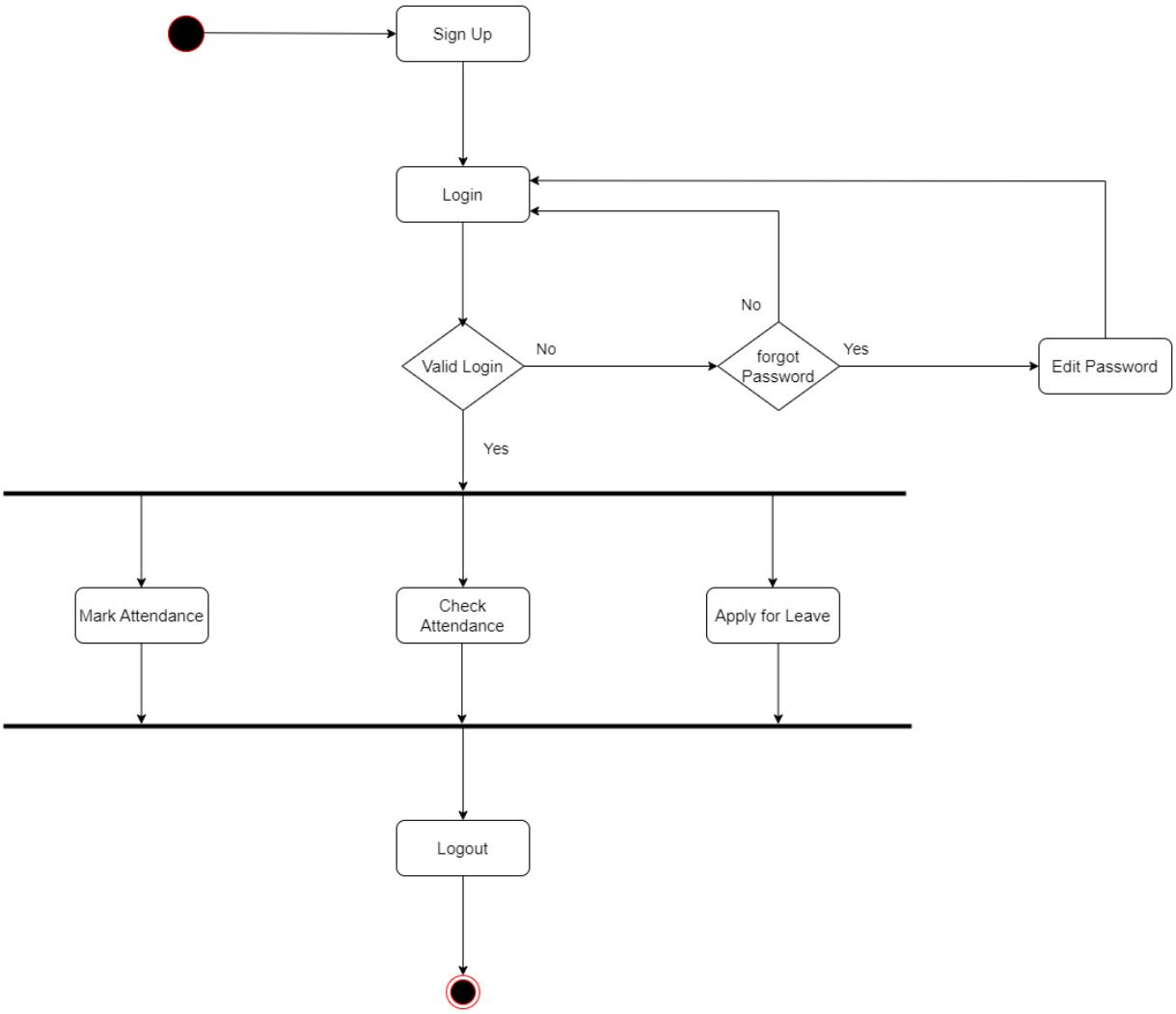
3. Use Case Diagram:



4. Class Diagram:

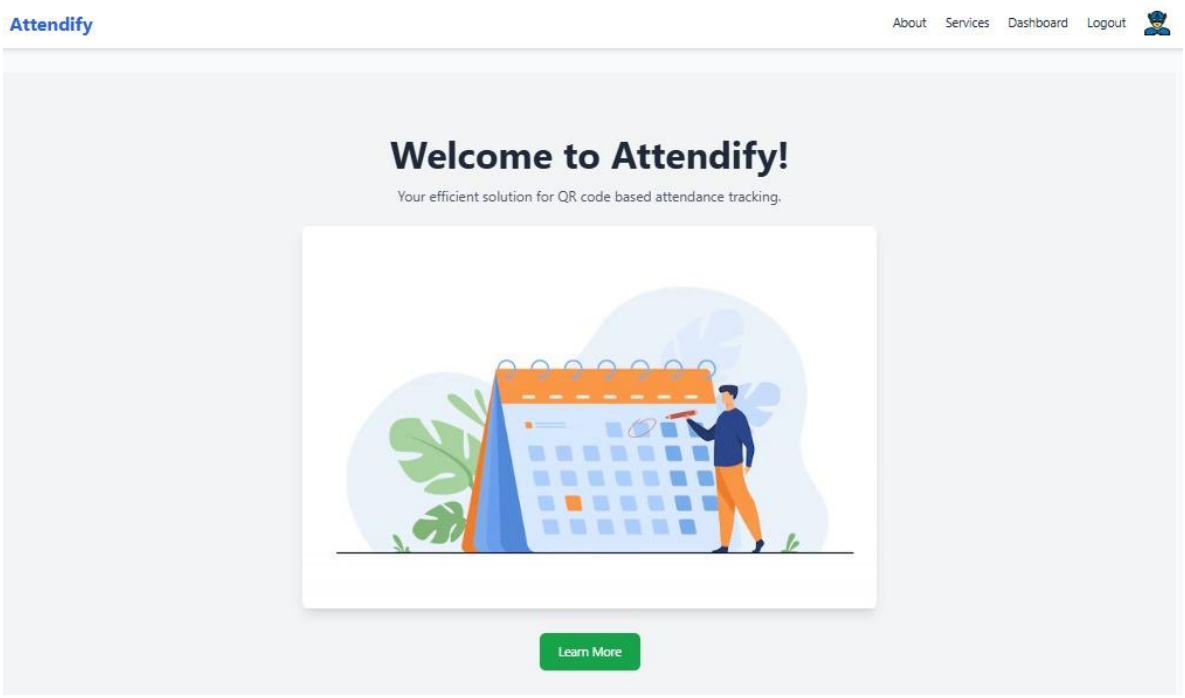


5. Activity Diagram:

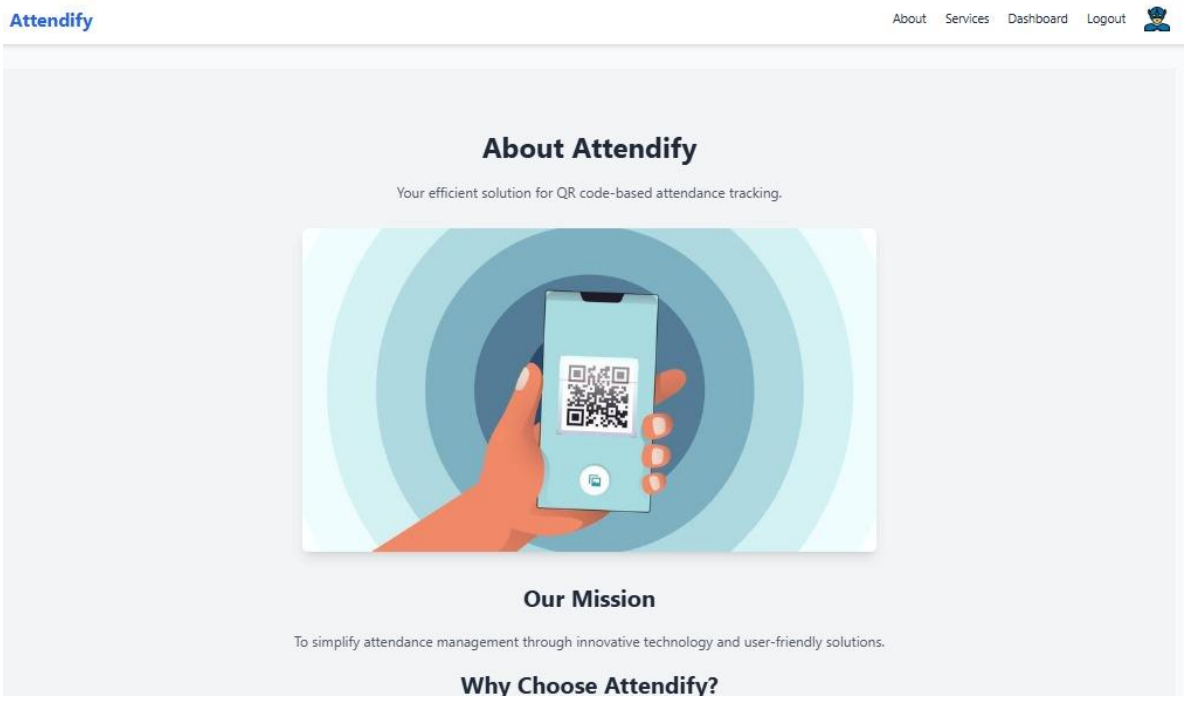


User Interface:

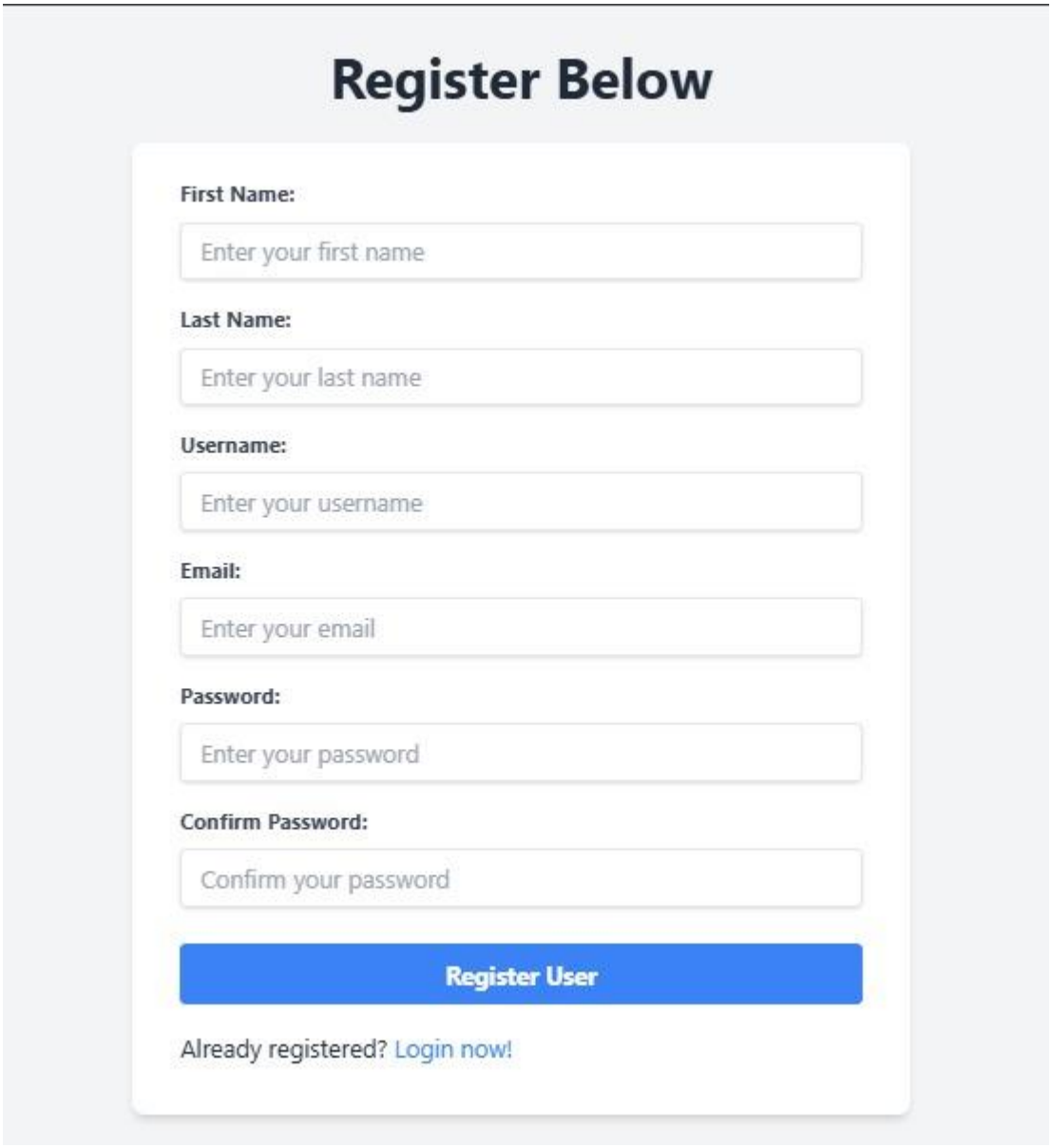
Home Page:



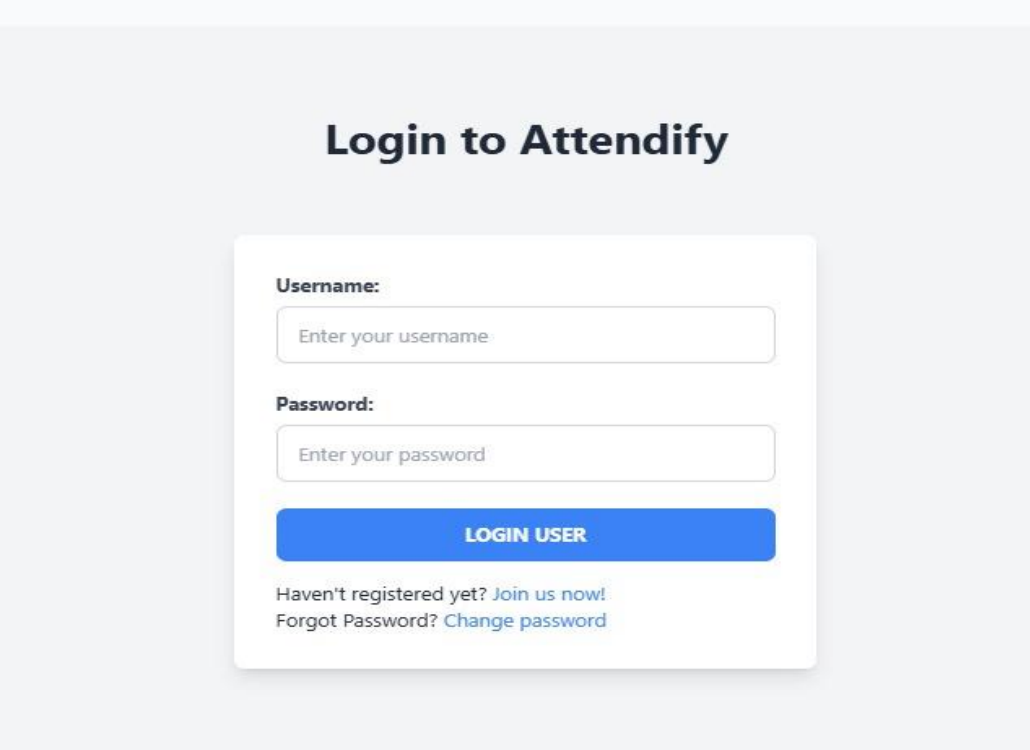
About Attendify:



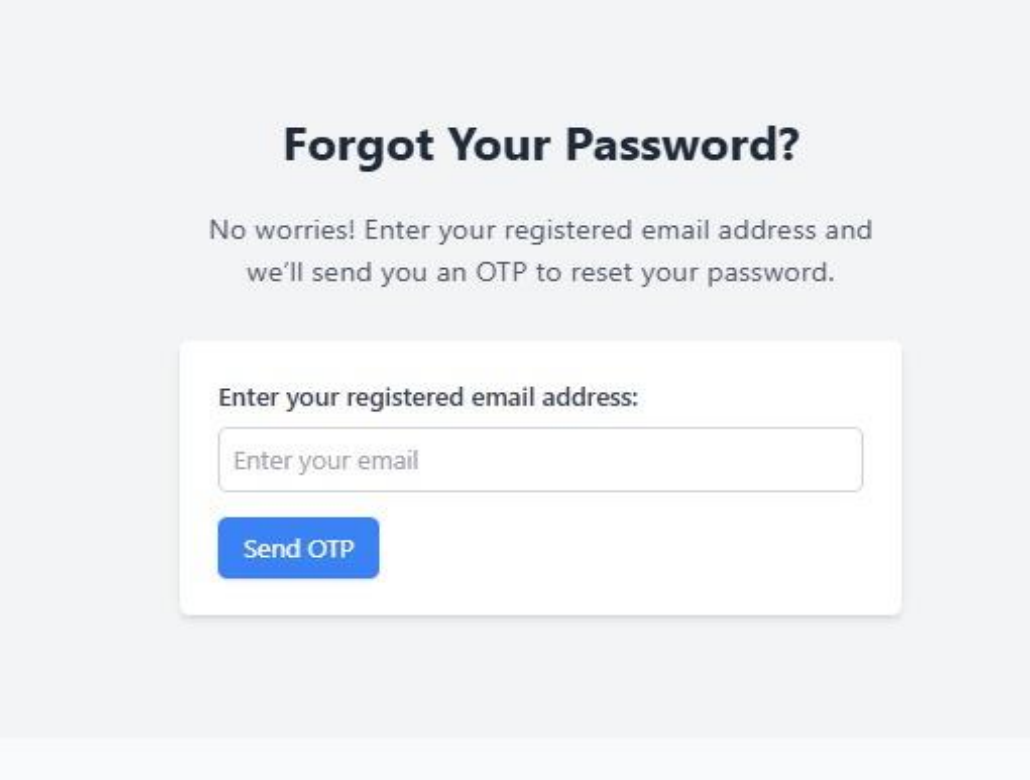
Registration page:



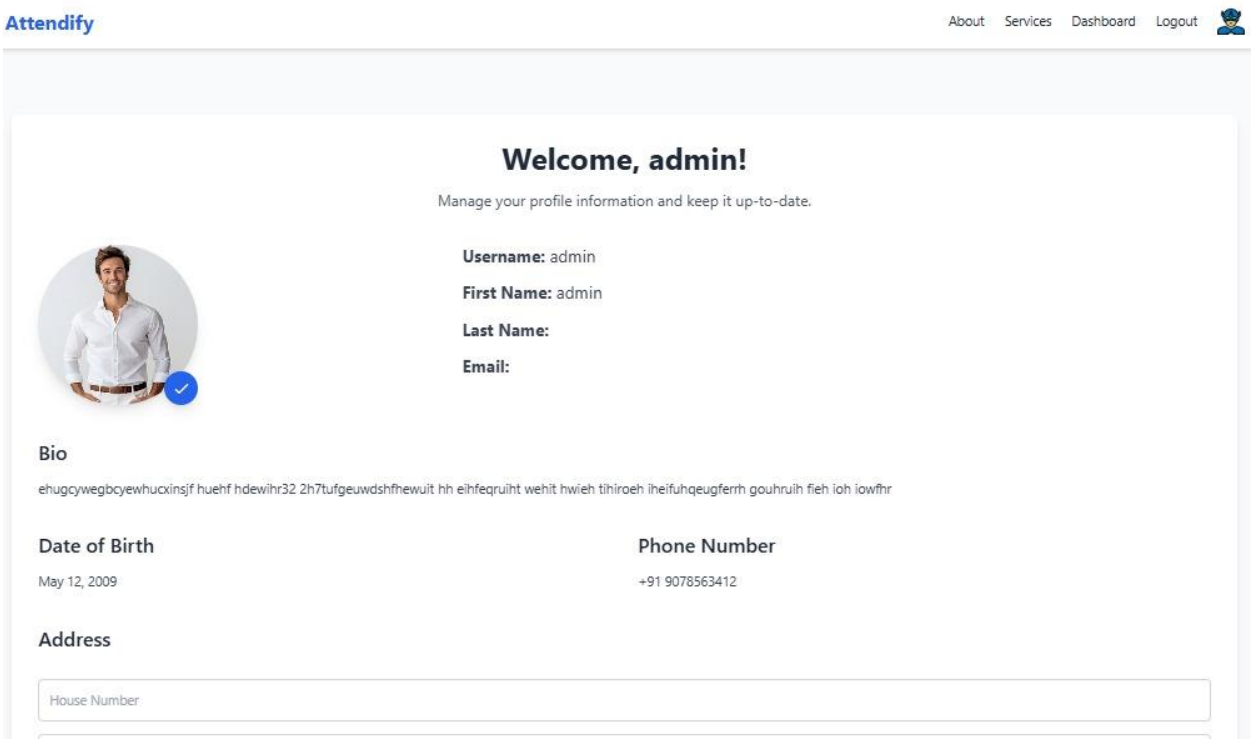
Login Page:



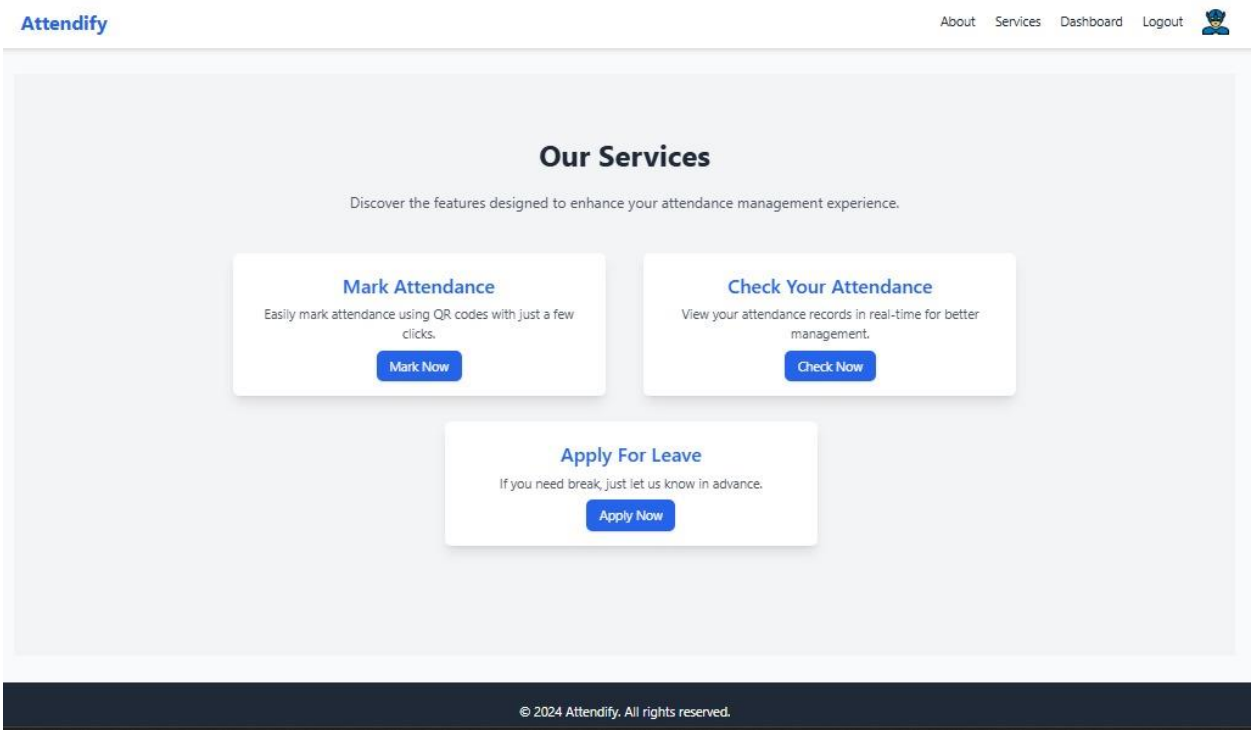
Forgot Password:



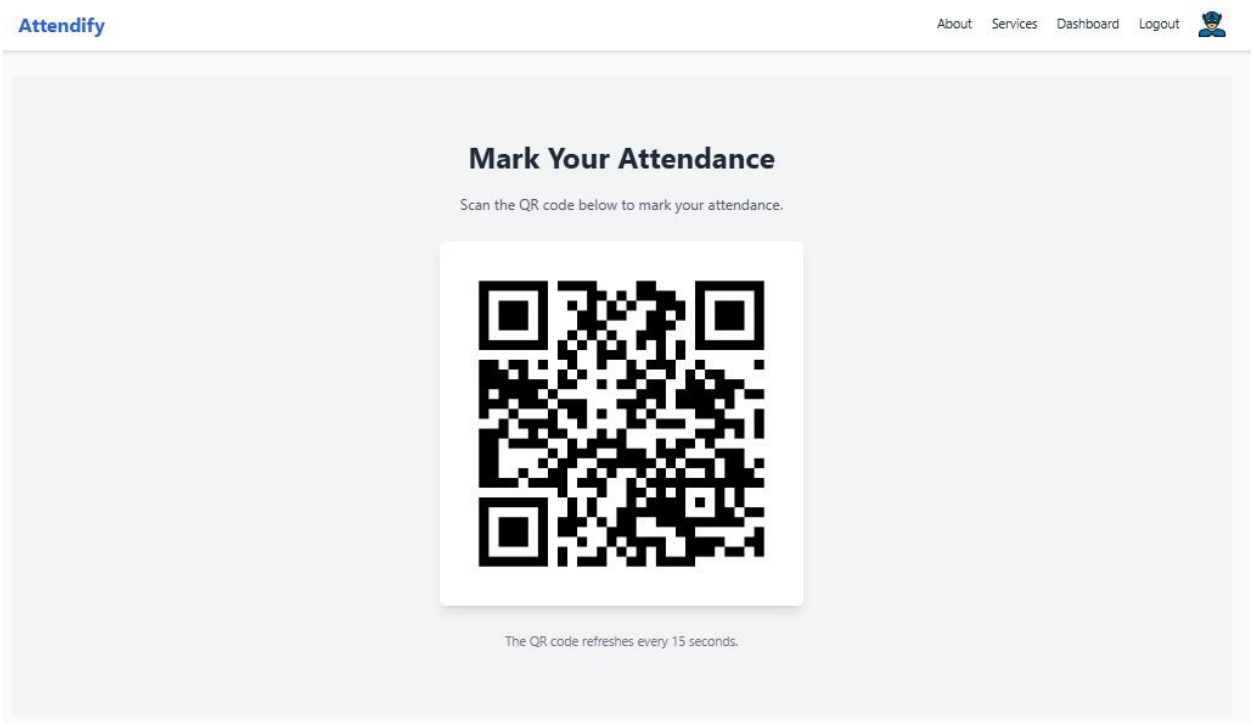
User Profile:



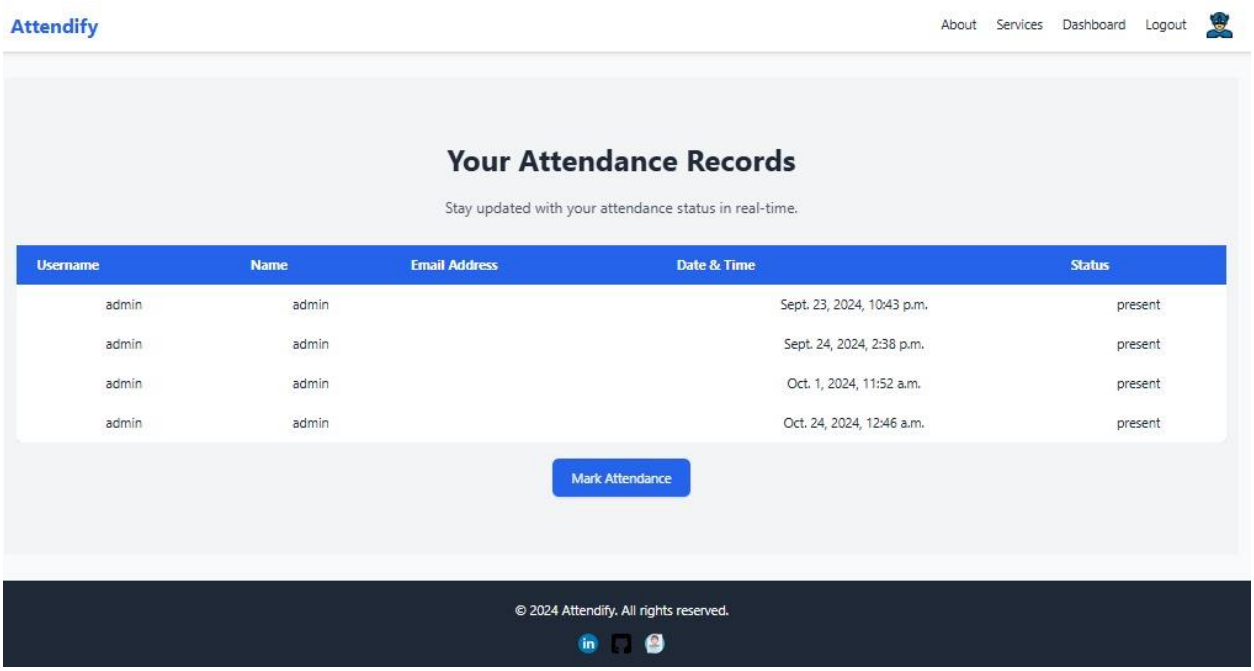
Services Page:



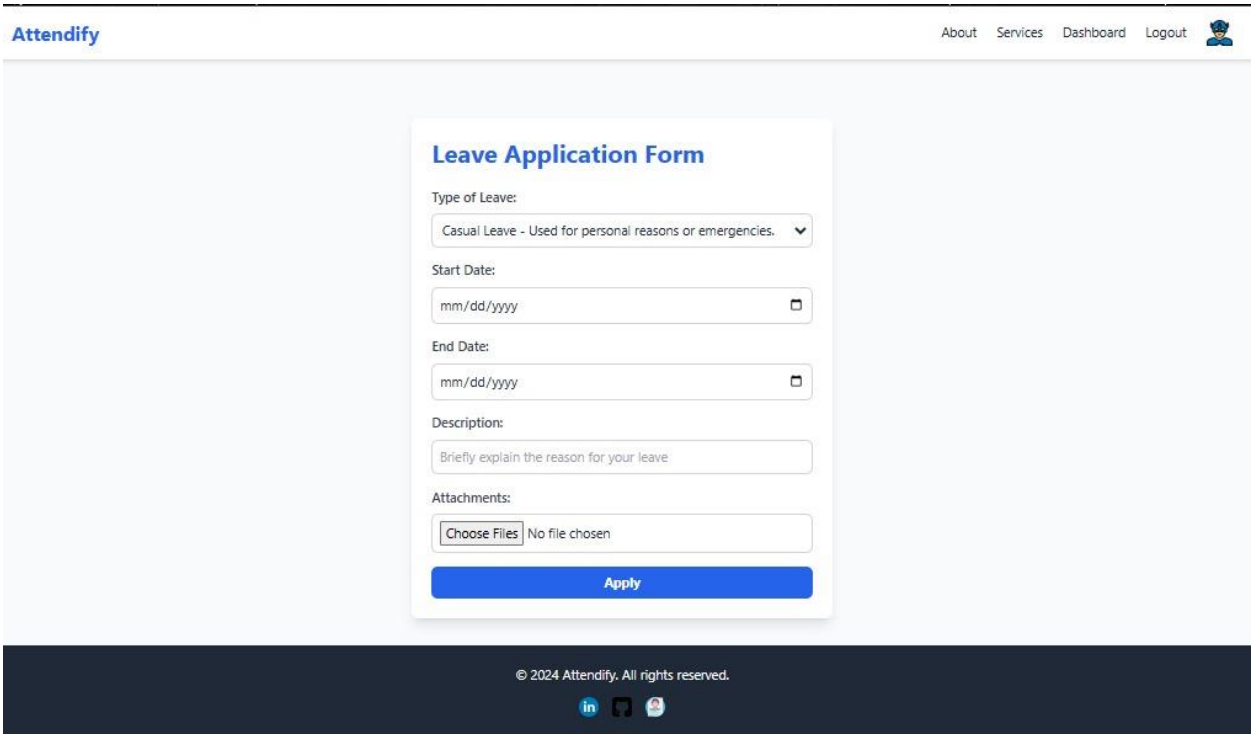
QR Code:



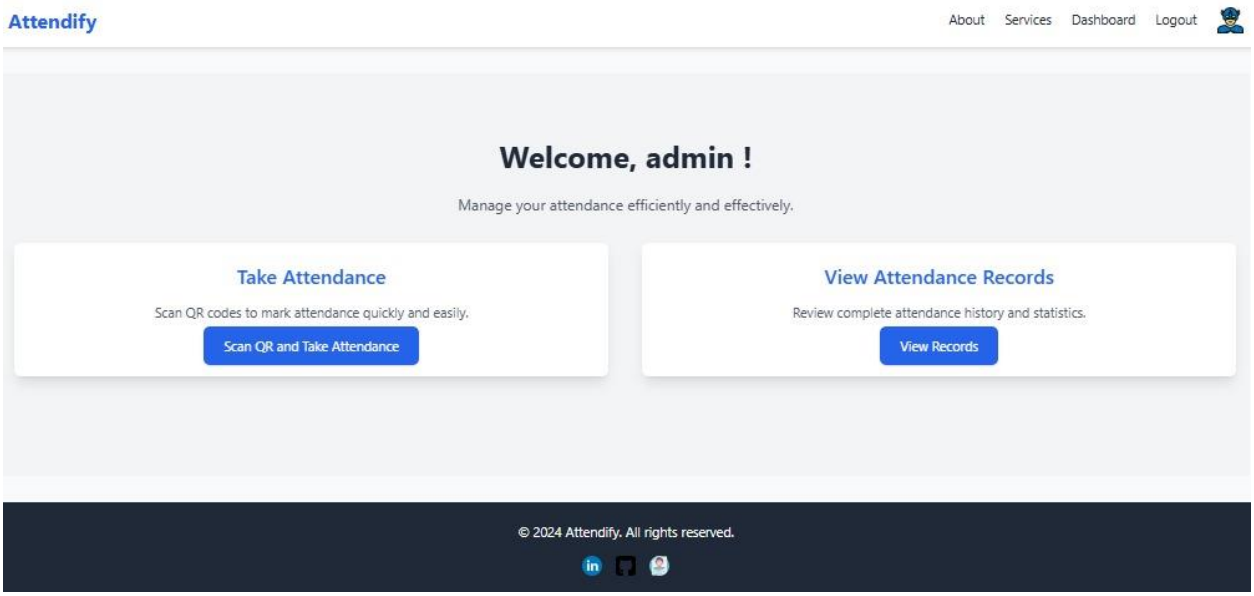
User Attendance Record Page:



Leave Application form:

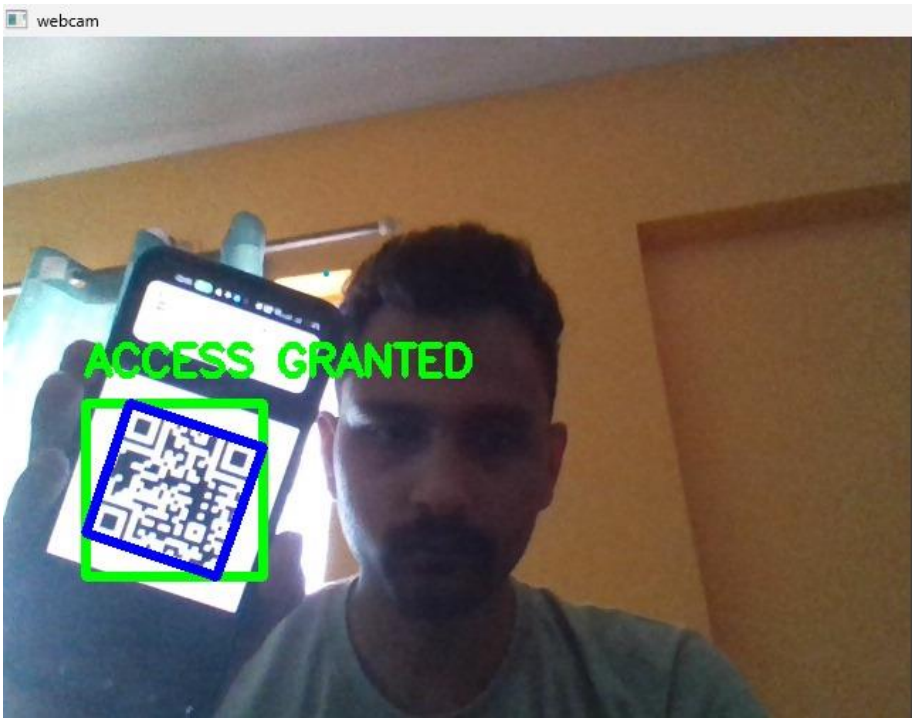


Admin Dashboard:

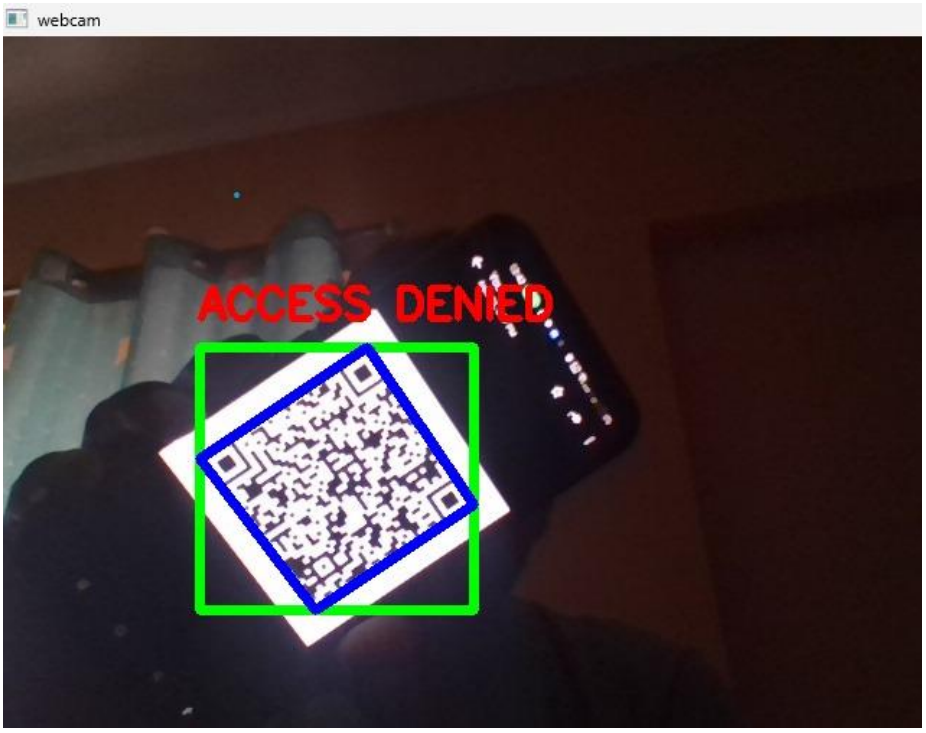


Tracking Attendance By Scanning QR Code:

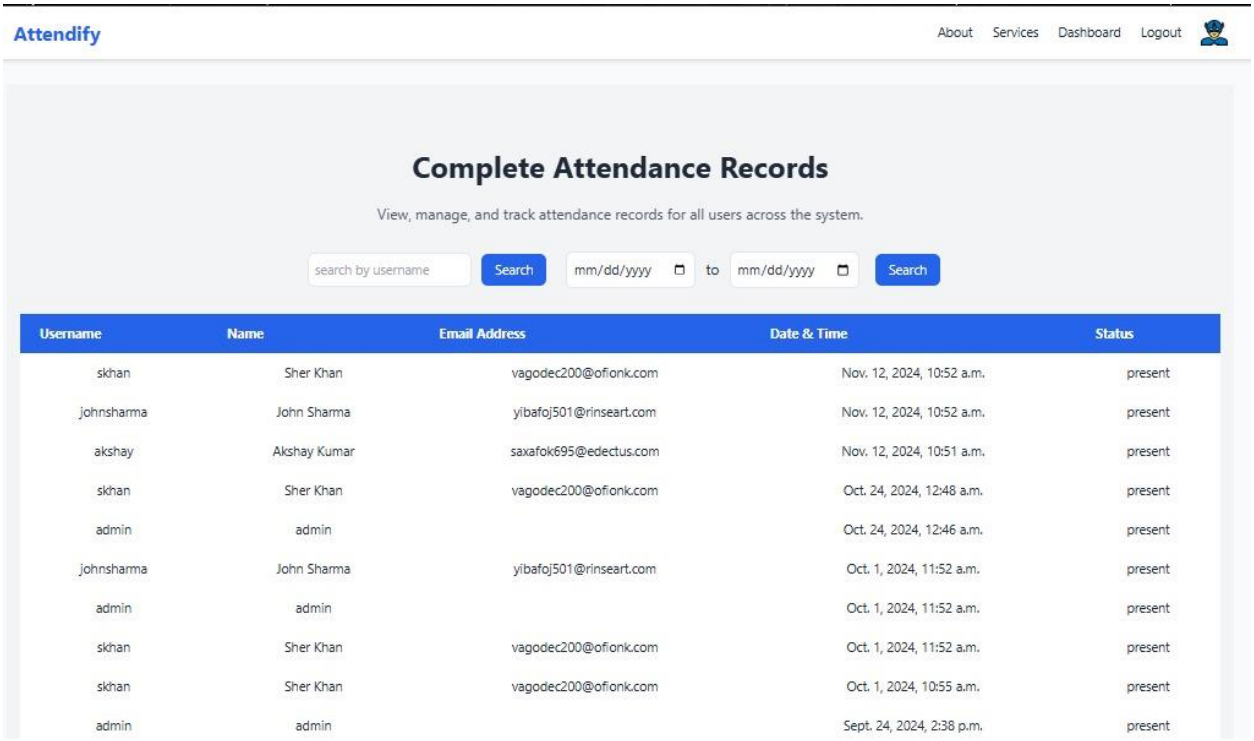
Access Granted:



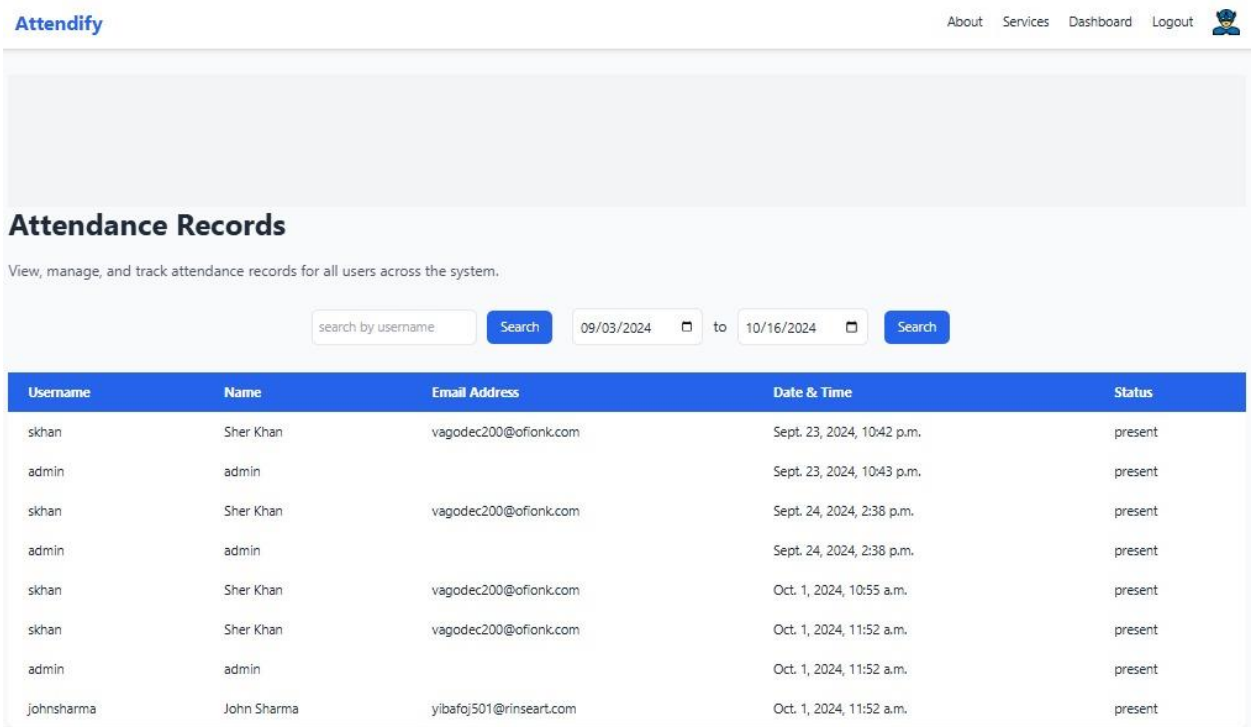
Access Denied:



Attendance Records of All Users:



Filtering Attendance Records Using Dates:



Database Table Structure:

1. Admin:

Sr no.	Name	Datatype	Size	Constraints	Description
1.	Admin Id	Int	20	Primary Key	Unique Id used by the Admin to Login
2.	Name	Varchar	50	Not Null	Name of the Admin
3.	Phone	Int	10	Not Null	Phone no. of the Admin
4.	Password	Varchar	20	Not Null	Password to be used for login
5.	Address	Varchar	50	Not Null	Address of the Admin
6.	Email	Varchar	50	Not Null	Email Id of the Admin

2.User:

Sr no.	Name	Datatype	Size	Constraints	Description
1.	User Id	Int	20	Primary Key	Unique Id used by the Admin to Login
2.	Name	Varchar	50	Not Null	Name of the Admin
3.	Phone	Int	10	Not Null	Phone no. of the Admin
4.	Password	Varchar	20	Not Null	Password generated by the admin to be used for login
5.	Address	Varchar	50	Not Null	Address of the Admin
6.	Email	Varchar	50	Not Null	Email Id of the Admin

3.QR Code:

Sr. no.	Name	Datatype	Size	Constraints	Description
1.	Id	Int	20	Primary Key	QR Code Id
2.	Date	Date	20	Not Null	Date for QR code
3.	Entry time	Int	10	Not Null	Entry time when scanner for the 1st time
4.	Exit time	int	10	Not Null	Exit time when scanned for the 2nd time
5.	User Id	Int	20	Foreign Key	Id of the User that scans the QR code

4. Monthly Report (Details of Report)

Sr no.	Name	Datatype	Size	Constraints	Description
1.	Report_Id	Int	20	Primary Key	Id of the report
2.	User_id	**Int**	20	Foreign Key	Type of the report to be taken

4. Attendance (Records)

Sr no.	Name	Datatype	Size	Constraints	Description
1.	Attendance Id	Int	20	Primary Key	Unique Id used for fetching particular attendance record
2.	User Id	Int	20	Foreign Key	Unique Id for User to fetch User's attendance record
3.	Date	Date	20	Not Null	Date of Attendance marked
4.	Start Time	Int	20	Not Null	Entry time in the office
5.	Exit Time	Int	20	Not Null	Exit time of the User

CHAPTER : 3

DRAWBACKS AND LIMITATIONS

Drawbacks and Limitations:

While the QR Code-based attendance management system offers numerous advantages, it is important to recognize its limitations and potential drawbacks.

Here are some of the key challenges:

1. Dependence on Technology

- **Internet Connectivity**: The system often requires an internet connection for real-time data syncing and updating attendance records. In areas with poor or no internet connectivity, the system may face disruptions or delays in recording attendance.
- **Device Compatibility**: Users need smartphones or web platforms with QR code scanning capabilities. Older devices or those without the necessary camera functionality may face difficulties in using the system.

2. Security and Fraud Risks

- **QR Code Tampering**: Despite encryption, QR codes can be subject to tampering or duplication. If a malicious user generates a fake QR code for a particular session, it could lead to incorrect attendance being recorded.
- **User Authentication**: Ensuring that the person scanning the QR code is the authorized individual can be challenging. Without proper authentication mechanisms (e.g., biometric or username/password verification), users could potentially mark attendance on behalf of others, leading to fraudulent records.

3. Reliance on Mobile Devices

- **Battery Life**: The need for a smartphone or mobile device to scan the QR code could be a limitation for users with low battery levels or malfunctioning devices. This could lead to missed attendance recording.
- **Tech-Savvy Requirement**: Users may require some level of technical familiarity with the app or web platform for scanning QR codes, which could be a barrier for less tech-savvy individuals, particularly in environments with diverse age groups or skill levels.

CHAPTER 5:

CONCLUSION

Conclusion:

The QR Code-based attendance management system presents a significant advancement over traditional methods of tracking attendance, offering increased efficiency, accuracy, and security. By utilizing QR code technology, this system eliminates the need for manual entry, reduces administrative workload, and ensures that attendance data is recorded in real-time. Additionally, it offers a cost-effective solution as it leverages widely available mobile devices and web platforms, minimizing the need for expensive hardware.

Throughout the development and analysis of the system, several enhancements were proposed to address its limitations, such as incorporating biometric authentication for added security, enabling offline functionality to overcome connectivity issues, and integrating geo-location tracking to ensure accuracy in attendance recording. These improvements, alongside advanced reporting features and role-based access control, will further enhance the system's usability and scalability.

The system’s user-friendly interface, combined with its real-time tracking and reporting capabilities, offers administrators valuable insights into attendance patterns and trends, empowering them to make informed decisions. With its ability to scale across various sectors such as educational institutions, businesses, and event management, this QR code-based attendance system is poised to become a cornerstone of modern attendance management solutions.

In conclusion, this project has demonstrated that QR Code technology is an effective and efficient tool for attendance management. With the proposed enhancements, the system can be further optimized to address current limitations, making it a reliable, secure, and cost-effective solution for any organization looking to streamline attendance tracking and improve operational efficiency.

CHAPTER 6:

BIBILOGRAPHY

Bibliography:

The following references have been used in the research and development of the QR Code-based attendance management system:

1. **M. A. M. S. Hossain, M. A. Rahman, and M. H. S. Alam,** "A Review on QR Code-Based Attendance System," *International Journal of Computer Applications*, vol. 179, no. 1, pp. 1-5, 2018.
    - This paper discusses the use of QR codes for attendance systems and explores the benefits and limitations associated with their adoption.
2. **S. R. Khusainov, and A. V. Minbaev,** "QR Codes in Educational Systems: A New Era for Attendance Management," *Proceedings of the International Conference on Modern Engineering and Technology*, 2017.
    - This source provides insights into the use of QR codes in educational institutions for attendance management and the potential for innovation in this area.
3. **C. P. R. D. Praveen, and R. G. Reddy,** "QR Code-Based Authentication System for Attendance and Access Control," *International Journal of Scientific Research in Computer Science and Engineering*, vol. 6, no. 3, pp. 123-130, 2018.
    - This paper explores how QR codes can be integrated with authentication systems for secure and accurate attendance recording.
4. **M. S. R. Hossain, and M. A. Ali,** "Designing and Implementing an Automated Attendance Management System Based on QR Code," *International Journal of Computer Science and Information Security*, vol. 16, no. 6, pp. 124-130, 2018.
    - Discusses the design and implementation of an automated attendance system using QR codes and highlights the efficiency of the technology.

Sample Code:

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>{% block title %} Attendify {% endblock %}</title>

    {% load static %}
    <link rel="stylesheet"
      href="https://cdnjs.cloudflare.com/ajax/libs/animate.css/4.1.1/animate.min.css" />

    <!-- Include Tailwind CSS CDN -->
    <script src="https://cdn.tailwindcss.com"></script>

    <style>
      body {
        background-color: #f9fafb; /* Light gray background */
      }
    </style>
  </head>
  <body class="text-gray-800">
    <!-- Navbar -->
    <header>
      <nav class="bg-white shadow-md text-gray-800 py-4">
        <div
          class="container mx-auto flex justify-between items-center px-6">
          <!-- Logo -->
          <a href="{% url 'index' %}"
            class="text-2xl font-bold text-blue-600 hover:text-blue-800 transition duration-
300">
            Attendify
          </a>

          <!-- Hamburger Icon -->
          <button
            class="text-gray-800 block md:hidden focus:outline-none"
            id="menu-button">
            <svg class="w-8 h-8" xmlns="http://www.w3.org/2000/svg"
              fill="none" viewBox="0 0 24 24"
```

```
          stroke="currentColor">
          <path stroke-linecap="round" stroke-linejoin="round"
            stroke-width="2" d="M4 6h16M4 12h16M4 18h16" />
        </svg>
      </button>

      <!-- Links -->
      <ul id="menu-links"
        class="hidden md:flex space-x-6 items-center">
        <li><a href="{% url 'about' %}"
            class="hover:text-blue-600 transition duration-300">About</a></li>
        <li><a href="{% url 'services' %}"
            class="hover:text-blue-600 transition duration-300">Services</a></li>

        <!-- Links based on user role -->
        {% if user.is_authenticated %}
        {% if user.is_superuser %}
        <li><a href="{% url 'dashboard' %}"
            class="hover:text-blue-600 transition duration-300">Dashboard</a></li>
        {% endif %}
        <li><a href="{% url 'logout' %}"
            class="hover:text-blue-600 transition duration-300">Logout</a></li>
        <li><a href="{% url 'profile' user.id %}"
            class="hover:text-blue-600 transition duration-300">
            <img src="{% static 'img/profile_icon.png' %}"
              alt="Profile Icon" class="w-8 h-8">
          </a></li>
        {% else %}
        <!-- <li><a href="{% url 'register' %}"
            class="hover:text-blue-600 transition duration-300">Register</a></li> -->
        <li><a href="{% url 'login' %}"
            class="hover:text-blue-600 transition duration-300">Login</a></li>
        {% endif %}
      </ul>
    </div>


    <!-- Mobile Menu (hidden by default) -->
    <div id="mobile-menu"
      class="hidden md:hidden bg-white shadow-md px-6 py-4 text-center">
      <ul
```

```
                class="space-y-4 flex flex-col justify-center items-center">
                <li><a href="{% url 'about' %}"
                        class="block hover:text-blue-600 transition duration-300">About</a></li>
                <li><a href="{% url 'services' %}"
                        class="block hover:text-blue-600 transition duration-300">Services</a></li>

                <!-- Links based on user role for mobile -->
                {% if user.is_authenticated %}
                {% if user.is_superuser %}
                <li><a href="{% url 'dashboard' %}"
                        class="block hover:text-blue-600 transition duration-
300">Dashboard</a></li>
                {% endif %}
                <li><a href="{% url 'logout' %}"
                        class="block hover:text-blue-600 transition duration-300">Logout</a></li>
                <li><a href="{% url 'profile' user.id %}"
                        class="block hover:text-blue-600 transition duration-300">
                        <img src="{% static 'img/profile_icon.png' %}"
                            alt="Profile Icon" class="w-8 h-8">
                    </a></li>
                {% else %}
                <!-- <li><a href="{% url 'register' %}"
                        class="block hover:text-blue-600 transition duration-300">Register</a></li> --
>
                <li><a href="{% url 'login' %}"
                        class="block hover:text-blue-600 transition duration-300">Login</a></li>
                {% endif %}
            </ul>
        </div>

    </nav>
</header>

<!-- Main Content -->
<main id="main-content" class="container mx-auto px-4 py-8">
    {% block content %}
    {% endblock %}
</main>

<!-- Footer -->
<footer class="bg-gray-800 text-white py-6">
```

```
    <div class="container mx-auto text-center">
        <p>&copy; 2024 Attendify. All rights reserved.</p>
        <ul class="flex justify-center space-x-4 mt-4">
            <li>
                <a
                    href="https://www.linkedin.com/in/himanshu-sharma-243b20205"
                    class="hover:underline">
                    <img src="{% static 'img/linkedin.png' %}"
                        alt="LinkedIn" class="w-6 h-6">
                </a>
            </li>
            <li>
                <a href="https://github.com/hsbhatra"
                    class="hover:underline">
                    <img src="{% static 'img/github.png' %}"
                        alt="GitHub" class="w-6 h-6">
                </a>
            </li>
            <li>
                <a href="https://hsbhatra.github.io/Personal-Portfolio/"
                    class="hover:underline">
                    <img src="{% static 'img/resume.png' %}"
                        alt="Portfolio" class="w-6 h-6">
                </a>
            </li>
        </ul>
    </div>
</footer>

<!-- JavaScript to handle menu toggle -->
<script>
    document.getElementById('menu-button').addEventListener('click', function() {
        var menu = document.getElementById('mobile-menu');
        if (menu.classList.contains('hidden')) {
            menu.classList.remove('hidden');
        } else {
            menu.classList.add('hidden');
        }
    });
</script>
```

```
        <script src="{% static 'js/script.js' %}"></script>
    </body>
</html>
```