Software Design Specification

Biometric Attendance Management System and Digital Notice Board

Project Code:

USH404252

Internal Advisor:

Fahad Maqbool

Muhammad Dahir Zaib Bajwa

Project Manager:

Dr. Muhammad Ilyas

Project Team:

Team Leader: M. Haseeb Shahzad (BSEF19M052)

Sulman Arshad (BSEF19M040)

Usama Bajwa (BSEF19M042)

Submission Date:

November 15, 2022

_____

Project Manager's Signature

Document Information

Category	Information
Customer	Department of CS & IT
Project	Biometric attendance system and digital notice board
Document	Software Design Specification
Document Version	1.0
Identifier	PGBH01-2022-DS
Status	Draft
Author(s)	Haseeb Sulman Usama
Approver(s)	Dr. Muhammad Ilyas
Issue Date	Sept. 15, 2022
Document Location	
Distribution	1. Advisor 2. PM 3. Project Office

Definition of Terms, Acronyms and Abbreviations

This section should provide the definitions of all terms, acronyms, and abbreviations required to interpret the terms used in the document properly.

Term	Description
ASP	Active Server Pages
DD	Design Specification

Table of Contents

1. Introduction

1.1 Purpose of Document

The purpose of the document is to deliver the details of the project, how it will work and how we are going to implement this system and the main purpose of this document is to deliver the detail about the design of the system. This document also tells about the whole functioning of this system. This document aims to deliver all the design aspects of the system. We are going to implement Object Oriented Methodology.

1.2 Project Overview

This project is about the biometric attendance of professors and showing important notices about the department on digitalized notice board. The major goal of creating this project is to create a system that will generate attendance summaries of professors, monitor time in and out of professors, and show rooms reserved information, and important notices on a digital notice board.
This system aims to generate summaries and record attendance digitally without the use of paperwork which was time-consuming. The benefit of digitalized notice board is to convey important notices fast and efficiently.

1.3 Scope

The scope of the biometric attendance management system and digital notice board is following
What's included?

- Monitor time-in and out of professors
- Generate a summary of attendance
- Maintenance of attendance records will be easy
- Room reserved information
- Important notices
- Time Table/ Classes Schedule

What's excluded?

- Leave management
- No access to staff except admin
- No attendance or leave management for student

2. Design Considerations

Some of the issue for our system like security issue of hardware components like biometric machine and digital notice board. Some other issues of our system is the stealing of confidential information of enrolled professors. Another issue is in case if biometric machine does not verifies the thumb impression of the professor.

2.1 Assumptions and Dependencies

Assumptions for this system are

- In the future, if requirements change like system also have a feature to mark the attendance of Non-academic staff and students via a biometric machine
- If we add a module for salary based on attendance.
- Leave the management of staff.

Dependencies for the system are

- As biometric machine needs electricity to perform their functionality so our system is also dependent on electricity.

2.2 Risks and Volatile Areas

We are using thumb impression biometric machine if requirement changes to use facial machine or any other biometric machine. In addition to this if we update the technology to GPS tracking to mark attendance. This will impact the design of the system.

3. System Architecture

The decomposition of the biometric attendance management system and digital notice board are following

1. Biometric Machine
    a. Record Time IN/ OUT
2. Digital Notice Board
    a. Reserved room details
    b. Important Notice
3. Admin Functionality
    a. Attendance Monitoring
    b. Attendance Summary
    c. Classes Schedule
    d. Generate Important Notices

The functionality of biometric machine is to verify the details of professor and to mark the attendance of the professor in the database of the system. It will record the time In and Out of the professor.
Digital Notice Board will show the classes schedule and the reserved room details and will show the important notice on the digital board.
In the Admin Functionality admin will be able to monitor attendance of Professor and will generate summary of the attendance. He will also be able to set classes schedule and to generate Important Notices which will be shown on the Digital Notice Board.

3.1 System Level Architecture

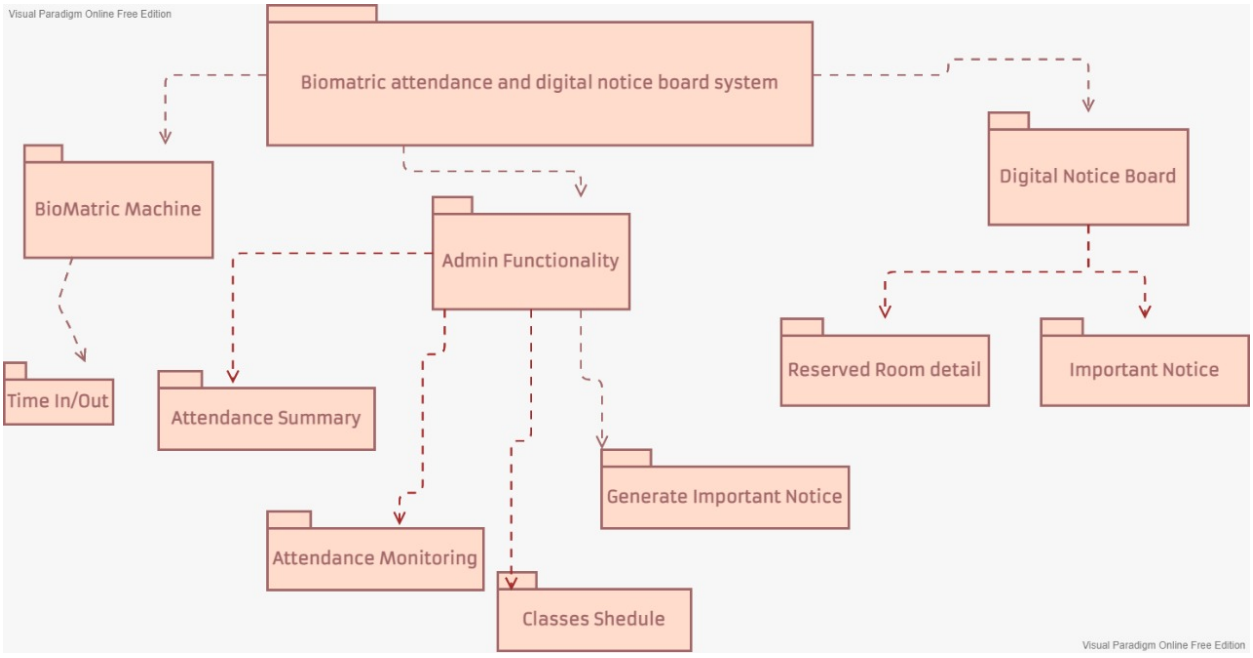


Figure 1: Package and Deployment Diagram

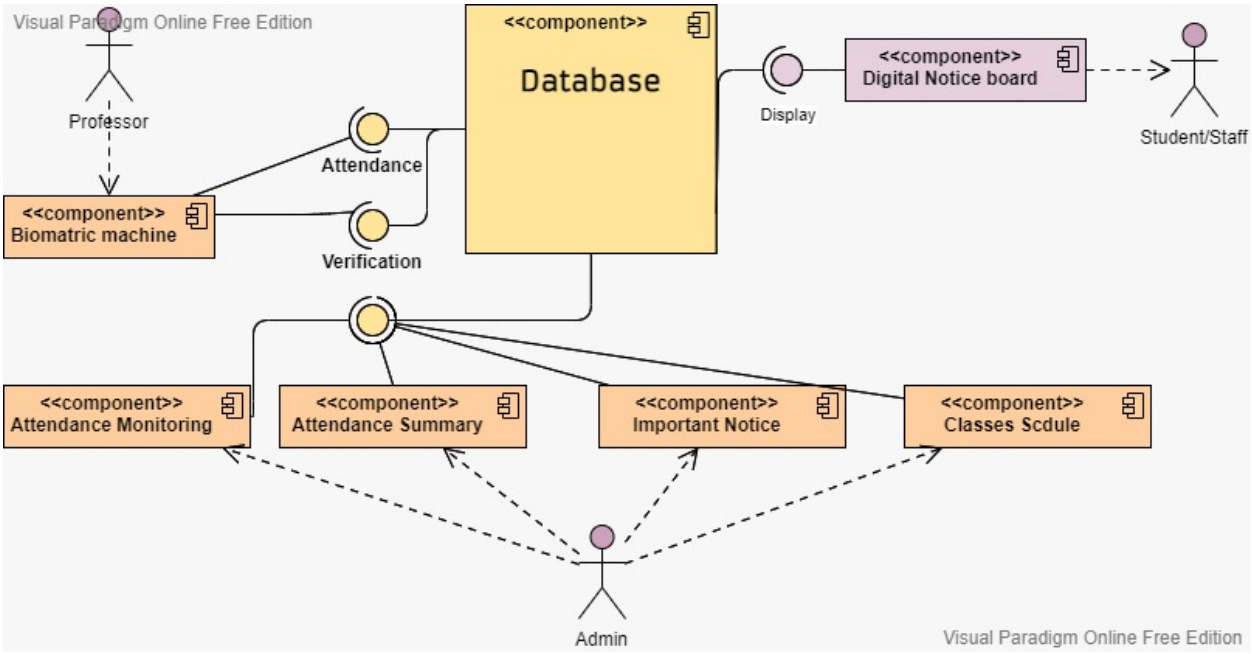
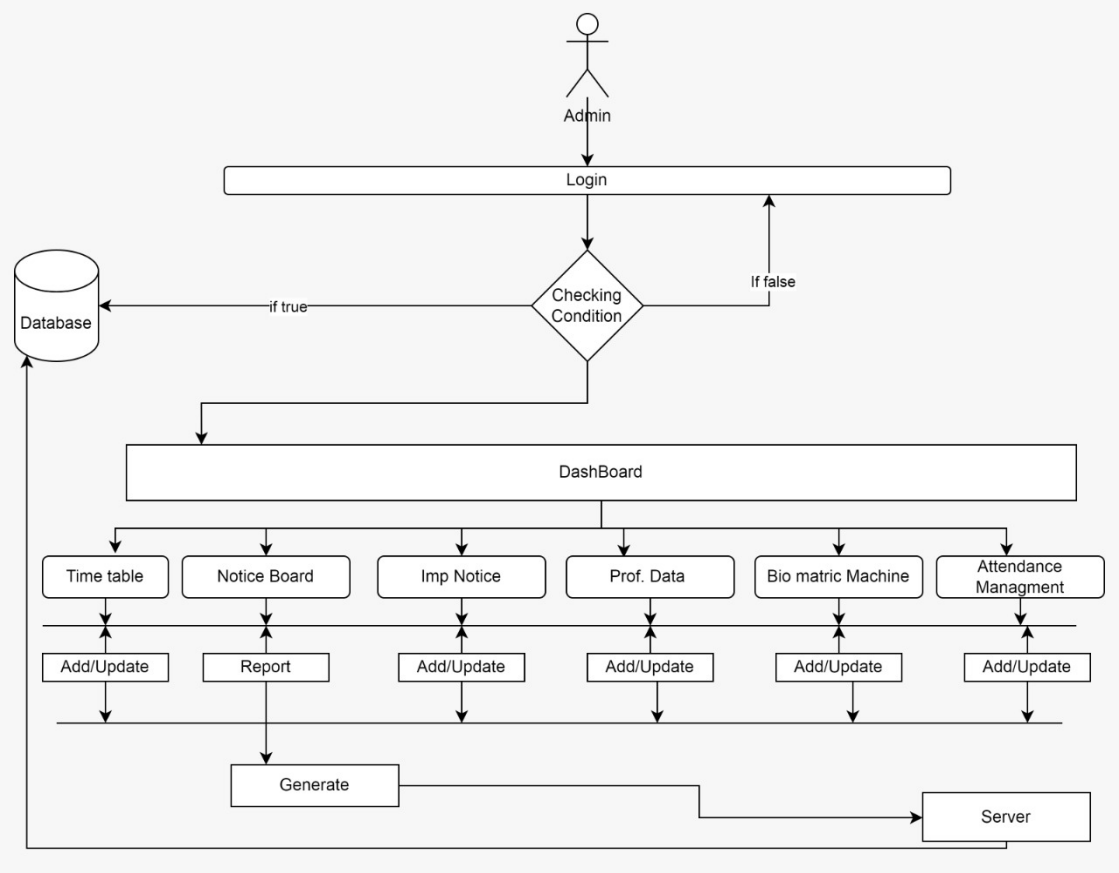
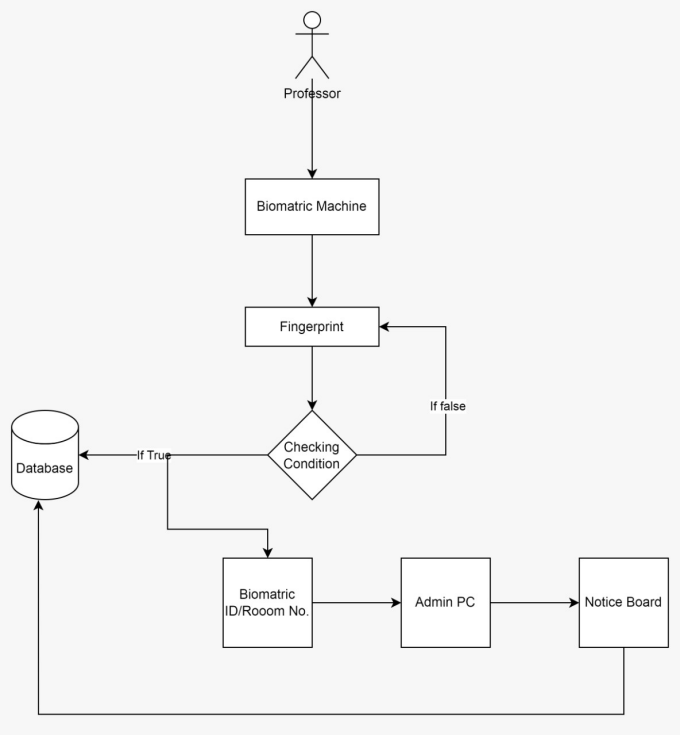


Figure 2: Component Diagram

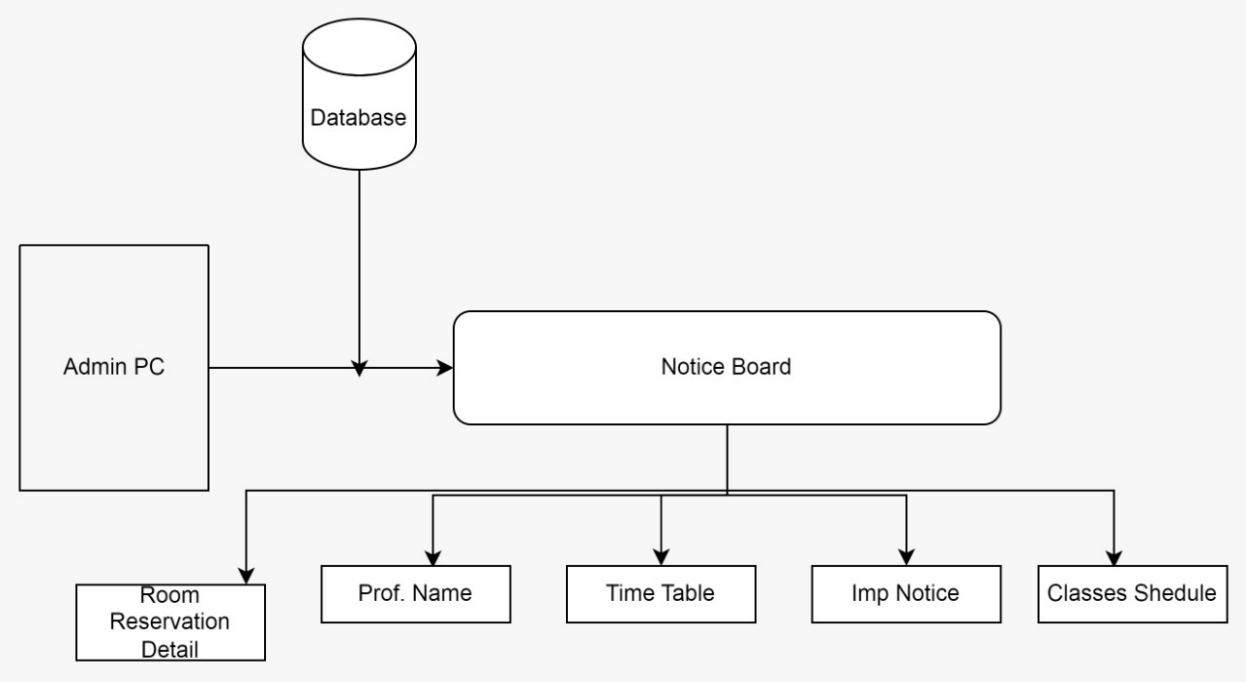
3.2Sub-System / Component / Module Level Architecture (Main)



3.3 Sub-Component / Sub-Module Level Architecture (Professor level)



3.4 Sub-Component / Sub-Module Level Architecture (Admin Level)



4. Design Strategies

Describe the design strategies or decisions that impact the overall organization of the system and its high-level structures. This information should provide the reader with insights into the key abstractions and mechanisms used in the system architecture.

The app will provide excellent user experience and will have interactive user interface. Admin will navigate through the components of the system easily. Students and staff of the department can also easily navigate through the reserved room details and classes schedule. Design strategies include:

- Well-designed user interface (UI)
- Fast loading time
- Strong data protection

4.1 Well-designed User Interface:

The interface of our system is interactive and Admin can easily navigate through the system parts. All the components are properly placed. Everything is properly placed for ease in navigation.

- **Future system extension or enhancement:** Application will be more interactive if we add animation and we add icons in future. This will make our system more user-friendly.
- **System reuse**: pre-made templates, UI toolkits, open-source frameworks and libraries, designing software, CSS animations will be used to make it more user-friendly
- **User interface paradigms**:
- **Data management (storage, distribution, persistence):**
- **Concurrency and synchronization:**

4.2 Fast loading time:

Application will be responsive and fast; it will not take more than 5 seconds to load the page content, ideally 2 seconds. System will take less resources and memory to load content quickly. Application will be responsive that creates good appearance on different screens and layouts.

- **Future system extension or enhancement:** Adding more servers, update software versions. Implementing a reliable content delivery network (CDN), compressing data.
- **System reuse**: code optimized CSS and JavaScript files, Fast web hosting, website speed testing tools, Bootstrap 5, CSS frameworks.
- **User interface paradigms:**
- **Data management (storage, distribution, persistence):**
- **Concurrency and synchronization:**

4.3 Strong data protection:

Multiple layers of security control will be implemented in the architecture. Keeping system software and plugins up-to-date. No user should be given enough privileges to misuse the system on their own. Data breaches, unsecured storage, poor controls, and other issues are the main threats to app security.

- **Future system extension or enhancement:** Encrypting, sensitive data and using multi-factor authentication.

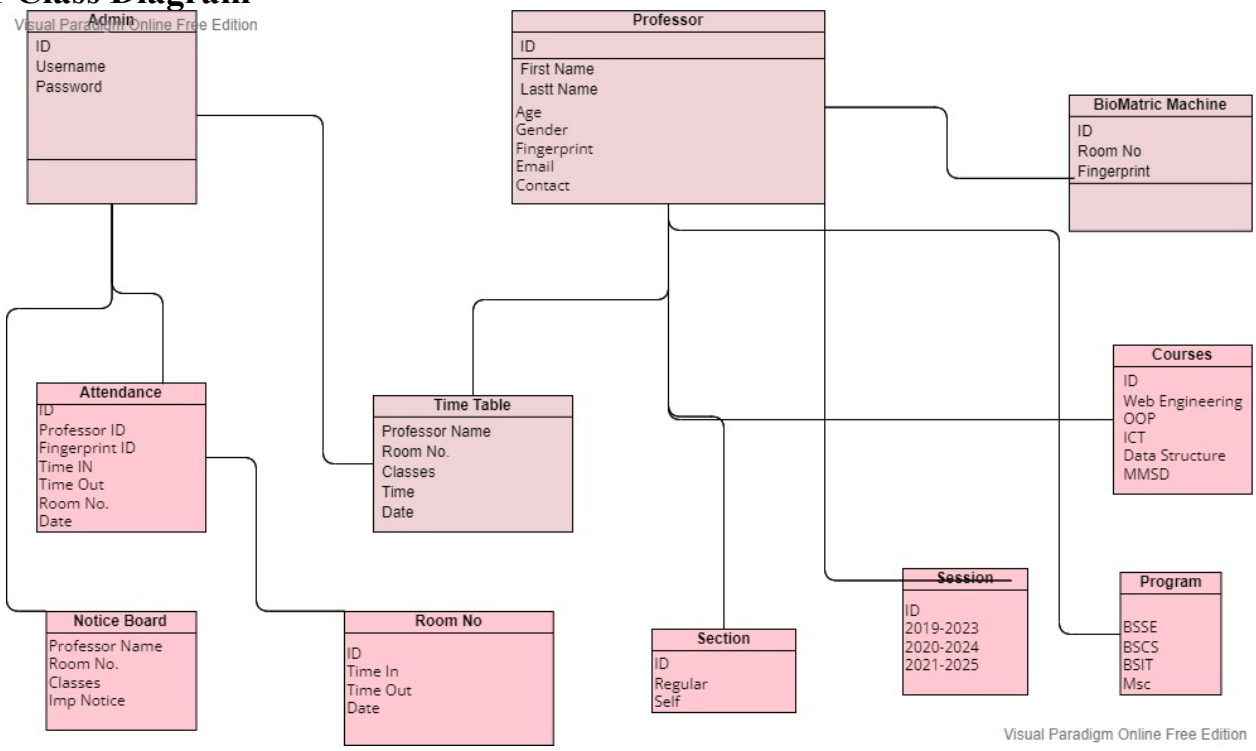
- **System reuse**: security testing tools, penetration testing for app vulnerabilities, plug-ins, technologies, firewalls architecture

- **User interface paradigms:**
- **Data management (storage, distribution, persistence):**
- **Concurrency and synchronization:**

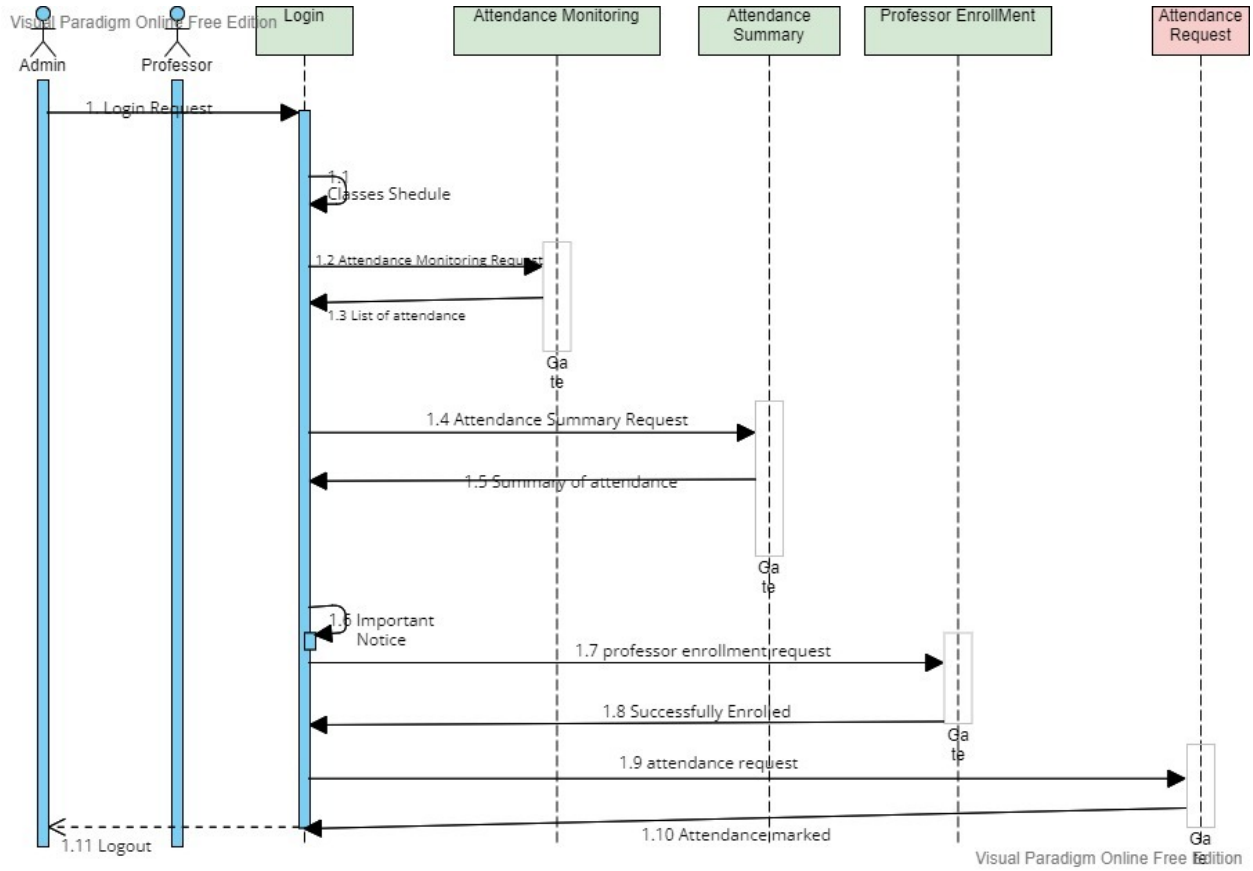
5. Detailed System Design

A detailed design include the following:

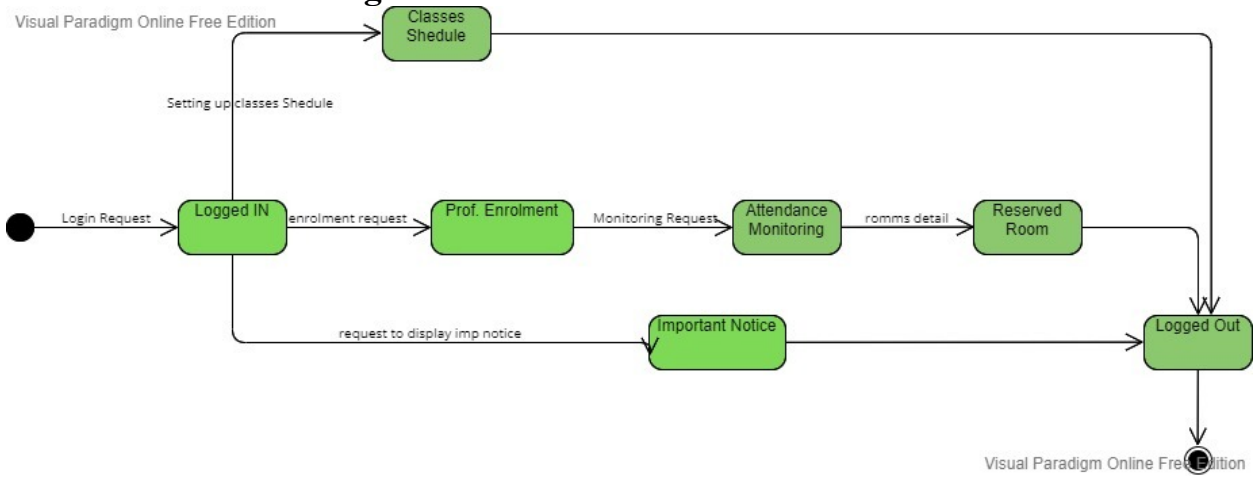
5.1 Class Diagram



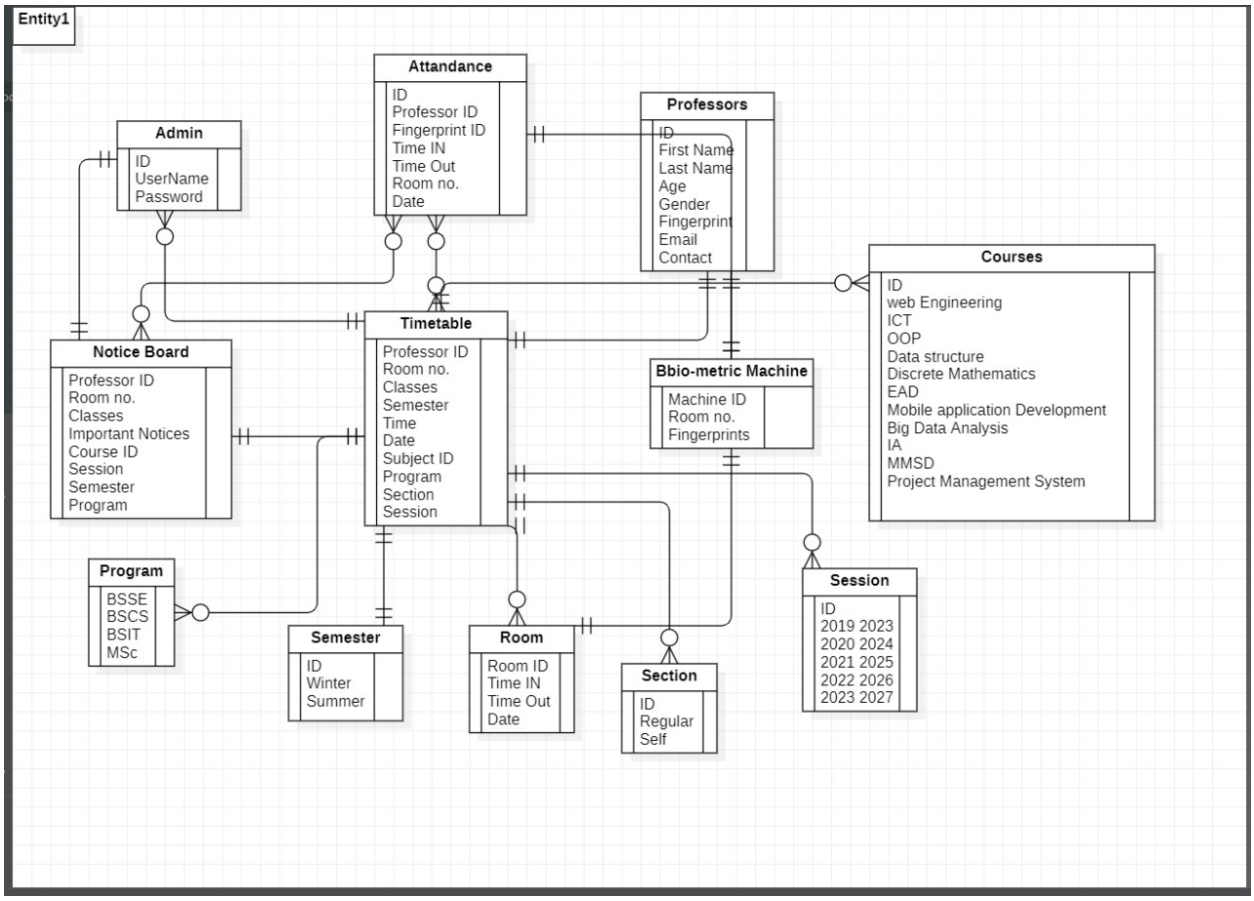
5.2 Sequence Diagram



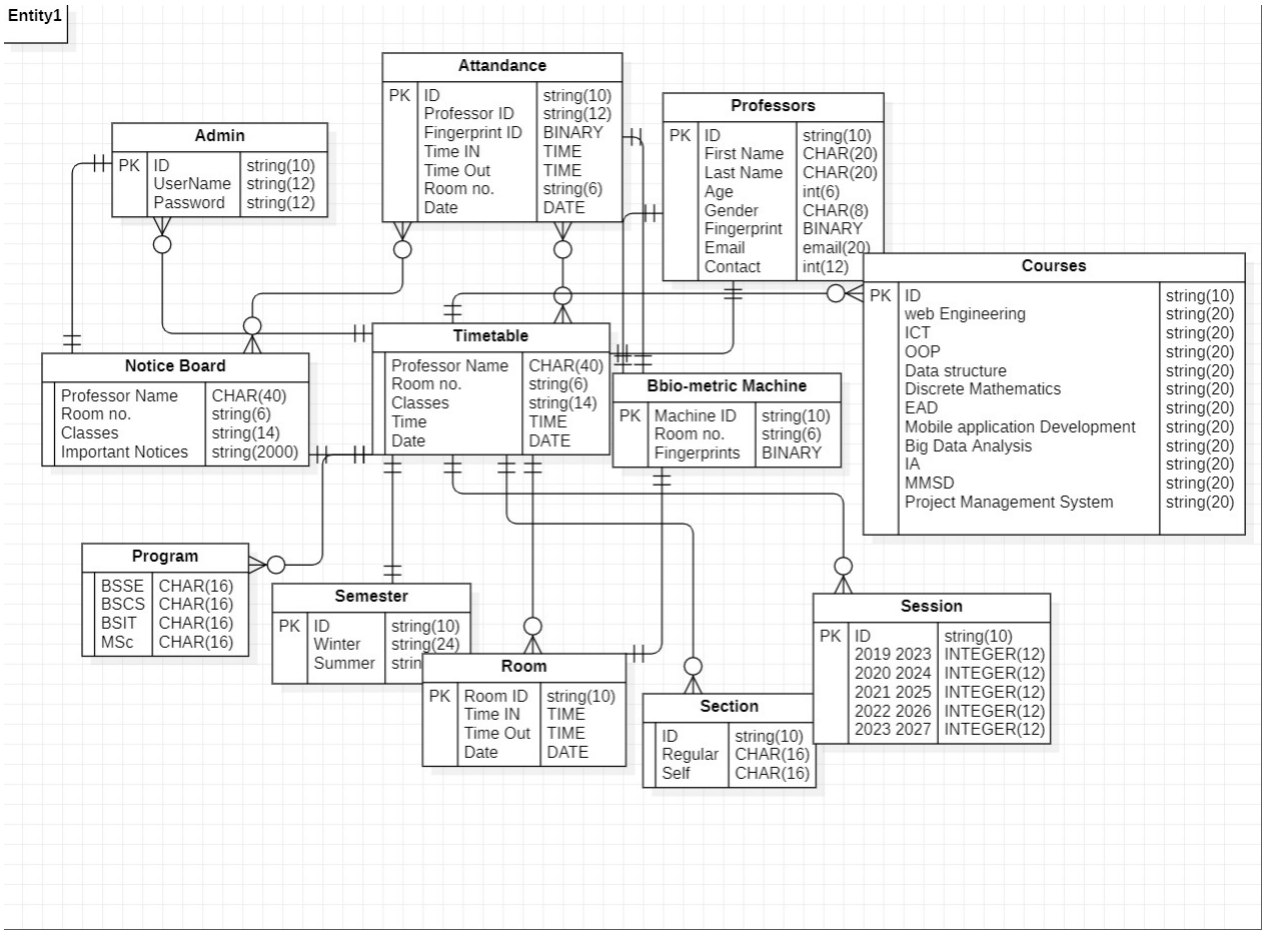
5.3 State Transaction Diagram



5.4 Logical Data Model

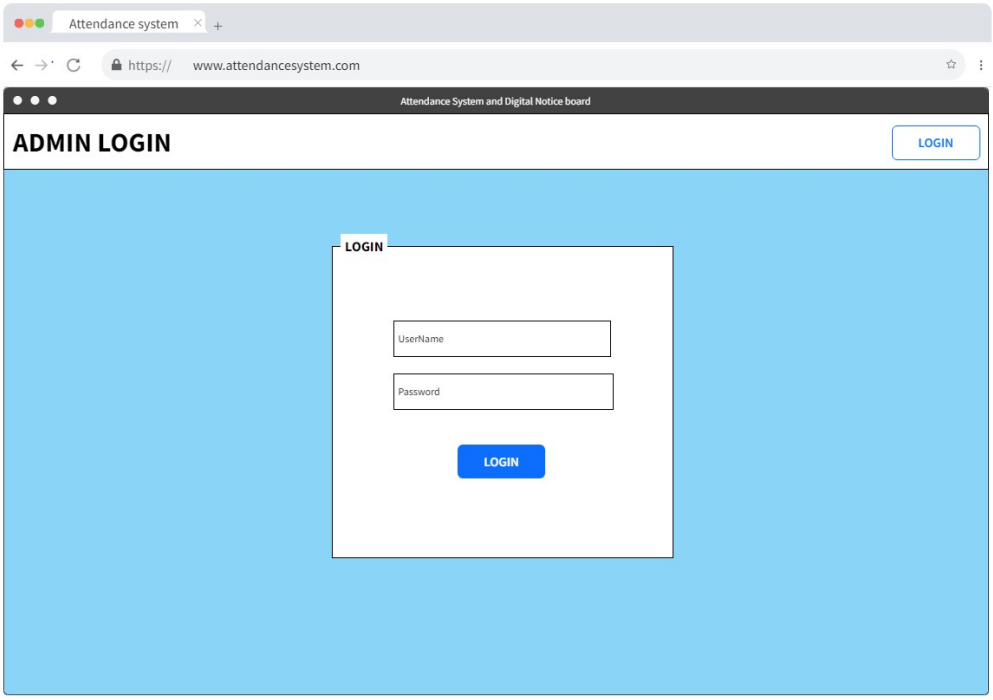


5.5 Physical Data Model

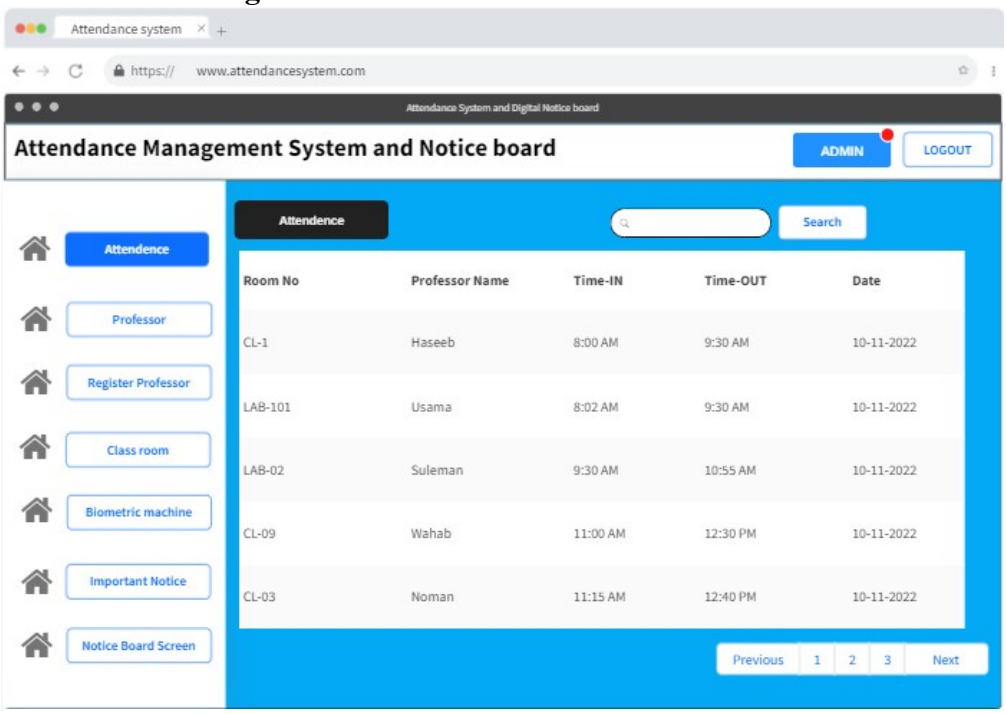


5.6 GUI's:

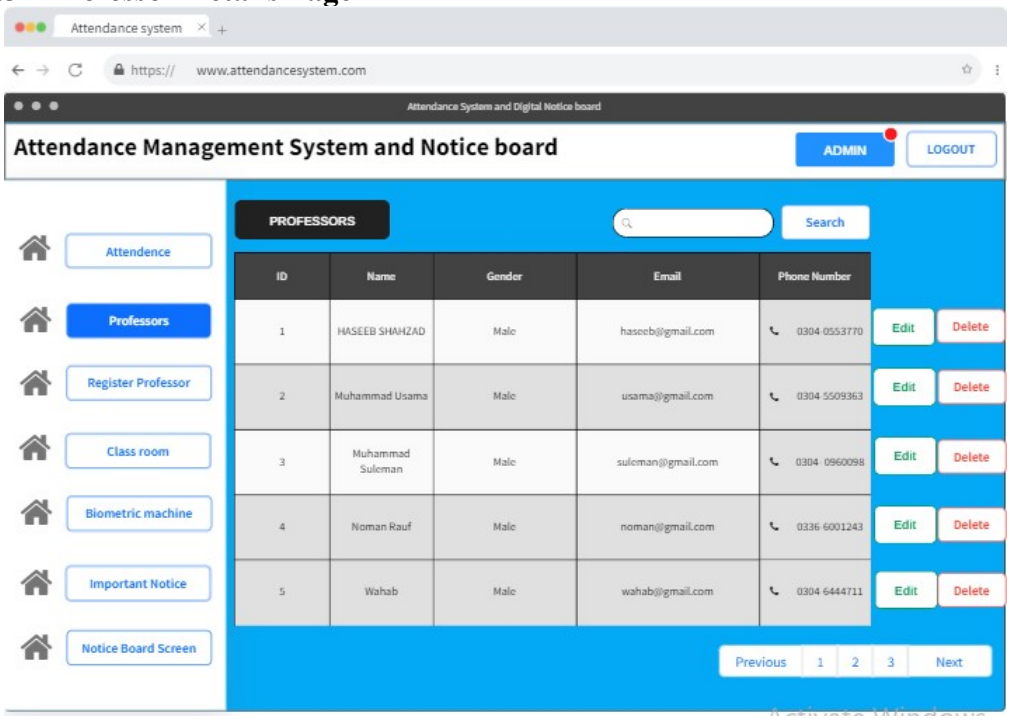
5.1.1 LOGIN Page



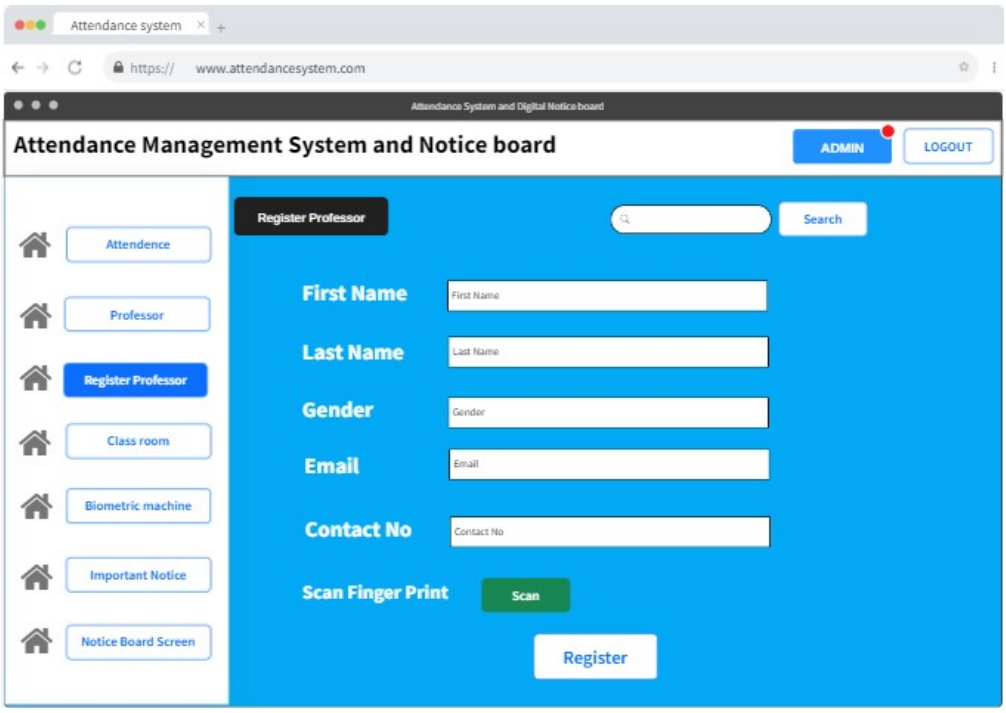
5.1.2 Attendance Page



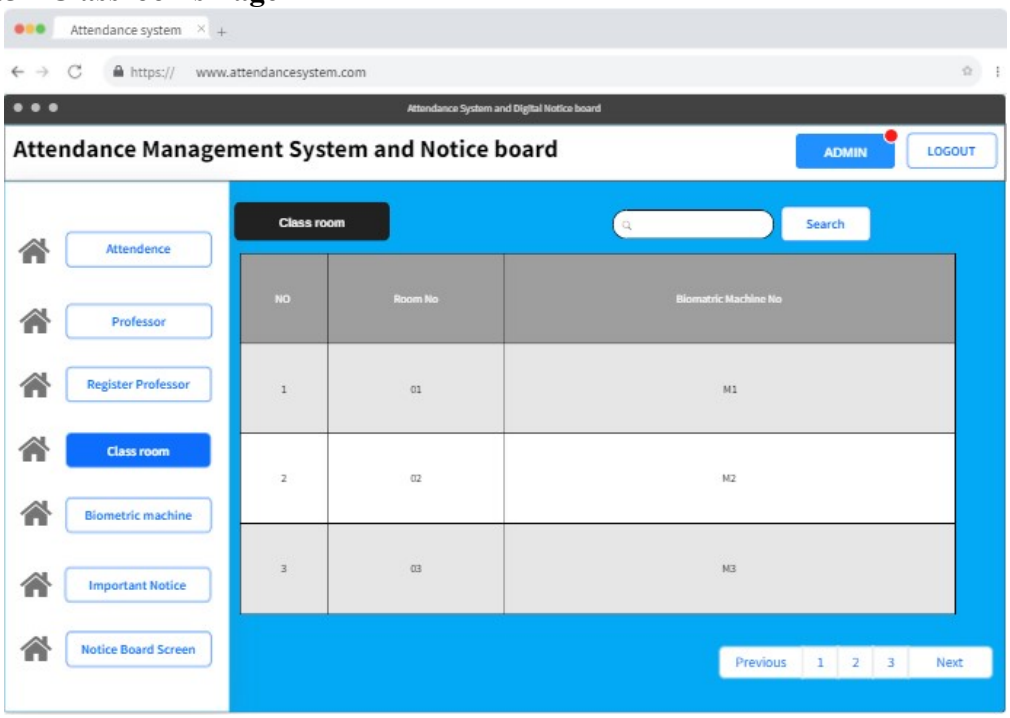
5.1.3 Professor Details Page



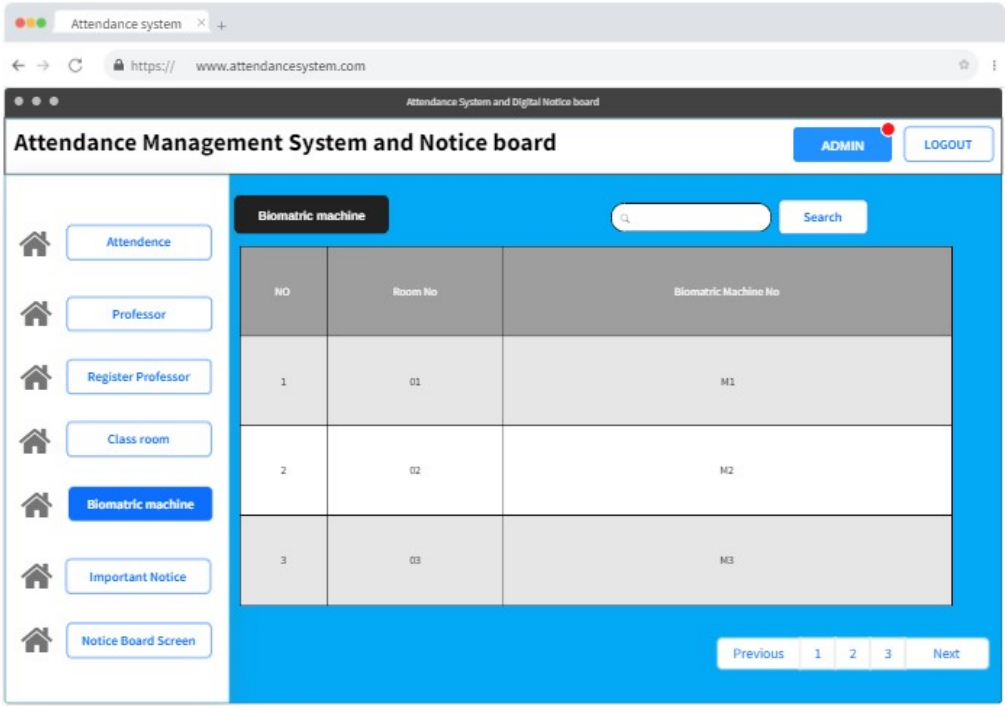
5.1.4 Professor's Enrollment Page



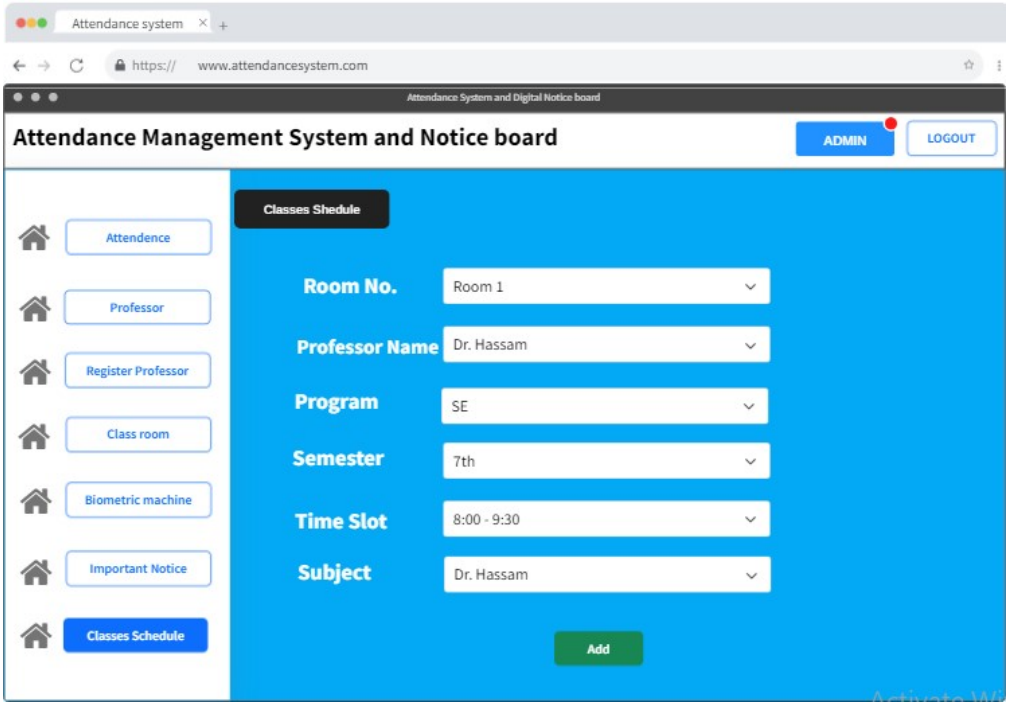
5.1.5 Classrooms Page



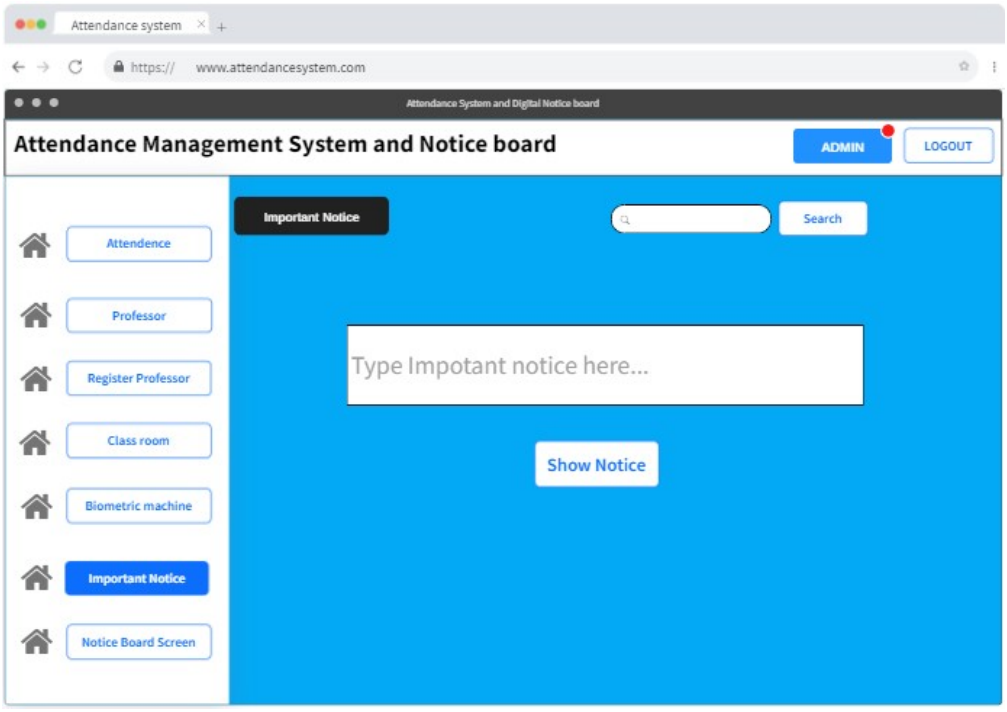
5.1.6 Biometric Machine Details Page



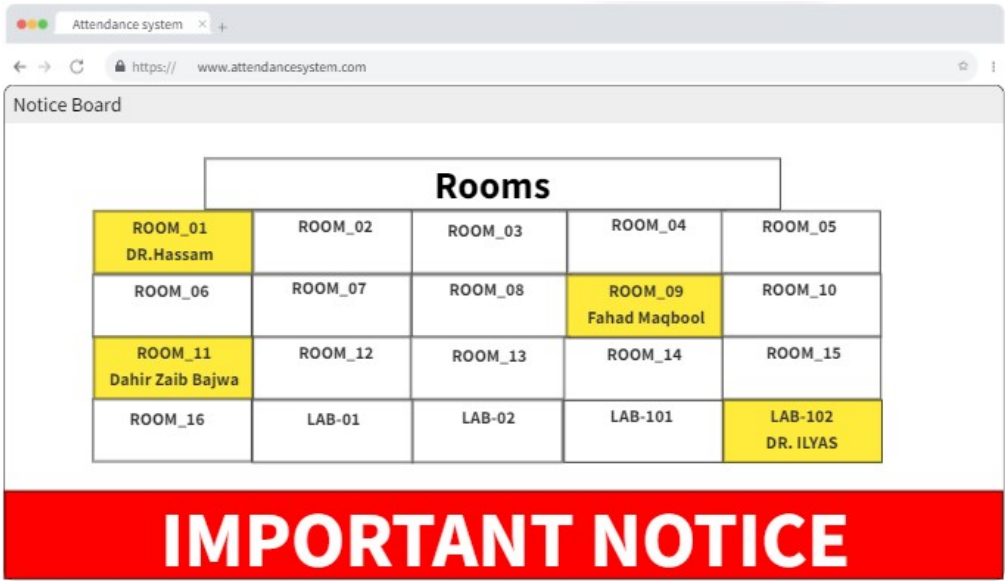
5.1.7 Classes Schedule Page



5.1.8 Notice Page



5.1.9 Notice Board Screen



6. References

Ref. No.	Document Title	Date of Release/ Publication	Document Source

Ref. No.	Document Title	Date of Release/ Publication	Document Source
PGBH01-2022-Proposal	Project Proposal	Oct 20, 2022	https://github.com/Haseebshahzad052/Biometric-Attendance-Management-system-and-Digital-Notice-Board/blob/main/BAMS%20Proposal.pdf
PGBH01-2022-FS	Functional Specification	Oct 20, 2022	https://github.com/Haseebshahzad052/Biometric-Attendance-Management-system-and-Digital-Notice-Board/blob/main/SRS%20%2B%20FS%20BAMS.doc