

**BANNARI AMMAN INSTITUTE OF TECHNOLOGY**

**An Autonomous Institution Affiliated to Anna University - Chennai, Accredited by NAAC with A+ Grade**

**Sathyamangalam - 638401 Erode District, Tamil Nadu, India**

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**Roll Number:** 7376221CS281

**Seat No:**300

**Project ID:** 21

**Project Title:** Academic Lab slot Booking

**Technical Components**

| **Component** | **Tech Stack** |
| --- | --- |
| Backend | Node.js, Express.js |
| Frontend | Angular |
| Database | MongoDB |
| API | RESTful services |

**Implementation Timeline**

| **Phase** | **Deadline** | **Status** | **Notes** |
| --- | --- | --- | --- |
| Stage 1 | Jul 20, 2024 | Under review | Planning and Requirement Gathering |
| Stage 2 | Jul 25, 2024 | In progress | Design and Prototyping |
| Stage 3 | Aug 1, 2024 | Not started | Database Designing |
| Stage 4 | Aug 10, 2024 | Not started | Backend Implementation |
| Stage 5 | Aug 20, 2024 | Not started | Testing & Integration |
| Stage 6 | Sep 17, 2024 | Not started | Deployment |

**Problem Statement**

The current manual process for booking lab slots in educational institutions leads to several challenges, including:

**Inconsistent Scheduling:** Students often face conflicts with other classes or commitments due to lack of a centralized booking system.

**Administrative Overload:** Faculty and administrative staff spend significant time managing and coordinating lab schedules.

**Limited Visibility:** Students lack real-time visibility into available lab slots, leading to inefficiencies and missed opportunities.

**Project Flow**

**Purpose:**

To develop a centralized lab slot booking system that allows students to book lab slots based on their availability and academic requirements while enabling faculty to manage and update available slots efficiently.

**Scope:**

This system includes user authentication, slot booking interface, real-time availability updates, and a management dashboard for faculty.

**Business Context:**

The lab slot booking system aims to streamline the process of scheduling lab sessions, thereby improving resource utilization and reducing scheduling conflicts. Primary stakeholders include students, faculty, administrative staff, and the IT department.

**Considerations:**

* All users must access the system using their organization-provided email IDs.
* Users must have regular access to internet-enabled devices.

**Dependencies:**

* Integration with the organization's email system for authentication.
* Reliable performance and availability of the institution's network infrastructure.

**User Personas:**

* **Student:** Needs to book lab slots that fit into their academic schedule.
* **Faculty:** Requires the ability to manage and update available lab slots.
* **Admin Staff:** Manages the overall system operations and resolves conflicts.

**User Stories:**

* As a student, I want to see available lab slots for my subjects so that I can book a slot that fits into my schedule.
* As a faculty member, I need to update the available lab slots for my subject so that students can book them.
* As an admin staff member, I want to ensure that the system runs smoothly and resolves any booking conflicts that arise.

**Functional Requirements**

* **User Authentication:** Secure login using organization-provided email IDs.
* **Slot Booking Interface:** Students can view and book available lab slots.
* **Availability Management:** Faculty can update and manage available lab slots.
* **Conflict Resolution:** System automatically detects and notifies users of scheduling conflicts.
* **Real-time Dashboard:** Faculty and admin staff can view and manage lab schedules in real time.
* **Notification System:** Automatic email notifications to students and faculty about booking confirmations, cancellations, or changes.
* **Reporting and Analytics:** Generate reports on lab usage, booking trends, and conflict resolutions to help in planning and resource allocation.

**Non-Functional Requirements**

* **Performance:** The system should handle concurrent requests efficiently to ensure smooth booking and updating processes.
* **Scalability:** The architecture should support future expansion in terms of users and additional features.
* **Security:** Ensure data protection and secure access to the system through robust authentication and authorization mechanisms.
* **Usability:** Provide an intuitive and user-friendly interface for both students and faculty.
* **Reliability:** Ensure high availability and minimal downtime to support continuous access to the booking system.

**Flowchart**

