
Requirements and Design Document

for

PanelHub

Version 1.0

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Glossary

System	The PanelHub application
API	Application programming Interface, from data is received or sent to backend service.
Scholar	Students of NITC
Faculty	Faculty of NITC
F#	Functional requirement
UI	User Interface - the frontend of the application where users will interact with the application.

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MERN Application Design Document: PanelHub

1. Introduction

Project Vision

PanelHub is a web-based scheduling platform that simplifies and automates the process of booking and managing project evaluation slots in academic institutions.

Problem Statement

Academic scheduling for project evaluations is often inefficient due to manual coordination, lack of real-time visibility of faculty availability, and overlapping bookings. This leads to scheduling conflicts, wasted time, and frustration for both students and faculties. PanelHub addresses these issues by providing a centralized, automated system to streamline scheduling and ensure transparency.

Target Audience

The primary users of PanelHub are:

- **Faculty:** Responsible for adding and managing faculty availability, approving scholar requests for booking slots.
- **Scholars (Students/Researchers):** Undergraduate, postgraduate, and doctoral students who need to view, book, and manage evaluation slots with their respective faculty panels.

Key Objectives

The key objectives of PanelHub are to:

- Provide an intuitive platform for slot booking and cancellation.
- Reduce scheduling conflicts through real-time updates and conflict prevention.
- Improve transparency by allowing scholars to view available slots.
- Enhance efficiency for administrators by centralizing faculty and venue management.

2. Functional Requirements

Key Features & Scope: A high-level list of the main features that will be built.

F1: Scholar should be able to create an account in the system using name, valid NITC email ID, password, department (CSE, ME, ECE, EEE, CE), course category (UG/PG/PhD).

F2: Faculty should be able to create an account in the system using name, valid NITC email ID, password, department.

F3: Scholar and Faculty should be able to login into the system.

F4: The system should be able to do role based authorization and direct them to role specific dashboards. (Scholar Role, Faculty Role).

F5: In the faculty dashboard, the system shall display a table like calendar up to 1 week ahead where the faculty can add/delete the free time for each course category. The calendar will be a table like structure where dates are the rows of the calendar and time as the columns of 1Hr periods. The time is limited between 8:00 AM to 8:00 PM. No free slots can be added on Sundays.

F6: In the Faculty dashboard, the system should display the confirmed status bookings in the order of date and time.

F7: In the Faculty dashboard, the system shall display to the faculty the booking requests approved by the faculty which are in pending status (Partial approval - waiting for other faculties approval).

F8: In the Faculty dashboard, the system shall display the booking requests which are yet to be approved by him/her.

F9: The system shall delete the bookings requests from scholars and other faculties of the panel when a faculty rejects the request for booking.

F10: The system shall provide the filtering functionality to the faculty to filter based date, time and course category.

F11: A faculty may cancel a confirmed booking from their dashboard. This action cancels the booking for all participants and notifies the scholar and other panel members.

F12: In the Scholar Dashboard, Scholar should be able to find a suitable slot for presentation by giving the details like list of his/her department faculties (up to 3 faculties in the same department of the Scholar) required in the panel and date. Each slot is of 1Hr duration.

F13: When the scholar applies a search option for a slot, the system shall display the all slots corresponding to his/her department where all the panel faculties have common free time on that specific date. If no slots are available, the Scholar has to select some other date for getting the slot.

F14: The system shall allow the Scholar to book the slot. One active booking is allowed.

F15: System should display status of the booking whether pending (waiting for approval from each panel faculties) or confirmed to the Scholar. The status turns from pending to confirmed when all the faculties in the list approves.

F16: The system shall allow the Scholar to cancel the confirmed/pending booking.

F17: The system shall send notification to Scholar and panel faculties regarding every state change in the booking.

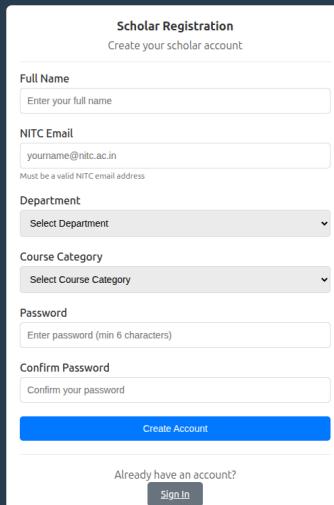
F18: The system shall provide a logout option for Scholar and Faculty.

3. UI Design

Below are the sample UI designs which will almost resemble the final product which will be developed. Dummy data is given in the UI for the purpose of presentation of the UI.

3.1 Scholar Registration Page

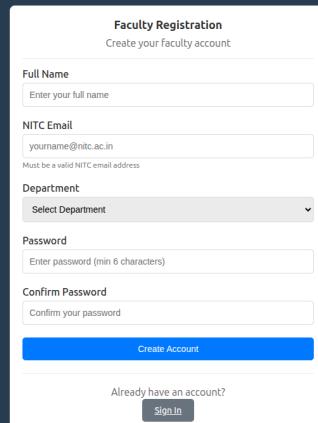
This page is for a scholar to create an account in the system.



The screenshot shows a "Scholar Registration" form titled "Create your scholar account". It includes fields for Full Name (placeholder: Enter your full name), NITC Email (placeholder: youname@nitc.ac.in, note: Must be a valid NITC email address), Department (dropdown menu: Select Department), Course Category (dropdown menu: Select Course Category), Password (placeholder: Enter password (min 6 characters)), and Confirm Password (placeholder: Confirm your password). A blue "Create Account" button is at the bottom, followed by a link "Already have an account?" and a "Sign In" button.

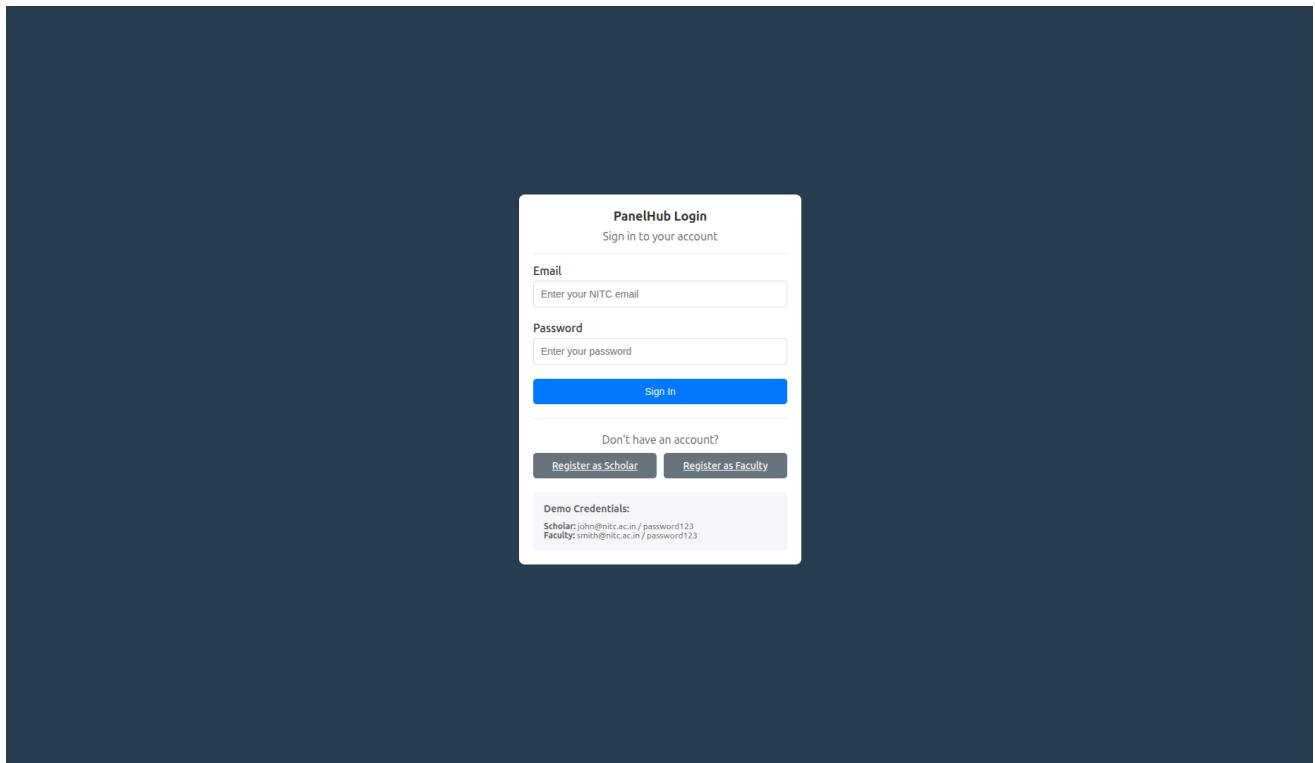
3.2 Faculty Registration Page

This page is for a faculty to create account the in system



The screenshot shows a "Faculty Registration" form titled "Create your faculty account". It includes fields for Full Name (placeholder: Enter your full name), NITC Email (placeholder: youname@nitc.ac.in, note: Must be a valid NITC email address), Department (dropdown menu: Select Department), Password (placeholder: Enter password (min 6 characters)), and Confirm Password (placeholder: Confirm your password). A blue "Create Account" button is at the bottom, followed by a link "Already have an account?" and a "Sign In" button.

3.3 Login Screen



3.4 Manage Free Slot for faculty

Faculty can add his/her free slots in this table.

The 'Manage Free Slots' interface for faculty. The top navigation bar includes 'PanelHub', 'Welcome, Dr. Smith (Faculty)', and 'Logout'. On the left, a sidebar lists navigation options: 'Manage Free Slots' (selected), 'View Confirmed Booking', 'Manage Approved Booking', and 'View Unapproved Booking'. The main content area is titled 'Manage Free Slots' with the sub-instruction 'Click on any cell to add or remove free time for different course categories'. It features a 7x16 grid representing days (Mon-Sun) and time slots (8:00 AM to 8:00 PM). Cells are colored based on course categories: white for 'No free time', light green for '1 category', yellow for '2 categories', and light blue for '3 categories'. A legend at the bottom left defines these colors. The bottom of the page has a footer with the copyright notice '© PanelHub'.

Welcome, Dr. Smith (Faculty) Logout

Manage Free Slots
Click on any cell to add or remove free time for different course categories

Date	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	
Mon Oct 27	UG, PG		PG	PhD			UG, PhD	PhD	PG	PhD			UG, PhD	UG, PhD
Tue Oct 28	UG		PhD	PG	PhD	PG	UG	PG, PhD	UG, PG		UG, PhD		PG, PhD	
Wed Oct 29	UG, PG, PhD	UG, PG	PhD	UG, PhD	PG					UG		PG	PhD	
Thu Oct 30	PG	PG, PhD	PG				PhD	PhD	UG, PG, PhD	UG, PhD	UG	PG		
Fri Oct 31	UG						UG		UG, PG, PhD	UG	UG	UG		
Sat Nov 1	PG	UG, PhD	PhD				UG	UG, PG	UG			UG	PhD	
Sun Nov 2	PG	PG, PhD		PhD			UG, PhD	UG		PhD		PhD		

Manage Free Time
Date: 10/31/2025
Time: 11:00 AM

Available for:

- UG Students
- PG Students
- PhD Students

Legend:
No free time | 1 category | 2 categories | 3 categories

Close

© PanelHub

3.5 View Confirmed Booking for faculty

Faculty can see the confirmed booking on this page.

Welcome, Dr. Smith (Faculty) Logout

Confirmed Bookings
View all confirmed presentation bookings where you are a panel member

Filter by Date mm/dd/yyyy Filter by Time All Times Filter by Course Category All Categories

Presentation Booking
Date: 1/15/2024 | Time: 10:00 AM | Duration: 1 hour Confirmed

Scholar Details:

Name: John Doe
Email: john@nitc.ac.in
Course Category: UG
Department: CSE

Panel Members:

Dr. Smith
smith@nitc.ac.in

Dr. Johnson
johnson@nitc.ac.in

Dr. Brown
brown@nitc.ac.in

Confirmed: 1/12/2024, 8:00:00 PM Cancel Booking

Presentation Booking
Date: 1/20/2024 | Time: 3:00 PM | Duration: 1 hour Confirmed

Scholar Details:

Name: Mike Johnson
Email: mike@nitc.ac.in
Course Category: PhD
Department: CSE

Panel Members:

Dr. Smith
smith@nitc.ac.in

Dr. Johnson
johnson@nitc.ac.in

Dr. Taylor
taylor@nitc.ac.in

Confirmed: 1/16/2024, 10:15:00 PM Cancel Booking

© PanelHub

3.6 Manage Approved Booking for faculty

Faculty can manage the partially approved bookings.

The screenshot shows the 'Manage Approved Bookings' section of the PanelHub application. On the left sidebar, there are several navigation options: 'Manage Free Slots' (highlighted with a green checkmark), 'View Confirmed Booking' (highlighted with a green checkmark), 'Manage Approved Booking' (highlighted with a yellow exclamation mark), and 'View Unapproved Booking'. The main content area has a title 'Manage Approved Bookings' with a subtitle 'View bookings you have approved that are still pending approval from other faculty members'. It includes three filter sections: 'Filter by Date' (with a date input field 'mm/dd/yyyy'), 'Filter by Time' (with a dropdown 'All Times'), and 'Filter by Course Category' (with a dropdown 'All Categories'). Below these filters, there are two booking entries under the heading 'Presentation Booking'. Each entry shows a scholar's details (Name: Alice Brown, Email: alice@nitc.ac.in, Course Category: UG, Department: CSE) and a panel members status table. The first panel member, Dr. Smith, is shown as 'Approved You' (green background). The second panel member, Dr. Johnson, is shown as 'Pending' (yellow background). The third panel member, Dr. Brown, is also shown as 'Pending' (yellow background). A red 'Pending Approval' button is located in the top right corner of each booking entry. At the bottom of the page, there is a red 'Cancel Booking' button and a copyright notice '© PanelHub'.

3.7 View Unapproved Booking for faculty

Faculty can approve/reject the booking request from a scholar.

The screenshot shows the 'View Unapproved Bookings' section of the PanelHub application. On the left sidebar, the same navigation options are present: 'Manage Free Slots' (highlighted with a green checkmark), 'View Confirmed Booking' (highlighted with a green checkmark), 'Manage Approved Booking' (highlighted with a yellow exclamation mark), and 'View Unapproved Booking' (highlighted with a yellow exclamation mark). The main content area has a title 'View Unapproved Bookings' with a subtitle 'Review and approve/reject presentation booking requests where you are a panel member'. It includes three filter sections: 'Filter by Date' (with a date input field 'mm/dd/yyyy'), 'Filter by Time' (with a dropdown 'All Times'), and 'Filter by Course Category' (with a dropdown 'All Categories'). Below these filters, there is one booking request entry under the heading 'Presentation Booking Request'. The entry shows a scholar's details (Name: Charlie Wilson, Email: charlie@nitc.ac.in, Course Category: UG, Department: CSE) and a panel members status table. All three panel members (Dr. Smith, Dr. Johnson, Dr. Brown) are listed as 'Pending' (yellow background). A red 'Awaiting Your Approval' button is located in the top right corner of the booking request entry. At the bottom of the page, there are red 'Reject' and green 'Approve' buttons, and a copyright notice '© PanelHub'.

3.8 Book Slot by scholar

Scholars can search the free slots available for the faculties in the required in the panel.

PanelHub

Welcome, John Doe (Scholar) Logout

Book Presentation Slot
Select faculty members and find available slots for your presentation

Select Faculty Members (Max 3)
Select up to 3 faculty members | Selected: 0/3

Preferred Date
mm/dd/yyyy

Search Available Slots

© PanelHub

Available Slots
Select a slot to book your presentation

11:00 AM
Duration: 1 hour
Book This Slot

11:00 AM
Duration: 1 hour
Book This Slot

3:00 PM
Duration: 1 hour
Book This Slot

Selected Panel:
• Dr. Lee
• Dr. Johnson
• Dr. Taylor

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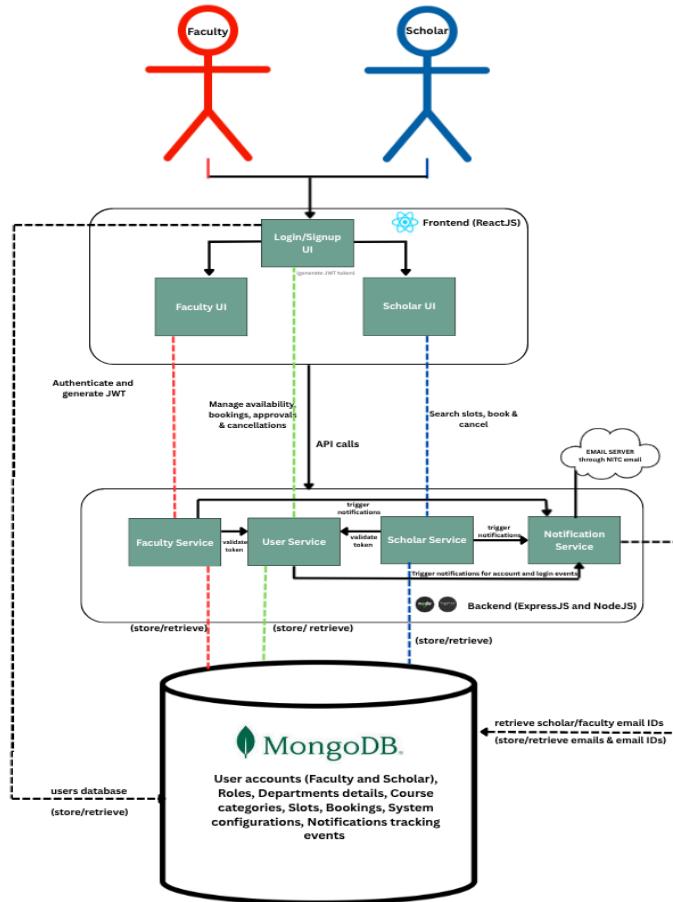
3.9 Manage Booking by scholar

Scholars can manage the booking from this page.

The screenshot shows the PanelHub application interface for a scholar named John Doe. The top navigation bar includes 'Welcome, John Doe (Scholar)' and a 'Logout' button. On the left sidebar, there are two options: 'Book Slot' and 'Manage Booking'. The main content area is titled 'Manage Your Bookings' with the subtitle 'View and manage your presentation slot bookings'. A section for a 'Presentation Slot' is displayed, showing a date of '1/15/2024' and a time of '10:00 AM'. Below this, under 'Panel Members', three scholars are listed: Dr. Smith (smith@mitc.ac.in), Dr. Johnson (johnson@mitc.ac.in), and Dr. Brown (brown@mitc.ac.in). Dr. Smith is marked as 'Approved' with a green checkmark icon, while Dr. Johnson and Dr. Brown are marked as 'Pending' with a yellow exclamation mark icon. A 'Pending' status indicator is also present in the top right corner of this section. At the bottom of this section, it says 'Created: 1/10/2024, 3:30:00 PM' and features a red 'Cancel Booking' button. Below this, a 'Booking Status Guide' section provides a visual legend: 'Pending' (yellow box, 'Waiting for approval from all panel faculties'), 'Confirmed' (green box, 'All panel faculties have approved the booking'), and 'Cancelled' (pink box, 'Booking has been cancelled by you or a faculty member'). The footer of the page contains the copyright notice '© PanelHub'.

4. System Architecture

4.1. High-Level Diagram



4.2. Technology Stack

- **Frontend:** React 18.x, React Router 6.x, Axios, Tailwind CSS
- **Backend:** Node.js 20.x, Express 4.x, Mongoose 8.x
- **Database:** MongoDB 7.x
- **Authentication:** JSON Web Tokens (JWT)

4.3. Database Schema (MongoDB Collections)

4.3.1 Role Collection

Stores the type of users the system will have.

```
{  
  _id: ObjectId,  
  name: String  
}
```

4.3.2 Department Collection

Keeps track of departments

```
{  
  _id: ObjectId,  
  name: String  
}
```

4.3.3 Course Category Collection

Keep track of the course category.

```
{  
  _id: ObjectId,  
  name: string  
}
```

4.3.4 Users Collection

Holds data for both Scholars and Admins.

```
{  
  _id: ObjectId,  
  name: String,  
  email: String,          // must be NITC email  
  password: String,       // hashed  
  role: ObjectId,         // reference to Role collection  
  department: ObjectId,   // reference to department collection  
  courseCategory: ObjectId, // reference to course category collection  
  createdAt: timestamp  
}
```

4.3.5 Booking Collection

Core collection for venue slots.

```
{  
  _id: ObjectId,  
  scholarIds: // reference to Scholar  
  facultyApprovals: {  
    Faculty1: {  
      facultyId:  
      approveStatus:  
    }  
    Faculty2: {  
      facultyId:  
      approveStatus:  
    }  
    Faculty3: {  
      facultyId:  
      approveStatus:  
    }  
  }  
  status: String, // "pending", "booked"  
  date: Date,  
  startTime: String, // "10:00"  
  duration: Number, // always 1 hr  
  department: ObjectId, // reference to department  
  courseCategory: ObjectId, // reference to course category  
  createdBy: ObjectId, // reference to Users (Scholar)  
  createdAt: timestamp,  
  updatedBy: ObjectId,  
  updateAt: timestamp,  
}
```

4.3.6 Faculty Free Slots Collection

Collection which stores the booked slot details.

4.3.7 Notification Collection

To track emails sent from system events.

```
{  
  _id: ObjectId,  
  recipient: {  
    scholarIds: ObjectId[],    // reference to user ID  
    facultyIds: ObjectId[]     // reference to faculty ID  
  },                         // recipient  
  event: String,      // booking Created/Cancelled, slot Updated/Deleted  
  slotId: ObjectId,
```

```
    createdAt: timestamp,  
    sentStatus: boolean  
}
```