CSD415 Project Phase II
Interim
Forum Management System

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Abstract

- Focuses on creating a comprehensive website for efficient management and monitoring of CEC's diverse forums and communities.
- Acts as a centralized hub, uniting diverse entities and facilitating forum management by college staff.
- Ability to facilitate accreditation and audit processes, making the management of these forums more efficient and transparent.
- Enhances external visibility, fosters community engagement, and provides easy access to past/upcoming events.

Domain of Project & Topic

Domain:

Web Development

Project Topic:

Forum Management System

Relevance of the Topic

The following points highlight why this project is pertinent:

- Growing Number of Forums and Communities
- Need for Centralized Management
- Accreditation and Auditing
- Improving Community Engagement
- Learning frontend and backend frameworks in web development.

Introduction

Overview

- Responding to the evolving needs of our academic community at CEC.
- Proposal for a robust web application, the 'Forum Management System.'
- Aims to revolutionize the management of student forums and communities.
- Forums include IEEE, IEDC, Tinkerhub, GDSC, TPC, and others.
- Objectives: Streamline administrative tasks, enhance transparency, and promote community engagement.

Proposed Project

- Project aims to address an issue at the College of Engineering Chengannur (CEC).
- Goal is to create a web-based solution for managing various forums and communities.
- Currently, multiple college forums operate independently.
- Lack of centralized management leads to challenges in coordination.
- There are issues with administrative overhead and limited visibility.
- The application will streamline forum management.

The Project

Problem Statement:

To develop a web application that centralizes forum management, ensures transparency, and enhances the experience for both coordinators and members, prioritizing precise database management and event coordination.

Proposed Solution:

- Forum Management System (FMS): A web-based application as a centralized hub for CEC's forums and communities.
- Key Features:
  - Centralized Management
  - Event Scheduling
  - Attendance Tracking
  - Communication Hub
  - Transparency and Visibility
  - Member Engagement

Preparatory Work

Key Technologies Explored

1. **Next.js:**
   - *Description:* A React framework for building web applications.
   - *Insights Gained:* Understanding its role in modern web development and its benefits for our project.
2. **Express.js:**
   - *Description:* A minimal and flexible Node.js web application framework.
   - *Insights Gained:* Exploring its capabilities for server-side operations in our system.

Key Technologies Explored (Continued)

3. **Microsoft Azure:**
   - *Description:* A cloud computing platform offering various services, including computing, analytics, storage, and networking.
   - *Insights Gained:* Investigating the capabilities of Azure for hosting and deploying web applications.
4. **Nginx:**
   - *Description:* A web server that can also be used as a reverse proxy, load balancer, and HTTP cache.
   - *Insights Gained:* Exploring its role in server architecture and its potential use in optimizing web application performance.

Insights from Forums:

Insights from Forums:

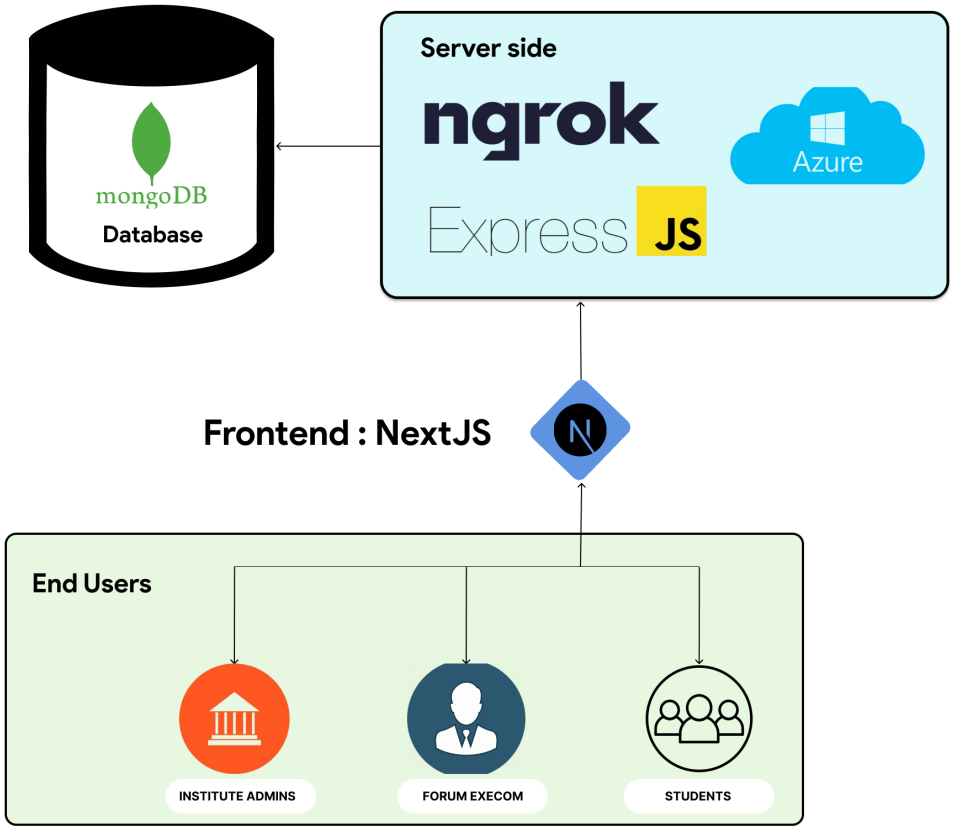
- Explored various forums: IEEE, IEDC, GDSC, NSS, Tinkerhub, Training and Placement Cell, FOCES, NCC.
- Identified distinct data management practices in forums.
- Forums like Tinkerhub, IEEE, IEDC use exclusive database systems for organizational officials.
- Existing systems showed a crucial gap in accessibility and functionality.
- Recognized the need for a more inclusive and efficient Forum Management System.

Literature Review

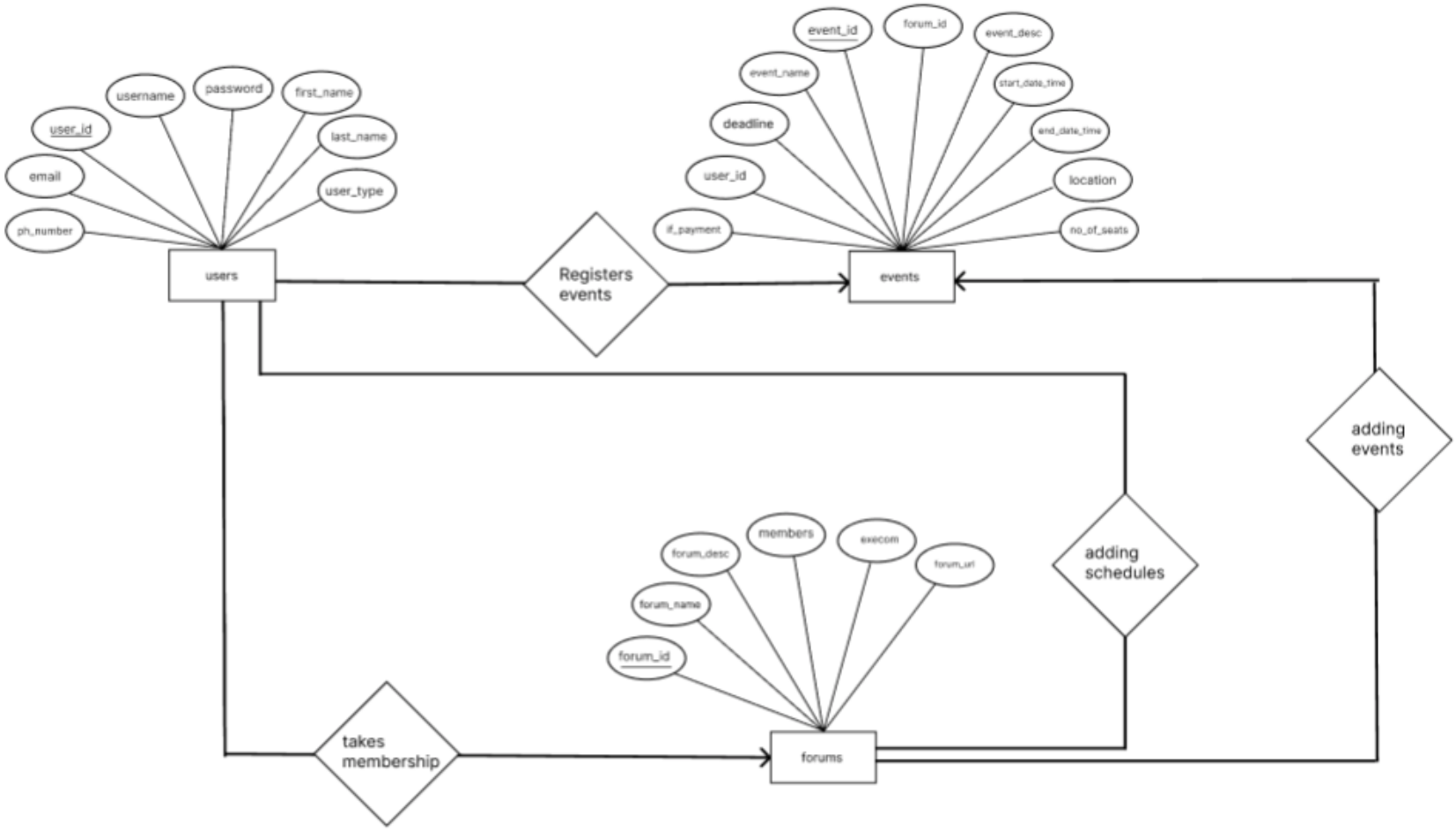
Literature Review

- **Platform Exploration:**
  - KonfHub for event organization insights.
  - GDSC Dashboard for community-driven initiatives.
  - YepDesk for optimizing event features.
- **Informed Design and Enrichment:**
  - Literature review informed key design decisions.
  - Diverse platform perspectives enriched project adaptability.
  - Continuous reference ensures alignment with best practices.

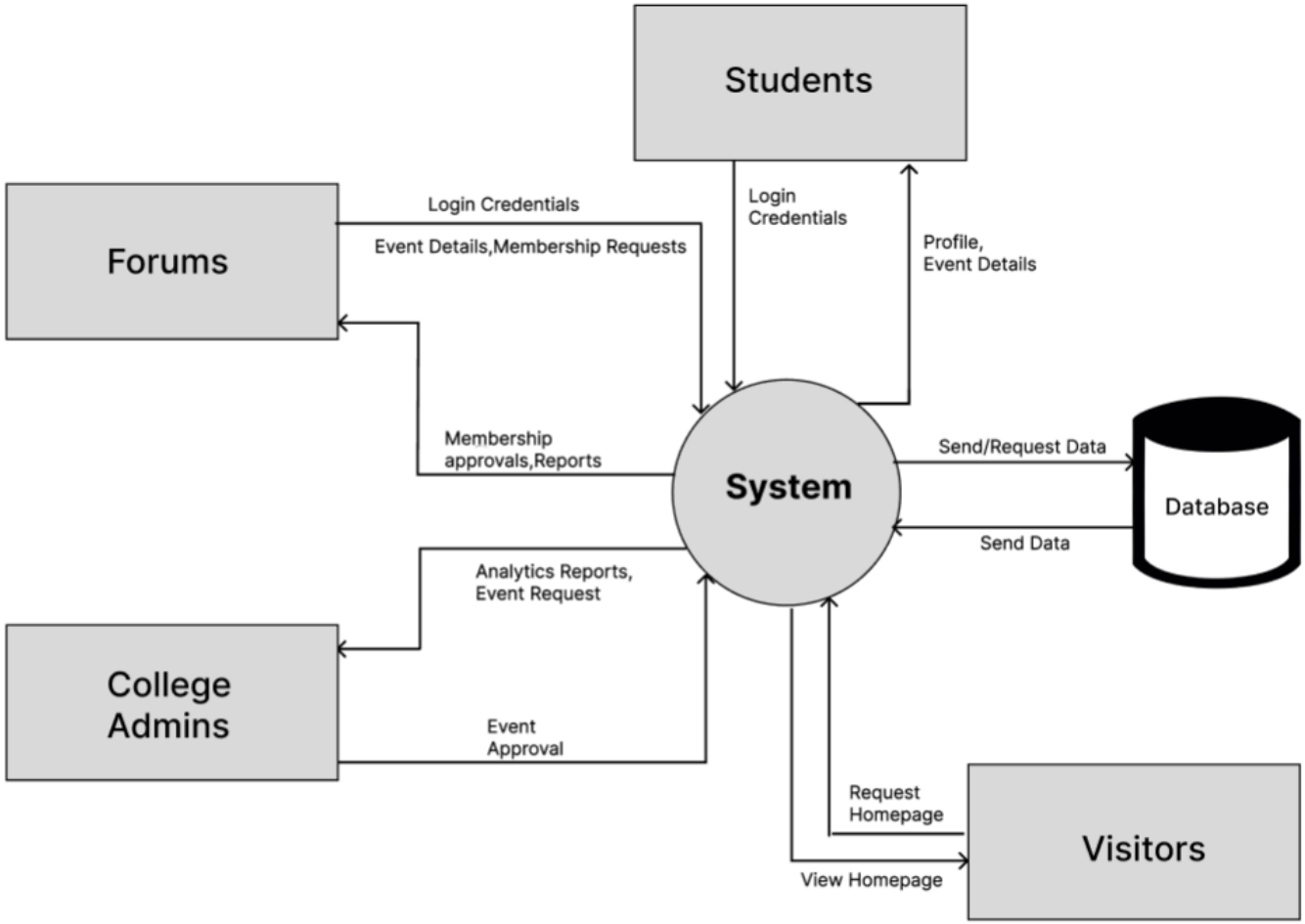
Web Application Architecture



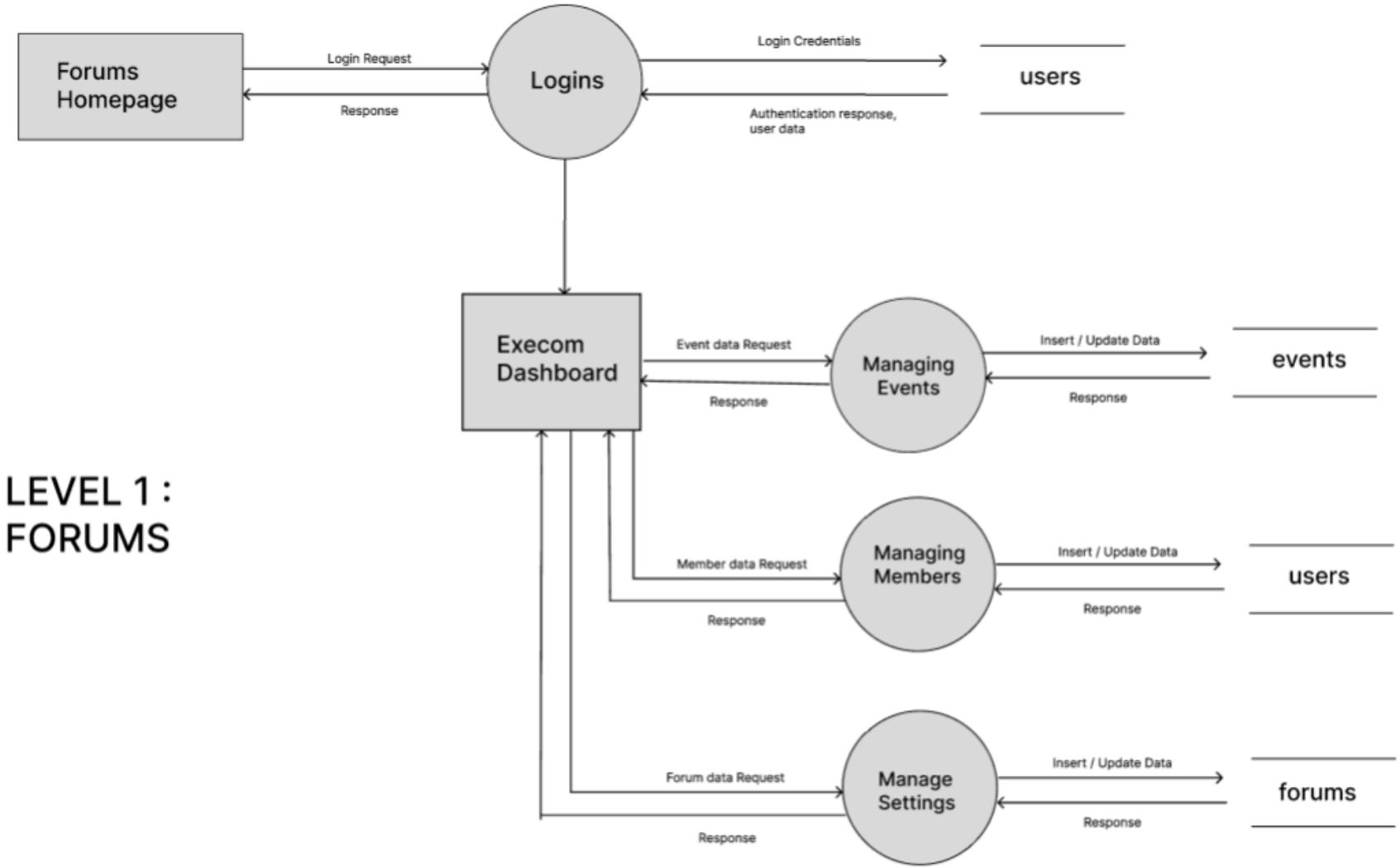
ER Diagram


username
password
first_name
user_id
last_name
email
user_type
ph_number
users
Registers events
events
event_id
forum_id
event_desc
event_name
start_date_time
deadline
end_date_time
user_id
location
if_payment
no_of_seats
adding events
adding schedules
members
execom
forum_desc
forum_url
forum_name
forum_id
takes membership
forums

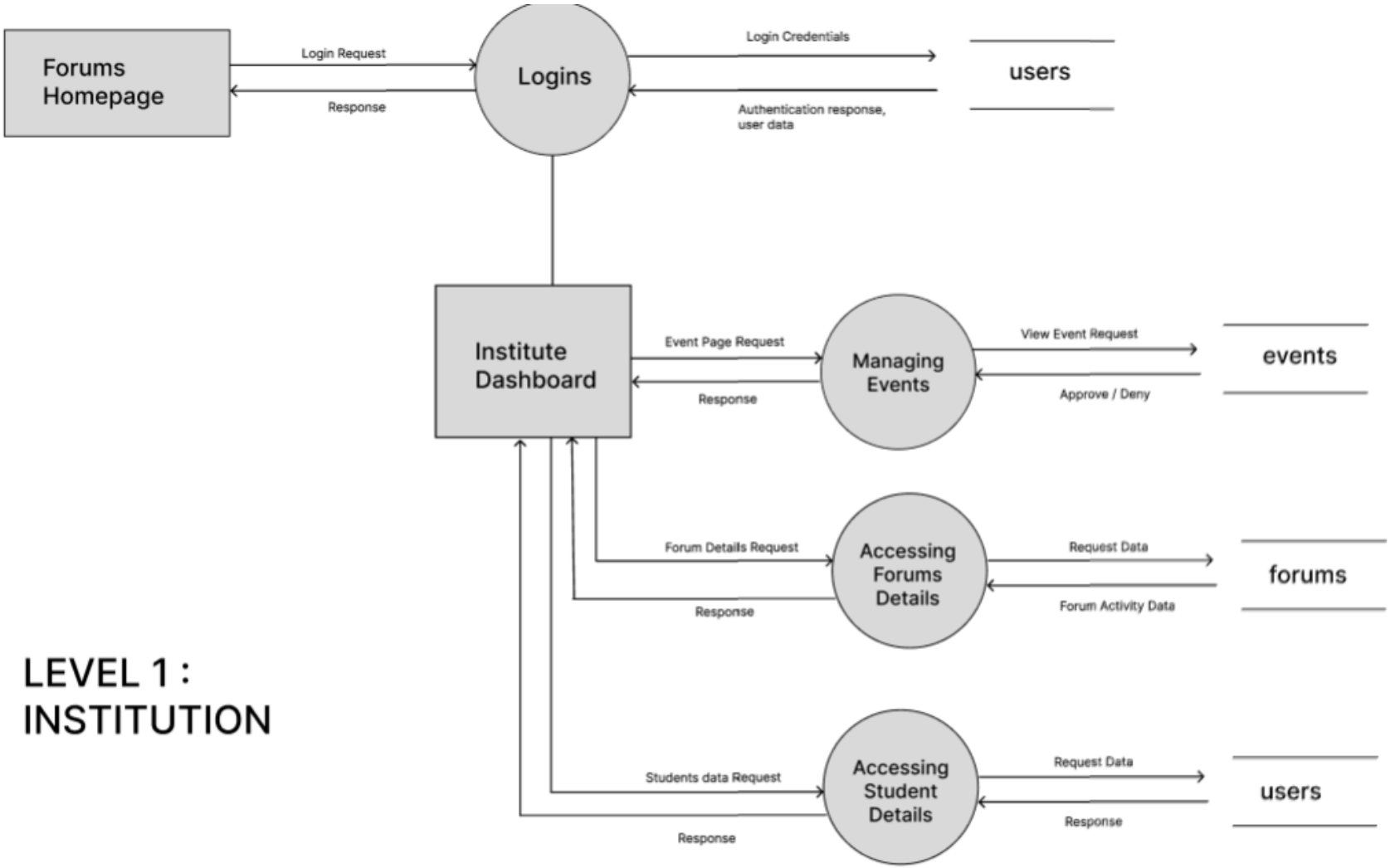
DFD Level -0


Students
Forums
Login Credentials
Event Details,Membership Requests
Login Credentials
Profile, Event Details
Membership approvals,Reports
System
Send/Request Data
Database
Send Data
Analytics Reports, Event Request
College Admins
Event Approval
Request Homepage
View Homepage
Visitors

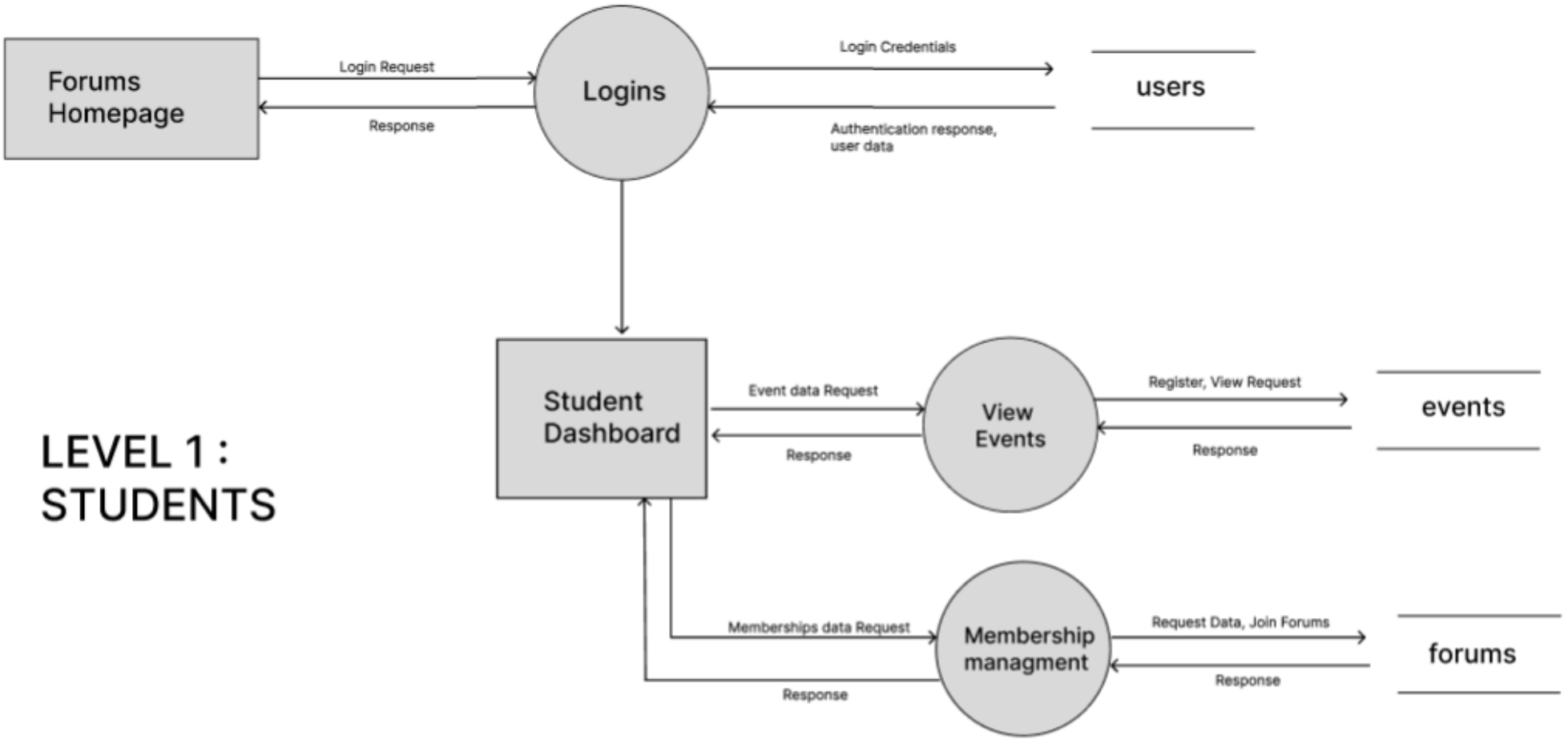
DFD Level -1(Forum Execom)



DFD Level -1(Institution)



DFD Level -1(Student)



LEVEL 1 : STUDENTS

Work Schedule:

- **August - September 2023:** In this initial phase, our focus will be on project planning, team formation, and assessing the availability of necessary resources. We will ensure that all required hardware and software resources are in place, and any deficiencies will be addressed promptly.
- **October - December 2023:** These months will be dedicated to system design and architecture development. Our team will collaboratively design the structure and core functionality of the web application, outlining its key components and user interfaces.

Work Schedule:

January - February 2024: In these months, we implemented the module of authentication completely, while implementing the Student and Admin modules partially. We have also configured our site in a server we assembled in the College lab, and the website is publicly accessible.

Work Schedule: Next Steps

As we transition into the interim phase, we have reached the halfway point in the project implementation.

- **March 2024:** Completion of the remaining modules for both admin and user.
- **April 2024:** Testing of the website, along with checks and improvements to the backend.

Hardware & Software Specifications

Hardware:

- Personal laptop or computer for Development
- Internet Connectivity

Software:

- Development tools such as Visual Studio Code (VSCode) for coding and project management.
- Frontend development framework - NextJS & Reach
- Backend development framework, ExpressJS for web application development.
- Database management system - MongoDB
- Web server - nginx.
- Git and Github for Version Control

Authentication Algorithm

```
1: Start
2: User authentication page loads
3: if user exists then
4:     User enters the username and password values in the login
5:     Credentials are validated with database
6:     if credentials are correct then
7:         6-digit OTP is sent to the email address corresponding to the user credentials
8:         Entered OTP is verified
9:         if OTP is correct then
10:            User dashboard is loaded
11:        else
12:            Authentication failure
13:        end if
14:    else
15:        Authentication failure
16:    end if
17: else
18:    Sign-up page is loaded for user registration with details Name, Email Address, Username,
   and Password
19:    6-digit OTP is sent to the email address entered
20:    if OTP entered by user is correct then
21:        Entered OTP is verified, and credentials are successfully entered to the database
22:    else
23:        Registration failure
24:    end if
25: end if
26: Stop
```

Add Organisation Algorithm

Algorithm 1 Adding Organization to User Algorithm

```
Start
User logs in to the dashboard
When Join Organization is clicked, asks for the organization to join
if organization is selected then
    Asks to enter the membership ID of user
    Name of user, organization name and ID is verified with the JSON file in the server
    if the ID is correct corresponding to the user then
        The membership is added to the user
    else
        User is not part of the organization (Join Organization failure)
    end if
end if
Stop
```

Organisation Event Creation Algorithm

Algorithm 2 Organization Event Creation

1: Start
2: Admin logs in to the dashboard.
3: When "Create Event" is clicked, the system prompts for the event details, including name, date, time, and event poster. After filling in the details, proceed to step 4.
4: Before creating the event, the system checks the backend to see if any event already exists on the entered date and time. If no event exists, go to step 5; otherwise, go to step 6.
5: The new event is sent to the backend server along with the event image and details. The database is updated, and the calendar date is marked with the event.
6: A warning message is displayed, stating "An event is already scheduled on that particular date and time." The admin is instructed to choose a different date or time.
7: Stop

Evemt Report Generation Algorithm

Algorithm 3 Event Report Generation

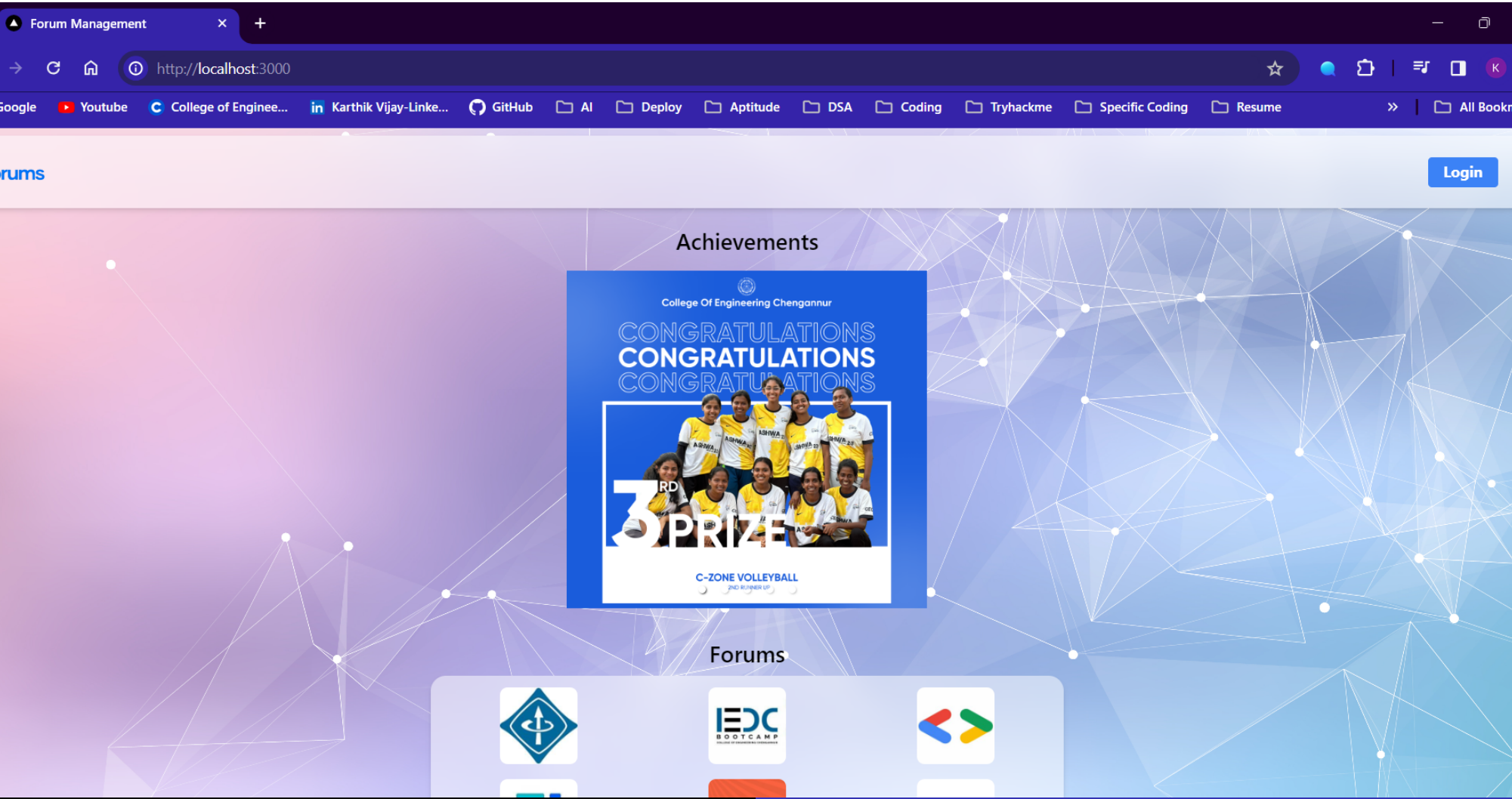
1: Start
2: Admins can generate the report of events for each event in their corresponding organization.
3: Admins can select the event name for which report is to be generated.
4: Event Name, Organization name, and other details are filled out automatically by fetching from backend.
5: Enter the body of the report by the admin.
6: When submitted, using the report generator script, it collects the data entered and fills in the predefined report template.
7: After successfully generating the report, admins can download the report in PDF format.
8: Stop

Report of Project Implementation

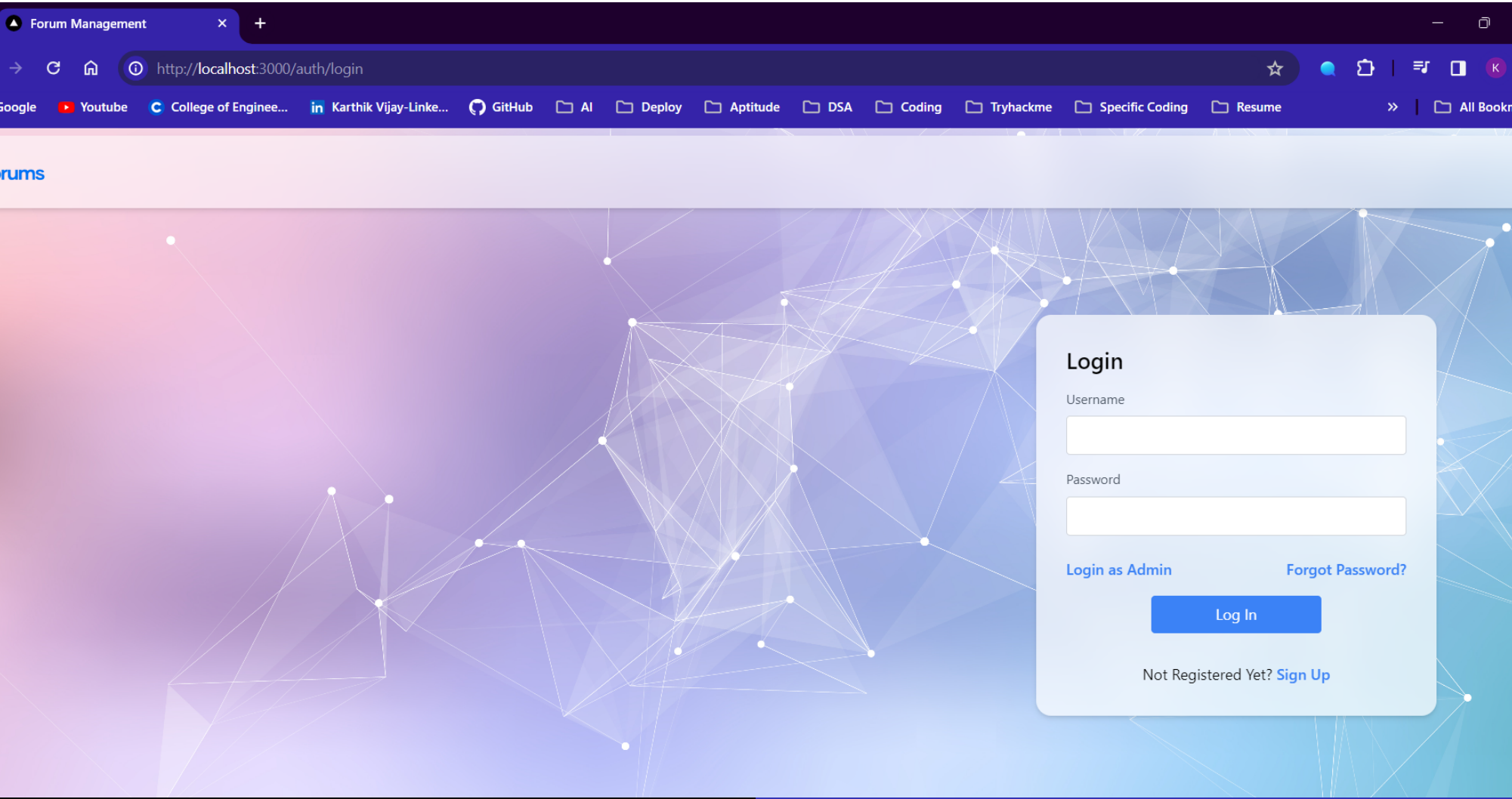
Report of Project Implementation - Key Activities

- Configured Server at College to host the website.
- Created the landing page.
- Completed the Authentication module.
- Started working on Admin and User page.

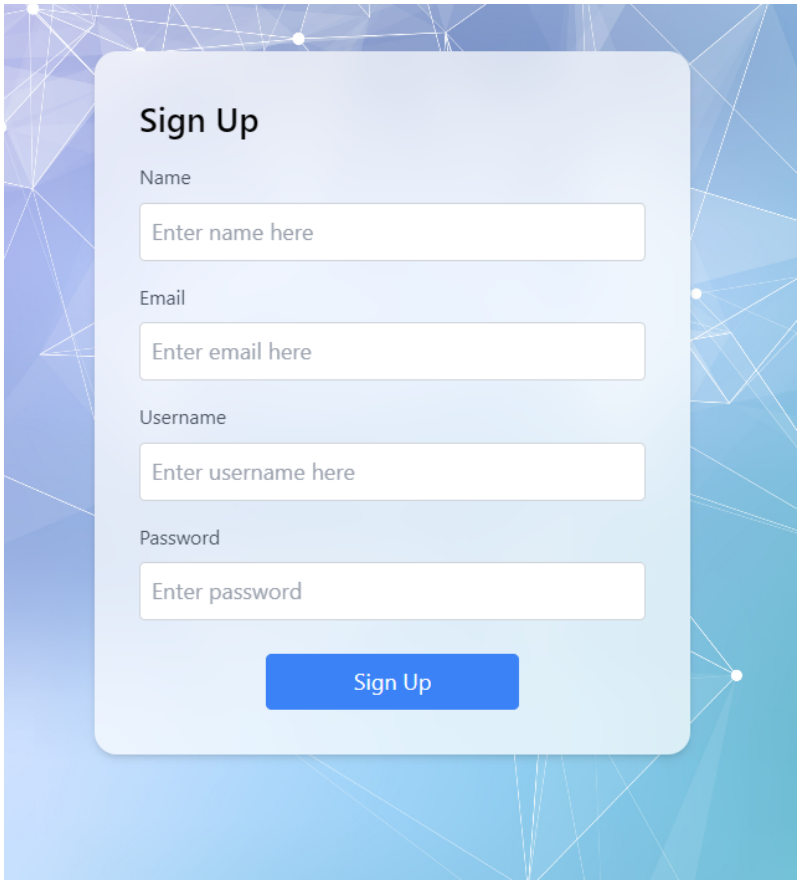
Landing Page



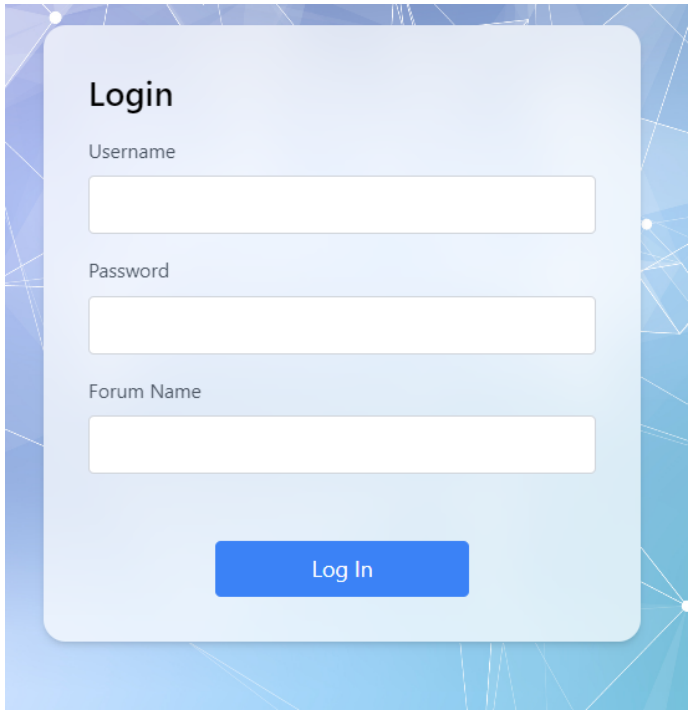
Authentication Module - Login(user)



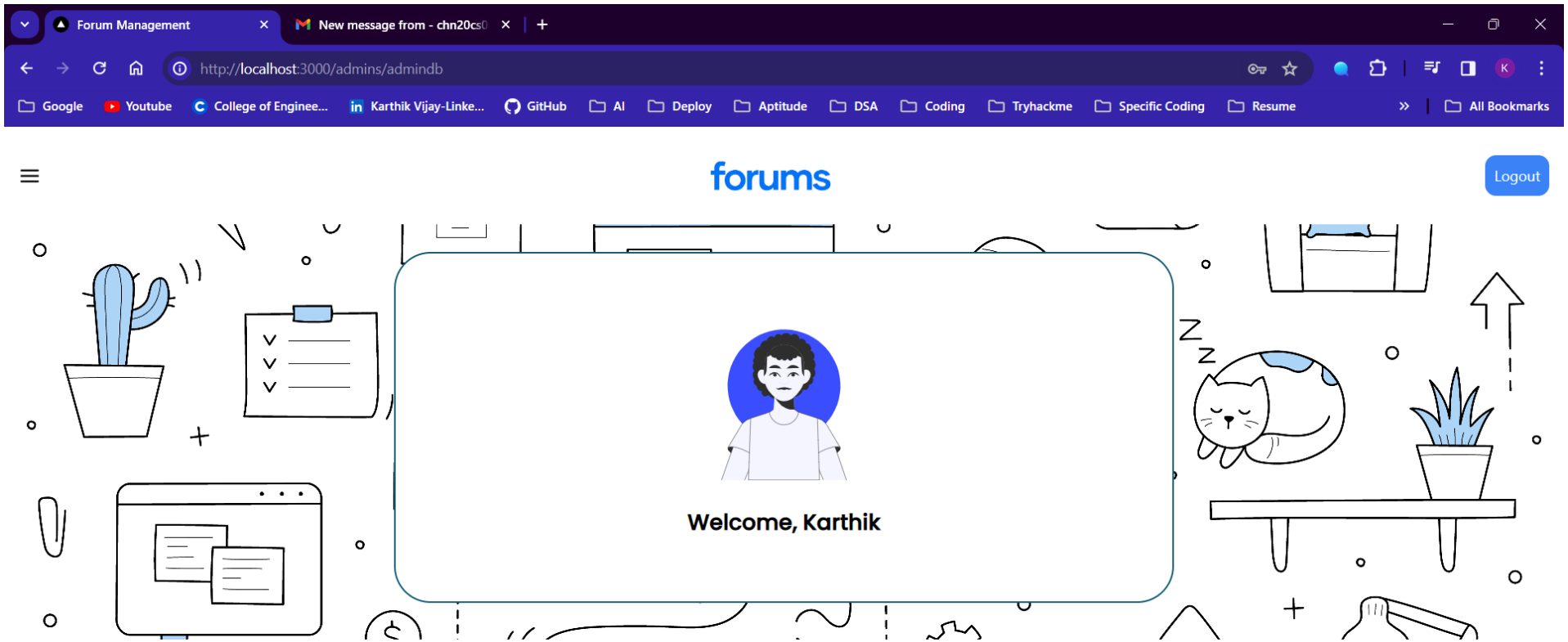
Authentication Module - Sign Up



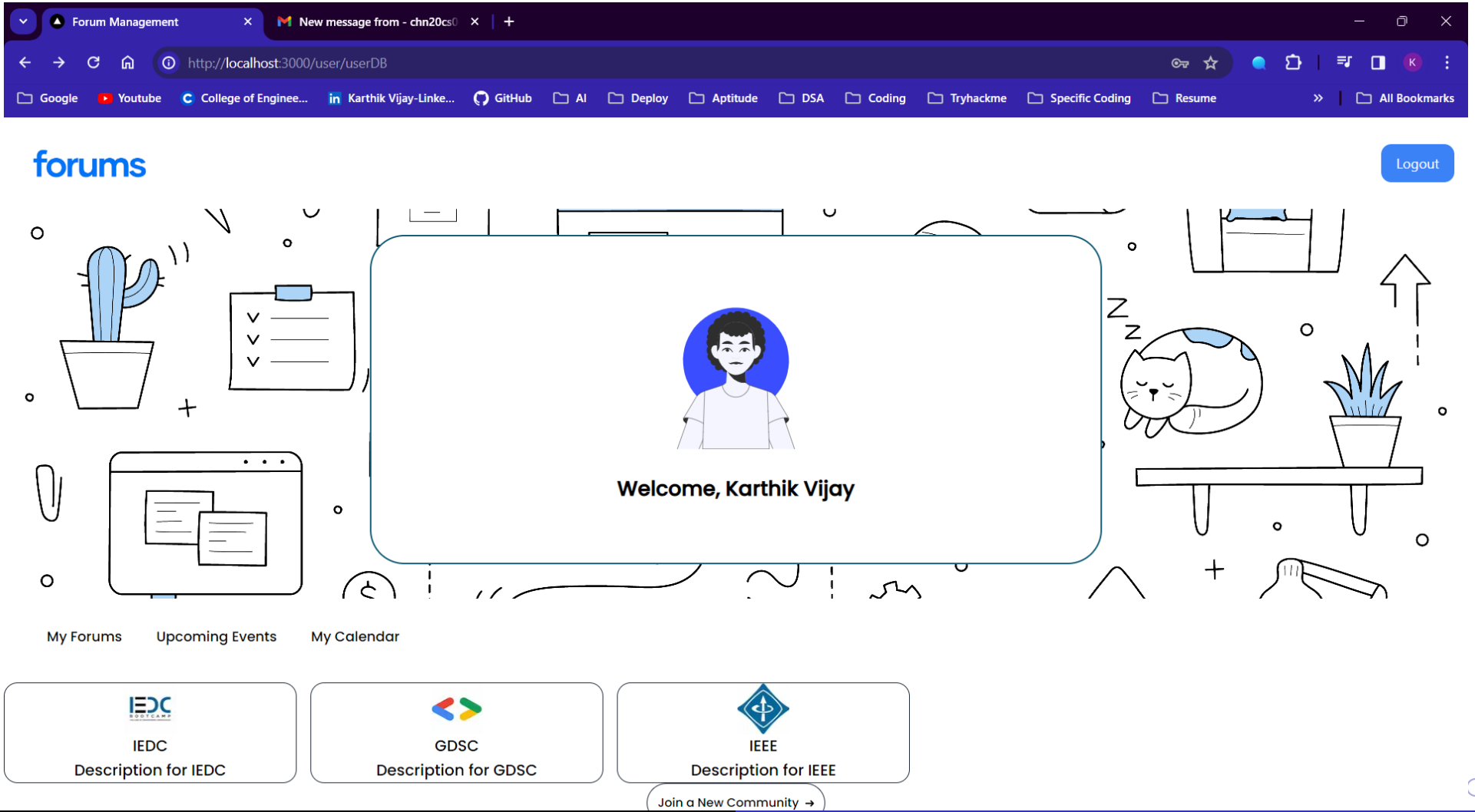
Authentication Module - Login(admin)



Admin Module - Admin Dashboard



Student Module - Student Dashboard



Conclusion

After the successful completion of the design phase, a smooth implementation is worked on, where we have almost covered came through the half the way of implementation part. As per the planning, we are moving on with the flow towards the completion of the project.

References

- Google and Bevy: GDSC Dashboard, link: https://gdsc.community.dev/
- Vercel: NextJS Documentation, link: https://nextjs.org/docs
- OpenJS Foundation : ExpressJS Documentation, link: https://www.expressjs.com/
- Nginx: nginx Docs, link: https://nginx.org/en/docs/

Thank You

Thank You!