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Development of Web- Based Student Chapter Portal For Universities

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Abstract **– This project aims to develop a web-based Student Chapter Portal (SCP) for efficiently managing and streamlining the activities of various student chapters, including CSI, TPC, GDG, IETE, IEEE, SPARK, VANGUARD, AESA-MESA, ISHRAE, RANGMANCH, BENCHMARK, GUFTAGOO, RECROSS, and STUDENT COUNCIL. The current manual system for handling records, events, and attendance is time-consuming and lacks coordination. The proposed SCP unifies all chapters on a single platform with three login modules—Admin, Student Leaders, and Members—providing secure, role-based access. Student leaders can manage members, attendance, and events, while members can view announcements, register for activities, and track participation. Built using PHP, MySQL, HTML5, CSS3, JavaScript, and Bootstrap, the portal ensures a user-friendly, responsive, and secure system that automates management tasks and enhances collaboration across all student chapters.**

I. Introduction

The rise of digital technology has encouraged educational institutions to adopt web-based systems for better efficiency and communication. Managing multiple student chapters manually—handling events, memberships, attendance, and updates—often leads to confusion and extra workload. The Student Chapter Portal (SCP) provides a centralized platform with role-based access for admins, leaders, and members to simplify event management, attendance tracking, membership registration, and information sharing. This system ensures transparency, saves time, and improves coordination and student involvement across all chapters.This system ensures transparency, saves time, improves coordination, and boosts student participation across all chapters.

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A. Project Background

The Student Chapter Portal (SCP) is a centralized platform designed to manage all student committees in the college, including CSI, TPC, GDG TAPAS, IEEE, IETE, ISHRAE, AESA MESA, SPARK, VANGUARD, Student Council, Benchmark, Rangmanch, Recross, and Guftagoo. It streamlines tasks such as event posting and registration, member recruitment, attendance tracking, and role assignment, which are currently handled manually and often lead to confusion and errors. The system supports secure login through college email IDs and offers three dashboards: a user dashboard to view events and apply for committees, a leader dashboard to manage applications, attendance, and events, and an admin dashboard to oversee all activities and add/remove committees. Future improvements may include options to upload event photos/videos and a separate coordinator login for attendance viewing.

1) *Event Management Module*
This module allows each student chapter to post, manage, and promote upcoming events on the portal. Committee leaders can add event details, share publicity content, and monitor registrations, while students can view events and register through the system. This ensures structured event communication and centralized access for all chapters.

2) *Attendance Management Module*
This module manages attendance of committee members for meetings, events, and activities. Leaders can mark, approve, or reject attendance, and students can track their attendance status. The system records participation history, encouraging active involvement and accountability among members.

3) *Membership & Recruitment Module*
This module handles committee recruitment by allowing students to apply to any chapter through the portal. Leaders and admins can review applications, approve or reject members, and assign roles to selected candidates. The system also restricts re-application for 2 hours after rejection to maintain fairness.

4) *User Role & Access Module*
The system provides secure login using official college email IDs only. It includes three dashboards: User (to view events and apply for committees), Leader (to manage events, members, and attendance), and Admin (to approve applications, manage committees, and monitor overall activities). This ensures controlled access and smooth coordination across all student chapters.

ISSN : 2455-135X

B. Aim and Objective

- To streamline event management, member recruitment, and attendance tracking.
- To provide secure, role-based access for students, leaders, and admins.
- To maintain organized records of members, roles, and committee activities.
- To improve communication, transparency, and coordination across all chapters.

C. Purpose

The purpose of this system is to replace manual and scattered management of student committees with a single digital platform. It enables easy event posting, registrations, attendance handling, and member management, ensuring smooth operations, reduced workload, and improved student engagement.

D. Features of the Student Chapter Portal System

CentralizedMulti-Chapter Management
Manage all student committees from a single platform.

Secure Login System
Only college email IDs can be used to access the portal.

Role-Based Dashboards
Separate dashboards for Students, Committee Leaders, and Admins.

Event Management & Publicity
Committees can create, publish, and promote events; students can view and register.

Online Event Registration
Students can register for events directly through the portal.

Attendance Management
Track and approve attendance for committee meetings and events.

Membership & Recruitment System
Students can apply to join committees, and leaders/admins can approve or reject applications.

Role Assignment
Committee leaders can assign and update member positions.

Re-application Time Restriction
If rejected, a student can reapply only after 2 hours.

Add/Remove Committees
Admins can create new committees or remove existing ones.

Activity & Data Records
Maintains structured records of events, members, roles, and attendance.

Real-Time Updates
Users can stay updated on committee events and announcements instantly.

Scalability for Future Features
Future updates may include event gallery uploads and class coordinator access.

II. LITERATURE REVIEW

Several research works emphasize the importance of digital platforms in modernizing student-related operations in educational institutions. The paper **“Student Management System”** by Dimpal Agrawal et al. highlights that many institutions still depend on manual, paper-based methods to handle student records, attendance, and communication, which leads to inefficiency and errors. The authors propose a centralized web-based management system that improves communication, automates routine tasks,

ISSN : 2455-135X

and ensures real-time information access for students and administrators .

In **"Research and Design of College Student Classification Management Information System Based on Big Data Technology"**, Dengyong Wang and Rong Wang emphasize the need for standardized, scalable digital systems to manage student information across departments. The study adopts modular architecture and a secure multi-role access model, ensuring efficient database handling and systematic information flow, improving data accuracy and management transparency .

Another study titled **"Development of a Web-Based Student Portal System for University Students"** by Khalid Wahab et al. presents a centralized portal that replaces manual processes with digital services like attendance monitoring, assignment uploads, quiz management, and result access. The system uses role-based dashboards for students, teachers, and administrators, demonstrating how online platforms enhance accessibility, transparency, and overall academic workflow .

These studies highlight the growing need for centralized and automated student platforms. Inspired by this literature, the proposed **Student Chapter Portal** extends these concepts to student organizations by integrating committee management, event handling, attendance tracking, and member recruitment under one unified system. Unlike traditional academic portals, this system focuses on multi-chapter coordination and student leadership workflows, ensuring real-time communication, transparency, and improved student engagement across all campus committees.

III. METHODOLOGY

The Student Chapter Portal (SCP) serves as a centralized and role-based information system designed to digitize and manage operations of all student committees. The system follows structured software engineering practices, including requirement analysis, use-case modeling, ER diagramming, and database design. The portal is developed using web-based technologies for the interface and a secure database for backend management.

A. Requirement Analysis

Requirement analysis involves understanding user expectations, technical needs, and defining system behavior. It identifies necessary functionalities and constraints for the successful development of the Student Chapter Portal.

1) Functional Requirements

Functional requirements define tasks and features the system must support. Key functional requirements include:

-User authentication via college email ID
-Role-based dashboards (Student, Leader, Admin)
-View and register for events
-Add, update, and publish committee events (Leader/Admin)
-Member recruitment and application review
-Attendance marking and approval

ISSN : 2455-135X

-Member role assignment within committees
-Add/Remove committees (Admin)
-Controlled re-application window for rejected users

2) Non-Functional Requirements

Non-functional requirements define system quality attributes. These include:

-User-friendly and responsive interface
-Secure authentication & data privacy
-High performance and fast response
-Reliability and role-based access control
-Scalability to add future features (media uploads, coordinator login)
-Platform availability and smooth navigation

B. Database Design

The Student Chapter Portal database stores student, committee, event, and attendance information securely. It uses structured tables with relational integrity to ensure proper data handling.

Key stored data includes:

-Student details and login credentials
-Committee and role information
-Event details & registrations
-Attendance logs
-Application/recruitment records

C. Use Case Diagram

A use case diagram illustrates system interactions between actors and system processes. In this system:

- **Students** can view events, register, apply for committees, and check attendance status.
- **Committee Leaders** manage events, verify attendance, process applications, and assign roles.
- **Admin** oversees all committees, approves/rejects registrations, and manages portal access.

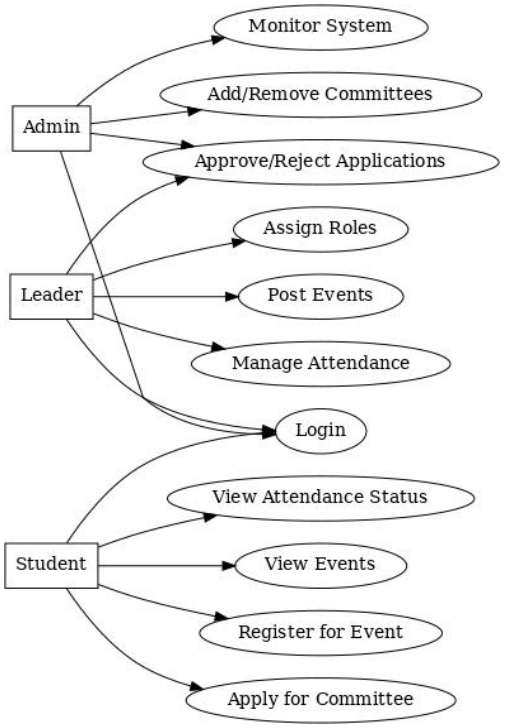

Fig. 1. Use case diagram for Student Chapter Portal

D. Entity-Relationship Diagram (ERD)

The ERD represents logical relationships among database entities such as:

-Users
-Committees
-Events
-Registrations
-Attendance
-Roles

ISSN : 2455-135X

Relationships illustrate how users interact with committees and events, maintaining structured and secure data flow.

E. Physical Data Model

The physical model converts ERD into database tables and fields. Steps include:

-Creating tables for users, committees, events, attendance, applications
-Assigning attributes and constraints
-Establishing primary/foreign keys
-Ensuring referential integrity
-Applying email-based authentication and role mapping

F. Implementation of System

This phase converts design into a fully functioning platform. Development includes:

1) Client-Side Technologies

The client-side technologies focus on building an interactive and responsive user interface for students, leaders, and admins.

-HTML5 used for structural interface design
-CSS3 for styling and consistent UI appearance
-Bootstrap framework to ensure responsiveness across laptops, tablets, and mobile devices
-JavaScript for dynamic event handling and real-time page interactions
-AJAX (if used) for smooth data loading without page refresh
-Icons & UI Libraries (FontAwesome / Bootstrap Icons) for clean user dashboards
-User Experience Optimization to ensure intuitive navigation, minimal clicks, and fast access to key features

2) Server-Side Technologies

The server-side development focuses on secure data handling and logic execution.

-PHP / Node.js used as backend logic layer
-MySQL relational database to store users, events, applications, attendance, and committee data
-REST-based API architecture for efficient communication between frontend and backend
-Secure authentication system allowing login only through official college email IDs
-Session Management & Access Control to distinguish Student, Leader, and Admin dashboards
-Encrypted password storage for secure user data
-Data validation and sanitization to prevent invalid entries and ensure system reliability

3) Future Enhancements

-Event picture & video gallery uploads
-Class coordinator dashboard for attendance monitoring
-Analytics dashboards for participation metrics

ISSN : 2455-135X

IV. USER INTERFACE OR RESULTS

The most critical and creative aspect of development is to design the user interface. User interface design determines how the system will look from outside to the user and respond to the user.

A. Login Page

The login page allows users to securely sign in using their institutional email and password. Only college-authorized email IDs are allowed, ensuring authentication and restricted access. Users without an account can navigate to the sign-up page.

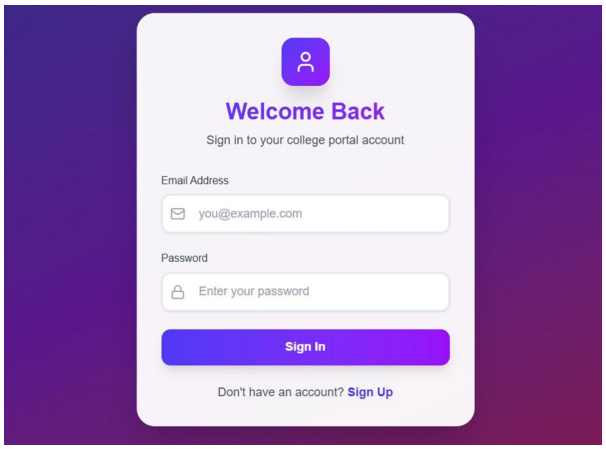

Fig.1. Login Page of the Student Committee Portal.

B. Admin Dashboard

The Admin Dashboard acts as the control center for managing the portal. Admins can view total users, committees, pending approvals, and recent system activity. Admins can add or remove committees, approve or reject applications, and manage user roles.

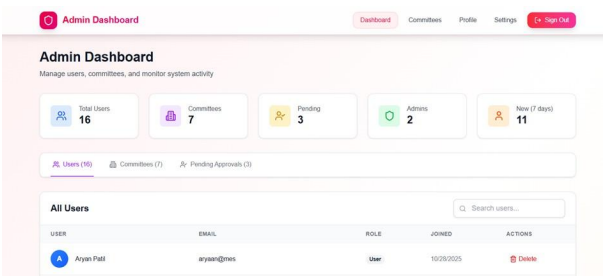

Fig. 2. Admin Dashboard Interface.

C. Student Dashboard

After login, students view their personal activity panel. This dashboard displays account status, membership history, and recent actions such as committee applications and logins. Students can also navigate to committees, settings, and their profile.

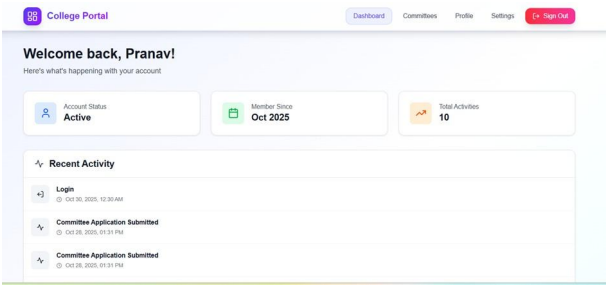

Fig. 3. Student Dashboard Interface.

D. Committees Page

Students can browse all committees available in the college. Each committee card contains details such as category, year of establishment, and social/website links. Students can view details or apply to join—based on recruitment status.

ISSN : 2455-135X

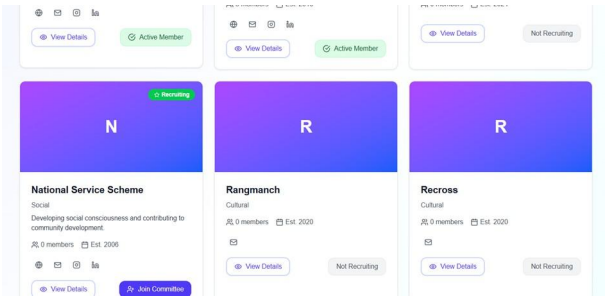

Fig. 4. Committees Overview Page.

V. TESTING OF STUDENT CHAPTER PORTAL

Testing is the process of executing a software system to identify defects and ensure that the application functions as expected. The objective of testing is to verify that each module performs accurately under different scenarios. A good testing process identifies potential errors before deployment and ensures system reliability, usability, and performance.

A. Test Case

A test case can be defined as *"a set of conditions or actions executed to verify a specific feature or functionality of a software application"*. The following test cases were executed to validate core modules of the College Committee Portal such as login, user registration, committee application, and attendance.

TABLE I. TEST CASE FOR USER REGISTRATION FUNCTIONALITY

ID	Test Case	Pre-Conditions	Input Test Data	Expected Result	Actual Result	Pass/ Fail
1	Test if user can register successfully	User not registered before	Valid name, email, password	User registered successfully and redirected to login page	Works as expected	Pass
2	Test registration with empty fields	No account exists	Leave all fields empty	System should show required field error	System displays error and stays on registration page	Pass
3	Test registration with already registered email	Account exists with same email	Existing email, valid password	System should show "Email already exists"	System displays error message	Pass

ISSN : 2455-135X

TABLE II. TEST CASE FOR LOGIN FUNCTIONALITY

ID	Test Case	Pre-Conditions	Input Test Data	Expected Result	Actual Result	Pass/Fail
1	Successful login	Valid registered account	Correct email & password	User logged in and redirected to dashboard	Works as expected	Pass
2	Login with incorrect password	User exists	Valid email, wrong password	System shows “Invalid Credentials”	System shows error	Pass
3	Login with empty fields	User exists	Empty email & password	System shows required field error	System displays validation error	Pass

TABLE III. TEST CASE FOR COMMITTEE APPLICATION MODULE

ID	Test Case	Pre-Conditions	Input Test Data	Expected Result	Actual Result	Pass/Fail
1	Apply for committee successfully	User logged in	Select committee, valid user data	Application submitted & shown in pending approval list	Works as expected	Pass
2	Apply without selecting committee	User logged in	No committee selected	Warning message & no submission	Error shown correctly	Pass
3	User applies to same committee twice	User applied already	Same committee again	System prevents duplicate application	System restricts duplicate entry	Pass

ISSN : 2455-135X

VI. CONCLUSION AND FUTURE WORK

The Student Chapter Portal provides an integrated and centralized platform for managing all student committees within the institution, addressing the limitations of traditional manual processes. The system streamlines key activities such as member registration, role assignment, event management, attendance tracking, and application approvals, enabling seamless collaboration between students, committee heads, and administrators. With secure login through institutional email and a structured approval mechanism, the portal ensures transparency, authenticity, and accountability across all chapter operations.

Through this system, daily administrative operations become faster, more organized, and more reliable. It improves data accessibility, enhances communication, and encourages student participation across various chapters. The portal successfully achieves its goal of creating a unified digital environment that supports institutional growth and student engagement, making campus activities more efficient, paperless, and future-ready.

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