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BIET Smart Hub: A Smart Dashboard with Real Time Event Tracking and an AI Based Chatbot for Student Support

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Abstract: *College information is often distributed across notice boards, circulars, messaging groups and department level channels. This can make it difficult for students to locate current event information, seating allotment documents, photographs and other institutional details. BIET Smart Hub is a web based portal developed to bring selected college information together in one place. The student facing interface provides access to the homepage, events, gallery, department information and published seating allotment documents. An authenticated administrative interface supports the creation and maintenance of event records, images and allotment documents. The application uses HTML, CSS and JavaScript for the interface, Python Flask for server-side request handling and MySQL for structured data. The paper describes the system organization and the functions represented in the available interface screenshots. The current implementation offers a centralized information access point and reduces the need to maintain separate information channels for each supported module.*

Keywords: *College information portal, Flask, MySQL, event management, seating allotment, gallery, student support chatbot.*

I. INTRODUCTION

BIET Smart Hub is a web based college information portal designed to serve as a single, structured point of access for institutional information that would otherwise be scattered across disconnected channels. The system recognizes two broad functionally distinct categories of users, students or public visitors and administrators and builds its entire architecture around the different needs of each.

Students, who form the majority of the portal's traffic, interact with the system purely as consumers of information. They can view the homepage, browse the full catalogue of college events, drill into individual event details, view associated event photographs, explore department level information and search or download seat allotment documents that administrators have marked as published. Nothing on the student side requires authentication it is intentionally open and read only, optimized for quick, frictionless discovery. Administrators, by contrast, operate on the other side of the same data. After authenticating, they gain access to a dedicated management layer where they can log in securely, maintain event records, upload and manage event images, and administer seat allotment records creating, editing, publishing, or removing content without ever needing to touch the underlying database or filesystem directly.

The project is built on a Flask Blueprint structure, a modular pattern that separates the application into logically distinct components rather than cramming all routes and logic into a single file. An application factory function is responsible for initializing the Flask application instance and registering the main Blueprint during startup a pattern that keeps configuration, initialization and route registration cleanly separated and makes the codebase easier to reason about and extend later.

Database connectivity is not scattered across individual routes or templates instead, it is centralized through a dedicated database helper module. Every part of the application that needs to talk to MySQL goes through this single access point, which reduces duplication and keeps connection handling logic consistent throughout the codebase.

Notably, the project deliberately avoids using an ORM and instead uses raw SQL through the MySQL connector library. This is a conscious architectural trade off raw SQL means every query is explicit and visible in the code rather than abstracted behind ORM generated statements. For a data model of this project's size and complexity a handful of related entities like departments, events, event images and allotments this explicitness is considered more suitable than the additional abstraction layers an ORM would introduce, since it keeps the relationship between code and actual database operations transparent and easy to debug.

Problem Statement

College information is often distributed through multiple and disconnected sources. Students may face difficulty in

finding events, seat allotments, and campus information quickly. Management of event details and documents can increase administrative workload. There is a need for a centralized platform to organize and publish college information. Event photographs and related content may not be available in a well-structured digital gallery. Therefore, a unified system is required to provide organized, accessible, and efficient college information management.

Objectives

The main objectives of BIET SmartHub:

- To develop a centralized web-based platform for managing college information and campus activities in one place.
- To provide department administrators with a secure interface to create, update and manage department specific events, seat allotments, gallery albums and department-related information.
- To reduce manual information management and improve the accessibility and organization of college resources.
- To design an AI-based chatbot module capable of real-time interaction and instant query resolution.

Scope

A centralized information portal can improve discoverability and consistency for frequently accessed institutional information. In BIET SmartHub, department data is reused by event and allotment records. Events are connected to their photographs, and allotment records.The project also needs a distinction between published and unpublished content. Students should see the information that the administrator has decided to publish, while the administrator needs access to management functions. The use of status fields and administrator.The need for the project is therefore not simply to create another website. It is to demonstrate a structured information workflow where data is stored centrally, related records can be queried, content can be maintained through an administrative interface, and students receive a simpler read-oriented experience.

II. MATERIAL AND METHODS

Existing System

In the existing system, college information is shared through notice boards, circulars and various communication channels. Students need to check multiple sources to get information about events, seat allotments and other updates. Managing event details and documents involves manual administrative work. Since the information is not available on a single centralized platform, accessing previous event photos and related information can also be inconvenient. College information is often shared through notice boards, circulars, and separate communication channels.

- Students may need to check multiple sources for events, seat allotments, and other updates.
- Managing event information and documents can involve manual administrative work.
- Information may not be organized in a single centralized platform.
- Accessing previous event photos and related information can be inconvenient.

Proposed System

The proposed system provides a centralized web platform for students and administrators to access and manage college information. It allows administrators to create, update, publish and manage events. Students can view and download seat allotment documents and access event photographs through an organized gallery. The system also provides department-wise categorization and filtering to make information easier to find. Overall, it reduces manual work and improves the organization and accessibility of college information.

- Provides a centralized web platform for students and administrators.
- Allows administrators to create, update, publish, and manage events.
- Provides organized seat allotment documents with viewing and downloading options.
- Provides an event-based gallery for accessing photographs.
- Uses department-wise categorization and filtering for easier information access.
- Reduces manual work and improves the organization and accessibility of college information.

System Architecture

BIET Smart Hub is a web-based college information portal developed to provide a centralized platform for accessing and managing college-related information. In the existing system, important college updates, event announcements, department information, and seat allotment details are shared through different communication channels such as notice boards, WhatsApp groups, emails, and department-specific platforms. This makes it difficult for students to find the latest information at the right time. BIET Smart Hub addresses this problem by bringing all important college information together in a single, organized and user-friendly platform. It reduces information gaps, avoids confusion, and makes college-related updates easily accessible to students and public visitors.

The system is designed with two main categories of users: students or public visitors and administrators. Students can access the portal without creating an account or logging in. They can view the homepage, explore upcoming and past college events, check event descriptions, dates, timings, venues, and photographs, and browse information about different departments. They can also search for published seat allotment documents and download the required files whenever needed. Student access is completely read-only, which means they can view and download information but cannot make any changes to the portal. This simple access system makes the platform convenient and easy to use for everyone.

Administrators have a separate and secure login system that allows them to manage the information available on the portal. They can create, update, publish, and delete college event details through the administrative dashboard. They can also

upload, view, and manage event photographs and maintain seat allotment documents by adding or updating the required files. All administrative operations are performed through the web interface, so administrators do not need to access the database or file storage directly. This makes information management easier, improves data organization, and helps ensure that students receive updated and accurate college information.

The project is developed using the Flask web framework with a modular Blueprint structure, which divides the application into separate functional components. This structure makes the application easier to develop, maintain, manage, and extend in the future. MySQL is used as the database management system to store and organize information such as event details and seat allotment records. A separate database helper module is implemented to manage database connections and perform database operations efficiently. The project uses raw SQL queries through the MySQL Connector library instead of an Object Relational Mapping (ORM) tool, making database interactions straightforward and easy to understand. Flask routes and Jinja2 templates are used to connect the backend functionality with the user interface and display dynamic content. Overall, BIET Smart Hub provides a simple, secure, organized, and centralized solution for managing and accessing college information.

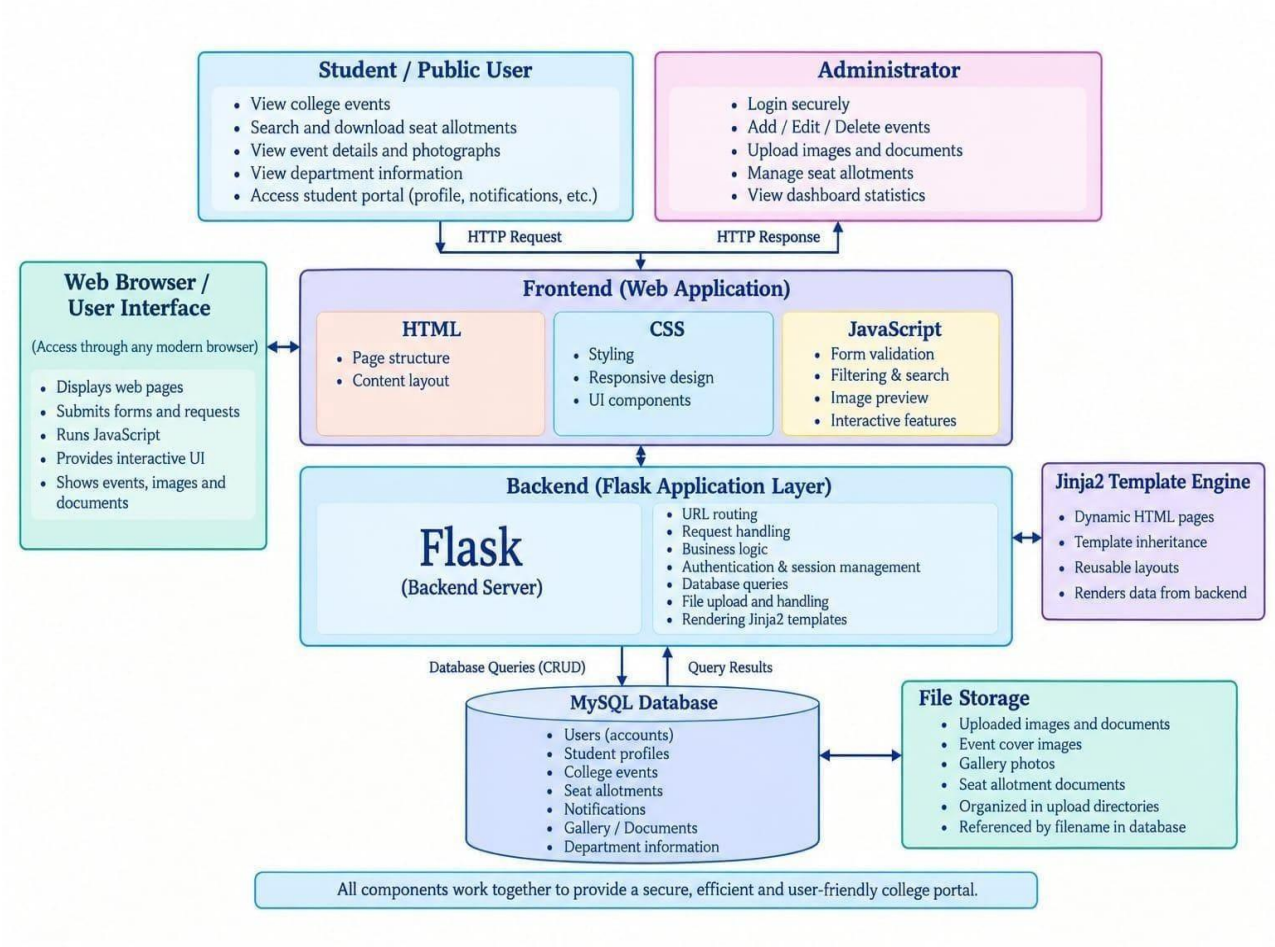

Fig. 1. System Architecture of Biet SmartHub

Technologies Used

Technology	Purpose
Python	Used for backend programming and application logic.
Flak	Used as the web framework to handle routes and server-side operations.
MySQL	Used to store and manage project data.
MySQL Connector	Used to establish connectivity between Python and the MySQL database.
Jinja2	Used as a template engine to render dynamic HTML pages.
HTML	Used to structure the web pages.
CSS	Used to style the web pages and improve the user interface.
Javascript	Used to implement client-side interactivity and dynamic features.
Visual Studio Code	Used as the development environment for writing and managing code.
Google Chrome	Used to access and test the web application.

Implemented Modules

- **Events Management Module:** This module allows administrators to create, update, publish, and delete college events through a dashboard. interface. Administrators can manage events by entering details such as title, description, date, time, venue, and department. Event data is stored in MySQL and supports department-wise filtering.Students can view upcoming events, descriptions, and images. Only authorized administrators can modify events, while students have read-only access.Flask routes and Jinja2 templates handle event management and display.
- **Gallery Management Module:** This module provides an event-wise digital gallery to store and display photographs of college events.Administrators can upload and delete multiple images for each event.Images are stored in organized directories, with filenames maintained in MySQL.Students can view and download event photographs.File type and size validation ensures secure uploads.Flask manages image uploading, retrieval, and deletion.
- **Seating Allotment Module:** This module automates examination seating arrangements, reducing manual effort and errors.Administrators provide student details, room capacity, and seating constraints.The system generates seating arrangements using a row-offset interleaving algorithm to avoid adjacent placement conflicts.Generated seating charts are stored as downloadable documents.Students can view or download their seat allotments.Seating records are linked to specific examinations or events in MySQL.
- **CampusBot (Chatbot) Module:** CampusBot is an AI-based chatbot that provides instant answers to common student queries.It handles queries related to events, schedules, seating arrangements, departments, and college FAQs.It is integrated into the student interface for easy access.The backend processes queries using college data and a predefined knowledge base.It reduces administrative workload by providing quick responses.Future enhancements can include multilingual support and improved query understanding.

Testing Methodology

The testing methodology of BIET SmartHub ensures that all modules function correctly, efficiently, and securely. Unit testing is performed to verify individual modules, while integration testing checks the interaction between the frontend, Flask backend, and MySQL database. Functional and validation testing ensure that features such as event management, gallery uploads, seating allotment, and CampusBot work as expected. Security testing verifies role-based access and prevents unauthorized modifications. Finally, system testing and user acceptance testing are conducted to evaluate the overall performance, reliability, and user-friendliness of the platform.

III. RESULTS

Functional Testing

Functional testing of BIET Smart Hub is performed to verify that all application features work according to the specified requirements. The homepage, navigation menus, department details, event listings, event descriptions, and photographs are checked to ensure they display correctly. The seat allotment search functionality is tested to verify that users can find and download the available documents. Administrator login is tested to ensure that only authorized users can access the admin dashboard. Event management functions, including adding, editing, and deleting events, are verified. Image and document uploads, notification management, and database operations are also tested. The testing ensures that all modules perform their intended functions and provide correct results to users.

Test ID	Scenario	Expected outcome	Actual result
TC01	Admin Login with valid username and password	Admin dashboard displayed successfully	verified
TC02	Admin Login with invalid credentials	Error message displayed	verified
TC03	Add Event with event details and image	Event added successfully	verified
TC04	Edit Event with updated details	Event information updated successfully	verified
TC05	View Events by selecting an event	Event details displayed successfully	verified
TC06	Upload Seat Allotment document (PDF)	Document uploaded and published successfully	verified
TC07	Download published document	Document downloaded successfully	verified
TC08	Gallery Management by uploading event photographs	Photos uploaded and displayed successfully	verified
TC09	Search and Filter using keyword, category or department	Matching records displayed correctly	verified
TC10	Delete selected event or document	Selected record deleted successfully	verified

The table presents representative scenarios from the project's test plan. The expected outcomes are not evidence that tests passed. Actual results must be completed from testing records.

Results Summary

The BIET Smart Hub project successfully provides a centralized web-based platform for accessing and managing college-related information. It brings college events, department details, photographs, notifications, and seat allotment documents into a single platform. Students and public visitors can easily view events, explore departments, and search and download available documents. The administrator module allows authorized users to add, edit, and delete events, upload images and documents, and manage notifications. The system uses HTML, CSS, JavaScript, Flask, MySQL, and Jinja2 to provide an organized and user-friendly experience. It reduces dependency on multiple communication channels and makes information easily accessible. The application provides secure administrator access and efficient information management. Overall, BIET Smart Hub achieves its objective of simplifying college information sharing and improving communication between the administration and students.

Observed Application Functionality

The BIET Smart Hub application provides a centralized platform for accessing college-related information through a user-friendly interface. The homepage allows students and public visitors to explore college details, departments, events, and announcements. Users can view event descriptions and photographs, search for published seat allotment information, and download the available documents. The administrator module provides secure login and allows authorized users to add, update, and delete events, upload photographs, manage seat allotment records, and publish notifications. The changes made by administrators are reflected on the public website. The application successfully integrates frontend, backend, database, and file storage functionalities to provide organized information management. Overall, the system simplifies access to college information and improves communication between students and the administration.

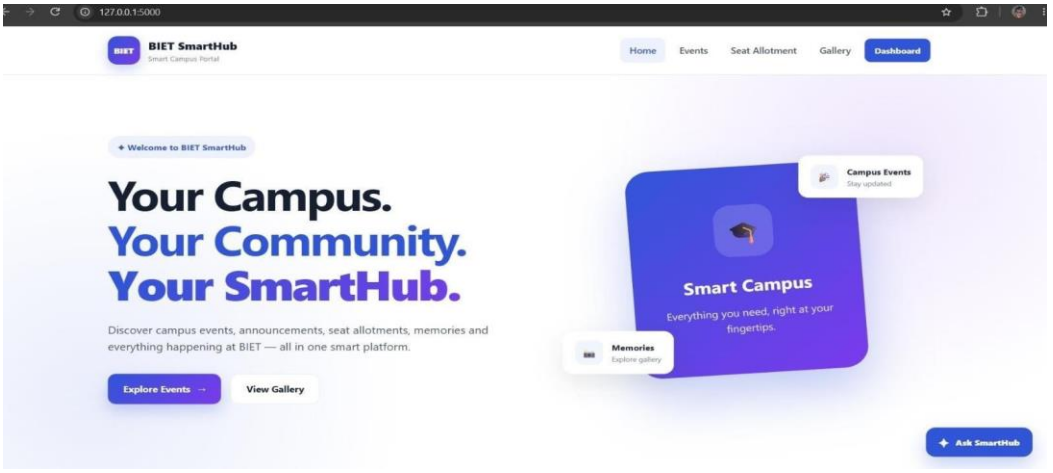

Fig. 2. The BIET SmartHub homepage provides a centralized platform to explore college events, announcements, seat allotments and photo galleries. It offers easy navigation, a dashboard and an AI chatbot to help students access campus information in one place.

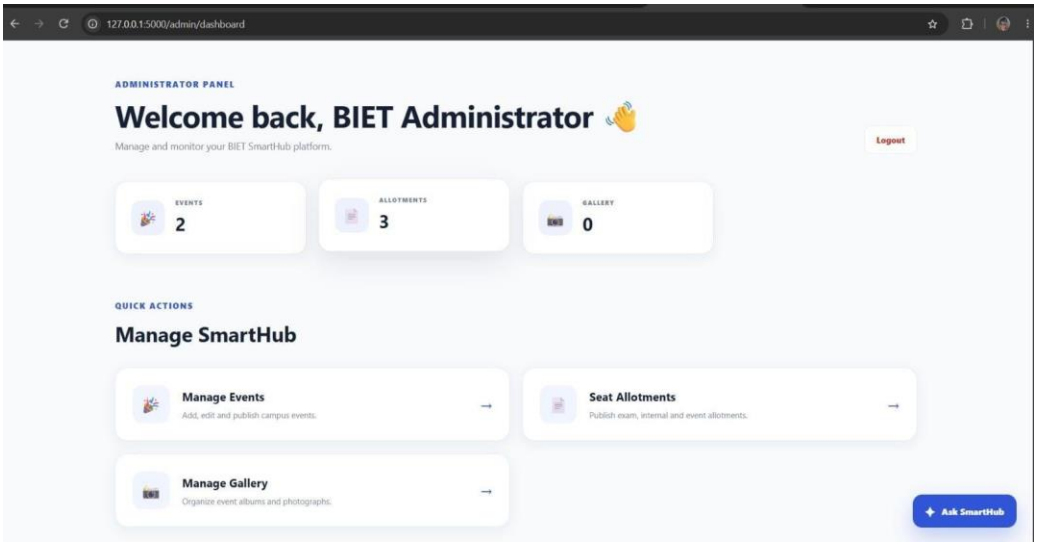

Fig. 3. The BIET SmartHub Admin Dashboard allows administrators to monitor events, seat allotments and gallery details. It provides quick actions to add, edit and manage campus events, publish seat allotments, organize photographs, and securely log out.

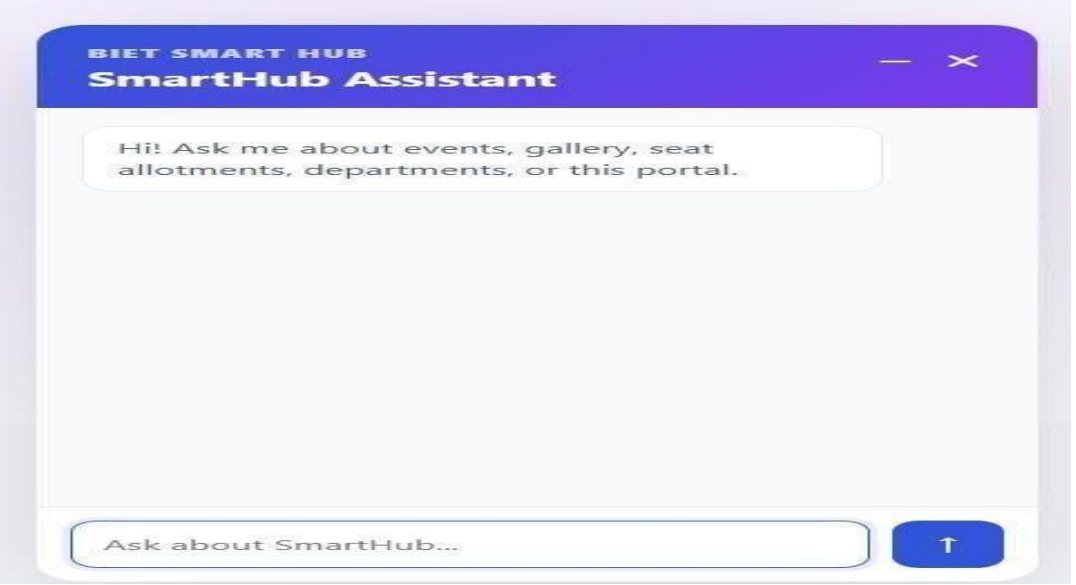

Fig. 4. The SmartHub Assistant is an AI chatbot that helps users find information about college events, galleries, seat allotments and departments. Users can type their questions in the chatbot and receive assistance related to the BIET SmartHub portal.

IV. DISCUSSION

The BIET Smart Hub project provides an effective solution for managing and sharing college-related information through a centralized web-based platform. The system simplifies communication by bringing events, department details, photographs, notifications, and seat allotment documents together in one place. The public interface allows students to access information easily, while the administrator module helps manage and update content efficiently. The integration of HTML, CSS, JavaScript, Flask, MySQL, and Jinja2 ensures smooth interaction between different components of the application. The system reduces manual work, avoids information duplication, and improves accessibility and communication between students and the administration. Overall, BIET Smart Hub demonstrates how web-based technologies can improve college information management through a simple, organized, and user-friendly approach.

V. CONCLUSION

BIET SmartHub successfully transforms the college's fragmented and manual approach to information management into a single, centralized, web-based platform accessible to both students and administrators. By combining event management, document handling, and communication in one place, the system eliminates the need for multiple disconnected information sources. Its role-based access control ensures secure administrative operations, allowing only authorized personnel to manage and publish events while students can easily access relevant information. The automated seat allotment generation reduces manual work and errors, while the event-based gallery organizes and preserves college event photographs for easy access.

Additionally, department-wise categorization and filtering help users quickly find relevant information, saving time and effort. The integration of CampusBot provides instant, AI-based responses to student queries, reducing their dependency on faculty and administrative staff. Overall, BIET SmartHub achieves its objective of replacing a fragmented information system with an organized, centralized, and automated platform. It improves administrative efficiency, reduces errors, and enhances the accessibility and reliability of college information, providing a strong foundation for future expansion and institution-wide adoption.

REFERENCES

1. S. V. Sonekar, R. Kokate, and R. I. Uikey, "Design and Implementation of a Web-Based Campus Event Management System," International Journal of Novel Research and Development (IJNRD), vol. 10, no. 5, 2025.
2. J. R. V. Jeny, P. Sadhana, B. Jeevan Kumar, S. Leela Abhishek, and T. Sai Chande, "A Web-based College Event Management System and Notification Sender," in Proc. IEEE International Conference, 2023.
3. M. Ninawe, P. Sarangpure, P. Sahare, D. Shende, and M. Yadhav, "Web-Controlled Centralized Digital Notice Board for Smart Institutions," International Journal of Electrical, Electronics and Computer Systems, vol. 14, no. 1, pp. 91–97, 2025.
4. S. Adetona, E. Hassan, R. Salawu, and S. A. Omolola, "The Development of a Web-based Application of Examination Seating Arrangement for Student," ABUAD Journal of Engineering Research and Development, vol. 3, no. 1, pp. 23–33, 2020.
5. R. R. Chand and N. A. Sharma, "Development of Bilingual Chatbot for University Related FAQs Using Natural Language Processing and Deep Learning," in Big Data Intelligence and Computing (DataCom 2022), Lecture Notes in Computer Science, vol. 13864, Springer, 2023.
6. "Enhancing Student Support with AI: A College Assistance Chatbot Using NLP and ANN," Conference Paper, 2024