College Management System and Enquiry with Chatbot Using AI

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Abstract

The College Management System is an Web-based application that represents a new technical way to manage all department-related work. A smart college management system is useful for both students and colleges. On existing systems, all activities are performed manually. It is very expensive and time-consuming. The proposed system allows students to view the results using an Android phone. The data is stored on the university server. Save the data using SQL Server. A chat-bots aims to make a conversation between both human and machine. The machine has been embedded knowledge to identify the sentences and making a decision itself as a response to answer a question. Chat-bots will be completely based on a text-based user interface, allowing the user to type commands and receive text as well as text to speech response. Chat-bots are usually stateful services, remembering previous commands in order to provide functionality. It can be utilized securely by an even larger audience when chat-bots technology is integrated with popular web services

.**Keywords**: College Management System, Student Information System, Login and Registration, Attendance Management, Academic Performance Tracking, Result Uploading, Feedback System, SQL Server, Paperless System NLP (Natural language processing), Sentiment Analysis, synsets, Word Net etc.

Introduction

In today's efficient educational landscape, management of academic records, attendance, and communication is critical for colleges and universities aiming to streamline operations and enhance the student experience. Traditional, paper-based systems have proven inefficient and prone to errors, as they require significant manual labor and time, making them inadequate for handling the diverse needs of modern institutions. To address these challenges, the proposed College Management System introduces a web-based solution that automates and integrates essential administrative functions across multiple departments. This system is designed to create a centralized platform accessible to administrators, faculty, and students, each with specific modules tailored to their roles. The Administrator Module empowers college staff to oversee data security, manage user access, and maintain records, ensuring that student information is stored and handled securely. Administrators hold privileges to monitor, approve, and modify data, reducing reliance on physical documentation and enabling quicker access to information. Chatbot (also known as a talkbot, chatterbox, Bot, IM bot or Artificial Conversational Entity) is a computer program that mimics human conversations in its natural format including text or spoken language using artificial intelligence techniques such as Natural Language Processing (NLP).

Image and video processing, and audio analysis.

Literature survey

In today's scenarios, many Web based applications are used for specific purposes, such as Information about special events, student attendance, etc. These applications help employees in almost every way. This app is used to review various works based on college automation. This proposed web-based application boasts to get updated information for the benefit of students and staff. The administrator is the most privileged person to maintain or track all current updated information. It also has all the privileges to manage the data stored in the application's database. Only the administrator can review or properly approve a particular record. The proposed system addresses the shortcomings of existing systems in a way that guarantees better performance. Surprisingly, it can be used by parents as well as students, staff, and higher institutions from each institution that the application is primarily targeted at.

System implementation

1. Existing system

These systems typically encompass functionalities such as student enrollment, course registration, attendance tracking, examination management, and grade reporting. Many CMS solutions are often standalone applications that may lack integration with other systems used by the institution, leading to data silos. Existing systems generally provide limited user interfaces, which can hinder user experience for both faculty and students. Furthermore, many of these systems are not cloud- based, resulting in accessibility challenges and higher maintenance costs. While they have significantly reduced manual paperwork and improved efficiency, existing systems often struggle with data security, scalability, and the ability to adapt to the changing needs of educational institutions. Natural Language Processing: A field of AI focused on the interaction between computers and human language. This field enables the analysis and interpretation of human language in several tasks, such as classification

2. Proposed system

The proposed college management system aims to revolutionize the administrative and educational processes within academic institutions by introducing a comprehensive, cloud-based platform that integrates various functionalities into a single interface. This system will encompass key features such as streamlined registration, admissions, attendance tracking, examination management, and grade reporting, all designed to enhance efficiency and communication. A user- friendly interface will cater to the needs of students, faculty, and administrators, facilitating ease of access and navigation.

1. User Login and Complaint:

User registers himself/herself on Chat-Bot application. Then submits his/her complaints and queries regarding the electronic and home appliances purchased.

2. Chat BOT Responding System:

a. NLP Processing and Sentiment Analysis for Complaint:

When user complaint is submitted to the system, NLP is applied and sense of the complaint is detected. The sense of the words is found using part of speech tagging and wordnet dictionary.By Using the sentiment analysis negation level of a complaint is detected. And user complaints are prioritized accordingly.

b. Search Questions in knowledge database:

Once the negation level of the complaint is detected,furthermore, the exact question in the complaint is detected using WorldNet.

3. Answer the Complaints

As described above whenever user submits a complaint, the level and exact issue/question of the complaint are detected. Then it is checked that is there such question registered in database. If the answer is found then that answer is sent to that User. If a particular question is not found in the database such questions are answered by admin person. Once he answered the question the answer is sent to that user. And that question along with answer is stored in database so that whenever such questions will be asked so that they get answered directly from the database. Due to this admin doesn't need to answer same question manually anymore.

4. System module

User Management Module: Handles user registration and authentication for students, faculty, and administrators. Provides role-based access control to ensure that users can only access features relevant to their roles.

- **Student Enrollment Module:** Manages the admission process, allowing students to apply online and upload required documents. Facilitates course registration and enrollment in classes.
- **Course Management Module:** Enables faculty to create and manage course offerings, including syllabus, schedule, and resources. Allows students to view available courses, prerequisites, and descriptions.
- **Attendance Management Module:** Tracks student attendance through automated systems, enabling both manual and biometric entry. Generates attendance reports for faculty and administration.
- **Examination Management Module:** Facilitates the scheduling, administration, and grading of examinations. Supports online assessments and automated grading features.
- **Grading and Assessment Module:** Allows faculty to enter and manage grades, providing a transparent view of student performance. Generates report cards and transcripts for students.
- **Communication Module:** Provides messaging features for students and faculty to facilitate communication regarding courses, assignments, and other academic matters. Supports notifications for important events and deadlines.
- **Analytics and Reporting Module:** Offers data analytics tools for real-time insights into student performance, attendance patterns, and resource utilization. Generates customizable reports for administrative.

Explanation of use cases

Below are key use cases that outline how different actors interact with the system, along with their goals and the flow of events.

1. User Registration and Login

- **Actors:** Students, Faculty, Administrators
- **Description:** This use case involves user registration and authentication. Users must create an account or log in to access the system.
- **Preconditions**: The user must have internet access.
- **Basic Flow:**

1. The user navigates to the registration or login page.

2. For registration, the user fills in required details (name, email, password).

3. The system validates the information and creates a new user account

4. For login, the user enters credentials.

5. The system verifies credentials and grants access..

2. Student Enrollment

- **Actors:** Students, Administrators
- **Description**: This use case allows students to apply for admission and enroll in courses.
- **Preconditions:** The user must be logged in as a student.
- **Basic Flow:**

1. The student accesses the enrollment portal.
2. The system displays available programs and courses.
3. The student selects desired courses and submits the enrollment request.
4. The system confirms enrollment and updates the student's record. Stemming and Lemmatization: Reduce words to their base form (e.g., "running" → "run") to avoid redundancy.

3. Course Management:

Actors: Faculty, Administrators Description: This use case enables faculty to create and manage courses.

- **Preconditions:** The user must be logged in as faculty.
- **Basic Flow:**

1. The faculty member navigates to the course management module.
2. The system provides options to create, update, or delete courses.
3. The faculty member enters course details (name, syllabus, schedule).

4. Attendance Tracking

- **Actors:** Faculty, Students
- **Description:** This use case allows faculty to mark student attendance and students to view their attendance records.
- **Preconditions:** The user must be logged in as faculty or student.
- **Basic Flow:**

1. The faculty member selects a class and marks attendance.
2. The system updates the attendance records.
3. Students can view their attendance status through their profiles.

5. Examination Management Actors: Faculty, Students
Description: This use case allows faculty to schedule exams and students to view their examination schedule.

- **Preconditions:** The user must be logged in as faculty or student.
- **Basic Flow:**

1. The faculty member accesses the examination module.
2. The faculty schedules an exam, setting date, time, and location.
3. The system updates the examination schedule.
4. Students can view their exam schedule on their dashboard.

6. Grading and Assessment Actors: Faculty, Students

Description: This use case allows faculty to enter grades and students to view their grades.

- **Preconditions:** The user must be logged in as faculty or student.
- **Basic Flow:**

1. The faculty member accesses the grading module.
2. The faculty enters grades for assignments .
3. The system saves the grades and updates the student's profile.
4. Students can view their grades through their accounts.

7. Communication

Actors: Students, Faculty, Administrators

Description: This use case enables users to send and receive messages within the system.

- **Preconditions:** The user must be logged in.

- **Basic Flow:**

1. The user navigates to the communication module.
2. The user selects a recipient and composes a message.
3. The system sends the message and stores it in the inbox.

8. Chatbot

Actors: User, Chatbot

Description: This use case allows to responses to answer of questions without the need of a human.

- **Preconditions:** The user must be logged in as an administrator or faculty.
- **Basic Flow:**

1. The user accesses the analytics module.
2. Communication with user
3. Solve all the queries that needed to user.

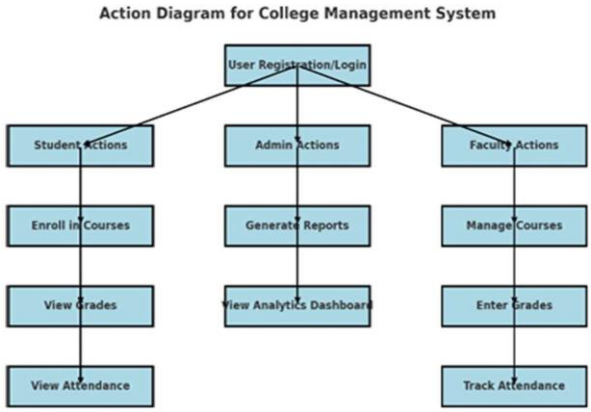

Fig. User Action

Conclusion

The development and implementation of a College Management System bring about a significant improvement in the management and operational efficiency of educational institutions. This system aims to streamline processes, enhance data accuracy, and facilitate seamless communication between various stakeholders such as administrators, faculty, and students. The use of digital technologies allows the college management system to centralize data, thereby reducing redundancy, improving accessibility, and promoting the efficient handling of information. Enhanced Administrative Efficiency: One of the most significant outcomes of implementing this system is the reduction in administrative burden. Traditionally, administrative tasks such as student registration, fee payment processing, attendance tracking, and exam management were handled manually, which is time- consuming and prone to errors. We create a software tool which will be used by any company to help the users to freely upload their queries. Once the complaint is registered in the database, automatic tokens are generated and conveyed to the customer through a text message and email for further tracking of the complaint. Natural language processing technologies are used for parsing, tokenizing, stemming and filtering the content of the complaint.

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