CHATBOT
MANAGEMENT SYSTEM

PROJECT SYNOPSIS

OF MAJOR PROJECT

BACHELOR OF TECHNOLOGY

Computer Science & Information Technology

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SESSION: 2022-23

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1. Overview

A Chatbot Management System is a web application that enables an admin to maintain, manage and visualize the data of chatbot and hence manage the chatbot along with extension of its feature.

1.1 Chatbot

A chatbot is an intelligent piece of software that is capable of communicating and performing actions similar to a human. There are two basic types of chatbot models based on how they are built; Retrieval based and Generative based models.

1.2 Minor Project : Institutional Information Chatbot

This minor project entitled "Institutional Information Chatbot" is a Retrieval based chatbot on one of the most popular messaging platforms- 'Telegram', implemented using *Telegram's public API*, on top of web-scrapping done on *Institute's website* (ies.ipsacademy.org). This is Retrieval Based Chat-Bot for a Messaging Platform (Telegram) for Services offered by Institute's Website.

The basic functionality of chatbot is to interact with the user to answer various queries related to the college like notice-board, schemes/syllabus, academic calendar etc. Some of the unique features added in our minor project is campus guide, personalized notices & syllabus, notes & alert system.

In minor project we use Postgres database for storing details of students and used later to provide personalized result to end user. The application is deployed on Heroku plateform which can be easily accessed by user on Telegram App.

The main idea behind building the chatbot is to make it easier for the student to get useful information, news and documents with a simple command/chat without having to worry about going from one tab to another tab or getting stuck on one page due to slow network speed. The major advantage of chatbot is the ease of using it. The chat-bot is built on top of an api that provides useful information extracted from institute's website with web-scrapping techniques.

1.3 Extension in Minor Project : Chatbot Management System

The major project entitled "Chatbot Management System" is the extension of our minor project (Institutional Information Chatbot). It is a web application that can be used for easy maintenance of our chatbot by a authorized user along with data visualization and scrapping management modules. Admin/Faculty interacts with web app (Chatbot Management System) and application interacts with Chatbot Database and Alert System Database using a Flask API.
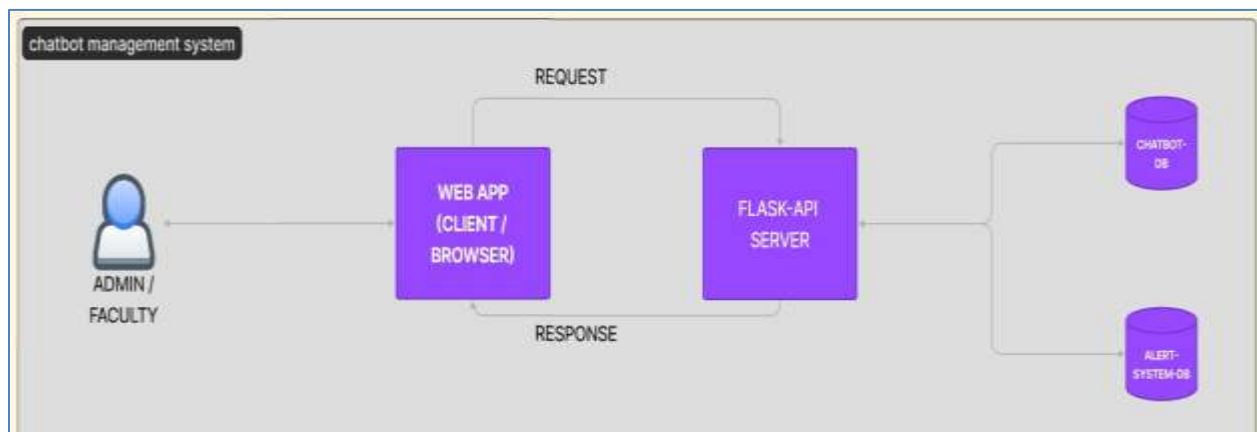
Figure 1.1 "Chatbot Management System"

1.4 Why Chatbot Management System?

When we have to retrieve data from database or update data in Chatbot database, one have to run SQL queries which need a technical knowledge of SQL and difficult for most to its users. Chatbot Management System is a solution of that problem which provide an efficient, effective and eye pleasant interface for performing such operation and any person with non-technical background can also perform this operations easily. It provide the layer of abstraction in accessing and manipulation data from database where API is used to perform operations.

1.5 Features of Chatbot Management System

Chatbot Management System is a web Application enabled with various features like Data Visualization, Notes System, Campus Guide, User Management, Scrapper Management, User Authentication, Customized Alert Bot which makes the easy maintainability of Chatbot and easy availability of user's data.

- **Data Visualization**

  Data Visualization is graphical representation of information and data. Application has a various bar graphs and charts used to the data regarding number of users from different department, number of notes availability of different subjects, data availability regarding details of faculty. This feature of Chatbot Management System makes the easy visualization of data which can be used to increase the resources available for user of Chatbot, to enhance the feature for Chatbot in future.

- **Notes System**

  Notes System is a module in application which provide an interactive interface where authorized user can see, update and delete the notes available in database for Chatbot users. API is used to update, delete and retrieve notes from database. This feature provides a easy way for faculties to provide notes to all their students.

- **Campus Guide**

  Campus Guide is module which provides an interface for admin to update, delete, add and display details of faculty from database using a REST API. This feature provides the easy way to add & edit the faculty details so that Chatbot provides the correct details of faculties to the Chatbot User.

- **User Management**

  User Management is one of the features of Chatbot Management System based on similar idea of Notes System/Campus Guide where admin are allowed to manage users of Chatbot. This feature helps the admin and faculty to get details of students and admin/faculty can delete the user having false details.

- **Scrapper Management**

  Scrapper Management is another module that facilitates the admin to schedule the scrapper. Main task of scrapper is to update new details in database that newly added on college website and trigger alert if new notice is found in database to user of specific department.

- **User Authentication**

  User Authentication ensure that a person having a valid credential can access dashboard/user data, can manipulate data for Chatbot. This feature helps in maintaining the valid details for Chatbot user.

- **Customized Alerts**

  It is most useful and important feature of Chatbot Management System, which provides the interface where admin/faculty can trigger any information, details, notice to the targeted users of Chatbot. Predefined alerts/alert templates are also available so that user do not have to write notice from scratch every time.

- **Alert Bot**

  Alert Bot is a supporting bot on telegram where a registered user get various alerts regarding new Notice on college notice board/department notice board, messages triggered by their department faculties regarding notes, detail or information.
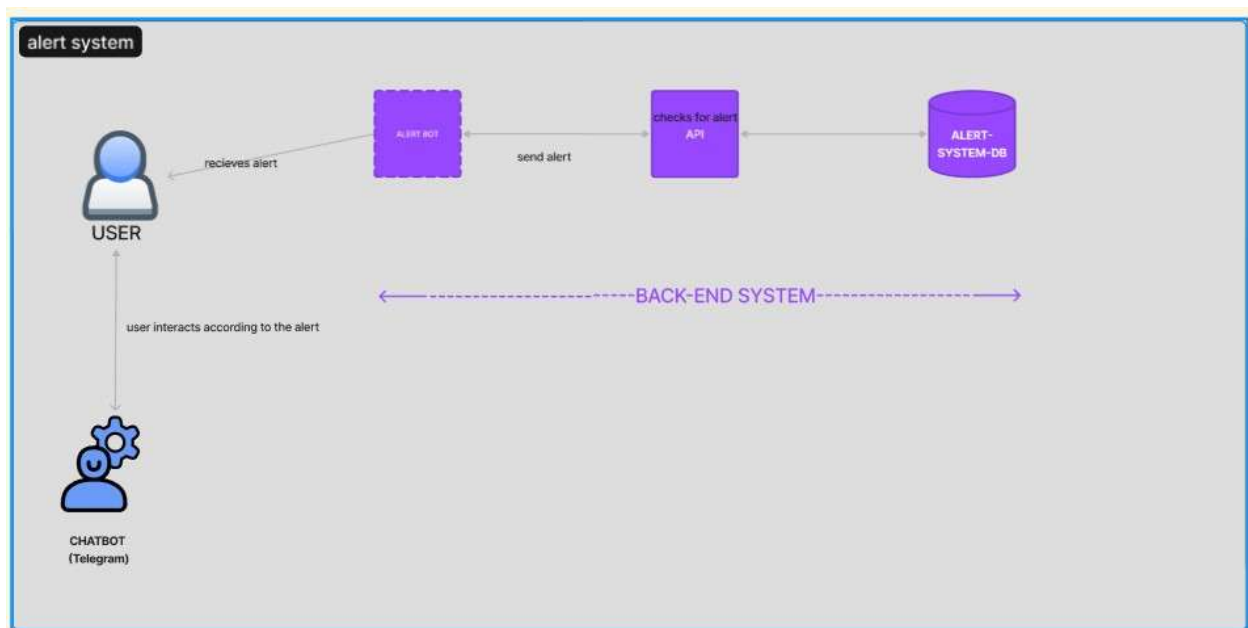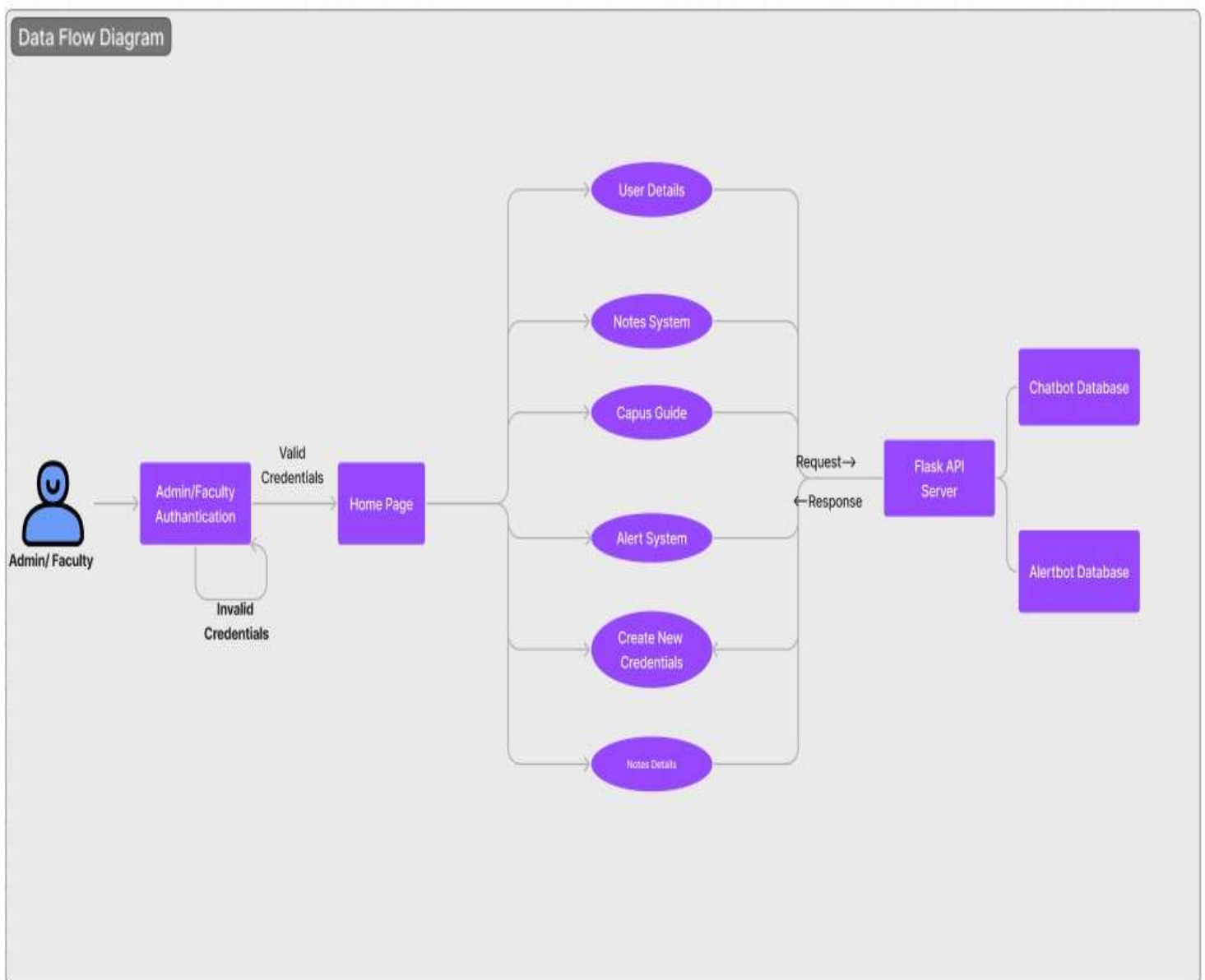

Figure 1.2 "Telegram Alert System"

2. Process Description

Chatbot Management System is a web application consisting of a dashboard supporting various features includes display of student details, notes details and its updation, interface to send alert messages, trigger scheduler to update data in database.

Dataflow Diagram

Figure 2.1 Dataflow Diagram

3. System Requirements & Limitations

Hardware Requirement

- Intel i3 with above 2 GHz Speed.
- 4GB Ram
- 256GB SSD/500GB HDD

Software Requirement

- Python 3.8 or above
- Python IDE (PyCharm, ATOM, Jupyter etc.)
- Telegram Desktop or Android/IOS Application (Latest Version preferred)
- Web Browser (Google Chrome, Microsoft Edge etc.)

Limitations
- **Performance**
  A web app is directly linked to a web browser. Due to this, the app size tends to get increased. The impact of this can be seen in the performance of a web application. A large web app performs considerably slower than a native desktop app.
- **Internet Dependence**
  An internet connection is compulsory when running a web application. Still there are many parts of the world where internet is not accessible. Without a reliable internet connection you cannot either browse the web or run the web application.
- **Reduced Speed**
  Often a web app operates relatively at a slower speed than the application hosted on a local server, and for those reasons can't completely replace mobile apps. It is also directly linked to our browser, because of which its app size tends to increase. A large app, therefore, is considerably slower than a native desktop one. Plus, as a web app runs completely on the internet, it frequently can feel slower due to the internet connection quality.
- **Deployed on Heroku**
  Application is deployed on heroku and heroku is going to stop the free tier from October 2022 so in future we might have to search for its alternative that is cheaper and effective.

4. Conclusion

- The major project will not only help us manage the chatbot, by creating a stand alone "College Information Management System with Chatbot", but also help the in understanding and managing data with the help of data visualization using various graphs and charts.

- Features like alert system will help the students get personalized alerts of the information such as notice board, new assignments, new feature updates etc.

- Using Web Application, anyone can access and manage the chatbot data with eye pleasing UI, with no prior technical knowledge required.

- Major project aims to provides an easy and effective way for faculties to provide the notes, assignment to their students.

- College Management System aims to provides the layer of abstraction with which we can update, read, manage and visualize data without directly interacting with database.

- The project will inbuilt with user authentication system, using this feature only a authorized person with valid credential can manipulate the data.

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