ARTIFICIALLY INTELLIGENT COLLEGE ORIENTED VIRTUAL ASSISTANT

Vishmita Yashwant Shetty, Nikhil Uday Polekar, Sandipan Utpal Das, Prof. Suvarna Pansambal
Department of Computer Engineering,
Atharva College of Engineering, Malad (W)
Mumbai, India

ABSTRACT - **Systems today are getting expert day by day and intend to help human in their day to day queries. Today AI is present in a variety of fields ranging from industries in manufacturing, to diagnosis in medicine technology, to customer care in public relations. There exist lots of online Artificial Intelligence (AI) assistants that help people solve their problems. So, here in the implemented system we built an AI that will solve college related query. It's like a small scale college oriented intelligent search engine. The implemented system is basically a Virtual Assistant that is strictly college oriented. The implemented system entertains the queries of a student regarding college related issues. Authentication mechanism is used by the implemented system for student identification. The authentication mechanism includes password protection. SQLite is used for password security. The implemented system was constructed in Android Studio Platform.**

Keywords - **Virtual Assistant, Bot, Chat, College, Assistant, Academic, AIML.**

I. INTRODUCTION

As the name of implemented system suggests, the vision was to develop a virtual assistant for college students to solve college based queries and provide college related information. The term 'Virtual' may be defined as "Not physically existing as such but made by software to appear to do so."
Thus, the implemented system is a virtual assistant, i.e., it is a software that uses artificial intelligence to guide a student and takes actions to effectively understand student queries and respond to them rationally. The implemented system can assist the user by solving user queries related to college.

1.1 NEED

Students face lack of knowledge of necessary information regarding college issues due to several reasons.
The reason may be caused because of loopholes in system. Such reasons include:

- Communication gap between student and college administration.
- Lack of student interest.
- No proper directions.
- Ignorance by student and/or college administration.

The other reasons may be:

- Student is new to college.
- Other high priority systems, internships, events etc.
- Student is physically or mentally disturbed or disordered.
- Natural calamities or unfavourable weather.

The student may have lack of information about the following:

- Class time-table.
- Lecture Topics.
- Lecture venue.
- Teacher assigned.
- Event timings.
- Event venue.
- Holidays.
- Examination time-table.
- Examination venue.
- Permissions.

The above information can have greater importance in respect of opportunities, examination details, and important events. Hence, here should be a store of such data that can provide required information whenever needed.

1.2 BASIC CONCEPT

This application can help college students by solving their issues related to query, and help them round the clock. The virtual assistant will has single knowledge base, i.e. a static knowledge base. The general (most frequent questions) that don't change with time for example, a query on timetable for a particular semester, college location, college address etc will be answered using static knowledge base whereas the implemented system can also answer information that change with time by using web services.

II. LITERATURE SURVEY

Natural language processing can be done in two way communication with device one is written communication as well as verbal communication with device written communication is much more easier than the verbal communication. In written communication syntax, semantic, lexical and morphological analysis is done. Whereas in verbal communication includes all the process in written as well as additional process include additional knowledge about phonology as well as enough added information to handle the further ambiguities that arise in speech[1]

This paper places an interest in some emerging capabilities for incremental speech understanding and processing in virtual human dialogue systems. This work is part of an in progress effort that aims to enable practical spoken dialogue with virtual humans in multi-party arbitration scenarios .These scenarios are designed to allow trainees to practice their intervention skills by engaging in face-to-face spoken negotiation with one or more virtual humans. An important factor in achieving naturalistic behaviour in these arbitration scenarios, which ideally should have the virtual humans representing fluid turn-taking, composite reasoning, and responding to factors like trust and emotions, is for the virtual humans to begin to understand [2].

The current custom in virtual human dialogue systems is to use skilled human recordings or limited-domain speech synthesis. Both approaches lead to good show but at an elevated cost. To determine the best trade-off between performance and cost, we perform an evaluation of a human and synthesize voices with respect to naturalness, conversational aspect, and likability. Varying the type, length, and content of utterances, and take into account the age and native language of ratters as well as their expertise with speech synthesis. The results suggest that a professional human voice can surpass both an amateur human voice and synthesized voices. Also, a high-quality general-purpose voice or a good limited-domain voice can execute better than part-time human recordings. As expected, in most cases, the high-quality general-purpose voice is rated

higher than the limited-domain voice. There is also a non-statistically significant trend that has been observed for long or negative utterances to receive lower ratings [3].

The aim of this paper is to explore business applications of chat bots, as well as to propose several extent metrics to evaluate practice, usability and overall quality of an embodied conversational agent. On the basis of these metrics we examine existing Polish-speaking commercial chat bots that, firstly, work in the B2C subdivision. Secondly, reach the widest possible range of users. And lastly, are most probably the most advanced commercial deployments of their creators. The system analyses various aspects of functioning of each personified conversational agent: optical look, form of operation on the website, speech amalgamation unit, built-in knowledge base, presentation of knowledge and supplementary functionalities, conversational abilities and perspective sensitiveness, personality traits, personalization options, emergency responses in unforeseen situations, possibility of rating chatbot and the website by the user [4].

III. REPORT ON THE PRESENT INVESTIGATION (EXISTING SYSTEM)

The team had referred technical paper published in IEEE Journal this paper they explained the design of a chat robot that is specifically tailored for providing FAQ Bot system for university students and with the objective of an apprentice advisor in student information bureau. The chat robot accepts natural language input from users, navigates through the Information storehouse and responds with student information in natural language.
In this paper, they model the Information storehouse by a connected graph where the nodes contain information and links interrelates the information nodes. The plan semantics includes AIML (Artificial Intelligence Markup Language) requirement language for authoring the information storehouse such that chat robot design separates the information repository from the natural language interface component.
Respectively, in the experiment, they constructed three experimental systems. Consequently, the information repository can easily be customized and concentrating on particular topic without recreating the code design. Investigational parameters and outcomes suggest that topic specific dialogue if coupled with spoken knowledge will yield the maximum dialogue assembly than the general spoken dialogue.

IV. SYSTEM IMPLEMENTATION

System is built on Android Platform using Android Studio. It uses SQLite for database connectivity and security. The UI is connected to jar library. This jar library accepts and categorize user query using natural language parsing. The jar library is connected to the AIML files in backend. The AIML files are used for pattern matching and response determination. The response is then received by java files and then displayed to user on UI.
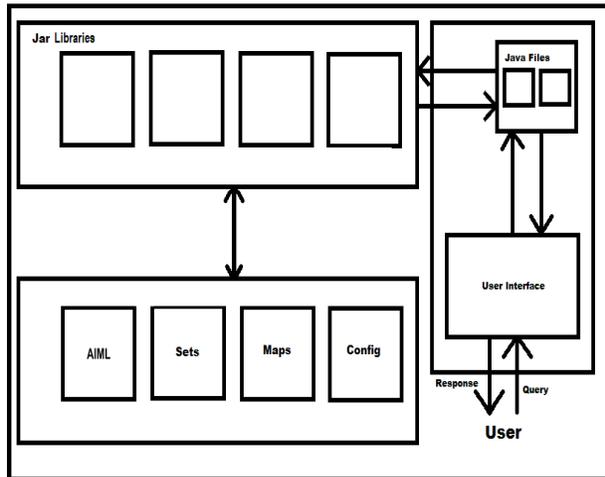
Architecture:

Fig. 4.0.1 Architecture

Blocks

User Interface:
This block serves as an interface between the user and the agent. The user fires a query which is then processed and the user gets a response for the query.

Java Files:
These are the set of java files and classes that are responsible to receive the user query and send it to the jar libraries. User query is sent as a parameter to bot object of main class file of jar library. Which is processed and the java file then receives the response from library and displays to user through user interface.

Jar Libraries:
The Jar Library consists java files that categories the user query by keyword generation. The keywords are generated by NL parsing and then used to sort the user query into categories. The keywords are then sent for pattern matching for response generation.

The jar libraries communicate with the underlying blocks of AIML, Sets, Maps and Configuration files for response generation.
- AIML: This block consists of number of AIML files that have categories and corresponding response to the categories. This is the most important block since the pattern matching takes place in this block.
- Sets: Contains set of values relating to particular subject, which are stored in a text files.
- Maps: This block basically deals with normalization and denormalization. This block consists of the synonyms put up as set. This is used to prevent necessity of making multiple patterns for different synonyms and increasing file size unnecessarily. In order to reduce redundancy caused due to multiple words with same meaning.
  This block stores entities and characteristic of that entity as a set, so as to enable the system to map the entity and characteristics of that entity to generate a more accurate answer.
- Configuration: This block store information about the bot.
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4.1 Process:
When a user logs into the application, the user is provided with two options of Sign In and Sign Up.
Sign In directs the user to sign in form, where user can fill in all credentials and if the user credential are correct he can enter into the app. Sign Up directs the user to registration form where user fills in all the data about the user and makes an account. After a user signs up, user is directed to sign in form. Once a user sign in the application, the user is shown a welcome page.
From here user can navigate to chat page for gaining some assistance.
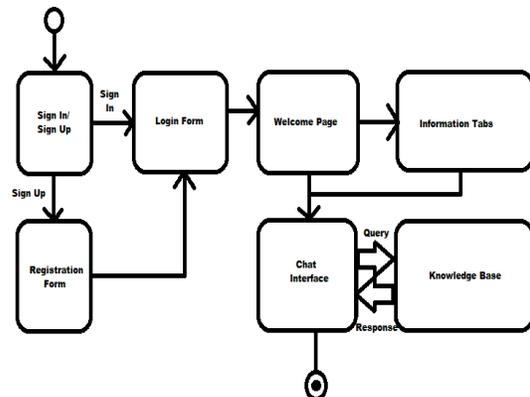

Fig. 4.1.1 Process

4.2 Query Processing:

a. When user types a query and hits the send button the query is send to java file which passes the query as a multiple line string to main function of jar library.

b. The main function parses the string using other java sub-files and generates the keywords. The main string is first categorized and processed by the main file and passed onto the respective java file. To parse the strings the main function uses the Sets block for synonyms and reduce redundancy, hence forming a generalized pattern of keywords.

c. This pattern thus formed is the matched against the AIML file corresponding to categorization.

d. The corresponding response is then picked up by the respective java file and returned to main function of jar library which in turn returns the response to the java main activity that adds the response to chat user interface.

4.3 Screens:
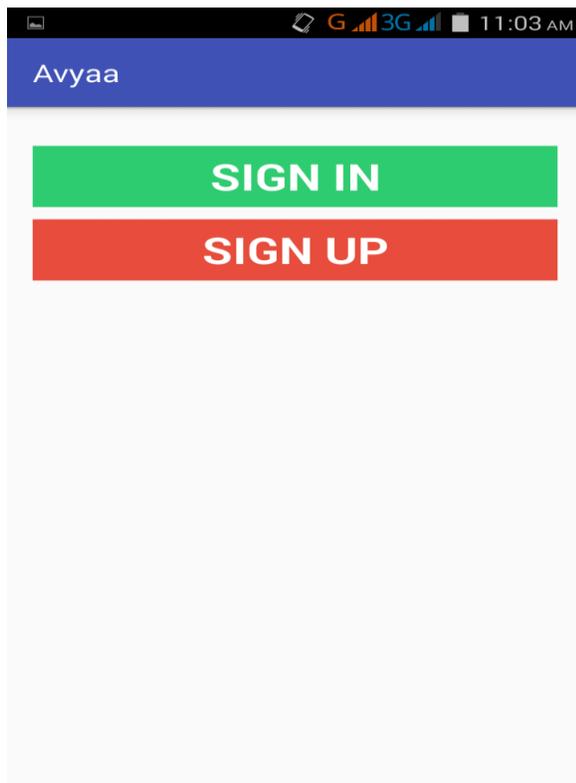
Fig. 4.3.1 Sign-Up Screen
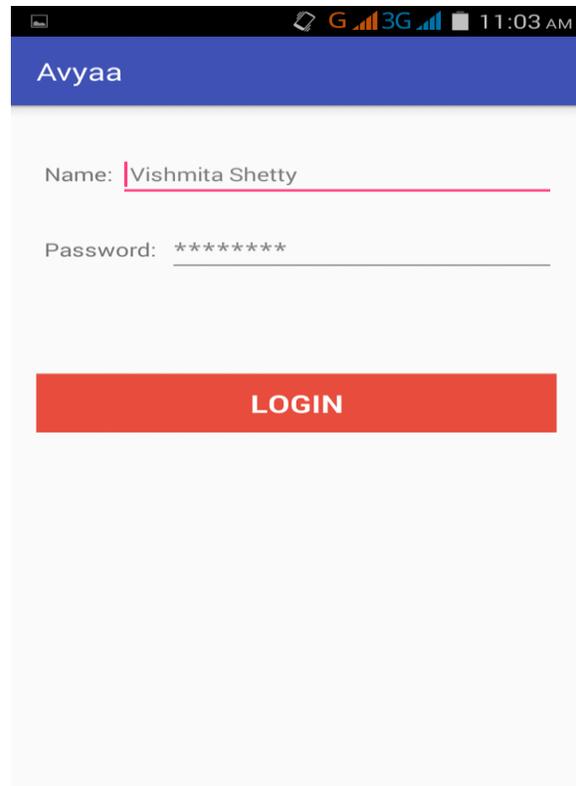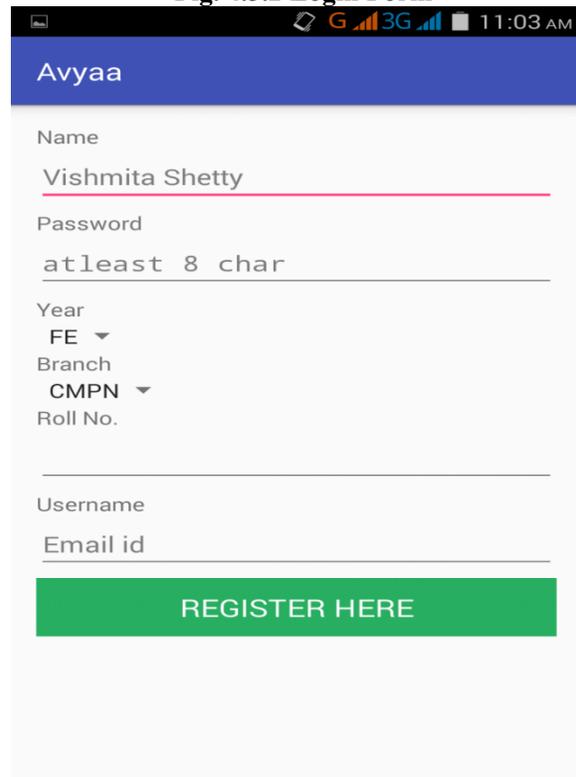

Fig. 4.3.2 Login Form
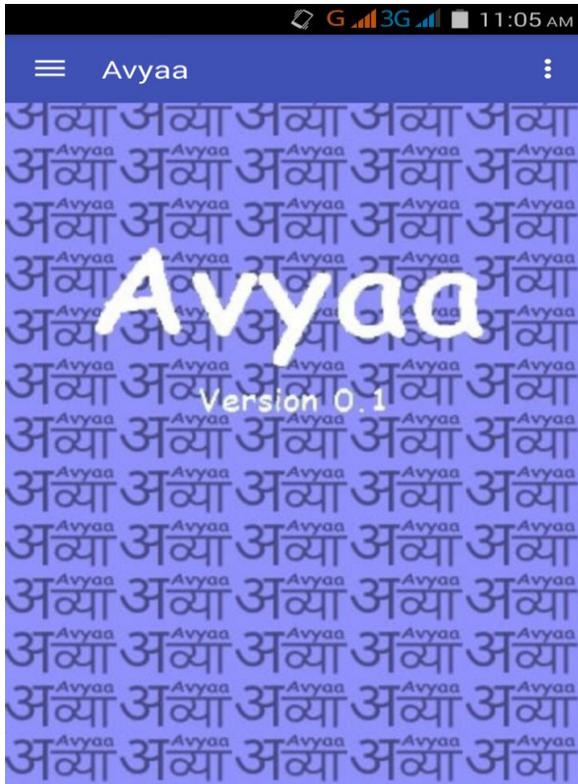

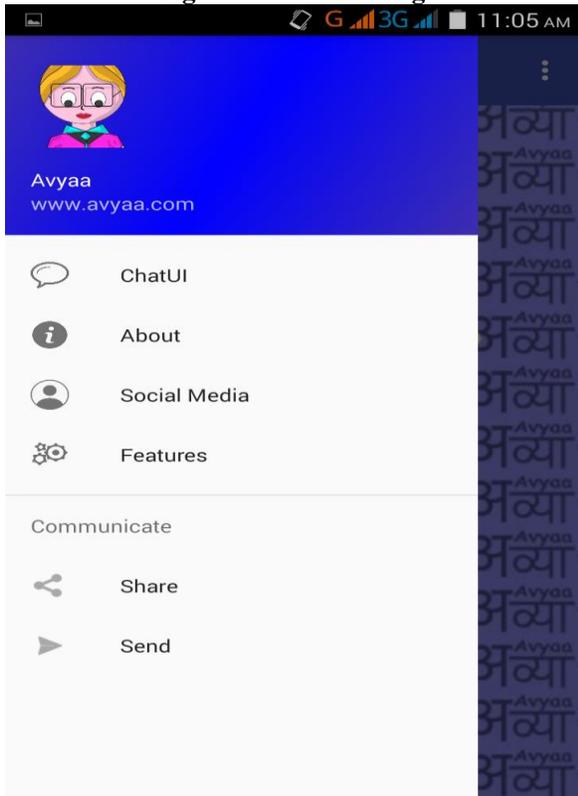
Fig. 4.3.3 Registration Form

Fig 4.3.4 Welcome Page
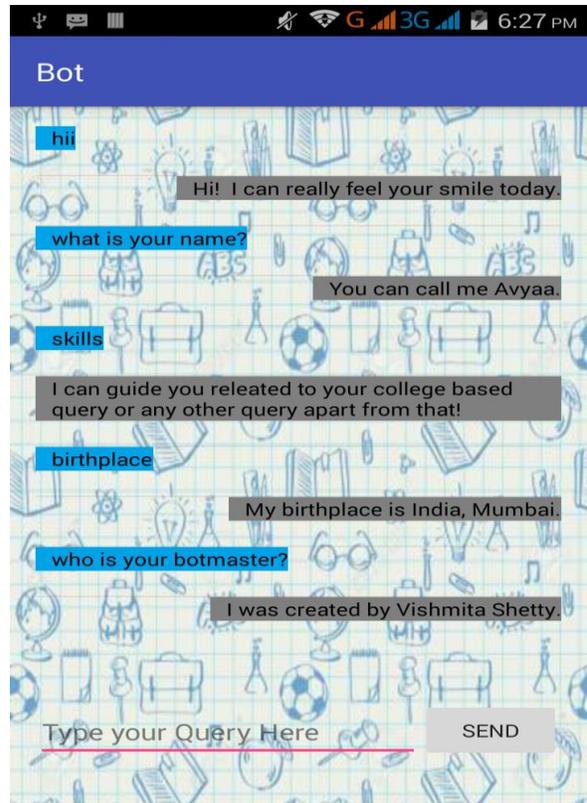

Fig. 4.3.6 (a) Chat UI
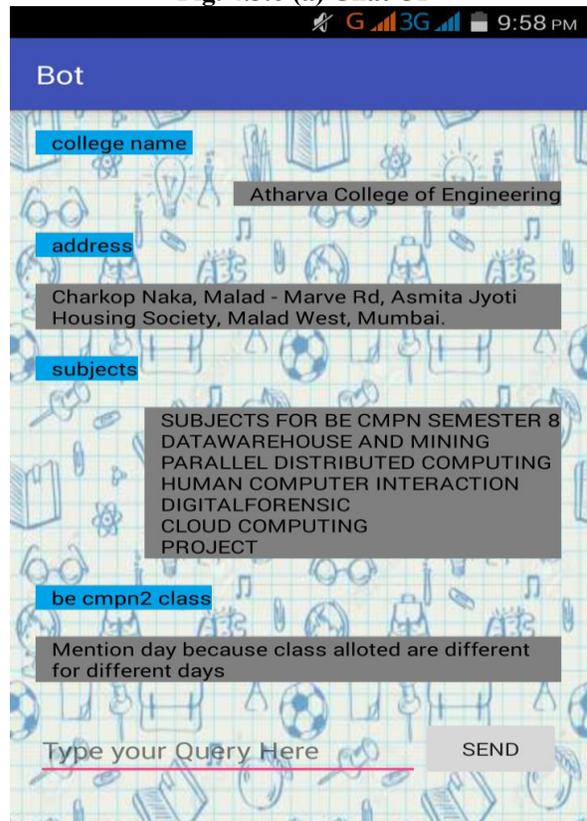

Fig. 4.3.5 Navigation Bar
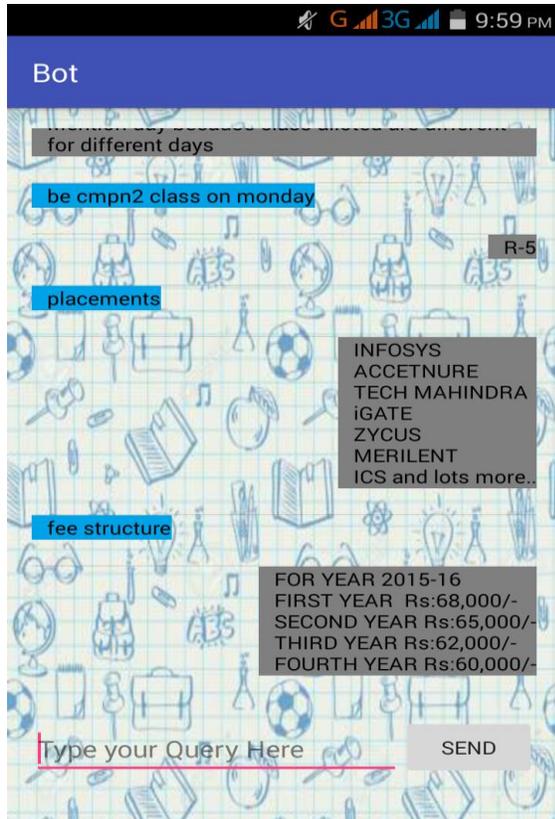

Fig 4.3.6 (b) Chat UI

Fig. 4.3.6 (c) Chat UI

V. Features

- Works on all Android devices above v2.2.5
- Can answer all general questions and college related questions.
- Easy access UI similar to chat application.
- Fully functional without net connection.

VI. FUTURE SCOPE

We can use neural networks as future implementation of system. Data compression and data encryption can be applied for data storage. And also the machine learning module could be added to AI so that the trending topics for a particular branch can be recognized by AI according to priority and notify user about the current priorities topic.

VII. CONCLUSION

The implemented system is an AI based college assistant that can assist college students through their college based queries thus reducing confusion and prevent loss of opportunities. The implemented system can give useful information such as

1. College Information
2. Date and Time
3. Location
4. Basic Information of some other things etc

VIII. REFERENCES

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