

**VOICE BASED CHAT BOT FOR COLLEGE MANAGEMENT SYSTEM**Dr.LJaba sheela<sup>1</sup>, A.Kiruthiga<sup>2</sup>, K.Kiruthika<sup>3</sup>, K.Kowsalya<sup>4</sup><sup>1</sup>Professor, Panimalar Engineering College, Chennai.<sup>2</sup>Student, Panimalar Engineering College, Chennai.<sup>3</sup>Student, Panimalar Engineering College, Chennai.<sup>4</sup>Student, Panimalar Engineering College, Chennai.

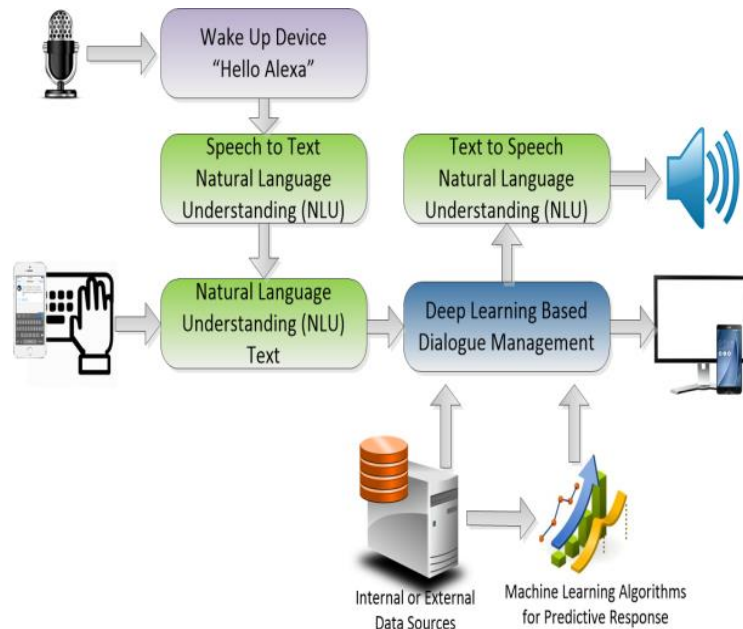
**Abstract** — Artificial intelligence conversational entities, are called as chat-bots. Chat-bot are computer programs capable to carry out conversation between human and computer. This application can run on local computers and mobile, but it has to be accessed through the internet. The proposed system investigates the implementation of existing chat bot system as an application named as android based chat-bot. Android based Chat Bot project will be built using voice recognition techniques and artificial intelligence algorithms that will analyze user's queries which was given by the user and understand user's input. This system will be an android application which will provide answers to the queries of the students. The answer to the query will be answered on the basis of the user's queries and the knowledge base. User need to give their query to the chat-bot via microphone. The proposed system is carried on to explain the design of a chat-bot as an android application to help students to check their details. The biggest advantage is that student does not have to go to college for the enquiry. Students just have to put their query to the bot by voice. Students can use this application for making enquiries at any point of time. This system may help students to stay updated with their marks. It is a domain specific chatterbox which is a student information system that helps users in various queries related to students and college.

**Keywords**- Android, Artificial intelligence, Speech recognition, Chatter box, internet

**I. INTRODUCTION**

Chat bots are software agents which conducts a chat between human and computer via voice. Chat bots are mainly used for numerous scope like customer services or information acquisition. There are two types of chat-bots are available, one whose functions are based on a set of guidelines and other is the more advanced version which uses speech recognition and artificial intelligence. The erstwhile tends to be defined and their smartness depends upon the complexity of the program. The one that uses artificial intelligence, understands language as it learns from the conversation with the people.

Android based Chat Bot project will be built using voice recognition techniques and artificial intelligence algorithms that will analyze user's queries which was given by the user and understand user's input. This system will be an android application which will provide answers to the queries of the students. The answer to the query will be answered on the basis of the user's queries and the knowledge base. The important keywords will be fetched from the keywords and the answer to those keywords will be searched in the knowledge base. If the match is found, the relevant answer will be provided to the user or the default message will be shown to the user. Users just ask the query to the bot via microphone that will be used for chatting. Artificial intelligence will be used to answer the user's queries. The user will get the appropriate answers to their queries. Students do not need to go to the institution to make the inquiry. The system will respond using an effective GUI which implies that as if conversation takes place between humans. The user just has to update their information into the database and has to login to the system. After login, through application the user can ask queries related to college activities through online with the help of this application. The user can query college related activities such as downloading the subject notes, see their internal marks and any other important notice. This will help the user to be updated with the important notices from the college. Not much time will be wasted by the user to search for the important notices. We propose a system which will work as an application and give users information about college related activities. In this project, our responsibilities included reading the user inputs and then respond to the query. This project is built using artificial algorithm called HMM (Hidden Markov Model) that analyzes user's queries and understand user's message. This system is an android application which provides answer to the query of the student. Students just have to query through the bot which is used for chatting. Through this chat bot, student can login by giving their login credentials. This system validates those information which given by student to check whether it is valid or not. If it is valid, it navigate to page where mike icon is present. By tapping the mike icon, student can give voice input to retrieve internal marks and it will display corresponding results in the form of text. The system replies to the user with the help of effective graphical user interface. The answers are appropriate for the user queries. The user does not have to personally go to the college for enquiry. The system analyzes the question and the answers to the user. The system answers to the query as if it is answered by the person. With the help of artificial intelligence, the system answers the query asked by the students. The user can query about the internal marks through online with the help of this android application.



*Fig1. System Architecture*

## II. RELATED WORK

We will discuss about two main chat-bot systems which are already exist.

### A. ELIZA

ELIZA is an early natural language conversational computer program which is designed in 1966 at MIT Artificial Intelligence Laboratory by Joseph Weizenbaum. It has been created to indicate the levity of conversation between humans and machines, ELIZA perform conversation by using a pattern matching and substitution methodology that gave users an illusion of understanding the program, but had no default framework for contextualizing events. Decree on how to interact were provided by scripts, written originally in MAD-Slip, which allowed ELIZA to progress user inputs and engage in discussion following the guidelines and directions of the script. ELIZA was one of the first chat-bot, but was also regarded as one of the first programs capable of passing the Turing Test.

Weizenbaum formerly addressed ELIZA in MAD-Slip for the IBM 7094, as a program to generate a natural language chatty possible with a computer. To perform this, Weizenbaum identified “fundamental technical obstacle” for ELIZA to beaten: the description of critical words, the preferred appropriate conversion, the procreation of reply relevant to the transfiguration or in the nonappearance of critical words and the arrangement of an ending capacity for ELIZA scripts. ELIZA begins its action of replying to an input by a user by first exploring the text input for a ‘keyword’. A ‘keyword’ is labelled as important by acting ELIZA script, which assigns to each keyword a precedence number, or a RANK, implemented by the programmer. If such keywords are detected, they are set into a ‘keystack’, with the keyword of the highest rank at the top. The input sentence is then shaped and transformed as the rule assist with the keyword of the highest rank directs.

### B. A.L.I.C.E

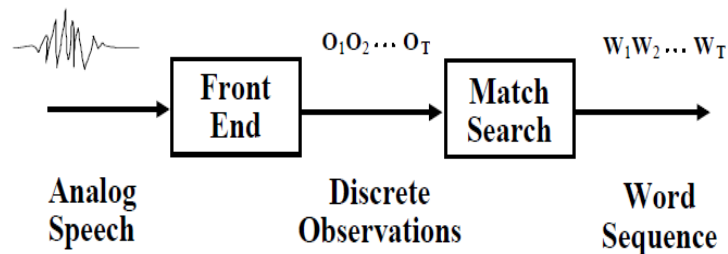
A.L.I.C.E (Artificial Linguistic Internet Computer Entity) also specified as Alice bot, or generally ALICE, is a natural language conversational chat bot –a program employs in chat with a human by applying some interrogative pattern matching rules to the human’s input, and in its online form it also commit on a hidden third person. It has won Loebner prize three times. It set up reply to the user’s query by implementing some pattern matching rules. It was influenced Joseph Weizenbaum’s ELIZA program. However, the program is impotent to pass the Turing Test, as even the normal user will often uncover its mechanistic form in short conversations. This program uses an XML Schema called as AIML (Artificial Intelligence Markup Language) for indicating the interrogative conversation rules. The construction of chat bot containing two separated parts namely-“chatbot engine “ and “language model” which gives us the moment to implement a chat bot in a newly established knowledge model. Language model is keptin AIML files. The fundamental unit of expertise in AIML is category, each category consists of an input or query, an output or response and an optional context. The input query is called the pattern. The answer or response is the template. The most necessary in ALICE is the pattern matching algorithms, which is simple and depend on depth first search. It also has srail tags, which can be used for minimizing the pattern and templates.

### C. PROBLEMS IN EXISTING SYSTEM

- ELIZA doesn't understand what it is saying. It only produces results according to rules that are predefined.
- ALICE does not have the ability to learn and can only come with data that exist in its database.
- Natasha is used only for the purpose of chatting with the users and providing information which is available over internet. This system is not used for purpose of reservation of hotels.

### III. METHODOLOGY

We built chat-bot using speech recognition as given below,



The speech recognition has done using GMM (Gaussian Mixture Model) and HMM (Hidden Markov Model) algorithm.

### D. GMM ALGORITHM

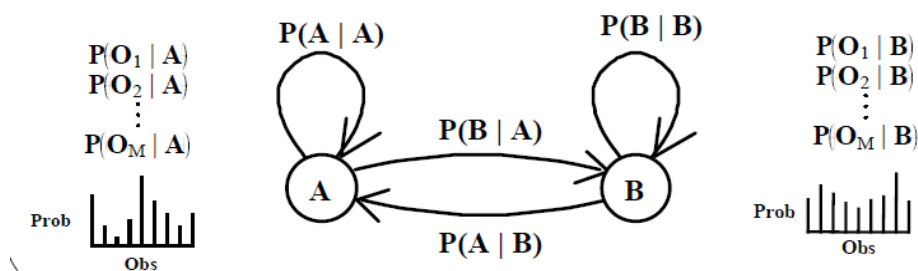
A GMM is a probabilistic model that consider all the data are produced from a variety of a definite number of Gaussian distributions with anonymous parameters. One can determine of mixture standard as establishing k-means clustering algorithm to integrate details about the covariance standard of the data as well as the underlying Gaussians. The GaussianMixture object implements the EM algorithm. The main complication in researching Gaussian mixture standard from unspecified data is that it is usually doesn't know which came from which inherent component. EM is a well-defined statistical algorithm to get around this problem by an incremental process. First one consider arbitrary components and calculates for each point a probability. Then, one twist the criterion to increase the prospect of the data given those assignments. Rerunning this process is endorsed to usually assemble to a local optimum.

### E. HMM ALGORITHM

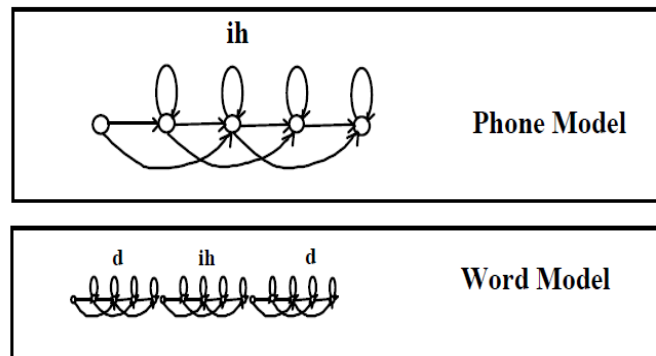
Hidden Markov Model (HMM) is a probabilistic Markov Model in which the system being formed is assumed to be a Markov model with hidden states. In simpler Markov model, the state is directly visible to the observer, and therefore the state transition probabilities are the only criterion, while in the hidden Markov model, the state is not directly visible, but the output, based on the state, is visible. Each state has a probability distribution over the desirable output tokens. Therefore, the series of tokens generated by an HMM gives some details about the sequence of states; this is also known as pattern theory.

#### Elements:

<b>States</b>	$S = \{S_0, S_1, \dots S_N\}$
<b>Transition probabilities</b>	$P(q_t = S_i   q_{t-1} = S_j) = a_{ji}$
<b>Output prob distributions (at state j for symbol k)</b>	$P(y_t = O_k   q_t = S_j) = b_j(k)$



Represent voice input as a sequence of information. Use HMM to model some unit of speech and connect units into larger units.



#### F. HMM PROBLEMS AND SOLUTIONS

- Evaluation:  
 Problem- Calculate Probability of observation sequence in a given model.  
 Solution- Forward and Viterbi Algorithm.
- Decoding:  
 Problem- Finding the state sequence which increases probability of observation sequence in a given model.  
 Solution- Viterbi Algorithm.
- Training:  
 Problem- Align system framework to increase probability of observed sequences.  
 Solution- Forward-Backward Algorithm.

#### IV. MODULES DESCRIPTION

##### ➤ VOICE ACTIVITY DETECTOR:

The Voice Activity Detector's (VAD) role is to segregate the user's voice frames from those containing noise. Voice Activity Detection, also referred as speech activity detection or speech detection, is an approach used in speech processing in which the presence or nonappearance of human speech is detected. Speech recognition also plays a crucial role in the discipline of appraisal method used in echo revocation and noise minimization algorithms. This technique is also useful in automatic earnings restriction methods. Our hefty speech analyzing algorithms backing trade-offs between the dormancy and accuracy of analyzing in different operation of this system.

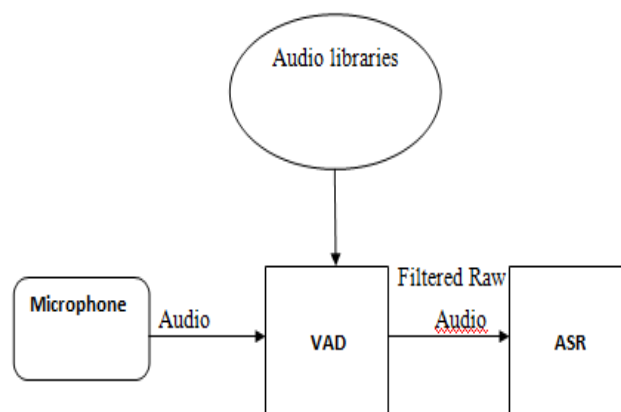
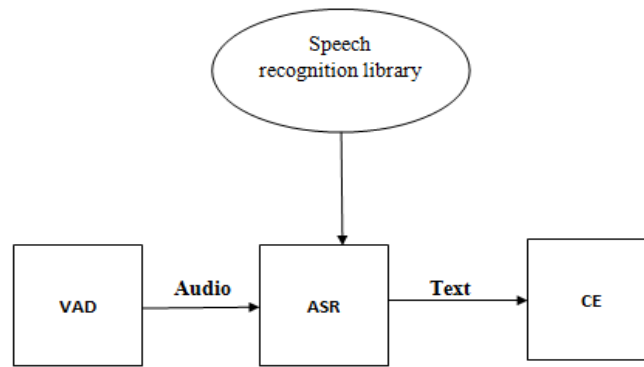


Fig 2. Voice Activity Detector

##### ➤ AUTOMATIC SPEECH RECOGNITION:

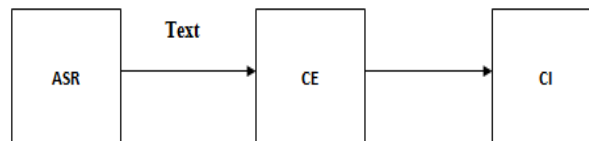
The Automatic Speech Recognition (ASR) module performs speech to text conversion. To convert voice input to text, a system has to go through certain crucial steps. When you give voice input, you create reverberation in the air. The ADC converter converts this analog wave into digital that the machine can understand. To do this, it digitizes, the speech by taking clear-cut frequency of the wave at periodic intervals. The system dribble the processed sound to clear unnecessary noise, and split it into various bands of frequency. It normalizes the sound, or aligned it to constant volume level.



*Fig 3. Automatic Speech Recognition*

➤ **CONVERSATIONAL ENGINE:**

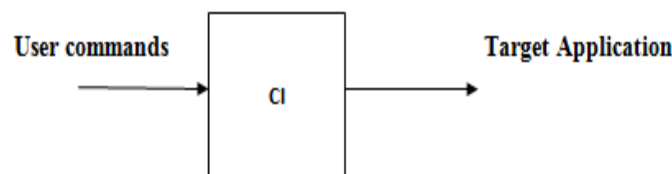
The CE extracts the content of the assertion, regulates the dialog flow and generates the actions relevant for the target domain. Conversational interfaces implemented with dialog flow performs with a various devices including phones, wearable, cars, speakers and other smart devices.



*Fig 4. Conversational Engine*

➤ **CONTROL INTERFACE:**

Audio CI handle spoken words or other transferred sounds as both the data input and system response, though reply via other means could be requested by the user.



*Fig 5. Control Interface*

## V. CONCLUSION

Currently chat bots have limited language support. They do not support multiple languages, dialects and do not understand colloquial usage. Hence there is a great scope for removing such language barriers in future chat bots. Also, AIML templates could be improved to include more variations for the same input. Artificial Intelligence personal assistants integrate various chat bot services into single platform and pave the way for a truly intelligent self-learning activity. Chat bots are also referred to as virtual assistants. It can be used in the various fields such as education, business, online chatting etc. It can be used in the field of education as a learning tool. The information necessary for education can be stored in the data base and can be retrieved any time by querying the bot. In business field, it can be used to provide solutions in a competent way. When the solutions are efficient, the business can be improved and the growth of the organization will be increased. This chat bot can be used in online chatting for entertainment purpose. People can chat with these bots online when they are bored for the purpose of entertainment. These bots can also be used to learn different kinds of language. The language that has to learnt can be stored in the database and can be learnt by asking questions to the bot. They can also be used in the field of medical to solve health related problems. Chat bots are going to explode and can be really dominating in future. Chat bots can provide a new and flexible way for users.

## REFERENCES

- [1].Y. Zhou, X. Ziyu, A. W. Black, A. I. Rudnicky, "Chatbot Evaluation and Database Expansion via Crowdsourcing", Proc. of the Chatbot Workshop of LREC, US, pp. **16-19, 2016**.
- [2].C. R. Anik, C. Jacob, A. Mohanan, "A Survey on Web Based Conversational Bot Design", JETIR, Vol.3, Issue.10, pp. **96-99, 2016**.
- [3]. B. Setiaji, F. W. Wibowo, "Chatbot Using A Knowledge in Database", IEEE 7th International Conference on Intelligent Systems, Modelling and Simulation, Thailand, pp. **72-77, 2016**.
- [4]. S. Ghose and J. J. Barua, "Toward the implementation of a topic specific dialogue based natural language chatbot as an undergraduate advisor," International Conference on Informatics, Electronics and Vision (ICIEV), Dhaka, **2013**.
- [5]. Ameya Vichare, Ankur Gyani, Yashika Shrikhande, "A chatbot system demonstrating Intelligent Behaviour using NLP," International Journal of Advanced Research in Computer Engineering & Technology (IJARCET) Volume **4** Issue **10**, October **2015**.
- [6]. Emanuela Haller and Traian Rebedea, "Designing a Chat-bot that Simulates an Historical Figure", IEEE Conference Publications, July **2013**.
- [7]. FilippoMalvisi,"Development of a framework for chatbots in HTML5 and javascript", **2014**.
- [8]. M. Wallace, "Fragmentation is the enemy of the Internet of Things Qualcomm",Qualcomm, **2016**.
- [9]. Miorandi, D., Sicari, S., De Pellegrini, F. and Chlamtac, I., **2012**. "Internet of things: Vision, applications and research challenges. Ad Hoc Networks", 10(7), pp.**1497-1516**.
- [10] Celesti, Antonio, Maria Fazio, Maurizio Giacobbe, Antonio Puliafito, and Massimo Villari. "Characterizing Cloud Federation in IoT", 30th International Conference on Advanced Information Networking and Applications Workshops (WAINA), pp. **93-98**. IEEE, **2016**.