

# Ai Chatbot

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**ABSTRACT**— The main aim and objective of this project is to build a AI Chatbot for Cyber Security Industry. In project we tried to build a chatbot focused for Cyber Security industry and trained it in such a way that other than the company Information it can also entertain some of the basic security quires

In this technological world every industry run behind AI and automation. One of the best application of integration of AI and Automation would be Chatbots. These are heavily used now-a-days.

For using software applications, user interfaces that can be used includes command line, graphical user interface (GUI), menu driven, form-based, natural language, etc. The mainstream user interfaces include GUI and web-based, but occasionally the need for an alternative user interface arises. A chatbot based conversational user interface fits into this space. The chatbot is a class of bots that have existed in the chat platforms. The user can interact with them via graphical interfaces or widgets, and the trend is in this direction. They generally provide a stateful service i.e. the application saves data of each session. On a college's website, one often doesn't know where to search for some kind of information. It becomes difficult to extract information for a person who is not a student or employee there. The solution to these comes up with a college inquiry chat bot, a fast, standard and informative widget to enhance college website's user experience and provide effective information to the user. Chat bots are an intelligent system being developed using artificial intelligence (AI) and natural language processing (NLP) algorithms. It has an effective user interface and answers the queries related to examination cell, admission, academics, users' attendance and grade point average, placement cell and other miscellaneous activities. Keywords:- Artificial intelligence, chat bot, knowledge base, lemmatization, natural language processing, semantic sentence similarity, wordnet.

## I. INTRODUCTION

### Overview of Project:

Chatbots are basically AI intelligence bots which can interact with the user or customers depends upon the usage. It is an application of Artificial Intelligence and Machine Learning. Now-a-days technology is increasing rapidly. In this technological world every industry is trying to automate things to provide better services. One of the great application of automation would be chatbot.

There are basically two types of Chatbots :

**Command based** Chatbots that function on predefined rules and can answer to only limited queries or questions. Users need to select an option to determine their next step.

Here in this project an AIChatbot which is focused for Cyber Security Industry and trying to solve of the use cases of industry by training it in such a way that it can answer some of the basics queries of cyber security as well other than just the customer services.

Nowadays, we see the chat bots everywhere Chat bots are the source of answers to the users questions in any particular domain where it is operating. Chat bots are the source of answers to the users questions in any particular domain where it is operating. The most popular example today is the Amazon's Alexa. Chat bots are at almost every place, one can see it at every second website they visit. A bot is helpful in answering queries related to information which might be unreachable at that website easily. Most of the websites avail users with chat bots to aid them to go through what the websites facilitate. They are turning out to be our virtual assistants in everyday lives.

Basics of chat bot A chatbot is an artificially intelligent creature which can converse with humans. This could be text-based, or a spoken conversation (in case of voice-based queries). Chat bots are basically used for information acquisition. It can run on the local PCs and mobile phones, though most of the time it is accessed through the

internet. It can be compelling, captivating and spell-bounding. It is a conversational agent which interacts with users in a certain domain or on a particular topic with input in natural language sentences. Mainly a chatbot works by a user asking some question or initiating a new topic of discussion. Chat bots can be referred as software agents that pretend as human entity. These are the agents with AI embedded and using NLP they can answer to user questions. Predefined knowledge base helps develop a response to the query. B. Chatbot for College The need for college inquiry system arises due to various reasons which include: the slow nature of college website, an outsider would not know where to search for a particular piece of information, difficult for the person outside college's domain to extract information. The smart solution for all the drawbacks leads to the need of the system. The college inquiry system will provide the response by summarizing the query and then output answers, it also provides selective information what the user wants. A college system will dispense all answers relating to domains such as admission, examination cell, notice board, attendance, placement cell and other miscellaneous domains.

The major features of the chatbot are:

College admission related queries could be answered through it.

Viewing user profiles and retrieves attendance and grade pointers.

College students can get information about examinations to be held.

College students can fetch particulars about placement activities.

#### **Objective of Project:**

##### **The objectives of this project are:**

- To analyze users queries and understand users' messages.
- To provide an answer to the query of the user very effectively.
- To save the time of the user since s/he does not have to personally go to the college for inquiry.
- This system will help the student to be updated about the college activities.
- The system will reply using an effective GUI which implies that as if a real person is talking to the user

##### **The major features of the chat bot are:**

- College admission related queries could be answered through it.
- Viewing user profiles and retrieves attendance and grade pointers.

- College students can get information about examinations to be held.
- College students can fetch particulars about placement activities.

## **II. LITERATURE SURVEY**

### **Introduction**

Here we will elaborate the aspects like the literature survey of the project and what all projects are existing and have actually been used in the market which the makers of this project took the inspiration from and thus decided to go ahead with the project covering with the problem statement.

### **Literature Survey Papers**

ChatBot can be described as software that can chat with people using artificial intelligence. These software are used to perform tasks such as quickly responding to users, informing them, helping to purchase products and providing better service to customers. In this paper, we present the general working principle and the basic concepts of artificial intelligence based chatbots and related concepts as well as their applications in various sectors such as telecommunication, banking, health, customer call centers and e-commerce. Additionally, the results of an example chatbot for donation service developed for telecommunication service provider are presented using the proposed architecture.

2018 26<sup>th</sup> Signal processing and communications applications conference (SIU), 1-4, 2018

The use of chatbots evolved rapidly in numerous fields in recent years, including Marketing, Supporting Systems, Education, Health Care, Cultural Heritage, and Entertainment. In this paper, we first present a historical overview of the evolution of the international community's interest in chatbots. Next, we discuss the motivations that drive the use of chatbots, and we clarify chatbots' usefulness in a variety of areas. Moreover, we highlight the impact of social stereotypes on chatbots design. After clarifying necessary technological concepts, we move on to a chatbot classification based on various criteria, such as the area of knowledge they refer to, the need they serve and others. Furthermore, we present the general architecture of modern chatbots while also mentioning the main platforms for their creation. Our engagement with the subject so far, reassures us of the prospects of chatbots and encourages us to study them in greater extent and depth.

IFIP International Conference on Artificial Intelligence Applications and Innovations, 373-383, 2020

In this technology world, a recent technology called chatbot which have been in demand and usage for every business purpose and have hit the market. Chatbots is an interaction between person and bot which gives us a efficient service and it also gives the way to develop customer engagement and efficiency by reduction of cost by using these service. Chatbots can be accessible at anytime, which can handle capacity that is chatbot can chat with thousands of people at a time, It has a flexible attribute as well as customer satisfaction. A chatbot is constructed using natural language processing with the help of machine learning algorithm for training the bot and to make up the bot to perform in a right way and so training and testing is done using ML. This paper gives an overview of chatbot and challenges we faced behind the chatbot with extra features of images.

2019 IEEE International Conference on System, Computation, Automation and Networking (ICSCAN), 1-5, 2019

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### Existing System

As we know, there are many sites are available for college purpose and student get information through the websites many information available on the websites we can get it easily but if we want complex information websites are not able to provide sometimes these websites are very slow and take too much time to get information at the time of admission many students search for information about the college these college websites take too much time to search specific information it's a common problem over the year colleges work on it how to resolve it if we do

not get any information about the college, there is a need to go to college to get that information. College websites are literally slow because many people access it simultaneously so that the traffic increases and it increases the communication gap between students and the college.

### Need for new System

The need for a college inquiry system arises due to various reasons which include: the slow nature of the college website, an outsider would not know where to search for a particular piece of information, difficult for the person outside the college's domain to extract information. The smart solution for all the drawbacks leads to the need of the system. The college inquiry system will provide the response by summarizing the query and then output answers, it also provides selective information about what the user wants. A college system will dispense all answers relating to domains such as admission, examination cell, notice board, attendance, placement cell and other miscellaneous domains.

### PROBLEM DEFINITION

Artificial intelligence chatbot is a technology that makes interactions between man and machines using natural language possible.

From literature, we found out that in general, chatbot are functions like a typical search engine. Although chatbot just produced only one output instead of multiple outputs/results, the basic process flow is the same where each time an input is entered, the new search will be done. Nothing related to previous output.

This research is focused on enabling chatbot to become a search engine that can process the next search with the relation to the previous search output. In chatbot context, this functionality will enhance the capability of chatbot's input processing.

### Proposed System.

#### User Login:

User registers himself/herself on the Chat-Bot application.

#### Chat BOT Responding System:

- A. NLP Processing and Sentiment Analysis for Complaint:

### SCOPE

Chatbots seek to solve a difficult technical problem – namely, how to construct a machine that can reliably mimic human interaction and

intelligence. This is, in essence, a version of the so-called Turing test, which tests whether a computer (or any other machine) has the ability to display human characteristics and intelligence. In building chatbots that come increasingly close to passing the Turing test, engineers can create better user experiences and drive significant value for a diverse range of companies.

As of now, chatbots have a long way to go in reaching this goal. This article explores the current state of chatbot technology – how it's developed, how it's used, and how it will continue to evolve. While chatbots are only beginning to meet their full potential, they represent a powerful tool that deserves significant attention and investment.

From gauging purchase intent to answering questions about IT issues, chatbots are on track to play a major role in the contemporary enterprise. Chatbots are fully functioning, semi-autonomous systems that can assist customer service experiences and response time.

But that doesn't mean their future in the enterprise is secure. For chatbots to withstand the rapidly increasing technological shifts and become mainstays in the enterprise, developers need to examine the issues that have popped up with increased implementation.

The future scope of chatbots could include many benefits for enterprises, but experts say they will need to be gently nudged in the right direction for businesses to reap these benefits.

The future scope of this Chatbot application will be-

- More efficient chat bot
- It will replace the classroom instruction, textbook, practices and home workers.
- Live Chats, Video-Calling can be used in future to make the software more useful and demanding.

While voice interface may be optional, chatbots have been in the enterprise long enough for developers and experts to begin identifying what elements of chatbots are mainstay requirements. NLP development, human-like

conversational flexibility and 24/7 service are crucial to maintaining chatbots' longevity in enterprise settings. Chatbots are AI devices and, looking ahead, they need to keep up with AI trends, such as automated machine learning, easy system integration and developing intelligence.

chatbots need to have a basic foundation of natural language processing, learning and understanding. This extends to interpreting user intent, developing domain-specific language and improving their functionality to adapt and change based on the specifics of any conversation. As the chatbot novelty wears off and users become more demanding of operational ability, adaptability will become increasingly important.

If the future demands advanced chatbots that do more than use scripted, single-turn exchanges, then their method of interface will also have to advance. A voice interface can assist users with disabilities or those who are skeptical of technology, but it also requires another layer of NLP development.

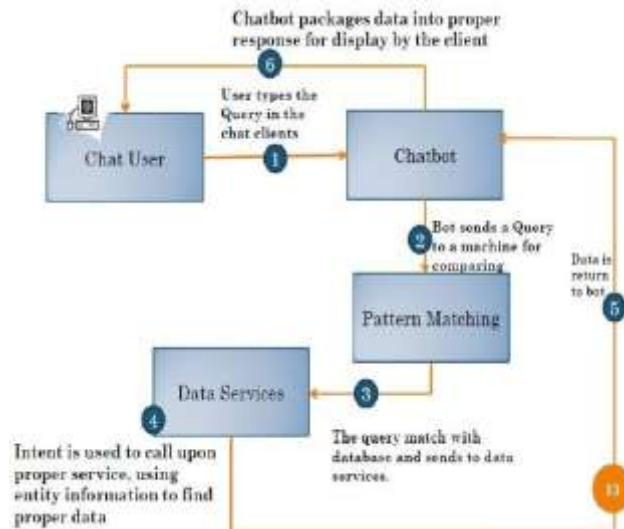
When a user complaint is submitted to the system, NLP is applied and the sense of the complaint is detected. The sense of the words is found using part of speech tagging and wordnet dictionary. By Using the sentiment analysis negation level of a complaint is detected. And user complaints are prioritized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

B. Search Questions in knowledge database:

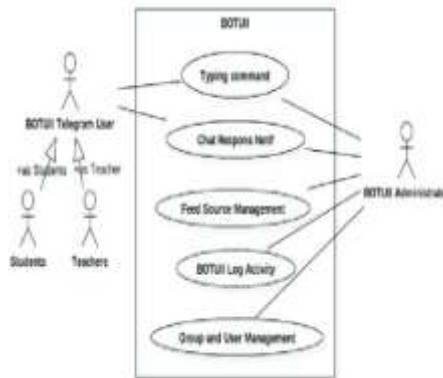
Once the negation level of the complaint is detected, furthermore, the exact question in the complaint is detected using WorldNet. As the complaint description can change from person to person. The same question may be asked differently from multiple users. One user asks a question so simply and clearly while another user may ask the same question more negatively. So it is necessary to find what is the exact technical issue with the particular product to give a correct solution

### III. DESIGN AND IMPLEMENTATION

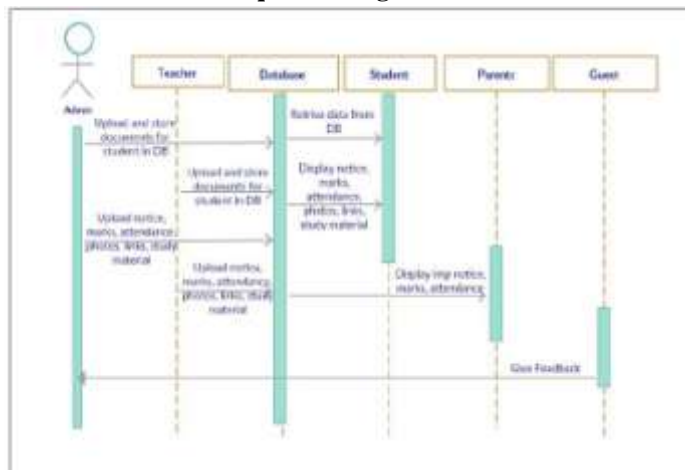
#### 3.1 Design



Use case diagram:



Sequence Diagram



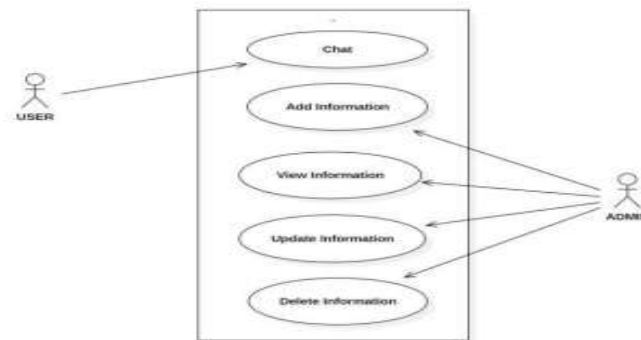
### 3.3 Methodology

The methodology that we used for this application is very simple. We used the concept of Natural Language Processing and building our own Neural network by using tflearn. We have used a json file "intents.json" for training our model. The intents.json is the file which consists of some sample chats and each chat block under a "tag". This intents file is being created by our team and we have not used any file from internet. We have

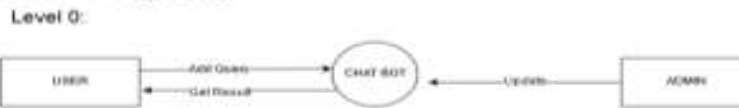
provided some basic chats regarding the Cyber Industry and some basics terminologies and some basic queries related to Cyber Security.

In this project file is used for training the model and the model is being trained by using fit() method of tflearn and saved the model as "model.tflearn". All the trained data is being stored in a file named "training\_data" and further this file is used for giving response.

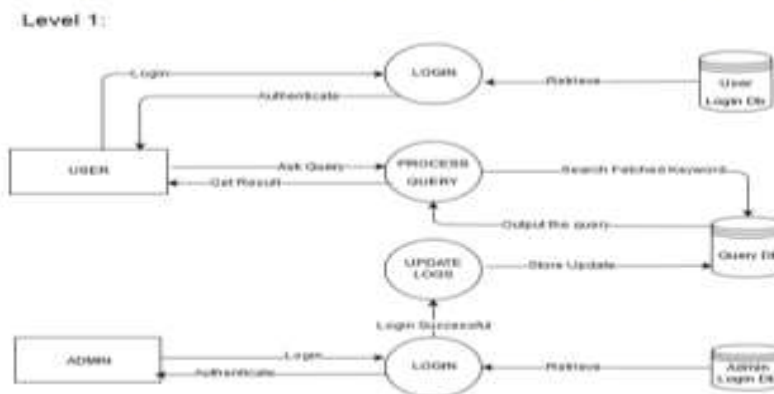
**Use Case Diagram:  
(User and admin roles)**



**Data Flow Diagram:**



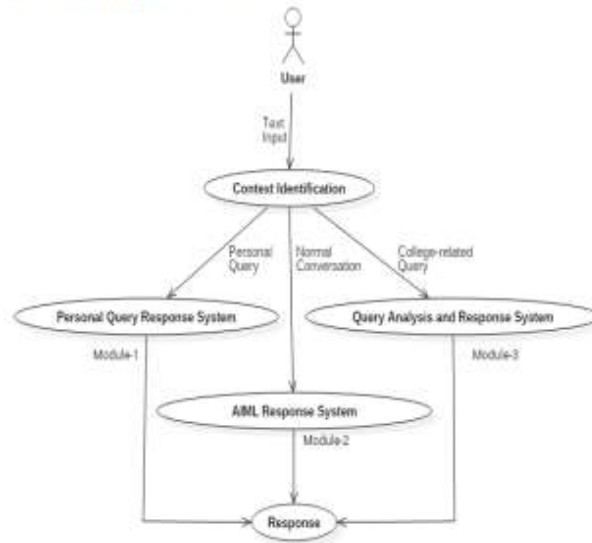
**Fig 2: Zero level DFD of Chatbot system**



User can add any query related to concerned field to chat bot further which can be sent ahead to the admin for the answer purpose Admin sets chat bot in such a way that it can give result to any query

related to any field in the chat box fed up by the admin

**Use Case Diagram:  
 (Context identification)**



Upon receiving personal queries like CGPA, attendance, etc., the authenticity of the user is checked through user-id and password. If the user detail is invalid, an appropriate response is sent. If the user authenticates successfully, the input text is processed to extract keywords. Based on the keywords, information required by the user is understood and the information is provided from the database.

If the user is trying to make a normal conversation with the bot, the input is mapped to an appropriate pattern in Artificial Intelligence Modeling Language (AIML) files. If the response is available, it is sent to the user. Other data provided to the chatbot such as username, gender, etc. are also saved. If the pattern is not available in AIML files, a random response is sent suggesting "Invalid Input".

When a user wants some information pertaining to college, the response will be provided through this module. If the input matches a pattern in the AIML files, the appropriate response will be sent to the user. If the AIML files have no entry for that particular query pattern, keywords are fetched from the input. An algorithm to check sentence similarity (NLP) is applied to the modified input to check its similarity with the questions of a predefined question-set, whose answers are available. If a sentence is retrieved with confidence > 0.5, we return the answer of that question as the response. If no questions map to the user input, the input is saved in a log file for improvement of the system by the admin. The administrator can incorporate the answer to that

query in the knowledge base if s/he finds it convenient. Also, a random response is sent to the user suggesting "Answer not available".

#### IV. CONCLUSION

##### Summary

It is often impossible to get all the data on a single interface without the complications of going through multiple forms and windows. The college chatbot aims to remove this difficulty by providing a common and user-friendly interface to solve queries of college students and teachers.

The purpose of a chatbot system is to simulate a human conversation. Its architecture integrates a language model and computational algorithm to emulate information online communication between a human and a computer using natural language.

The college student and employees can freely upload their queries. The chatbot provides fast and efficient search for answers to the queries and gets the relevant links to their question. A background research took place, which included an overview of the conversation procedure and tries to find out the relevant keywords related to that query to provide the proper link. The database storage includes information about questions, answers, keywords, and logs. We have also developed an interface. The interface developed will have two parts, one for users and the other for the administrator.

## V. FUTURE SCOPE

The future scope of this chatbot application will be-

- More efficient chat bot.
- It will replace the classroom instruction, textbook, practices and homeworkers.
- Live Chats, Video-Calling can be used in future to make the software more useful and demanding.

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