

# CHATBOT FOR IT INDUSTRY

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## ABSTRACT

A chatbot is an artificial intelligence software that can simulate a conversation with a user in natural language through websites or mobile applications. There are different approaches and tools that can be used to develop a chatbot. To achieve the desired results different combinations of AI forms such as natural language processing, machine learning and semantic understanding would be the best option. The chat-bot is purely based on a text-based user interface, which allows the user to type commands and receive text in response. It can be utilized by larger audience when integrated with various web services. Chat-bot for IT industry is built using artificial algorithms that analyze user's queries and understands user's messages. The response is formulated by matching the input sentence from the user with the knowledge base. The user can ask any kind of question related to the company through the chat-bot. The system analyses the question and then answers to the user by using an effective Graphical User Interface. It seems as if a real person is talking to the user.

**Keyword:** - Artificial Intelligence, Chat Bot, Natural Language Processing, and Graphical User Interface etc.

## 1. INTRODUCTION

As the need of chatbots has become significant with the extensive use of personal systems which tend to communicate and the inclination of their makers to provide natural language for them in order to communicate with humans. Chat bots are the source of answers to the user's queries in any specific domain wherever it is operating. The primary aim of a chatbot is to simulate a conversation with a human in such a way that it seems that the user is actually talking with a human. visit. A chatbot helps in answering queries associated with the information which might not be easily accessible at that website. Many websites assist users in understanding what exactly the websites facilitate with the aid of chatbots. They are turning out to be our virtual assistants in everyday lives. We are developing chat-bot for IT industry using artificial intelligence algorithms which will analyse user queries. The system being a web application will come up with appropriate answers to the analysed queries of the user. The answers will be given using natural language processing and artificial intelligence algorithm. The bot will reply to the user with the help of implicit graphical user interface (GUI).

## 2. EXISTING SYSTEMS

Over half a century ago, Weizenbaum has developed a powerful chatbot called ELIZA (Weizenbaum 1966). ELIZA was based on predefined templates and just reflected back to the user the statement the user would just say. Since then chatbots are said to be a source of entertainment and are used in many computer games. ALICE (Artificial Linguistic Internet Computer Entity) is inspired by ELIZA. It is a program that enables conversation with a human by applying some pattern matching rules to the user's query and then generating a suitable response. Siri was developed by Apple. It is a computer program that works as a virtual personal assistant and knowledge navigator. The feature uses a natural language user interface to answer questions, give suggestions, and perform actions by using a set of Web services.

### 3. PROPOSED SYSTEM

#### 3.1 Context Identification:

The input text is pre-processed to systematize the input as per the requirement of system. Based on the keywords used in the text, proper context is acknowledged.

#### 3.2 Personal Query Response System:

If personal queries related to student internships or job application requirements arise, then the input text is processed to extract keywords. Based on the keywords, required information is understood and is provided from the database.

#### 3.3 Artificial intelligence Response System:

If the user is trying to make a normal conversation with the bot, the input is mapped to an appropriate pattern in the knowledge base. If the response is available, it is sent to the user. But if the pattern is not available, a random response is sent suggesting “Invalid Input”.

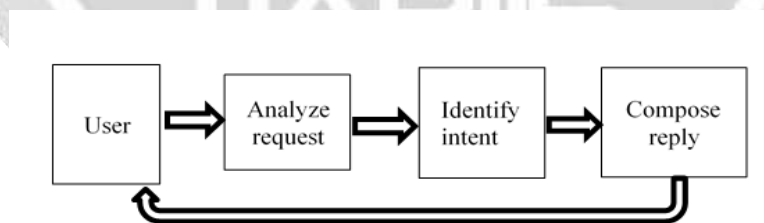
#### 3.4 Query Analysis and Response System:

When a user wants some information regarding company the response will be provided if the input matches a pattern in the database. If there is no entry for that particular query pattern, keywords are taken from the input. An algorithm to check sentence similarity (NLP) is applied to the revised input to check if it is similar with the questions of a predefined question-set, whose answers are available. If a sentences found 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 for improvement of the system. The administrator can assimilate the answer to that query. Also, a random response is sent to the user indication “Answer not available”.

### 4. DESIGN

There are two different tasks a chatbot follows:

1. User request analysis
2. Returning the response



#### 4.1 Structured query language Database:

To create our knowledge base for normal conversation, we have used SQL files to store the question and answers pair. When user converses with our chat bot, the input is matched to patterns listed in the SQL files and corresponding answer is returned as response.

#### 4.2 Lemmatization and POS Tagging:

Information extraction from the input text was done by extracting keywords. For example, “What is objective of the company?” contain “objective” and “company” as the keywords. Appropriate Lemmas of the keywords were found

using Lemmatization and POS tagging, to group together the various incurred form of the words. For example, interesting, interest and interested should map to interest. Python's "nltk" package was used for this purpose.

#### **4.3 Semantic Sentence Similarity:**

There are various combinations in which user can input the same query. For example,

Q1: What is the process for internship application?

Q2: How do I apply for internship?

Q1 and Q2 both have the same meaning. Also, there will be more such combinations for the same query. Finding every combination is not feasible. The performance of the system could also get affected. To overcome this issue, similarity between the user input and the queries present in the available question set is discovered. The query which matches with the input with maximum score is selected to provide appropriate response. Similarity score for two sentences is calculated by averaging the similarity of the individual keywords of those sentences. Every keyword of the first sentence is matched with the corresponding keyword of the second sentence so that word with maximum similarity is found. Then the similarity score of individual words are averaged to constitute the sentence similarity.

### **5. FUTURE ENHANCEMENTS**

Along with text-based queries we can include voice-based queries. The users will have to give a voice input and the system will give output in the form of text. Furthermore, on successful realization of chatbot in IT domain, we can implement it in other domains like sports, medical, educational purposes, etc. It will be favorable in all the different fields as without spending much time, we are able to access the relevant information easily.

### **6. CONCLUSION**

To get all the data on a single interface without the complications of going through multiple forms and windows is difficult. The chatbot aims to remove this difficulty by providing a common and user-friendly interface to solve queries. The architecture of chatbot involves a language model and computational algorithm to simulate information via online communication between a human and a computer using natural language processing. The chatbot effectively provides fast and efficient answers to the queries and gets the relevant links to their question. According to a background research, which included an overview of the conversation procedure, chatbot tries to find out the appropriate keywords related to that query to provide the proper link. The database storage includes information about questions and answers according to the expected audience.

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