

AI CHAT BOT USING PYTHON AND NLP

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ABSTRACT

A chatbot is a computer program that can talk to humans using artificial intelligence in messaging systems. Every time the chat bot gets input from the user, the response is pre-defined, and it also gives dynamic responses. As the responses increase, so does the accuracy of the chatbot. The fundamental technologies for chatbot are machine learning, natural language processing (NLP), and Artificial intelligence (AI). The chatbot that we are going to develop uses and natural language processing engine, webhooks, api services and speech recognition. It uses the snatchbot api services to interact with the user, the snatch bot engine performs the execution of the specified intents based on the user's request. The user's request is processed, and the response are stored in the snatchbot inbox and analysis function is performed. It has several functionalities like fitness calculation, weather forecasting, English to French , English to Hindi , English to Tamil translations, it can also do search operations and it can also enable a live chat with a person which notifies the developer or the in charge through mail, every functionality done are processed through the api services of Microsoft and google. The Chatbot works in a environment with a good bandwidth. This uses the chat base analysis for the analysis process, and it uses the secure url accessing function to find the usage of the bot based on analysis. The goal of this project is to develop a universal chatbot which can be accessed anywhere, and multi-purpose based one. This project uses the advanced technologies like artificial intelligence and machine learning to improve its services. Specifically, it will consider developing chatbots as a channel for distributing information. The chat bot is developed in a universally understandable language so that it is easy for the user to interact and get responses.

Keywords: AI, Python, NLP, Chatbot.

I. INTRODUCTION

Chatbots also known as chatter robots, are software agents that simulate human conversation via text or voice messages. One of Chatbot's first and main goals has always been like an intelligent human being and makes it difficult for others to understand their true nature. Developing more chatbots of different structures and capabilities, and their use has expanded widely. These chat agents can get into the point of tricking users into thinking they are talking to a human, but they are very limited in improving their knowledge base at runtime. To understand user input and provide a meaningful response, the chatbot uses artificial intelligence and deep learning methods. They interact with humans, using natural language, and various applications of chat robots such as medical chatbots, call centres, etc. A Chatbots can help doctors, nurses, patients, or their families.

II. METHODOLOGY

Speech and Response:

Speech analysis can be divided into three stages: (1) voice recognition and conversion to text, (2) text processing, and (3) response and action. These stages are explained as follows: First, speech independent of the speaker passes through a microphone into a digital signal processing package built into a computer to convert it into a stream of pulses containing speech information. Specific instructions can be used to read the input speech and then to convert it into text. Second, the resulting text is split into separate words to tag them with labels for parts of speech according to their positions and neighbors in the sentence. Different types of grammar can be used at this stage to split individual words with tags to form phrases. Keywords can be extracted from these phrases by eliminating the unwanted words in the coloring operations. These keywords can be checked and corrected if they are not correct. Finally, a chatbot can be constructed to give the smart response required to a speech conversation in a natural language.

Security in Chatbot:

End-to-end encryption: This prevents anyone other than the sender and the recipient from seeing any part of the message. This is widely adopted by Chatbot designers and is undoubtedly one of the most powerful ways to ensure chatbot security. It is a major feature of chat services like WhatsApp, and major tech developers have made sure to ensure the security of such encryption, even when you challenge national governments. This type of encryption is particularly relevant to fulfilling your legal obligations under the GDPR, which includes the requirement that “companies are specifically required to take action to de-identify and encrypt personal data”.

ChatBot Analytics:

Bot analytics and Bot Metrics are conversational analytics for bots that provide fine analytics of your bot with training.

Platforms: Kik, Facebook, Slack.

ChatBot Developer Platforms:

Api. AI, Wit.ai and Microsoft Bot Framework are user experience platform to build brand- unique bots, and for devices and applications it processes NLP

i.e., Natural Language Processing.

ChatBot Customer service engines :

Reply.ai and Agent.ai makes your chatbot scalable and replies just in seconds to maintain the scalability.

Platforms: Facebook Messenger, Kik, Telegram, Slack, WE Chat, Skype, Android, IOS.

AUTHENTICATION ALGORITHMS:

A fundamental component understands what any user says at a given time and then converts this language into well-defined input that can be further processed by the system. Chatbots are domain-specific so they should support multiple features. The natural language processing engine consists of the latest algorithms of machine learning that are used to identify the intent of the user and then match them with the list of those intents that are supported by the bots.

NATURAL LANGUAGE PROCESSING:

Natural Language Processing, or NLP is defined as the automatic conversion of speech, like speech and text, by software. NLP helps modern computers communicate with humans in their own language and scales other language-related tasks. NLP makes it possible for every computers to read text, hear speech, interpret it, measure sentiment and determine which parts are important. Today's modern machines can analyze more language-based data than humans, without fatigue and during a consistent, unbiased way. Considering the staggering amount of unstructured data that's generated a day , from medical records to social media, automation are going to be critical to completely analyze text and speech data efficiently. NLP includes many various techniques for interpreting human language, starting from statistical and machine learning methods to rules-based and algorithmic approaches. The basic tasks of NLP include tokenization and parsing, lemmatization or stemming, part-of-speech tagging, language detection and identification of semantic relationships.

ARTIFICIAL INTELLIGENCE:

Artificial intelligence (AI) is intelligence demonstrated by modern machines, unlike the natural intelligence displayed by humans and animals, which involves consciousness and emotionality. The distinction between the previous and therefore the latter categories is usually revealed by the acronym chosen. 'Strong' AI is typically labelled as AGI (Artificial General Intelligence) while attempts to emulate 'natural' intelligence are called ABI (Artificial Biological Intelligence). AI may be a broad term covering several subsets or sorts of AI . These subsets are often divided by the sort of technology required – some require machine learning, big data or tongue processing (NLP), as an example . These subsets also can be differentiated by the extent of intelligence imbedded into an AI machine – more commonly referred to as a robot.

III. MODELING AND ANALYSIS

Chatbot application uses Natural Language processing and Artificial Intelligence for interacting with the user. It tries to identify the users query and act accordingly. It is a combination of existing chatbot like fitness bot, weather bot , search engine , live conversation bot , translation bot. Our chatbot uses url encryption to perform security measures. Every url access and usage is monitored by cuttly api services and every chat response is

analysed with the help of chat base analytic. Every message or request or response the user sends is stored as the result in both snatch bot inbox and chat-based inbox.

It is multi-functional bot which can perform many operations. It is secure and every response is monitored and stored so the developer can enhance the further development process. It works fine by managing request from one or more devices. Our bot can be implemented in any web application or mobile application using api services which can be created by the developer.

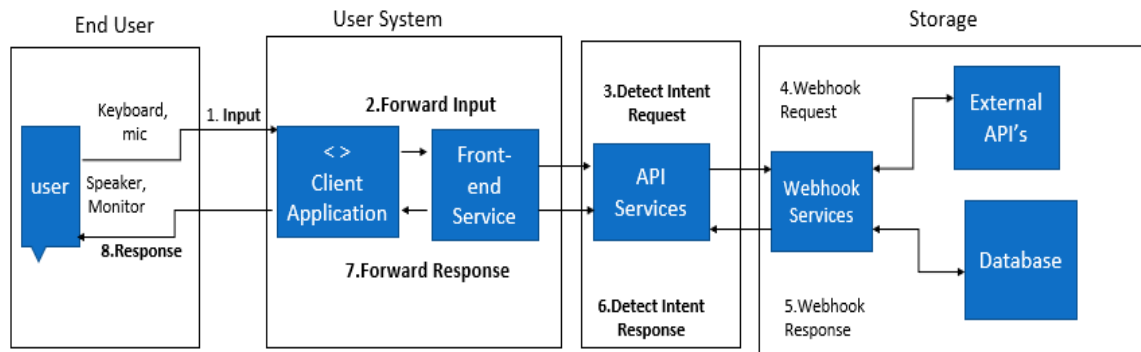


Fig 3.1 Chatbase Message analytics Graph

SNATCHBOT PLATFORM:

SnatchBot is an Intelligent Virtual Assistant Platform with RPA(Robotic Process Automation). Build bots for your Website, WhatsApp, Messenger, Telegram, Viber, etc . The bot-building platform is a complete platform-as-a-service (PaaS), which means that it allows users to design, test and deploy high-quality bots without the need to develop their own infrastructure. These bots are speech enabled and can be used with nearly any communication channel, like text, voice and e-mail; messaging tools like Facebook, Skype, Slack, The great news is that we provide pre-trained NLP models. They are trained with state-of-the-art Entity seeking models, which contains massive datasets of sentences. They really are effective and highly recommended. They already have a pre-trained models are probably the way to go. They also have pretrained NLP models for recognizing negative and positive Entities. This is crucial for sentiment analysis. If we want our chatbot to be sensitive to expressions of emotion from the user, then deploying these models will allow the bot to adjust the conversation according to whether it identifies enthusiasm or discontent in the response of the user's .

MICROSOFT AZURE API :

Cognitive Services are a group of machine learning algorithms that Microsoft has developed to unravel problems within the field of AI (AI). The goal of Cognitive Services is to democratize AI by packaging it into discrete components that are easy for developers to use in their own apps. Translator is a cloud-based machine translation service you'll use to translate text in near real-time through an easy REST API call. This service uses modern neural machine 39 translation technology and offers statistical machine translation technology. Custom Translator is an extension of Translator, which allows you to create neural translation systems. The customized translation system are often wont to translate text with Translator or Microsoft Speech Services.

GOOGLE SEARCH API :

Programmable Search Engine enables us to create a custom search engine for your website, your blog, or a collection of websites. We can configure our engine to search both web pages and images. We can fine-tune the ranking, add our own promotions and customize the look and feel of the search results of the user query.

OPEN WEATHER API:

Open Weather Map is an online service, owned by Open Weather Ltd, that provides global weather data via API ,including current weather ,forecasts , nowcasts and historical weather data for any geographical location . The company provides us

a minute-by-minute hyperlocal precipitation forecast for any location of the user specification . The convolutional machine learning model is used as a tool to utilise meteorological broadcast services and data from airport weather stations, on-ground radar stations, weather satellites, remote sensing satellites, METAR and automated weather stations. They are providing highly recognisable weather results which makes working with the weather data a way easier.

CHATBASE:

Chatbase is a free, cloud-based tool that integrates with our current Google account and allows us to integrate our bots into the analytics platform. It lets us to perform both analyze and optimize our bots. The purpose of this service is to help bot builders better understand the below mentioned :

- How to improve the bot’s accuracy
- How to enhance user experience
- What best works for increasing conversions

The user interface is fairly straightforward. We are taken to a dashboard where we can see information like:

- Active users
- Retention cohorts
- Sessions

CUTTLY:

Cutt.ly is an advanced link shortener which allows for a detailed analysis of the link click rate and professional management of all our links. Managing our links is even easier using the features available in the dashboard after logging in, as well as using the API. Their platform makes link management way to easier than ever, and advanced analytics allow you to understand what is happening with your links - so you know what you can improve and get the highest click-through rate. • Link shortening • Link Analytics • Branded links and own domains • Advanced dashboard • Dashboard for API links • Unique link click-through rate

IV. RESULTS AND DISCUSSION

Chatbots can reach out to a large number of audience on messaging apps and be more effective than humans. We developed chatbot a which capable information- gathering in a more effective manner the developed chat bot application works with a secure and safe manner every message is stored and analysis is done. The chatbot uses many tools and services for security , efficiency, and proper functionality. Security is achieved with the help of URL encryption with the help of Cuttly . The efficiency and functionality is measured with the help analysis and URL manager provided by Cuttly, Chatbase .The existing chatbots lack the knowledge of multitasking , analytics, and universal accessing, the existing chat bots are defined to perform specific predefined functionality and actions but the developed chatbot overcame most of the drawbacks that the existing system had over years . Our chatbot over came the above draw back’s with the help of Snatchbot Services which provided universal access and deployment, Chatbase tool for analyzing, and Cuttly the URL managerThe use of technologies like Artificial Intelligence, Natural Language Processing and Machine Learning made creation of a effective and efficient functionable chatbot.

Chatbase analysis is done to check the active session timings and usage of which type of message is method is used more frequently. Existing chatbot’s doesn’t use any kind of analytics like this for analyzing the user queries.

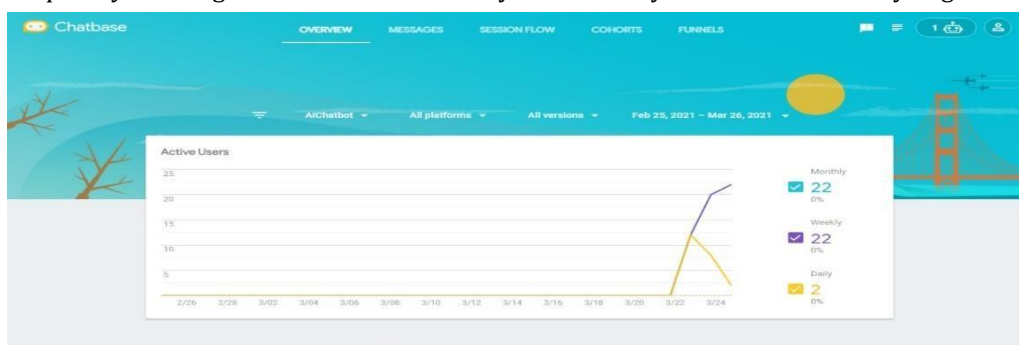


Fig 4.1. Chatbase Message analytics Graph

Usage graph monitors the usage of chatbot in various platforms for identifying in which platform the bot is used maximum so that we can create a effective one specifically to meet the user demands and Existing chatbots are not designed to work on different platforms

Dashboard

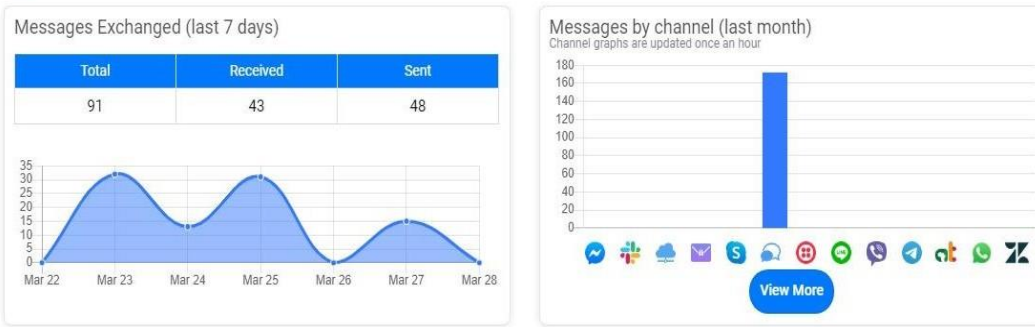


Fig 4.2. Chatbot Usage Graph

Cuttly is a URL shortener, manager and analyzer which is capable of managing the URL and to monitor the usage at its peak level . It checks how many times a particular URL is accessed in a day and through which platform. Existing Chatbots cannot be accessed using URL’s since they are integrated with certain applications.

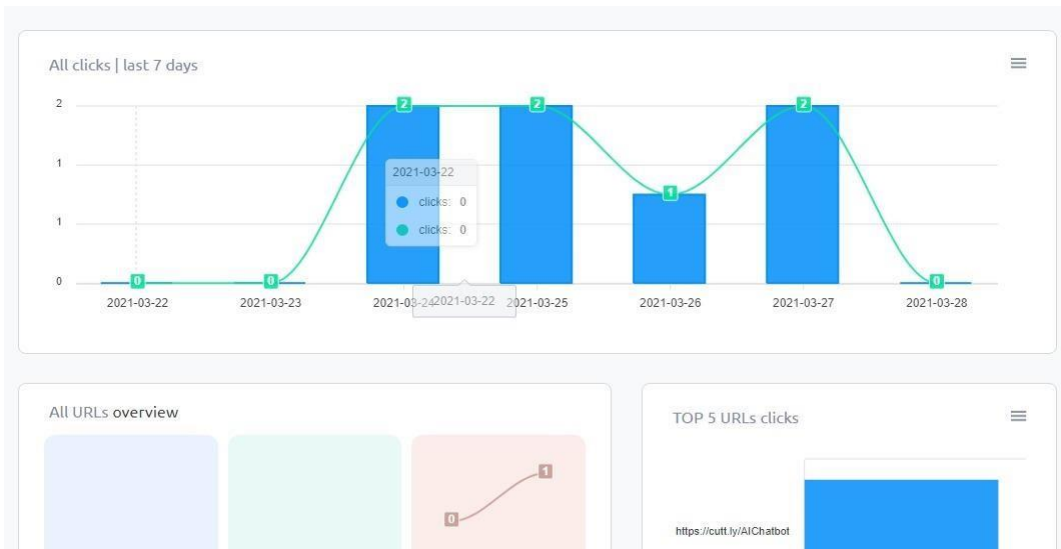


Fig 4.3. URL Accessing and Monitoring Graph.

V. CONCLUSION

The developed chatbot can work with applications like messenger, telegram, slack, skype, WhatsApp, line and it can also be used as a customized bot for private websites. The chatbot uses google, Microsoft API, chatbase analysis, cuttly URL analyser these tools helps the chatbot work securely and efficiently. It has several functionalities like fitness calculation, weather forecasting, English to French translation, it can also do search operations and it can also enable a live chat with a person which notifies the developer or the in charge through mail, every functionality are carefully monitored and analysed for properly for better development and action. The bot can be used as a custom API based one. The behaviour of the bot can be customized based on the user’s request and based on the analysis done, it can also access IOT devices and make them work by configuring the static IP address into the intent function. The chatbot can be integrated into mobile and web application easily with the help of custom API. The performance of the bot can be developed more efficiently and effectively with the help of analytics tools.

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