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# HEALTHCARE CHATBOT

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**ABSTRACT:** - Chatbots mimic human speech to make the software more user-friendly or just for amusement purposes. NLP (Natural language Processing ) and AI ( Artificial intelligence ) are new emerging technologies that can be utilized to improve the capacity of chatbots to stimulate a more natural and free-flowing conversation. Chatbots can be used to offer customers support and services as more and more mobile device users switch to more frequent use of texts and messaging

Healthcare chatbots provide a customized experience to each user in ways that may be more practical and effective than humans are capable of. By communicating with consumers in a human-like manner, a medical chatbot enhances the work of a healthcare professional and aids in enhancing their performance. Medical chatbots are conversational AI powered tools that facilitate communication between patients, insurance providers, and healthcare professionals. These bots can be quite useful in providing timely access to pertinent healthcare information to the appropriate parties.

We discuss current chatbot research and uses in the fields of medical and healthcare education. Our main areas of concentration include the use of virtual patients in medical education patient education regarding healthcare issues, and the use of chatbots as course assistants to improve the curriculum for healthcare professionals. Because of their mobility and affordances, chatbots are increasingly being used into the teaching and learning processes in the field of healthcare education.

Clients of this application can have discussions with the wellbeing chatbot likewise to how they would have discussions with different clients. Through a series of questions, the health chatbot helps people identify their symptoms in order to assist them decide whether or not to see a doctor. People who are unsure of whether their symptoms

are temporary or call for further testing from a doctor may find this.

**Keywords—** Natural Language Processing, Artificial Intelligence, Chatbot, Multilingual Functionalities.

## I. INTRODUCTION

Artificial intelligence (AI) programs known as chatbots communicate with users in real-time using natural language. This technique, which has its roots in the 1960s, aimed to see if chatbot systems could deceive users into thinking they were speaking to real people. Using natural language input, a chatbot is computer software that examines the data individuals offer and answers them in a smart and important manner. These are tools of interpersonal communication designed to simulate natural conversations or dialogues. Health chatbots are bots that might be utilized for emergency patients and direct them to the proper consideration. These chatbots are more dependable and secure when compared to google search when consumers are attempting to determine the origin of their symptoms.

Additionally, Medical chatbots are conversational AI powered tools that facilitate communication between patients, insurance providers and healthcare professionals. These bots can be quite useful in providing timely access to pertinent healthcare information to the appropriate parties. Medical or healthcare chatbots may be utilized for a variety of goals, from bettering patient experiences and assisting medical personnel to optimizing healthcare procedures and revealing useful information.

The chatbot's objective is to provide a generalized concept of the type of ailment the person may be dealing with. This information might be real or incorrect. Virtual assistants who communicate through text are helping might be real or incorrect. Virtual assistants who communicate through text are helping to manage drugs, monitor chronic

health issues and recognize symptoms. The use of smartphones, together with the growing popularity of health applications, IOT, telehealth and other related technologies, is boosting the healthcare market. The main advantage of employing chatbots is that customers may ask any question without being aware of the right keywords. The robots can easily understand natural language by comparing the terms associated with the question, and they can then quickly and accurately deliver answers.

More people than ever before are looking for health information. Both general health counselling and instructions for the patient's next steps in seeking medical care are rapidly increasing. Overbooking and the workload are acknowledged. Health chatbots may speed up processes, giving both patients and medical staff more free time. They might also stop things from happening that take up too much time for people and produce little. The remaining parts of this article are structured in the following ways:

## **II. MOTIVATIONS AND RELATED WORK**

### **A. MOTIVATIONS**

Chatbots have been around for a while. But the real buzz around this technology didn't start until the spring of 2016. The recent resurgence of interest in chatbots can be attributed to both significant advances in artificial intelligence (AI) and a significant shift in usage from online social networks to mobile messaging apps like Facebook Messenger, Telegram, Slack, Kik, and Viber. The first of these criteria suggests that sophisticated chatbots might become commonplace shortly. The second is that service providers must communicate with clients via mobile messaging. Despite these characteristics, modern chatbot implementations suggest that issues with conversational user interfaces and the field of human-computer interaction in general still exist (HCI). Chatbots suggest not just a shift in the way people communicate, but also a shift in how they communicate.

Chatbots, as we all know, are a very popular method of communication between the user and the system text interface. We'd want to use this technology to construct a college website for more cost-effective communication between students and management. Students will seek information from a chatbot on the school website rather than going to the employer or authorities directly. Bots based on college websites are used to build good communication between different branches and to assist management in developing creative solutions.

A chatbot is a piece of software that use artificial intelligence (AI) to stimulate a natural interaction with a user through messaging services, mobile applications, and websites. Users are able to converse with chatbots that have a conversational user interface (CUI). This indicates that users do not require any apps to be downloaded or launched on their devices. CUI are easy to use and comprehend.

### **B. RELATED WORKS**

People must engage and be as open as possible about the issues they are having in order to live a healthy lifestyle. The chatbot will then use natural language processing to construct an application.

A novel approach for medical assistance using a trained chatbot is required [2].

Without physically being present in the hospital, the user can use the chat-Bot to ask any personal question about health care. Information is supplied to a chatbot using the Google API for voice-to-text and text-to-voice conversion, which then retrieves relevant replies and displays them on an Android app. [3].

The chatbot can get the data on these ailments thanks to AI. With the use of various machine learning algorithms, the data of these users may be gleaned from their symptoms. Users are connected via text-to-text diagnostic, which provides a personalized diagnosis to support their symptoms. [4]. Medical chatbots are used to increase access to care, cut down on costs, and save time and money. [5].

The development of artificial intelligence (AI) technologies has made chatbots look like a potential option for accelerating doctor-patient communication. [6].

Many explorers have now finished deciding the fundamental side effects and cost adequacy.

According to Paper [7], we can find solutions to our daily difficulties by using artificial intelligence technology and other algorithms that are utilized to identify symptoms. Long-term progress can be made to deliver a more realistic experience using the same, detailed understanding of symptoms and oral interactions. [8]. A healthcare chatbot thought is changing the essence of the clinical and horticultural areas by offering arrangements as well as making them more reasonable.

The chatbot will be assisted in realizing the probability of diseases by live data of the symptoms obtained from a questionnaire. Effective diagnosis is also possible. [9]. In paper [10] we have seen what's in store patterns and valuable open doors with respect to the mechanical headway in the medical care industry.

### **III. METHODOLOGY**

A medical chatbot's primary goal is to provide 24/7 assistance. They aim to develop a chatbot that can relate to the patient and then provide medical information by speaking in everyday language. The dialogue is started and moderated by the chatbot.

#### **CHATBOT TRAINING**

Predicting what users will say and what they expect from chatbots is the main goal of chatbot training. The AI chatbot must be trained to comprehend the various modes of questioning used by clients.

##### **1. Defining the chatbot's specific use cases**

It's crucial to start the process by identifying the precise issues of the AI-powered chatbot training with a wish list of tasks that the bot needs to perform. Instead, it's crucial to start with a precise business issue that your bot will develop to address. This ensures that your bot is designed to efficiently assist the company.

If a chatbot is created that lets users check the progress of their orders but discover that less than 3% of the customers actually utilize this feature. This may be avoided by starting with the issue you want to tackle.

##### **2. Ensure that intentions are clear.**

The AI-powered chatbot will frustrate users if it is unable to comprehend their needs. Creating intents that are extremely specific and have a single aim to prevent that and to correctly understand how to teach a chatbot.

3. Ensure that each purpose has several utterances. The degree to which the sample utterances accurately reflect the language used in everyday life will directly affect how usable the AI chatbot is. Use several alternative phrases to activate each intent throughout development and testing. Repeat this step several times to get it right. To make sure all possible wordings have been covered, and to keep updating the custom values and example utterances.

4. Assemble a diversified staff to manage the training of the bots.

The more diverse the training team is, the better idea to the training team is, the better because the idea is to train the bot for every conceivable scenario. A diverse team will be more likely to pose novel questions. In chatbot training, this is essential.

##### **5. Ensure the purpose of your entities.**

Having composed a number of utterances, a note is made of the phrases that correspond to the important variable data. Tagging every word in an utterance is not required because the purpose of entities is to extract pertinent information, - word utterances like "Barcelona" should not be used as entities as they may confuse the chatbot.

##### **6. Don't stop training.**

After the chatbot is put into use, the work is not over. A chatbot must constantly develop to be effective. Valuable information about the chatbot and the company is received by identifying circumstances when the AI-enabled chatbot requires further training. It is surprising how the users are interacting with the chatbot. Keep in mind that new intentions give new chances for chatbot training and improvements.

A chatbot is sometimes confused with AI, which is a common misunderstanding. It's not always the case like that. AI or AI capabilities are features of a good chatbot. For example, they will use NLP (Natural Language Processing). But not all chatbots require highly developed AI capabilities.

The purpose of a chatbot should be to provide the user with relevant information in response to a query. The more you can plan for, the less artificial intelligence will be required to carry out labor-intensive jobs.

Building a strong decision-tree-based chatbot by mapping out the user flow. The development team will direct the user along a predetermined path. Understanding the intended outcome or course of action will make learning how to train a chatbot simpler and faster.

## **DATA PROCESSING**

Data processing happens when information is gathered and put into a usable manner. A data scientist or team of data scientists frequently performs data processing, which must be done correctly to avoid having a negative effect on the outcome, or data output.

Data processing converts raw data into more readable formats (graphs, papers, etc.), giving it the context and structure necessary for computer interpretation and usage by staff members within an organization.

1. Data acquisition: The initial stage in data processing is data collecting. Data lakes and data warehouses are only two of the sources from which information is retrieved. To ensure that the data obtained (and subsequently used as information) is of the best possible quality, it is crucial that the data sources provided are reliable and well-built.

2. Data preparation: Data preparation occurs after data gathering. Data preparation, often known as "pre-processing," is the stage of data processing when unstructured data is organized and cleaned up in preparation for the following stage of data processing. Raw data is thoroughly verified for mistakes during preparation. This step's goal is to get rid of poor data—redundant, inaccurate, or missing data—and start producing high-quality data for the greatest possible business intelligence.

3. Data input: The clean data is then imported into its final location and converted into a language that it can comprehend. The first step in transforming raw data into meaningful information is data intake.

4. Processing: The data that was entered into the computer in the previous step is actually

processed at this stage in preparation for interpretation. Machine learning methods are used for processing, albeit the process itself may differ differently based on the source of the data (data lakes, social networks, linked devices, etc.) and its intended application (examining advertising patterns, medical diagnosis from connected devices, determining customer needs, etc.).

5. Data output and interpretation: It is at this point that non-data scientist may finally use the data. It is understandable, translated, and frequently presented as graphs, movies, photos, plain text, etc.) The data may now be self-served by members of the organization or institution for their own data analytics initiatives.

6. Data storage: Data storage is the last step in the data processing process. Data is kept for later use after it has been processed for all of it. Whilesome information might be useful right away, the majority of it will be useful down the road. Additionally, compliant data storage is required under GDPR and other data protection laws. Members of the company can swiftly and readily access data as needed when it is correctly kept..

## **DATA TRAINING**

The initial dataset used to train machine learning algorithms is known as training data. These data are used by models to develop and improve their rules. A machine learning model's parameters are fitted to a series of data samples in order to train the model using examples. The terms training dataset, learning set, and training set are also used to refer to training data. Every machine learning model needs it since it enables them to accomplish desired tasks or generate correct predictions.

Simply, the machine learning model is built using training data. It demonstrates what the desired result should look like. The model repeatedly studies the dataset to fully comprehend its characteristics and to modify itself for enhanced performance. Training data can be broadly categorized into two types: labeled data and unlabeled data.

Supervised learning makes use of labeled training data. It makes it possible for ML models to

discover the traits connected to particular labels, which may be applied to categorize more recent data points. In the aforementioned illustration, this means that a model can use labelled image data to comprehend the characteristics of particular fruits and use this knowledge to classify fresh photographs.

The opposite of labelled data is unlabeled data. It's unlabeled data or data that lacks any labels for distinguishing categories, traits, or features. It is utilized in unsupervised machine learning, and in order to draw conclusions, ML models must look for patterns or resemblances in the data.

## TOKENIZATION

The initial stage in every NLP pipeline is Tokenization. It significantly affects the remainder of your pipeline. The technique of tokenization involves dividing up text and unstructured data into pieces that may be handled separately. One can utilize a document's token occurrences as a vector to directly represent it.

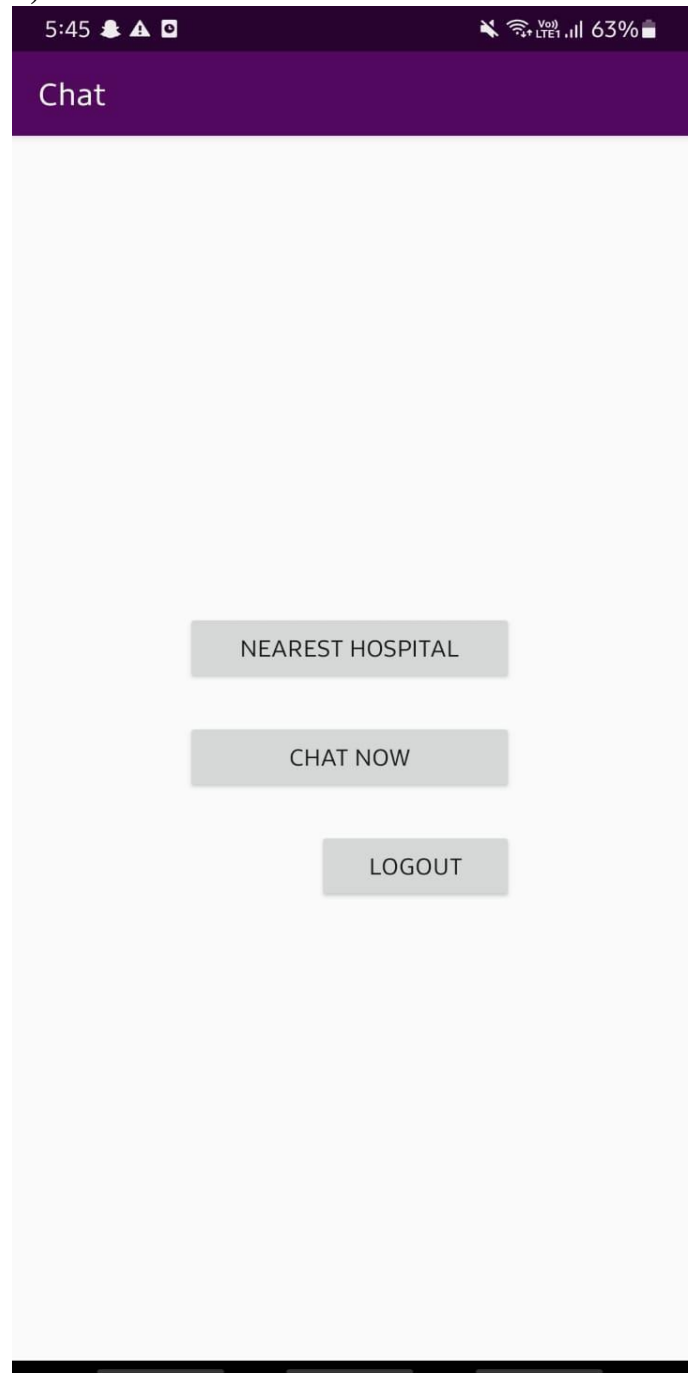
This rapidly transforms a piece of writing or an unstructured string into a format for numerical data that is suitable for machine learning. They can also be used directly by a computer to start beneficial tasks and responses. Additionally, they could be used as features in a machine learning pipeline to start more complex decisions or actions. Sentences, words, letters, and sub words may all be broken apart using tokenization. Sentence tokenization refers to the process of dividing a text document into sentences.

Natural Language Toolkit (NLTK) Word Tokenization: NLTK is an open-source Python library for natural language processing. Along with a collection of text processing modules for categorization, tokenization, stemming, and tagging, it gives easy to understand connection points to more than 50 corpora and lexical resources, including WordNet. The NLTK tokenize module makes it simple to tokenize the text's sentences and words.

Text Blob is a Python package for handling textual data. For tackling typical natural language processing (NLP) tasks including part-of-speech tagging, noun phrase extraction, sentiment analysis, classification, translation, and more, it offers an uniform API.




## IV. RESULTS

### 1) MAIN PAGE



## 2)MESSAGE BOX


5:45



63%

Chat




Please enter your symptoms



SUBMIT

## 3)CHATTING WITH HEALTH CARE BOT

5:45



62%

Chat

fever

chills

fatigue

cough

high fever

breathlessness

Yes

No

Yes

Yes

No

Do you have sweating ?

YES

NO



#### 4)OUTPUT

5:46

VoLTE

62%

Chat

high fever

Yes

breathlessness

Yes

sweating

No

malaise

Yes

chest pain

No

fast heart rate

No

rusty sputum

No

phlegm

No

Disease Name: Pneumonia

Cure: You may have Pneumonia. Consult your doctor

#### 5)NEARBY HOSPITALS LOCATIONS

5:47

VoLTE

62%

LIFE CARE HOSPITAL

Gangothri circle, 23/24,new99, 20th Main Rd, 1st Stage, BTM Layout, Bengaluru

Sagar Hospitals Kumaraswamy Layout

Shavige Malleshwara Hills, DSI, behind Dayananda Sagar Institution Campus, Bengaluru

Banashankari Hospital

963/A, Bannerghatta Main Rd, Weavers Colony, Gottigere, Bengaluru

Gangothri Hospital

27, Dr Puneeth Rajkumar Rd, BTM 2nd Stage, Kuvempu Nagar, स्टेज 2, BTM Layout, Bengaluru

Vijayashree Hospitals

No.3, Bannerghatta Main Rd, near Dr. RML College of Law Annex, Jyothi Nagar, Bohra Layout, Gottigere, Bengaluru

Kavya Hospital

861, 4/158, Begur Rd, Hongasandra, Bengaluru

Aswad Hospital

Reddy Building Rupena Agrahara, 206, AH43, Muneswara Nagar, Sector 6, HSR Layout, Bengaluru

Samastha Hospital

04, Sagar Complex, Gopalakrishna Layout Vasanthapura Main Road, Opposite KEB Subramanyapura PO, Vasanthapura Main Rd, Bengaluru

Vivekananda Hospital

153, Near Haryana Handloom, 2nd Cross Rd, Bannerghatta Main Rd, Bilekahalli, Bengaluru

Jayadeva Hospital

B-8, B T M I Stage, Marenahalli Rd, KEB Colony, Jayanagara 9th Block, Jayanagar, Bengaluru

Shekhar Hospital Jayanagar



## V. CONCLUSION

People in today's society are less concerned with their health and believe that their busy schedules and numerous commitments prevent them from getting regular checkups. Because of this, people overlook any discomfort their bodies express until it develops into a serious and uncomfortable health issue. Chatbots, in the opinion of medical specialists, can help patients who are unsure of where they will obtain the required care. This paper discussed the design and implementation of a health chatbot application and examined, through an end-user survey, the factors that drove its adoption and usage. The reason for the proposed well-being chatbot is to rapidly evaluate side effects and hazard factors for the individuals who are worried about their well-being status and to give direction and data about future advances.

The health chatbot application is definitely not a substitute for a clinical specialist as a virtual specialist since there are various illnesses with comparative side effects. This application's sole goal is to encourage the user to visit a doctor and treat their symptoms seriously. There is no lawful starting point for claims in case of a shoddy well-being result since this chatbot is irregular and just exists to illuminate the patients on their well-being state.

Health chatbots have a bright future ahead of them because of their benefits, which include faster processing times for patients, easier work for experts, smaller waiting lines, and giving precedence to those who actually require medical attention. In order to increase patient knowledge and information, counselling and education are also provided.

Translation is becoming more and more necessary as individuals connect more internationally. Many people now use free internet translation services, but copying and pasting material can be time-consuming.

With several benefits, both from the business and customer service aspects. Building multilingual chatbots lets organizations engage with a wider and more diverse audience as more companies try to employ chatbots in novel and creative ways. Here, we've created a healthcare chatbot that interacts with people to help them recognize symptoms and find out if they inherit a condition or illness. The System can be trained with a larger

and more comprehensive dataset to obtain better results.

## REFERENCES

- [1] Rohit Binu Mathew, Sandra Varghese, Sera Elsa Joy, Swanthana Susan Alex | Published 2019 | Computer Science - 3rd International Conference on Trends in Electronics and Informatics (ICOEI)
- [2] D. Madhu, C. Jain, Elmy Sebastain, Shinoy Shaji, A. Ajayakumar | Published 2017- Medicine International Conference on Inventive Communication and Computational Technologies (ICICCT);
- [3] H. Anandakumar and K. Umamaheswari, "A bio-inspired swarm intelligence technique for social aware cognitive radio handovers," Computers & Electrical Engineering, vol. 71, pp. 925-937, Oct. 2018. doi:10.1016/j.compeleceng.2017.09.016
- [4] S. Anil Kumar, C. Vamsi Krishna, P. Nikhila Reddy, B. Rohith Kumar Reddy, I. Jeena Jacob. (2020) | Self-Diagnosing Health Care Chatbot using Machine Learning | International Journal of Advanced Science and Technology, 29(05), 9323-9330.
- [5] Shifa Ghare, Sabreen Shaikh, Tasmia Bano Shaikh and Habib Fakih Awab | Self-Diagnosis Medical Chat-Bot Using Artificial Intelligence || EasyChair Preprint no. 2736
- [6] Nicholas A. I. Omoregbe, Israel O. Ndaman, Sanjay Misra, Olusola O. Abayomi-Alli, Robertas Damasevicius, "Text Messaging-Based Medical Diagnosis Using Natural Language Processing and Fuzzy Logic", Journal of Healthcare Engineering, vol. 2020, Article ID 8839524, 14 pages, 2020
- [7] Prof. Amar Palwankar, Ms. Priyadarshani A. Satpute, Mr. Riddhi Dighe, and Ms. Rutuja Bhopale, "ARTIFICIAL INTELLIGENCE BASED HEALTHCARE CHATBOT SYSTEM", IEJRD - International Multidisciplinary Journal, vol. 5, no. 5, p. 6, Jun. 2020.
- [8] Dinesh Kallal, Vatsalya Samiuddin | IOSR Journal of Computer Engineering (IOSR-JCE)
- [9] e-ISSN: 2278-0661, p-ISSN: 2278-8727, Volume 22, Issue 1, Ser. III (Jan - Feb 2020), PP 50-56