MEDICAL ASSISTANT CHATBOT USING AI

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ABSTRACT:

The age of the smart computer has arrived. With the emergence of Artificial Intelligence, Machine Learning, and Deep Learning, machines have begun to impersonate humans. Chatbots are conversational software agents that use Natural Language Processing to communicate, and they are an excellent example of such a device. A chatbot is an application that helps users to initiate a conversation with a computer. This is an Artificial Intelligence (AI) tool that can be used to build chat apps, mobile apps, and online services. A chatbot is a computer that uses Natural Language Processing (NLP) to respond to requests. Since each language has its own morphology, the chatbot must be able to decipher words into their constituent morphemes. One of the activities that NLP should be able to perform is morphology. Health chatbots will conduct one-on-one conversations with patients and answer relevant questions. This programme would look at the current e-healthcare structure, which involves a dynamic relationship with human computers, and suggest an alternative: a chat interface that is programmed and trained to behave and communicate with patients in the same way that a human does.

Keywords: *Artificial Intelligence- AI, Natural Language Processing- NLP, Chatbot, Morphology*

1. INTRODUCTION:

A chatbot is Artificial Intelligence software that can simulate a natural language conversation (or chat) with a user through messaging apps, websites, smartphone apps, or the telephone. A chatbot is often defined as one of the most innovative and promising forms of human-machine interaction

Chatbots and Artificial Intelligence can be perplexing, especially when attempting to understand how these technologies can be used in healthcare. Chatbots, on the other

hand, are the most straightforward way for any provider organisation or healthcare business agency to incorporate emerging technologies into their operations.

Chatbots are progressively being used in hospitals. Computer programmes that converse through textual methods aid in the identification of symptoms, the management of drugs, and the tracking of chronic health conditions. It's important to note that the chatbot isn't intended to diagnose a human. The chatbot's goal is to help people find out whether they are seriously sick by leading them and supporting them.

For the first time, medical chatbots decrease healthcare practitioners' workload by avoiding hospital costs, needless medications and tests, and hospital admissions and readmissions as patients' adherence to therapy and understanding of their symptoms increase.

This has a lot of advantages for patients: Less time spent driving to the doctor's office means less money spent on needless medications and procedures, as well as instant access to the doctor.

2. LITERATURE REVIEW:

The chatbot industry is still in its early stages, but it is rapidly expanding. Later on, several procedures, such as bibliometric assessment and long-term memory networks, developed and presented as part of the chatbot's evolution. Chatbots are not only delivering helpful services, but they are also interacting with consumers and offering solutions to their problems using AI ML chatbots rather than actual humans according to this paper. For healthcare practitioners, AI has become a valuable tool. This paper also tells that Chatbots are used in a variety of industries, including healthcare, retail, media and entertainment, travel and tourism, e-commerce, and so on. This kind of analysis is also used in other areas, such as information science [1]. This paper explains about human chatbot interaction using the Natural Language Processing concept. Also, it is feasible to fully automate activities such as creating financial reports or analysing data using natural language understanding and natural language generation. They mentioned that morphology is concerned with the composition and character of words. One of the activities that NLP should be able to perform is morphology. Since each language has its own grammar, the chatbot must be able to decipher words into their constituent morphemes [2]. This paper explains how continuous monitoring is essential for the elderly. The development of biometric remote monitoring systems with

device-level AI has become critical for remote patient monitoring. For early identification of health concerns, AI is effective in real-time monitoring of changes in activity and behaviour patterns. Also, useful for elderly people who cannot every time visit doctor for consultation. For older individuals, chatbots help with medication adherence and care coordination. Furthermore, these people would no longer be humiliated because they would seek help from a computer [3]. This paper explains how Chatbots can help spread wellness awareness and they are an interesting feature that can assist and communicate with users. It has the ability to serve as a psychologist. Also, they introduced the study of many chatbots and created our own client using python and web-based apps in this article. The primary goal of this study is to assist researchers in identifying several methods for developing a user-friendly client for needed fields.For early diagnosis of health disorders, AI is beneficial in real-time monitoring of changes in activity and behaviour patterns. People with many health issues are self-conscious about their bodies, but by offering companionship and comfort, a talking agent can alleviate this issue by allowing people to speak frankly about their problems [4]. This paper explains about the meaning of phrases or words in the related human natural language is referred to as semantics. If the user writes incorrect sentences or makes grammatical errors, the chatbot will be able to determine the context of the words by treating them as individual morphemes and will react appropriately. Any of this is accomplished by the philosophy of morphology. The chatbot can help with wellbeing management by effectively assessing the issues of various individuals coping with depression and anxiety and helping them as a friend or partner [5]. Taking all of these factors into account, as well as the importance of fitness in everyone's life, we hope to create a chatbot that can fix all of these issues.

3. PROBLEM DEFINITION:

In the healthcare sector, AI has proven to be a lifesaver. AI is expanding its reach across the market, from tracking viruses to utilising life-saving robots. However, one cannot presume the robots would be able to take the place of doctor's appointments.

Chatbots, according to emergency service providers, may help people who aren't sure where to go for medical help. Many patients are unsure of whether they need to see a specialist and when they need to use telemedicine to reach out to a doctor.

4. OBJECTIVE:

- The main goal is to bridge the language gap between consumers and health-care providers by providing straightforward responses to customer questions.
- People nowadays are more likely to be addicted to the internet, but they are unconcerned about their personal safety. Hence not going to the doctor with a minor ailment that might turn into a major problem in the future.
- With the help of healthcare chatbot, less money spent on treatments and tests that aren't essential.
- The goal of any healthcare practitioner is to give amazing services to their patients, chatbots are a great way to get patient feedback. Chatbots are a fantastic method to get customer feedback. Healthcare practitioners can use this information to improve their practise.
- Chatbots assists in simultaneously catering to a large number of target audiences 24/7

5. RESEARCH METHODOLOGY:

Using python programming language and NLP morphology concept, the researchers have proposed to design Medical Assistance chatbot. Python is a framework that provides a user-friendly interface to make the connection easier and more effective. Python was used to develop the chatbot**.** Python is a popular general-purpose programming language with a user-friendly interface that makes the connection easier and more effective. It comes with built-in dictionary and list data structures that can be used to create powerful runtime data structures [6].

The methodology is to start this section by implementing Chatbot and explaining how researchers use it to present health management using the NLP morphology concept. By typing in their questions, the user may obtain the necessary information. The user may then inquire about any medical assistance they need about symptoms, medications to be taken, diet-related recommendations, and activities that the user needs to remain fit. The chatbot can supply the customer with the same facts and therefore solve their problems.

The architecture diagram seen in the figure 1 explains the whole definition of morphology. NLP has several phases, including lexical analysis, syntactic analysis, and semantic analysis, with this paper focusing mostly on morphological analysis. The key issue that it addresses is the confusion of understanding terms and providing the right solution to the customer by dividing into sub-divisions.

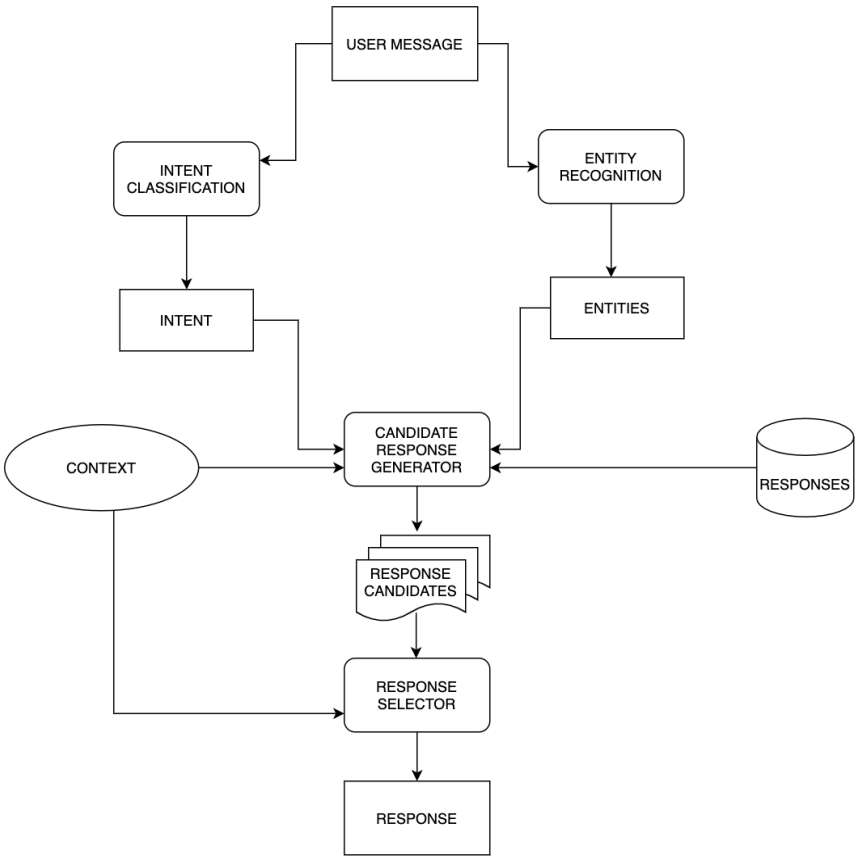

Figure 1: Architectural diagram

The components depicted in the above architecture diagram are as follows. The user message is the first module. There are two sections to the message: object identification and intent designation. The following modules are framework, creator, and session. It addresses the user's specifications, an abstract definition, and the activity to be carried out.

Researchers have developed groups phrases and interrogative statements by grammar, semantics, and morphology, and then by answer. We generated a text file that included the prime buffer, where we piled the text that the bot would generate for the user. Certain packages have been added in order to enhance the chatbot's workflow.

The program has been written in python IDLE and because of the morphology principle, even though the user makes such spelling errors or abbreviations of some term, the chatbot would be able to detect the error.

The figure 2 depicts the process of morphological analysis. Words are broken down into smaller units called morphemes using morphology. Free and attached morphemes are the two types of morphemes. When isolated from a phrase, free morphemes will stand alone as single words, whereas bound morphemes have no meaning.

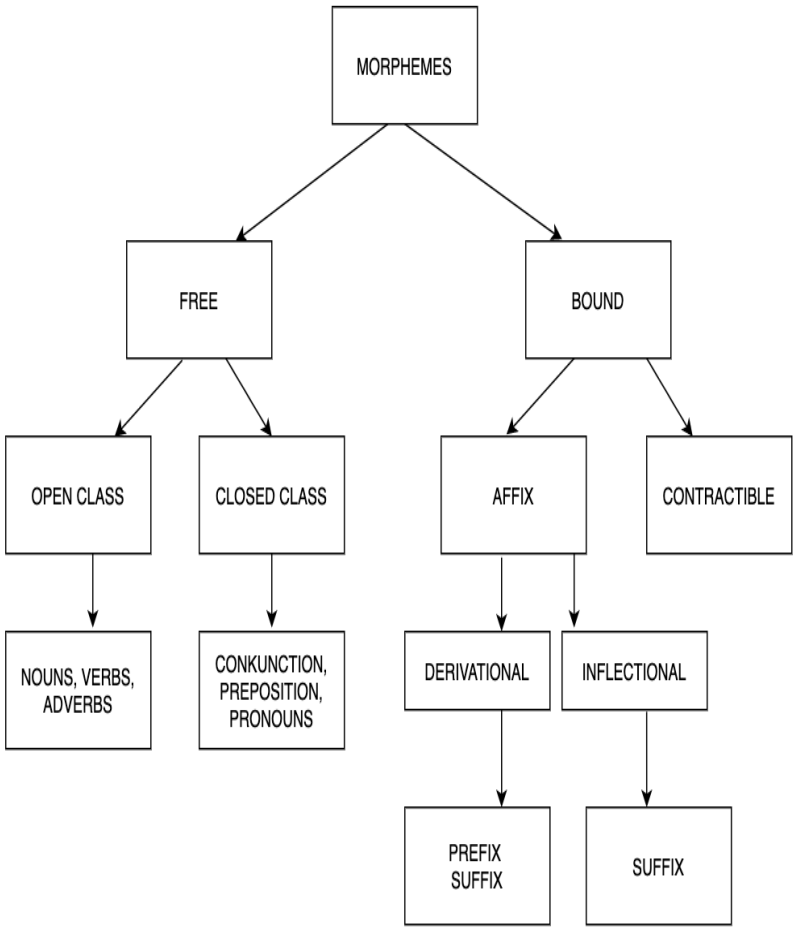

Figure 2: Morphological analysis

6. ANALYSIS FINDINGS:

The researchers need to train the chatbot for answering the user queries. The chatbot will analyse the details presented by the customer and reacts to an individual's medical help needed. The morphology definition allows the bot to function more efficiently when it

understands the meaning of each aspect of the word separately, allowing it to correct mistakes**.**

User-Bot Interaction is critical for a chatbot's proper operation. Understanding the user's intents aids in the creation of appropriate chatbot responses. Some methods use real data to train the bot, but finding valid data is always difficult. Other methods frequently use log data to analyse user intent. Users' questions can now be paired with a satisfactory response thanks to advances in deep learning. However, in order for the chatbot to link all of those questions to correct intents and provide the correct response, the model must be trained in order for the chatbot to adapt a more AI-based approach.

Patients like talking to actual doctors, and chatbots sound more human thanks to artificial intelligence. In reality, some chatbots with sophisticated self-learning algorithms can have in-depth, human-like conversations.

7. LIMITATION:

One of the most significant drawbacks of chatbots is that they were programmed to only answer first-level questions. They may not be able to answer complicated questions. There is a need to teach them how to properly communicate with the clients. To work successfully, it is mandatory that chatbots be trained well.

8. CONCLUSION:

This paper puts forward on how to create a chatbot in Python using the morphology principle in this framework. It was focused on medical assistance, and by engaging with our chatbot, various users would be able to address their problems. Even, during pandemics while seeing a doctor for mild illnesses is impossible, this chatbot comes in handy.

To have an unrivalled healthcare experience, doctors must be accessible to patients around the clock, engaging and helping them during the recovery period, which is not feasible. Patients who are struggling with health problems may need to ask a few questions that do not necessitate an appointment.

In the other hand, the questions do not go unanswered. With too much to do in so little time, doctors cannot be able to devote enough time to each patient. This is where medical chatbots come into play.

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