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A Survey on Chatbot Implementation in Health Care using NLTK

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Abstract– Conversational Bots have become a common user interface for many software services. Conversational Bots can come in very handy when we need any human level interaction with the system. These Conversational chat-bot provide cost-effective and very reliable support especially in the field of health management. They provide us a wide range of options from setting us reminders to scheduling appointments with our doctors and even taking care of our daily basic regular needs. Normally Users are not aware about all the treatment or symptoms regarding the particular disease. For small problem user have to go personally to the hospital for check-up which is more time consuming. Also handling the telephonic calls for the complaints is quite hectic. Such a problem can be solved by using medical ChatBot by giving proper guidance regarding healthy living.

Keywords - Natural Language Processing, Machine Learning, IM - Instant Messaging

I. INTRODUCTION

There are hundreds of unhealthy behaviour such as smoking, drinking, physical in-activeness that may lead us to many health problems. The main idea for creating a chat-bot in health care domain is to create awareness among many people about the ill effects on health related issues and the consequences which follows along with it. There are many ways we can create a chat-bot. The easiest way is to use a pre-existing software model which would be almost ready to use. The other way is code everything entirely from scratch. With the likes the tools like Natural Language Processing, building a chat-bot from scratch has become slightly easier process. We can use Natural Language Processing by importing one of the python modules - Natural Language Toolkit (NLTK).

We can even create chat-bots using some machine learning algorithms for more human like interactions.

All the above disadvantages can be overcome if we have the particular domain expertise. Another simple way is to use the already existing platforms to satisfy our needs. There are many platforms which provide us this software such as Slack (slack.com), Microsoft, HipChat (www.hipchat.com), Messenger, WeChat and many more.

II. PROCESSING THE USER QUERIES

This paper gives the information regarding products which is useful for consumers to obtain what they want exactly. Question Answering (QA) systems can be identified as information accessing systems which try to answer to natural language queries by giving answers suitable answers making a use of attribute available in natural language techniques [1]. The system takes a plain text as input and answering all type of questions output by qualified user is the output. The purpose is to provide a generic solution to this problem. this paper helps in recognizing the reality in texts and giving the past content for developing a conversation which is used in middle-school CSCL scenarios[2]. A smart chatbot [3] for customer care by using Software as a Service which analyze message of each application server. It help the user to resolve the issue by providing a human way interactions using LUIS and cognitive services which is implemented on AWS public cloud. Admin feeds input to the machine so that machine can identify the sentences and taking a decision itself as a response to a question. The database used in the project is MySQL. The illustration and execution of SQL in the pattern matching operation is required. The conversation can be done so that it can add some knowledge to the database as it has not been modeled before. If in case the input sentences in the database did not match then it will be remodeled[4]. The evaluation of sentence equivalence is completed with bigram that splits the input sentence in to two parts. The data of chatbot are deposited in the database. The database is appointed as information storage and predictor is used for storing the function and perform pattern matching. This application can be developed by using programming language of Pascal and Java[5]. This paper uses artificial intelligence for predicting the diseases based on the symptoms and give the list of available treatments. It can facilitate us to figure out the problem and to validate the solution[6].

Author gives chatterbot which is based on AIML (Artificial Intelligent Markup Language) structure [8] for training the model and uses Microsoft voice synthesizer for identification of the word spoken by the user. Natural language processing used for understanding and Microsoft speech recognition is used in speech recognition and speech synthesis for speech to text and text to speech so people get along with it easily.

III. CONSTRUCTED SYSTEM ARCHITECTURE

In the constructed system the user dialogue is a linear design that proceeds from symptom extraction, to symptom mapping, where it identifies the corresponding symptom, then diagnosis the patient whether it's a major or minor disease and if it's a major one an appropriate doctor will be referred to the patient, the doctor details will be extracted from the database, the user will be identified by the login details which is stored in the database.

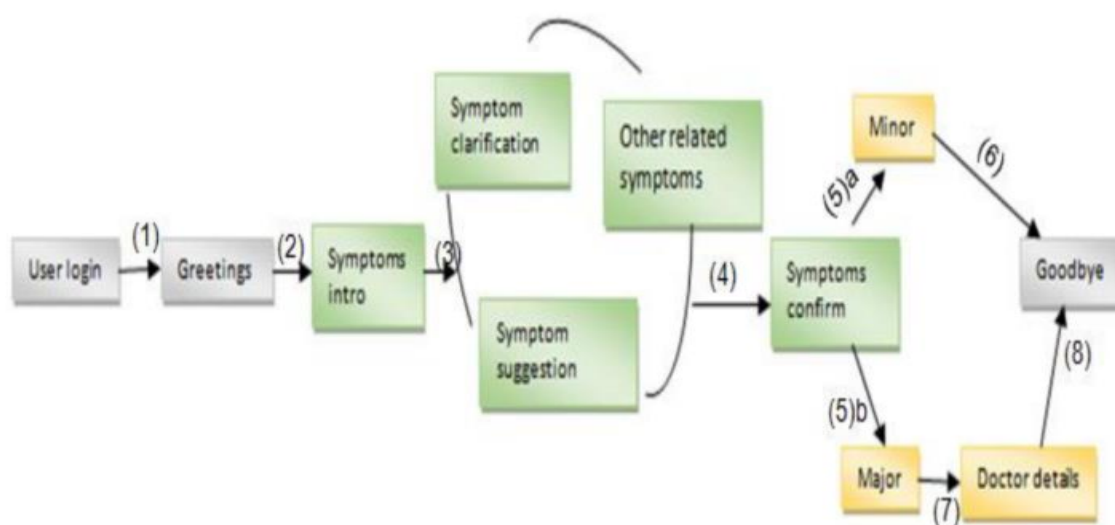


Fig1: Finite state graph

In fig1, Chatbot’s dialogue design is represented using finite state graph. In order to achieve an accurate diagnosis, the logic for state transitions are made, natural language generation templates were used, and system initiative to the user and get responses from the user. Besides its greetings and goodbye states, our agent has three main conversational phases: acquisition of basic information, symptom extraction, and diagnosis. Our bot starts off by asking about the user’s email and password for login and then enters a loop of symptom extraction states until it acquires sufficient information for a diagnosis. Users have the option of entering the loop again to talk to the doctor about another set of symptoms after receiving their first diagnosis and the another option is that the user can view their history of chats about what they have discussed.

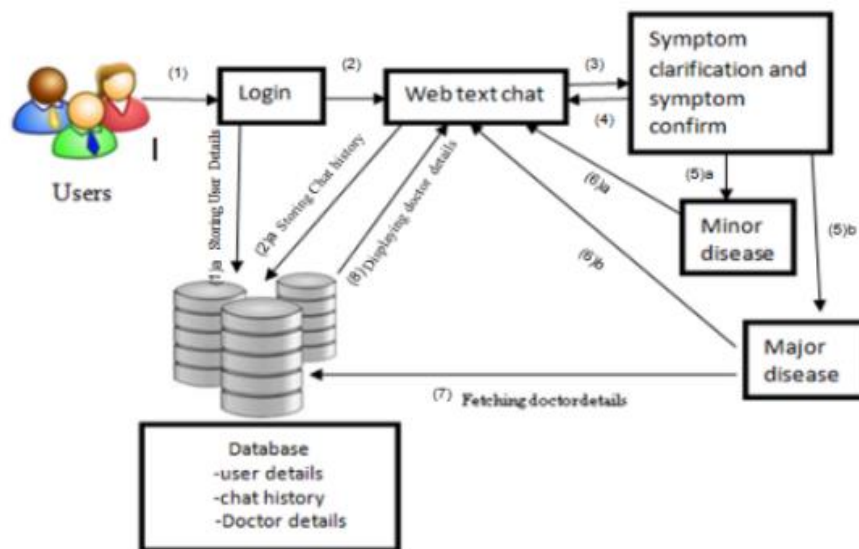


Fig2: Functional Architecture

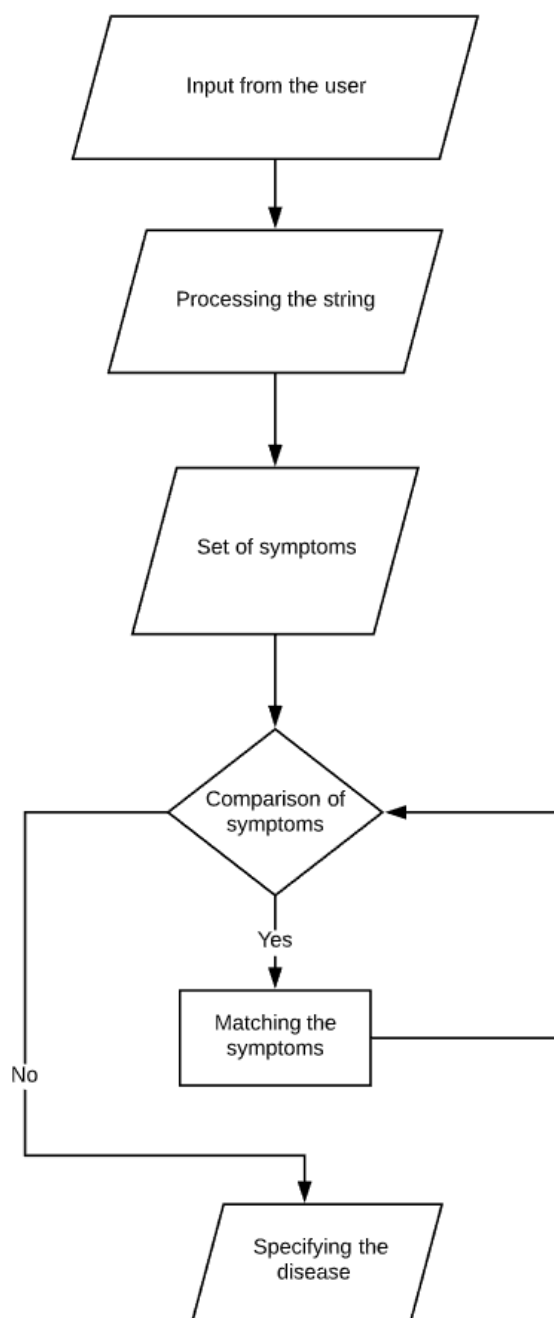
The above Figure proceeds with the users login where the users’ details will be stored in the database. Then the user can start their conversation with the chatbot and it will be stored in the database for future reference. The chatbot will clarify the users symptoms with serious of questions and the symptom conformation will be done. The disease will be categorized as minor and major disease. Chatbot will reply whether it’s a major or minor disease. If it’s a major one user will be suggested with the doctor details for further treatment.

a. USER VALIDATION AND EXTRACTION OF SYMPTOMS

The validation of the user login details occurs here. Then Symptoms are extracted using String Searching Algorithm where substring representing the symptoms is identified in the natural language text input. When users give directly the symptom name such as(e.g. “I have a cough, fever, and nausea”), the system will easily identify it. But however, the system should also be able to handle input like, “When I read, I’m okay at first, but over time, my eyes seem to get tired, and I start to see double.” In this case, the system should extract substrings like “eyes tired” and “see double” (and not substrings like “read” or “okay”).

b. MAPPING EXTRACTED SYMPTOMS WITH TRAINED DATASETS

Given some extracted substring from the user’s input, we generate a list of suggested closest symptoms .We then ask the user to confirm if they have any of the suggested symptoms. Based on their reply few diseases are being shortlisted. Then further symptom clarification and symptom suggestions are being done by asking the users a series of questions and the mapping of the symptoms to the exact disease is done.



c. SPECIFYING THE DISEASE AND REFERRING A DOCTOR

This process carries the list of diseases in the database and each symptom being entered is compared to the symptoms of the common diseases. Next symptom is checked until a matching one is found. The diseases are shortlisted based on the end users input on the question evaluation. The accurate disease is identified and specified to the end user by the chatbot. The chatbot checks whether the identified disease is a major issue or minor issue based on the conditions built in the chatbot. If it is a major issue the chatbot refers a specialist to the end user by sending the doctor details .And if it is a minor issue the chatbot specifies the disease and alerts the end user with a first aid or remedy and asks to visit a doctor shortly.

d. PRODUCING THE END RESULT:

The project result is as follows The user will have text to text communication with the chatbot and get the specific disease and the user can also get their previous chat history through their details which are stored in the database.

IV. CONCLUSION

From the review of various journals, it is concluded that, the usage of Chatbot is user friendly and can be used by any person who knows how to type in their own language in mobile app or desktop version. A medical chatbot provides personalized diagnoses based on symptoms.

V. FUTURE SCOPE

In the future, the bot's symptom recognition and diagnosis performance could be greatly improved by adding support for more medical features, such as location, duration, and intensity of symptoms, and more detailed symptom description. The implementation of Personalized Medical assistant heavily relies on AI algorithms as well as the training data. At last, the implementation of personalized medicine would successfully save many lives and create a medical awareness among the people. As said before, the future era is the era of messaging app because people going to spend more time in messaging app than any other apps. Thus medical chatbot has wide and vast future scope. No matter how far people are, they can have this medical conversation. The only requirement they need is a simple desktop or smartphone with internet connection. The efficient of the chatbot can be improved by adding more combination of words and increasing the use of database so that of the medical chatbot could handle all type of diseases. Even voice conversation can be added in the system to make it more easy to use.

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