Data Mining Robot using AI/ML

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Abstract: *Medical services are essential to a dignified life. Nonetheless, it is hard to get the discussion with the specialist for each medical issue. Thus our thought is to make a clinical chatbot utilizing Artificial Intelligence that can analyze the user's query related to health and give essential insights considering the illness prior to counseling a specialist. This will assist to reduce medical care costs and improve availability of clinical information through healthcare chatbot. The chatbots are PC programs that utilize normal language to connect with clients. The information is stored in the data set by the chatbot to distinguish the sentence watchwords and to settle on a query choice and answer the query. Positioning and sentence likeness computation is performed utilizing n-gram, TF IDF and cosine closeness. The score will be acquired for each sentence from the given informative sentence and more comparable sentences will be fetched for the question given. The outsider, the master program, handles the inquiry introduced to the chatbot that isn't perceived or is absent in the data set. In brief, we have proposed a conversational health chatbot which performs multiple functions of providing home remedial solution to user's health query through conversational means along with ease to book appointment with doctor by providing link of concerned doctor. All these steps would basically lead to wellness of user health and thus healthifying our user.*

Keywords: Chatbot, NLP, Artificial Intelligence, Infection, Query, Machine learning

I. INTRODUCTION

Businesses constantly need to evolve and adopt newer trends for their growth in industry. Now-a-days companies are implementing chatbots that help in solving customer queries, improving communication, and remote troubleshooting to enhance customer experience hence minimize human efforts. From Siri, the user found a perfect partner to savor its hours of solitude. From stupid questions to some pretty serious advice, Siri has been always there for them. The question arises that why can't we have such conversations related to our health? Here we have come up with the idea of a medical chatbot. In our proposed concept, we have introduced a conversational chatbot which will answer all the health related questions. During this procedure, if it seems to be a minor disease then our chatbot recommends home remedies for temporary cure or an emergency medication which will help to get relief. Despite taking those remedies if the user didn't get relief, they can ask for a recommendation from a doctor which our chatbot provides along with the link where the user can book an appointment.

A chatbot is an intelligent piece of software which is capable of communicating and performing actions similar to a human. Chatbots are used a lot for interaction with customers, marketing on social network sites and instantly messaging the client. A chatbot has the ability to process user input and produce an output. Usually, chatbots take input as natural language text, and the output should be the most relevant output to the user input sentence. Chatbots can also be described as "online human-computer dialogue system with natural language" .Chatbots consist of an automated dialogue system that can attend to thousands of potential users at once.[1] Based on the responses and how they are built there are two basic types of chatbot models. How do the Chatbots function? NLP and Machine learning are the main technologies that lie behind chatbots. When a question is presented to a chatbot, a series or complex algorithm processes the received input, understands what is the user's query, and based on that, determines the answer suitable to the question. Chatbots have to depend on the ability of the algorithms to detect the complexity of both text and spoken words. Some chatbots perform very well to the point but it becomes difficult to differentiate whether the user is a machine or a human. However, handling complex conversations is a huge challenge such as where there is a usage of various figures of speech, it may be difficult for machines to understand.

1.1 Types of Chatbots

Chatbots are categorized into two different types. Let us have a look at both types and see how they function.

- Retrieval based Chatbots: A retrieval-based chatbot uses input patterns and responses that are predefined. Then it uses some type of heuristic approach to select the appropriate response. It is widely used in the industry to make goal-oriented chatbots where we can customize the tone and flow of the chatbot to drive customers with the best experience.

- Generative based Chatbots: Generative type of chatbot models are not based on some predefined responses. This type of chatbot are based on sequence to sequence neural networks. This idea is the same as machine translation. In machine translation, we translate the source code from one language to another language but here, we are going to transform user input into an output. It needs a large amount of data which is based on Deep Neural networks. There are a number of interesting chatbots, which can make your life easy. For companies, development of chatbot focuses on improving their business processes and providing better user experience to their customers. It is also being utilized to serve customers on platforms like Facebook, Amazon, IRCT and others. However, most of the Facebook chatbots are easy to develop and use, as many of them do not need coding, and anyone of us can create them.
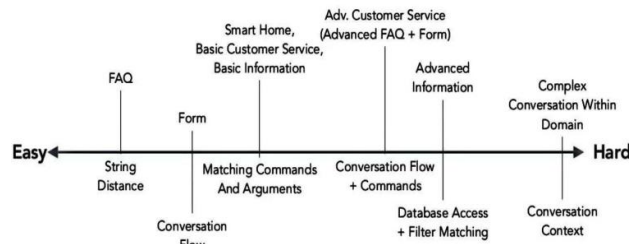

Figure 1: Types of Chatbot

1.2 Motivation

We initially investigate various structures of ANNs for NLP and analyze the current models used to assemble a chatbot. We at that point endeavor to pick up knowledge into the inquiries: What are Deep Neural Networks and for what reason would they say they are significant? How is a chatbot working starting today, what are their constraints and where we would be able to endeavor for improvement? We evaluate some novel executions and report on their adequacy. We have investigated articles, which are principal to this issue just as the ongoing improvements in this space.

With the several chatbots available in the market it provides only personal information to users and makes the customer suffer in a panic situation because of poor responsive GUI. In this dissertation work this states to cover all the flexibility in chatbots and sufficient data sets to provide a suitable answer of all questions possibly conducted in a panic situation by user. It focuses on a particular domain.

II. LITERATURE REVIEW

Automatized medical chatbots are conversationally built with technology in mind with the potential to reduce efforts to healthcare costs and improve access to medical services and knowledge. We built a diagnosis bot that engages patients in the conversation for their medical query and problems to provide an individualized diagnosis based on their diagnosed manifestation and profile. Our chatbot system is qualified enough to identify symptoms from user inputs with a standard precision of 65%. Using these diagnosed symptoms which were extracted, correct symptoms were identified with a recall of 65% and a precision of 71%. Finally, the chatbot returned the expected diagnosis based on user input for further operations. This determines that a medical chatbot can provide an accurate diagnosis to some extent to patients with simple symptom analysis and a conversational approach, this suggests that an effective spoken language medical bot could be viable. Moreover, the relative effectiveness of this chatbot indicates that more automated medical products may flourish to serve a bigger role in healthcare. [2]

A popular dialogue system in the field of Natural Language Processing (NLP) is called chatbot. Chatbots aim to create conversations between machines and humans. COVID-19 is a member of the Coronaviridae (CoV) family of the

Coronaviridae family which causes the respiratory system to become severe in humans. This research paper predicts the answer of chatbot to questions about COVID-19 with the RASA framework and uses the DIET Classifier pipeline for 300 training data. The test results of the DIET Classifier model on rasa.core.test and rasa.nlu.test provided confidence values of F1-Score, precision, and accuracy for the correct answer to the question about COVID-19, namely 1.0 with a percentage of around 85%. [3] In this literature review, they try to help humans about the home remedies that should be follow during the period of COVID-19 virus. So, we're also trying to add that feature to our chatbot and help people more efficiently.

Nowadays, educators can showcase the technology of chatbots in various fields such as teaching and learning. Earlier the resources were almost negligible, in the field of education with the learning design integrated in it. But now with the advancement of technology, chatbots can fill the gap in the teaching landscape too. Using chatbots in the education domain is reassuring, since these bots can point out some of the logistics and diversified issues that a normal class might face. Besides this, with the further advancement of Artificial Intelligence, tech-giants like Apple, Google, and Amazon are providing platforms where they focus more on building conversation rather than technicalities of computer programming i.e., to be more specific in natural language processing(NLP). In this paper, we have built a rule based chatbot on a platform named Discord, also showcased how a chatbot can be integrated into other online platforms to counter the challenges faced in teaching. Q/A features are used to get in-depth knowledge about various pre-installed data in chatbot. [4]

The difference between system earnings and patient waiting costs, inactivity costs and overtime costs as a target device. Combined planning and planning system for booking system is established under the prescribed length of diagnosis and treatment time. A neighborhood search algorithm is precise for optimal scheduling of patients and scheduling is given. Numerical experiments indicate that the optimal schedule overbooks the first interval; no-show probability has a significant impact on the overbooking and system performances.An overbooking policy is recommended to reduce the negative impact of non-observation compared to allowing patients to enter. [5] In this literature review, they consider that patients wait so long to ask the doctors for their treatments. So they create a project that can simply give an appropriate time to visit the doctor by booking their slots on their site. But we created a chatbot in which you can not only book an appointment but also know about the home remedies that you should follow if required.

III. PROBLEM STATEMENT

A chatbot is a computer program that mimics human conversation through voice commands or text chats or both. Chatbot, which is a short form for chatterbot, is an artificial intelligence (AI) feature that can be embedded and used through any major messaging applications. There are a number of synonyms for chatbot, which include "talkbot," "bot," "IM bot", "interactive agent" or "artificial conversation entity."

Previously existing chatbots only provided conversation features. But the model we proposed not only has a conversation with the user but it also suggests home remedies for quick relief as well as it provides a feature to book an appointment with a doctor regarding the user's problem. There was no such chatbot that provides all these features together.

IV. METHODOLOGY

This approach starts with taking the text as an input from the user in the android app. We encourage users to enter the query for the chatbot and then we read the entered query in the edit text. Then it sends the value to the interface of our hosted Program – O. It get the reply from the Server, this server gives reply in the JSON format. We need to parse it to get the bots response. If the bots response is null then set the response to the error string and show it to the user. Repeat the same task for continuous chatting with the chatbot. The following are the steps that explain the implementation in detail to accomplish the above-mentioned tasks:

1. Read the user input when the user enters the Click event of the send button.
2. User input is being sent to the program – o hosted server using the HttpUrlConnection. We are dealing with the internet stuff that's why we need to call this method in the AsyncTask of the android system. In the background of the app, AsyncTask runs.

3. Wait till getting the reply from the server. The OnPostExecute method of the AsyncTask will get the reply in JSON format. Then it is being sent to the JSON parser to extract the bot''s response.

4. After extracting the bot's responses, we need to display it to the user. So, it must display the response to the text view.
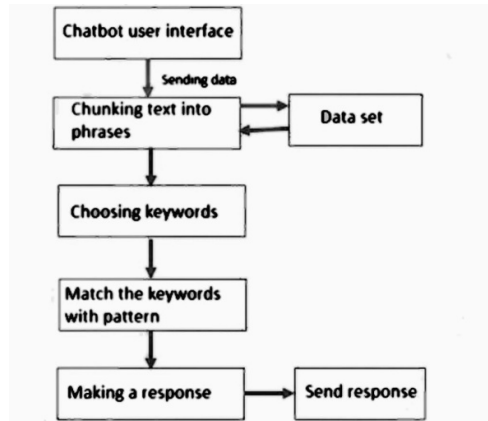
5. Then repeat the process for the next user inputs.

Figure 2: Working of chatbot

V. RESULT

Once our dataset model is trained it will be used by our chatbot to give relevant replies to the user's query. Chatbot will fetch data from the dataset and provide responses to the user. The main technology used behind this chatbot is the NLP algorithm along with machine learning. Keeping the identical problem in mind, also a function of booking doctor's appointments is provided. Hence our chatbot has conversations with users, providing help with their health issues along with feature of provision to book appointment with doctor. The response and queries of the user will be saved and can be used for improvement of further communication.

Figure 3: Result of our system

VI. CONCLUSION AND FUTURE SCOPE

For the success of any business, smart solutions are important. We can also conclude this from the situation of the past two years as well as the current scenario. From providing services 24/7 to customers, improving current marketing activities, saving time spent on engaging with users to improving internal processes, chatbots can yield the much needed competitive advantage. Chatbots can also reduce cost and streamline other administrative tasks. If you are thinking about developing a chatbot, the best thing to do is to approach a company that will understand your business needs to develop a chatbot that helps you achieve your business goals.

The future scope is to use HR dataset on the same model and develop the other modules of the proposed system namely feature extraction, text classification, order ranking, response generation etc. by applying the other models of deep neural network for each module of the proposed system and testing for the initial stage of recruiting process of HR system. We will also test the system to find out the areas that need to be improved and make the chatbot feasible in the real time. In future work this conversational model can be used as the backend working and frontend will be designed such that two way communication can be accomplished using the bot UI. The frontend will be developed in the future using the API flask library of python. This model can be used in future to accomplish the self-learning part of the fully functional chatbot.

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