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HOSPITAL MANAGEMENT SYSTEM WITH CHATBOT

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ABSTRACT-Intoday's fastpacedlifepeopleoftendon'ttakeproperc areoftheirhealth. People try to avoid going to doctor for diagnosis either because they don't like it or they don'tget time. To lead a good life healthcare is very much important. But it is very difficult to obtain the consultation with the doctor in case of anyhealth issues. Theproposed idea is to create a medical chatbot using Artificial Intelligence that can diagnose the disease and provide basic details about thediseasebeforeconsultingadoctor.Tored ucethehealthcarecostsandimproveaccessi bilityto medical knowledge the medical chatbot is built. Certain chatbots acts as a medical reference book, which helps the patient know more about their disease and helps to improve their health. The user can achieve the real benefit of a chatbot only when it can diagnose all kind of disease and provide necessary information. Chatbots are programs that mimic human conversation using Machine Learning algorithms. It is designed to be the ultimate virtual assistant helping one to complete tasks ranging from answering questions in health care domain. Chatbots are currently the one of the best trending technologies available.It is certainly one of the most advanced and time saving technology also. But yet to accomplishmany tasks there is a need to make chatbots efficient in medical field as well. To address this problem this project provides a platform where human can interact with a chatbot which are highly trained on datasets using Machine Learning algorithms. Machine Learning algorithms take a more natural approach for computation rather thantakingalogical approach.Theoutputis depended on the dataset they are trained on. We can implement in real time medical systemand convert the text results in voice format.

KEYWORDS: Machine learning, Natural language processing, Chatbots, Artificial intelligence, Medical system

1. INTRODUCTION

Chatbot's are such kind of computer programs that interact with users using natural languages. For all kind of chatbots the flow issame, though each chatbot is specific in its ownarea knowledge that is one input from human is matched against the knowledge base of chatbot. Chatbot's work basically on Artificial intelligence, so using this capability we have decided to add some contribution to the Health Informatics. The high cost of our healthcare system can often be attributed to the lack of patient engagement after they leave clinics or hospitals. Various surveys in this area have proved that that chatbot can provide healthcare in low costs and improved treatment if the doctors and the patient keep in touch after their consultation. To answer the questions of the user chatbot is used. There is very a smaller number of chatbots in medical field. The main purpose ofthe scheme is to build the language gap between the user and health providers by giving immediate replies to the Questions asked by the user. Today's people are more likely addicted to internet but they are not concern about their personal health. They avoid to go in hospital for small problem whichmay become a major disease in future. Establishing questionanswerforumsisbecomingasimplewayto answer those queries rather than browsing through the list of potentially relevant document from the web. Many of the existing systems have some limitationsuchasThereisnoinstantresponse given to the patients, they have to wait for experts acknowledgement for a long time. Some of the processesmaychargeamounttoperformlivechator telephony communication with doctors online. This system allows computer tocommunication between human to computer by using natural language processing (NLP). There are three analyses which understand natural language i.e. identification of main linguistic relations is completed to parse

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subject into object of the sentences. Chatbot is an Entity which imitates human discussion in its particular accepted set-up together with a text or vocal language with techniques such as Natural LanguageProcessing(NLP).Theaimofthissystem is to replicate a person's discussion. The development of chatbot application can be donewith making a user interface to send input and receive response. It is a system that interacts with userbykeepingthetrackofthestateof

interaction and recollecting the preceding commands to give functionality.

2. RELATEDWORK

Mamta Mittal, et.al,…[1] explained the importance of medical chat bots and present our developed medical chatbot, developed oninternet technologies. Our chatbot also assists user queries regarding hospital information, including specialists' availability, OPD timings, room registration, number of beds, emergency information, and doctor availability, among others. This is the first real time developed medical chatbot for query queue management in hospitals based on the literature survey. Additionally, it improves users' satisfaction by providinganswers to all their health and personal assistance related queries. The proposed chatbot virtuallyassists userslikereal reception staffof a hospital. It provides users with total medical assistance24*7.However,theseexistingsystems failed to save the chat history and were not fully customised to understand the user's ultimate message. Thus, these bots did not fully understand what the user said and provided responses from the knowledge stored in the bot brain. Therefore, we developed a special chatbot that includes collecting local hospitalinformation responses by integrating web-based techniques. Present medical chat bots are integrated with speech recognition such thatusers can communicate through either voice or text messages. To implement a chatbot, several

techniques and optimisation algorithms are available. Gradient Descent (GD) is an optimisation algorithm used to evaluate the coefficients of function (f) that minimise the cost function. Itis aprimaryoptimisationalgorithm to assess the minimum cost function.

ByeongJinYe,et.al,…[2]implementeda rule-based or artificial intelligence-based communication software that uses a mobile device to provide answers and relevant information in response to questions posed through text or voice conversations. This technology is increasingly used for applications in credit scoring and marketing strategies due to the universalization of smart devices and mobile (online) communication and the expanding influence of messenger apps. Recently, chatbots have been increasingly used as a tool for digital healthcare. For example, the chatbot program "Kohby"atKangbukSamsungHospitalprovides informationonhealthcheck-upsand

administrative services such as appointments or payments. In addition, the chatbot also provides appropriate answers to questions about symptoms and diseases, and connects the patient with an appropriate doctor through "HealthTap" and "Babylon Healthcare". The chatbot additionally provides information regarding treatment and managementforcancerpatientsorinterventionsfor stress or mental health problems. Furthermore, chatbot also plays a role in motivating and sustaining lifestyle changes, for example, quitting smoking. Because chat bots are optimised for mobile devices and can therefore obtain the necessaryinformation without the needto install a separate app, the number of users and the service area are becoming increasing significantly. However, no chatbot program has yet been developed that explains the results of the general health examination explicitly and providesmethods for follow-up management, that are easilyunderstood by the general public.

A Kumaresan Angappan, et.al,…[3] facilitated the job of a healthcare provider and helps to improve their performance byinteracting with users in a human-like way. Chatbot in health caremayhavethepotentialtoprovide patients with access to immediate

medical information, recommend diagnoses at the firstsignofillness,orconnectpatientswithsuitable healthcareproviders(HCPs)acrosstheircommunity Healthcare chat bots are the future ofmedical field asit aids in reducingthe amount ofphysical contact between patient and the doctor in the day to day growing population. Our chatbot (Dr.bot) uses naturallanguageprocessingtointeractwiththeuser. Dr.bot uses pattern matching to recognise the user input and provide a suitable response from the provided dataset. The proposed system will include abriefsummary of herbal medicines, their uses and suitablehomeremediesthatcanbeusedtotreat and cure most of the common diseases. In

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thispandemicwecoulddecreasethephysicalcontactby the usage of medical chat bots which will provide herbal methods to cure the disease in home itself. By using a healthcare chatbot people can avoid unnecessary visit to clinics and hospitals.Especially in remote areas, it is becoming more difficulttoconsultamedicalspecialistwhenthereis an emergency situation.

Karthik Saligrama, et.al,…[4] facing unprecedentedpressurebecauseofchanging demographics, administrative requirements, workforce shortages and increasing morbidity as well as changes in information technology demand and expectations. As of late, there has been significant advancement in man-made consciousness (AI) and its application in social insurance.Inthecomingyears,thesemethodsare anticipated to assume control over a portion of the exercises presently being conveyed by cliniciansandmedicinalservicesdirectors.There has additionally been an extraordinary measureof expansion about the capacities of AI and even now and again guarantees that AI will supplant human clinicians through and through. These points of view do not seem to reflect current restrictions of AI frameworks. Currently, there is little discussion in scientific literature or public policies as to how AI techniques can be incorporated in healthcare delivery. Most medicinal services associations, these days, have a detached relationship to their customers with regards to correspondence. The customer looks through the site to discover data and it is even difficulttoexploretoarriveattheexactdatathey need. Most associations, including emergency clinics and clinical practices, have done little to propel their customer interchanges frameworks. Regularlythisincorporatesaninquiryandanswer page on a site. In recent years, there has been enormous advancement in man-made consciousness (AI) with the improvement of profound neural systems, common language handling, PC vision and mechanical autonomy. These methods are presently effectively being applied in social insurance with a significant number of the wellbeing administration exercises at present being conveyed by clinicians and directorsanticipatedtobetakenoverbyAIinthe coming years.

Umar Jameel, et.al,…[5] developed the system the patient can tell the problem to the chatbot and the chatbot will use its algorithm to solve the patient problem by recommending a particulardoctortohim.Likeapatienttellinghis problem to a chatbot, chatbot then starts processingalgorithmstofindtheperfectsolution for the patient then recommends a doctor as a result. The chatbot will use the answer question box to communicate with patients. Patient tells his/herproblemtothechatbotusingtext,thenthe chatbot will respond to the problem using a query. The healthcare chatbot is a great tool for communication between patient and bot. With thehelpofchatbotdoctorscansavetheirtimefor minor problems and it also helps patients tosolve theirissues.Apatientcanhaveaconversationwith a bot using text and the chatbot will respondinstantly without any delay. The trends of chatbots are increasing day by day with thepassage of time because of the loadof patients in hospitals. With the help of artificial intelligence, the proposed system will be developed using natural language processingthat means the chatbot first diagnoses the patient's problem then recommends a doctor forconsultation. During the COVID pandemic, the trends of virtual assistance increased, and people are interacting with robots andvirtualassistants.Inmanycountries,there are robots in hospital receptionists to solve problems of people and work like humans.

J. Jinu Sophia, et.al,…[6] easiest way is to use a pre-existing software model which would be almost readyto use. The other wayis 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 Processingby importing one of the python modules - Natural Language Toolkit (NLTK). We can even createchat-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. 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 ownlanguage in mobile app or desktop version. A medical chatbot provides personalized diagnoses based on symptoms.

Farah Shaik, et.al,…[7] primarily focusedon aiding India who since April hascrossed over a 100,000 cases per day and currently over 300,000 a day. Evidence presents that the variant found in India spread faster and is moreharmful than others. In just a short periodof time it has taken over and become dominant in major Indian cities making it

hardertocontrolthesituation. As students, we were motivated to propose a server-less chatbot named 'Covisstance' that addresses this issue and helpsin providing users with real time information of availability of hospital beds and oxygen ventilators in the hospitals in their area. For testing purposes, we have implemented this for the state New Delhi but at a production level, this service can be extended to serve all states and hospitals can be connected to a common secure database. In the literature, several researchers attempted to design medical chat bots providing supportandinformationtopatients.Forexample. A Chatbot used to virtually assist patients and provide information and advice to eradicate physical visit. This chatbot is based on Thailand and has 7 features some of which are contact information, guidelines, and lists of hospitals. However, to the best of our knowledge thereis no solution specifically designed to findavailable bed spaces and ventilators for critical and non-critical patients during the COVID-19 pandemic. The Covisstance server less chatbot addresses a critical issue of providing aid to locate hospitals and oxygen ventilators which enables high accessibility and ease of use. It is implemented by integrating several powerful servicessuchasMicrosoftPowerVirtualAgents, Microsoft Power Automate Flow, MicrosoftLists and Microsoft Language Understanding AI service (LUIS).

Yuvadee Jitgosol, et.al,…[8] presently, tourism and service industries have incurred a major role in further developing the economy of Thailand. Thus, supporting the staff with good personnel administration is not an option but indeed necessary. Human resource departments should consider offering supportive welfare or benefits, rewarding good or outstanding work, providing motivation, and retaining or regularizing personnel as are the factors to develop the business effectively. Overall, the databasecanbeupdatedanytimeandcanbeused for searching for information 24*7With a user friendly interface design, it is also programmed in a way that helps recognize the behaviour of employees, such as in using social security services, requesting personal leave or days off each year.

Soufyane Ayanouz, et.al,…[9] understand the user input and provide a meaningful response, the chatbot uses artificial intelligence and deep learning methods. Moreover, they interact with humans, using natural language, different applications of Chat- bots such as medical chat bots, call centres, etc. A chatbot could help doctors, nurses, patients or their families. Better organization of patient information,medicationmanagement,helpingin emergencies or with first aid, offering a solution forsuperficialmedicalissues:theseareall possible situations for chat bots to step in and reduce the burden on medical professionals. In this paper, we performed a detailed survey on recent literature. We examined many publications from the last five years, which are related to chat bots. Then we presenteddifferentrelatedworkstooursubject,andthe AI concepts needed to build an intelligent conversational agent based on deep learning models Finally, we presented a functional architecture that we propose to build an intelligent chatbot for healthcare assistance.

Shreekar Kolanu, et.al,…[10] can educate and bring in an awareness to the people andfollowahealthylifestylewiththehelpofour bot named "DiaBot" which is integrated into the web based platform to help and show people whether they are diabetic prone and help them leadagoodhealthylife."Diabot"whichwillhelp manage diet plans, suggesting plans and calorie intakes. We'll allow patients to book appointments, find nearby clinics and hospitals. The bot will include an UI for a proper user experience.Integratedintoitaredetailsondiets, Map and a detailed review system. Diabetes can be dangerous and fatal, if not treated and taken care of. The body either doesn't make enough insulinorcan'teffectivelyusetheinsulinitdoes make. Our bot will act as the earlier solution to patients with mild symptoms. Identifying the type of diabetes makes it easier for patients to figure out the treatment necessity in the future. Enhancetheuserwitheaseofinformationsothat the user is educated about the basic problems he isgoingthruintheinitialstages.Also,toidentify whether the patient has already been affected or in the starting stage. Being aware of the symptoms and getting a regular check-up is the motivebehindthisproject.Theproposedsystem is that the bot will ask the details of patients and according to the info given by the patient it will suggest the patient to maintain healthy balanced diet, by suggesting nutrition foods, less calorie foods and other parameters etc.

3. BACKGROUNDOFTHEWORK

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In existing system, implement Question Answering(QA)systemswhichcanbeidentified 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.Thesystemtakesaplaintextasinput andansweringalltypeofquestionsoutputby qualified user is the output. Synchronous written conversations (or "chats") are becoming increasinglypopular as Web-based mental health interventions. This review is based on an evaluation of individual synchronous Web-based chat technologies. Through the current evidence oftheapplicationofthistechnology,thetentative support for mode of intervention is seen. Interventions utilizing text-based synchronous communication showed better outcomes compared with Waitlist conditions and overall equivalent outcomes compared with Treatment As usual, and were at least as good as the comparison interventions. However, the issue of whether these technologies are cost effective in clinical practice remains a consideration for future research studies. Medical search has several unique requirements that distinguishitself from traditional Web search. A common scenario in which a person performs medical search is that he feels uncomfortable but is uncertain about his exact medical problems. In this case, the searcher usually prefers to learn all kindsofknowledgethatisrelatedtohissituation. However, existing medical Web search engines are optimized for precision and concentrate their search results on a few topics. This lack-of-diversity problem is aggravated by the nature of medical Web pages. When discussing a medical topic, many medical Web sites use similar, but not identical, descriptions by paraphrasing contents in medical textbooks and research papers.

4. PROPOSEDMETHODOLOGIES

In the proposed 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 appropriatedoctor willbereferredtothepatient, the doctor details will be extracted from the database, the user will be identified by the login detailswhichisstoredinthedatabase.Inorderto achieve an accurate diagnosis, the logic for state transitionsaremade,naturallanguagegeneration templates were used, and system initiative to the userandgetresponsesfromtheuser.Thissystem helps users to submit their complaints and queries regarding the health. Customer satisfactions the major concern for developing thissystem..Theactualwelfareofthechatbotis tofacilitatethepeoplebygivingproperguidance regardingthegoodandhealthyliving.Forthe reason that many of the people do not have fundamental awareness of physical condition. So we proposed the medical chat-bots functioning depends on Natural language processing that helps users to submit their problem about the health. The User can askany personal query related to health care through the chat-Bot without physically availabletothehospital.ByUsingGoogleAPI for text voice conversion at the time of answer retrieval in medical chat bot. Query is sent to ChatBot and gets related answer and display answer on android app. The System's major concern behind developing this web based platform is analyzing customer's sentiments.

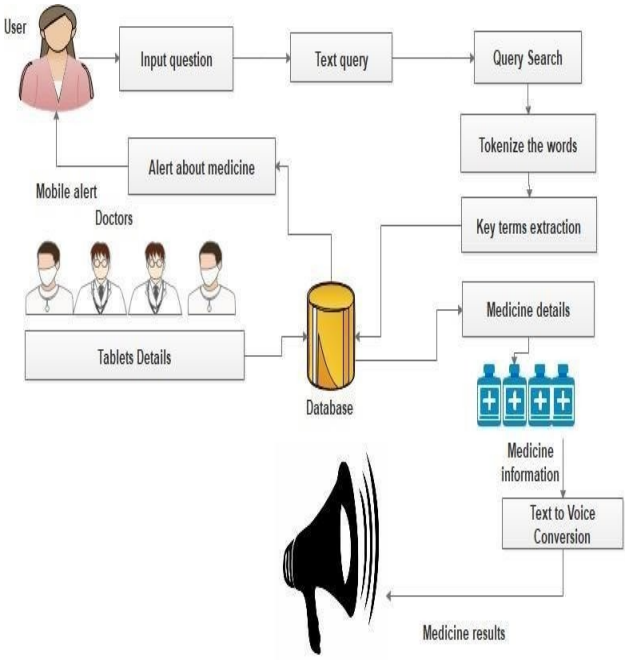

Fig1:Proposedarchitecture

Fig 1 specifies, user provide input question and extract the keyword from query based on text mining algorithm. Then provide theresults in the form of medicine details.

INTERFACECREATION

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Chatbot's are such kind of computer programs that interact with users using natural languages. For all kind of chatbots the flow is same, though each chatbot is specific in itsown area knowledge that is one input from human is matched against the knowledge base of chatbot. Chatbot's work basically on Artificial intelligence, so using this capability we have decided to add some contribution to the Health Informatics. The high cost of our healthcaresystemcanoftenbeattributedtothe lack of patient engagement after they leave clinicsorhospitals.Varioussurveysin thisarea have proved that that chatbot can provide healthcare in low costs and improved treatment ifthedoctorsandthepatientkeepintouchafter their consultation. To answer the questions of the user chatbot is used. There is very less number of chatbots in medical field. In this module,wecandesigntheframeworkforhealth care domain to patients to get the answers without any human assistance. Admin can train keywords with answers for future processing.

POSTQUESTIONS

The user can chat as if chatting with a human. The bot then ask the user a series of questions about their symptoms to diagnose the disease. It gives suggestions about the different symptoms to clarify the disease. In this module, patient can be registering their details and login to the system. After that the post the questions related to health issues. The question can be in the form of text.

KEYWORDEXTRACTION

In the first step, questions are collected and perform preprocessing steps to remove the noisy words. The basic steps are

Tokenization

Thegivendocumentisconsideredasastringand identifying single word in document i.e. the givendocumentstringisdividedintooneunitor token

RemovalofStopWord

In this step the removal of usualwords like a, an, but, and, of, the etc. is done.

Stemming

Astemisanaturalgroupofwordswith equal (or very similar) meaning. This method describesthe base of particular word. Inflectional and derivational stemming are two types of method. One of the popular algorithms for stemming is porter's algorithm. Afterthat extract the keywords and forward tonext module

TOPKRESULTS

In this module, keywords are forward to server page. If the user wants any medical diagnosis of the disease based on the symptoms provided, then the chatbot uses the machine learning algorithm to provide tablets details.

TEXTTOVOICECONVERSION

Text-To-Speech is a process in which input text is first analyzed, then processed and understood, and then the text is converted to digital audio and then spoken. This technique synthesizes sound by concatenating short samplesofsoundcalledunits.Itisusedinspeech synthesis to generate user specific sequence of sound from a database built from the recording ofothersequences.Theanswersareconvertedto voice and hear by microphones using speech synthesis.

6.CONCLUSION

In this system we build up a system which is useful for medical institute or hospitals to help the users to freely ask medical dosage related queries by voice. System gets output for medicine API and speaks out and displays all medicine names. We are using NLP because we wanttoacomputertocommunicatewithusersin their terms. Large amount of data which is too diverse and complex to be evaluated by traditional methods are being generated by the health care transactions. The application of data miningonmedicaldatacanfocusonnew,useful and potentially lifesaving knowledge. The extraction or mining process of knowledge from thelargeamountofdataissaidtobedatamining. It is considered as an innovation which tends to help the physicians who deal with large amount ofdata.Amedicalchatbotprovidespersonalized diagnoses based on symptoms.

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