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A Diabetic Diet Suggester and Appointment Scheduler Chatbot using Artificial Intelligence and Cloud

Shreekar Kolanu¹, Shikhar Jyoti Dutta², Saurav Roy³, M. Maheswari⁴

¹ SRM Institute of Science and Technology, Kattankulathur, India.

² SRM Institutes of Science and Technology, Kattankulathur, India.

³ Software Engineer, B.Tech VIT Vellore, India.

shreekarkolanu@gmail.com¹

Abstract

Conversational Artificial Intelligence has gained a lot of traction due to its ability to communicate with the user and the machine with automated texting and dialog flow based applications that allow computers and humans to communicate in a human-like manner. Hence leveraging this technology, it is able to help guide diabetic patients when they are suffering from diabetes or just to self assess and to make things easier for the people which will allow them to learn and follow a healthy diabetic diet. The usage of Conversational AI-bot will Identify and give answers and analyzes the queries asked that is available based on the text trained. It also allows us to automate book and assist the receptionist to book appointments without any errors This makes things easier and enabling a faster appointment service and this bot helps people to be cautious and lead a healthy life.

Keywords: Conversational Artificial Intelligence, Cloud Services, NLP, Watson AI, Chatbot, Diets, Diabetes

1. Introduction

Some of the problems that we face in today's world are diseases and issues that can impact lives in a long term and we usually tend to not recognize them and even think about it. This paper can educate and bring in an awareness to the people and follow a healthy lifestyle with the help of our bot named "DiaBot" which is integrated into the web based platform to help and show people whether they are diabetic prone and help them lead a good healthy life. "Diabot" which will help 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. Integrated into it are details on diets, Map and a detailed review system. Diabetes can be dangerous and fatal, if not treated and taken care of. Your body either doesn't make enough insulin or can't effectively use the insulin it does 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. Enhance the user with ease of information so that the user is educated about the basic problems he is going thru in the initial stages. Also to identify whether the patient has already been affected or in the starting stage. Being aware of the symptoms and getting a regular checkup is the motive behind this project. The proposed system 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. We would give one more option like the patient can book the appointment to clinics thru bot and it will book. Also we will use google map api for the patient to book and see available clinics for

booking appointments also using google calendar api to assist the users in booking the date and time.

1.1 Architecture of the System

The basic model is the presence of a user interface with the bot integrated to it. The website will contain all the necessary information on diets, maps, contact and review which is easily accessible to the users. For an easier interaction the bot will be used which will give the output from a few questions. The main component will be the chatbot window dependent on 2 major functionalities discussed in section 1.2 where the very first option which we have is prepare diet and the second option we have is schedule appointment, so its the users to choice to choose whichever service he would like to get initiated with. Usually the prepare diet option is preferred as it the main path to

determine if the user wants to get the diet suggested as per his details, in a very organized manner the advanced dialog flow in fig[2] which will identify the inputs given by the user and co-relates with the type of diabetes assessed by the Watson AI. Once the type is identified it then redirects you to chose your diet plans suggested under the type identified. Also, generating a caution note on the risk level indulged with the user. Once the risk level is identified he/she could proceed with appointment scheduling option. It is a choice based flexible option system where they can chose based on their location and list of clinics, hospitals and multi speciality hospitals are shown, once selected the hospital they can block a slot on the google calendar which the bot gives the link and final confirmation details.

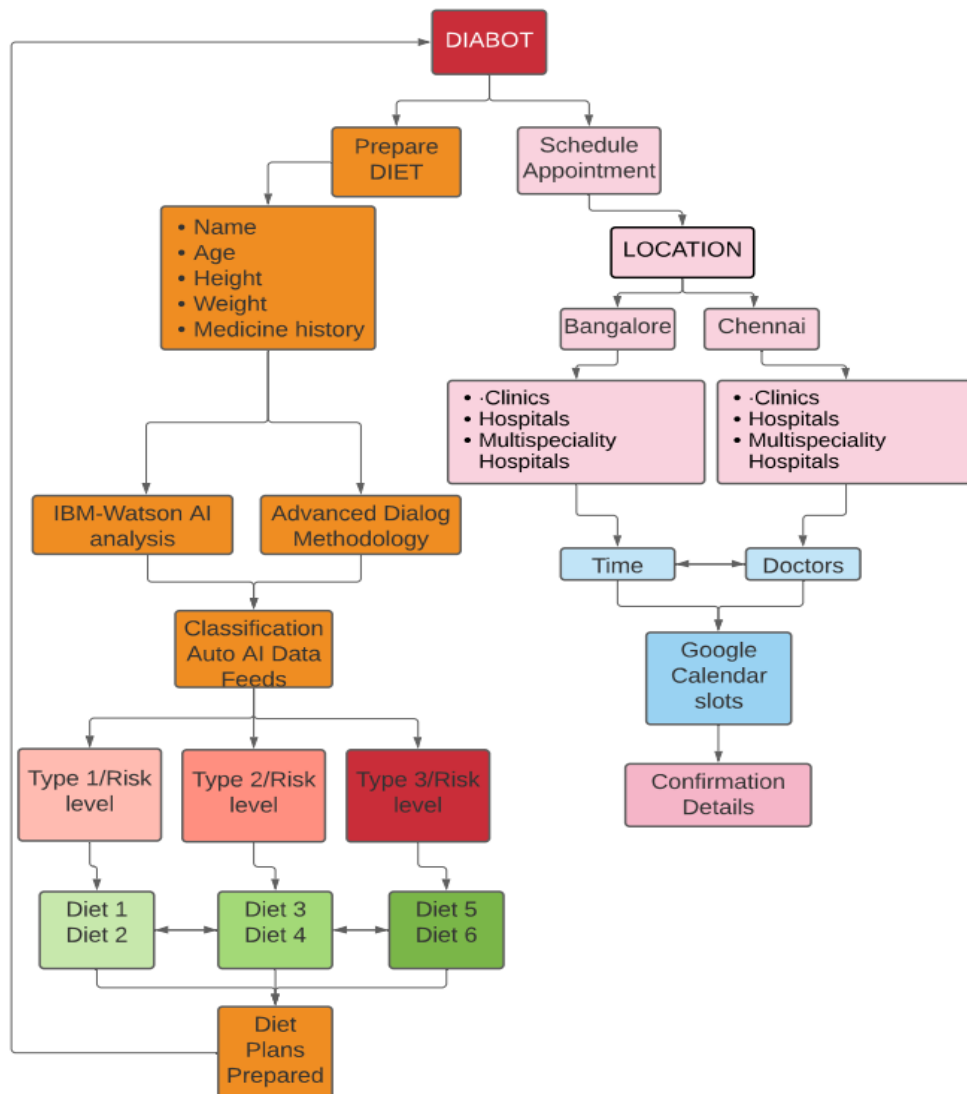


Fig.1. Architecture Flow of the System

1.2 Functionality

The proposed system is that the bot will ask the details of patients on the name, age, weight, height and medical history. The bot will display some options on symptoms based on that it'll analyse and determine the type of diabetes the patient is suffering. Upon determining the bot requests on whether the patient wants a diet plan or to book an appointment. Diet suggestions varies on calorie intake, nutrition and various other features from which the patient needs to choose from. Introducing an option for users book the appointment to clinics thru bot and it help them get an appointment easily and fast. Also we will use google map api for the patient to book and see available clinics for booking appointments as well as the google calendar api to book the date and time slot. When the patient chooses to book an appointment it'll give options of clinics in the area, and available doctors. The appointment is booked on the time available and a link to google calender reminder is sent to the user.

2. Methodology

This chatbot is focused on the IBM cloud which offers watson AI technology which comprises of AI based Intents and Entity which is then later trained based on the advanced dialog flow which identifies and detects the text based on the query asked and internal natural language processing will take place and trains the intents based on the dialog flow shown in figure[2]

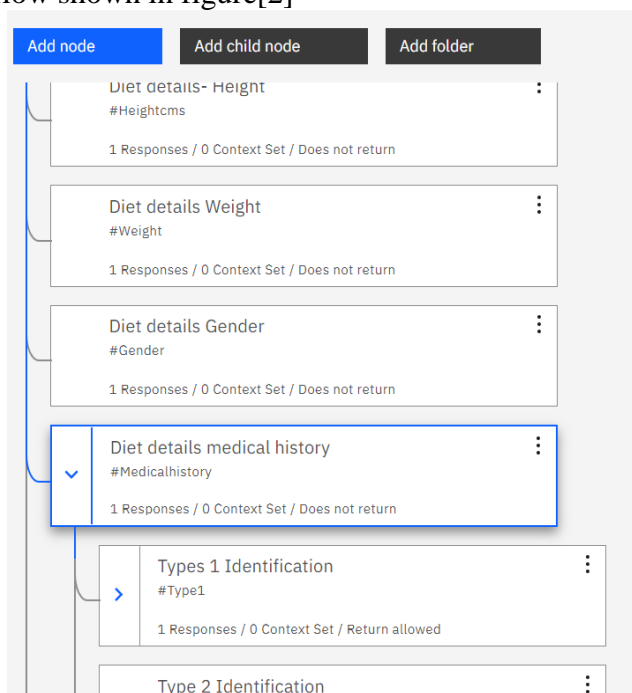


Fig.2: Advanced Dialog methodology

3. Related Work and Comparisons

However in order to work with conventional chatbot and to have a general classification of various ways of designing a chatbot, it can be done by handling queries based on the natural language using different strategies[1] which gives an overall understanding of designing a chatbot. But using advanced dialog methodology seen in figure[2] system, it allows to develop and makes changes very fast without any complex constraints in order to update the data as soon as possible. Infact combining the api keys to this methodology can give more flexibility in giving a broader approach and better suitable output to a query[3]. To also understand the usage of cloud services which enables a cross platform usage and heavy load balancing access to the particular service helps in a seamless interaction and faster responses/second.[4] . To also have the most appropriate information regarding the medical datasets regarding the diabetes issue, it is highly laid towards the most updated medical data centers, which provides the valid information which will be used to curate and generate reports based on the accurate information accessed by the service to fetch the right data.[5]. Managing of the functionalities like figure[1] using the the methods to combine more that one functionality performing at a time relating to the user's request was to be taken from various management methods of flow to detect the diabetes issues can be used[7]. The usage of planning the exact amount of AI is described in[8] to exactly provide the required results can be extracted to understand that limited usage or above the limit can be known. To create an impact with such technology and look for the most intelligent human like automation, it has to deliver the best accuracy that is spoken like a human and understand like a human[6]. The power of analyzing the human behavior via text messages is to be noticed here as it gives an approximation of 82-85% of human like responses which is satisfied and covered overall messages from various topics by DIABOT seen in figure[3]

With a massive **82.3%** of Total Coverage text message identification by multiple users.

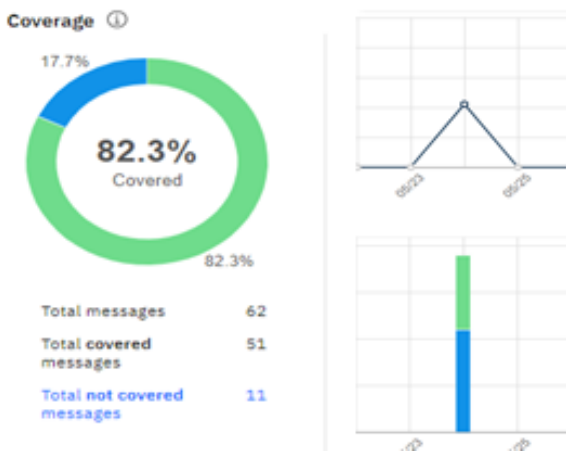


Fig.3. Total messages coverage-trend

The classification of the NLP models identifying and co-relating to the advanced dialog methodology will be suitable at a faster and easy pace which will in return bring the best results[9]. Suitable recommendation as per the plans to be introduced will not be clashed so that the visibility and transparency of the information required will be stabilized with the use of the required recommendations only when required[10]. In order to understand how important healthcare is for people and especially at an elder stage it is important to impart and make this a daily/weekly practice to self asses to stay fit and well[11]. Implementation of unique assessments and creative programs will make it more interesting and usable at a daily basis[13]. The usage of the bot is to be accessible at an open source so that the usability and reach is expected as the formats can easier to alter, update and modify at a larger scale[14]. Can be flexible at cross-platforms and called with api requests to be developed and used in smart gadgets can be possible with the downloadable JSON formats and huge amounts of data can be collected and used with the http requests. Also pertaining to enormous requests at a single instance with multiple formats is transferable to various domains, sub-platforms and cross-platforms to be a wholesome integration on the cloud services as well as the platform based services with the help of its one click deployment methods and scripting requests to view and use the Ai-based bots[15].

4. Result and Analysis

This paper finally intends to say that without much of wasting time or typing a lot of questions it can

redirect you to get what you need so the overall system is 82-85% automated so that the user doesn't need to keep question the bot as it has been pre-trained with the most expected questions and it just asks the users to click the buttons and it makes it easier and faster. Also, showing that it has only an avg of 3.67 manual messages every 2 users asked to the bot. This also concludes that it answers most of the questions as per the result seen in figure[4] and figure[3]

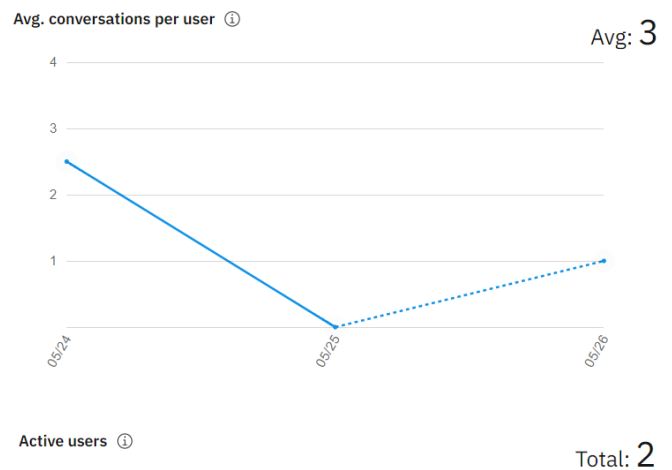


Fig.4. AVG manual Conversations Vs Number of users

Conclusions and Future Work

This paper has introduced a faster way to enable users to learn and develop a healthy lifestyle while exploring this project it also increases the enthusiasm within the users to go ahead and self-asses themselves whether they are needed a diabetic plan based on the questions asked. It also assists them in deciding a plan that is appropriate for their diet, and the bot provides a report whether they are in a severe or early stage of the disease. The purpose is to enable a faster way of suggesting diets based on diabetic type and help them book an appointment to the best recommended hospital by giving the user the choice based flexible appointments system.

There is hope that this system will be useful to people who are just in the preliminary stage of diabetes or those who anticipate in the near future by taking care beforehand by following the suitable diets and being healthy now and in the future. The focus of this work has been on implementing a Web-based platform with the Ai-Bot integration that will take into consideration the

various factors that affect users with diabetes and help them develop a healthy lifestyle which is very critical for every human with long term healthiness.

References

- [1].S. Hussain and G. Athula, "Extending a Conventional Chatbot Knowledge Base to External Knowledge Source and Introducing User Based Sessions for Diabetes Education" 2018, pp.698-703, doi:10.1109/WAINA.2018.00170.
- [2].Gunggu A, Thon CC, Whye Lian C. Predictors of Diabetes Self-Management among Type 2 Diabetes Patients. *J Diabetes Res.* 2016;2016:9158943. Epub 2016 Aug 3
- [3].Stafford, Richard. (2010). Constraints of Biological Neural Networks and Their Consideration in AI Applications. *Advances in Artificial Intelligence.* . 2010. 10.1155/2010/845723.
- [4].Jamili oskouei, Dr. Rozita & MousaviLou, Zahra & Bakhtiari, Zohreh & Bux Jalbani, Khuda. (2020). IoT-Based Healthcare Support System for Alzheimer's Patients. *Wireless Communications and Mobile Computing.* 2020. 1-15. 10.1155/2020/8822598.
- [5].L. Athota, V. K. Shukla, N. Pandey and A. Rana, "Chatbot for Healthcare System Using Artificial Intelligence," 2020 8th International Conference on Reliability, Infocom Technologies and Optimization (Trends and Future Directions) (ICRITO), 2020, pp. 619-622, doi: 10.1109/ICRITO48877.2020.9197833.
- [6].U. Bharti, D. Bajaj, H. Batra, S. Lalit, S. Lalit and A. Gangwani, "Medbot: Conversational Artificial Intelligence Powered Chatbot for Delivering Tele-Health after COVID-19," 2020 5th International Conference on Communication and Electronics Systems (ICCES), 2020, pp. 870-875, doi: 10.1109/ICCES48766.2020.9137944.
- [7].S. Mall, M. Gupta and R. Chauhan, "Diet monitoring and management of diabetic patient using robot assistant based on Internet of Things," 2017 International Conference on Emerging Trends in Computing and Communication Technologies (ICETCCT), 2017, pp. 1-8, doi: 10.1109/ICETCCT.2017.8280339.
- [8].J. Bozic, O. A. Tazl and F. Wotawa, "Chatbot Testing Using AI Planning," 2019 IEEE International Conference On Artificial Intelligence Testing (AITest), 2019, pp. 37-44, doi: 10.1109/AITest.2019.00-10.
- [9].Ayanouz, Soufyane & Anouar Abdelhakim, Boudhir & Benhmed, Mohammed. (2020). A Smart Chatbot Architecture based NLP and Machine Learning for Health Care Assistance. 10.1145/3386723.3387897.
- [10]. P. Kandpal, K. Jasnani, R. Raut and S. Bhorge, "Contextual Chatbot for Healthcare Purposes (using Deep Learning)," 2020 Fourth World Conference on Smart Trends in Systems, Security and Sustainability (WorldS4), 2020, pp. 625-634, doi: 10.1109/WorldS450073.2020.9210351.
- [11]. R. B. Mathew, S. Varghese, S. E. Joy and S. S. Alex, "Chatbot for Disease Prediction and Treatment Recommendation using Machine Learning," 2019 3rd International Conference on Trends in Electronics and Informatics (ICOEI), 2019, pp. 851-856, doi: 10.1109/ICOEI.2019.8862707.
- [12]. D. P. Sarkar, M. F. Farden, M. A. Islam, R. J. Rony and T. Motahar, "A Low-cost Healthcare Bot for Elderly People," 2019 3rd International Conference on Imaging, Vision & Pattern Recognition (icIVPR), 2019, pp. 18-23, doi: 10.1109/ICIEV.2019.8858567.
- [13]. C. Chun Ho, H. L. Lee, W. K. Lo and K. F. A. Lui, "Developing a Chatbot for College Student Programme Advisement," 2018 International Symposium on Educational Technology (ISET), 2018, pp. 52-56, doi: 10.1109/ISET.2018.00021.
- [14]. S. Mall, M. Gupta and R. Chauhan, "Diet monitoring and management of diabetic patient using robot assistant based on Internet of Things," 2017 International Conference on Emerging Trends in Computing and Communication Technologies (ICETCCT), 2017, pp. 1-8, doi: 10.1109/ICETCCT.2017.8280339.
- [15]. Bates, Mary. (2019). Health Care Chatbots Are Here to Help. *IEEE Pulse.* 10. 12-14. 10.1109/MPULS.2019.2911816.