Diabetes Prediction System using Classification techniques & Healthcare Consultation using Artificial Intelligence

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ABSTRACT

Diabetes is a global diseases that has affected over 388 million people and cause many deaths and serious condition. This is due to the late detection and diagnosis of the disease as it causes a delay in treatment and becomes harder to prevent it from worsening. It is important to detect the disease at an early stage and start early treatment to prevent it from becoming life-threatening. The aim of this project is to produce a system that can accurately predict the disease in real-time for the user and provide online consultation by doctors and chatbots which will help prevent major illnesses in future. The project targets anyone who may want to check whether they have the disease or not. It also serves as a platform for doctors to provide online consultation to their clients. The project will follow the Knowledge Discovery in Database approach. Implementing the system will reduce time consumption, produce real-time results cost-freely & early detection of diabetes. The project is expected to produce a functional system which accurately predicts diabetes based on the data entered in real-time to minimize visits to clinics and cut the cost of the test while providing online health consultation.

Keywords: *Diabetes Prediction System, Classification techniques, Artificial Intelligence, Healthcare Consultation*

RESEARCH HIGHLIGHTS

According to Editor (2019), it is estimated that 415 million people are living with diabetes in the world, which is estimated to be 1 in 11 of the world's adult population. 46% of people with diabetes are undiagnosed. This is supported by Information et al, (2020) that, early detection and treatment of diabetes is an important step toward keeping people with diabetes healthy. It can help to reduce the risk of serious complications. Therefore, it shows the importance of diagnosing the disease at an early stage so that the patients can start to tackle and treat the disease early which will potentially delay or prevent major complications or even death. This project focuses on accurately predicting the presence of diabetes type 2 in a patient in real-time. According to the World Health Organization, more than 34 million Americans have diabetes (about 1 in 10), and approximately 90-95% of them have type 2 diabetes. It will produce a utilizing information mining framework which can help to anticipate whether the patient has diabetes or not. Moreover, foreseeing the illness early prompts treating the patients early and minimizes chances of serious illnesses and early death."

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Research Objectives

The proposed project will be able to accurately predict diabetes in a patient or the user who uses the system by prompting them to enter required details. Furthermore it provides access to users to various different hospital links and immediate online consultation by doctors on the system itself. It will also prompt user to enter their data needed to predict diabetes and show the results to the user in a clear and understandable manner to avoid any doubts or confusion. The system is easy to use, free of cost and gives result in real-time. So, the user does not need to physically visit a hospital or a clinic, nor pay for the blood test and wait for days to get their results. The research objectives are to study and research how

diabetes affects a person and promote early diagnosis. It also present a Decision Tree and Naïve Bayes model for diabetes prediction in a person. Finally, it develop an effective prototype application including a chatbot.

Methodology

As the project involves implementation of a system that predicts diabetes, and a lot of noisy datasets, hence, Knowledge Discovery in Database methodology will be followed to pre-process and get insights of the data in order to better understand the performance metrics that are required in the process of predicting diabetes. The data is from National institute of Diabetes, PIMA Indian Diabetes Dataset which will help to diagnostically predict the presence of the illness in a person. Interview is one of the fact-finding techniques that is used to collect information and system requirements from the target its audience or user. This technique was chosen because interviewing a domain expert and, in the case of this intended project, a doctor helps one to get detailed information and feedback or even suggestions that will help in project. Furthermore Knowledge-based methodology will also be used for the chatbot included in the system that helps to answer user's queries or make appointments.

Results

When the respondents were asked how would the diabetes prediction system will help the healthcare industry, they responded that the system may encourage early treatment which will reduce the chances of getting major complications and it can also help to identify areas where more people are likely to have diabetes, so scientists can research on that.Accordin to them, Machine learning are playing a huge role in the healthcare industry and affecting the medical professionals and their performance. They added that, technology has helped the medical professionals and healthcare workers to improve their performance by greatly reducing the workload, since the technology has allowed automation of tasks in many areas. Additionally, the robot and such intelligent machines help the healthcare workers to diagnose a patient properly and effectively. They responded that, the system may promote early diagnosis as it would eliminate the need to physically visit the hospital and get tested which would also cost an individual. Since the system is available and accessible to everyone online, this gives convenience to people to test themselves for diabetes and in turn promotes early diagnosis. According to the respondents, the system have a commercial value as hospitals and labs may deploy these types of systems to minimize the need to perform a blood test for diabetes diagnosis. They also added that, accuracy is the most important thing to consider when working on projects in the medical field.

Findings

55.8% of the respondents are male. 67.4% of the respondents are in the age category of 15 – 24 years old. 37.2% of the respondents consume sugary food regularly. 83.7% of the respondents claimed do not have diabetes and never gotten tested for diabetes. 76.7% of

the respondents have never been tested for diabetes. 22.2% argued that getting tested for diabetes is very time consuming while 16.7% of the people say that it is very costly and hassle. about 13.9% of the respondents think that it is a very long process to get tested for diabetes. 62.8% of the people prefer the diabetes prediction system to be an online website while only 37.2% of people want it to be a mobile application. 81.4% of the respondents stressed that they would use an online system that would help them test for diabetes while only 18.6% of the people have said that they would not use it. 81.4% of the respondents stressed that the intended system should also provide it online consultation to the user one 9.3% of the respondents are unsure of it and the rest think it is not needed.

Acknowledgement

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