Smart Health Care Implementation Using NaïveBayes Algorithm

Dr. K. Suresh Babu, Dr.G.Murali, Paul John Maddala
Professor,Computer Science and Engineering, VVIT, Nambur, Andhra Pradesh, India.
Professor,Computer Science and Engineering, JNTUACEP,Pulivendula,Andhra Pradesh,India.
CSE Graduate, Computer Science and Engineering, VVIT, Nambur, Andhra Pradesh, India.

Abstract
With today's lifestyle, heart disease and diabetes are two of the most frequent chronic diseases that have become a mainstream health issue. It is critical to recognise the signs and treat the sickness as soon as possible. Machine learning is utilised in a variety of applications. It is a process of determining a vast number of pre-existing data in order to generate new data. In the health-care system, Machine learning is critical for predicting illness based on symptoms and classifying diseases such as diabetes and heart disease. The primary goal of Machine learning in the health-care system is to develop a new automated tool for identifying and disseminating relevant health-care data. Various attributes are given into the system here.
*Keyword***:** Machine learning, Heart disease, Diabetes,Symptoms, Naïve Bayes algorithm and R tool.

I.INTRODUCTION
Machine learning has been one of the most effective tools when it comes to handling vast amounts of data [1]. In today's rapidly growing generation, and with new emerging technologies at our disposal, data becomes even more important than ever in everyone's lives. This applies especially to fields such as healthcare, which can benefit individuals on a personal level.
Every year, a large amount of data is generated in the health industry, which might be useful if used correctly. Many studies are currently being conducted in order to provide society with the most efficient and cost-effective healthcare system possible. Nonetheless, not all of the research findings have progressed toward the goal. When it comes to the patient's health, one must be more vigilant to ensure that the developed system has the desired influence on disease treatment. One could wonder why there is a need for computer assisted healthcare when there are so many doctors in the globe. This question is justified for a number of reasons. In many regions of the world, there is still a shortage of physicians who can properly investigate disease symptoms, and the cost of consultation is rising dramatically. There are a number of issues that must be solved in order to improve the current system and offer humanity with the most accurate results. The most crucial part of maintaining a healthy society is human health. There have been many life-threatening disorders in this fast-growing generation and quick change in lifestyle, which may result in dreadful outcomes [9]. The two most frequent diseases in this category are heart disease and diabetes. These chronic diseases can affect anyone of any age, from infants to senior individuals. It becomes essential for everyone to notice the symptoms of sickness early on and receive appropriate treatment. In the documented medical services, Machine learning plays a critical role. The task of reviewing basic information and extracting critical information using computers is known as information acquisition. Machine learning is a method for discovering and displaying large amounts of data [2]. It is used to recognize information and display it to individuals in a clear and understandable manner.
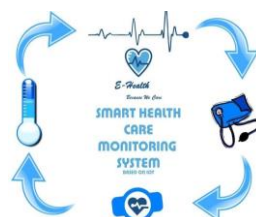

Fig.1: Smart Healthcare

The welfare insurance industry collects vast amounts of data on medical treatments, which is unfortunately not "mined" to show good decision-making skills [7]. Enforcing information mining strategies can help to cure this problem. Appropriate data analysis methods can improve the accuracy of medical findings. Unfortunately, not every physician is skilled in performing medical analyses and there are often lack resources available at health organizations. As a result, incorporating automation into the field of medical diagnosis could be immensely advantageous to doctors. It is possible for social insurance companies to choose their preferred point of view   Machine learning can be compared as a smart suggestive gadget. In terms of medical information, it is possible to gather knowledge and facts about an infection from the patient's explicit put away estimates. In this sense, data mining has developed into a field within human services [6]. By structuring information mining systems, it is possible to predict the productivity of therapeutic treatments. The health prediction framework using the nave Bayes Outcomes information mining system demonstrates that this method is the best at understanding the targets of the defined mining objectives. [4] It can predict the likelihood of patients developing heart disease or diabetes using medical characteristics such as age, sex, pulse, and glucose. It allows for the collection of large amounts of data, such as designs and relationships between restorative components linked to heart disease. Smart Health is a framework that is web-based, easy to use, versatile, solid, and scalable. To improve the scope of the developed framework, the R tool has been integrated to visualize the results in the most reliable structure.

II.RELATED WORK

Machine learning has been popular in the realm of healthcare, and it has played an important role in identifying new trends in the sector. Machine learning takes existing data from a database and transforms it into new studies and outcomes. Database management, machine learning, and artificial intelligence are all used in machine learning to evolve new patterns and the information linked through these designs. The fundamental goal is to automate or semi-automate the evolution of information. A review of machine learning for healthcare forecasting has been proposed by Sujatha R et al. [3]. The paper summarised statements about machine learning structure, management, economics, and medical health care. A variety of tests must be performed to determine sickness. The rate of testing can be reduced using machine learning approaches. In terms of time and performance, the reduced number of tests is critical. Machine learning algorithms have been developed by K. Gomathi to estimate different diseases [4]. The method identifies machine learning algorithms for predicting various types of sickness. The study looked at a number of research publications with an emphasis on heart disease, diabetes, and breast cancer. J48 and decision tree approaches are compared in this researchThe outcome of machine learning methods benefits health care systems by allowing clinical organisations to group patients with similar illnesses and give them with effective therapy [6]. Machine learning is helpful in forecasting the length of time patients will spend in the hospital, doing health analyses, and establishing an accurate data system [3]. Prashant Tiwari et al. have presented an android-based health-care system [5]. This allows the user to receive rapid consultation for the ailment in question via a smart health maintenance app. Several diseases with similar symptoms keep information in the system. The technology allows the operator to discuss their symptoms and problems.

III.MOTIVATION

Heart disease and diabetes are two examples of diverse, unending diseases that commonly occur and spread among people. A substantial majority of the general population is unaware of the illnesses' side effects and their never-ending problems. Various data mining devices are used to predict the precision level in various social insurance issues, therefore we decided to develop a framework that will aid in the detection and prediction of cardiovascular sickness and diabetes. To enable people who are suffering various symptoms to confirm the condition that is causing their symptoms and anticipate the appropriate disease, such as heart disease and diabetes in patients. The link between these illnesses can be deduced based on the symptoms that are associated with these infections.

IV.METHODOLOGY

The goal of the methodology is to develop a predictive health care system that utilizes machine learning techniques such as the Naive Bayes algorithm; this process is known as "Knowledge Discovery," and it involves the following steps:

Data Selection

Data is taken from websites, and the data that is relevant to our mission is filtered and saved.

Data Pre-processing

This method is part of Machine Learning and involves transforming raw data into a readable format [10]. In particular behaviours, practical knowledge is frequently partial, unequal, and/or missing, and it is expected to contain many inaccuracies.

Naïve Bayes Algorithm

The Bayes hypothesis is based on the rare occurrences of two distinct events. It is often used to generate possibilities for given information. For example, if a patient exhibits certain symptoms, the Bayes hypothesis can be used to increase the likelihood that a proposed diagnosis is correct, assuming that the observations are accurate. Specifically, the proximity of one element of a class to another element does not affect the proximity of another element. For example, a fruit can be identified as an apple if it is red and round in shape, even though these characteristics depend on other characteristics. A naive Bayes classifier uses these attributes to increase the probability that the fruit is an apple. Credulous Bayes classifiers can be created in various ways depending on the specific probability model in a supervised learning setting. In complex situations, Naive Bayes classifiers often perform significantly better because they consider independent factors for the purpose of predicting events.
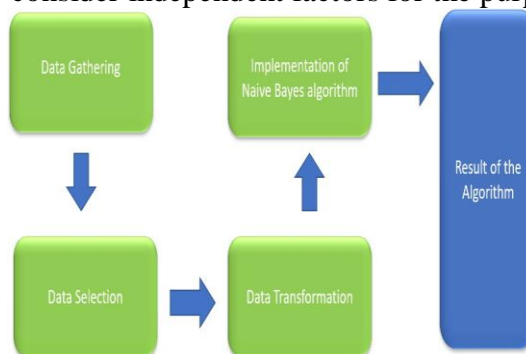

Fig. 2: System Architecture

V.RESULTS

The study' conclusion is to look for key patterns to forecast and classify whether the patient's symptoms suggest heart disease, diabetes, or neither. R shine, an open source package in R that provides the most sophisticated web application framework, is used to present the findings. The projected disease for the supplied attribute values is shown in the screenshots below.
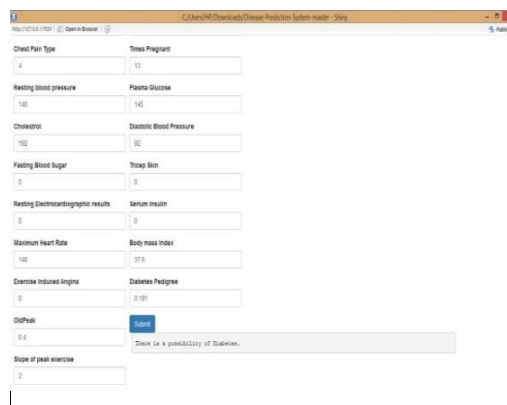

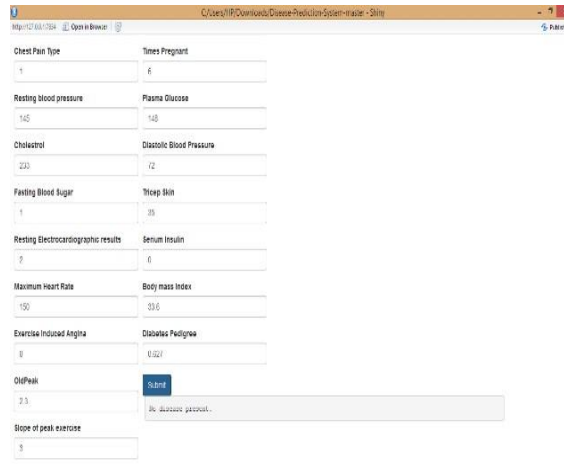Fig. 3: A screenshot demonstrating the absence of disease.

Figure 4 depicts the possibility of heart illness because the user input fits the appropriate heart disease symptoms from the dataset.
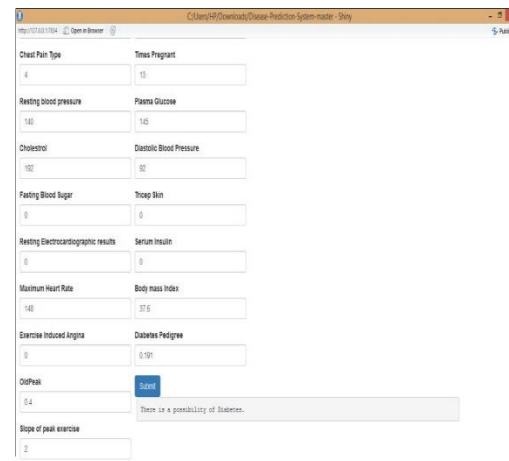

Fig. 5: A Screenshot showing the possibility of diabetes

Figure 5 depicts the possibility of diabetes, since the user input fits the appropriate diabetic symptoms from the dataset.

VI.CONCLUSION

Machine learning has tremendous implications in the medical industry, and it refers to a broad procedure that necessitates a thorough understanding of clinical criteria. Information obtained via the use of machine learning algorithms can be used to create effective decisions that improve clinical association and patient well-being. Machine learning necessitates appropriate innovation and systematic tactics, as well as frameworks for detailing and following that can aid in result estimation. The framework would significantly reduce human effort, reduce the cost and time required in terms of HR and skill, and improve analytic precision. The prediction of illnesses using Machine Learning applications is a challenging and dangerous task because the data found is noisy, unnecessary, and large. In this case, information mining instruments reveal to be extremely valuable in the investigation of therapeutic information learning. The framework has been shown to be effective in predicting coronary artery disease and diabetes.

VII.REFERENCE

[1] Pinky Saikia Dutta, Shrabani Medhi, Sunayana Dutta, Tridisha Das, Sweety Buragohain, "Smart Health Care Using Machine learning", International Journal of Current Engineering And ScientificResearch, Volume- 4, Issue-8,2017.
[2] Sujatha R, Sumathy R, Anitha Nithya R, "A Survey ofHealth Care Prediction Using Machine

learning ", International Journal of Innovative Research in Science, vol. 5, Issue 8, August 2016.

[3] K .Gomathi, Dr. D. Shanmuga Priyaa, "Multi Disease Prediction Using Machine learning Techniques", International Journal Of System and Software Engineering, Volume 4, Issue-2, December 2016.

[4] Vishwakarma, Pushpanjali Patel "Smart Health Care", International Research Journal of Engineering and Technology, Volume 4, Issue 4, April 2017.

[5] Ionuț ȚĂRANU, "Machine learning in healthcare: decision making and precision", Database Systems Journal vol.

[6] VI, no. 4/2015

[7] Ajinkya Kunjir, Harshal Sawant, Nuzhat F. Shaikh, "'Machine learning and Visualization for prediction of multiple diseases in health care", International Conference On Big Data Analytics and computational Intelligence (ICBDACI), IEEE 2017.

[8] M.A. NisharaBanu, B.Gomathy, "Disease Forecasting System Using Machine learning Methods", International Conference on Intelligent Computing Applications, IEEE 2014.

[9] Ms. Ishtake S.H, Prof.Sanap S.A., "Intelligent Heart Disease Prediction System Using Machine learning Techniques" International J. of Healthcare & Biomedical Research, Volume: 1, Issue:3, April 2013.

[10] Shadab Adam Pattwkari and Asma Parveen, "Prediction System For Heart Disease Using Naïve Bayes", International Journal of Advanced computer and Mathematical Sciences ISSN2230-9624. Vol-3,Issue 3, 2012,pp 290-29