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Decision Tree based Health Prediction System

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Abstract: Now a days, diseases have become one of the major causes of human death. To reduce this rising growth of medical problems, data mining techniques have been popularized on higher scale. It has potentially enhanced the clinical decisions and survival time of patients. But choosing appropriate data mining technique is the main task because accuracy is the main issue. The paper presents an overview of the decision tree technique with its medical aspects of Disease Prediction. Major objective is to evaluate decision tree technique in clinical and health care applications to develop accurate decisions. It uses already existing data in different databases to transform it into new research and accurate results. Managing patient's historical data is also made easy and less complex with less effort. This paper describes health prediction results online using decision tree technique with maximum accuracy and presents a glimpse of how this website will work.

Keywords: Decision tree technique, Disease prediction, Data mining.

I. INTRODUCTION

This is a Web based application named 'Decision Tree Based Health Prediction System' as Decision trees are one of the most regularly utilized prescient demonstrating calculations practically speaking in view of its flexibility, easy comprehension and debugging. Here we propose a system that permits users to get moment direction on their medical problems on the web. The system is fed with various symptoms and the diseases associated with that symptoms. The Health Prediction System is an end client support and online web based application.

The system contains information of different manifestations and the sickness/disease related with those indications. The system permits users to share their symptoms and issues. It at that point forms user's indications to check for diseases that could be related with it. Decision Tree strategy have been utilized to figure the most precise sickness that could be related with a patient's symptoms.

It is the appliance of Computing and communication technologies to optimize health information science by collection, storage, effective retrieval (in due time and place).The proposed system is especially employed by the all the people where confidentiality and integrity of the info has utmost importance. Computer assisted information retrieval may help support quality deciding and to avoid human error. Imagine a doctor who has got to examine 5 patient records; he or she is going to undergo them with ease. If the amount of records grows with a time constraint, it's almost certain that the accuracy with which the doctor delivers the results won't be as high.

II. LITERATURE SURVEY

1) *Smart Health Care System using Data Mining K.VEMBANDASAMY, IJISET International Journal of Inno vative Science, Engineering& Technology, Vol. 2 Issue 9, September 2018*-The healthcare industry collects huge amounts of healthcare data which, unfortunately, are not "mined" to discover hidden information for effective decision making. Data mining has been a current trend for attaining diagnostic results. Huge amount of unmined data is collected by the healthcare industry in order to discover hidden information for effective diagnosis and decision making.
2) *Analysis of health care data using different data mining techniques Gosain and A. Kumar, " 2009 International Conference on Intelligent Agent & Multi-Agent Systems, Chennai,* - Data mining is an important area of research and is pragmatically used in different domain like finance, clinical research education, healthcare, etc. Further the scope of data mining has thoroughly been reviewed and surveyed by many researchers pertaining to the domain of healthcare which is an active interdisciplinary area of research.
3) *Data mining techniques for medical data: A review Parvez, S Qamar, SQA Rizvi – International Journal of Computer Applications, 2018* - Data mining is an interesting field of research whose major objective is to acquire knowledge from large amount of data. With advances in healthcare related research there is a wealth of data mining techniques available. However, there is a lack of effective analytical tools to discover hidden and meaningful patterns and trends in data.

III. MODULES AND ITS DESCRIPTION

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A. Admin Module

Admin has the overall authority of the system. The admin can include new symptoms and diseases in the system.
An admin adds the doctor and sends an enlistment email indicating his id and password.
Everything about the patient and specialist is shown in the admin module.

B. Patient Module

1) *Patient Login:* Patient logins to the framework utilizing his ID and Password.
2) *Patient Registration:* If Patient is another client, he/she needs to enrol by giving subtleties then he/she gets it id and secret word.
3) *Disease Prediction:* Patient will indicate the no. of manifestations he/she is encountering and likewise the framework will anticipate malady.
4) *Search Doctor:* Patient can scan for specialist by their name or address. The framework will consequently propose the specialist with all the subtleties of the specialist.
5) *Feedback:* Patient will give feedback. This will be accounted for to the administrator.

C. Doctor Module

1) *Doctor Login:* Doctor will get to the framework utilizing his User ID and Password gave by administrator by email.
2) *Patient Details:* Doctors can see patient's subtleties.
3) *Notification:* Doctor will get notice on what number of individuals have scanned for him/her alongside the patient's history.

IV. PROBLEMS IN THE EXISTING SYSTEM

Day-to-day advancement of technologies may question us about enhancement in making human decisions in health sector. The lack of ability of electronic health record systems to exchange and make use of information hinders even the simple computations as access to relevant data in health sector plays vital role. Also health data has privacy issues which in turn makes data collection and sharing of data complex. Earlier the system was manual and file based for treatment and maintenance of information. It was Space and Time consuming which affected the efficiency of the daily activities performed at the hospital. In the previous system managing historical data of patients was tedious. We often need to visit the clinic for diagnosis due to unavailability of doctors. There was no feedback system in the existing system for taking feedback from patients. Current system requires huge amount of information regarding treatments, diseases consultation, etc. spread throughout hospitals which does not meet management standards. Also multiple copies of the same information which exists in the hospital lead to many inconsistencies. To get proper treatment of disease and to consult right doctor, managing data efficiently in various data stores was a tedious job which resulted in less accuracy of disease prediction. Also previous system was based on data mining techniques like navies Bayes, KNN,etc. which has less accuracy rate compared to decision tree technique mentioned below in comparison table.

V. PROPOSED SYSTEM

The system is meant to use intelligent decision tree data processing technique to guess the foremost accurate illness supported patient's symptoms. The system is fed with many symptoms and therefore the diseases related to it .The user provides the symptoms he/she is facing and checks for further symptoms Accordingly the system checks the InfoBase extracts the data from it and predict the accurate disease that the person is affected by. The most a part of this technique is that it gives multiple symptom options in order that the patient could search every possible symptom he/she is facing. This results in the accuracy in prediction.

If user's symptoms don't exactly match any disease within the database, then it shows the diseases user could probably have supported his/her symptoms. If the system isn't ready to provide suitable results, it urges users to travel for biopsy, x-ray or CT scan.

In proposed system the admin adds the doctor for security reasons because it is a web application so there are chances of getting fake registrations. Thus the safety and privacy is maintained. The proposed system features a feedback option which can help admin to form this application more upgraded and solve all the problems associated with the system. This technique provide many expertise doctors. The small print and address of the doctors are provided thus patient can directly search doctors by name or address.

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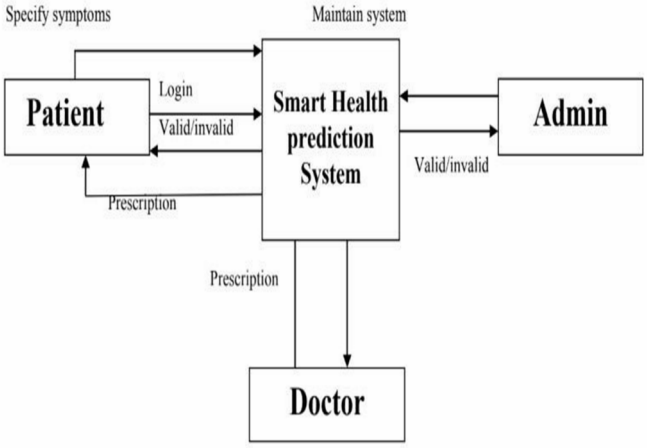
VI. ARCHITECTURE DESIGN



VII. METHODOLOGY

Decision Tree Analysis is a general, prescient demonstrating instrument that has applications crossing various zones. All in all, Decision trees are developed by means of an algorithmic methodology that distinguishes approaches to part an informational collection dependent on various conditions. Decision Trees are a non-parametric administered learning technique utilized for both characterization and relapse assignments. The objective is to make a model that predicts the estimation of an objective variable by taking in straightforward choice standards derived from the information highlights. The choice principles are by and large in type of on the off chance that else articulations. The more profound the tree, the more unpredictable the principles and fitter the model.

A. Decision tree Algorithm

1) System asks for first symptom from the user and inserts into final table.
2) And related to that symptom it checks all disease. And searches for all the disease which has these symptoms in it and marks its flag as 1.
3) Then system looks for disease whose flag is 1, and takes 1 symptom from that disease and checks if it is present in final table if it's not present then adds it into temp table, or else brings new symptom and again checks it.
4) So finally we will have set of temporary symptoms based on its final symptom.
5) And gives user options to choose from this temp table set of symptoms.
6) User selects new symptom and that is also inserted into the final table.
7) Again new set of symptoms are generated based on this final symptom. And user is given choice to select form
8) If user select none of above then systems scans the final symptoms and shows the related disease to that symptoms.

VIII. ADVANTAGES

A. Easy to Understand.

Decision tree output is extremely easy to know even for people from non-analytical background Useful in Data exploration Decision trees are one among the fastest ways to spot most vital variables and relation between two or more variables. Feature selection and variable screening are implicitly performed by decision trees.
Decision trees do not requires more effort from users for data preparation.
Less data cleaning is required in comparison with other designing and modelling techniques. It's not influenced by outliers and missing values to a good degree.
Data type isn't a constraint.
It can handle both numerical and categorical variables also can handle multi-output problems.

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IX. IMPLEMENTATION

To implement this website, the implementation divides in two parts that is front end and back end of this site. Front end includes the design of this site and back end includes the main source code of this site. Front end is designed using HTML and CSS. For back end we used asp.net for coding and MySQL for database. The project is implemented in visual studio 2010 and sql server.

X. OUTPUT SCREENS

Fig 1 Login Page

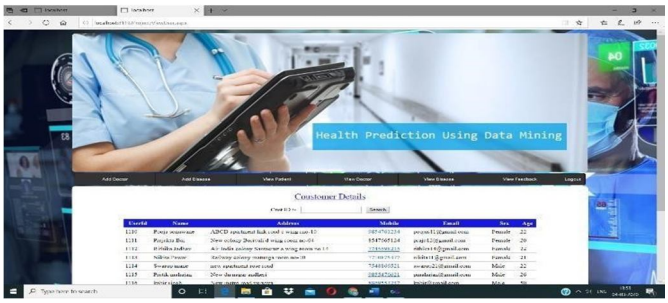

Fig 1.1 Admin Login

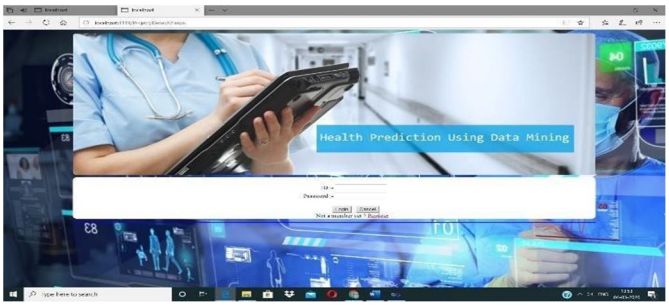

Fig 2 Patient Login

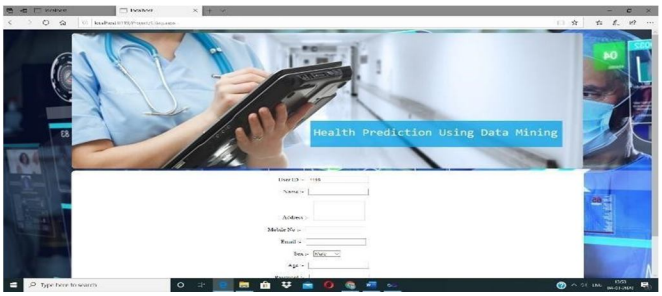

Fig 2.1 Patient Registration Form

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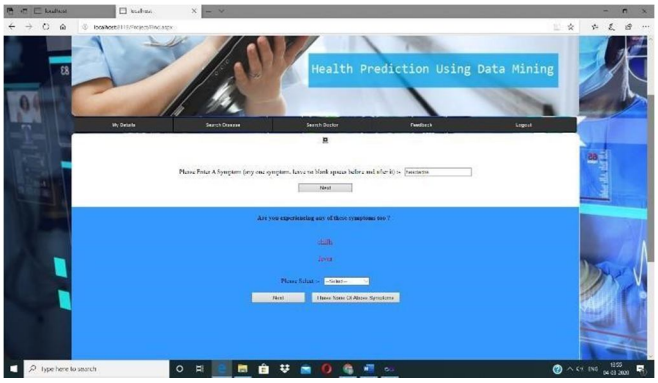

Fig 2.2 Disease Prediction

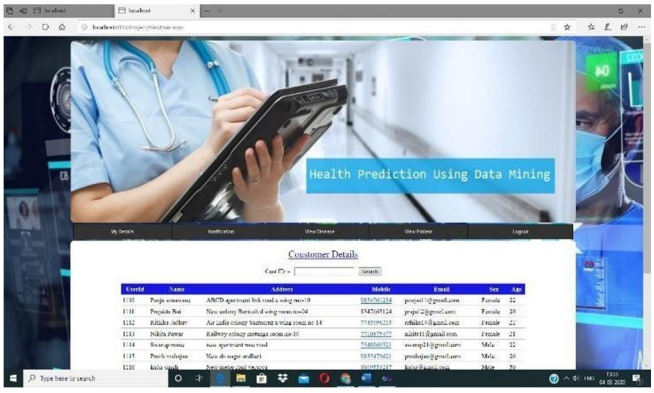

Fig 3 Doctor Login

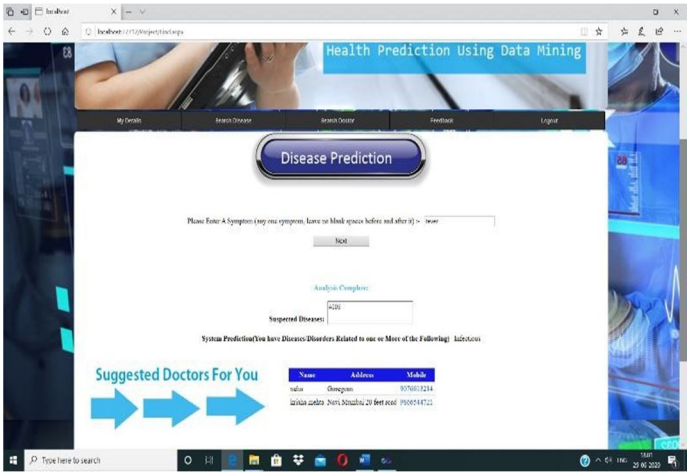

Fig 4 Predicted Disease And Suggested Doctors

XI. CONCLUSION

This paper reviews the decision tree technique for health prediction. The need for data mining has increased and have very much importance in the field of medicine, as it represents comprehensive process that demands thorough understanding of needs of the healthcare organization. Knowledge gained with the use of decision tree data mining technique can be used to make successful decisions that will improve success of health care organization and health of the patients. Decision tree technique gives the accurate results for predictions. Health care organizations that use data mining applications have likelihood to predict future requests, needs, desires and conditions of the patients and to form adequate and optimal decisions about the treatments.

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XII. FUTURE SCOPE

Further enhancements that can be done in the system could be converting this web application into an android app.It will be then available to users on mobile basis and its use can be further increased.

The feature of getting doctor online on chat so that patients can directly talk to the concerned doctors can enhance the web application.

We can upgrade this application by also adding voice and video chat feature. This will make this web application predictable in true sense.

XIII. ACKNOWLEDGMENT

First of all, we would like to thank our project guide Prof. Narendra Gawai for giving us the courage, guidance and suggestions for doing this major project. We gathered useful and valuable information about data mining techniques for our project the process of analysing and doing research on the valuable inputs helped us to explore knowledge, was a continuous source of inspiration and a unique experience.

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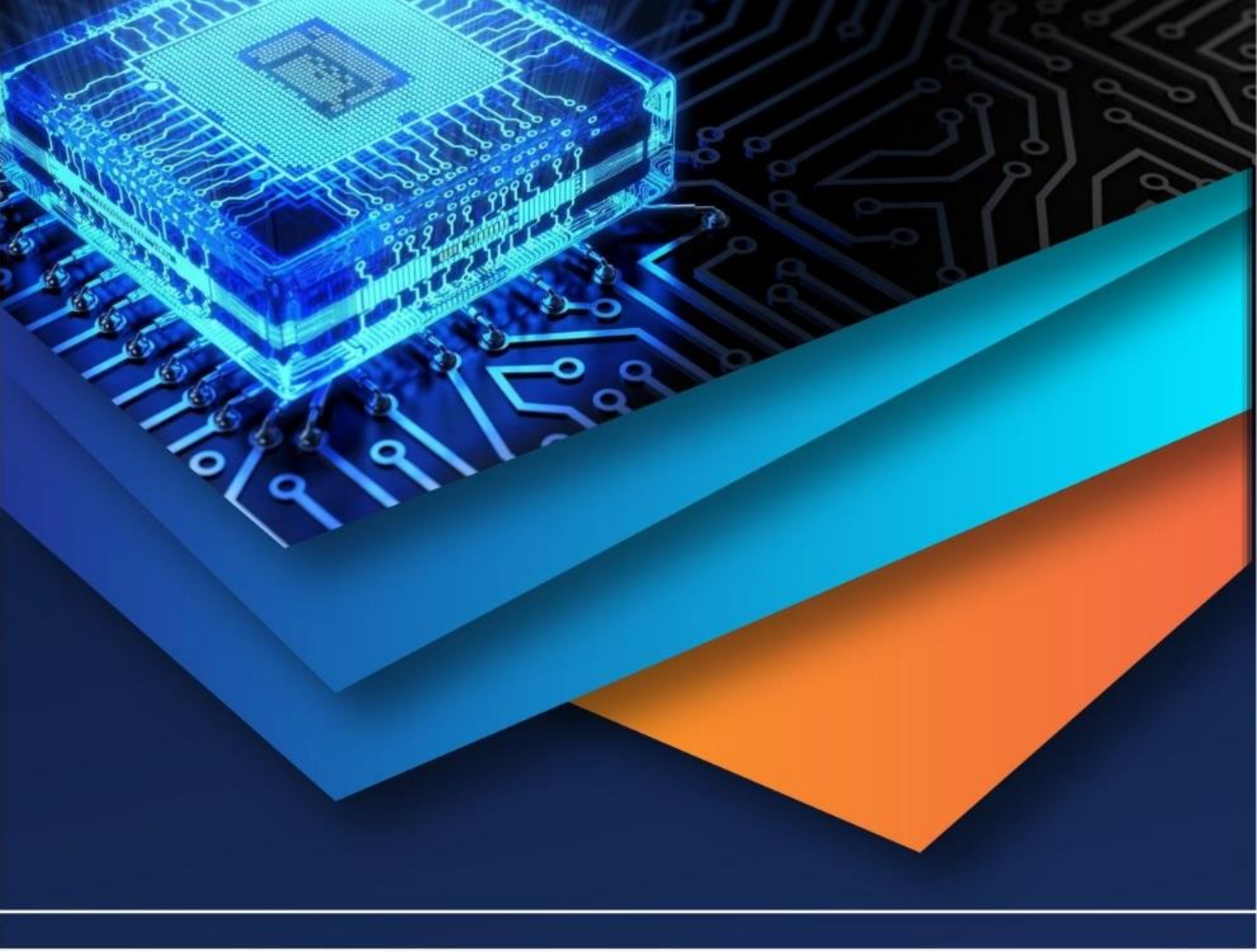

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