

A Security Approach for Heart Diseases for Active Health Care Consumer Using Data Mining

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Abstract— Data Mining is a method that requires analyzing and exploring large blocks of data to glean meaningful trends and patterns. In today's life, every person on earth relies on allopathic treatments and medicines. Data mining techniques can be applied to medical databases that have a huge scope of opportunity for textual as well as visual data. Medical errors are generally costly and harmful. They caused a large number of deaths worldwide annually. A clinical decision support system offers the opportunity to reduce medical errors and also to improve patients safety. Certainly, one of the most crucial facet in applying such a system is the diagnosis and therapy for heart diseases. Data mining classification techniques are implemented to analyze the different kinds of heart based problems. This paper is objective at developing a heart disease prediction system using data mining clustering techniques. The health's care system is "data rich" however "knowledge poor". This healthcare data can be used to extract knowledge for antecedently disease prediction. Currently data mining techniques are widely used in clinical expert systems for prediction of various types diseases. These techniques discovers the hidden relationships and patterns of the healthcare data. Thus, a gesture to the make use of knowledge and experience of several specialists and clinical screening data of patients composed in databases to relieve the diagnosis procedure regarded as a great challenge. The healthcare system industry gathers enormous amounts of heart disease data that unfortunately, didn't mine to determine concealed information for effective diagnosing.

Index Terms— coronary Heart Disease Prediction, Data Mining Technique, data rich, Doctor

I. INTRODUCTION

Data mining is process of education useful information from large amount of databases. Data mining is extremely useful in an exploratory analysis because of nontrivial information in large volumes of data. The data mining techniques are useful for predicting the various Diseases in the medical field. Cardiovascular diseases and coronary diseases are one of the highest- flying diseases of the modern world. According to world health organization about more than 13 million deaths occurs worldwide, every year due to heart problems. It is also one of the deadly diseases in India which causes maximum casualties. The diagnosis of this disease is intricate process. It

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should be diagnosed accurately and correctly. Due to limitation of the potential of the medical experts and there. Unavailability at specific places put their patients at high risk. Normally, it is diagnosed using intuition of the medical specialist. It would be highly advantageous if the techniques will be integrated with the medical information system. Prediction of diseases plays an important role in data mining. Healthcare organizations can reduce costs by accomplishment of computer based data and/or decision support systems. Healthcare services data is very vast as it incorporates patient records, resource management information and updated information. break down information. Treatment records of many patients can be stored away in computerized way; furthermore data mining methods may help in finding out a few vital and basic inquiries related with healthcare organizations. There are different reasons for the occurrence of Heart Diseases, which can be frequently investigated through the Attribute Set related to different test results of Patients. The different sources of medical data are Medical Analysis, Diagnostic Centres, past Case Sheets, Doctor Prescriptions. Coronary Heart diseases can be predicted through the analysis made on some attributes like age, sex, chest pain type, blood pressure, cholesterol, fasting blood sugar, Maximum heart rate achieved. Based on the values of the attributes, we make indexes for all associated frequent item sets. The presence of these item sets depends on the threshold value specified. Data mining techniques like Kmeans clustering algorithm is used for validating

II. SYSTEM ARCHITECTURE

Architecture of the system

This android application uses java language in software known as android studio. The application has two login pages one for user login(user interface for patient) and admin login(login for the admin).Here the machine learning code which is written in python would be uploaded to the cloud and the symptoms entered by the user in the application would be sent to the cloud in json format and the output will be retrieved in the same format and the most probable disease will be predicted. Also a full page information about the particular disease will be presented. The next activity page will contain the top 5 average rating drugs which are relevant to the disease. A feedback form will also be provided, so that if the patient checks with a real doctor then how accurate was the disease prediction. This would help improve the application in future.

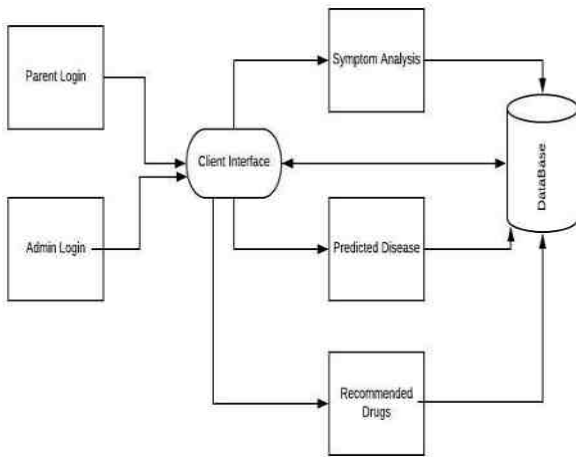


Fig 1: Data Flow Architecture

Existing Systems

The existing systems suffer from the drawback that only limited types of data collection modules. as per the current situation facing the world , the large number of covid-19 patient the traditional way of storing of data is not suitable way

Proposed System

This application aims at collecting the medical records of patients in the database and by using that the Heart Disease such as Cardiac arrest and the Heart Attack is predictable. This will save the lot of patient’s lives. Now a day we have lot of patient’s records and that not properly utilized. In this application, we have used the data mining technique to mine the relevant data, which we need to predict the Heart Disease. In the application, there are modules, which is for Doctor and Patient. When the patient is new to the system, he/she has to register in the application henceforth they can able to track their health status, whenever they go for a treatment. Doctor would able to access all the client’s Health Records and there is a feature to do analysis. It will bring the various records and analysis in the Graph Format therefore, it makes the process easy for the doctor.

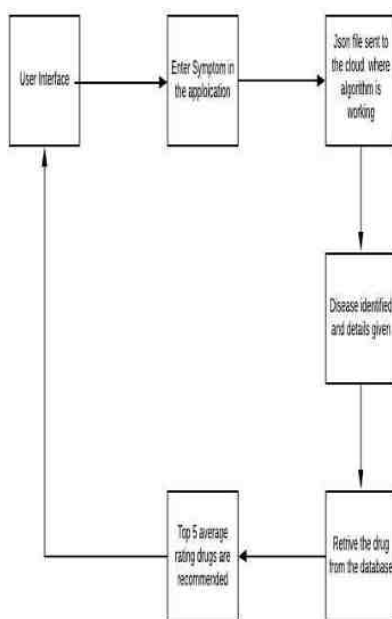


Fig 2: proposed system

Heart Disease Prediction Using Support Vector Machine

Healthcare industry collects spacious disease related data that is unfortunately not mined to discover hidden data or information that could be used for effective decision making. It aims to understand support vector machine and use it to predict lifestyle diseases that an individual might be susceptible to. Moreover, we propose and simulate an economic machine learning model as an alternative to deoxyribonucleic acid testing that analyzes an individual’s lifestyle to identify possible threats that form the foundation of diagnostic tests and disease prevention, which may grow due to unhealthy diets and excessive energy intake, physical dormancy, etc.

III. MODULES IMPLEMENTED

1. Patient Module

- Patient Register
- Patient Login
- Patient Disease History
- View Disease Report

2. Doctor Module

- Doctor Register
- Doctor Login
- Doctor Analyze Report
- Performance Report

STEPS:

Patient:

1. Login/Register in the Application
2. Upload the Basic Health Information
3. View the Report History
4. View the Disease Report
5. Logout from the Application

Doctor:

1. Login/Register in the Application
2. Analyze the Patient’s Health Report
3. View the Performance Report
4. Logout from the Application

MODULES DESCRIPTION:

• Patient’s Module:

Patients register their details like name, email, phone, username and password. Patient logs into the system with registered username and password Patient enter their disease history attribute details like age, gender, smoking habit, drinking habit, fast food intake habit, whether they are overweight, whether they are mentally stressed, whether they have pain in chest, blood pressure detail, blood sugar details. Patient disease history virtue values are analysed with naive bayes algorithm and finally Disease prediction is show to user as graph.

• Doctor’s Module:

Doctor registers their details like name, email, phone, specialist in, username and password. Doctor logs into the system with username and password. In this module doctor can take a view patient disease history attribute details like age, gender, smoking habit, drinking habit, fast food intake habit, whether they are overweight, whether they are mentally

stressed, whether they have pain in chest, blood pressure detail, blood sugar details. In this module doctor can take view overall clustered report. The cluster report will say large percentage of heart attack and heart related disease is due to smoking habit or drinking habit or fast food intake habit or stress factor, etc. The report says whether the patient has the high risk of heart disease, diabetes or cancer. In this module doctor can analyse the disease based of the set of attributes like how many patients have cancer attack who have their age greater than 60, whether sugar level greater than 180 may cause diabetes, cholesterol level greater than 120 may cause heart disease.

DEVELOPMENT APPROACH:

Top down Approach:

The importance of new system is that it is user friendly and a better interface with user's and admin working on it. It can overcome the problems of manual system and the security-based problem.

Top down approach of software development is the incremental approach to the construction of program structure of the modules. Modules are integrated by moving through the control hierarchy, prologue with the main control modules. Module subordinate to the main control modules is in-corporate into the structure in either a depth first or breadth first manner. The top down approach is performed in a serious of following steps:

1. The main module that is overall(package) software is divided into five modules that are under the control of the main control module.
2. Depending on the top down approach selected subordinate scrag is replaced one at a time with actual components.
3. Tests are conducted as every component is integrated. On completion of each test variant stub is replaced with real time component. Regression testing may be conducted to ensure the new errors have not been introduced.

TESTING METHODOLOGIES

Testing is important stage in software development process. System test is implementation should be a confirmation that all is correct and have an opportunity to show the users that the system works as they expected. It accounts the large percentage of technical effort in software development process.

Testing phase is the development phase that validates the code against the functional specifications of the process. Testing is a crucial to the achievement of the system goals. The objective of testing is to discover errors. To fulfill this objective a series of test step such as the Unit testing, Integration testing, Validation and System testing where planned and executed.

• Unit Testing

Unit testing is testing phase cycle that changes made in a existing or new program this test is carried out during the programming and each module is found to be working satisfactorily

• Integration Testing

Integrated testing is a systematic process for constructing tests to uncover errors associated with interface. Objective is to

take unit tested modules and build a complete program structure.

• Validation Testing

Software validation is achieved through a serious of different testes that demonstrate conformity with requirements. Thus, the proposed system under consideration has been tested by validation & found to be working properly.

• System Testing

System testing the whole system is tested for various interface between each module and program units are tested and recorded. This testing is done with sample data object. The securities, communication between interfaces are tested.

CONCLUSION

Medical related information's are huge in nature and in our application we have shown how to use the huge data effectively to predict the Heart Disease using the technique Data Mining. This application helps doctors to manage the Health Records of the patient's and also this will make the treatment faster if they have the report of the user already with them. Faster treatment saves lives data effectively to predict the Heart Disease using the technique Data Mining. This application helps doctors to manage the Health Records of the patient's and also this will make the treatment faster if they have the report of the user already with them. Faster treatment saves lives. This application helps for patient's to track their Health Records therefore it is helpful for them to take care of their health in a regular manner. The Analysis report helps in predicting the Heart related Disease easily and easy for the doctor's to predict the possibilities.

FUTURE WORK

In the proposed system, we have database to store the records of the patients and when the count of the patients increases means, more data will be generated and the storage will become a problem. Therefore, in Future release there will be a cloud facility to store all the records in the cloud therefore the data protected safely and can be retrieved from anywhere if we have the right to access the data. Smart device will be synced with our application in the future release therefore, the patient's real time health condition will get reduced.

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