



iJRASET

International Journal For Research in
Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 7 Issue: VI Month of publication: June 2019

DOI: <http://doi.org/10.22214/ijraset.2019.6108>

www.ijraset.com

Call: ☎ 08813907089

E-mail ID: ijraset@gmail.com

Disease Prediction with Machine Learning Algorithm

Prof. B. B. Shah¹, S. S. Chikkmat²

^{1,2}Suman Ramesh Tulsiani Technical Campus – Pune University

Abstract: The new Medical Health care & Management System with web application is designed to resolve the issues related to the management of health check up, appointments, reports. In order to manage the Health Check up a web application is designed. Disease prediction model is also used which predicts Heart Diseases for the patients. In order to predict disease three different classifiers are used which predicts heart disease. Among the three modules the SVM & Random forest has higher accuracy compared to the KNN classifier. The three classifiers have got different accuracy, SVM & Random forest have got same accuracy 85.24% & K-Nearest Neighbour have got 67.21% accuracy.

Keywords: MongoDB database, Web Application, Health Check Up, PHP, Cloud, Machine Learning, Classifier

I. INTRODUCTION

This web application is developed to manage health care services with its information & data. Information Technologies have brought revolution in the Medical Sector which is the most significant health sector. This doctor provides the best suggestion to the patients by viewing the medical reports online. This system provides flexibility to the patients to book an appointment get consultation of the doctors. This research papers discussed the details of the web application. There is fast growth in the field of data analytics which plays an significant role in the healthcare research. As there are large quantity of data generated in healthcare field which provides accurate analysis of medical data which benefits in immediate disease detection. The learning curve begins with observations of data, by looking for patterns in data which us used to make better decisions based on the data that we provide. Machine learning methods generates analysis of large amount & big quantities of data. Combining machine learning with AI and cognitive technologies can make it even more effective in processing large volumes of information related work. Section I provides an introduction about the Medical Health Care services provided by this system. Section II provides details & related work to this proposed system. Section III provides the details of the proposed system health care management system web application developed. Section IV provides detail information about the methodology used to develop this system & the output of the web application.

II. PROPOSED SYSTEM

The proposed health care management system provides a digitized health care system through an online web application. Through this web application, clients get access to the medical reports & can consult the doctors. They can also book appointments & choose a diagnostic centre wherever they want to conduct health in India. The proposed system consists of many modules which are integrated with each other. This proposed system also interacts with cloud services which stores medical reports of the health check-up which can be accessed by the clients & the doctors also. The Proposed system contains 5 modules as Admin module, Client module, Doctor Module, Corporate Module, Diagnostic Centre module. The proposed modules also contains disease prediction module which predicts Heart disease for the clients. The doctor or User has enter the medical reports data which will predict whether the person will have heart disease or not.

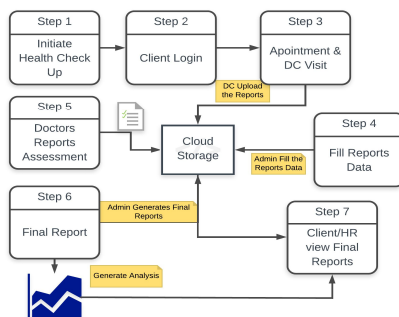


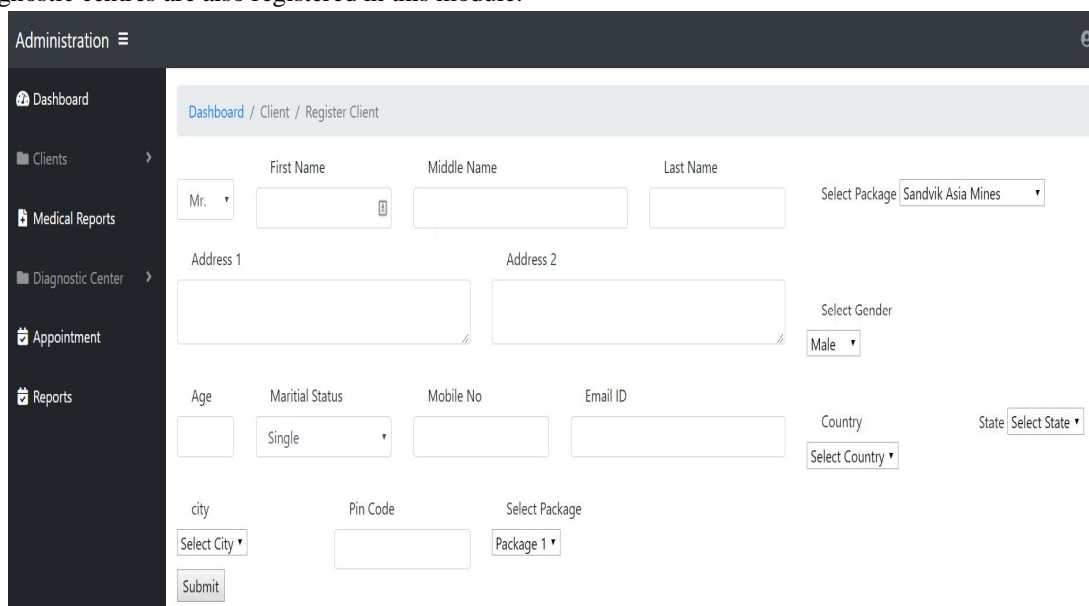
Fig 1. Basic Flow Chart

III.METHODOLOGY

The methods used for web application development is agile web application development method. The web application is developed with languages as PHP, HTML, JavaScript, CSS. The editor used is Visual Studio Code with help of Laravel Framework. The backend data base is MongoDB & Apache Server. The data will be stored in the mongo database and the medical reports will be stored amazon AWS cloud Simple Storage Service (S3) service.

A. Admin Module

- 1) This Module which is used by the administration for managing the health check-up, appointments of the clients, reports uploading & downloading.
- 2) The client registration is done in this module, which also send the new login id & password to the clients.
- 3) Appointment is also booked & also sends the appointment details through mail to the client.
- 4) The medical reports are uploaded on the cloud which later can also be downloaded.
- 5) The new diagnostic centres are also registered in this module.

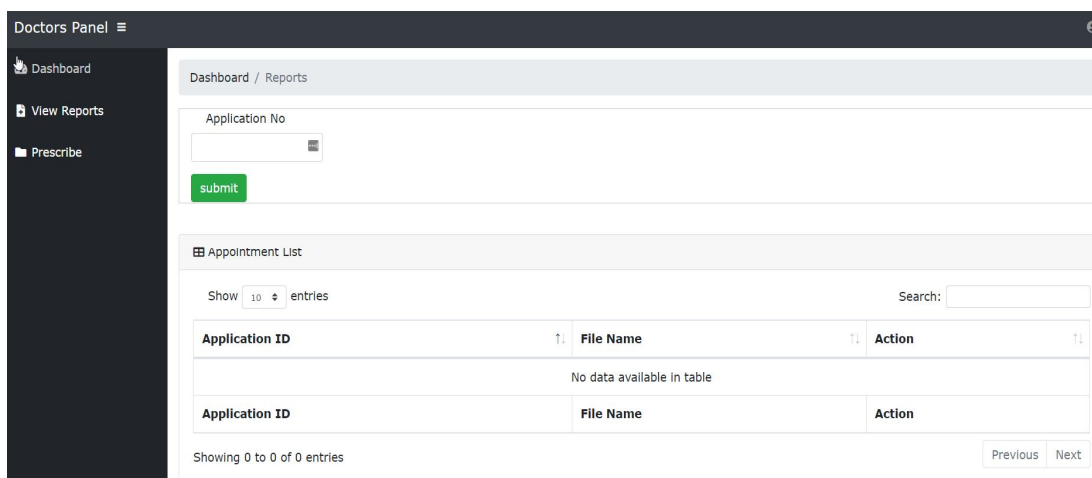


The screenshot shows the 'Register Client' form in the Admin Module. The form includes fields for First Name, Middle Name, Last Name, Address 1, Address 2, Age, Marital Status, Mobile No, Email ID, City, Pin Code, and Select Package. There are also dropdown menus for Gender (Male), Country (Select Country), and State (Select State). A Submit button is at the bottom.

Fig 2. Admin Module

B. Doctors Module

- 1) This modules is for doctors who will view the reports & based on this reports will prescribe medicines & Suggestions to the client.

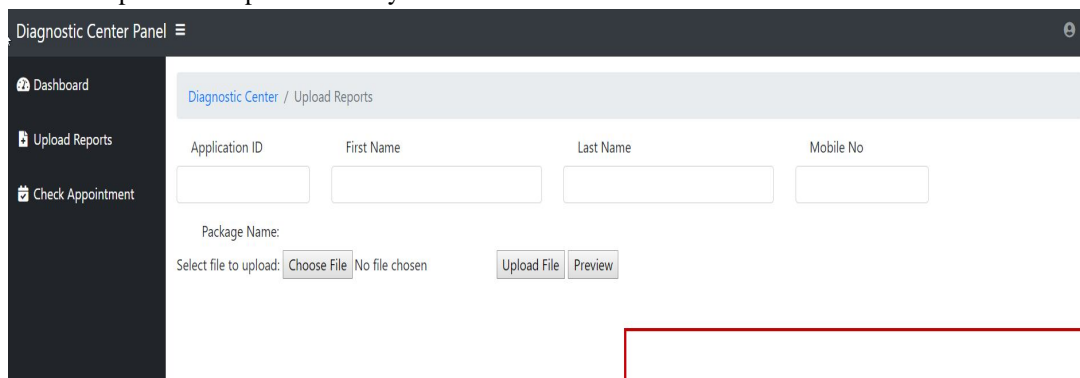


The screenshot shows the 'Doctors Panel' with the 'Reports' view. It includes a search bar for Application No, a Submit button, and an Appointment List table. The table has columns for Application ID, File Name, and Action. The table is currently empty, showing 'No data available in table'.

Fig 3. Doctors Module

C. Diagnostic Centre Modules

- 1) The diagnostic centre views the appointments & confirms the appointment. This centre will also provide significant instructions to the client before conducting the health check-up.
- 2) The diagnostic centre upload the reports on the system.

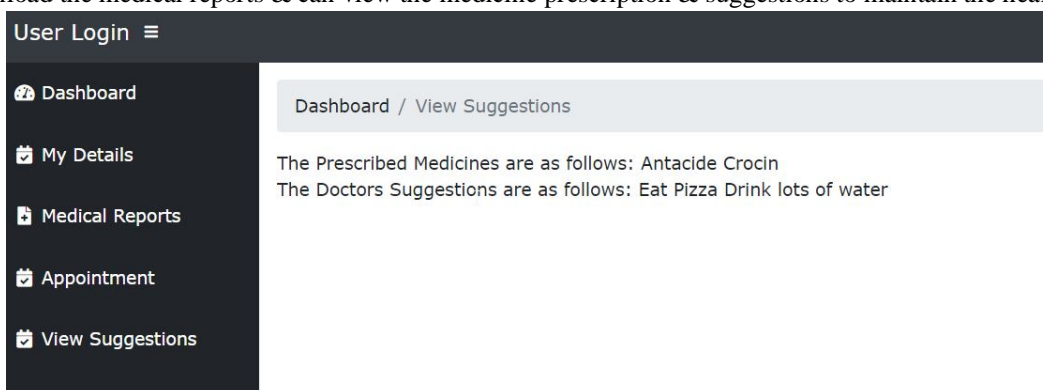


The screenshot shows the 'Diagnostic Center Panel' with a sidebar menu containing 'Dashboard', 'Upload Reports', and 'Check Appointment'. The main content area is titled 'Diagnostic Center / Upload Reports' and contains a form with the following fields: 'Application ID', 'First Name', 'Last Name', and 'Mobile No'. Below these fields is a 'Package Name' label and a 'Select file to upload:' section with a 'Choose File' button (showing 'No file chosen') and 'Upload File' and 'Preview' buttons.

Fig 4. Diagnostic centre Module

D. Client Module

- 1) The client logs in the system provided through registration process.
- 2) The client books appointments by selecting the state, city & diagnostic center.
- 3) They can download the medical reports & can view the medicine prescription & suggestions to maintain the health.

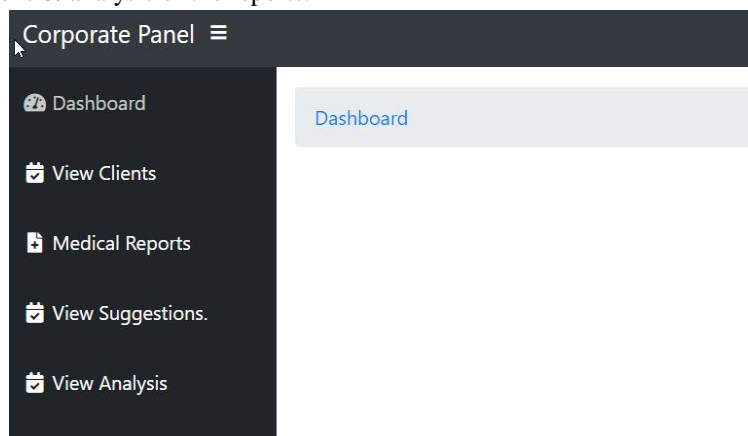


The screenshot shows the 'User Login' interface with a sidebar menu containing 'Dashboard', 'My Details', 'Medical Reports', 'Appointment', and 'View Suggestions'. The main content area is titled 'Dashboard / View Suggestions' and displays the following text: 'The Prescribed Medicines are as follows: Antacide Crocin' and 'The Doctors Suggestions are as follows: Eat Pizza Drink lots of water'.

Fig 5. Client Module

E. Corporate Module

- 1) The corporate companies will view the registered employees & also download the medical reports.
- 2) They can also view suggestions & analysis of the reports.



The screenshot shows the 'Corporate Panel' with a sidebar menu containing 'Dashboard', 'View Clients', 'Medical Reports', 'View Suggestions.', and 'View Analysis'. The main content area is titled 'Dashboard'.

Fig 6. Corporate Module

F. Heart Disease Prediction Module.

- 1) This module predicts heart disease after entering the data. Classifiers are used to predict the disease. The three classifiers are SVM, Random Forest & KNN. The SVM classifier & Random Forest classifier have higher accuracy to predict the disease compared to the KNN classifier. The following table shows the accuracy comparison of three algorithms.

TABLE I
comparison of classifier algorithm accuracy

No	Classifier Algorithm	Accuracy
1	Support Vector Machine	0.8524
2	Random Forest	0.8524
3	K-Nearest Neighbours	0.6721

The data set is taken from UCI heart disease of Cleveland, Hungary, Switzerland & VA Long Beach. This database consists of total 76 attributes, of which many published experiments have reference for using a subset of 14 of them. The Cleveland database has been used by Machine Learning researchers for many years. The presence of the disease is determined with two values 1 which indicates heart disease & 0 indicated no heart disease.

- 2) Support vector machine has higher accuracy compared to the KNN algorithm; it has 85.24% accuracy. It can predict heart disease more accurately. The SVM offers very high accuracy compared to other classifiers such as logistic regression, and decision trees. The classifier separates data points using a hyperplane with the largest amount of margin. That's why an SVM classifier is also known as a deterministic classifier. SVM searches for an optimal hyperplane which helps in classifying new data points. It segregates the data set. The margin is known as the distance between the either of nearest points.

Algorithm works as follows:

- a) Segregate the classes to generate hyperplane.
- b) The maximum segregation from the either data points is selected.

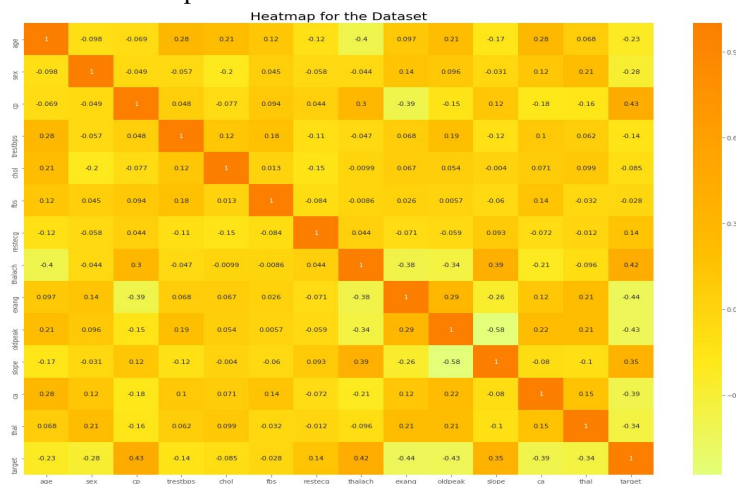
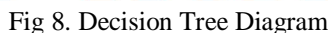


Fig 7. Heat Map

- 3) Random forest neighbour has similar accuracy to the SVM.

Algorithm works as:

- a) Select Random Sample from a given set.
- b) Construct decision tree for each sample & get a prediction result from each decision tree.
- c) Perform a vote for each predicted result.
- d) Select the prediction result with the most votes as the final prediction.



- 1) Calculate the distance
- 2) Find the closest neighbours
- 3) Vote for labels.

The Health care management system in web application is developed by referring the reference papers. This newly developed web application will provide flexibility & provide services to the organizations & clients as well.

- [1] S. S. Chikkmat, Prof. B. B. Shah "Medical Healthcare Management System with Web Application", International Journal for Research in Applied Science & Engineering Technology (IJRASET), Volume 6 Issue XII, Dec 2018
- [2] F. Anjum, A.S. Shoaib, A.I Hossain, M.M. Khan "Online Health Care", IEEE 8th Annual Computing and Communication Workshop and Conference (CCWC), pp. 580-583, 2018
- [3] C. Gyorodi, R. Gyorodi, G. Pecherle, A. Olah "A Comparative Study: MongoDB vs. MySQL" 13th International Conference on Engineering of Modern Electric Systems (EMES) , pp. 1–6, 2015
- [4] M. Hillsm "Evolution of Dynamic Feature Usage in PHP" IEEE 22nd International Conference on Software Analysis, Evolution, and Reengineering (SANER), pp. 525 – 529, 2015
- [5] R. Sharma, S.R. Kumar, K. Gupta "Strategies for Web Application Development Methodologies" International Conference on Computing, Communication and Automation (ICCCA), pp. 160 – 165, 2016.
- [6] W. Jiang, M. Zhang, B. Zhou, Y. Jiang, Y. Zhang "Responsive Web Design Mode and Application" IEEE Workshop on Advanced Research and Technology in Industry Applications (WARTIA) pp. 1303 – 1306, 2014



10.22214/IJRASET



45.98



IMPACT FACTOR:
7.129



IMPACT FACTOR:
7.429



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089  (24*7 Support on Whatsapp)