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**Smart Health Consultation**

PROJECT REPORT

*Submitted by*

**SAFA**

**CCV15CS035**

*in partial fulfillment for the award of the degree*

*of*

**BACHELOR OF TECHNOLOGY**

IN

**COMPUTER SCIENCE AND ENGINEERING**

**COCHIN COLLEGE OF ENGINEERING & TECHNOLOGY**

**VALANCHERY**

**A P J ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

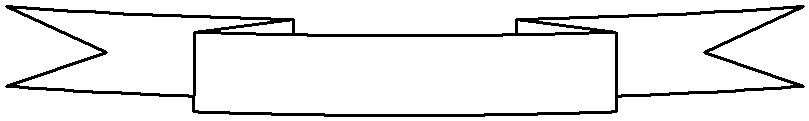
**NOVEMBER-2018**

**COCHIN COLLEGE OF ENGINEERING & TECHNOLOGY**

**VALANCHERY**



**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**



**CERTIFICATE**

Certified that this project report “Smart Health Consultation” is the bonafide work of “SAFA” Reg No:CCV15CS035 of department of Computer Science & Engineering in partial fulfillment of the requirements for the award of the degree of Bachelor of Technology in Computer Science & Engineering under the A P J Abdul Kalam Technological University the year 2015-2019.

**Seminar Guide** **Head of the Department**

Place: Valanchery

Date:

**ACKNOWLEDGEMENT**

Every success stands as a testimony not only to the hardship but also to hearts behind it. Likewise, the present Project work has been undertaken and completed with direct and indirect help from many people and I would like to acknowledge the same.

First and foremost I take immense pleasure in thanking the **Management** and respected principal**, SakkariyaThodungal,** for providing me with the wider facilities.

I express my sincere thanks to **Ms. Alma Mary Margret.**, Head of Department of Computer Science and Engineering for giving me opportunity to present this seminar and for timely suggestions.

I wish to express my deep sense of gratitude to the seminar coordinator

Ms. Alma Mary Margret,Asst. professor, Department of Computer Science and Engineering, who coordinated in right path. Words are inadequate in offering my thanks to Guide **Ms.Jitha P.B,** Asst. professor Department of Computer Science and Engineering, for her encouragement and guidance in carrying out the seminar.

Needless to mention that the **teaching** and the **non-teaching facultymembers** had been the source of inspiration and timely support in the conduct of our project. I would like to express my heartfelt thanks to my beloved **parents** for their blessings, our **classmates** for their help and wishes for the successful completion of this seminar.

Above all I would like to thank the **Almighty God** for the blessings that helped me to complete the venture smoothly.

**ABSTRACT**

Nowadays consulting a doctor is a tiresome task, we need to find the respective doctor, book appointments and wait for consultation. This is more hectic in the case of emergencies especially when the patient is in an unknown area, finding a doctor is not easy. The patient’s appointment may be cancelled when doctor’s schedule is changed. In this case, time consumption in emergencies may cause harm to the patient. As a solution to this problem, we introduce a fast and easy to access Smart health consulting system. The smart health consulting system aims at maintaining patient health records and getting appointments from various doctors of related treatments. The system user must register as a member of this system and keep updating his/her medical history (by own as well as referring doctor).System predicts a doctor or a list of doctors specialized for respective treatments such as (skin specialist, ENT specialist, cardiologist etc.) at particular locations. The available schedules and timings of selected doctor is shown, where the patient can choose appropriate appointments. This project consists of a general user area, doctor’s area and a patient’s area. The general user area provided with help system, video tutorials and testimonials.

The doctor’s area consists of daily schedules (details of appointments per day) and leave management. Patient’s area consists of medical data management, registration for treatment and billing. Consulting a doctor is an obvious thing in our day-to-day life, but the availability of the doctor during the time of our requirement is unpredictable. In order to overcome the issue a proposal of android application is made, this smart health application enables users to get instant report on their health issues through an intelligent health care application online. This E-health application enables user to express their symptoms and issues. It then processes user’s issues and symptoms to check for various health issues that could be associated with the symptoms given by the user. If the application is unable to provide a particular solution then it urges the user to under-go tests like blood test, CITI scan accordingly. Data mining is the computer-based process of analysing enormous sets of data and then extracting the meaning of the data. Data mining tools can answer business questions that traditionally taken much time consuming to resolve. The huge amounts of data generated for prediction of disease are too complex and voluminous to be processed and analysed by traditional methods.

Data mining provides the methodology and technology to transform these mounds of data into useful information for decision-making. By using data mining techniques it takes less time for the prediction of the disease with more accuracy. We survey different papers in which one or more algorithms of data mining used for the prediction of disease. Result from using neural networks is nearly 100% in one paper. So that the prediction by using data mining algorithm given efficient results. These large amounts of data are very important in the field of Data Mining to extract useful information and generate relationships amongst the attributes. The doctors and experts available are not in proportion with the population. In addition, neglect symptoms often. Disease diagnosis is a complex task, which requires much experience, and knowledge. In the health care industry, the data mining is mainly used for predicting the diseases from the datasets. The Data Mining techniques, namely Decision Trees, Naive Bayes disease database.

**Keywords:** Smart health, Android application, E-health, Intelligent health care application, Naive Bayes algorithm.

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**ABBREVIATIONS**

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**CHAPTER 1**

**INTRODUCTION**

* 1. **BACKGROUND**

The use of computer systems in decision-making, prediction and recommendation has been a trending topic of research for more than a decade. The recent advances in medical science can be attributed to advances in computer technology. However, the prediction of medical behaviour is still a very challenging task, which is done with the help of a medical professional. The occurrence of every disease shows a pattern based on its symptoms. The focus of this project is to propose a system to exploit these patterns for predicting the associated diseases and facilitating doctors for their treatment. The core idea behind this was that every symptom of a disease has a unique impact on severity .By prediction we mean to forecast an occurrence of a condition based on some mathematical calculation. For implementing this prediction, we need a recommender system. A recommender system is a system, which reads an input, finds a pattern in it, which is based on the dataset given to train the system. Based on the pattern it figures out a solution for the problem.

A naïve solution can be to create a database of every possible disease and its symptoms and predicting diseases based on that. The biggest drawback about this solution is that the efficiency and speed of this solution are very less and the size of this dataset would be very large. The solution that we suggest is, of using the symptoms with the ratings given by the patient, to predict the possible diseases. The main objective of this project is to develop an Intelligent System using data mining modelling technique, namely, Naive Bayes. It is implemented as web based application in this user can enter the disease symptoms and update the past medical history if any. It retrieves hidden data from stored database and compares the user values with trained data set. It can answer complex queries for diagnosing disease and thus assist patients to make intelligent clinical decisions, which traditional decision support systems cannot. By providing effective treatments with authorised doctors, it also helps to reduce treatment costs.

* 1. **PROJECT SCOPE**

Here the scope of the project is that integration of clinical appointments support with computer-based patient records could reduce time consumption, patient’s risk, enhance patient safety, decrease unwanted practice variation, and improve patient outcome. This suggestion is promising as data modelling and analysis tools, e.g., data mining, have the potential to generate a knowledge-rich environment, which can help to significantly improve the quality of clinical choices .The System is developed using Naive Bayesian Classification technique. The system extracts hidden knowledge from a disease database. This is the most effective model to predict patient’s disease of patients according to the provided symptoms. This model develop a prototype Disease Prediction System using data mining modelling techniques, namely, Naïve Bayes. So it provides effective treatments, it also helps to reduce treatment costs and enhances visualization and ease of interpretation. With immense knowledge and accurate data in that field. Large corporations invest heavily in this kind of activity to help focus attention on possible events and risks that are involved. Such work brings together all available past and current data, as a basis on which to develop reasonable expectations about the future.

**CHAPTER 2**

**LITERATURE SURVEY**

**2.1 A NOVEL METHOD FOR DISEASE RECOGNITION &**

**CURE TIME PREDICTION BASED ON SYMPTOMS**

Healthcare is a sector where decisions usually have very high-risk and high-cost associated with them. One bad choice can cost a person’s life. With diseases like Swine Flu on the rise, which have symptoms quite similar to common cold, it is very difficult for people to differentiate between medical conditions. Here propose a novel method for recognition of diseases and prediction of their cure time based on the symptoms. We do this by assigning different coefficients to each symptom of a disease, and filtering the dataset with the severity score assigned to each symptom by the user. The diseases are identified based on a numerical value calculated in the fashion mentioned above. For predicting the cure time of a disease, we use reinforcement learning.

The algorithm takes into account the similarity between the condition of the current user and other users who have suffered from the same disease, and uses the similarity scores as weights in prediction of cure time. We also predict the current medical condition of user relative to people who have suffered from same disease by prediction we mean to forecast an occurrence of a condition based on some mathematical calculation. For implementing this prediction, we need a recommender system. A recommender system is a system, which reads an input, finds a pattern in it, which is based on the dataset given to train the system. Based on the pattern it figures out a solution for the problem.

A naive solution can be used to create a database of every possible disease and its symptoms and predicting diseases based on that. The biggest drawback about this solution is that the efficiency and speed of this solution are very less and the size of this dataset would be very large. The solution that we suggest is, of using the symptoms with the ratings given by the patient, to predict the possible diseases and the possible cure time of these diseases.

Our solution is novel and better because we predict the diseases based on the severity of the patients symptoms and the cure time prediction is based on real-life data given by other patients. For an accurate prediction, we give different coefficients to all the symptoms possible for a disease.

**2.2 PREDICTION SYSTEM FOR**

**HEART DISEASE USING NAIVE BAYES**

In this fast moving world people want to live a very luxurious life so they work like a machine in order to earn lot of money and live a comfortable life therefore in this race they forget to take care of themselves, because of this their food habits change, their entire lifestyle change, in this type of lifestyle they are more tensed they have blood pressure, sugar at a very young age and they don’t give enough rest for themselves and eat what they get and they even don’t bother about the quality of the food if sick then go for their own medication as a result of all these small negligence it leads to a major threat that is the heart disease. It is a world known fact that heart is the most essential organ in human body if that organ gets affected then it also affects the other vital parts of the body. Therefore, it is very important for people to go for a heart disease diagnosis. Because of this, people go to healthcare practitioners but the prediction made by them is not 100% accurate.

Quality service implies diagnosing patients correctly and administering treatments are effective. Poor clinical decisions can lead to disastrous consequences, which are therefore unacceptable. Hospitals must also minimize the cost of clinical tests. They can achieve these results by employing appropriate computer-based information and/or decision support systems. The healthcare industry collects huge amounts of healthcare data, which, unfortunately, are not “mined” to discover hidden information for effective decision-making. Discovery of hidden patterns and relationships often goes unexploited. Advanced data mining techniques can help as a remedy for this situation. This research has developed a prototype Heart Disease Prediction System (HDPS) using data mining techniques, namely, Decision Trees, Naïve Bayes and Neural Network. Results show that each technique has its unique strength in realizing the objectives of the defined mining goals. HDPS can answer complex what if queries, which traditional decision support systems cannot.

**CHAPTER 3**

**DESIGN METHOD**

**3.1 SEARCH DOCTOR**

This application enables the user to search for the doctors available depending upon the requirement i.e. the symptoms/disease the patient has. Various doctors for various specializations related to important parts of the body like heart, kidney, brain, liver etc. could be found on this application with the doctor’s availability, contact details.

**3.2 ONLINE APPOINTMENT**

After undergoing the registration, login procedures the user can find the required doctor with his scheduled timings, contact details the user can get an appointment from the doctor easily by this application.

**3.3 ADD DOCTORS**

An admin is the one who can view both the patients and the doctors with this application. The admin can add further more doctors depending upon the requirement and feedback given by the users. The details given by the user and the doctors can be edited or updated anytime.

**3.4 COLLECT FEEDBACK**

Every user of the application can provide certain feedback of the doctor/application after logging in this helps to continuously monitor and improve the efficiency of the application and it can satisfy every user depending upon the requirements. Admin can check the feedbacks provided by the user and act accordingly.

**3.5 SYSTEM DESIGN**

**3.5.1 SYSTEM A5RCHITECTURE DESIGN**

In this project, it is discussed majorly about the requirements, architecture, and usage of the proposed android mobile application. The patients, doctors, use the application and the admin so the system can be viewed in three perspectives from various users (patients, doctors and the admin) the system architectures are depicted below.

**3.5.1.1 Patient’s Perspective**

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**Fig 3.1 Patient’s Perspective**

The user can access or use the various features integrated by installing the android application into the mobile, the home page of the application consists of the register and login options, where the new user needs to register by providing few details like name, phone number, e-mail id. In addition, a registered user will be directed to the options page where various options like his/her details which can be edited, Diseases can be searched with the symptoms seen, doctor’s ID or name or address can search various doctors. A user can give feedback after the usage and logging out from this page directs to the home page i.e. the page, which is seen immediately after opening the application.

**3.5.1.2 Admin Perspective**

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**Fig 3.2 Admin Perspective**

An admin is the one who coordinates both the users and the doctors by providing necessary details for both of them. Admin can add the doctors to the application depending on the requirement and the feedback sent by the users, Admin is the only one who can add doctors to the application. The details of ID, name, phone number and address of the doctor must be entered while adding a doctor into the application. Further modules of the application are view various doctors, patients, diseases given in the form of symptoms by the user, a disease can be added into the application too that enables the user to find out the doctors specialized to treat that disease, Admin can check the details by using view feedback module in the application.

**3.5.1.3. Doctor’s Perspective**

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**Fig 3.3 Doctor’s Perspective**

Another user of the application is a doctor. A doctor module consists of doctors details, which can be updated by the doctor in case any contact info/address of the doctor is changed. Notifications enable the doctor to check the id of the patients who need a doctor’s help. View disease module enables the doctor to view the patient ID and the symptoms provided by the user, View patient module enable doctor to view various patient’s details who have used the application including their details like ID, name, contact details etc. using the application.

**3.6 METHODOLOGY**

**3.6.1 SEARCH HOSPITAL**

In this paper we mainly focus on the how to find the doctors who are specialized to treat a particular disease that too in a shorter span. The doctors who are added to the application can be viewed by various patients including their contact information, availability of the doctor etc. this whole searching process is said to be carried out by the data which has been stored earlier by the admin which can be also be updated at any desired time.

**3.6.2 IMPROVISE APPLICATION**

The feedback module, which is provided to the user or the patients, enables to gather various feedbacks given by vivid users of the application. Both the doctors and the admin. Can view this module. The doctors can improve their services. Whereas, an admin can further more add doctors as per the requirement of the users (patients).

**3.6.3 SQLITE DATABASE**

SQLite database is a Relational database management system (RDBMS) which is used to both add and retrieve the data from the database or the stored location (In our proposed application SD card acts as the storage location), SQLite database can be used both as both web and android application.

**CHAPTER 4**

**DESIGN EXAMPLE**



**Fig 4.1 User activities**

User activities is the page displayed immediately after logging in by user where he can get details about various diseases and doctor, doctors can be searched based on id, name & address . Here the user can provide feedback.



**Fig 4.2 Admin activities**

Here, the admin can view various patients who used the application, Can view various doctors, Admin can also add doctors to the application depending on the requirement and feedback given by the users. Admin can access the details of both the doctors and the patients.



**Fig 4.3 Doctor Activities**

Here, the doctor can view various patients who used the application; the doctor can check the notifications to know about the disease of the patients. The details of the doctor can be updated/edited anytime to ensure the appointment of patients.

**CHAPTER 5**

**CONCLUSION**

The “Smart health consultation” Android Application is helpful for patient to search the hospital based on specialist. This application is simplify the task of patient and doctor. This application facilitates the interaction between patient and doctor. It helps to optimize the work of patient and doctor. Installation of the app in the Smartphone is quite simple and more useful to patients who have normal idea of android mobile. Smart health consulting android system is an effortless, efficient and influential mobile application for the society.

As we have already mentioned, we address the problem of predicting diseases using “Naïve Bayes algorithm” and their respective Doctor’s appointment time based on the symptoms. The focus was on the classification of symptoms based on their severity and importance and using this knowledge to calculate a numerical value to identify diseases. Although the method was tested in a limited environment with high accuracy, it can be extended to larger settings. We also provide a severity rating for the current condition, relative to the other users with similar symptoms. The test results for various medical conditions can be used to further improve the reliability of the system. Since the results are dependent on the experience of previous users, it is important to isolate genuine experiences from fake ones.

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