Project Synopsis

Of

FULL STACK DEVLOPMENT (App- MedTrackerXpert)

Submitted as a part of course curriculum for

Bachelor of Technology
in
Computer Science

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2022-2023

DECLARATION

We hereby declare that this submission is our work and that, to the best of our knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgement has been made in the text.

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CERTIFICATE

This is to certify that Project Report entitled "**MedTrackerXpert**" which is submitted by **Vikas Yadav, Sujal Gupta and Anmol Ratan** in partial fulfilment of the requirement for the award of degree B. Tech. in Department of Computer Science of Dr A.P.J. Abdul Kalam Technical University, Lucknow is a record of the candidates own work carried out by them under my supervision. The matter embodied in this report is original and has not been submitted for the award of any other degree.

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Prof. Pawan Kumar Pal

ACKNOWLEDGEMENT

It gives us a great sense of pleasure to present the synopsis of the B. Tech Mini Project undertaken during B.Tech. Third Year. We owe a special debt of gratitude to Prof. Pawan Kumar Pal, Department of Computer Science, KIET Group of Institutions, Delhi- NCR, Ghaziabad, for his/her constant support and guidance throughout the course of our work. His sincerity, thoroughness and perseverance have been a constant source of inspiration for us. It is only his/her cognizant efforts that our endeavors have seen the light of the day.

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Finally, we acknowledge our friends for their contribution to the completion of the project.

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ABSTRACT

Healthcare and medicine are playing a huge role in today's world. Through this project, we aim to create one of most convenient ways to buy cheap medicines, do this by recommending alternative medicines which are affordable to the patients. As we know that dolo 650 (one of the most common medicines for fever), in place of that we can use another medicine called capol 650 which is as effective as dolo 650 but is relatively cheap. In such a way we will scan all the medicine prescribed by the doctor and can provide cheap alternatives to them. Further, this app will also feature online doctors, where patients can take online appointments. We will also include the features of AI/ML to categorize and recommend the best doctor available as data entered by the patients. The medical industry generates a huge amount of patient data which can be processed in a lot of ways. So, with the help of machine learning, we have created a System that can categorize and find best optimal doctor required by the patients as per their affordability. This project can help a lot of people as one can afford the medicines easily and further take online appointments and take the necessary precautions.

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CHAPTER 1
INTRODUCTION

1.1 Introduction

There are times when we need a doctor suddenly but sometimes, they are not available due to some reason, and we are left in trouble. The system we have proposed is user friendly to get help and advice on health issues immediately through the online healthcare system. Now a days, with the help of statistics and posterior distribution the problems are swiftly and easily diagnosed. The classification rules which help in solving the prediction of disease are generated by the samples trained by themselves and help in solving the problem easily.

It is approximated that greater than 70% of people in India are prone to various body diseases like viral, flu, cough, cold etc. in intervals of 2 months. As many people don't understand that the general body diseases could be symptoms of something more harmful, 25% of this population dies or gets some serious medical problem because of ignoring the early general body symptoms and this is a very serious condition that we are facing, and the problem can be proven to be a very dangerous situation for the population and can be alarming if the people will continue ignoring these diseases. Hence identifying or predicting the disease at the very basic stage is very important to avoid any unwanted problems and deaths.

The main motive of the proposed system is the prediction of the commonly occurring diseases in the early phase as when they are not checked or examined, they can turn into a disease more dangerous disease and can even cause death. This system will predict the most possible disease based on the given symptoms by the user and precautionary measures required to avoid the aggression of disease, it will also help doctors to analyze the patterns of diseases in society. This project is dedicated to the Disease prediction System that will have data mining techniques for the basic stages of the dataset and the main model will be trained using the Machine Learning (ML) algorithms and will help in the prediction of general diseases.

1.2 Problem Statement

- Many of the people in our country take medicine from local quack doctors when they are sick, which in turn creates more problems.
- Medicines are expensive in our country. For example, lower middle class and lower-class people cannot afford such expensive medicines readily.
- If a user wants to go for the alternative medicines, he/she must go through different sites and sources. There is no common system.

1.3 Objective

a. Our aim is to provide the solutions to the same type of medicines at the low price in the place of that medicine.
b. It will provide the system to the patients here they can easily interact with the doctors readily at anytime, anywhere when required.

1.4 Scope

- To digitalize health care.
- We can try to improve the app by introducing tracking of diseases using AI/ML.
- This project includes **registration of patients, storing their details into the system, and computerized billing and labs**.
- We aim to create one of most convenient ways to buy cheap medicines, do this by recommending alternative medicines which are affordable by the patients.

CHAPTER 2

LITERATURE REVIEW

2.1 Machine Learning Algorithms, Real World Applications And Directions

In the model proposed by showed important ML approaches to predict the disease but this model which was proposed by works on the K-Nearest Neighbor (KNN) and Convolution Neural Network (CNN) approach of the machine learning algorithm. Both the KNN and CNN approaches are used in this system which is different from the approach which is used in our project. CNN uses both the structures as well as the unstructured data for the prediction of the disease which makes it more time consuming.

The accuracy of the system proposed by comes out to be very high i.e., above 95% for the KNN algorithm and 100% for the CNN algorithm that is very high for an ML model, in such cases the model is said to be overfitting.

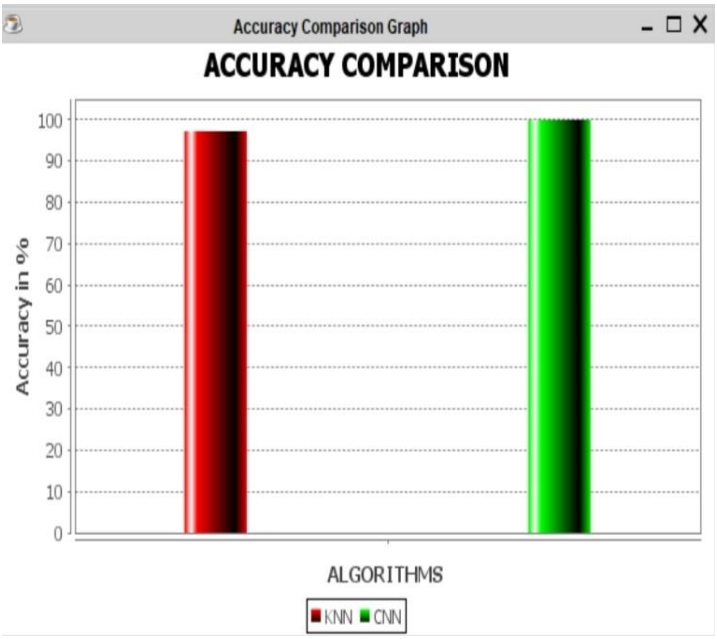

Figure 2.1: Accuracy of The Model

- The model proposed by is used for Disease Prediction and uses different ML algorithms like Forest for correcting the dataset problems and SMOTET for balancing the dataset and then it uses the Ensemble learning technique.
- Input the ML model is taken only by the electronic reports which are produced by the blood examination of the patient or the user. Some of the input only in

this model are glucose level, cholesterol, lipoprotein, blood pressure and other inputs which are only be possible by the physical examination the user or the patient.

- The model proposed by uses big data analytics and the deep learning models for the prediction of Disease The dataset is big, so it uses the Big Data analytics like Map reduce is used in this model and on that the deep learning models are used for the prediction of the Disease which makes it a very big process and it becomes very time consuming.

- This model needs the full medical examination of the user or the patient for the prediction of the disease. The full medical history of the patient or the user is taken as an input to this model which is stored with the help of the big data tools and then used by the deep learning models to predict the disease. This model also needs all the medical record of the patient like all the medications which the patient or the user was taking and the list of doctors which he or she has visited which help in proper analysis of the patient's problem.

- In the model proposed by uses different ML algorithms like Random Forest, Logistic Regression, Decision tree and others for the sake of prediction of the Disease and is used for the prediction of the Heart Disease, Breast Cancer, and Diabetes.

- Some of the inputs which are used in this system are Cholesterol Level, Blood Pressure, Glucose Level in the body etc. This model has accuracy rate of 91% for the decision tree algorithm and 87% for the Naive Bayes algorithm but has a very limited scope in the prediction of the Diseases as it can only predict the Disease which are related to the Heart, Diabetes and Breast Cancer and cannot predict the general Diseases.
- In the model proposed by makes use of Support Vector Machine (SVM) technique of the Machine Learning for the prediction of the Diseases. The dataset used in this model has some general symptoms like eating habits, physical activity and they are rated in this model between 1-5 where 1 is for excellent and 5 is for very bad. This model is more focused on the lifestyle is the user that the user is active or not that how much physical work is he or she is doing in day to day life and how much stress he or she have in life and on the basis of that the health of the user is predicted.

- In the model proposed by uses big data techniques for the disorders and helps in the prediction of the disease like thyroid, chronic diseases. This model uses the Mahout Hadoop technique of big data analytics for the prediction of diseaseMahout has all the data mining techniques in it which makes the system efficient and powerful. In this model the Mahout part of the Hadoop system helps in the analysis of the data which is stored in HBase and based on that the disease are predicted in this model.

2.2 Development Environment for Android Application Development

An Android is an open-source operating system, key mobile applications having API libraries for executing android applications. Android smart phones offer advanced computing ability and connectivity as compares to other mobile phones operating systems. Android is an operating system which is designed so that communication between hardware and software with user interface can easily be done. Android apps can be written using Kotlin, Java, and C++ languages.

The Android SDK tools assemble your code along with any data and source files into an APK, an Android package. It is a record file with an .apk suffix. One APK file contains all the matters of an application for android and is the file that Android-version uses to set up the app. Android plan settings to organize these API levels in your app. According to the official Android website (Android2008) the platform is based on the four core features.

There are several methods which can support developing process of any project such as: • Waterfall • Prototyping • Incremental development • Spiral development • Rapid application development • Agile software development • Object oriented • Top-down programming • Unified process (CMS 2008) • System testing.

Developing an application usually takes lots of time and needs professional knowledge of software. And then as people do not find the application they tend to wait until somebody is developing one, or they must go to the web and ask people to implement their ideas. On different forums there are tons of brilliant ideas, but they will wait until developers see them. On the other hand, there are lots of enthusiastic developers who are looking for ideas to implement them.

When applying the Android application framework, Android will support the components via some C/C++ libraries to make them service us better. • Bionic system C library: it is the C language standard • library, and the bottom library of the system, • which is invoked by Linux system. • Media Framework: based on the Packet Video, • Open CORE to support the playback and recording of • audio and video in multiple formats, such as MPEG4, • MP3, AAC, AMR, JPG, PNG. • SGL: 2D graphics engine library. • SSL: located between TCP/IP protocol and other • application protocols to support data communication. • OpenGL ES1.0: support for 3D effect. • SQLite: relational database. • Web kit: Web browser engine.

Chapter 3

PROPOSED METHODOLOGY

3.1 Flowchart

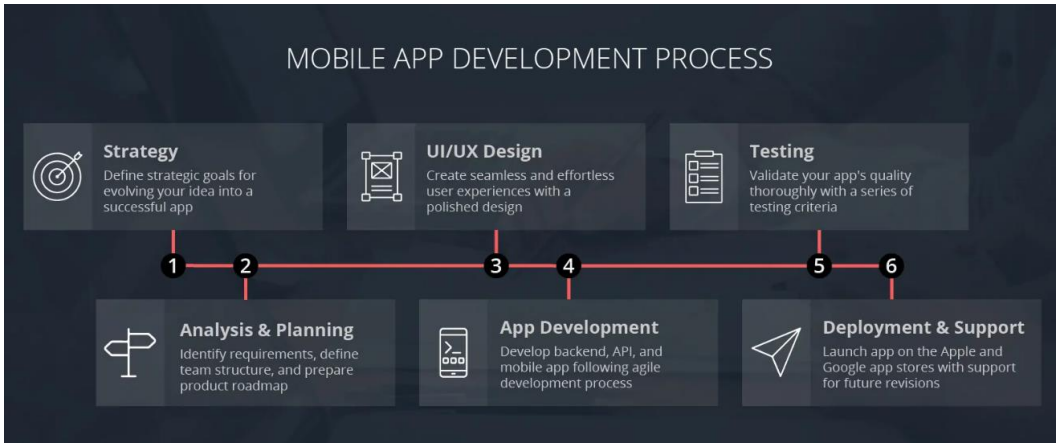

Figure 3.1.1

Above shows the process of formulation of an application model required to be followed for designing the app with different features.

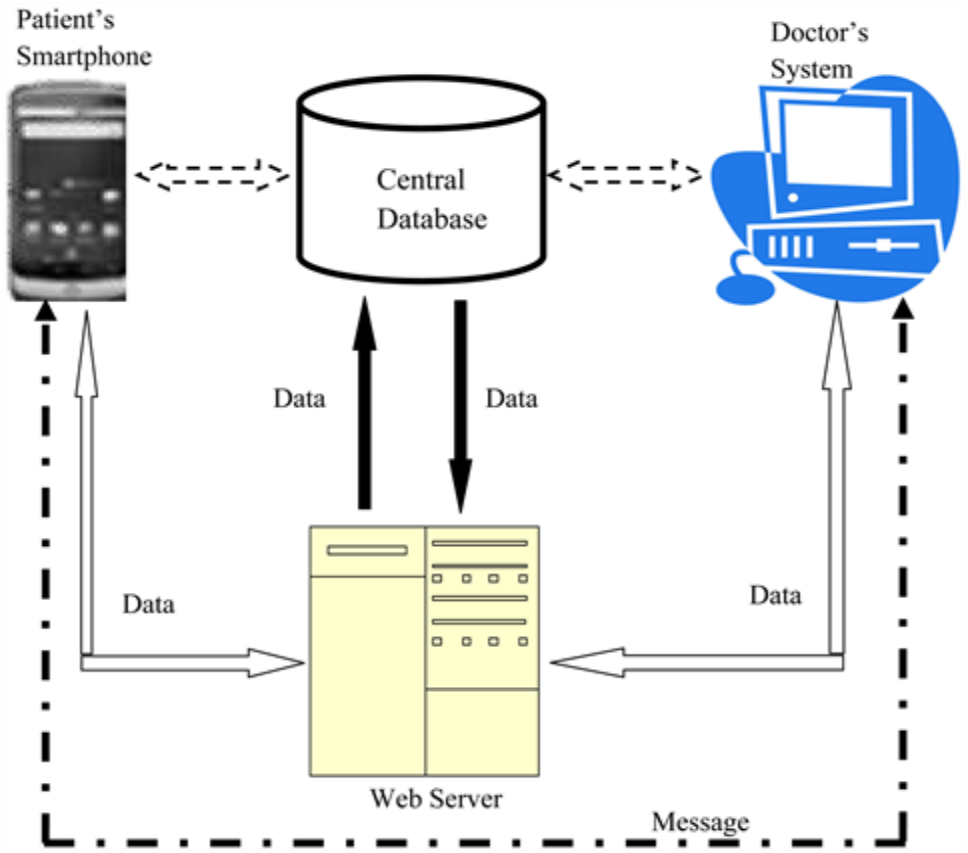

Figure 3.1.2

It shows Correlation between the features and further, it is also showing the flow of data between client side and server side.

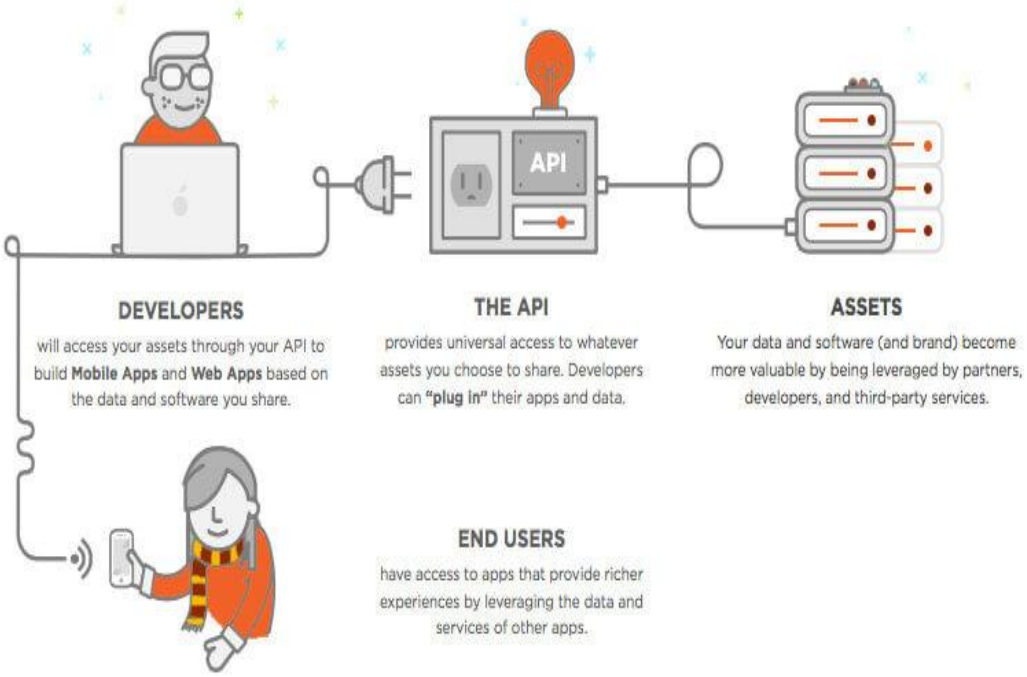

Figure 3.1.3

It shows the relation of backend development with the end users.

3.2 Algorithm used

- KNN ALGORITH

The working of the K-NN algorithm is as followed:

Step-1: Start to select the K value for example k=5

Step-2: Then we will find the Euclidean distance between the points. It is calculated by the as:

Step-3: Then we will calculate the Euclidean distance of the nearest neighbor.

Step-4: Then count the number of data points in each category. For example found three values for Category A and two values for category B.

Step-5: Then assign the new point to the category having maximum number of neighbors. For example, Category A has the highest number of neighbors so we will assign the new data point to category A.

Step-6: So finally, our KNN model is ready.

- RANDAM FOREST ALGORITHM

Random Forest working is possible in two phases ,first is to create the random forest by merging N decision tree, and second is making prediction for each tree created in the first
phase. The working of the random forest is as follows:

Step-1: Firstly it will select random K data points from the training set.

Step-2: After selecting k data points then building the decision trees associated with the selected data points
(Subsets).

Step-3: Then choose the number N for decision trees that you want to build.

Step-4: Repeating step 1 and 2.

Step-5: Finding the predictions of each decision tree and assigning the new data points to the category that wins the majority votes.

- XGBoost ALGORITHM

The working of XGBoost algorithm are as follows:
Step 1: Firstly, create a single leaf tree.

Step 2: Then for the first tree, we must compute the average of target variable as prediction and then calculating the residuals using the desired loss function and then for subsequent trees the residuals come from prediction that was there in the previous tree.

Step 3: Calculating the similarity score using formula:
where, Hessian is equal to number of residuals; Gradient2 = squared sum of residuals; λ is a regularization hyperparameter.

Step 4: Applying a similarity score we select the appropriate node. The higher the similarity score, more the homogeneity.

Step 5: Applying similarity score we calculate Information gain. Information gain help to find the difference between old similarity and new similarity and tells how much homogeneity is achieved by splitting the node at a given
point. It is calculated by the formula:

Step 6: Creating the tree of desired length using the above method pruning and regularization can be done by playing with the regularization hyperparameter.

Step 7: Then we can predict the residual values using the Decision Tree you constructed.

Step 8: The new set of residuals is calculated as: where ρ is the learning rate.

Step 9: Then go back to step 1 and repeat the process for all the trees.

Chapter 4

TECHNOLOGY USED

a. XML (FOR FRONTEND DEVLOPMENT)

XML stands for Extensible Markup Language. XML is a markup language much like HTML used to describe data. It is derived from Standard Generalized Markup Language (SGML).

Advantages of XML

Here are few advantages of using Django which can be listed out here:

- XML uses human, not computer, language. XML is readable and understandable, even by novices, and no more difficult to code than HTML.
- XML is completely compatible with Java™ and 100% portable. Any application that can process XML can use your information, regardless of platform.
- XML is extendable. Create your own tags, or use tags created by others, that use the natural language of your domain, that have the attributes you need, and that makes sense to you and your users.

b. Dart (FOR FRONTEND DEVLOPMENT)

Dart is a programming language designed for client development such as for the web and mobile apps. It is developed by Google and can also be used to build server and desktop applications.

It is an object-oriented, class-based, garbage-collected language with C-style syntax .It can compile to either machine code or JavaScript, and supports interfaces, mixins, abstract classes, reified generics and type inference

c. Flutter (FOR BACKEND DEVELOPMENT)

Flutter is Google's Mobile SDK to build native iOS and Android apps from a single codebase. When building applications with Flutter everything towards Widgets – the blocks with which the flutter apps are built. The User Interface of the app is composed of many simple widgets, each of them handling one job.

Chapter 5

CONCLUSION

The main objective of this project was to create a system that would scan and provide alternative recommendations of medicines which are as effective as expensive medicine. Because of this project the user doesn't need to traverse different websites and other problems which saves time as well. Diseases, if diagnosed early, can increase your life expectancy as well as save you from financial troubles. For this purpose, we have used various frontend, backend and AI/ML algorithms like Random Forest, and K Nearest Neighbor (KNN) to achieve maximum accuracy.

REFERENCES

1. Ariponnammal, S. and Natarajan, S. “Transport Phonomena of Sm Sel – X Asx”, Pramana – Journal of Physics Vol.42, No.1, pp.421-425, 2011.

2. Barnard, R.W. and Kellogg, C. “Applications of Convolution Operators to Problems in Univalent Function Theory”,JSER., Vol.27, pp.81–94, 1987.

3. Shin, K.G. and Mckay, N.D. “Open Loop Minimum Time Control of Mechanical Manipulations and its Applications”, Proc.Amer.Contr.Conf., San Diego, CA, pp. 1231-1236, 1984.