Disease predictive, best drug: big data implementation of drug query with disease prediction, side effects & feedback analysis

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Abstract

Nowadays medicine consuming has become day to day activities for the people who were suffering from diseases. Hence many of the people are not aware of the medicine which is prescribed by doctors or pharmacies. Once they are affected by diseases they are approaching doctor and they are in taking the medicines prescribed by them, without having any knowledge about it and gets affected by its side effects. Due to the advancement in medical field many different approach are proposed about using medicines. Many medicines are available for one disease in which some causes side effects. Some patients have an side effect in which the medicine causes same side effects which results in increase in disease.My proposed system is that first we will identify the disease based on patient symptoms and do analysis in that and we will predict disease and suggest the best tablet which do not causes side effects by doing analysis on trained sets based on patient positive improvement and sort the best medicine in ascending order and suggest the medicine to patient, if the patient has some side effects in that top order medicine, next medicine is pescribed and we make appointment for good and best available doctors and book an appointment for that patient.

I.   INTRODUCTION

There is one old proverb which states that Good medicine takes bitter in mouth. From these we can understand that medicine plays a vital and more important role in our life. The medical mafia, people who were affected by infections or disease suffers a lot with infection as well as medicine inhabitation. People who are taking medicine should undergo numerous precautions and effective measures. In our present system, if a person is affected by disease, he will consult doctor and the doctor will prescribe some tablets. These tablets may contains some side effects because we take lot of medicines. In some medicines they will mention regarding this. i.e. For example – in medicine itself they mention that if the medicine is consumed for a longer period of time, these side effects will happen. Many people is un aware of it. Some people has not to take the medicine itself. But for some disease let us say diabetes or hair fall or thyroid , we may consume many tablets which may causes side effects, but the doctors will analysis regarding the medicine should be given to patients or not. But still some doctors do not analysis the side effects correctly , so we cannot say full proof or idle for the existing system. Basically we approach a doctor and we go by doctor opinion. Mostly people will not think to get the second opinion. For example diseases like fever, cold, headache people do not get the second opinion. But for some disease we should get second opinion but that too if the consulting doctor was famous, from him it is questionable to consult for second doctor and it will be complicated. So purely we had to relay on doctors. In present system they mention that one or more tablets may have some side effects in which is analysed by patients profile such as age, sex, genetic information and life style. Its states that particular medicine is taken by patients for long period and these side effects may occur. It is one of major core concept in existing system. In Proposed we implement big data and android based application. First we work on disease diagnosis. After disease diagnosis, we suggest the best tablet for particular disease. Then we analysis the side effects of patients who in take the tablets suggested based on disease diagnosis. Then we analysis the patients will have particular side effects or not. We have server in which we have trained set of symptoms. These symptoms will be compared by patient symptoms and identify the disease suffered by patient. Here we train sets and identify disease by using Supervised machine learning. In Supervised machine learning algorithms we use Support Vector Machine algorithm. Once disease are diagnosed, we analysis the list of medicine available for that disease. Later we analysis the patients profile in which these drugs are given. We analysis the positive and negative improvements of patients for particular drug. We identify the best drug and arrange the drug based on top order wise. We also analysis the side effects of these drugs. Let us assume patient have breathing problem and gastric problem. For breathing problem patient may have medicine which as gastric problem. Hence once patient has these medicine gastric problem will increase more and lead to effects although it is considered as best medicine for breathing problem. To avoid this we can move to alternative medicine(next medicine). As a result best medicine is prescribed to patients.

II. RELATED WORK

The existing related studies reveals The prevailing related reports exhibits folks who are taking medicine must bear countless precautions and effective measures. In our reward procedure, if a individual is littered with disease, he'll seek advice general practitioner and the physician will prescribe some capsules. These capsules could involves some side effects on account that we take lot of drugs. In some medicines they're going to point out concerning this. I.E. For example – in remedy itself they mention that if the treatment is consumed for an extended interval of time, these aspect results will happen. Many men and women is un aware of it. Some persons has not to take the medicine itself. However for some sickness let us say diabetes or hair fall or thyroid , we may consume many pills which may explanations part effects, but the medical professionals will evaluation related to the medicine will have to accept to patients or now not. However still some doctors do not analysis the facet results correctly , so we are not able to say full proof or idle for the prevailing procedure. Basically we technique a physician and we go by means of general practitioner opinion. Ordinarily men and women is not going to believe to get the second opinion. For example diseases like fever, cold, headache persons don't get the second opinion. However for some ailment we will have to get 2d opinion but that too if the consulting doctor used to be famous, from him it's questionable to seek advice for 2d general practitioner and it's going to be elaborate. So in simple terms we needed to relay on medical professionals. In reward process they mention that one or more pills will have some side results wherein is analysed by way of sufferers profile akin to age, sex, genetic know-how and existence style. Its states that special treatment is taken by using sufferers for lengthy period and these side results may arise. It is certainly one of fundamental core suggestion in existing system.

III. PROPOSED METHOD

In this section, we will describe the system framework and support vector machine learning algorithm and its modules.

A. System Framework

Fig. 1 shows the proposed system framework. The proposed framework is the integration of Big Data and Android based input user by any user for easy data analysis process. We also analyse the disease and best drug advised to that specific patient through Big Data analysis. Use can post the query through system or through Android Application also. We also arrange appointment to the Best Doctor for the consultation based on user feedbacks.

ADVANTAGES:

- Easily analyse the disease
- Also provides the drugs based on disease

- Suggest best doctor

- Arrange the doctor appointment

The following shows the diagram of system framework in which each modules are implemented and executed. In each module analysis is done separately and major impact is executed and implemented. Diagnosis plays an important role in this.

System Framework
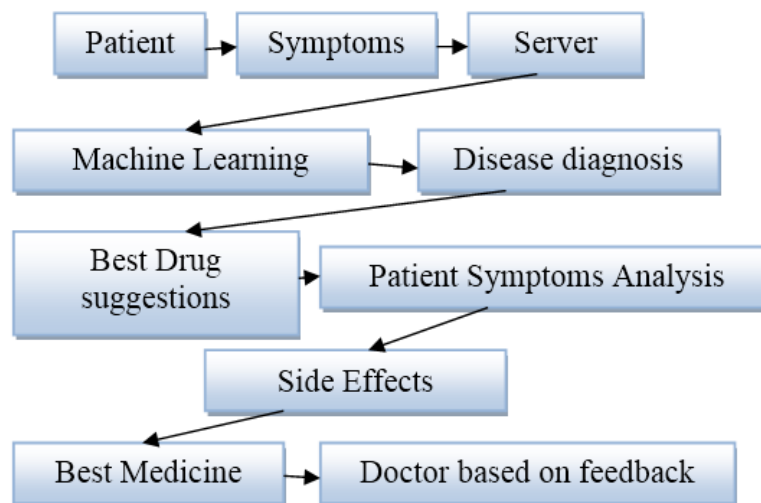
Fig 1. System Framework

B. **Module Lists**
- Server deployment
- Construction of disease training set
- Drug and side effects training set construction
- Big data based analysis
- Best drug recommendation
- Side effect intimation and doctor appointment

1. Server deployment

Cloud Data Service Provider will contain the large amount of data in their Data Storage. Additionally the Cloud carrier Provider will keep the all the person records to authenticate the user when are login into their account. The drugs and disease information will be stored in the Database of the Cloud Provider. Also the Data

Server will redirect the User requested job to the Resource Assigning Module to process the User requested Job

2. Construction of disease training set

In this module we can design and implementation of train the disease to system. Server will store a set of trained dataset and its relevant diagnosis pattern is explained below

Computation:

We implement this by using Support Vector Machine algorithm. Let us see how this works. Here we uses linear kernel to predict the disease and best drug for the treatment.

Lets we consider that we have 2 dimensional space and 2 classes of objects. We want to put the border between them. We can put the border as wide as possible and keep the objects separated. Let us take example for two objects. Hyper plane can be represented by scalar Z and normal vector A. The normal vector determines the orientation. The bios on the other hand contrivers the displacement from the origin. The margin mentioned above can be described by 2 hyper planes.
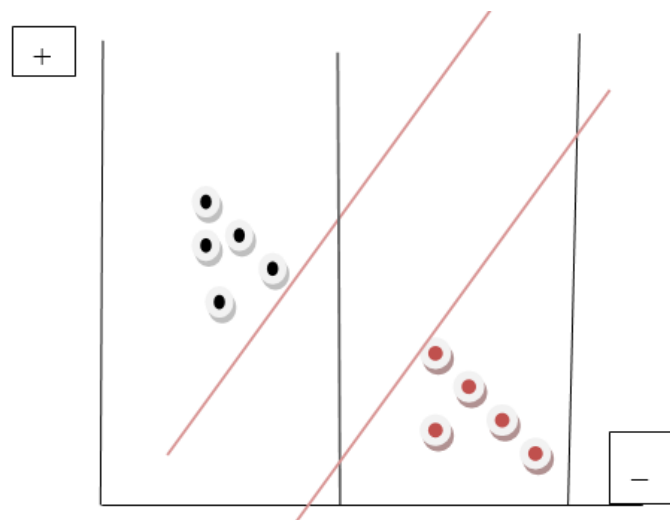
$A^Tx + z = 1$

$A^Tx + z = -1.$

By changing the angle of margin we can rotate the hyper plane or if you want to shift you can increase or decrease the bios.The width of the margin can be represented as

$2||A||$

Of the normal vector. It means the width is inversely proportional to the length of the normal vector.Now its time for notations we denote it as x1 and x2.We use y1 and y2 to describe the labels.

$X1 = [-1,1]^T$
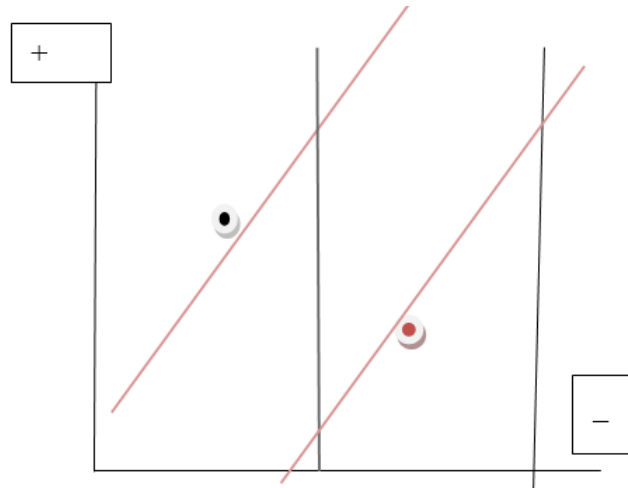
$X2 = [1,-1]^T$

Hence we want to maximize the width of the margin.

$$\therefore \min_{w,\alpha,w,b} = \quad \alpha_i - \frac{1}{2} \quad \alpha_i \alpha_j y_i y_j x_i^T x_j i,j = L \quad (\alpha)$$

This formula helps to increase the width of the margin.

By this we can predict the disease and suggest for best drug and analyze the side effects with positive outcome and analyze the best doctor for appointment.

3. Drug and side effects training set construction

In this module we will train the drugs for every disease and also train the side effects of the drugs. User will be giving their Symptoms & Diagnostic reports to the system for the diagnosis of the disease.

4. Big data based analysis

In this module we implement big data, in this we will have lot or large amount of data that information may wanted or unwanted, in simple information in the big data are unstructured. So in this module the patient is going allow permission to access the server by the big data analyst. The big data analyst get the all the disease and drugs information which mention above and extract the information by the approach of map

reducing formation to get all useful information which is useful for consumers and patient.
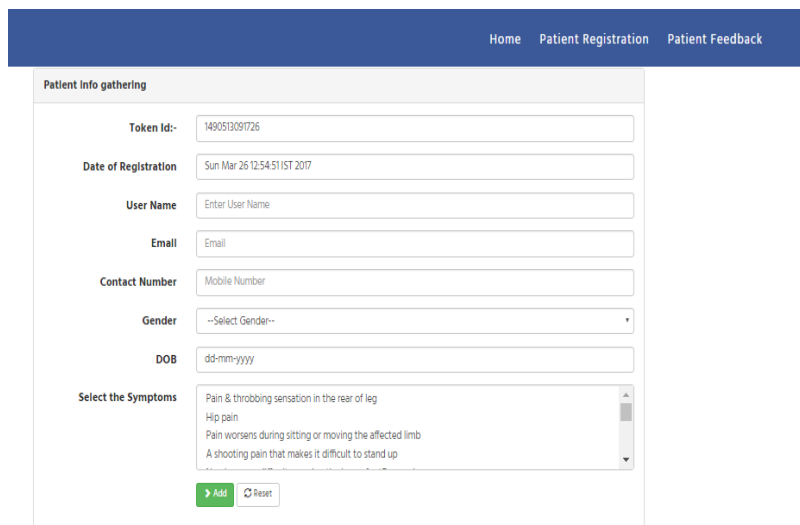
5.   Best drug recommendation

In this module we develop and approach in which we can get the symptoms of patient. We do analysis and suggest the best medicine based on patients symptoms and suggest the best tablet based on the medicine which is already given to patients with positive outcome. We also analysis the negative outcome. With the help of these outcomes we arrange the best drugs in top order. In which top most medicine is prescribed for patients. In patient has side effects in that next medicine is prescribed.

6.   Side effect intimation and doctor appointment

In this module we develop an app that allows a user to query for drugs that satisfy a set of conditions based on drug properties, such as drug indications, side effects, and drug interactions, and also takes into account patient profiles. In this we automate the suggestion of the alternative drugs. So that we can provide the medicine to diseases i.e. a preferred medicine .so the researcher will analysis the dosage of the drug and the symptoms

IV.   EXPERIMENTAL RESULTS

The following are the screen shots in which input is given for identifying disease and best doctor for appointment. Based on patient and feedback and success and negative rate, treatment is given

The following shows the output in which appointment is received by doctor and suggest drug and treatment for patient

The following shows the output in which appointment is received by doctor and suggest drug and treatment for patient

V.   EXPERIMENTAL EVALUATION

The system is simulated and tested in environment where support vector machine learning algorithm is used. SVM helps in predicting best medicines without side effects based on patient's symptoms. Analysis is done in many areas regarding the diseases and side effects and best drug prediction.

VI.   CONCLUSION

In this paper, we get the patient information and we analysis the best medicine based on patients symptoms and suggest the best tablet based on the medicine which is

already given to patients with positive outcome. We also analysis the negative outcome and We also analysis the side effects of the tablet and provide the most useful and efficient data to the patients and book appointment for best doctor for consultation.

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