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A Comparative Study on Healthcare System using Data Mining Prediction Techniques

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Abstract: Its fast growing fields is health care system. The medical industries have large amount of set collections about diagnosis, patient information and medications. To derive these data is into useful pattern and to predicting forthcoming trends data mining approaches are used in health care industries. The health care industries start with new treatments and giving medicine every day. The healthcare organization should give the important recognition and the patients to procuring good excellence of service. This paper examines various data mining techniques which are used in medicine area for good decision making.

Keywords: Data mining, Prediction Techniques, Decision Making.

I. INTRODUCTION

Data mining is the tool for searching hidden values from large amount of data. As the patients population increases the medical databases also increasing every day. The transactions and analysis of these medical data is intricate without the system based analysis technique. The system based analysis mentioned the regulating medical diagnosis system. This automated diagnosis system involves the medical specialist to make good resolve the treatment and disease. Data mining is the broad areas for the doctors to managing the huge amount of patient's data sets in many ways such as make sense of complex diagnostic tests, comparing with previous results, and joining the different data together. This automated diagnosis system focuses to increases the quality of service given to the patients and reduces the medical expenses.

II. DATA MINING WITH DATA COLLECTION

Data mining is the process of joining the different data source and acquires the new pattern from that data collection. The following diagram represents different stages of data mining process.

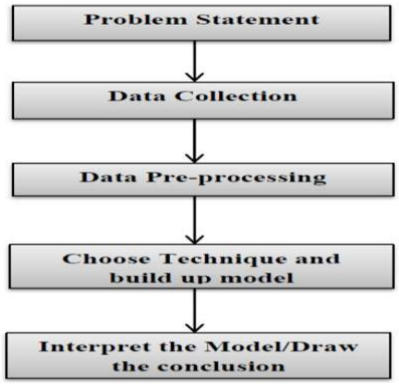

Fig. 1 Data collection

III. HEALTHCARE DATA MINING

Healthcare data mining is the huge development area in Data mining technology. Data mining involves and performing for healthcare management.

It allows systematically and it involves the data and analysis to increase the care and reduce the cost simultaneously could access to as much as 40% of healthcare system. In the healthcare system data mining techniques are doing active role prediction. Few of the prediction of data mining techniques are as follows:

1. Decision tree
2. Neural network
3. Support Vector Machine

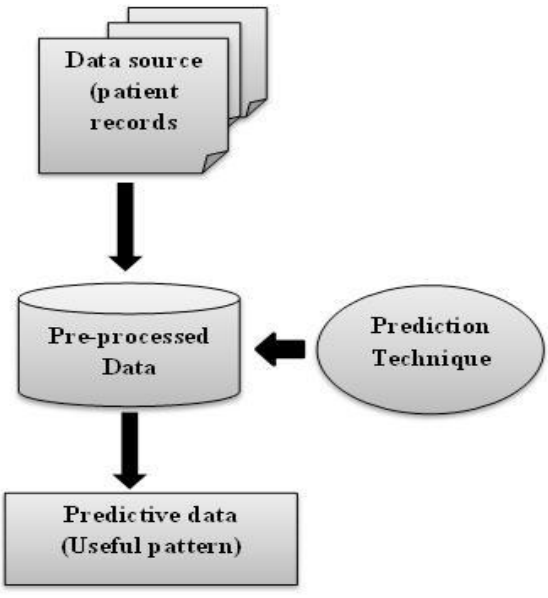

Fig. 2 Prediction Technique

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IV. PREDICTION TECHNIQUES

A. Decision Tree

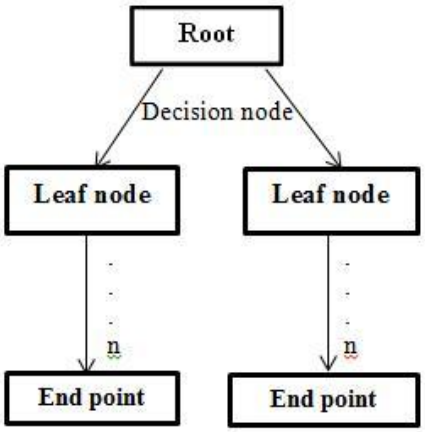

Fig. 3 Decision tree Structure

The decision tree contains of root node, branch and leaf ode. The root node is the one of the top node in the tree Structure, each internal node identifies the test on attributes, the class label are know n by the leaf node, and the branch node is used to take part the test results. Decision tree is easy and fast method since it does not necessary any field of knowledge. In the decision tree inputs are divided into two or more groups repeat the steps till complete the tree as shown on Fig. 3

Few of the decision tree algorithms are:
a) ID3 (Iterative algorithm)
b) C4.5 (ID3)
c) CART (Classification & Regression Tree)
d) **CHAID** (Automatic Interaction Detector)

B. Artificial Neural Network

Neural network is a broad area is used decision making technique. Since 1959 neural network are proposed for healthcare decision making. In neural network the neurons are started with random weights. Neuron doesn't know anything they have to train.

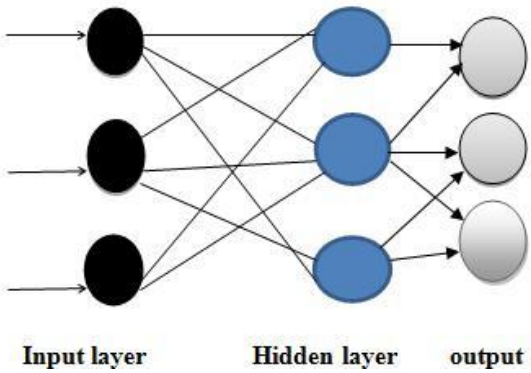

Fig.4 Neural Network

C. Support Vector Machine (SVM)

Generally support vector Machine (SVM) is the classification technique. Initially it is developed for binary type classification then it is extended to receive multiple classifications. This SVM creates the hyper plane on the original inputs for effective separation of data points.

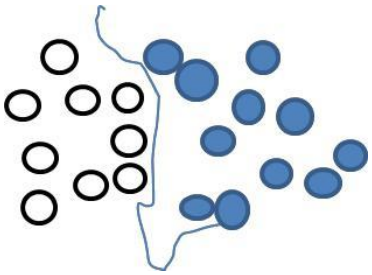

Fig. 5 Input using SVM

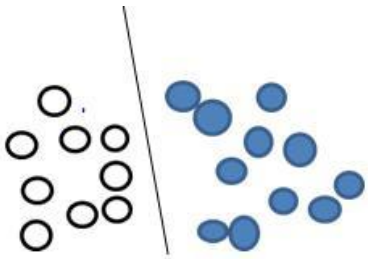

Fig. 6 Output using SVM

VI. COMPARITIVE STUDY OF DIFFEEENT PREDICTION IN HEALTHCARE

A main goal of the data mining in the medical area is better prediction through the experience and scientific observations. This sector explores different data mining prediction applications which are in medical area.

This section examines data mining applications in medical domain by different research worker given in detail. Various data mining tools are used to predict in different healthcare problems. In this section, the following list of medical issues has been studied and estimated.

a. Heart disease
b. Cancer
c. Eye disease
d. Diabetics

There may be large number of data mining techniques and data mining tools are available for predicting heart disease, various cancers, diabetics, eye disease and dermatological conditions.

The following table presents comparison of disease, data mining techniques and the accuracy of the data mining techniques.

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TABLE I .COMPARISON OF DATA MINING TECHNIQUES

S.NO	ACCURACY (%)	DATA MINING TECHNIQUE	ALGORITHM	DISEASE
1.	75.21	Decision tree(SPSS)	Chi-Square	Diabetics
2.	91	Decision tree	C4.5	Diabetics
3.	94.3	SVM	SMO	Diabetics
4.	92	Decision tree/Neural network	Back propagation	Eye disease
5.	99	Neural network	Learning algorithm	Urinary system disease
6.	84.14	Classification	Naïve Bayes	Lung cancer
7.	86.7	Decision tree(WEKA)	C4.5	Breast cancer
8.	93.75	Regression Tree	-	Parkinson's disease
9.	88.76	Classification	Naïve Bayes	Heart disease
10.	86	Classification	Laplace Smoothing	Heart disease
11.	98.24	Classification	k- nearest neighbour's algorithm	Heart disease

VII. CONCLUSION

We presented this paper to analyze the various data mining application in the healthcare domain to discover new range of pattern information. There is variety of data mining tools and techniques are available for health care diagnosis systems that are clearly defined in this paper. This data mining based prediction system are reduces the human effects and cost effective one.

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