RFID BASED MONITORING AND HEART DISEASE CLASSIFICATION USING MACHINE LEARNING

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Abstract: Heart disease is the most prevalent degenerative disease in seniors in which progression can be prevented or delayed by early diagnosis. Heart disease is a term casing any disorder of the heart. Some heart disease leads to death. In order to reduce the number of deaths from heart disease, there has to be a quick and efficient detection technique. This work presents a Machine learning model, involving the mining of texts integrated into the mining of structured data. This model aims to assist specialists in the diagnosis of patients with suspicion of Heart disease. Firstly, we need to collect a set of medical records of different patients who are all having heart disease. Then, a new structured attribute was created from a text mining process. It was the result of predicting the patient's pathological history information stored in an unstructured textual attribute. J48 algorithm creates a decision tree for machine learning that was applied to obtain the risk level. We may also implement RFID for patients. RFID is known for its distinctive ID number. Using this advantage, in the first part, the monitoring of a patient is done whenever he arrives at the hospital. In case of any shifts from the hospital, the information is still accessible. Every patient is provided with a unique RFID number and all the details relating to the patient and treatments are store in a federal database that is retrieved by the server.

Index Terms - **RFID, Heart disease, ID Number**

I. INTRODUCTION

Life is dependent on a competent functioning of heart because the heart is a necessary part of the body. If the function of the heart is not suitable, it will affect the other body parts of humans such as the kidney, etc. Heart disease is a disease that affects the purpose of the heart. There are a number of times of factors that raise the risk of heart disease. In the present day, in the world heart disease is the main cause of death. The world health organization (WHO) has expected that 12 million deaths occur year due to heart disease. Prediction by using gives us worldwide; ever techniques give us accurate result of the disease. IHDPS can find out and extract hidden knowledge related with heart disease from a historical heart disease database. It can answer compound queries for diagnosing heart disease and thus help healthcare analysts and practitioners to make intelligent clinical decisions that conventional support cannot. A few kinds of heart disease are cardiovascular disease, heart attack, Coronary heart diseases, and stroke. Stroke is a type of heart disease; it is caused by tightening, blocking, or hardening of the blood vessels that go to the brain or by high blood pressure. System based on the risk factors would not only help medical professional but as well it would give patients a caution about the possible presence of heart disease even before he visits a hospital or goes for rich medical check-ups. The integration of RFID technology with the Information system will improve the quality of patient care and safety treatment by tracking the real-time status of patient treatment, clinical staff, doctors, war allocation a critical clinical equipment available for patients. We have identified the key entities in a smart hospital System and developed the database model by integrating RFID technology. We also proposed the architecture for RFID base smart hospital systems. On the basis of the proposed architecture, we have developed a working prototype application.

A mechanical problem that limits the ability of the heart's chambers to fill with blood. When weakened, the heart is unable to keep up with the demands placed upon it; blood returns to the heart faster than it can be pumped out so that it gets backed up or congested. Documentation should indicate whether the heart failure Heart failure is a situation in which the heart is not capable to pump adequate oxygen-rich blood to meet the body's needs. It usually develops behind other conditions have weakened or spoilt the heart. Heart failure is measured a chronic situation and tends to develop slowly over time. Though, patients may incidence a sudden onset of symptoms, which is known as acute heart failure. Congestive heart failure (CHF) means the heart do not pump as well as it should to meet the body's oxygen difficulty, often due to heart diseases such as cardiomyopathy or cardiovascular disease. CHF can affect from either a dense ability of the heart muscle to contract or from mechanical trouble that limits the ability of the heart's chamber to fill with blood. When weakened, the heart is unable to keep up by means of the stress placed upon it; blood proceeds to the heart earlier than it can be pumped out so that it gets backed up or full. Documentation should point to whether the heart failure is sensitive or chronic and the part of the heart that is affected. The left-sided heart work stoppage is the most ordinary figure. It causes squatness of breath due to fluid and blood support up in the

patient's lungs. Right-sided heart breakdown may reason fluid and blood to back up into the patient's stomach, legs, and feet, resultant in swelling.

Heart sickness is the most important reason of death in the United States.1 Stroke is the fifth most important reason of death in the United States. Together, the heart is affected. Left-sides heart failures the most common figure. It causes shortness of breath due to fluid and blood backing up in the patient's lungs. Right-sided acute or chronic and the part of the heart that is affected. Left-sided heart failure is the most common form. It causes shortness of breath due to fluid and blood backing up in the patient's lungs. Right-sided heart failure may cause fluid and blood to back up into the patient's abdomen, legs, and feet, resulting in swelling. Heart failure may cause fluid and blood to back up into the patient's abdomen, legs, and feet, resulting in swelling, disease and stroke, along with a different cardiovascular disease, are in the midst of the most common and costly health trouble facing the Nation today, clerical for about $320 billion in health care expenditures and connected expenses early heart disease is the most important cause of death in the United States.1 Stroke is the fifth leading cause of death in the United States. Together, heart disease and strokes, along with other cardiovascular diseases, are among the most prevalent and costly health trouble facing the Nation today, accounting for approximately $320 billion in health care expenditures and related expenses yearly.

II. LITERATURE

2.1 Comparing Machine Learning Used for Heart Disease Prediction

Heart related diseases or Cardiovascular Diseases (CVDs) are the main reason for a huge number of deaths in the world over the last few decades and has emerged as the most life-threatening disease, not only in India but in the whole world. So, there is a need of reliable, accurate and feasible system to diagnose such diseases in time for proper treatment. Machine Learning algorithms and techniques have been applied to various medical datasets to automate the analysis of large and complex data. Many researchers, in recent times, have been using several machine learning techniques to help the health care industry and the professionals in the diagnosis of heart related diseases. This paper presents a survey of various models based on such algorithms and techniques and analyze their performance.

2.2 Identification of significant features and Machine Learning in predicting heart disease

Cardiovascular disease is one of the biggest causes for morbidity and mortality among the population of the world. Prediction of cardiovascular disease is regarded as one of the most important subjects in the section of clinical data analysis. The amount of data in the healthcare industry is huge. Data mining turns the large collection of raw healthcare data into information that can help to make informed decision and prediction. There are some existing studies that applied data mining techniques in heart disease prediction. Nonetheless, studies that have given attention towards the significant features that play a vital role in predicting cardiovascular disease are limited. It is crucial to select the correct combination of significant features that can improve the performance of the prediction models.
This research aims to identify significant features and data mining techniques that can improve the accuracy of predicting cardiovascular disease.

2.3 Heart Disease Diagnosis Using Machine Learning Technique.

The main topic is prediction using machine learning techniques. Machine learning is widely used now a days in many business applications like e commerce and many more. Prediction is one of area where this machine learning used, our topic is about prediction of heart disease by processing patient's dataset and a data of patients to whom we need to predict the chance of occurrence of a heart disease.

III. EXISTING SYSTEM

Clinical decisions are often made base on doctors' perception and knowledge rather than on the knowledge-rich data hidden in the database. This practice leads to not needed biases, errors and severe medical costs that affect the quality of service provided to patients. There are many ways that a medical misdiagnosis can near itself. Whether a doctor is at mistake or hospital staff, a misdiagnosis of a serious sickness can have very extreme and harmful effects. The National Patient Safety establishment cites that 42% of medical patients feel they have had knowledgeable medical errors or missed diagnoses. Patient safety is sometimes carelessly given the back seat for other concerns, such as the cost of medical tests, drugs, and operations. Medical Misdiagnoses are a serious risk to our healthcare professionals. If they carry on, then people will fear to go to the hospital for treatment. We can put an end to medical misdiagnosis by informing the community and filing claims and suits besides the medical practitioners at fault.

IV. PROPOSED SYSTEM

In the proposed system, every patient is provided with a unique RFID number and all the details concerning the patient and treatments are stored in a centralized database which is retrieved by the server. The main goal of this system is to predict heart disease for patients. Raw hospital data set is used and then pre-processed then Classification (j48 algorithm) on the pre-processed data set. Machine learning has been widely used in clinical decision support systems for prediction or diagnosis of various diseases with accuracy.
  o   One important application of Machine learning is to diagnose heart disease.

Advantages of Proposed System

1. In the proposed system Machine learning - selecting the suitable treatment for heart patients.
2. Time consumption is less and High performance and accuracy.
3. To make it easier this concept of maintaining a centralized information system and sharing has been planned through the use of RFID technology.
4. The integration of clinical decision hold up with computer-based patient the books could reduce medical errors. Enhance patient safety.
5. Decrease unnecessary practice variation, and improve patient outcome. The marks will be of greater.

Algorithm

- **J48 Algorithm**

There are many decision tree algorithms and among them the most popular is J48 which uses a pruning technique to build a good decision tree. Pruning is a method which tries to eliminate the over fitting data which is not so relevant in making a decision and leads to poor prediction. At last, a tree is built to provide flexibility and accuracy balance. The decision tree approach is more powerful for classification problems. There are two steps in this techniques building a tree & applying the tree to the dataset. There are many popular decision tree algorithms CART, ID3, C4.5, CHAID, and J48. This system J48 algorithm uses pruning method to build a tree. Pruning is a technique that reduces size of tree by removing over fitting data, which leads to poor accuracy in predications. The J48 algorithm recursively classifies data until it has been categorized as perfectly as possible. This technique gives maximum accuracy on training data. The overall concept is to build a tree that provides balance of flexibility & accuracy.
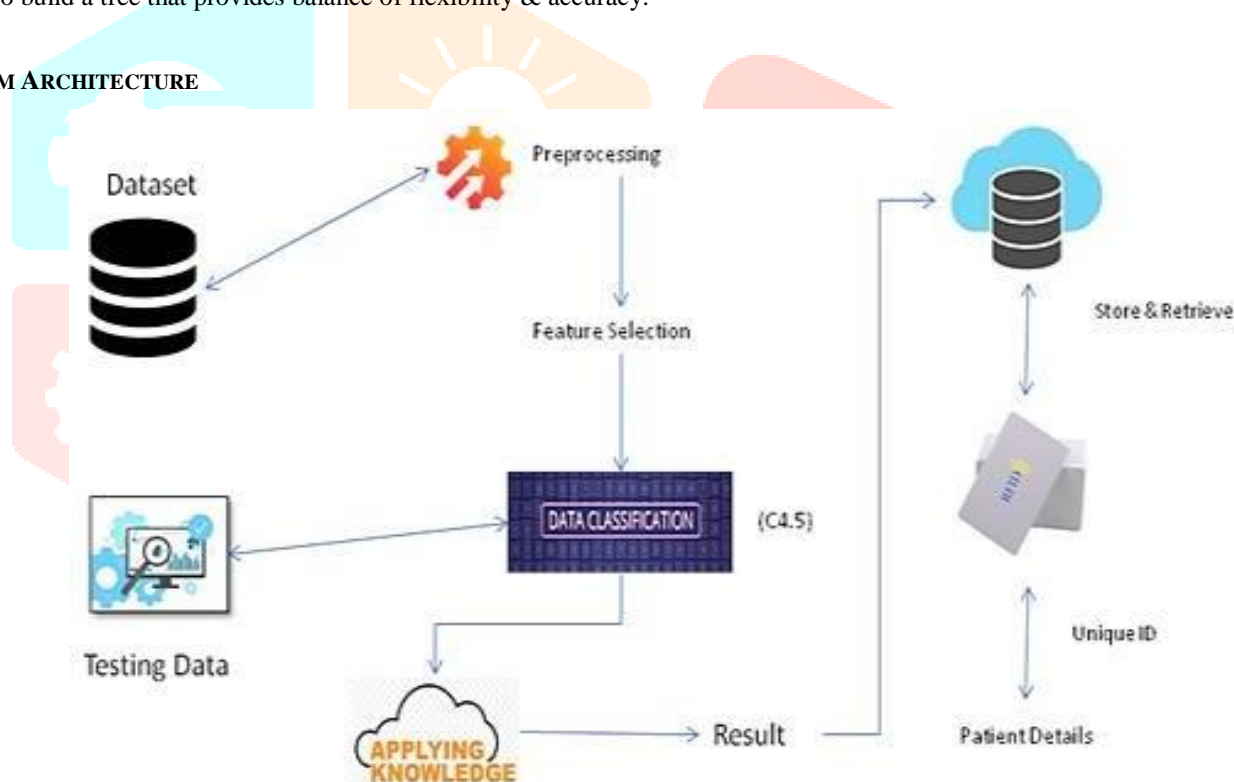
V. SYSTEM ARCHITECTURE

Figure1: System Architecture

5.1 Preprocessing

Data preprocessing is an important step inside the mining device Data preprocessing is an essential step within the mining machine. Real worldwide data are commonly noisy incomplete, inconsistent. Data cleaning can be applied to get rid of noisy and accurate inconsistencies in statistics. Data cleaning is typically step process.

- First to discover mistakes in a facts
- Then set after which to accurate them.

5.2 Feature Selection

Feature selection is the system of locating the meaningful input. It is extracting beneficial facts or features from current information because Data nearly constantly incorporates greater records than is needed to construct the model, or the wrong kind of facts. Correlation based feature choice can pick out beneficial capabilities for type. It unearths which feature is especially correlated to the elegance and not plenty correlated to another featured of the elegance.

5.3 Classification

J48 is an extension of ID3. The extra features of J48 are accounting for missing values, decision bushes pruning, derivation of regulations, and many others.

In case of capacity over turning into pruning may be used as a tool for precising. This set of rules it generates the guidelines from which specific identity of that statistics is generated. The aim is step by step generalization of a decision tree until it earnings equilibrium of flexibleness and accuracy.

5.4 RFID Generation

In this module, the patient being issued the RFID tag if he/she is a brand new affected person else the reader reads the tag and his/her details like unique ID number, call, age, blood institution, treatment details, doctor attended, previous health centre visited and so forth. At the stop the details are updated in the login. In case the patient is going to another health facility then the centralized server shares the records so that the information retrieved from the database are the updated one. So in this manner the method of wearing the information and the documents is completely disregarded. When the RFID tag is shown to the reader, the reader reads the price and is stored in the database from which it's far retrieved by using the server and the information are displayed.

Figure2: Reader RFID Tag ID
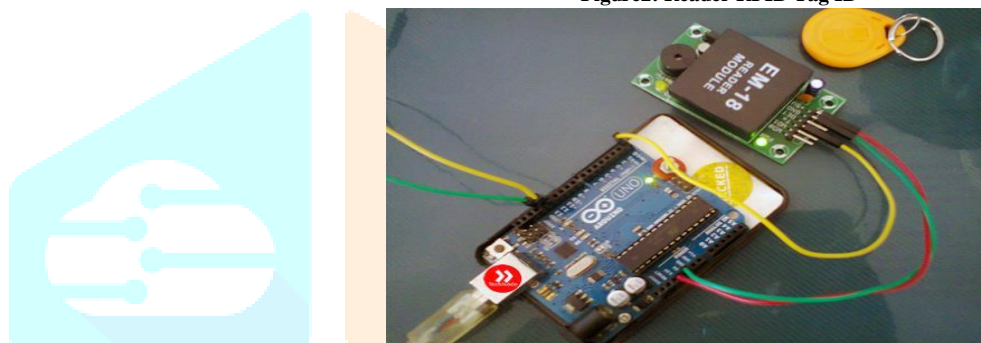
VI. CONCLUSION

Usual physical activity results in a variety of favorable effects on cardiovascular and general health, with incremental benefits evident with increasing exercise dose. This phenomenon is seen in healthy individuals and in patients with recognized cardiovascular disease, for example, in the cardiac rehabilitation setting. In contrast, determined action may aggravate cardiac instability and ventricular arrhythmia in susceptible individuals, such that the majority of sudden deaths in young athletes occur in those harbouring inherited or congenital cardiac disorders.

Pre-participation screening has the potential to detect such individuals, in whom abstinence from aggressive sports may be mandated. Debate still exists concerning the optimal strategy for screening, although ECG-based protocols have now been endorsed by many of the International sports governing bodies. The issue of screening is complicated by the physiological remodeling evident in the hearts of healthy athletes, which may create a diagnostic overlap with pathological conditions. Borderline cases must be evaluated on a case-by-case basis with knowledge of the person athlete's demographic and sporting profile. Recent attention has focused on the concept that chronic patience exercise may lead to adverse cardiac remodeling and Arrhythmogenesis in previously healthy individuals, although this has yet to be convincingly demonstrated in large cohorts.

VII. FUTURE ENHANCEMENT

In future immunotherapy is the big expectation to detect beside cancer, heart disease, and arthritis. From gut bacteria to Nano-drugs, from immune cells to plant- derived drugs-Cancer research is throwing up a host of possibilities that are likely to get firmed up in 2016. The most talented is using the body's own immune system to fight against cancer cells by genetic tweaking. This allows the body's Special Forces-T-Cells- to start recognizing cancer cells as enemies and targeting them. This has worked for blood cancers and is poised for breakthroughs in solid cancers. Meanwhile, gut bacteria have been shown to help fight cancer while conventional chemotherapy may be replaced by less toxic targeted Nano-particles of drugs.

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