

Big Data Healthcare in Tackling Chronic Diseases-Diabetes

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Abstract— With growing population day by day, Big Data has emerged into an enormous thing in all the sectors like business, healthcare, and agriculture and so on around the world. Big Data analytics can revolutionize the healthcare industry. It can improve operational efficiencies, plan responses to improve the quality of medical trials and reduce the healthcare spending from system to governments. Nowadays chronic diseases have grown at a larger rate which has become a serious issue in healthcare department. Chronic diseases have been endured for a long period of time but they cannot be cured completely. Diabetes is a major problem mostly in United States and Saudi Arabia. Healthcare data contains huge, complex and different types of data.

Keywords — Big Data, Big Data Analytics, Chronic diseases, Diabetes, Parallel SVM, R.

I. INTRODUCTION (SIZE 10 & BOLD)

(Size 10 & Normal) Big data has been defined in so many ways. Big data can be defined as an all-encompassing term for any kinds of huge datasets in which traditional approaches unable to process the data. Big data can be categorized into 5V's :- volume, variety, velocity, veracity and value. Volume refers to large data created in every second. Variety refers to different types of variables. Velocity refers to as the speed at which the data is generated. Veracity refers to the quality of data can vary greatly. Value refers to relevant information can be extracted to give to all the sectors.

A. HealthCare Industry Overview (Size 10 & Bold & Italic)

In today's era healthcare industry is one of the most critical industries as it is fast growing. In the near future, the cost of healthcare is projected to continuously increase. For example, estimates put U.S healthcare costs \$4.1 trillion in 2016. Individual segments within healthcare industry also follow the same trend. A report by IMS research estimates that spending for pharmacy drugs will increase to \$1.2 trillion by 2016. [1]

B. Big data in chronic diseases

The number of chronic patients is increasing day by day thus becoming an alarming sign for individuals and organizations. Here data analytics plays an important role in decision making in improving patient's health. therefore it is necessary to understand and analyze the data and be able to face the new challenges. A chronic disease or a chronic condition is a condition which is persistent or otherwise long lasting or a disease that comes with time. There are many types of chronic diseases like arthritis, diabetes, kidney problems, asthma and so on. The symptoms of chronic disease are enlarged lymph nodes, fatigue, sore throat, loss of memory, unexplained muscle pains and pains that moves from one point to another and so on.

Diabetes or diabetes mellitus is a condition in which the body is unable to produce enough insulin which is needed to regulate the amount of sugar in the body[8]. Diabetes is one of the fastest growing diseases around the world. Basically there are three main types of diabetes: (1) Type 1 diabetes mellitus is a condition where the person has to wear an insulin pump or inject insulin into his body as the body is unable to produce insulin. (2) Type 2 diabetes mellitus is a condition where cells refuse to use insulin. (3) Gestational diabetes mostly occurs in pregnant women as they have not gone under diagnostic tests develop high blood sugar level.

C. Proposed Methodology

There are several methods proposed for healthcare monitoring for example using a smart biowatch or an electronic health band[1]. These kinds of methods collect information and transfer it to the system through the network. Then it preprocess the data as it contains faulty and noisy data. But here we use Support Vector Machine (SVM method) which is a classification technique. SVM provides an optimal hyper-plane which is able to give the maximum margin between the two vectors of the two classes. The disadvantages of SVM approach is that it is expensive and it runs slow. To overcome these advantages we use parallel SVM in which the outcome of the two support vector machines is the input to next support vector machine. Here we use

MapReduce technique to implement the parallel SVM method[9].

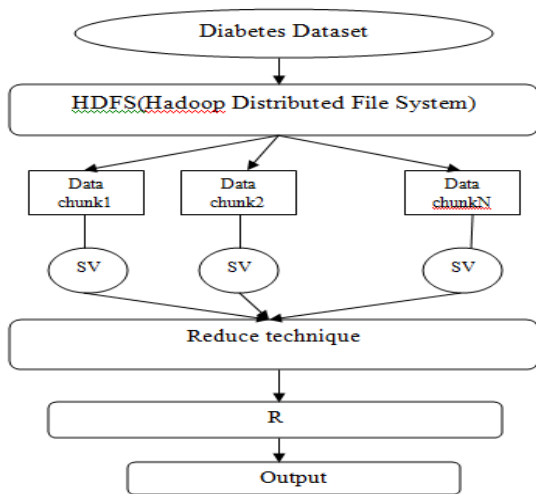


Fig 1: Architecture of proposed method.

II. CONCLUSION AND FUTURE WORK.

Chronic diseases are major facing challenge facing the healthcare system today, making enormous tolls on public health and increasing high levels of healthcare spending. Today healthcare understands what to do with Big data and is trying to explain all the innovative ideas. Big data is a new trend and its tools and platforms are trying to explore new collaborative ideas. Future work will be to implement the proposed work.

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