

Big Data Analytics using in Healthcare Management System

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ABSTRACT

Big data is the new technology for healthcare management system. Present day's big data analytics are using in everywhere because of its good data management and its large storage capacity. In hospital managements the patients and doctors record keeping safe is the important role in healthcare system. In worldwide the big data method is extended use in the area of medicine and healthcare system. In this sector so many problems are there in implementing big data in healthcare system especially in relation to securities, privacy matters, standard records, good governance, managing of data, data storing and maintenance, etc. It is critical that these challenges to overcome before big data can be implemented successfully in healthcare. The amount of data being digitally collected and stored safely in big data Hadoop clusters. This paper introduces healthcare data, big data in healthcare systems, applications, advantages, issues of Big Data analytics in healthcare sector.

KEYWORDS: Big Data analytics, Healthcare, Personalized medicine, health promotion, Hadoop cluster

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1. INTRODUCTION

Big data is the one of the most using technology in healthcare management system. Big data has implications on healthcare on hospital's patients, staffs, doctors, medicine providers, researchers, health professionals. The health record is very useful to provide patients records with up-to-date information to assist them to make the urgent decision medical treatment. The medical records include patient's basic data, doctor's data, surgical data, medicine data, etc. this information is stored in one single record like PMR (patient medical record), and it is stored in Hadoop cluster. It has some security and privacy. Only authorized persons can use this data properly.

In health sector different forms of data and large amounts of data are generated. For example hospital database include patients and staffs summary, hospital structure, different types of medical equipment, medical devices, etc. In big data technology we use different types of records for patients information are stored in this types only these are EMR (electronic medical record) and EHR (electronic health record). Big data in health sector is very useful in both research and clinical

2. LITERATURE SURVEY

Big data in health informatics can be used to predict outcome of diseases and epidemics, improve treatment and quality of life, and prevent premature deaths and disease development. Big data also provide information about diseases and warning signs for treatment to be administered.

This will help not only to prevent co-morbidities and mortality but also assists government to save the cost of medical treatment. It is very useful not only in clinical medicine for diagnosis/detection but also in epidemiological research as the big data will provide huge amount of data. The government, non-governmental organization and/ or pharmaceutical companies can use the data to formulate policies, strategies, intervention or medical treatment such as drugs development. The Malaysia National Health and Morbidity Survey in 2015 has revealed that the number of obese Malaysians have risen to 17.7% compared to 4.4 % in 1996 and 17.5% of those aged 18 and above have diabetes compared to 11.6% in 2006. Most of the time, medical data are collected in silos in their respective healthcare centres and is governed and controlled by hospitals or clinics administrative departments. Should big data is successful implemented in Malaysia, it will reduce wasteful overheads and effective managed.

3. BIG DATA TECHNIQUES

"Big Data is the term for the collection of datasets so large and complex that it becomes difficult to process using ion hand databases management data processing applications".

The 4 V's of Big Data:

- **Volume:** It is getting vast as compared to traditional sources through which data used to be captured large amounts of data generated every seconds.(email, twitter, msg).

- **Velocity:** The speed at which data is being generated, it is phenomenal and never stops the speed of data moving in and out data management.
- **Variety:** Data comes from various sources, machine generated and people generated different data formats in terms of structured or unstructured data. Data comes in all varieties in form of structured, numeric data in traditional databases to unstructured text documents, email, video, audio, stock ticker and financial transactions.
- **Veracity:** Trustworthiness of data the quality of data, as one little control of the volume.

3.1. BIG DATA APPLICATIONS

- Public sector services.
- Healthcare contributions.
- Learning services.
- Insurance services.
- Industrialized and Natural Resources.
- Transportation services.
- Banking sector and Fraud Detection.

4. BIG DATA IN HEALTHCARE SYSTEM

Coordination of patients and hospital persons is more important, because the patients trust is very valuable. Every patient likes good services and transparency in hospital. Patients all information like his/her basic data, test result data, surgical data, medicine data, referred doctor data all the data are stored in hospital database. Here security is more important. Using big data technology we provide security and privacy for hospitals data. The big data method is extended use in the area of medicine and healthcare. Mainly this technology rises the cost of healthcare is also increasing more and more.

In Big data method collecting all medical record and stored in Hadoop cluster, it is very secure and maintenance also cost effective. Once the patients registered his/her name and his /her data it will be stored in the hospital database safely forever and whenever required, the doctor or patient can use it. For example, present day's data is used in such an extent that doctor prescribes the medicines without even visiting the patient by knowing the heartbeat and temperature through the heartbeat and the temperature monitoring watch fitted on the patient's hand that stays in a remote place. Now a day these types of devices are using to take care of patient.

4.1. CHALLENGES IN BIG DATA WITH HEALTHCARE

There are some challenges of Big Data analytics in healthcare systems.

- Capturing Or collecting the data
- Storing the patients and doctors information
- Sharing medical records data
- Searching particular medical record database
- Analysing and processing the data
- Hospital data security and privacy
- Maintenance of good quality data
- Maintain standard healthcare report

4.2. ADVANTAGES OF BIG DATA IN HEALTHCARE

- A. Big data provide the full information on the patient's and at the same time able to administer medical data without any delay.

- B. Big data is also used in predictive data analysis it is used to identify and address the medical related problems immediately.
- C. Big data providing some security features, like it is very effective in identifying the frauds in healthcare system.
- D. Quick access: Big data allows development or modification of a functions or program to identify the health related problems.
- E. Medicine industry: Big data could facilitate the pharmaceutical companies to identify new potential and effective drugs and deliver it to the users more quickly.

4.3. ISSUES WITH BIG DATA IN HEALTHCARE

- Doctor and Patient data confidentiality
- Accountability
- Security and privacy matters
- Medical Records maintenance
- Storage and maintenance cost
- Accessibility and Availability
- Varieties of data available in healthcare
- Data management

CONCLUSION:

Big data is very effective and useful because of it can handle both structured and unstructured data formats. Hospitals are producing large number and different form of data. Using traditional data processing techniques and tool/software in Healthcare data management is very critical to handle because now a day large number of data are produced in healthcare sector, handling these data has some problem. Using big data and Hadoop methods to solve those problems very effectively and easily. Understanding the unstructured clinical notes in the right index is the one of the challenge. In hospital among all 80% of health data is clinical data and which is unstructured as documents, images, clinical or doctor's notes. The amount of data being digitally collected and stored safely in big data clusters. Only authorized persons can access the data in database. Finally Hadoop-based Big Data has effective advantages like accountability, efficiency, reliability, scalability and security.

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