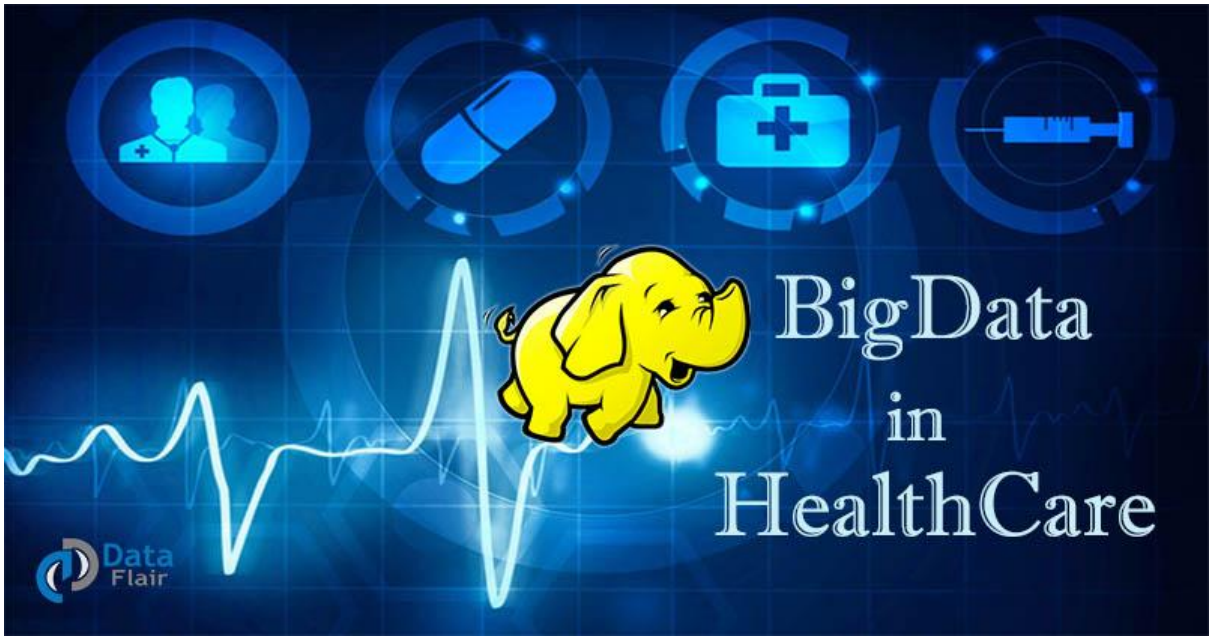
Big Data in Healthcare – Real World Use-cases

Contents

1. Objective

This blog will take you through various use cases of Big Data in Healthcare. Understand how Big data is transforming healthcare and medical science and how big data bring revolution in the healthcare industry, we will understand the same using various real world case studies of big data and analytics in healthcare. How big data is changing healthcare and reducing the cost & improving outcome.



2. Introduction

Big Data revolution is transforming the way we live. The last few years have seen a tremendous generation of data which impacts our day to day life and health care has also not been untouched by it. The healthcare industry has certainly lagged behind other industries such as banking, retail, etc. in the usage of Big Data. Other industries have embraced Big Data earlier and have reaped profits and greater customer satisfaction.

3. Big Data in Healthcare

Healthcare industry generates huge data about every patient but accessing, managing and interpreting the data are critical to creating actionable insights for better care and efficiency. The American Healthcare expenses represent 17.6% of its GDP, which is far more than the expected benchmark. Clinical trends also play a role in the rise of Big Data in Healthcare. Earlier physicians used their judgments to make treatment decisions, but the last few years have seen a shift in the way these decisions are being taken. Physicians review the clinical data and make an informed decision about a patient's treatment. Financial concerns, better insights into treatment, research, efficient practices contribute to the need of Big Data in Healthcare industry. As per prediction by IDC, 30 percent of providers will use cognitive analytics with patient data by 2018.

4. IOT and Big Data Analytics in Healthcare

IOT adds a great value to the healthcare industry. Devices that generate data about a person's health and send it to the cloud will lead to a plethora of insights about an individual's heart rate, weight, blood pressure, lifestyle and much more. **Big Data**allows real-time monitoring of patients, which leads to proactive care. Sensors and wearable devices will collect patient health data even from home. This data is monitored by healthcare institutions to provide remote health alerts and lifesaving insights to their patients.

Smartphones have added a new dimension. The apps enable the smartphone to be used as a calorie counter to keep a track of calories; pedometers to keep a check on how much you walk in

a day. All these have helped people live a healthier lifestyle. Moreover, this data could be shared with a doctor, which will help towards personalized care and treatment. Patients can make lifestyle choices to remain healthy.

5. Big Data and Cancer

Big Data aims to collect data from pre-treatment and pre-diagnosis data to the end stage. This data is aggregated with clinical and diagnostic data which makes predicting cancer more feasible. This predictive analysis helps to categorize different cancers and improves cancer treatment.

By leveraging historical data of patients with similar conditions, predictive algorithms can be developed using R and big data machine learning libraries to project patient trajectory.

96% of the potentially available data on patients with cancer is not yet analyzed. Based on this idea, Flatiron Health developed a service called Oncology Cloud. This service aims to gather data during diagnosis and treatment and make it available to clinicians to advance their study.

6. Clinical studies, Predictive analysis, and Inventory Management

Clinical studies can be performed in a much efficient manner. Researchers who conduct clinical studies can take a variety of factors combined with multiple statistics to attain higher precision in their studies. Genomic data is very important for the healthcare industry. The values of diagnostic tests are vital to the reduction in lab testing and genome analysis costs.

Socioeconomic data can play a significant role in the **predictive** analysis. This data might show that people with certain zip code do not have access to cars (rural places) or other vehicles. Health systems thus identify patients in these areas and predict missed appointments, non-compliance with medications and more. The possibilities with predictive analysis with Big Data are endless.

There are many benefits of Big Data in Healthcare for managing the hospital inventory. It averages the supplies per treatment enabling Just in Time Inventory which reduces cost.

7. Big Data helps fight Ebola in Africa

Big Data helps predict the spread of epidemics. The mobile phone location data track population movements, which predict the spread of the virus. This gives insights about the most affected areas, which in turn leads to better planning of treatment centers and enforce movement restriction in those areas.

8. Big Data Innovations in Healthcare

Big Data – Hadoop, Spark, Flink has been a source of innovation in healthcare. Some Big data case studies in Healthcare are as follows:

a. Asthmapolis

It has developed a GPS-enabled tracker that records inhaler usage by asthmatics. The information is transferred to a centralized database and used to identify trends about individual, group and population. The data are then merged with information about asthma catalysts. This information helps physician offer personalized care and treatment to asthma patients.

b. Ginger.io

It offers a mobile application which allows their patients to be tracked through their mobile phones to remotely deliver mental health treatments. The smartphone sensors are monitored and the information is used for behavioral health therapies.

c. AiCure

It uses mobile technologies, facial recognition technologies, and big data and Spark to examine if a patient is taking the right medications at the right time. This will help doctors to ensure that the patient is taking his medications properly and alert him if something goes wrong.

d. United Healthcare

It is processing data inside a Hadoop big data framework to give them a complete view of its 85 million members individually and then using it for clinical improvements, financial analysis and fraud and waste monitoring.

This is just the beginning. With the development of technologies, new and better treatments and diagnoses will help in saving more lives by curing more diseases. The future of medical science is based on data analytics.