

Analytics for Hospitals Healthcare Data

Literature Survey:

1. Proposed application of big data analytics in healthcare at Maharaja Yeshwantrao Hospital

Authors: Mimoh Ojah , Kirti Mathur

Published In: 2016

This paper gives an insight of how we can store healthcare data digitally like patient's records as an Electronic Health Record (EHR) and how we can generate useful information from these records by using analytics techniques and tools which will help in saving time and money of patients as well as the doctors. This paper is fully focused towards the Maharaja Yeshwantrao Hospital (M.Y.) located in Indore, Madhya Pradesh, India. M.Y hospital is the central India's largest government hospital. It generates large amount of heterogeneous data from different sources like patients health records, laboratory test result, electronic medical equipment, health insurance data, social media, drug research, genome research, clinical outcome, transaction and from Mahatma Gandhi Memorial medical college which is under MY hospital. To manage this data, data analytics may be used to make it useful for retrieval. Hence the concept of "big data" can be applied. Big data is characterized as extremely large data sets that can be analysed computationally to find patterns, trends, and associations, visualization, querying, information privacy and predictive analytics on large wide spread collection of data. Big data analytics can be done using Hadoop which plays an effective role in performing meaningful real-time analysis on the large volume of this data to predict the emergency situations before it happens. This paper also discusses about the EHR and the big data usage and its analytics at M.Y. hospital.

2. A look at challenges and opportunities of Big Data analytics in healthcare

Authors: Raghunath Nambiar , Ruchie Bhardwaj

Published In: 2013

Big Data analytics can revolutionize the healthcare industry. It can improve operational efficiencies, help predict and plan responses to disease epidemics, improve the quality of monitoring of clinical trials, and optimize healthcare spending at all levels from patients to hospital systems to governments. This paper provides an overview of Big Data, applicability of it in healthcare, some of the work in progress and a future outlook on how Big Data analytics can improve overall quality in healthcare systems.

3. Predictive Big Data Analytics in Healthcare

Authors: A. Rishika Reddy , P. Suresh Kumar

Published In: 2016

In today's world the massive set of data is generated from different organizations throughout the world. This huge and heterogeneous data is called Big Data. Big Data Analytics offers tremendous insights to different organizations especially in healthcare. The traditional database architectures are not up to the mark to face the challenge with huge data, which is pouring into organizations today, and it creates a big havoc. Big Data plays an important role in achieving predictive analysis in the healthcare domain. Big Data can handle huge explosion of data, which is found in many medical organizations. Big Data Analytics plays a major role in solving issues and challenges arises in healthcare domain. This paper gives an overview of storing and retrieval methods, Big Data tools and techniques used in healthcare clouds, role of Big Data Analytics in healthcare and discusses the benefits, outlooks in nascent fields of predictive analytics, faces challenges and provides solutions. The results also shows the astronomical role of Big Data Analytics in healthcare.

4. Quality of information for quality of life: Healthcare big data analytics

Authors: GGT Dantanarayana , Tony Sahama

Published In: 2015

Business intelligence and analytics, and big data analytics have become increasingly important in describing the data sets and analytical techniques in software applications that are so large and complex. These two techniques have been used as analytics by several e-commerce communities. For example, vendors such as Amazon and eBay have adapted these techniques to significantly advance in innovative and highly recommended scalable e-commerce platforms and product systems to target potential customers thus increasing business revenues. In a similar context, the health community have experienced not only more complex and large data content, but also information systems that contain a large number of data sources with interrelated data. Furthermore, due to the increasing diversity and differentiation of expansions by service providers in the form of primary or nursing care, a variety of service organisations in the public and private hospital networks including new medical specialist facilities have resulted in challenging, and highly dynamic environments resulting in the creation of big data with its enumerate complexities, for instance sharing information with expected security requirements of stakeholders. Therefore, the health community will have to adapt the concept of big data analytics in order to solve major issues that have occurred due to complex shared information.

5. Data Visualization and Predictive Analysis for Smart Healthcare: Tool for a Hospital

Authors: Amala Menon, Aishwarya M S, Anu Maria Joykutty

Published In: 2021

The healthcare industry is one of the most significant sources of Big Data. It is not feasible to manually interpret and understand the huge amounts of data generated by hospitals accurately. This creates the need for a data analytics and visualization tool. Visualizations are intuitive and help interpret the data easily. It would help the hospital to get insights from the data and to provide better service to the society. The aim of this project was to develop a data analysis and visualization tool for a hospital. This was implemented as a web application. The web application is developed using Django, which is a Python-based free and open-source web framework. For the visualizations embedded in the application, the Python library Altair was used. The application supports the upload of files that are the source for the visualizations and provides interactive visualizations based on the analysis performed. The visualizations can be exported as images using the application. Generating visualizations of choice becomes easier using navigation by menu bars in the application rather than writing complicated queries to the database. The tool ultimately attempts to help the hospital optimize time and resources effectively. Prediction using Long Short Term Memory (LSTM) for pharmacy orders and number of orders per patient will further help the hospital predict trends, patterns and outliers. Analysis tools will help analysing past, current and predict future pharmacy and diagnostics in a hospital which ultimately lead to better quality, efficient smart healthcare.

6. Big data in health care: A mobile based solution

Authors: Minerva Panda , Syed Mohd Ali

Published In: 2017

In the present Indian scenario, healthcare information is independently maintained by hospitals, institutions and not readily accessible in a centralized, informed manner. This greatly limits the health providers' efforts to improve quality and efficiency. Through this paper, we address this issue on bringing various information from many sources into one place in realtime which can be truly life saving. Also, low ratio of doctor to patient and the low per capita income in India hikes the medical expenses thereby increasing the patient's inaccessibility to receive proper health care in their reach especially for people in the rural areas. A means by which the bridge between the patients and doctors can be gapped and how patients can be treated at a lower expense is the prime concern. This paper focuses on the development of a mobile/web application, through which patients sends their symptomatic query to the doctors through a server. The mobile application will be equipped with first aid instructions, according to the nature and severity of the symptoms, either the patients are directed to respective departments or given emergency help for further treatment. Within the time huge amount of data is collected from users and doctors, this big data will be used to train machines to automate the tasks to some extent. The information gained from analyzing massive amounts of aggregated health data can provide useful

insight to improve quality and efficiency for providers and insurers alike. This makes the patients reach out for healthcare solutions easily and cheaply and makes healthcare a easy reach for the unprivileged also. Thus, this unified model can serve as a data collection, delivery as well as an analytic tool in the healthcare domain.