Chapter 47
Big Data Analytics in Healthcare Sector

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ABSTRACT

The importance of big data over analytics made the process of solving various real-world problems simpler. The big data and data science tool box provided a realm of data preparation, data analysis, implementation process, and solutions. Data connections over any data source, data preparation for analysis has been made simple with the availability of tremendous tools in data analytics package. Some of the analytical tools include R programming, python programming, rapid analytics, and weka. The patterns and the granularity over the observed data can be fetched with the visualizations and data observations. This chapter provides an insight regarding the types of analytics in a big data perspective with the realm in applicability towards healthcare data. Also, the processing paradigms and techniques can be clearly observed through the chapter contents.

DATA ANALYTICS AN OVERVIEW

There are different types of analytics. They are Predictive analytics, Descriptive analytics, Diagnostic analytics and Prescriptive analytics. Among these predictive analytics is very useful to predict the future events. Predictive analytics uses many techniques such as statistical learning, machine learning, data mining a nd artificial intelligence. The patterns found in past and transactional data can recognize risks opportunities for future. Applications of predictive analytics are as follows; Customer Relationship Management (CRM), Fraud Detection in Banking sectors, Risk Management, Direct Marketing, Healthcare, etc. The following Figure 1 depicts the types of data analytics.

Figure 1. Types of analytics
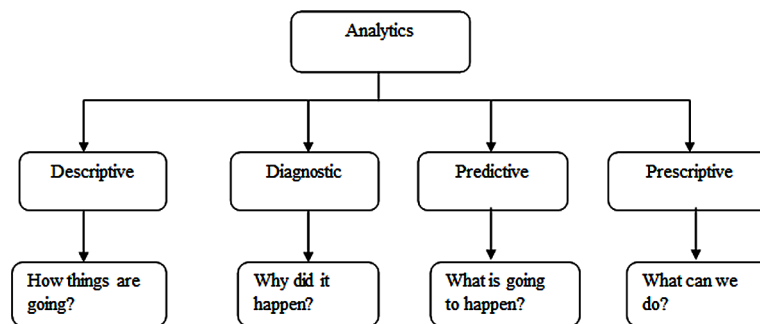
APPLICATIONS OF DATA ANALYTICS

Data analytics has its applications towards diverse fields in real time perspective. The major domain includes search engine, weather forecasting, medical informatics, recommender systems, image and speech recognition, risk analysis and logistic support recognition. Let's discuss the application of analytics over health care sector.

Data analytics plays a major role with an adherent potential to improve the notion of healthcare system. Patient monitoring system with improvement over care and cost reduction factor plays a major role towards the betterment of patient health. Monitoring and managing the risk behavior of patients also plays a significant role for the determination of risk corresponding to specific disease. Approaches, in machine learning, mathematical statistics, and soft computing paradigms plays a major role in data classification and prediction.

Systematic process in data analytics and data models enhances prediction over medical data with the target that the patients receive right direction to diagnosis in right time. Algorithms in analytics can also serve to detect fraud and abuse over medical informatics.

ANALYTICS IN HEALTHCARE

The healthcare community is changing from huge volume-base data to value-based data that is designed to achieve higher quality, lower costs and a better patient knowledge. To succeed, healthcare contribu-

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