Analytics for Hospital Healthcare Data

ABSTRACT

The main aim of this paper is to provide a deep analysis on the research field of healthcare data analytics., as well as highlighting some of guidelines and gaps in previous studies. This study has focused on searching relevant papers about healthcare analytics by searching in seven popular databases such as google scholar and springer using specific keywords, in order to understand the healthcare topic and conduct our literature review. The paper has listed some data analytics tools and techniques that have been used to improve healthcare performance in many areas such as: medical operations, reports, decision making, and prediction and prevention system. Moreover, the systematic review has showed an interesting demographic of fields of publication, research approaches, as well as outlined some of the possible reasons and issues associated with healthcare data analytics, based on geographical distribution theme.

REFERENCES

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ADVANTAGES

1. **Predictive Analytics In Healthcare**
   Predictive data analytics help the healthcare sector with advanced decision making, improve patient treatment quality and reduce repetitive visits for patients at large. It can help in the detection of early signs of patient health deterioration in CCU, ICU and general ward. Therefore, reducing readmissions and ensuring to avoid downtime of medical supplies and equipment. The goal of predictive data analytics in healthcare is to reduce costs and make data selection quicker. It can help in the identification and in the selection of at-risk patients to offer better preventative care. Big data provides informed interaction with patients, consumers, and the general population.

2. **Early Detection and monitoring of Diseases**

   Big data analytics and machine learning are constantly changing the dynamics of the healthcare landscape. The new approaches towards monitoring the disease helps detect any chronic data diseases.Big data allows medical experts to diagnose and treat any disease using information, medical records, and clinical research by healthcare professionals.Using individual data and insights of the patient, the health of a patient's family can also be monitored and detected early. If a patient's family has diabetes or any chronic disease in the family, it can be determined early and symptoms can be monitored with early signs.

3. **Care of High – Risk Patients**

   Advanced healthcare is generally considered a luxury and becomes complicated for patients who require emergency medical assistance. The updated and digitised healthcare technology allows for patients to maintain health records 24 x 7 and keep a check on health patterns for more effectiveness. The predictive data analysis helps identify patients with contagious diseases where they are isolated with a minimal or lesser chance of risk. For example, during covid-19 any patients' interaction with any other covid patients were advised to stay isolated till they were tested negative allowing for a reduction in the overall outbreak.

DISADVANTAGES

1. **Security:** There have been many security breaches, hackings, phishing attacks, and ransomware episodes that data security is a priority for healthcare organizations. After noticing an array of vulnerabilities, a list of technical safeguards was developed for the protected health information (PHI). These rules, termed as HIPAA Security Rules, help guide organizations with storing, transmission, authentication protocols, and controls over access, integrity, and auditing. Common security measures like using up-to-date antivirus software, firewalls, encrypting sensitive data, and multi-factor authentication can save a lot of trouble.

2. **Meta-data**: To have a successful data governance plan, it would be mandatory to have complete, accurate, and up-to-date metadata regarding all the stored data. Te metadata would be composed of information like time of creation, purpose and person responsible for the data, previous usage (by who, why, how, and when) for researchers and data analysts. Tis would allow analysts to replicate previous queries and help later scientific studies and accurate benchmarking. Tis increases the usefulness of data and prevents creation of "data dumpsters" of low or no use.

3. **Querying:** Metadata would make it easier for organizations to query their data and get some answers. However, in absence of proper interoperability between datasets the query tools may not access an entire repository of data. Also, diferent components of a dataset should be well interconnected or linked and easily accessible otherwise a complete portrait of an individual patient's health may not be generated. Medical coding systems like ICD-10, SNOMED-CT, or LOINC must be implemented to reduce free-form concepts into a shared ontology. If the accuracy, completeness, and standardization of the data are not in question, then Structured Query Language (SQL) can be used to query large datasets and relational databases.