IDEATION PHASE
LITERATURE SURVEY

1. Big Data Analytics in Healthcare

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This article explores how big data analytics offers a great boon to the healthcare industry, as it helps to make better decisions. Accordingly, it investigates the potential unique characteristics, different phases, and analytical tools of the big health data. Some of the open research challenges and feasible solutions are highlighted in order to reduce the healthcare cost, enhance treatment, and improve the quality of patient care. With the help of analytics tools, data scientists can able to integrate health related information from both internal and external sources. Ultimately, physicians can be alerted to do their treatment and reach out to patients in an efficient way. This massive volume of huge healthcare data eventually leads so a risk of exposure of the data, makes it highly vulnerable. Thus, it is very essential for analysts and data scientists to consider security issues and deal with the data sets in such a way that will not lead to the disruption of privacy. However, big data analytics is still a challenging and time demanding task in healthcare that needs expensive software, hardware, storage, computational infrastructure, skilled data scientists and professionals in the healthcare sectors. Furthermore, it has to enable the data lakes to be scaled up and down rapidly by adapting the system to the actual demand. The combination of disruptive technologies including machine learning, augmented reality and artificial intelligence on big data is already assisting, multiplying caregivers' ability to improve the quality of patient care. The comprehensive review of

several big data analytical techniques available for healthcare applications will be discussed in future.

2. Big Data in Health Care: A Mobile Based Solution

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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 lifesaving. 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 doctor scan 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 analysing 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.

3. Health Big Data Analytics: A Technology Survey

Gaspard Harerimana; Beakcheol Jang; Jong Wook Kim; Hung Kook Park

This paper discuss about Because of the vast availability of data, there has been an additional focus on the health industry and an increasing number of studies that aim to leverage the data to improve healthcare have been conducted. The health data are growing increasingly large, more complex, and its sources have increased tremendously to include computerized physician order entry, electronic medical records, clinical notes, medical images, cyber-physical systems, medical Internet of Things, genomic data, and clinical decision support systems. New types of data from sources like social network services and genomic data are used to build personalized healthcare systems, hence health data are obtained in various forms, from varied sources, contexts, technologies, and their nature can impede a proper analysis. Any analytical research must overcome these obstacles to mine data and produce meaningful insights to save lives. In this paper, we investigate the key challenges, data sources, techniques, technologies, as well as future directions in the field of big data analytics in healthcare. We provide a do-it-yourself review that delivers a holistic, simplified, and easily understandable view of various technologies that are used to develop an integrated health analytic application.

4. A Systematic Review on Healthcare Analytics: Application and Theoretical Perspective of Data Mining

Md Saiful Islam,Md Mahmudul Hasan, Xiaoyi Wang, Hayley D. Germack, and Md Noor-E-Alam·

This paper discuss about The growing healthcare industry is generating a large volume of useful data on patient demographics, treatment plans, payment, and insurance coverage—attracting the attention of clinicians and scientists alike. In recent years, a number of peer-reviewed articles have addressed different dimensions of data mining application in healthcare. However, the lack of a comprehensive and systematic narrative motivated us to construct a literature review on this topic. In this paper, we present a review of the literature on healthcare analytics using data mining and big data. Following Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, we conducted a database search between 2005 and 2016. Critical elements of the selected studies—healthcare sub-areas, data mining techniques, types of analytics, data, and data sources—were extracted to provide a systematic view of development in this field and possible future directions. We found that the existing literature mostly examines analytics in clinical and administrative decision-making. Use of human-generated data is predominant considering the wide adoption of Electronic Medical Record in clinical care. However, analytics based on website and social media data has been increasing in recent years. Lack of prescriptive analytics in practice and integration of domain expert knowledge in the decision-making process emphasizes the necessity of future research.

5. Big Data Analytics in Healthcare Systems

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This paper discuss about Traditional data processing techniques are not able to handle big data in healthcare systems. Big Data analytics overcomes the limitations of traditional data analytics and will bring revolutions in healthcare. Big Data analytics has the potential in disease surveillance, epidemic control, clinical decision support, population health management, etc. Hadoop-enhanced computing is intensive computing for large-scale distributed data and Hadoop-based Big Data has advantages in efficiency, reliability, and scalability. There are challenges of Big Data analytics in healthcare systems. Capturing, storing, sharing, searching, and analyzing data are the challenges of Big Data in almost every area. In addition, data security and privacy, data quality, real-time processing, integration of heterogeneous or disparate data, and standards for healthcare data are also challenges of Big Data analytics in healthcare systems.

6. Role of Hospital Information Systems in Improving Healthcare Quality in Hospitals Dhyana

Sharon Ross and R. Venkatesh

This paper represents the role of information systems in quality improvement in hospitals. Hospital Information Systems (HIS) have great potential in reducing healthcare cost and in improving health outcomes. The purpose of this study is to offer analytical research that explores the role of hospital information systems in delivery of healthcare in its diverse organizational and regulatory settings. This paper aims to examine the role of hospital information systems in improving health care quality in hospital. Primary data was collected through distributing

questionnaire to patient. A total of 214 samples were collected from major corporate hospitals in the capital city of Tamil Nadu, i.e., Chennai and used for this research paper. Methods and Analysis: Friedman test was implied to find the effect of implementing hospital information systems in hospitals to improve healthcare quality. Findings: Implementing hospital information systems in hospitals has a greater effect on improving healthcare quality among hospitals and this increases patient satisfaction.

7. Analysis of Research in Healthcare Data Analytics

Mohammad Ahmad Alkhatib, Amir Talaei-Khoei, Amir Hossein Ghapanchi.

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.

8. A Survey Of Big Data Analytics in Healthcare and Government

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This paper gives an insight of how we can uncover additional value from the data generated by healthcare and government. Large amount of heterogeneous data is generated by these agencies. But without proper data analytics methods these data became useless. Big Data Analytics using Hadoop plays an effective role in performing meaningful real-time analysis on the huge volume of data and able to predict the emergency situations before it happens. It describes about the big data use cases in healthcare and government.

9. A Framework for Pandemic Prediction Using Big Data Analytics

Imran Ahmed, Misbah Ahmad, Gwanggil Jeon, and Francesco Piccialli

This paper tells about the number of (Internet of Things) IoT devices and systems is increasing day by day. These devices and sensors produce a lot of data used in different life sectors such as industry, business, surveillance, healthcare, transportation, communication, and many others. In healthcare, the increasing volumes of information gathered via different devices, sensors, and systems put pressure on physicians. In this work, we take advantage of big data analytics and IoT in order to present a framework for healthcare organizations that might be beneficial in the detection prediction and analysis of pandemic and epidemic diseases. For the case study, we considered the novel coronavirus pandemic (COVID-19) outbreak, which affected people worldwide. The presented framework applications might be helpful in the rapid collection of big data, visualization of pandemic information, breakdown of the pandemic risk, tracking of confirmed cases, tracking of prevention levels, and effectiveness assessment, prevention, and control. We developed a health monitoring framework for the analysis and prediction of COVID-19. Using big data analytics, we perform descriptive, diagnostic, predictive, and prescriptive analysis. From insight analysis of the data, we concluded that most of the patients suffering from the pandemic disease are recovered. We also compared the neural network-based

model results with other machine learning algorithms. Without using any computationally expensive deep learning-based model, the neural network-based model achieves 99% accuracy.

10. A Systematic Review on Healthcare Analytics: Application and Theoretical Perspective of Data Mining

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