

Review of Big Data Applications in Health Care Sectors

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ABSTRACT: *The drug industry is deemed one of the world's main assets, and pays for a large proportion of the economies of governments. Health expenditure is expected to grow from 3.5% to 8.6% of GDP throughout 2015 and 2020 in major countries of the world. Given such huge costs, medical organizations have to provide their customers with elevated-quality healthcare services at a reduced cost. Yet thousands of millions of investments alone don't ensure high-quality programs. Yet hundreds of millions of investments are not the only assurance the programs are decent quality. Thereby, most health facilities, with small budgets, a constant surge of inpatient volumes and the rising cost of health care instruments and pharmaceutical companies, are now experiencing growing difficulties. The volume of information gathered through their use is rising exponentially at the present time of extremely advanced technology in medical devices and medical equipment. This paper aims to evaluate and utilization of the big data in field of health care supply chains.*

KEYWORDS: *Data Analytics, Big Data, Healthcare, Pharmaceutical Companies, Supply Chain Management.*

INTRODUCTION

The volume of information gathered by one of their own is increasing dramatically in the present period of progressively modern technologies in medical equipment and medical facilities. Often important and evident is the massive growth in the number of EMRs that healthcare entities hold[1]. Authors and professionals have now become appealing to discuss the possibility of continuing to invest this Big Data in service improvement. Business Intelligence (BI) has been the basis for many successful business implementations and channel social media sites to harvest understanding from big data. Several scholars studied how this quantity of data is distributed and stored, while others concentrated on the use of large data[2]. Big data usage includes examining it in order to solve existing problems, investigate developments and help decision-making as shown in figure 1.

A wealth of literature was created which investigates the degree to which cloud computing in the health care industry can profit. Nevertheless, the utilized of data analysis in the medical supply chains have been very minimal. Existing quantitative papers examined the major implementations of Big Data in production supply chains broadly. Big data in healthcare pertains to collect, analyze and leverage data that are too wide, too complicated for traditional information processing, as consumer, clinician, physical, and biological plausibility. Big data is often examined by software and hardware scientists through smart devices instead. The surge in healthcare large-scale data is being brought about in reaction to the digitalization of healthcare knowledge and the growth of value-added services[3]. In order that the documentation can be gathered, stored and analyzed, health systems must adopt innovation to respond to the obstacles of medical data—including volume, velocity, variety and truthfulness.

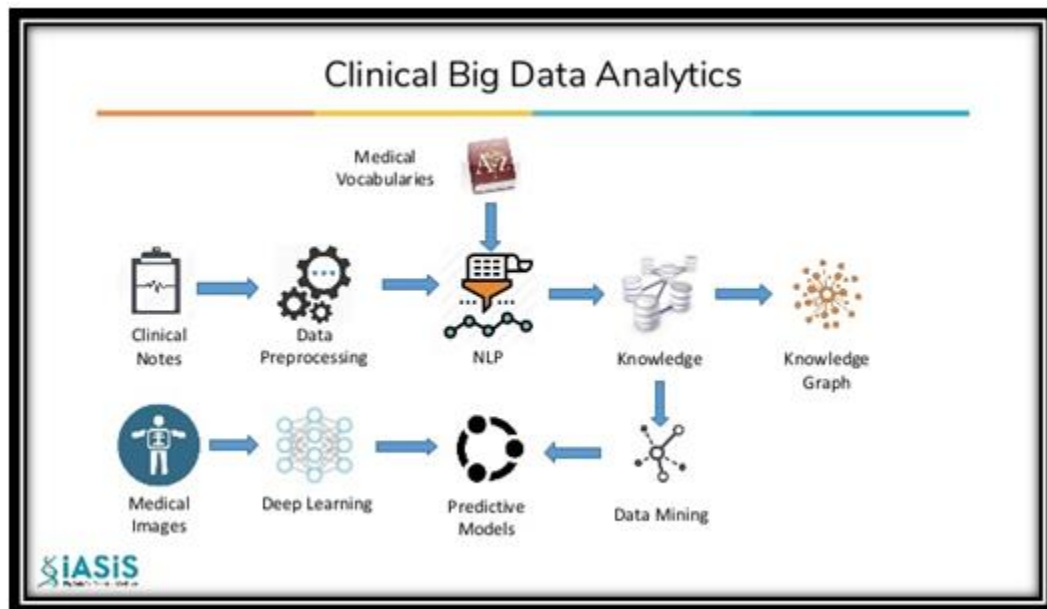


Figure 1: Big Data Usage

The massive amount of information, reduced health-care costs and an emphasis on demand, has become much more prominent in the medical-care industry as three major factors have shifted[4]. Big data helps health services to turn these problems into possibilities of customized hospital care and standardized service as explained in figure 2.

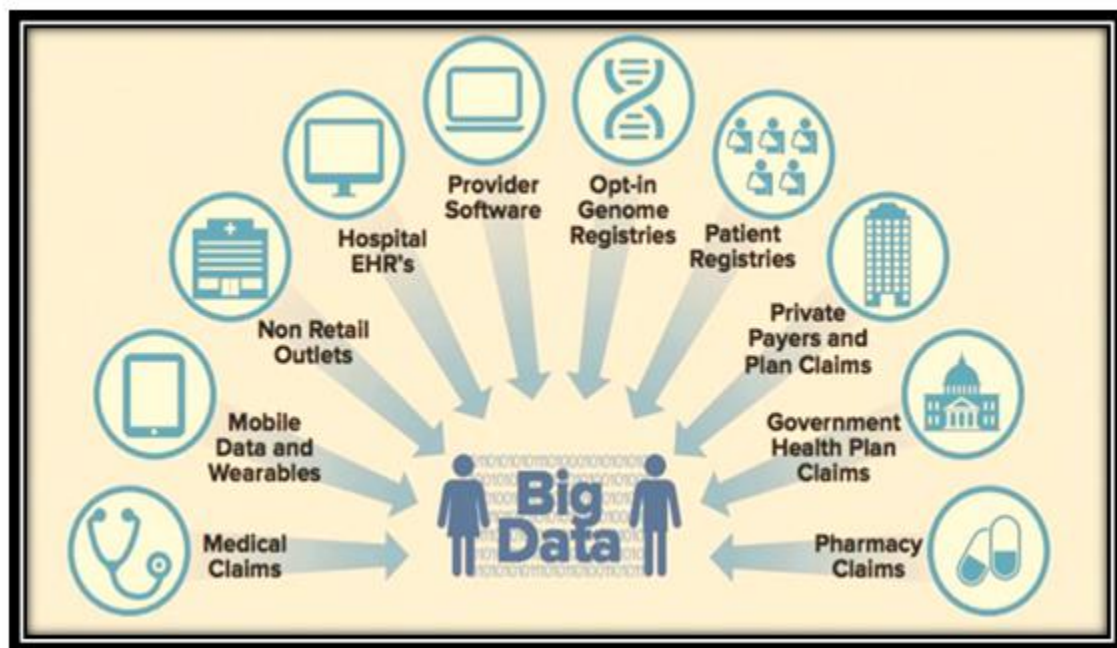


Figure 2: Illustration of use of big data in healthcare field

LITERATURE REVIEW

1. Big Data used as a knowledge system in the field of healthcare

An author in his research paper talks about health care systems in 2017, which implement large quantities of information quickly, powered by reporting, legal and regulatory standards and care for patients. The change in the public health system would soon increase the size of publicly stored medical records. At the same time, quick advances in the clinical analysis have been made. Thus, an efficient information management system

based on large data is necessary in order to track patients and to recognize the doctor's therapeutic choices. This research paper suggests an information management system focused on big data to make therapeutic choices. A series of repositories including the Medical Imaging Records, Electronic Health Record (EHR), Collaborative Clinical Reports and Genetic Informations is built for the new information network. The suggested technique interacts asynchronously with various data outlets and provides the practitioner with several possible choices. Figure 3 shows a large network information system.

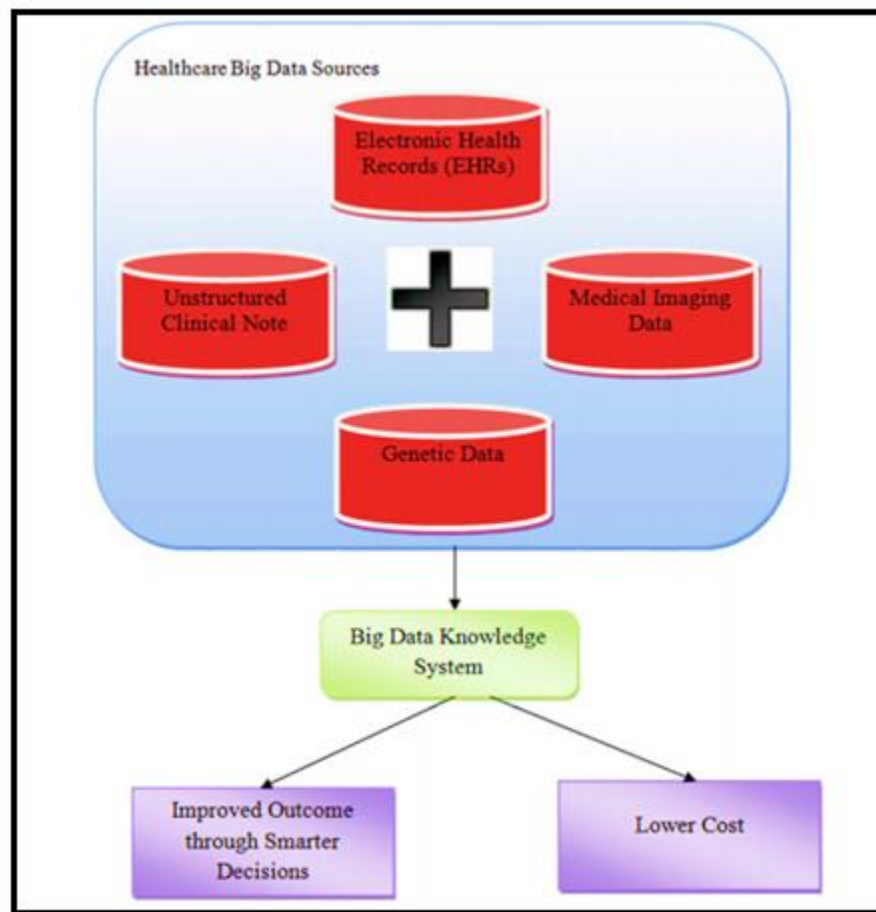


Figure 3: Block diagram of proposed paper.

The systems are extensive, from EHR, diagnostic records for testing, unfocused clinical information and genetic data. Nowadays, medical evidence is implemented easily by healthcare systems and gradually increase the size of relevant health records. This paper explores characteristics, problems and introduces a large-scale information network in the area of healthcare. A selection of databases, e.g. EHR, medical imaging records, non-structured clinical observations and genetic data, are used to establish the new information system.

2. Healthcare Big data analysis case study

In almost all fields, such as shopping, finance, manufacturing, telecoms and industrial sectors, Big Data Analytics addresses different problems and helps to meet the business goals worldwide[5]. Healthcare Technology is a field where technology is commonly utilized to make major decisions. In the area of Pediatrics, a large volume of data has been generated throughout the past several decades from reports, legislation and regulatory standards, paper-based or difficult-copy clinical care. Therefore the usage of Big Data Analytics in healthcare and medical services is a major step in creating a lower-cost system[6]. It offers access to this large dataset, which allows different forecasts and informed decisions to save lives in a timely manner.

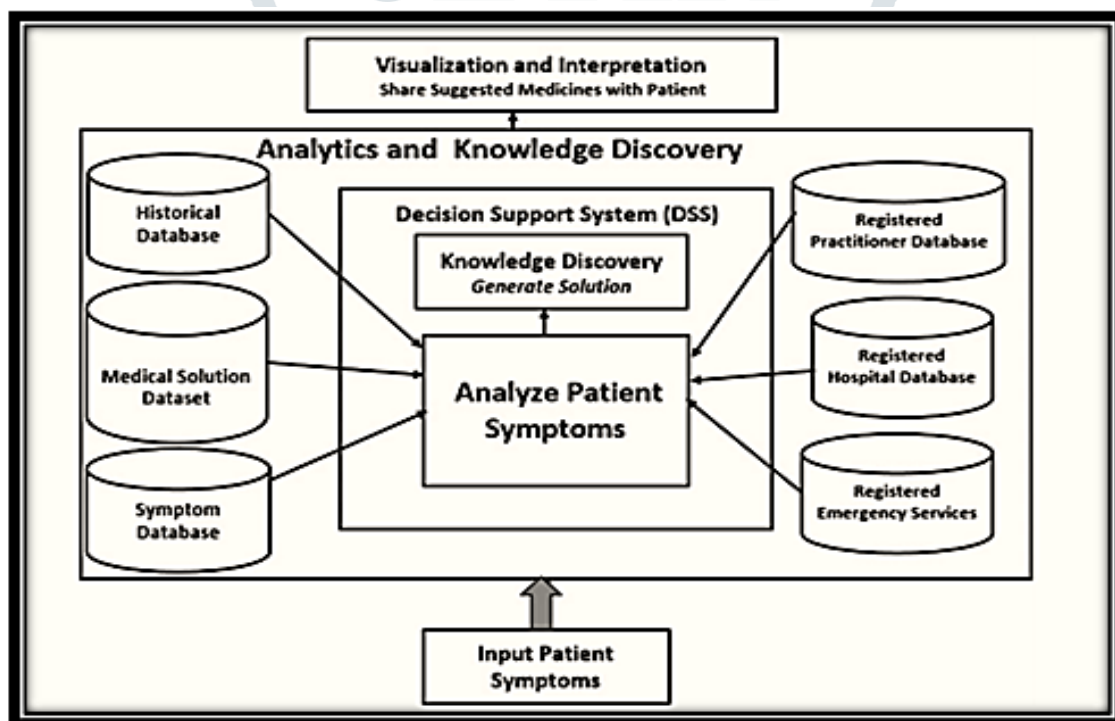
3. Med-App application built using Big Data

The software framework proposed—MedApp discusses the aforementioned concerns and is an efficient alternative in certain cases. It is a complex structure focused on data processing as was seen below in the figure 4. There are three primary layers mentioned in the table 1.

Table 1: Primary layers

(a) Source of data: Symptoms received from patients
(b) Analytics and Knowledge Discovery
(c) Visualization and Interpretation

The working of the proposed framework as shown in figure 4. Firstly, patient symptoms are entered into the proposed framework, then the symptoms are analyzed with the help of the historical database, medical solution dataset and symptoms database. Additionally, some more databases may be used to analyze the symptoms entered by any user in the framework which may include but not restricted to a registered registered hospital database, practitioner database, registered emergency database. After analyzing a solution is generated which is visualized and interpreted. The solution is shared with the patient.

**Fig. 4: Working of the proposed framework**

The quick resolution approach to MedApp is shown below with the aid of the flow chart provided in figure 5.

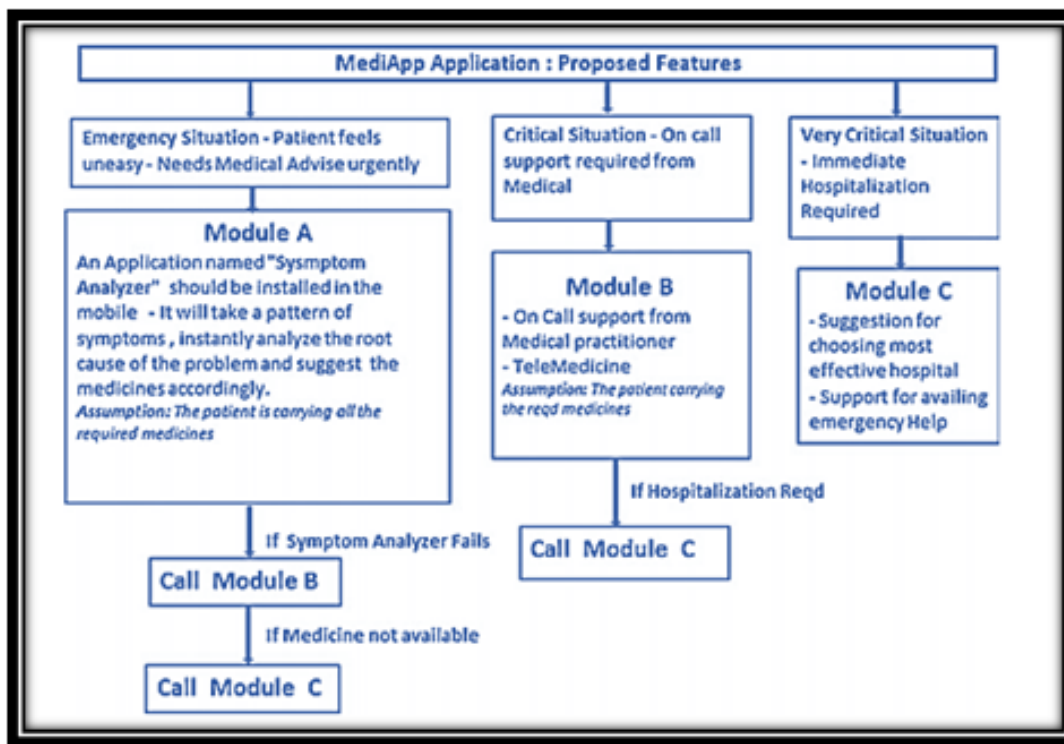


Figure 5: MED Application

CONCLUSION

Big data in medical care applies to enormous quantities of knowledge — developed by widespread internet penetration and computerization of all types of information, also health records — too big or nuanced to make sense through conventional technologies. Predominantly, the question was how all these details were gathered and processed rapidly in order to provide concrete knowledge. Yet healthcare companies are now able to retain and evaluate these information hidden stashes with new big data technology so that patterns are identified, patients better treated and more expected. This paper reviews a few applications of large data store in fields of the healthcare & has determined that with the help of big data technology, many predictions and recommendation systems are developed. With a help of the big data organization and the vast amount of the data which is collected day by day, actionable data is extracted from the vast amount of data to solve many issues in the medical field.

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