

The Impact of the Big Data on the Healthcare Information Systems

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Abstract - This article explores the possible implications of the big data on Informatics of health. Possible research questions are: 1). What are the applications in health care information systems are the most affected? 2). What algorithm/program shall be used for big data? 3). What the privacy, security, and ethical issues are there for big data? In the field of biology, big data becomes the latest technology for genomics. Other possible areas: Parma co monitoring, the care of patients and the management of the chain of medical supplies.

Keywords— *Big Data, Big Data in Medical Field, Healthcare System using Big Data*

I. Introduction

Due to the explosion of the information, big data is one of the hottest topics in the analysis of data and information systems of health today. The U.S. government announced the great initiative of research and development of data for 200 million dollars in 2012. The initiative is studying the possibility of using the big data or a database on a large scale to resolve the major problems that the Government must address. The financing will be granted to six ministries and organizations that include the National Institutes of Health. In a recent article published in the Harvard Business Review, McAfee and Brynjolfsson (2012), includes two scenarios for the implementation of the preaching on the big data and sales. The objective of the document is to explore the possible implications of the big data on Informatics of health.

II. WHAT IS BIG DATA?

The Big Data is similar to the business analysis and business intelligence, but all the big data is much greater. Three "V" dimensions are commonly used to describe the big data: volume, speed, and variability. Figure 1 illustrates the traditional relationship between the information systems and business intelligence. Several reasons taking into account the evolution of big data. The first is the importance of informatics in the memory. The traditional pcs: Central Processing Units (CPU) and secondary storage device (such as a hard disk). There is a transfer of data between the CPU and the secondary storage during the treatment of data. Although it is an economic environment to use the computers of the processing speed of the computers tend to be slow. Oracle and SAP Hana designing new computer systems that use memory systems (Monk &

Wagner, 2013). Therefore, the computer systems of today are capable of processing data on a large scale than before.

The second reason for the increase of the massive amounts of data has been placed on social network. In the exploration of traditional data and business intelligence, the data are based on the internal data generated by the systems of enterprise resource planning (ERP) or health information systems. The data used in these systems are also called "structured data" that is still limited. Social networks have become popular that six years ago, but already generates a large amount The data. Some data are very useful for the analysis of data. These external data or some of the internal data not used called unstructured data. As shown in figure 2, big data analysis combines the data of structure and unstructured data that come from internal data not used, social media and other external data sources.

III. What you can do with BIG DATA FOR INFORMATION SYSTEMS?

An excellent example of a real case for the analysis of data has been provided by Duhigg (2012) when "revealed that the giant retail target may determine if a girl was pregnant by the monitor the behavior of consumers (Trank, 2013)." (Lee, Chen and Kao, 2013). With these data, the objective should be able to "anticipate their future consumption of products related to infant feeding, as diapers." Hill (2012) explained how to attack as if a girl was pregnant with the help of data mining tools. "diana from hired a statistical employment center Andrew data mining tools to predict the behavior of consumers, income develops from 44 million in 2002 to 67 million in 2010." (Lee, Chen and Kao, 2013).

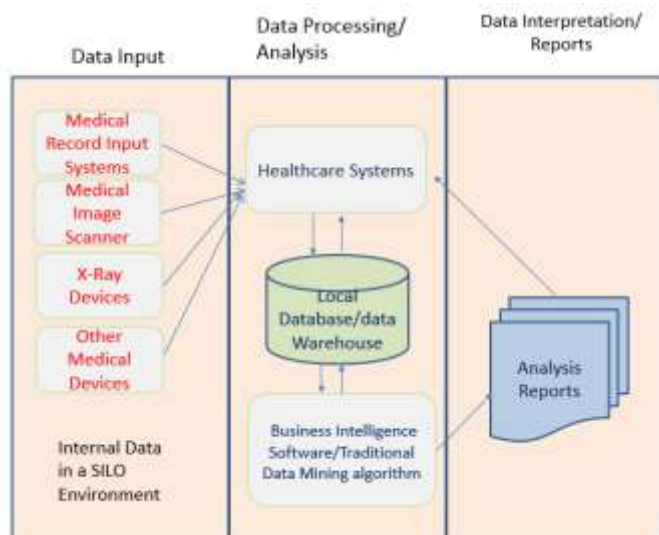


Figure 1. Traditional relationship between health information systems and business intelligence

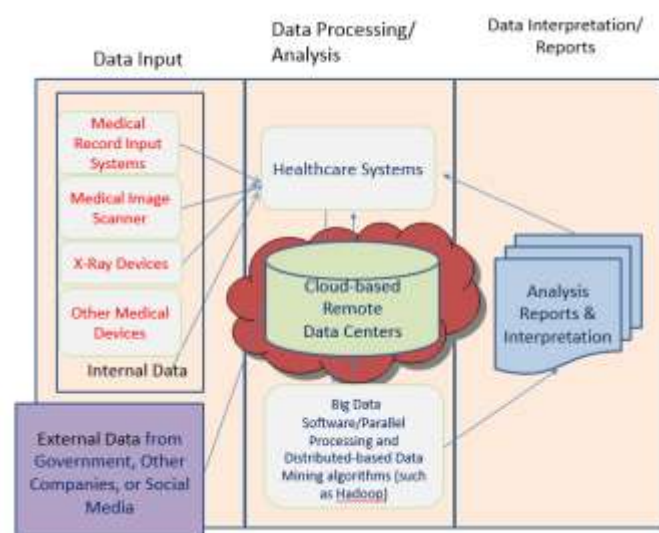


Figure 2. Relationship between informatics of health and the big data

Clearly, there is a great potential for the big data on health care in the information systems. For one, as main computer-based business intelligence (BI) or the data exploration programs that SAS or SAP BW should have the capacity to get to level to manage the analysis of the big data. Several ERP vendors and systems of health and major corporations such as IBM, Microsoft, SAP, Oracle and SAS have already worked in various projects big data (Lee, Chen and Kao, 2013).

The research on applications big data is still in phase and in the development, but several applications are each time more general. In the field of biology, big data has become the most recent technological tool for genomics. Marx (2013) mentions that the biologists use the big data to examine everything relating to the regulation of genes and the evolution of genomes of coastal algae why, what remains where microbes in the cavities of the human body and the way in which the genetic constitution of several types of cancer influences the way in which the patients with cancer." There were 12 years for the

Human Genome Project to collect, analyze and interpret the enormous amount of data required to produce a card of approximately 20 000-25 000 genes, but may not have a single day to use the new technologies big data to obtain the same result (Ross, 2012).

Schultz (2013) indicates the big data can be used in the development cycle of pharmaceutical products in the following areas: 1) Genomics, 2) A clinical surveillance, and 3) the pharmacovigilance. Chawla and Davis (2013) has developed a new system called engine of recommendation and evaluation in collaboration (CARE) to predict the risk of disease custom. The Big Data also facilitates the storage and treatment of medical imaging data (there are, 2011).

Research Questions for the BIG DATA

We carried out a study of the literature (Chawla and Davis, 2013; Jee & Kim, 2013) and make the research questions possible for big data:

- What applications (modules) in health care information systems will be affected by the majority of the big data?

In the company, search marketing, sales forecasting, and finance are the most affected. In the field of health, genomics, pharmacovigilance, and the care of the patients are the most important aspects.

- What algorithm/program shall be used for Big Data?

The traditional algorithms include statistics (regression analysis, time series, Clustering and clustering sequential), Mathematics (network of neurons of Bayes and), and others (decision tree and the Structured Query languages -- SQL). What will the algorithms for the analysis of the big data? Traditional SQL is based on the relational database. We are going to see more complex forms as NoSQL (also called "not only SQL") and for the analysis of data Hadoop big (Schultz, 2013). For example, Hadoop MapReduce, includes a software framework for writing applications, that "trafficking of large amounts of data in parallel on the clusters composed by thousands of nodes of base material in a reliable system and fault tolerant" (The Apache Software Foundation, 2013).

- What the privacy, security, and the emerging ethical issues for big data?

Several concerns and issues of privacy arising out of the utilization of the big data (Hill, 2012). For one, by reason of the Health Insurance Portability and Accountability Act (HIPAA), better known as providers of health services and the institutions are aware of the importance of security and privacy. The ethical issues are another concern.

The case of the use of information objective mentioned before is an excellent example of the way in which the issues of ethics possible, of the need to protect the confidential patient information and customer information. Increasing applications of the data the use of a higher central control for the data centers and cloud computing. For example, health and hospitals in Cook County (CCHHS system) in Illinois has installed an infrastructure of unified virtual data center to serve the needs of the operation of more than 20 establishments through the region of Chicago (from Ritchey, 2012). The European Bioinformatics Institute (EBI) in the United Kingdom, one of the largest data summaries of biology, the shops currently 20 pétaoctets of data and back-ups in the genes, proteins and small molecules (Marx, 2013). A failure of security for the data center to the size and the nature of these could trigger both on the financial plan and a financial disaster for the institutions, hospitals, and individuals without talking the mental pain could lead to such communications.

announced an investment of 200 million dollars in new investments in R&D. Extract from:

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