

BIG DATA: A REVOLUTION IN THE HEALTH CARE INDUSTRY

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ABSTRACT

Data has become the key to staying competitive in today's global economy. Managing the three Vs of big data like volume, velocity and variety is a big challenge for the organizations. Gone are the days of data collected exclusively in electronic health records and other structured formats. Increasingly, the data is in multimedia format and unstructured. The paper analyses the role of big data in the health care industry whereby most of the hospitals are surviving only because they are paid for the treatment done and, not for the results, so to establish themselves and to be known for their treatments, they have to make the system better by paying for results, rather than paying for procedures and this can be done through big data's. The trend with new models, including accountable care organizations (ACO), is to incent and compensate providers to keep patients healthy. At the same time, patients are increasingly demanding information about their healthcare options so that they understand their choices and can participate in decisions about their care. Patients are an important element in keeping healthcare costs down and improving outcomes. BCBS (Blue Cross and Blue Shield) is taking steps to employ the use of Big Data to help prevent 1-million heart attacks by 2017. The data have been collected from various sources and analyzed. The conclusion of the paper is that big data play a prominent role in providing patients with accurate and up-to-date information and guidance rather than just data that will help them make better decisions and adhere to treatment process.

Keywords: Accountable Care Organizations, Big data, Blue Cross, Database, Technology

INTRODUCTION

The health care - based data are naturally much more complicated and difficult to collect than social-media data. The big data will enable to predict more accurately which treatments will be effective for which patient, and which treatments won't be applicable. A better understanding of the relationship between treatments out comes, and patients will have a huge impact on the practice of medicine in the health care industry. The health care industry is now awash in data in a way that it has never been before: from biological data such as gene expression, next generation DNA sequence data, proteomics, and metabolomics, to clinical data and health outcomes data contained in ever more prevalent electronic health records (EHRs) and longitudinal drug and medical claims. We have entered a new era in which we can work on massive datasets effectively, combining data from clinical trials and direct observation by practicing physicians.

STATEMENT OF PROBLEM

As data becomes less local and more regional and global, the quality of both data and metadata has to improve over time. At the same time, sharing data on a global basis will lead to security

challenges, as well as issues resulting from different standards, terminology and language barriers which can be solved through the big data.

OBJECTIVES OF THE STUDY

The present study proposed the following objectives

1. To know the application of big data in health care.
2. To study the use of big data in health care.

RESEARCH METHODOLOGY

The data used for the study is secondary data comprising of official websites, journals, magazines and articles. Since the data is secondary it is more dependable and reliable.

REVIEW OF LITERATURE

During the course of the study, the study of several authors was referred and it is imperative that an outline of the literature survey is put to note and the following references are worth mentioning.

Priyanka Ketal[1], "A Survey on Big Data Analytics in Health Care" International Journal of Computer Science and Information Technologies, Vol. 5 (4), 2014, has examined that the health care industry can uncover the additional value from health information used through the big data analytics.

Tim O'Reilly, Julie Steele, Mike Loukides, and Colin Hill[2] – "How Data Science Is Transforming Health Care" has proved how data science is transforming health care and concluded that a better understanding of the relationship between treatments, outcomes, and patients will have a huge impact on the practice of medicine in the United States.

Timothy Schultz[3], "Turning Healthcare Challenges into Big Data Opportunities: A Use-Case Review across the Pharmaceutical Development Lifecycle" Bulletin of the Association for Information Science and Technology, has highlighted the role of big data in genomics, clinical monitoring and pharmacovigilance.

Wullianallur Raghupathi and Viju Raghupathi [4], "Health Information Science and Systems" have evaluated the promise and potential of big data in the health care and concluded that the potential is great and however there remains a challenge to be faced.

ANALYSIS AND FINDINGS

Current application of big data in health care industry

Big data in healthcare is overwhelming not only because of its volume but also because of the diversity of data types and the speed at which it must be managed¹. It includes clinical data from CPOE and clinical decision support systems (physician's written notes and prescriptions, medical imaging, laboratory, pharmacy, insurance, and other administrative data); patient data in electronic patient records (EPRs); machine generated/sensor data, such as from monitoring vital signs; social media posts, including Twitter feeds (so-called tweets), blogs, status updates on face book and other platforms, web pages and less patient-specific information, including emergency care data, news feeds, and articles in medical journals. By digitizing, combining and effectively using big data, healthcare organizations ranging from single-physician offices and multi-provider groups to large hospital networks and accountable care organizations stand to realize significant benefits².

Driving change and increasing the use of analytics in health care

Each of these areas alone has the potential to contribute highly to a positive development of how health care is practiced and paid for, and together, they have the potential to significantly improve the triple aim.

1. The promise of value-based health care.
2. The ability to track more aspects of health care.
3. The trend toward engaging patients as more active consumers.

1. The promise of value-based health care

It is an approach that focuses on health outcome per rupee spent. The value-based system pays providers based on their contributions to desired outcomes. With a value-based approach, quality and satisfaction increase, and innovation is encouraged. The push toward a value-based emphasis will require new systems for managing and analyzing health care data, including new efforts for standardization, measuring outcomes and understanding quality measures in health care³. Value-based health care increases pressure for innovations, which could make operations easier and will discourage unnecessary operations. Processes that focus on quality and increased health outcome per amount spent will increase the efficiency of health care.

Example: In considering the payment for hip replacements, the traditional method provides payment according to the number of procedures performed and in some systems leads to a fixed number of procedures. Payers who define and reimburse according to patients' desired functions or results have more incentive to achieve patient value.

Furthermore, a successful introduction of value-based health care can have positive effects far beyond medical care domains. Clinical researchers, as well as industries like pharmaceuticals and medical technologies, have everything to gain from a value-based approach in the health care industry.

2. The ability to track more aspects of care

Value - based health care puts high demands on the ability to record and monitor data regarding specific information and achieved quality. Typically, a risk-based adjustment is applied to compare fairly. This Value-based health care puts high demands on the ability to record and monitor data regarding specific conditions and symptoms, procedures and resulting quality. Adjustment accounts for different results depending on the age and health of the patient, among other factors. One way of approaching these information needs is to establish registries that focus on health care outcomes.

3. Engaging patients as consumers

With more and more health care data becoming available, patients are taking an active interest in their health care choices. For starters, patients have become more eager to evaluate services using information from the Web and other channels. This underlines the importance of using analytics for risk adjustment to provide the consumer with the right information to make informed and fact-based decisions. As patients become more informed, they not only demand the most modern health care, but they also tend to take a role in collecting and sharing their own health care data with providers. This can increase patient adherence to physician instructions, which is a critical factor in adverse events or post-discharge gaps in appropriate care.

Challenges of big data in health care industry

The healthcare must be supported by big data analytics for processing the data. The criteria for platform evaluation may include availability, continuity, ease of use, scalability, ability to manipulate at different levels of granularity, privacy and security enablement, and quality assurance. Since most platforms currently available are open source, the typical advantages and limitations of open source platforms also apply. To succeed, big data analytics in healthcare needs to be packaged so it is menu driven, User-friendly and transparent. Real-time big data analytics is a key requirement in healthcare. The lag between data collection and processing has to be addressed. The dynamic availability of numerous analytics algorithms, models and methods in a pull-down type of menu is also necessary for large-scale adoption. The important managerial issues of ownership, governance and standards have to be considered. And woven through these issues are those of continuous data acquisition and data cleansing. Health care data is rarely standardized, often fragmented, or generated in legacy IT systems with incompatible formats. This great challenge needs to be addressed as well.

SUGGESTIONS

The hospitals need to be empowered either big or small, to access their data and use it in innovative ways that changes their businesses. The use of big data in health needs to be gradual, allowing people to choose between opting in and opting out.

SCOPE OF THE STUDY

A study on SaaS which is an important technology for democratizing the results of big data can be done. This solution allows the healthcare entities that control subsets of data to expose access through services that eliminate some of the aggregation and integration challenges.

CONCLUSION

The problem in healthcare isn't the lack of data but the lack of information that can be used to support decision-making, planning and strategy. The data of all the patients needs to be validated, processed and integrated into a large data source for a meaningful analysis. The scope of the big data challenge begins here. The healthcare organizations need to devote time and resources to visioning and planning. This will provide the foundation needed for strong execution. Without this preparation, hospitals will not realize the envisioned benefits of big data and will risk being left behind competitors. Technology is the force for increasing the efficiency of modern healthcare [5]. The doctors have started realizing that their patients have started becoming the digital inhabitants expecting their physicians to be tech savvy and ready to be connected as they want better prevention and treatment all around. The connectivity that cloud services provides to medical professionals means moving towards improvements through the Big Data.

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