

## The changing face of healthcare and life sciences: The impact of big data

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The life sciences and healthcare industry in 2014 has been defined by the growing market demand to apply newly developed technology, including big data analysis, to healthcare and medical device practices.

While many of the amazing technological advances in the space are driven by a desire to aid humanity, the industry has also been caught between increased economic and regulatory pressure, which is forcing many to electronically collect heaps of data while struggling to find the technology solutions that enable them to leverage this valuable data in an effort to reduce costs, improve quality and adhere to new industry standards.

Trends that reflect newly available technology have started to develop. The adoption of healthcare big data technology has become a major theme in the sector this year, just as it has in several other industries. Many new technology offerings have been created to tie together data from multiple sources that can be accessed by researchers and physicians to allow them to easily exchange information. This also aids in clinical research and development practices by offering another valuable tool to gather and analyze data.

Tied to the big data trend is the emergence of personal healthcare data aided by physicians' adoption of EHR (electronic health record) technology. By allowing patients to own and access their healthcare data on a healthcare information dashboard, patients can more easily understand risks and preventable care options. Pooling anonymized patient data together gives physicians and researchers a valuable data set that can be used to discover disease patterns leading to better diagnosis, and physicians are already starting to work with vendors to develop big data diagnostic tools.

Through an intelligent system database, patients and physicians can better understand the patterns and symptoms that affect their healthy lifestyles. While this type of big data solution is gaining a foothold, there is still resistance from some doctors due to their concern over critical review of their procedures. For instance in 2012 New York State used EHR data to publically rank surgeons and hospitals on their mortality rate during cardiac surgery. The surgeons who fell to the bottom of the list either improved or stopped performing surgery.

One good example of using big data to improve diagnosis is an application that uses spectral dynamics technology used for medical diagnostics. Spectral dynamics is based on the premise that every physical condition has its own unique signature, and by means of analysing these signatures, any physical state



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can be diagnosed and treated. CME (Complex Medical Expert) is a diagnostic system that was invented leveraging this theory and technology, and is aimed at helping physicians determine diagnoses and corresponding treatments for clinical pathologies.

The FDA is also thinking ahead regarding how big data can improve drug safety, medical device and regulatory adherence. Initiatives like the Janus and Sentinel programs will help the FDA electronically collect information on drug approvals, making large strides in a traditionally paper and manual process heavy industry. Once the FDA can determine how best to leverage the huge amounts of data they'll be collecting, the industry will start gearing up for an industry-wide big data change over.

The emergence of big data technology in healthcare and life sciences not only aids getting safer medical treatments to market quicker, but also allows doctors to shift their focus from the existing practice of treating people after they become sick, to empowering doctors and patients (through wearable devices, and other technology) to manage their overall health and prevent diseases in their earliest of stages.

It's important to note that while early identification and diagnosis of diseases is a great potential value of new big data technology, predictive models can also be created to help life sciences companies develop more efficient and effective medicine and clinical trial strategies.