Smarter Clinical Solutions

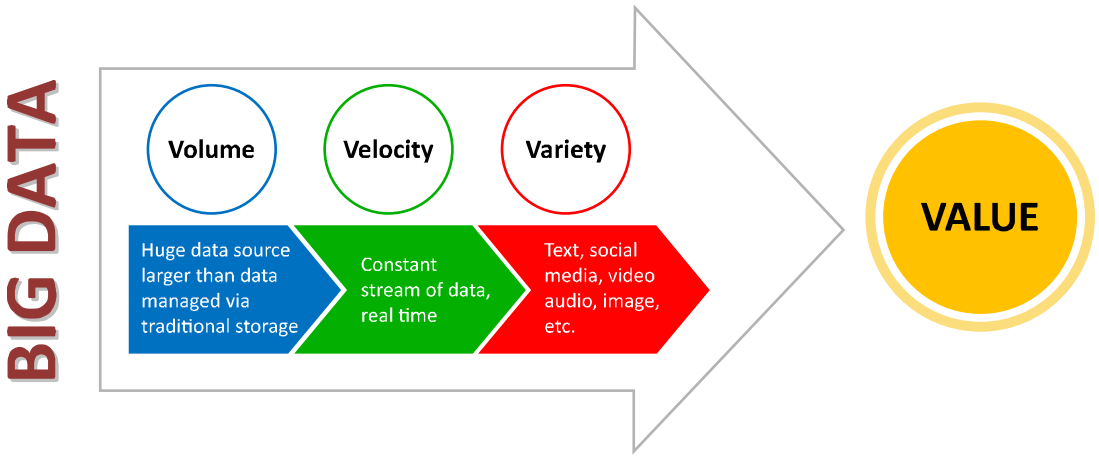
WHITE PAPER

BIG DATA in Pharmaceutical Industry

The BIG DATA revolution

Over past few years there has been a buzz around the word called “BIG DATA”. We will see this term being used were ever companies are finding huge amount of data coming from various data sources.

The revolution in social media in past decade has added more interest to this term. With new and varied sources of data available, companies are looking to integrate all sources into a big pool of data. But such datasets are also difficult to manage and are complex in nature. As such over the past few years many data management tools have emerged to handle these kinds of data and traditional approach like RDBMS no longer holds good in these changing environment.



Analyzing real world data could become a cornerstone of value-based pricing methods

The V’s in Big Data:

According to Gartner, "Big data is high volume, high velocity, and/or high variety information”. If these data is handled properly with greater processing techniques, it has the potential to create value for an Organization.

Velocity

The forms of data which are constantly coming to the system and is in most of the cases real time are grouped under this name. This data serves the purpose of knowing what is happing now in the real world and can help in making effective decision. Take for example medical Devices and sensors are generating data constantly and in real time, which if not tracked on time may become useless. Social media for example generates megabytes of data per second which gives a sense of velocity in data flow.

Volume

With increase in number of sources, the amount of data collected is huge and is only growing day by day. The magnitude of data is so immense that they cannot be handled by traditional methods of data storage, processing and analysis. Take an example of patient data which runs into millions of past records and are continuously added.

Variety

This refers to data which has different variety to it; it may be structured, semi-structured or completely unstructured. The reason for such variety lies in the type of data which can be a text or an image or video among others. Source can be social media, blogs, data, Web searches and may more. In fact sources can be anything, as long as it can be captured and converted into meaningful data. In life sciences text data i.e. literatures, patient electronic records, clinical research data etc. constitutes a major portion of the variety of available data.

Data Veracity

This is one more term added to three V's recently which deals with the authenticity or reliability of the data that is being sourced. For example social media may not be an authentic data as per present regulations but still has meaningful and important data or insights which cannot be ignored, especially when efficacy or safety of a drug is in question or if a new drug has to be developed.

The challenges that most companies now face are in getting answers to questions like how to capture these sources of data? How to mine these data into usable data? What about storage? How to share these data? How to analyze & present? And most importantly, what insights we can get?

Big Data is real time that gives advantage of knowing what is happing now rather than getting sense of what has already happened. With the evolution of cloud computing, cheaper storage and faster processing speeds, these new trends in technological advancements are fueling the use of Big Data day by day. Now you see not only organization but individuals and devices are also producing data in mega volumes, even up to terabytes per second. But that is not all, hidden in these datasets are information which can provide greater insights to organizations generating immense business value.

The focus should be on intent, as this information can help create new business strategies and help make valuable decisions.

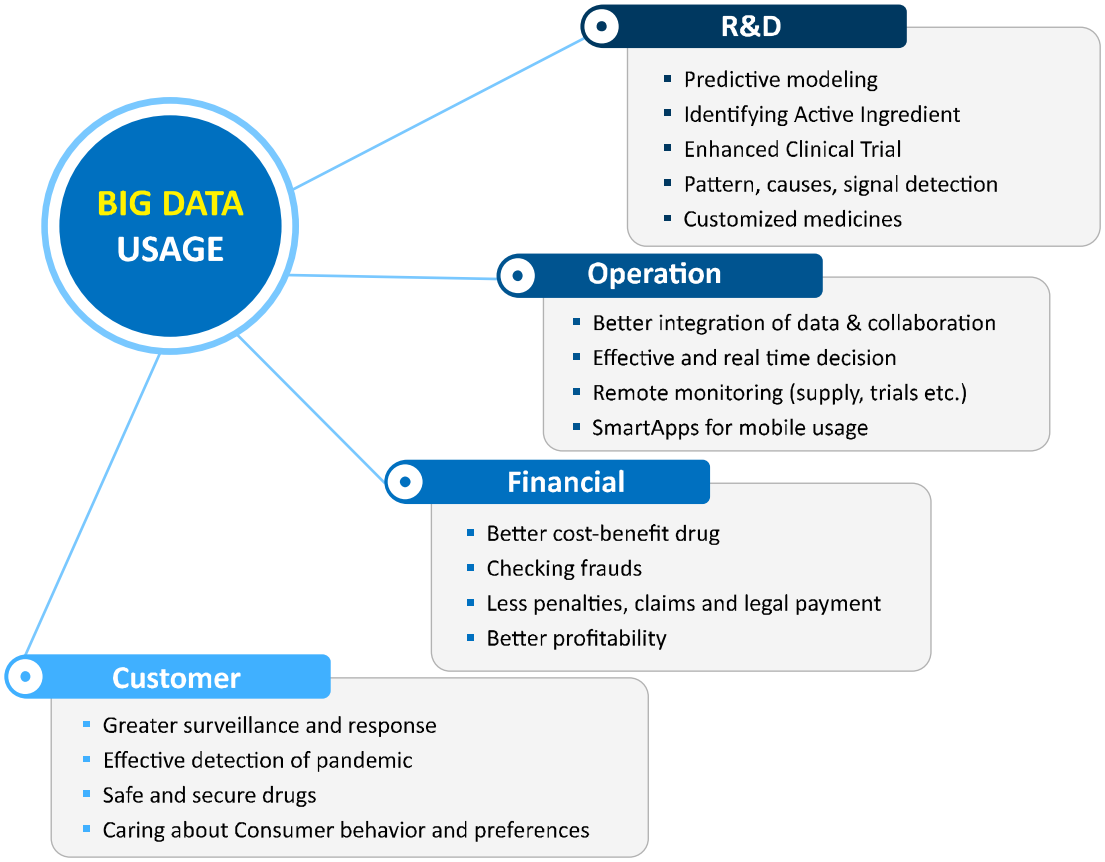
Big-Data opportunity in pharmaceutical R&D is real and the rewards will be great for companies that succeed

BIG DATA an opportunity for Pharmaceutical Industry?

Pharmaceutical industry is a data intensive business with its verticals generating or using various types of data. The volume of data is increasing exponentially each day with added variety of sources. In the health-care and pharmaceutical industries, raw data is generated from various internal and external sources for example Research work, R&D process, clinical trial process, doctors, academicians, medical devices and patients.

Effective usage and analysis of these data will aid pharmaceutical companies in identifying active ingredient that have desired therapeutic effect and develop them into effective approved medicines more quickly. Drug development is a costly process which requires lot of time and expenditure. Use of Big Data gives an opportunity to be used at various stages

of drug development timeline, by providing greater knowledge, new techniques, timely decisions whereby reducing the cost and time.



The focus should be on intent, as information gained from Big Data can help make valuable decisions

It also provides the potential to increase the involvement among all stakeholders in drug research and development, commercialization, and supply. Over the time it is seen that both regulators and insurance payers are looking at Real-world outcomes. Cost Vs Benefit model of pricing is becoming all the more important to pharmaceutical companies as payers, hospitals and even patient start demanding the necessicity of real world evidence and may become a necessity in future. Pharma co's can respond to this cost-benefit pressure by pursuing Big Data, virtue of which they can mine text literature or track social media etc. and can show conclusive real-world outcomes, and there by differentiating themselves from rest of the competition.

Regulators are looking at the prospect of mining this large pool of data to find any adverse effect signal or medical error. These data insights can help better patient safety and will impose more accountability on drug producers or distributors among others.

Focus groups are yielding to the active listening results that come from harvesting millions of on-line customer driven interactions, processing and correlating that data via algorithms which feed computer visualization to clarify what consumers truly want.

This also provides an opportunity for companies to show their concern for the public at large and Big Data can help improve surveillance. Companies can respond to situation quickly. It can also help companies to stock or move medicines during unfortunate events

like natural disaster or predict outbreak of a pandemic saving numerous lives within short period of time.

As thousands of products and therapies are already in market that are used or prescribed by many. Validating efficacy, drug safety, comparing product differentiators, designing marketing strategies or protecting patents etc. will become all the more important. Usage of Big Data will also help companies to innovate product or process and will help generate new ideas.

Traditionally life sciences lag behind in use of Big Data. As McKinsey & Company says new value systems are emerging from which companies can no longer ignore. They are Right living, Right care, Right provider, Right value, and Right innovation.

The road ahead is indeed challenging, but the Big-Data opportunity in pharmaceutical world is real, and the rewards will be great for companies that succeed.

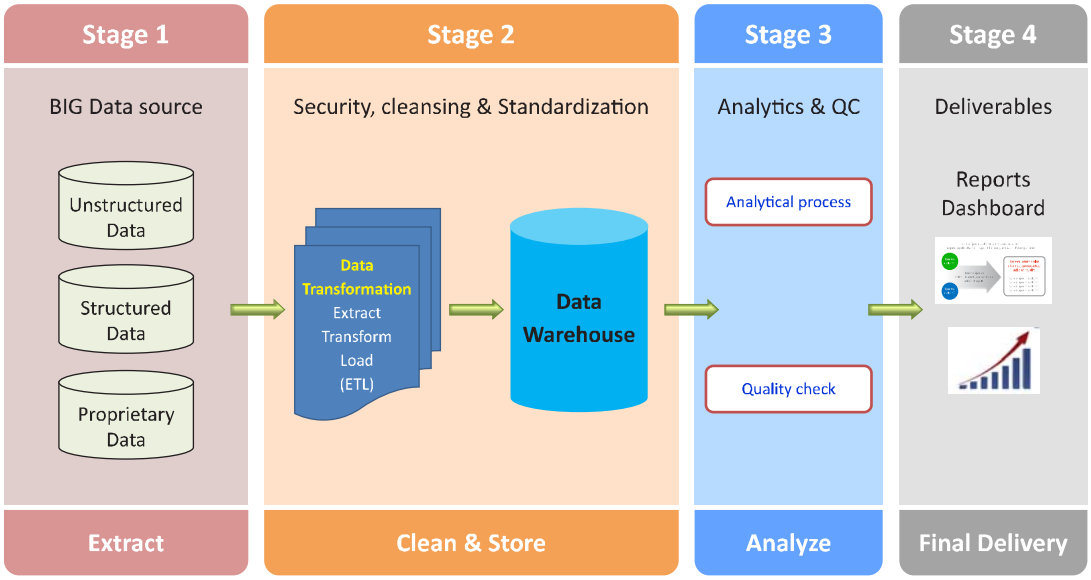
Scope for Analytics using Big Data

Big data analytics (BDA) has emerged one of the important topics of discussions. It has the potential of research and analytics providing an opportunity to the organization to think beyond business intelligence & data mining and include predictive analytics. It represents a new data management and analytical approach that has the potential of changing the way many companies have been doing business. It is designed to derive previously untapped intelligence and insights from data to address many new and important questions.

Big Data analytics is the process of interrogating large volumes of data, from a variety of data sources and in different formats, to deliver greater insights into available data. These insights can help in making real time or quick decisions. Various analytical concepts such as Text mining, NLP, Artificial intelligence, Statistics and Predictive analytics can be effectively used to manage, process, analyze data from virtually every possible source. Big data analytical approaches can be employed to recognize inherent patterns, visualize outcome, carry out correlations between entities, bring out the sentiment in the text and many more.

Typical stages of process flow from data to final reports are shown below:

Regulators mulls the use of Big Data to dig out Adverse Event signals or Medication Error



Conclusion

Big Data and Analytics are an important communication tools for effective decision making. Pharmaceutical companies, as a continuous process are looking for ways to improve upon the odds of getting a new drug through in the market. They strive to go through drug discovery to market as quickly as possible and that too in the most cost effective way. All the while they have to counter numerous risks and legalities, at the same time have to deliver maximum benefit to patients.

In order to help companies fulfill in their business objectives and to overcome challenges, Big Data analytics – which includes data integration, data mining, and analytics etc. – will help pharmaceutical industry make smarter decisions.

With varied data sources being added constantly, possibilities are enormous. Least to say, the use of BIG DATA will evolve over time and we will provide greater value to all the stakeholders.

Big data is designed to derive previously untapped intelligence

About MakroCare

Expert Strategic development and commercialization global partner for pharmaceutical, biotechnology and medical device industries. Our experience, programs and processes bring a new dimension to development strategy, regulatory/risk planning & management, clinical research, medical/scientific support and emerging region expansion.

MakroCare has operations and presence in US, UK, EU, and Asia. MakroCare is well positioned to meet the demands of the expanding product portfolio needs of our life sciences clients worldwide. We also understand the demands of an increasingly competitive market.

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