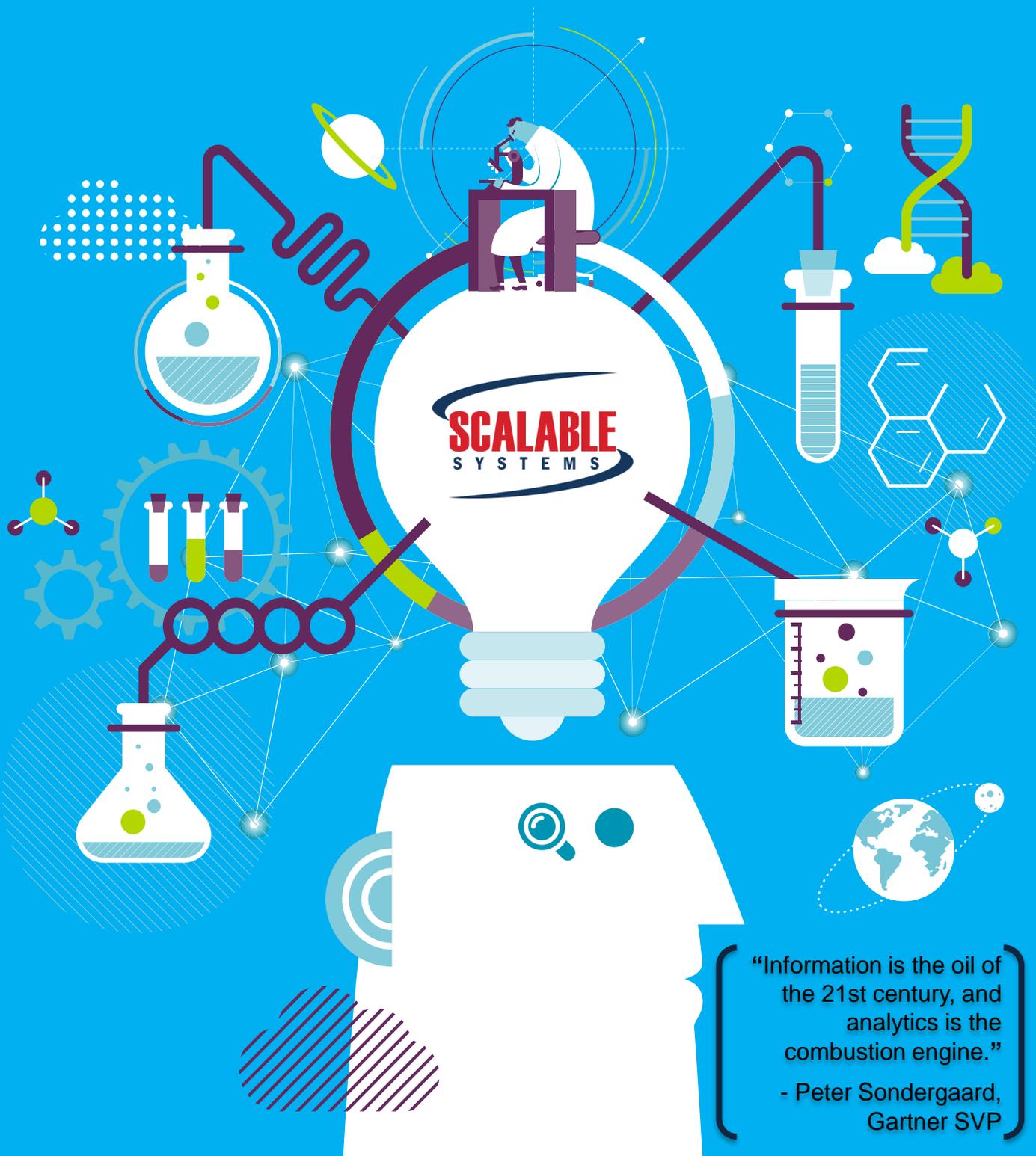


LEVERAGING BIG DATA IN LIFE SCIENCES

A Scalable Systems White Paper on Life Sciences



“Information is the oil of
the 21st century, and
analytics is the
combustion engine.”

- Peter Sondergaard,
Gartner SVP

EXECUTIVE SUMMARY

The life sciences industry has been much noted for lagging behind in implementing and profiting from the rapidly developing world of Big Data. While innovators are capturing market share by correlating transaction records and other sales chain data with data from sales reps' mobile devices, the new social media "feedback economy" and other sources, the bulk of the industry remains overwhelmed by the challenges of harnessing this valuable yet massive resource. But in today's increasingly competitive environment, Big Data mining and analytics represents an advantage that can no longer be ignored.

Social networks are changing the dynamics of pharmaceutical sales and marketing, exerting ever-more-powerful influences on people's opinions of products, marketing campaigns, brands and even entire companies. The disruptive daily volume of social media tweets, posts, blogs, boards, reports and reviews is overwhelming many companies. This unstructured data cannot be addressed with traditional Business Intelligence (BI) warehousing and mining techniques, but powerful new tools are coming to the fore.

Meanwhile, pharmaceutical reps need not only to provide doctors with valid information about medications, but to employ web-tracking technologies and social media analytics to transform their ability to capture and utilize customer data. Their need to reassure doctors on the value of medications, and of new prescriptive uses of specific drugs, includes being aware of and able to respond to any concerns that are voiced online. While negative reviews and videos are increasingly capable of going viral, even simple customer "dislikes" can reduce a product's sales. This is a new paradigm, and no company can afford to ignore its customers' increasingly powerful voice.

Properly applied, social data insights into consumer trends, patterns and concerns are proving invaluable. Big Data mining can streamline decision-making quickly identifying patterns in customer service problems, spot purchasing trends, and provide valuable insights for generating more successful messaging and marketing. Such analytics can also be used to reduce fraud and the counterfeiting of medications. According to the New York Times, a 2011 study of 179 large companies found that those adopting "data-driven decision making" achieved productivity gains of 5 to 6 percent.

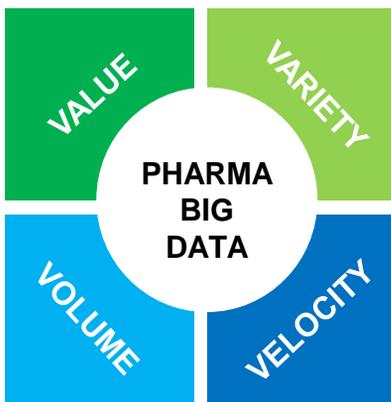
According to the Wall Street Journal in 2011, the ineffectiveness of particular drugs in target populations ranges from roughly 40% for anti-depressants, asthma and diabetes to 50% for arthritis patients. Negative feedback from ineffective or improperly prescribed medications make it imperative to leverage Big Data for informational social marketing initiatives and ongoing customer support.

UNDERSTANDING BIG DATA

As patients continue to become more knowledgeable about and personally involved in making healthcare choices, and with direct-to-consumer marketing becoming so important, it is imperative to utilize Big Data analytics. However, since conventional BI database tools are insufficient for handling, analyzing and reporting on these increasingly valuable data sets, many companies now have significant blind zones with respect to their global presence. The ability to successfully manage the tsunami of daily data, ranging from website referrals, customer transactions, patient records, mobile devices and social media, demands the use of advanced, cost-effective cloud solutions and new business tools.

For many companies, their volume of raw data is increasing at more than 50% per year.

With unstructured data growing ever more massive, the danger of “garbage in-garbage out” has also been amplified. In addition to the staggering Volume, Variety and time-sensitive Velocity intrinsic to Big Data, there is also the issue of Veracity - the need to be sure of the validity of the data. Successfully addressing such Four V challenges, and profiting from the dynamics of a hyper-connected world, requires leading-edge expertise in rapidly capturing, cleaning and effectively presenting analyses of huge mines of natural language data.



Data are becoming the new raw material of business

- Craig Mundie,

Head of research and strategy, Microsoft

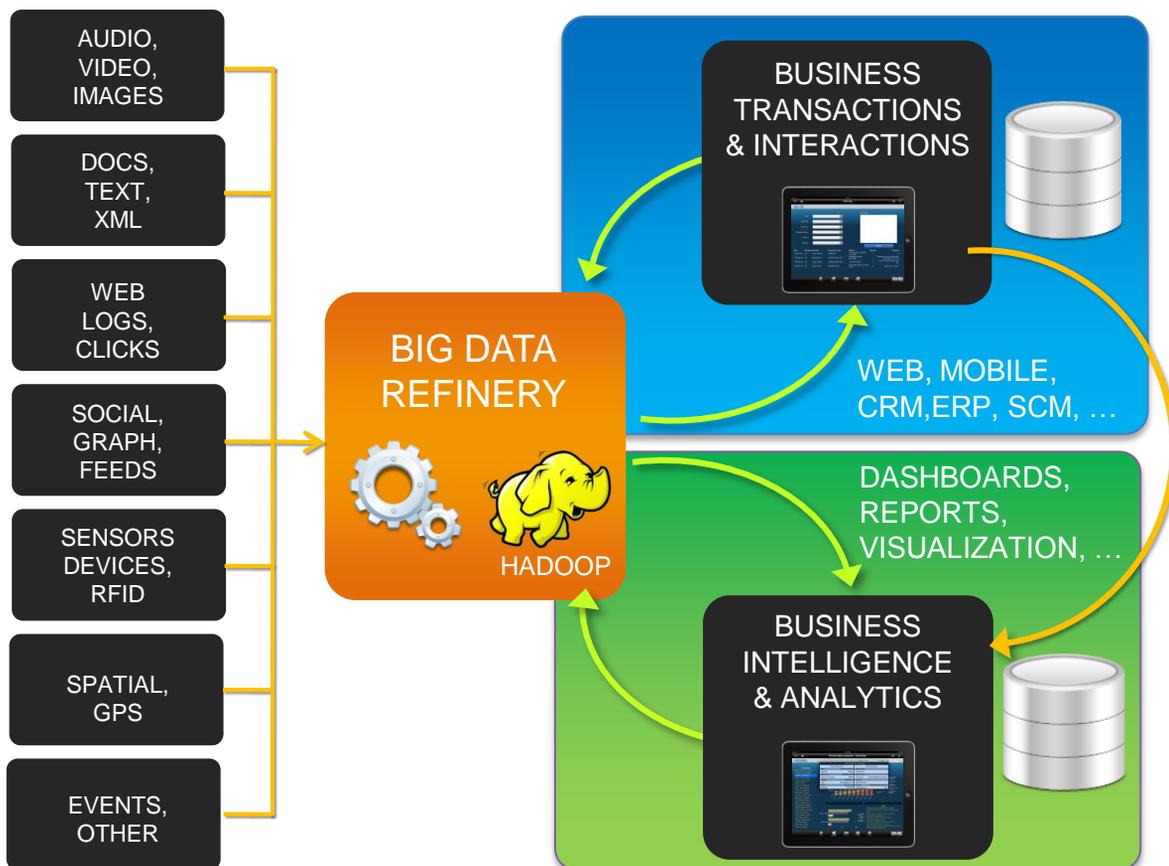
Big Data utilizes server clusters, processing engines such as Hadoop, and new interactivity tools to store, mine and analyze virtually unlimited amounts of highly complex statistical data. To maximize the information's value, these complex data sets must then be presented in effective real-time dashboard visualizations. Without the creative insights of a data scientist, though, such visualizations will often not provide the level of value and intelligence desired. A data scientist must possess math and programming skills plus scientific insights to evaluate huge numbers of factors, ask the right questions, and then produce meaningful visualizations.

The potential benefits from Big Data are enormous. Unlike traditional sources of costly consumer intelligence, such as from surveys, focus groups and corporate research, social data is instantly available. Voluntarily given by your customer base, it also has the advantage of providing key demographic and psychographic data for free. Not only can it help you track and optimize traditional and social media campaigns, but sentiment analysis unveils your customers' emotions and preferences, providing instantly actionable information about your products and brands.

LEVERAGING BIG DATA FOR PHARMA

Social, mobile, cloud and Big Data analytics must be seamlessly integrated with a company's traditional databases in order to transform and position life science businesses for optimal performance and success. Social data mining and analytics can produce real-time measurements of products and services that can be leveraged with a business's existing data, dashboards, metrics, KPIs and applications. As people increasingly share their personal information, concerns and criticisms with the world at large, the ability to identify and address social media feedback and impacts will separate the winners from the losers.

Although Big Data is complex, and seemingly unwieldy, it can be effectively processed with the help of existing IT architecture that most companies already have in place. This enables more productive and profitable decisions to be made. This process requires a holistic approach to understanding a great variety of data types, including customer comments, concerns, conversations, likes and dislikes. It also necessitates that robust data cleaning and enrichment processes are in place and rigorously enforced to eliminate data toxicity.



PHARMA BIG DATA ANALYTICS

ENABLING YOUR REPS

Customer Relationship Management analytics is necessary to improve the quality of pharma sales calls, enable collaboration across teams, allow companies to better understand customer and market dynamics, and enhance a sales force's ability to effectively generate increased sales. However, pharmaceutical sales reps must be able read and write information directly to CRM and information systems. Likewise, mobile dashboards must be customized to display only the relevant information sales reps need to do their jobs.

Big Data analytics is an incredible tool for understanding relationships and trends within massive sets of data. Transaction records, prescription orders, customer feedback and clinical data all contribute to the data sets available to a pharmaceutical enterprise. Through the use of mobile devices, social media, cloud services and Big Data analytics, such solution packages can empower an enterprise. Modernizing all applications and their maintenance through the employment of new social business intelligence tools and technologies can also drastically reduce some existing application costs. Increased ROI, better communication and greatly improved access to information are just a few of the benefits to life sciences enterprises and their sales reps.

A robust and dynamic mobile life sciences solution can:

Empower pharmaceutical sales representatives with insightful data	
Shorten market cycles and increase customer satisfaction	Reinvigorate current products for revenue maximization
Unleash the potential of an enterprise's data vaults	Monitor and optimize marketing and sales efforts
Utilize social, mobile, cloud and Big Data services	Refine the supply chain process



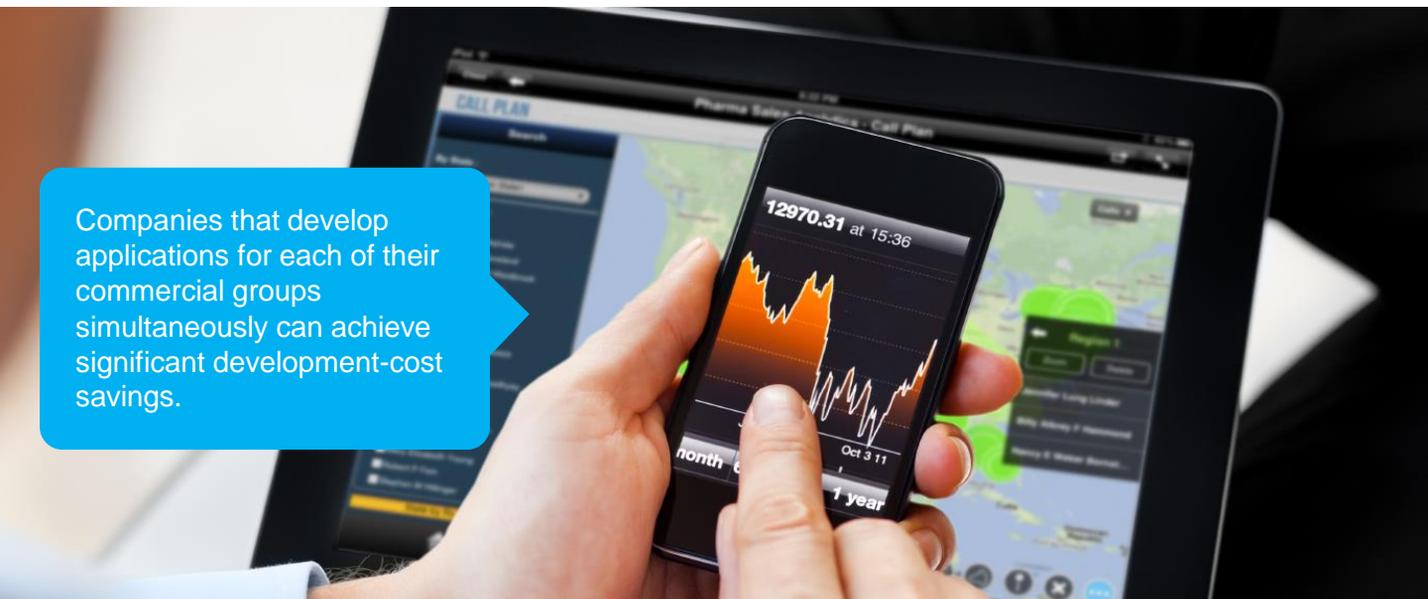
MAKING MOBILE WORK

Various sources have estimated that 65% to 80% of pharma reps were utilizing iPads by the end of 2012, but such usage presents challenges including additional programmer costs, the limited availability of authoring tools and the iPad's utilization of Flash technology. Life sciences organizations can benefit greatly when such problems are successfully overcome.

Big Data applications for iPads can help sales reps stay connected as they initiate contacts, make sales and maintain relationships. Such tools can leverage reps' opportunities to gain market share through comparative selling, including by providing clinical data comparisons and by better analyzing a doctor's or practice's demographics. This knowledge can also generate opportunities for presenting the benefits of specific medications for a wider variety of a practice's patients.

For life sciences sales reps, comprehensive data mining, analysis and visualization can optimize approaches to physicians. Solutions that focus on the analysis of data for the purpose of extracting insights and knowledge streamline such decision-making processes. By bringing together prescription drug data, call planning and CRM data on iPads, your field force will be better prepared to more effectively target and engage the prescribing physician. Such analytic tools also help sales representatives with performance-over-time in therapeutic market prescriptions while identifying valuable new prospects.

Enterprise Mobile Applications for sales reps work on virtually any mobile device and can augment employees' productivity and efficiency. EMAs can be tailored to specific workflows, business processes and transactions, and are designed to help employees do their jobs faster and with more ease. However, sufficient training is key to deploying devices such as the iPad, as reps and account managers will simply not use them effectively unless they are comfortable with the technology. With proper training and utilization, organizations benefit from instant insights and feedback, resulting in a more productivity workforce that will have a significant impact on their bottom lines.



Companies that develop applications for each of their commercial groups simultaneously can achieve significant development-cost savings.

THE FUTURE IS NOW

To succeed in today's world, pharmaceutical sales reps and organizations need to utilize Big Data technologies. Facebook, Google and Amazon and are among the many companies already substantially benefiting from and relying upon behavioral analytics. Each of these companies is using Big Data to improve their customer service and optimize their marketing operations.

Facebook, for example, utilizes the technology to evaluate targeted ads, friend suggestions and other member-focused activities. Facebook also employs analytics that leverage users' preferences, histories, current activity and other data sources for pattern recognition and data mash-ups. According to industry observers, however, pharma is so far doing a poor job of looking beyond Facebook 'likes' and 'dislikes', failing to utilize social graphs that can be mined to deliver valuable insights about patients, their behavior patterns and disease states.

Pharma companies need to better understand their clients' needs while incorporating detailed medical records for prescribing drugs to produce the best patient outcomes. This data must be effectively pushed out to an organization's sales force to deliver the required in-depth knowledge and analysis for revealing key performance indicators and metrics. Call analysis, segmentation analysis, social analytics and sales analysis are all elements that need to be provided to sales reps on the go.

A 2012 InnoThink Center For Research multi-year assessment of recently approved drugs at 12 large pharma companies assigned research costs of \$3.7 to \$11.8 billion per approval, which highlights the need to be on the leading edge in leveraging Big Data to maximize ROIs.



CONCLUSION

Successfully harnessing and capitalizing on the ever-expanding data landscape is of critical necessity in the era of Big Data. Leveraging its ability to provide sentiment analysis will allow you to achieve stronger customer understanding, improve customer relations and enable insight-driven decision making. When combined with robust data analytics and visualization, Big Processing can provide unprecedented insights and increased productivity to your enterprise's operations. In today world, these are becoming primary requirements for enabling a life sciences company to succeed.

Optimizing a client's enterprise for success is our main motivation at Scalable Systems. For life sciences companies, we have developed a comprehensive suite of services customized to help leverage operations through the implementation of sound database development and modeling, master data management and data masking solutions. We focus on providing a holistic approach to overcoming the challenges of cleaning, storing, searching and analyzing unstructured, structured and raw data - and then presenting it in ways that provide incredibly valuable insights.

We view our dynamic approach to social data as an art form, embracing processes that are both creative and constantly evolving. Our team of strategists can customize an organic solution to fit any pharma company's specific needs. By utilizing social, mobile, cloud and Big Data analytics in combination with the general knowledge from nurses, doctors, sales reps and IT professionals, we can transform a life sciences business for optimal performance and success.

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About Scalable Systems:

Scalable Systems is a global software consulting, development and IT outsourcing company providing both onshore and offshore software solutions and integration services to business enterprises around the globe. Scalable Systems has proven expertise encompassing low cost but high quality and reliable software solutions and services in areas including Data Management, Business Intelligence, Content Management and Applications Development.