Robin Robinson

Big Data: It's Not THE VOLUME It's THE VALUE

Accurate analysis of big data can transform every aspect of the life-sciences business model.

The term big data can refer to large volumes of data, or small, unstructured pieces. Most recently, the term references the enormous flow of information that is suddenly available from the many healthcare technology tools that have become available to and used by consumers. According to experts, the word "big" in big data should illustrate the huge opportunity for actionable insights that can be used to enrich operations and provide targeted solutions all along the molecule-to-market spectrum. The massive amount of data available through so many touch points will provide new insights about customers, products, markets, and stakeholders that can be leveraged to better align decision-making with business objectives.

Studies are mapping big data as a growing trend in the industry as companies use it to improve results and revamp operations. As the value of this process becomes more apparent, companies will use big data to transform strategy and business model design from marketing, product development, human resources, operations, and more, according to PwC, which published the report Capitalizing on the promise of Big Data.

"Big data is providing a new way of doing business — one that is driven by information-based decision-making and new types of products and services enriched with data," says Gurpreet Singh, principal and health industries IT strategy and enterprise architecture leader, PwC. "Big data insights and intelligence derived from fast-moving data sets can help inform split-second strategy decisions, spur innovation, inspire new products, enhance customer relationships, uncover fraud, bolster operations, and build competitive advantage."

"From groundbreaking discoveries to personal health, big data is the next frontier of healthcare," says Matt Balogh, senior VP, director of technology, Ogilvy CommonHealth. "Consumers, HCPs, manufacturers, and the entire healthcare network are generating data; that's not new. What's new is to use the data to benefit everyone."

Big data for the healthcare industry means evolving one's perspective on care.

"We're not augmenting the traditional healthcare model; we're reinventing it," Mr. Balogh says. "Healthcare is poised with all the systems to generate, collect, and use data to redefine services in ways never before possible through new industries, new technologies, and new, more holistic sources of data."

The biggest driver behind the industry's increased interest in big data is the proliferation of information flowing from consumer devices and online communities. This information is not only plentiful, but the newfound knowledge that comes from information is now available to the industry easily and immediately in today's digital world.

FAST FACT

EVERY DAY, 2.5 QUINTILLION BYTES OF DATA ARE CREATED.

Source: IBM

Mr. Singh calls this "innovating at the edge," which he describes as gathering new information directly from the patient or customer side of the equation. While this new channel certainly provides vast amounts of information, the more important aspect is the new data enable valuable insight into patients, such as how they are using drugs, and how those drugs are affecting outcomes.

"There are a lot of new data sources being created by consumer-oriented devices on a large scale," he says. "This is a brand new set of information that we never had before."

According to statista.com, as of 2013 more than 1 billion healthcare and fitness apps have been downloaded from the Apple app store.

comScore reports that more than 50% of the population happily carries a device that collects massive amounts of data.

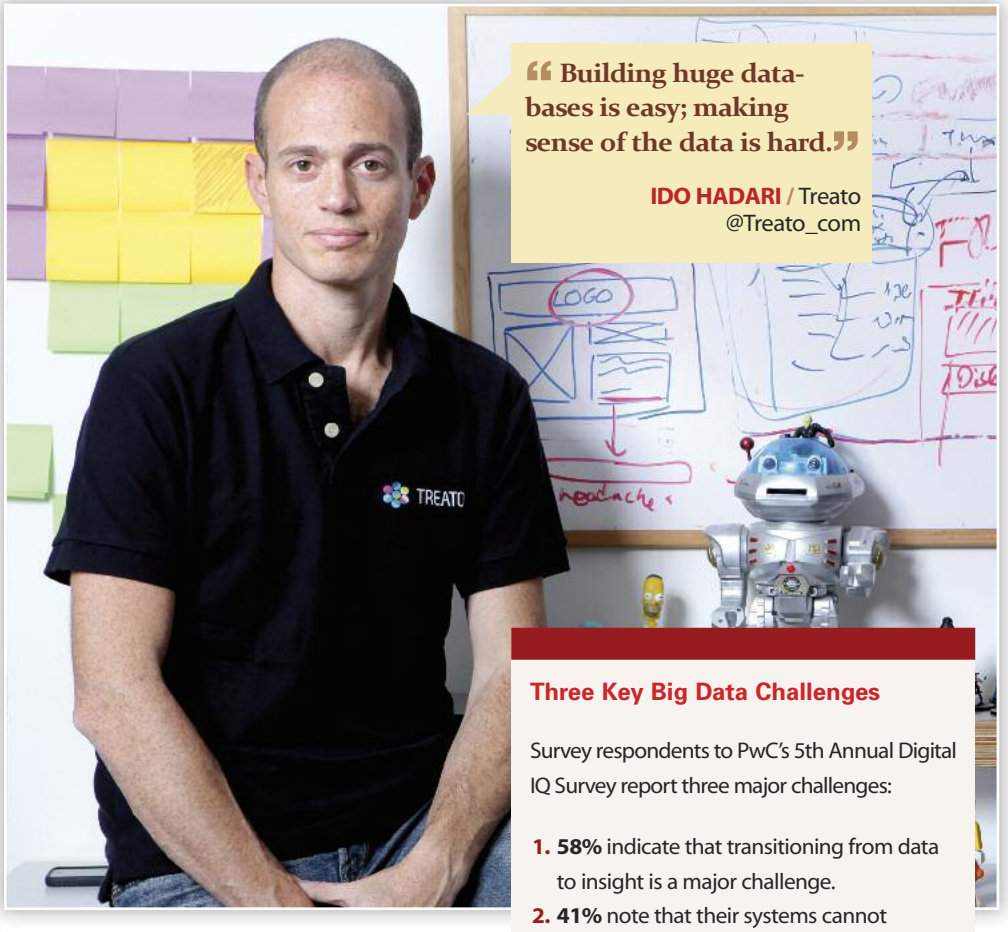
"Smartphones have officially entered the late majority stage of the technology adoption curve," Mr. Balogh says. "Their general adoption has not just popularized smartphones, it has enabled a new industry of technology that connects to them — technology that generates massive amounts of data and puts it to good use, especially for healthcare."

These fresh data are not only new, but also voluminous, and full of valuable information about the consumer, which can be determined much more quickly than ever before.

FAST FACT

THE BIG DATA INDUSTRY IS EXPECTED TO DRIVE $54.59 BILLION IN IT SPENDING BY 2016, COMPARED WITH ABOUT $27 BILLION IN 2011.

Source: Gartner



> "Building huge databases is easy; making sense of the data is hard."
>
> **IDO HADARI** / Treato
> @Treato_com

"For me, one of the most interesting applications of big data is tapping into the minds of patients en masse, or the wisdom of the crowd, to identify new treatment opportunities and detect health threats in real time, take action, and measure results — all of which used to take months or years, but can now be done in weeks, days, or even hours," says Ido Hadari, CEO of Treato. "This new information can serve drug manufacturers, payers, providers, and HCPs in improving their products, services, and operations and optimizing them to patients' needs and wants."

Along with the new source of information stemming from consumers, there are other aspects that are driving the industry's use of big data. According to Ben McGraw, director, life-sciences industry solutions, TIBCO Spotfire, three recent changes in the industry are shaping the impact of big data: the exploding market for medications in emerging markets, the implementation of the Physician Payments Sunshine Act (PPSA), and the rapid uptick in business development and licensing.

"All three of these transformations involve tremendous opportunity and challenges with big data at the center," Mr. McGraw says. "If big data is leveraged correctly, life-sciences companies will be able to capitalize on the two-thirds of pharmaceutical sales growth that will happen in emerging markets over the next five years; look beyond PPSA as a compliance activity to an opportunity to profit from improved branding and marketing efforts to get the most lift from marketing campaigns; and make successful strategic decisions on licensing opportunities, find the most appropriate partners, key opinion leaders, and perform robust competitive analysis."

It's not the Technology, It's the Insights

Mr. Hadari says the biggest challenge is not in collecting data, but in applying relevant analysis to make the insights valuable.

"Building huge databases is relatively easy," he says. "Making sense of the data, extracting the right data, and making the correct analysis — focusing on the wheat and not the chaff — are the biggest challenges of this domain."

Although new technology makes the collection of information faster and the types of information available more diverse, it can be difficult to separate the noise from the signal. According to Mr. Singh, companies will need to have strong intake functions and solid visualization and analysis functions to take full advantage of big data.

"In this world of new data being created every second, along with relatively inexpensive storage, it is hard to separate the signal from the noise," he says. "The quality of data is not necessarily increasing and in some cases it is decreasing. Therefore, choosing the right data to be analyzed is crucial. The insight gained must lead to a path of action."

According to Samer Forzley, VP of marketing at Pythian, the biggest challenges are not on the technology side where data collection occurs, but just in defining the right objective or use cases for the data being collected. A company needs to have an idea of what insight it is looking to uncover before implementing a big data project. This involves understanding the business process and visualizing the data system that will help prove a hypothesis or reveal the answer or solution to a problem, he says. For example, in some instances, the insights need to come from data collected in real time. In other cases, numbers need to be crunched and data sets need to be defined to find the correct insight.

"A common issue is that companies go down the wrong path because they have not taken time up front to think about how the data are going to be used," Mr. Forzley says. "This step is very important because the infrastructure of the data collection system depends on what the company is trying to determine. A wrong implementation will mean that the project does not yield the type of insights that are being sought."

The ability to collect data in real time has many advantages. It can be beneficial in many cases where quick analysis of real-time data can reduce the timeline for a clinical trial or allow a sales rep to adjust a sales call message right before a meeting to better align with the needs of the physician.

In the clinical trial arena, real-time data collection and insights are crucial to development teams, which need to be able to quickly visualize and interact with enormous volumes of operational, clinical, and safety data in a single in-

Three Key Big Data Challenges

Survey respondents to PwC's 5th Annual Digital IQ Survey report three major challenges:

1. **58%** indicate that transitioning from data to insight is a major challenge.
2. **41%** note that their systems cannot process large volumes of data from different sources.
3. **25%** report they lack the talent to undertake deep analysis of big data.

The Network Effect: Big Data Meets Crowdsourcing

Big data — everyone is generating it, yet we don't quite know how best to harness it. The life-sciences industry collects mountains of data from every customer interaction across various sources, then struggles to manage it all, derive actionable insights, and communicate information effectively and legally. Some of this is a result of the highly regulated nature of the industry; some of it is a result of the silos built within organizations, both functional and technical. Despite many attempts, finding a way to efficiently share and consolidate these data has eluded companies for years.

Enter crowdsourcing, the generation of data or insights through the collective contribution of many individual sources of information, often online. The advent of social media has shown a new way to build collaborative databases of insights across multiple domains in the cloud — think Wikipedia. Life-sciences companies are starting to leverage crowdsourcing in clinical research to reduce inefficiencies and drive innovation. The NIH's new National Center for Advancing Translational Sciences (NCATS), for example, recently created the Therapeutics Discovery program to help re-engineer the research pipeline using crowdsourcing techniques. By crowdsourcing compounds that already have cleared several key steps in the development process, including safety testing in humans, scientists nationwide can contribute their expertise to advancing these resources for new disease therapies.

There is an opportunity to tap into crowdsourcing with the data networks already built by providers of business-oriented, cloud-based solutions. In CRM systems, field teams are populating information daily with the most current information available on healthcare practitioners and organizations. By leveraging this continuous, real-time data stream to create a shared network accessible in the cloud, life-sciences companies have the opportunity to create a single customer master that's always more current, more accurate, and more complete than any static customer master database any one company can piece together on its own.

The technology is here. It requires a multitenant technology platform for shared resources. It demands the cloud for continuous input and easy access. And, it insists on a solution provider of global proportions for complete data. The result is a network effect, or crowdsourcing of life sciences, without the risks of uncontrolled social media feedback.

Source: Dan Goldsmith, General Manager, Veeva Network

> "It is more important than ever for life-sciences companies to implement the right combination of better information, stronger processes, and integrated technologies to move data from operational support to a competitive advantage."
>
> **BALKRISHAN KALRA** / Genpact

> "From groundbreaking discoveries to personal health, big data is the next frontier of healthcare."
>
> **MATT BALOGH**
> Ogilvy CommonHealth, part of Ogilvy CommonHealth Worldwide

terface to support forward-looking decisions, rather than retrospective results tracking.

"To streamline clinical trial data analysis, real-time access to clinical data during all phases of clinical development is imperative, allowing the interaction with the data as soon as it is collected," Mr. McGraw says.

For marketing purposes, real-time analytics can help improve marketing decisions by making it faster and easier to analyze syndicated and internal call, sample, or detail data to quickly uncover hidden opportunities and risks in the market.

"By developing a deeper understanding of target markets, consumer trends, and competitors, the most effective sales and marketing strategies can be deployed," Mr. McGraw says.

Making Big Data Work for Health Records

People are invested and taking an active role in managing their health.

"They're not resisting the datafication of healthcare; they're embracing and contributing to it," Mr. Balogh says. "This adoption represents a new age in active data contribution to people's own wellness. This information can be used to collaborate with doctors who are leveraging another important repository of big data — electronic medical records (EMR)."

According to Mr. Balogh, EMR represents the evolution of the traditional healthcare dialogue between doctor and patient. EMR-enabled dialogues incorporate specialists, payers, labs, pharmacists, hospitals, and care networks unifying their data collection to provide better healthcare, resulting in healthier patients. More than that, it signifies a new age of data enlightenment through meaningful and individually relevant big data.

"Through the strategic integration with health information systems (HIT) this information can now be shared securely between consumers, providers, government, and researchers," he says. "Ultimately this critical use of big data will reduce costs, expand access, and improve quality of care and overall wellness for us all. In the very near future, I predict that small data will find common sharable data sets. Like giant Venn diagrams overlaying personal data, disparate sets will combine to achieve great insights. Big data will become more actionable as we find better ways of making sense of it all. In 2012, the Obama administration announced the Big Data Research and Development Initiative to extract knowledge and insights from complex collections of digital data, releasing millions in funding to agencies such as the National Institutes of Health."

Much of this is already happening in the mainstream. Cautious advancement with a focus on security has made some of the big data as it relates to the individual challenging for healthcare.

"Make no mistake, big data will have a transformative effect on healthcare," Mr. Balogh says.

John Copeland, managing partner, marketing strategy and insights, Rosetta, believes that it's likely that many of the biggest opportunities and challenges of big data in healthcare spring from the same source: the ability to aggregate and consolidate patient data across multiple sources over time.

"Electronic health records (EHRs) hold the

TRENDING QUESTION: BIG DATA OPPORTUNITIES BRING BIG CHALLENGES

As the industry embraces the realities of big data, thought leaders from across all functions provide input on crucial opportunities and challenges.

NICK COLUCCI

President and CEO
Publicis Healthcare Communications Group

Billions of people globally are connected online through Facebook, Twitter, community forums, and chat rooms, openly sharing opinions and life stories — unfiltered big data. Culling information via social listening provides both a big opportunity and a challenge for health and wellness marketers. But applying the same blanket approach and yesterday's tools simply won't work in this new world. One of Publicis Healthcare Communications Group's firms— in-sync— advises us that the place to start is to listen and identify online behavior patterns. This group employs a social science lens to dive deep into social channels to understand how humans operate. This type of big data complements more traditional brand research and informs clients about consumers' patterns, ultimately pointing to the best micro-communities to laser-target to reach the intended audience. Deep insights like these help ensure the right message is reaching the right person at the right time in the right way, which can set a brand apart.

NEIL DE CRESCENZO

Senior VP and General Manager
Oracle Health Sciences Global Business Unit

Pharmaceutical and biotechnology companies, while historically data rich, are compiling structured and unstructured data at unprecedented levels to meet the evolving demands of healthcare payers, providers, and patients and their families. One of the areas in which we see the greatest opportunity for using big data is in accelerating the translation of scientific advances into more personalized and effective treatments. This process requires the ability to manage, integrate, analyze, and leverage clinical and financial claims and other biomedical information from across the healthcare enterprise and from external sources. We also see the potential for big data to usher in a new generation of clinical trials, which leverages continuous remote patient monitoring via machine-to-machine (M2M) technology. Such solutions can collect thousands of data points per minute, which can give rapid indication of protocol compliance as well as potential adverse events while driving new levels of data collection efficiency. The greatest challenge for many health sciences organizations is quickly creating the infrastructure required to process and manage big data. These hurdles are rapidly disappearing. However, thanks to modern, purpose-built data models that support interoperability, proven big data infrastructures that can scale while addressing data privacy and security, and powerful, intuitive analytical applications that deliver actionable intelligence when and where it is needed.

SANJAY JOSHI

Managing Principal, Operations and Technology Solutions Business
ZS Associates

Big data can help advance three fundamental opportunities on the commercial side. It can play a transformative role in making firms profitably shift from a predominantly high-cost direct sales model to a lower-cost, highly instrumented, and targeted multiple channel promotional model by employing big data analytics across preference, access, cost, and context dimensions. It also can drive a much more patient-centric model through analytics of diverse, voluminous, patient data, for example data stemming from EMRs, social media, and compliance. Finally, big data can help firms shift to a much more agile response marketing strategy based on timely analytics of promotion response and much faster target-execute-measure-refine campaign cycle. There are three key challenges to usher in a big data-led transformation. First, big data efforts are fragmented and disjointed across multiple corporate initiatives and may not always have senior executive sponsorship to provide direction and support. Second, many corporations are struggling to build their analytics quotient (AQ), such as deep analytics, resources, roles, skills, and governance mechanisms. Finally, and most fundamentally, many firms lack an accurate, unified view of their data — that single version of truth — that big data can process and mine.

JEFF MEEHAN

Chief Commercial Officer
MD On-Line

Physicians, hospital networks, and government agencies are all facing challenges with data. How to get data, how to store it, how to manipulate it, what to do with it, and how to improve the quality of care based on it. Billions of dollars are being invested in the process and the likelihood is that it will take years to make meaningful progress toward achieving such lofty goals. That being said, there are pockets of opportunities to leverage data now. Data should not just be used for market intelligence; data must be used to market intelligently, which means making data actionable. Some savvy pharma marketers are exploring a number of ways to evaluate the effectiveness of these pockets, to support the vehicles that are achieving successful outcomes.

TIM MORETON

Founder and Chief Technology Officer
Acunu

Big data originally focused on collecting and managing large datasets — it was about size, not speed. But now, real-time big data apps are appearing that allow manufacturers to seek anomalies and spot trends before they become issues. Apps also allow for the real-time monitoring of patients by applying complex analytics to spot problems and reactions before manual processes can. Marketing programs are measured in minutes not in weeks. These are not reworking old use cases with more data on cheaper platforms; they are innovations. Big data can improve quality and service, not just save cost.

SAUL MORSE

VP, Multichannel Integration
Palio+Ignite
@saulmorse

The biggest opportunity is going to be access to wide-scale availability of data that were previously beyond the reach of patients and physicians alike. The abundance of cheap sensors and the amount of data being collected is phenomenal. Sensors such as fuel bands and digital glucometers, and other such devices now open up additional possibilities for data capture in everything from heart rate, blood sugar, exercise levels, sleep patterns, etc. The challenge will be aggregating and assembling all of these disparate data streams to extract the right data at the right time to maximize relevance. There is so much data becoming available, knowing which piece to concentrate on will increasingly become an art form.

(Continued on next page)

DAVID ORMESHER
CEO
closerlook

Big data gives pharma marketers the opportunity to get smarter. Instead of guessing what healthcare professionals need to make more informed therapy decisions, brand teams can know and respond accordingly. This customer-level insight allows marketers to create and deliver real value. Traditionally, the value of pharma has been locked up in the product itself. When companies are squeezed on price; they suffer, but when additional services are provided to customize the customer experience, the profit model changes. Better customer knowledge at the individual level provides both clues for describing the whole product and an ability to test new approaches. The democratization of data, however, will challenge the culture of sales and marketing organizations. Investing in big data results in a single view of the customer that can be made available to everyone in the organization, laying the foundation for a new operating culture. Finally, there is an immediate economic benefit of using big data to measure marketing impact and productivity. Real-time measurement delivers recommendations on message, target, and channel priorities.

GARY PALGON
VP, Healthcare Solutions
Liaison Healthcare

Big data is about more than volumes of information. Big data is fundamentally about the aggregation and analysis of disparate, complex information, and how to overcome false walls or barriers when it comes to sharing such information across enterprise boundaries. For instance, there are silos of valuable clinical information being spread throughout the healthcare and pharmaceutical ecosystems, waiting to be liberated in order to speed research and improve patient outcomes. As the industry embraces big data, cloud-based technology is developing at a rapid pace to address data sharing opportunities across the enterprise. The challenge, however, is to also advance business relationships to accompany the technology.

JOHN POULIN
Managing Director
Huron Life Sciences

Big data and industry regulations are changing the definition of the pharma customer. Sales, marketing, operations, and compliance professionals now have the opportunity to access information about how their products are being discussed and used that was previously unavailable. The data are there for the taking, and with care, the data can all be gathered and analyzed without violating privacy restrictions while helping companies identify trends, such as patterns of customer behavior, to understand their customers and determine strategic direction. The challenge with big data is that it will come from places such as aggregate spend, disclosure regulatory filings, and patient databases, so pharmaceutical manufacturers will need to use caution and use the data in a compliant manner. Specifically, there are four major concerns with using healthcare data for sales and marketing activities. These concerns are: understanding the impact of the Sunshine Act on commercial activity, HIPAA compliance, cross-channel challenges, and compliance controls over enterprise data.

BONNIE RISHELL
CEO
ROI2 Inc.
@Influence_Intel

Looking forward one of the biggest opportunities that big data will provide the pharmaceutical industry is the advancement of predictive analytics. This will aid in providing optimal quality of care through increasing the collaboration between the provider, payer, patient, and physician, producing real-world tangible outcomes. Some of the biggest challenges facing big data is the use of targeting and root cause analysis. The issue lies with proving effective comparisons and providing the information of what works for certain diseases, then identifying the population of health information on the community level. If these challenges can be overcome and big data can be used in these ways, this will give the pharmaceutical industry the ability to reveal insights within data and apply it to real-world action.

RICHARD THOMAS
Chief Information Officer
Quintiles

Making informed decisions based upon a real-time view of the changing world is the opportunity. With more data than ever before, providing near instant reflections of a particular scenario is possible. The opportunity is using this knowledge day-to-day and in those pivotal decisions that are taken through the life of a product. The ability to take action based on the here and now, not a view from six months ago, will separate the leaders from the laggards. The challenge is to create a meaningful view for decision-making. The emerging role of the data scientist continues to be the bridge — and constraint — between insight and action. Organizations will need to change the day-to-day all the way through how strategy is constructed if the benefits of big data are to be realized. We need to move from show me to tell me what to do.

SCOTT WEINTRAUB
Chief Marketing Officer
HRM

Finely parsed data can provide incredibly accurate geographic segmentation, as well as identifying very specific needs on the local level. Companies can group similar markets for scalable efficiency and know just which tactics and messages to deploy. However, so-called big data is only of value if it can be successfully integrated into all the disparate information into the business in an actionable way. That's the challenge: brand managers need a resource that can interpret multiple data sources relevant to payers, providers, population, prescribers, places, and the product.

promise of better patient experiences and care as well as lower overall healthcare costs as healthcare providers and institutions share information on patient tests, treatments, and outcomes," he says. "Mindful of these benefits, legislation has provided financial incentives for the industry to push forward on the development of EHRs through the 2009 HITECH Act. However, these comprehensive patient profiles also pose a number of important challenges and issues."

The first issue, Mr. Copeland says, involves the security of EHRs and the potential misuse of the information they contain.

"As technology and other structural factors encourage EHR adoption, it will be important for legal and ethical questions to keep pace," he says.

The second issue surrounds the ramifications of errors from EHRs, which could be much more severe than similar errors in consumer data records in other industries, like a retailer's loyalty program.

"Whether through miscoding or data

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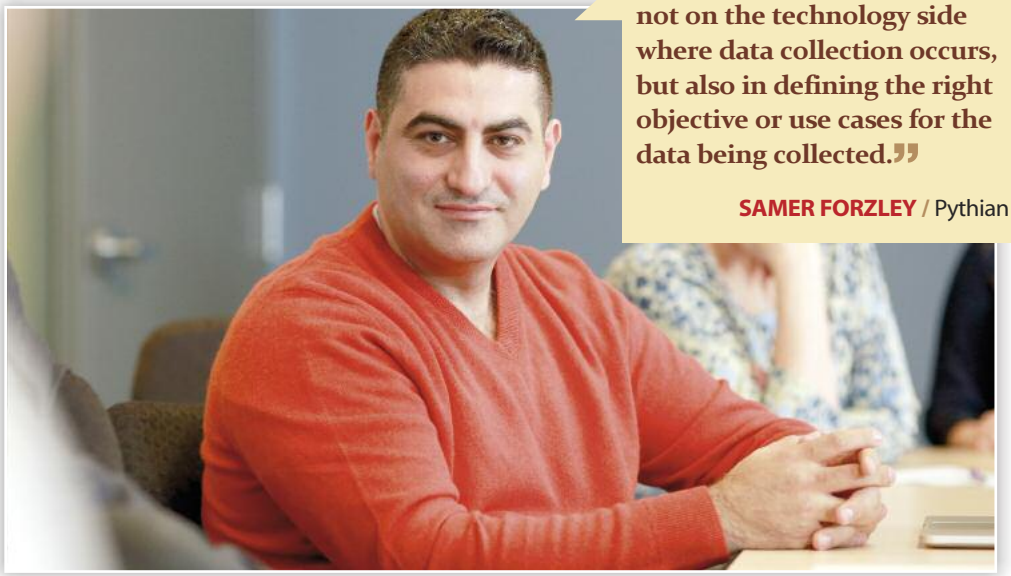

> "The biggest challenges are not on the technology side where data collection occurs, but also in defining the right objective or use cases for the data being collected."
>
> **SAMER FORZLEY** / Pythian

> "By developing a deeper understanding of target markets, more effective sales and marketing strategies can be deployed through big data."
>
> **BEN MCGRAW** / TIBCO Spotfire

FAST FACT

90% OF THE DATA IN THE WORLD TODAY HAS BEEN CREATED IN THE LAST TWO YEARS ALONE.

Source: IBM

degradation, such errors could result in wrong diagnoses, incorrect treatments, or worse."

Big Data Best Practices

In the life-sciences industry, the volume of data generated is only increasing, especially in light of healthcare reform and an emphasis on digital data, says Balkrishan Kalra, senior VP and business leader, life sciences, Genpact.

"It is more important than ever for life-sciences companies to implement the right combination of better information, stronger processes, and integrated technologies to move data from operational support to a competitive advantage," he says. "Going forward, as payers are starting to further restrict drug usage to therapies that provide better patient outcomes — health and economic — big data is critical for drug manufacturers to showcase to payers that their drug is superior to others in the same class and provides a substantial measurable difference to the outcome of the patient, for example less visits to the ER, doctor's office and provides the economic benefit required. If done correctly, their drug usage will increase and provide formulary status and much needed growth. If not, drugs could be sidelined. The real opportunity in big data puts solutions to work to enhance consumer insights, decision making, develop stronger governance, improve regulatory compliance, and increase revenue. Implementing the right analytics, tools, people, and partners will put life-sciences players a step ahead."

Mr. Hadari says data must be presented so that the insights are clear at a glance and provide information that is actionable.

"Folks shouldn't need a degree in statistics to figure out what the data are saying," he says. "And it's not enough to have lots of servers crunching the data, the insights must be actionable."

An important aspect of any effective data management environment is to let the technology do as much of the work as possible, says Mark Smith, director of analytics and optimization, AbelsonTaylor. One of the best ways of capitalizing on this for decision making is to integrate a business intelligence (BI) tool-set into the architecture right from its initial design.

"Processing capabilities and infrastructure have advanced to be able to handle extreme amounts of data at a quick pace, but integration of a BI tool-set is often left until too late in the development process, to the detriment of the platform's overall ROI," he says. "These delays can cause valuable time and decision-making capabilities to be lost unnecessarily."

On the other hand, when properly set up, a robust BI tool can be tuned to identify early and significant trends in the data before human involvement is even needed.

"These quick reads can focus initial analysis efforts and shorten the time it takes to affect marketing decisions with important insights," Mr. Smith says.

Before the infrastructure is set in place, however, everyone in the organization needs to be invested in the project.

"The most successful data plans will bring all the organizational functions together — from IT to marketing, to finance, to operations — and basically have everyone in the discussion about objectives and data patterns; with input from all sources so that the company can create a proper infrastructure," Mr. Forzley says. "For a big data project to be successful, it is critical that everyone is at the table. Every department within a company has a different perspective on how to use the data and what they need from it." (For more information on shifting big data shift out of IT, see digital issue.)

Along with bringing all stakeholders to the table, companies need to be very selective in choosing the proper tools for the data collection.

"Some companies are rushing into big data because it's the shiny new thing," Mr. Forzley says. "But when decisions are made based on what others are doing, that may not be the best method for the business."

More important than having the data is making sure that there is a resource — a data scientist, for example — to manipulate the data and find the true insight so the project will be successful.

"The interesting thing about data is that the possibilities are almost endless, and so part of the challenge is for the industry to find people who understand the business and can visualize what data systems are needed to prove a hypothesis," Mr. Forzley says. "Unless those charged with managing the big data project consider these factors and ask the right questions, they won't be able to truly understand the data."

Big Data Challenges

Over time, organizations will become far more data-driven in how they make decisions; develop products and services; and interact with customers, employees, and stakeholders at all levels. Companies that move quickly to capitalize on the potential of big data will have a first-mover advantage, enabling them to innovate in ways that are difficult to replicate, PwC reports. That advantage will also come with many challenges.

Beyond deciding which data to use and the

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> "Many of the biggest opportunities and challenges of big data in healthcare spring from the same source: the ability to aggregate and consolidate patient data across multiple sources over time."
>
> **JOHN COPELAND** / Rosetta

FAST FACT

62% OF RESPONDENTS BELIEVE BIG DATA CAN HELP DELIVER A COMPETITIVE ADVANTAGE.

Source: PwC's Digital IQ Survey

> "Big data is going to provide a new way of doing business that is driven by data-based decision-making and services enriched with data."
>
> **GURPREET SINGH** / PwC

appropriate analytics to deploy, Mr. Hadari says learning how to effectively use insights to transform operations is the most significant challenge.

"Used properly, big data could dramatically change strategy and fundamental thinking and approach," he says. "For example, traditionally, market researchers have used targeted focus groups, or broad surveys to gather patient or end-customer input. Both have drawbacks — focus groups are limited in scope, and place the participants in an artificial construct that could affect the results; and surveys are a rigid set of questions solicited from a specific audience. However, today millions of patients are going online and sharing their experiences in a completely natural, unmediated fashion.

"By using big data technology, it is possible to sort through the massive amount of content and extract insights that can impact the way pharmaceutical companies educate their stakeholders, market their products, and interact with patients," Mr. Hadari continues.

Each segment within the pharma organization encounters its own set of challenges and realizes specific potential benefits from the massive amounts of information available, Mr. Smith says.

"Whether it's marketing, pricing, research, adherence, or patient outcomes, the challenges are very different based on the functional perspective within the industry, or even within the pharma organization itself," he says.

For marketers, however, the biggest challenge is gaining access to the right data within a reasonable timeframe and with enough meaningful context to draw insights, and as a result, confirm or adjust the strategy while it can still make a difference.

"It shouldn't be necessary for a team of data scientists to spend six months with the information before the marketer is provided with the critical insights that affect his or her brand," Mr. Smith says. "Technology, data capture, and management mechanisms aren't the differentiators they were just 12 months ago. There's a multitude of very capable solutions and technology partners available to pharma manufacturers and marketers today. The key differentiator in the next evolutionary cycle for big data will be providing strategic access to the information at the marketer's desktop in such a way that it's prewrapped in the right context to make decision-making easy."

Mr. McGraw agrees that insights need to be more accessible to users, who have the ability to freely explore the data without reliance on IT. This allows people to ask and answer questions as they arise, resulting in faster and more accurate decision-making and a more productive and flexible organization.

"Users must be empowered with a highly interactive and visual environment where they can perform self-service data discovery to uncover unexpected opportunities and risks buried in the data and then anticipate what's next using predictive analytics," he says.

> "For marketers, the biggest challenge is gaining access to the right data within a reasonable timeframe."
>
> **MARK SMITH** / AbelsonTaylor

Start Small with Big Data

PwC advisors say an effective way for a company to begin using big data is by launching a pilot, which does not require a substantial investment of time or money. The first step is to identify a pressing business issue to address through the pilot, and then get those within the organization onboard. The most successful pilots are tailored to the unique needs of the organization. There is no-one-size-fits-all approach, PwC reports.

For instance, a healthcare products company wanted to increase sales of a mature product line that had been essentially flat over three years. By creating a pilot that mashed up internal sales data with external data about medical offices, product consumption, demographics, and medical claims, PwC helped to reveal a mismatch between product demand and distribution, and pinpointed geographic areas the company could focus on to boost sales. The pilot produced a sizable sales increase and resulted in modifications to the sales management process relative to more mature products.

"With the right analytical tools, data can be aggregated on the fly and mined to reveal new patterns and relationships that yield insights into how to improve the business," Mr. Singh says. "An effectively designed and executed pilot can quickly demonstrate the potential of big data to generate insights needed to improve innovation, boost customer loyalty, support profitable expansion, or achieve other business goals — and often, to gain a competitive edge. The results of pilots will provide the direction needed by management to determine where to scale their investment." PV

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Robin Robinson

TECHNOLOGY *and Business* Needs Align around Big Data

In today's big data environment, cross-functional stakeholders need access to insights derived from vast amounts of information.

As companies begin to leverage big data for a competitive advantage, both business and technology functions must be aligned. There was a time when data management belonged within the realm of information technology (IT). The IT function collected, managed, and decided who had access to data. However, in today's business environment, it is crucial that all stakeholders — not just data scientists — are able to access and analyze the data they need. New technology tools and applications allow for a more cross-functional approach to big data, and more companies are moving toward science teams that include business analysts, quality engineers, and product managers who work together to align analytical efforts across all business objectives.

According to Mark Smith, director of analytics and optimization, AbelsonTaylor, data analysis can successfully sit in a variety of different functions, depending upon the organization.

"There is a clear trend of data analysis moving out of the sole domain of IT and into different areas of a pharmaceutical company," he says. "This trend will continue for the near future."

The new tools that are available are helping drive the trend forward, as they can now collect, process, and present data in a way that is easy to understand and that is in line with the different functional needs of business units. Moving forward, the technical part of collecting the data, pouring it into the data platform, and developing the tools for analytics will become even more of a backstage activity, leaving the center stage for those who need the analytics layer and insights from that data to make business decisions.

"Big data is no longer only for techies," says Ido Hadari, CEO of Treato. "New tools remove the technical barriers to handling the data, leaving just its highly desired insights, often with a set of tools to conduct further manipulation and querying for non-technical professionals. This will become the most powerful decision support tool that any health organization can have at its disposal."

"The trend is definitely about enabling anyone in an organization to freely explore the data without reliance on IT," says Ben McGraw director, life sciences industry solutions, TIBCO Spotfire.

"This allows people to ask and answer questions as they arise, resulting in faster and more accurate decision making," he says. "The end result is a highly productive and agile organization where IT can encourage data exploration by users, while staying focused on their own strategic activities."

> **"New tools remove the technical barriers to handling the data, leaving just its highly desired insights."**
>
> **IDO HADARI** / Treato

Mr. McGraw says cross-functional data exploration allows clinical development teams to make decisions based on accurate data. By viewing clinical trial data in this manner, researchers can drastically reduce the amount of time needed for medical review to identify poor enrolling sites. This allows for study timelines to stay on track and KPIs can make

decisions on new site recruitment strategies. This provides an optimized scenario for successful trial progression.

Setting up an architecture that allows for common reference capabilities and data access is a best practice for this trend, says Gurpreet Singh, principal and health industries IT strategy and enterprise architecture leader, PwC.

"A company can get an improved return on assets when it optimizes the core of common capabilities by leveraging repeatable patterns across different functions," he says. "Each organization may have specific and different questions, but there can be a common process of generating those answers."

For example, data intake, analytics, distribution, visualization, and collaboration are all examples of repeatable patterns that sit at the core, but the questions and sources can be different according to whether the data are for sales and marketing, commercial, R&D, supply chain, or manufacturing.

"It is important not to create siloed solutions because that's going to increase the overall spend and won't provide the ROI for each of those areas, so optimizing core processes is key," Mr. Singh says.

Samer Forzley, VP of marketing at Pythian, cautions against too much slicing and dicing of data, as this can create unproductive silos, impede ROI, and perhaps leave companies open to security risk.

"We've heard cases in different organiza-

TRENDING NOW

Thought leaders provide examples of how putting big data to work can solve many of the industry's challenges.

IDO HADARI

Treato

A pharma company needed to understand why there was such a significant pre-needle dropout rate for its treatment. Using a patient intelligence platform to analyze patient conversations, it uncovered concerns around efficacy and insurance coverage for this particular drug. These insights enabled the brand team to take immediate action: deliver a program for patient and physician education, reach out and engage specific patients to transform them into patient ambassadors, refine product positioning, and adjust insurance-related strategy. In another case, the analytics uncovered an unfamiliar use of an anti-congestion product in combination with additional OTC products for addressing infertility problems. The brand team for that product is now building a marketing strategy to leverage this opportunity responsibly.

BEN MCGRAW

TIBCO Spotfire

A company was having a difficult time accurately measuring the effectiveness of its multichannel relationship marketing programs. The challenge was evaluating the performance of sales reps in the field, analyzing how consumers were discussing healthcare issues in social media circles, and evaluating the effectiveness of nonpersonal promotions targeting physicians. Smart data analysis provided actionable insights that were previously unknown by spotting trends and outliers on how sales representatives were selling in the field and consumers and physicians were navigating websites and analyzing social media chatter. The ability to visualize the results of personal and nonpersonal tactics enabled the company to expand its reach and communicate more effectively with physicians and consumers than ever before.

GURPREET SINGH

PwC

Part of any big data strategy should include a pilot-and-prove approach as opposed to a build-it-and-they-will-come model. The latter model lacks the fluidity and flexibility of making changes along the way, whereas a pilot-and-prove approach is more a fast-fail approach. Test the hypotheses, validate the hypotheses, and integrate it into operations. As an example, a pharma company was examining a lot of different sources of data to determine its replenishment and sales and marketing deployment decisions. It collected weather data, pollen count data, point-of-sale data from pharmacies, and claims data. After mashing it together, signal analysis and visualization were conducted. The findings resulted in pinpointing locations with the highest demand, and the company was able to adjust supply chain needs to replenish more quickly in those areas. This is an example of a pilot-and-prove model that will move into the company's everyday operations.

MARK SMITH

AbelsonTaylor

One of the best examples I've seen is the use of the FICO adherence scoring algorithms and data analysis when new prescription activity is identified. This smart data analysis has provided the unique ability to identify an individual with a high risk of non-adherence to his or her prescribed therapy. In turn, this gives the healthcare professional, the pharmacy, and the pharmaceutical manufacturer an unparalleled chance to affect this negative adherence behavior before it occurs. Support programs and outreach communications can be created to provide these patients with the information and support they need to make better decisions and positively affect their lives by following their prescribed therapy. This process is currently being directed at chronic conditions such as diabetes and hypertension, where there is typically a long-term need to follow treatment protocols, and where there is also a significant patient reward for compliance.

> "There is a clear trend of data analysis moving out of the sole domain of IT."
>
> **MARK SMITH**
> AbelsonTaylor

> "IT needs to be a partner in the process to get full insight and promise of big data."
>
> **SAMER FORZLEY** / Pythian

> "A company can get a return on assets when it optimizes the core of common capabilities by leveraging repeatable patterns across different functions."
>
> **GURPREET SINGH** / PwC

tions, where marketing, for example, has bypassed IT when conducting big data projects, but that defeats the purpose of big data," Mr. Forzley says. "The whole promise of big data is to have all data together and have the capability to conduct an analysis on all of the data sets. If IT isn't involved in moving data from the existing environment and merging it with other unstructured data, the various functional areas will not be get a full insight into the information, which does not accomplish the objective of big data."

He says letting each organization perform its own analysis may result in incomplete findings.

"It is almost impossible to control results without involving IT," Mr. Forzley says. "IT needs to be a partner to gain the full insights and promise of big data. Furthermore, IT is familiar with data governance and can mitigate the chances of someone putting sensitive data on the cloud, which in the hands of the wrong provider may violate privacy regulations." PV

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