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2014 Guest Columns

WALL STREET JOURNAL

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Looking Beyond Big Data in 2015

By Randy Bean | Contributor | December 3, 2014

This is generally the time when we take stock of the past 12 months and look ahead to the year in front of us. In this context, I was having lunch with an esteemed colleague and pundit the other day when he asked me somewhat rhetorically, "So, what will we write about after Big Data has run its course?" Hmm, good question. While Big Data has yet to run its course, we should expect to discover fresh topics to write about and call attention to. So, looking back at the run that Big Data has experienced over the course of the past four plus years, here is a reflection and a forecast.

Big Data captured the moment. Love it or hate it, the term Big Data has resonated. It has been noted here that senior executives have expressed a widespread dislike for the term Big Data, believing it to be unhelpful, insufficiently specific, overblown, or generally devoid of substantive meaning. That being said, Big Data has been the right term for the right topic at the right time, which is why it has resonated both broadly and deeply.

Let's be clear that Big Data is not a magic bullet, a surefire path to success, or a breakthrough that all alone addresses a long challenging set of business issues. Big Data is however a "big idea" which has galvanized widespread interest and attention, resonating with a large non-specialist audience. It should be acknowledged as having moved "data" from obscurity to centrality and relevance. Largely because of Big Data, data as a subject area has been transformed from a field for specialists and technologists, to a topic of interest among the general population, from CEOs to casual observers. While Big Data may represent varying things to different audiences and constituencies (e.g. social media date, sensor data, unstructured data, massive volumes of data, all data), no previous term or characterization has more effectively captured the power, the opportunity, or the fascination that the emergence of data as a business science (e.g. data scientist) has attained in recent years.

Why is the topic of data of broad general interest now? Managing data is not new. Organizations have been capturing, organizing, analyzing, and reporting on data for decades. It would appear that Big Data has captured the imagination of technologists, executives, media, and the public as data has become more available, accessible, integral, and relevant to our professional, personal, and consumer lives. Data

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has become part of the cultural conversation, from Money Ball, to widely popularized data breaches, to the data capture activities of the NSA.

The impact of Big Data will emerge over time. Looking ahead, what should we expect? Most importantly, we should expect to be patient, realizing that the exact shape and form of the most compelling benefits of new capabilities tend to unfold over time. We cannot yet see or fully appreciate where Big Data will be most impactful. The practical benefits of the Internet have played out in ways sometimes more powerful, yet different, than many of the earliest forecasts. Customer Relationship Management (CRM) has enabled us to understand ("360 degree view") and serve our customers better in many regards (e.g. "get, keep, grow"), but not always as originally anticipated.

Many years ago, I asked the CIO of a leading financial institution how long he expected it would take for his company to adopt a series of new capabilities. I was surprised when he responded "10 years." To me, that seemed to be a lifetime in business. With the benefit of experience and hindsight, I can now appreciate the wisdom of his comment. Adoption implies change, and change rarely happens overnight. Many companies are staffed with organizations filled with data experts, but Big Data implies new skills and approaches. Universities are now graduating a next generation of technologists and business executives who will have been born of the Big Data time. Only as new skills, approaches, and expertise supersede and meld with traditional approaches will the practical impact of Big Data be felt in full.

To my colleague's question over lunch, I am not sure what we will be writing about in 2015. As Big Data enters its adoption phase and the focus moves from concept to execution and implementation, we will find new topics and challenges that warrant our interest and attention. The poet Carl Sandburg, once noted, "I don't know where I am going, but I am on my way." Stay tuned in 2015.

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Companies Bet Big on Big Data, Despite Doubts

By Randy Bean | Contributor | November 4, 2014

Big companies are betting big on Big Data. That is the main takeaway from NewVantage Partners 3rd annual Big Data Executive Survey, conducted last month. The survey was launched in 2012 at the request of C-suite executives participating in an executive roundtable breakfast I host in my capacity as managing partner for NewVantage Partners.

Understand that this is not a Nate Silver operation here. My methodology is informal, but dogged. I was asked to undertake the survey in the belief that I could tap into senior business and technology executives to get the "top view" of what senior leaders were planning to do with Big Data. My methodology is high-touch. I personally reach out to each executive, and through a combination of enticement, cajoling, persistence, begging, and pleading, manage to elicit ample participation.

This year, I contacted over 300 executives, heavily skewed to financial services and life science firms, mostly for the reason that these firms either traditionally invested heavily in data and analytics (financial services) or were just beginning to (life sciences). One hundred twenty five executives participated, representing 59 leading firms, including major banks (Bank of America, CitiGroup, JP Morgan Chase, Morgan Stanley, UBS, Wells Fargo), money management firms (Capital Group/American Funds, Charles Schwab, Fidelity Investments), credit card issuers (American Express , Capital One, MasterCard), insurance firms (Aetna , MetLife, New York Life Insurance), health and life science leaders (CVS Pharmacy, GlaxoSmithKline, Johnson & Johnson, Kaiser Permanente, Pfizer), and media, manufacturing, retail, and defense firms (Gannett , General Electric, Raytheon). Forty-two percent of the executives held positions with C-executive responsibilities or were business line presidents/chiefs. Twelve percent were CIO's, 12% chief data officers, and 8% CTO's.

So, what did these executives have to say about the progress of Big Data in the corporate world?

Big Data Investment is Growing. Thirty-five percent of executives report their firms will invest $10 million in Big Data initiatives in 2014, yet a much larger 75% forecast that their firms will invest this much by 2017. While a modest 6% of executives report investments of $50 million in 2014, a dramatically larger 28% project investments of this magnitude by 2017.

Executive Sponsorship is Critical. Executives report that sponsorship for Big Data initiatives starts at the top — 26% of initiatives were sponsored by the CEO, COO, or business line chief, 16% by the CIO, 13% by the CFO or chief risk officer, 11% by the chief data officer, and 8% by the chief marketing officer.

Business-IT Partnership is Essential. 88% of executives cited the importance of strong business-IT partnership — 77% citing business leadership and sponsorship, and partnership and organizational alignment, as being the most critical factors in ensuring successful adoption of Big Data initiatives within the corporation.

No Silver Bullets. Although 82% of executives characterized Big Data as highly important or mission-critical to their firms in the years ahead, I detected a note of caution. In speaking with a number of these executives privately, many expressed anxiety and uncertainty about the path forward.

Nearly all executives now view data and analytics as being necessary to the competitive development of their business, but executives remain divided on the path to take. Many firms are consolidating their data initiatives under the newly established chief data officer (CDO) role, with 43% of executives reporting that their organization has established a CDO function — up from 19% in 2012.

Yet, many executives express concern about the extent to which Big Data will deliver on the hope and promise that has prompted interest and investment. While organizations are putting Big Data into production (67% of executives reported a Big Data initiative in production), a number of executives have noted that the value metrics are still not fully evident. These executives note cultural challenges and gaps between technology promise and technology delivery, and question how significant the resulting time savings and cost savings from Big Data will really be. For these folks, the jury is still out.

Big Data will be a journey for corporations in the years ahead. What is clear is that big companies are making the commitment, and are down the path. Now, they will look for hard results. The legendary Satchel Paige said it best: "Don't look back; something might be gaining on you."

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How Business Culture Defines Data Success

By Randy Bean | Contributor | October 7, 2014

Few business executives would dispute the notion that having good data is a key competitive advantage and a critical component to business success. Yet, these same executives likely can recount funding requests for data initiatives that were long on promise and short on results. I have heard more than a few executives exclaim over the years, "Oh no! Not another data project!"

When I began advising Fortune 1000 companies on data and information strategy issues over a decade ago, I was operating under the assumption that 95% of my time would be spent on issues pertaining to technology. It didn't take long, however, to realize how mistaken I was. My experience in the intervening years has been that technology is a very small component of the equation when all is said and done. Rather, I have found that 95% of the decisions that are essential to business adoption, and the success of corporate data initiatives, are related to organizational alignment and business process.

This is another way of saying that the leading barriers to successful data adoption are almost always cultural and not technological. Technologically speaking, there are many ways to skin a cat. My experience on the technology front is that it is more important that an organization select the right technology *partner* than it is that they select the right technology *solution*.   Partnerships are for the long haul, while solutions come and go, and change and evolve.

The biggest issues that I hear time and again revolve around factors including sponsorship and ownership of data-driven initiatives, alignment of business and technology functions so that technology capabilities are effectively mapped to business objectives, and the establishment of standard processes and practices that enable firms to develop a discipline around the use and management of data.

A few years back, I was hosting a group of corporate CIO's for an executive thought-leadership breakfast roundtable. The discussion was centered on how effective organizations were in leveraging their data assets to support their key corporate objectives. A number of executives cited the recent usage of the term "Big Data" and noted that, for the first time, board members were asking the executive team, "What is our data strategy?" and "What will Big Data mean to our company?"

In an effort to help executive teams respond to these questions, and shed some light on the current state of data initiatives within the Fortune 1000, we embarked on an informal survey designed to take the pulse of top business and technology executives to understand the state of data in the large corporate world. The survey was more anecdotal than scientific, and was skewed toward heavy users of data, notably large financial services firms.

First published in the Fall of 2012, this executive survey of senior business and technology leaders is now in its third iteration, and here are a few of the preliminary findings of the 2014 survey, to be published next month, as they relate to the subject of business adoption:

- 65% of the 100+ executive respondents characterized themselves as a C-executive, or as chief of the data or analytics function for their company.

- Nearly 30% of the executives identified the CEO, COO, or CFO as the primary executive sponsor and primary executive owner for their data and Big Data initiatives.

- Nearly 87% of executives cited organizational issues as the most critical factor in successful adoption and data success – executive sponsorship, executive/business leadership, business and technology partnership, organizational alignment.

- Notably, only 4% cited choosing and implementing the right technologies as being the key to business adoption.

What is the takeaway from these preliminary findings? Organizations will continue to be flooded with a series of technology options in the years ahead. Many of these technology options will require deep and specialized expertise to evaluate their merits and their fit with the organizations environments and needs. Some of these technology solutions will provide meaningful breakthroughs in the ways in which they help companies ingest, parse, organize, report, and analyze the data at their disposal.

However, when the day is done, the ability of corporations to take full advantage of the technology options available to them will depend more on the corporate culture that has been forged to enable the usage of data and analytics, and the partnership and alignment of business and technology teams, than on any specific tool or technology. To paraphrase Einstein, getting the human things done right is always what is most important.

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The Legacy of Big Data

By Randy Bean | Contributor | September 9, 2014

A few years ago, I was invited to attend a one-day Big Data Conference held at Stanford University under the sponsorship of Accel Partners. This event represented a milestone in the history of Big Data. Accel Partners had emerged as the hottest venture firm in Silicon Valley on the heels of their successful investment in Facebook Inc. The event heralded a who's who of the tech elite. Among the notable speakers extolling the "revolutionary" potential of Big Data were Andy Bechtolsheim, co-founder of Sun Microsystems, and Doug Cutting, originator of Hadoop and chief architect at Cloudera, the latest red-hot Accel investment.

During the course of a picture-perfect May morning and afternoon in Palo Alto, one speaker after another set forth bold claims for Big Data. "Big Data was the next wave in technology innovation." "Big Data would change how the world made use of information." "Big Data would enable insights that would change society." It sounded like 1995 and the rise of the World Wide Web all over again. But one proposition caught my attention. Each speaker spoke about the technological underpinning that made Big Data truly compelling, which was the notion that you could just take your data and "load and go." The radical implication of the "load and go" notion was that data users would no longer have to go through the long and arduous processes of data engineering that had long thwarted the ambitions of data analysts.

Anyone who has ever worked in the corporate world knows the painful refrain to how long it takes to answer a new business question which requires adding a new data source: "Fifteen months and five million dollars." Senior business executives were resigned to a state of affairs where getting value out of data quickly was not something that they could expect to see in their business lifetimes. Then, out of the blue, a cadre of engineers, data experts, and venture investors were heralding a new day which promised freedom from the tyranny of the data gate-keepers. It was the data world's equivalent of the fall of the Berlin Wall. The oft-maligned edifice known as the Data Warehouse was under assault.

With the benefit of hindsight, and a few years' experience under our collective belts, we are seeing that Big Data is in some ways more than was hoped for. Long saddled with disparate sources of legacy data, corporations are for the first time able to successfully integrate these sources as a result of the cost and

speed advantages resulting from Big Data technologies. Corporations also are able to integrate new sources of information, such as unstructured data sources including documents, text, and pictures, and behavioral data that is captured through social media channels. The result is a growing sophistication in the data and analytics capabilities of mainstream companies.

Jonathan Bennett is chief financial officer for commercial markets with The Hartford, a $26 billion insurance and investment firm founded in 1810. With a long history of actuarial analysis, data has always mattered. Mr. Bennett possesses a clear-eyed view of both the opportunity and the challenge represented by Big Data, cautioning, that keeping a focus on cost and the benefits of better managing data "is just as important as breaking into new Big Data opportunities. If we can figure it out, cost reductions from the former will help fund expansion in the latter."

Big Data is not making the Data Warehouse obsolete overnight. The apostles of the Data Warehouse have fought back and demonstrated that it is not always as simple as "load and go." Although some data engineering has been eliminated or reduced, and Big Data approaches are reducing the costs of data management, data still needs to be standardized, data quality maintained, and access provided to constituent communities. Data management will continue to be an evolutionary process.

Today, it is hard to imagine life before the Internet. I suspect that we will look back a decade from now and view Big Data the same way. In the future, "the availability and analysis of data will become the competitive lifeblood for businesses," says Richard Mucci, president of Group Protection at Lincoln Financial. "The promise of Big Data is that when the winners and losers are sorted out, businesses find themselves on the right side of the ledger. Data-driven business models are not just nice to have, they are essential."

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Politics and Dirty Data

By Randy Bean | Contributor | August 12, 2014

A highly esteemed long-time colleague of mine tells the story of his coming out of MIT after completing a PhD program in computer science in the early 1990's. Dr. Luminary, as I'll refer to him, had worked in the MIT labs on parallel processing techniques for managing massively large amounts of data. This was Big Data in the laboratory stage 25 years ago. Dr. Luminary's first job was as a senior software engineer with Thinking Machines, the early pioneer in massively parallel processing systems. The company was so hot that Al Gore conducted a much publicized visit in 1987 – this may have been the genesis of his claim to having invented the Internet. At the very least, we should credit Mr. Gore for being onto the information super highway early on.

Dr. Luminary was very excited to use revolutionary new technology to help large Fortune 1000 companies extract key business insights from massive volumes of information. But it became clear that the large corporate world follows its own rules. The real obstacle to breakthrough innovation and success was due not so much to a lack of powerful new technology, but to "politics and dirty data." As he puts it, "We spent six months trying to reach agreement on a definition of what is a customer." As a former database marketer, my experience is that's more typical than unusual.

This apocryphal story highlights some well-documented challenges when it comes to making meaningful use of data and analytics. The first challenge is often organizational ("politics"). Data typically is a shared asset that cuts across the organization from production to consumption, with many touch points and derivations along the way. Many organizations have been actively engaged in tracing the lineage of their data and establishing data governance processes and standards so that there are some "rules of the road" that guide how organizations manage data. These rules include who "owns" the data; who has ultimate responsibility; and what is the process by which decisions governing data definition and usage are made. However well-intentioned all parties may be, reaching consensus on issues surrounding data is frequently a thorny process.

The second challenge is often referred to as data's "dirty little secret." This specifically pertains to the tremendous time and effort required to transform data ("dirty data") into a usable asset that has meaningful business value. Whole companies and an entire industry have been built to respond to this

need. It is the ongoing lament of many a data analyst who complains that they spend "20% of our time on data analysis, but 80% of our time on accessing and preparing the data." And, herein lies the big attraction and promise of Big Data for many a corporation – the ability to bypass the hundreds of hours of up-front data engineering to access the data much sooner and more easily, for purposes of analysis and putting this information to good use. This is the state of affairs today, as firms make the transition from traditional data environments to accelerated Big Data "lakes" and "hubs."

Lynda Applegate is the long-tenured Sarofim-Rock Professor of Business Administration at Harvard Business School, where for over 25 years, she has been teaching executives about innovation and entrepreneurship. Prof. Applegate has seen firsthand how critical and central data has become to the modern corporation, as well as to the innovative new startup. "The emergence of data and analytics in general management practices over the past decades has significantly influenced how businesses operate. Innovative firms have developed deep and rich data and analytical capabilities to distinguish themselves from their competitors," Prof. Applegate notes.

There is no question that access to insightful and timely data is enabling businesses, government agencies, medical researchers, and professional sports teams to spot opportunities and to act with greater agility. The biggest challenges are still human. To paraphrase the 911 Commission, "We had all of the data. We just didn't share it effectively and put the picture together".

Alas, Thinking Machines was ahead of its time, and filed for bankruptcy in 1994. Its assets were later acquired by Sun Microsystems. Al Gore ascended to the vice presidency of the United States in 1992, but fell short in his bid for the Presidency in 2000. He is now a venture capitalist. And Dr. Luminary still counsels organizations on how to navigate organizational politics and dirty data. Sometimes, progress comes gradually.

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The Culture of Data

By Randy Bean | Contributor | July 22, 2014

We live in a time when data is ascendant. It wasn't always this way though. Before there was a Google Inc., before terms like Big Data came into vogue, and before jobs like data scientist and chief data officer became sought after positions, data and analytics were considered to be something of a niche relegated to back office practitioners in market research, statistical analysis, and actuarial groups. The processing of electronically maintained data was referred to by the quaint moniker of electronic data processing.

For the better part of a generation, even as data progressively became more prevalent, and as firms wrestled with how to wring insight and benefit out of the accumulating hordes of new data that was being captured and maintained electronically, data and analytics remained largely a backwater for all but a few leading edge innovators. The technology community progressed through an evolution of terms used to describe fresh capabilities that would enable business executives to derive insight and value from their data assets – decision support systems, executive information systems, and ultimately, database marketing which evolved into customer relationship management and business intelligence.

There was a time when I would go to cocktail parties, and could not comfortably confess to working with data and analytics without driving other revelers to the far corners of the room. I often diverted the subject to discussion of travel, food, sports, the world financial markets, art or anything else that had more general appeal. That all changed with the release of the book and subsequent movie, Money Ball, starring Brad Pitt. When asked what line of work I was in, I could now proclaim, "I do Money Ball for Business!" It was around this juncture that I detected that data and analytics had now become fashionable.

The predominant applications of data and analytics have varied by industry over the years. In the early days of database marketing, I was engaged with clients who were attempting to enhance their cross-sell ratios, and increase the marketing propensity of the next-product-to-buy. My wife, working in the health-care field, was using data to analyze weekly morbidity and mortality rates. That put things into greater perspective for me.

A few years ago, I had the opportunity to visit the Pentagon. I had been thumbing through my university alumni magazine when I noted that a former college housemate of mine had recently been confirmed as the Assistant Secretary of Defense and Chief Technology Officer for Research and Development. When I contacted my old roomie, to my surprise I received an invitation to travel to the Pentagon to speak to an august assemblage on the topic of Big Data. Coming from private industry, and observing the dozen or so meeting participants attired in an assortment of full business suits, military uniforms with many stars and bars, and combat fatigues, I simply had no idea who in the room was the decision makers.

The fascination of this meeting for me was that I gained a greater appreciation for new facets of data and analytics as these military leaders discussed the criticality of capturing and analyzing sensor and others form of GPS data and military intelligence (e.g. chatter) to calibrate military actions and strikes in the field. Talk about getting your data quality and analysis correct. About a year later, I went to see the film Zero Dark Thirty about the Bin Laden raid. The film depicted the advanced levels of sophisticated data analysis required to track the Al Qaeda leader to his hideout in Pakistan.

We operate in a culture today where data and analytic practices have been acclimated into the mainstream. Whether this proliferation of data and analytics capabilities will yield sharper insight, engender greater social benefit, or enhance human wisdom, remains to be seen. Before we get too enthralled with the expectation that data and analytics will solve all of our problems and challenges, perhaps it's worth recalling the humble observation of the late Albert Einstein: "It's not that I'm so smart, it's just that I stay with problems longer."

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A Tale of Two Banks: Gold Rush to Digital Revolution

By Randy Bean | Contributor | July 7, 2014

Bank of America Corp. and Wells Fargo & Co., two banking giants with roots on the West Coast, both recognize data and analytics as core to their expansion and growth and central to their plans and vision.

Bank of America traces its roots to 1904, when Amadeo Giannini created the Bank of Italy in San Francisco to cater to immigrants. Wells Fargo was founded a half century earlier, also in San Francisco, when the demands of a budding gold rush port called for express and banking services between the New York financial markets and the new state of California.

During the banking consolidations of the past two decades, each bank was a leader in the use of sophisticated data warehousing and database marketing capabilities to facilitate rapid acquisitions and consolidation -- Wells Fargo with Norwest and Wachovia; Bank of America with NationsBank -- as they established national banking services.

Having long been sophisticated practitioners of data warehousing and advanced consumer analytics techniques, I was interested in understanding how each firm viewed the evolution of data and analytics, and the arrival of Big Data, in shaping their future strategies.

Cathy Bessant is the global technology and operations executive for Bank of America, and sits on the banks executive management committee. "Data is one of our most valued assets at Bank of America," she said. For Bank of America, The goal is to develop "great data," which is "timely, accurate, and complete" and "accessible to all who need to use it."

A. Charles Thomas is Wells Fargo's recently appointed executive vice president of enterprise data and analytics and the firm's chief data officer. Mr. Thomas notes, "Transformational change will come not just from collecting data, but from putting it to use in ways that create real value."

Bank of America's Ms. Bessant echoes this sentiment, "I draw a bright line between what is interesting and what is impactful." She cautions against "an overly theoretical focus." To illustrate her point, Ms. Bessant cites the recent success of Bank of America's new ATM program which can perform 80% of teller transactions and provide the ability for customers to speak to a bank employee live via video chat.

"We analyzed data to determine how our customers want to use ATMs and whether proposed features would decrease or increase customer satisfaction," she said.

Wells Fargo's Mr. Thomas points to several initiatives that his firm is undertaking: "The first opportunity is – believe it or not – small data." Mr. Thomas cites the example of credit risk where "we use analytics to monitor our concentration risk to ensure that no single exposure will have adverse effects on our business or our customers' business."

Mr. Thomas notes that "while there is a lot of conversation about 'Big Data,' we need to have the discipline to not drop the ball on the 80% of our analytics that don't need petabytes of data." Ms. Bessant agrees, saying "I'd vote we all stop using the term 'Big Data.' It makes a black box out of something that may not be easy to execute, but is conceptually simple".

Mr. Thomas anticipates a bright and evolving future for data and analytics in banking, citing the example of the Analytics Leadership Council that Wells Fargo has established to "uncover the next innovative product or service. We're now able to answer questions we didn't even think to ask 10 years ago" and then combine transaction data with new data types like voice, email and online. Mr. Thomas looks ahead to a time when "in the next few years, you'll see us evolve in ways that customers are accustomed to seeing from retailers like Netflix and Amazon".

Ms. Bessant sees a future where data and analytics "enable us to improve the experience for our customers and align our products and services to their preferences and behaviors."

Bank of America and Wells Fargo: two American banking institutions that have evolved far from their roots and for whom data and analytics will be core to the future. "What the assembly line was to the industrial revolution, data will be to the digital revolution," Mr. Thomas said. Well, it's a long way from the Gold Rush.

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Health Care Plays Catch-Up with Big Data

By Randy Bean | Contributor | June 17, 2014

My wife has spent her entire career in health-care management and when she talks about it, my brain tends to go numb. When I speak about Big Data and analytics, my wife tells her colleagues that she thinks I am in the CIA. I think she means NSA.

When it comes to data and health care, what I've never understood is why I must repeat my medical history every time I see a medical professional. Don't they keep this stuff on file? So, it surprises me when I am told by many very smart people that health care and life sciences are the next frontier for Big Data. While financial service firms have been collecting, organizing, analyzing, and acting on data for decades now, health-care firms are trying to leap from the Stone Age to the Information Age in real time.

To understand the Big Data opportunity, as well as the challenges, confronting the health-care system, I sought out two executives who have spent long careers in the financial services industry before coming to health care. I also spoke with a senior clinician and professor at Harvard Medical School, to elicit the perspective of a practicing physician.

Phil Fasano, executive vice president and chief information officer for Kaiser-Permanente, was previously chief business information officer at CapitalOne and CIO at JP Morgan Chase, so he knows a bit about data and information in financial services. "In health care, we have an enormous amount and variety of data—ranging from how long it takes a nurse to complete rounding and infection rates in a given area to genomic data."

Health care is still trying to get a handle of all this data and, in many ways, the business is a "discovery" business, said Mr. Fasano, which lends itself to the use of data for discovery that lies at the heart of the promise of Big Data. "We believe that the greatest value comes from leveraging Big Data to identify clinical protocols that improve patient access to information, clinical outcomes, and health care affordability," he said. "The future of Big Data lies in its ability to support the safest, highest quality, most individualized care without constraint of borders and boundaries."

But there are challenges; health care, if you haven't already guessed, is a highly regulated industry with "significant sensitivities about security and privacy of information," said Mr. Fasano, who is also co-author of the recent book, Transforming Health Care: The Financial Impact of Technology, Electronic Tools and Data Mining.

Another challenge is learning how to develop insights from "often incomplete data sets," said Blue Cross Blue Shield of Rhode Island COO **Bill Wray**. Mr. Wray notes that influencing the behaviors of providers and patients "requires that we focus on outcomes, working with 'pretty good' 80/20 information, versus seeking multiple 9s precision before we act. Getting people aligned to think this way is the critical first step that precedes any technological decisions."

"Health care has been late to the game," but it is catching up fast, says **Dr. Daniel Talmor**, professor of anesthesia at Harvard Medical School and interim chairman of the Department of Anesthesia, Critical Care, and Pain Medicine at Beth Israel Deaconess Medical Center in Boston.

Dr. Talmor cites the example of the intensive care unit, where understanding the risks facing patients means using data to establish risk profiles for individual patients and entire hospital units. He notes, "We capture thousands of data points on the ICU patient, from blood pressure to oxygen levels, labs results, and ventilation parameters. We have the ability to capture all of these data points every 15 seconds, then store and analyze these in a real-time clinical context. This enables us to understand the at-risk population and to treat the patient proactively, preventing complications with a resulting benefit to both the individual patient and to the health care system as a whole".

Big Data and analytics initiatives are beginning to change the face and practices of patient care. Mr. Fasano sums up the benefit nicely, "Big Data allows us to study larger populations at a lower cost and more nimbly than ever. The ability to analyze data more rapidly allows us to implement treatment changes quickly, improving—and in some cases saving—lives."

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Big Data and the Visionary Power of Change

By Randy Bean | Contributor | May 20, 2014

Percy Bysshe Shelley, the 19th century English romantic poet, is best known for his poem Ozymandius: "And on the pedestal these words appear: My name is Ozymandias, King of Kings: Look on my works, ye Mighty, and despair! Nothing beside remains…The lone and level sands stretch far away." Mr. Shelley's sonnet is a metaphor for change, and the impermanence of all things.

Change is a constant dynamic in the world of business. Periodically, change comes along that manages to do to existing business structures what centuries in the desert did to that "shattered visage" of Ozymandius. Is it too bold and hyperbolic to suggest that Big Data represents one of these transformational changes?

For the past decade, I have been organizing a series of thought-leadership roundtable discussions that bring together senior industry executives, academics, and authors to exchange perspectives on topics of common interest. I reached out to several of these thought-leaders to get their perspective on Big Data as a transformational change.

Tom Davenport in his new book <u>Big Data @ Work: Dispelling the Myths, Uncovering the Opportunities</u>, makes the point, "Big Data is such a broad business resource that it is sometimes difficult to envision all the ways that it can affect an organization and an industry." Let's consider just a few possibilities.

Geoffrey Moore, author of the landmark book <u>Crossing the Chasm</u>. Mr. Moore sees Big Data as altering the landscape of how firms approach the use of data and analytics: "It is a mindset issue…People raised on traditional analytics impose a schema on how they collect and store data. The new crowd throws it into a Hadoop store and imposes a schema upon reading. It is much less computer efficient, of course, which is why it was not an alternative until recently. But given 'Deep Blue' resources, eventually you too can be Gary Kasparov."

Wayne Eckerson, author of <u>Secrets of Analytical Leaders</u>. Mr. Eckerson says that Big Data is disrupting the traditional paradigm of data management within the enterprise: "Big Data is changing the landscape for data management. The traditional data warehouse was about getting the data. Business Intelligence

was about using the data. Big Data now offers an opportunity to leverage the power of data to drive the business in new ways."

Jeff Bussgang, venture investor and general partner with Flybridge Capital Partners. "What would you do differently if you had 1000x more information available to you? Managers around the world are thinking hard about this question, whether they want to or not, because the theory is becoming a reality. The "big idea" that is beginning to develop out of Startup Land is to use machine learning techniques to help parse through the data, apply business rules and make better – and higher ROI – decisions."

Mr. Bussgang sites an example from the world of advertising where "major brands are using software platforms like DataXu and Turn to analyze millions of data points in order to put the exact right advertisement in front of the exact right customer at the exact right time – all without human intervention." He sees a future where "we will wonder how it was that media plans were developed by humans. In industry after industry, this combination of Big Data and Machine Learning is proving to be a powerful, transformative force."

Sandy Pentland, professor at MIT's Media Lab. Mr. Pentland has studied and spoken widely on Big Data in the public and private sectors: "Data about human behavior, such as census data, have always been essential for both government and industry to function. In recent years, however, we have developed a `social physics' that allows us to analyze the `digital breadcrumbs' that we all leave behind us as we move through the world (e.g., call records, credit card transactions, and GPS location fixes."

Mr. Pentland goes on to note: "Scientists are discovering that we can begin to explain many things—financial crashes, revolutions, panics—that previously appeared to be random events. Insights obtained by using social physics to analyze digital breadcrumbs has the potential to revolutionize many fields."

Business leaders, academics, and pundits will continue to debate the capacity of Big Data to change our view of the future and what is possible. Hyperbole or not, Big Data is opening up new visions of opportunity. To paraphrase the poet Shelley, nothing is permanent. Change is a constant dynamic.

Today, Big Data is sweeping away established practices, existing paradigms and structures, long standing edifices and ways of doing business, and replacing them with something new and different. Change is the constant. What is new today will be surpassed by what is new tomorrow. "The lone and level sands stretch far away."

And, whatever became of the visionary apostle of change, Percy Bysshe Shelley? He drowned in a shipwreck off the coast of Italy in 1822, one month shy of his 30th birthday.

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Chief Data Officers Blaze Uncharted Corporate Frontier

By Randy Bean | Contributor | April 21, 2014

John Fremont is largely forgotten today, but in the history of the 19th century American West, Mr. Fremont was known as "The Pathfinder" for his westward expeditions and his role in establishing California as a state.

Today, emerging from the frontiers of Big Data and advanced analytics and the rapidly accelerating proliferation of data, comes a 21st century pathfinder: the chief data officer.

This past month, I had the occasion to moderate a panel of financial services CDOs at the Annual MIT Chief Data Officer Forum. The event, now in its fourth year, has grown from a handful of CDO's to a group of nearly 100 executives representing a "who's who" of the Fortune 1000.

Professor Yang Lee, of Northeastern University's D'Amore-McKim School of Business and co-director for MIT's Chief Data Officer Research Program, helps organize the program, and has conducted extensive research on the emerging CDO role. She notes: "The roles of CDOs are diverse and evolving. Yet, a noteworthy commonality is that these roles are well aligned with strategic business directions. Traditionally, data practices were led by middle managers, lacking executive collaboration. The emerging CDO practices are executive-led, accountable, and sustainable."

This perspective is corroborated by my discussions with a number of CDOs, all of whom have assumed their roles in recent years. Derek Strauss, chief data officer for TD Ameritrade, says that he has "peer relationships with the CIO, CTO and the Head of Application Development, as well as various business functions and operating units." This centrality helps him implement "an enterprise data and analytics program that cuts across the entire business and IT ecosystem." This speaks volumes about the centrality that corporations now place on data and data strategy.

Venkat Varadachary, chief data officer at American Express Co., echoes this observation: "The CDO at American Express provides leadership and governance across the organization to continually nurture, enhance and fully leverage our data assets in order to drive value for our customers. This role reports to the chief risk officer and also has accountability to a broader set of senior leaders in the company."

Terms used by CDOs to characterize their role include "ambassador", "reporter", "experimenter", and "coordinator." The complexity of the CDO role is underscored by the recognition that data is an enterprise asset that crosses all lines-of-business and corporate functions.

"I sometimes say that CDO stands for chief diplomacy officer," said Jennifer Ippoliti, chief data officer for Raymond James Financial. "The CDO functions as a conduit among business, technology, and operations to ensure that the solutions we build are aligned with business strategies."

The evolution and flux of the CDO role is reflected in preliminary data assembled from my interviews with a couple dozen CDOs and data gathered by Professor Lee in her research:

- 65% of CDO positions have been established within only the past 3 years
- 64% of CDO's report to a business executive – CEO, COO, CRO, or CMO
- 36% of CDO's report to a technology executive – CIO or CTO.

A common thread, regardless of structure, is that firms expect the CDO role to have a vision of the power of data within the enterprise.

David Gleason, Head of Data Strategy for Bank of New York Mellon observes: "We have an opportunity to leverage advances in data management technology to transform the business. We must continually educate the business leadership on the potential of data to transform and disrupt the business, and train the IT organization to embrace the disruptive powers of new technology -- which are often contrary to mandates to minimize operational risk."

Ultimately, for each CDO, the impact of their role will be measured by their effectiveness in transforming the organization through the use of data.

"Democratization of Big Data involves ensuring transparency and access to data, but also a cultural transformation for our people to embed data in their daily thinking," said Mr. Varadachary. "We seek to continue to evolve our culture where data and information are foundational.**"**

Ms. Ippoliti adds "By creating channels through which we can share information to offer optimum investment advice, we empower our financial advisors, which in turn improves the end customer experience."

Charting an uncharted corporate frontier, chief data officers are 21st century "pathfinders" forging the information and enterprise data frontier. Westward ho!

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Marketing Leaders Use Big Data to Enhance the Customer Experience

By Randy Bean | Contributor | March 24, 2014

Mainstream corporations are leveraging their Big Data and analytics capabilities to more effectively connect with customers and respond to their needs.

Businesses are aided in this quest by the growing availability of what MIT Professor Sandy Pentland calls 'digital breadcrumbs,' or customer-generated data from call records, credit card transactions, GPS location fixes.

For corporations focused on ways to enhance the customer experience, this ability to link behavioral, transaction, and customer interaction data provides vital insight into "always connected" consumers. "Data is the marketer's new best friend" comments Jive Software Chief Marketing Officer Elisa Steele. "Marketers must create a strategy centered on data and insights".

I had the opportunity this month to discuss the growing impact of Big Data in enhancing customer experience with **Jonathan Craig, executive vice president and chief marketing officer for Charles Schwab Corp**., the San Francisco-based brokerage and banking firm.

I posed a series of questions to Mr. Craig on the topic of how Big Data is changing the organizations internal and external processes, and how as the chief marketing officer, he anticipates collaborating with the CIO to enhance customer experience.

How is Big Data changing your *internal* processes for delivering customer value?

At Schwab, we've always used data analysis to continually get a better understanding of what our customers – and investors in general – want and need. Then we're able to use those insights to develop and evolve products and services that put the needs of investors first.

One of the biggest changes for us, though, is that in the past we would often start with a hypothesis and then look at the data to refute or validate. With big data, we are able to start in a more agnostic fashion and let the data drive us to the insights. This can lead to unexpected and powerful insights.

How is Big Data changing how you *externally* serve and deliver value to your customers?

We've always used data to provide timely, relevant and personalized communications to our customers. That can take the form of communicating to new clients to get them up and running with Schwab, or ensuring that existing clients are aware and engaged with the tools and services we offer, such as portfolio performance reporting.

We also use big data to keep clients on top of their investing strategy. For example, we alert clients when CDs and bonds are hitting maturity or when stock options are set to expire along with a summary of the actions they can consider taking.

But big data is also enabling firms to get a more holistic view of each client to serve them better. For instance, we have clients who work with Schwab both as individual investors and 401(k) plan participants through their employer. By seeing the 360-degree picture of how a client works with us, we're able to deliver the right content at the right time through the right channel – enhancing the customer experience and providing more value to our customers.

How do you anticipate collaborating with the CIO to deliver on the potential of Big Data?

For firms like Schwab, it used to be that the key imperative for collaboration was sales and marketing. To be sure that is still critical. That said, with the emergence of big data, the need for CIO/CMO integration is as strong or even stronger. At Schwab we acknowledge that and have prioritized strong partnership between technology and marketing. We meet regularly to share ideas, understand emerging investor needs and industry trends, and align on what we want to accomplish. We also look for marketers with technology acumen and technology team members who understand the power of marketing.

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Corporations like Charles Schwab, among others undertaking similar initiatives, are leveraging Big Data capabilities to formulate new ways for serving their customers, aligning their organizations, and enabling collaboration between the CIO and Chief Marketing functions to enhance customer experience. This provides further illustration of the tangible ways corporations are employing Big Data capabilities and approaches to deliver business value.

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Big Data Innovation: Fail Faster. Execute Smarter.

By Randy Bean | Contributor | February 18, 2014

I happened to be watching the Australian Open Men's Tennis Final last month when I noticed a long and intriguing tattoo on the forearm of the eventual champion, Stanislas Wawrinka of Switzerland. It read: "Ever tried. Ever failed. No matter. Try again. Fail again. Fail better." This quote, from the 20th century Irish novelist, poet, and avant-garde playwright, Samuel Beckett, offers an apt metaphor for the disruption and resulting innovation that Big Data is bringing to traditional data and analytics approaches.

NewVantage Partners 2013 Big Data survey of senior corporate executives reported that 64% of executives cited "new product development and innovation" as a leading driver of corporate investment in Big Data initiatives. By disrupting the established data and analytics practices of the past several decades, Big Data is transforming how corporations are organizing, engineering, managing and storing data. In so doing, Big Data is delivering innovation through greater data agility, rapid trial and error, and faster learning, resulting in accelerated speed to market, and in new forms of customer disintermediation and tailored customer experiences.

Deriving value from imperfect data. Paul Saffo, technology forecaster and managing director of San Francisco-based Discern Analytics, observes "failure is the foundation of innovation." In the world of data and analytics, corporations have been long bound by approaches that are costly and time-consuming, and which have hamstrung some of the more innovative ambitions of marketers and product developers.

While data must always be pristine and meet the highest standards of data integrity to support regulatory reporting and customer accounting, the standards for data discovery and research and development can be less rigorous. No customer wants to receive their 401K or credit card statement with incorrect information, but these same customers may welcome product recommendations and product offers based on indicative information. Not all data has to be perfect, and not all business functions require equal levels of data rigor.

At a recent roundtable of senior financial service executives that I hosted, several executives noted how Big Data is enabling organizations to rethink how they do business.

John Bottega has been one of the first executives to assume the emerging role of chief data officer, holding this position at CitiGroup Inc., The Federal Reserve Bank of New York, and Bank of America Corp. Mr. Bottega observes that the CDO role was "initially established to respond to regulatory demands, but this is changing. The CDO is now expected to spearhead 'offensive' data-driven initiatives to better understand customer behavior, develop innovative new products, improve wallet-share, and increase revenue."

Research and discover-based business functions like marketing and new product development generally have a greater tolerance for imperfect data, usually not requiring fully reconciled data. More important is currency of data, faster cycle times, the ability to operate on "cheap hunches" and the ability to access data faster without developing formalized requirements. For marketers, this can mean the ability to analyze vaster amounts of disparate data to divine new correlations and uncover new connections within customer sub-segments.

Big Data enables innovation by putting imperfect data into the hands of marketers, product developers, researchers, and strategic planners fast and easy, and enabling data scientists and business analysts to accelerate the speed at which they test-and-learn and iterate through new hypotheses.

As one executive put it, "unreconciled data meets 80% of our needs." Mr. Bottega observes: "Failure is informative. Even with imperfect data, business analysts can gain insight and knowledge with respect to the viability of an approach or hypothesis."

Learning faster means customer success. I noted in a [recent column for the CIO Journal](#) that Big Data is enabling a changing time and cost paradigm by enabling corporations to load the data they need when they need it, and in a cost-effective fashion. The emerging concept of the "data lake" means that companies can create pools of raw data and partially reconciled data that suffices for 80% of most analyses, particularly for discovery activities like marketing and product design. Organizations can more easily access the data they need when they need it, and deliver superior results to their customers because of this.

Here's Jim Smith, executive vice president for Wells Fargo, and head of the firm's Enterprise Data and Analytics and Digital Channels groups: "We're focused on not just Big Data, but using our data faster and more effectively. Our customers interact with us in many different channels and there has been tremendous data growth with the surge of online and mobile banking. Each of these interactions provides us with an opportunity to more accurately identify a customer's specific needs and interests. From there, we can evolve or improve how we provide a service or develop a new one."

Mr. Smith goes on to add that "we are looking at how customers interact with us across all touch points – digital, phone, ATM and inside the store. This activity allows us to see new patterns to help improve our service or help a customer find the right product or identify fraudulent behaviors. Big Data technologies will allow us to become more proactive on behalf of our customers."

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With worldwide data volumes projected to grow at a rate of 40% per year, marketing and sales leaders will need to process data faster and more simply, and undertake more rapid trial and error. As Mr. Saffo comments, "failure is essential because even the cleverest of innovations fail a few times before they ultimately succeed".

"Ever tried. Ever failed. No matter. Try again. Fail again. Fail better." An apt metaphor for Big Data innovation.

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Financial Services Firms See Results from Big Data Push

By Randy Bean | Contributor | January 27, 2014

Large financial service firms are starting to see concrete results from their Big Data initiatives. In an executive survey of c-executives from leading Wall Street firms conducted by NewVantage Partners in 2013, 96% of executives reported having a Big Data initiative planned or in progress, with 80% reporting having at least one initiative completed.

For the first time, Wall Street is seeing that Big Data could have an even greater impact on how they do business than initially imagined. Early adopters within the financial services world are seeing initial benefits that may exceed some of the more ambitious prophecies – though in ways not originally expected, and full enterprise adoption is likely to evolve over a decade and not overnight.

Faster time from analysis to decision means quicker time to market. The time which it takes to generate a critical business answer is moving from months or weeks to hours and minutes – many firms report a 100:1 time advantage – as a result of the incorporation of Big Data processes. In our survey, 87% of executives cited both accelerating time-to-answer (TTA) and the need for better analytics as the most common driver of Big Data investment for their firms.

Now, these Wall Street firms have results to report from initial proof of value pilot projects that have been launched in as condensed a period as 60-90 days, reducing the time it takes to move from analysis to decision:

- analyzing risk data in 3 hours versus 3 months
- pricing calculations performed in 20 minutes versus 48 hours
- behavioral analytics in 20 minutes versus 72 hours
- modeling automation from 150 models per year to 15,000 models per year.

Financial services leaders are seeing that they can load all of their raw data into Big Data environments, put this data into the hands of business analysts immediately, allowing business analysts to directly

identify that data which yields the greatest correlations and integrate the most compelling data into operational production environments quickly.

By putting data into the hands of business analysts faster, financial service early adopters are eliminating the need for many traditional IT data management roles, and enabling greater self-service for their business analyst communities. Business gets the data quicker. Business decides which data is important.   In the same way that the Internet has enabled customer self-service over the past decade and a half, Big Data enables business analyst self-service within the corporation.

Generating usable data at much lower cost structures. Financial service firms have traditionally spent vast sums on gathering, organizing, storing, analyzing, and reporting on data. In spite of these levels of investment, the state of corporate data is typically inadequate – slow to access, of questionable quality, inconsistent, restricted to expert users, expensive to manage and maintain. Ask most financial industry executives and they will tell you that to incorporate new data into a report, the standard response is that it will take "15 months and $5MM".

In our survey, 75% of executives cited the need for improved cost performance as the most important driver of Big Data investment. For these firms, the challenge is not one of managing large volumes of data. Rather, the challenge is integrating lots of sources of data.

Leveraging lower cost Big Data technology platforms, financial firms are seeing dramatic cost reductions:

- operational data store built for $300,000 in Hadoop versus $4,000,000 using relational database
- trading warehouse build for $200,000 in Hadoop versus $4,000,000 with a database appliance.

Big Data costs are lower because the technology of Big Data is radically less expensive (50:1 typically), the expert labor required to manage traditional data processes decreases, and the amount of critical data that must be maintained is ultimately much smaller. Wall Street is recognizing the benefits of migrating expensive data processes from high-cost computer mainframes to low-cost processing platforms.

Changing paradigm for financial service leaders.   Financial services firms are seeing meaningful results from their Big Data forays. By obtaining answers to critical business questions more rapidly and more cost-effectively, these firms are making faster business decisions, and accelerating their ability to get to market with new services quickly. The on-the-ground reality for leaders in financial services is that by transforming their end-to-end data management processes, they can lower costs, increase business value, and go-to-market faster with new customer-facing products and services.

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