Big Data Executive Survey 2013:

The State of Big Data in the Large Corporate World

Summary Report

With a Foreword by Thomas H. Davenport

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Foreword | Thomas H. Davenport

It's great to see another survey of Big Data usage among large organizations by NewVantage Partners. This sampling of Big Data is one of the few that focuses on large organizations and offers responses from C-level executives. I found that the results are consistent with my own research on "Big Data in Big Companies", but there are some surprises too.   Here are some reflections on both the expected and the unexpected.

Big Data is becoming a mature discipline. It's amazing that over 90% of the organizations surveyed are either doing something already with Big Data, and about a third of the respondents have a production application in place. This suggests to me that Big Data activities need to be melded in with other data management and analytics activities within these large organizations, and I suspect that is already happening.

Moving from TTA to TTD. I am pleased to read that the majority of respondents are pursuing Big Data initiatives in order to accelerate analytical processes and improve "time-to-answer," or TTA. Given the pace of business today, this is a smart move. The next steps will be translating TTA to time-to-decision and time-to-action.

Justification on faith. The results suggest that the great majority of Big Data projects are not being justified with rigorous ROI analyses. All the same, the wise manager will try to assess the benefits and save them in a file for later circulation. If there is a widespread belief that Big Data projects pay off, more will be funded later on.

The sandbox is being filled. It's good news that many companies are setting up Big Data sandboxes or data discovery environments. This should accelerate the development of Big Data and analytical applications. I am guessing that such sandboxes will be owned by IT, but arguably—at least in companies that are developing data-based products and services—it should be an R&D effort.

Early days for health care, but progress already. The survey suggests that health care is well behind financial services in the application of Big Data. This is not terribly surprising, as many health care organizations are still wrestling with basic transaction systems such as electronic medical records. I think it's encouraging that almost a quarter of the health care organizations surveyed have completed a Big Data project, with a majority projecting greater investment going forward.

The business/technology responsibility continuum. It was not surprising to me that survey respondents identified "executive sponsorship" as the factor most critical to business adoption of Big Data. Respondents also indicated that CIOs and CTOs, as well as Chief Data and Analytics officers, comprised half of the primary sponsorship, and that big data is primarily a technical responsibility than a business responsibility. However, Big Data projects deal with key operational and decision processes within organizations, we're going to need committed business-side sponsorship to be successful.

Where are the CMO sponsors? More than three quarters of the survey respondents (highest of any category) say that sales and marketing functions are driving the investment in Big Data, and an even higher percentage say that customer transaction data is a data domain of interest. Yet only 5% identify the Chief Marketing Officer as the primary executive sponsor.

These are fascinating findings. I don't know about the longevity of the "Big Data" term, but I am now convinced that the phenomenon itself is here to stay.

Thomas H. Davenport is the President's Professor at Babson College and was most recently Visiting Professor at Harvard Business School.   He is author of Competing on Analytics: The New Science of Winning, *cited by CIO Magazine as one of the "Top 15 Most Groundbreaking Management Books."*

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Introduction

NewVantage Partners Big Data executive survey was first conducted in 2012 at the encouragement of a group of Fortune 1000 senior business and technology executives who had participated in NewVantage Partners thought leadership roundtable discussions. These executives wanted to understand the state of Big Data initiatives among peer institutions in the large corporate world:

- Are Fortune 1000 corporations investing in Big Data initiatives? If so, what kind of Big Data initiatives are they investing in?

- What are the primary business benefits and where is the organizational value resulting from Big Data investments?

- Which factors are critical to successful business adoption of Big Data initiatives? Where is Big Data executive sponsorship coming from?

- What Big Data initiatives and solutions are organizations investing in during the coming year, and what is the forecast three years out?

The 2012 survey was the first Big Data survey targeted at Fortune 1000 senior business and technology executives responsible for overseeing enterprise Big Data initiatives – chief information and technology officers, chief analytics and risk officers, chief marketing officers, line-of-business heads, and function leaders.

The response to the 2012 survey exceeded expectations, resulting in several dozen corporate executive benchmark briefings for participating institutions, and extensive national press coverage from leading national and industry business press, including The Wall Street Journal, Harvard Business Review, MIT Sloan Management Review, and CIO Magazine, among notable publications.

Themes and Trends

The 2013 Big Data summary report identified a set of core themes and trends, which are highlighted in this report:

- Big Data is becoming a major reality in corporate America, as evidenced by significant investment.

- Big Data initiatives are being driven from the corporate suite and C-executive sponsorship is seen as key to successful business adoption.

- Big Data investments are being tied to critical business initiatives within large corporations.

- Organizations are still focusing on the "3 V's" of Big Data, but with a twist!
  Volume – How do we integrate larger volumes of data?
  Variety – How do we integrate more sources of data, including additional sources of structured data, and new sources of unstructured data?
  Analytical Velocity -- How do we accelerate the speed at which we can answer critical business questions and decrease Time-to-Answer (TTA)?

- Organizations are looking at new roles (e.g. Chief Data Officer) and processes to ensure the successful adoption of Big Data initiatives.

- Health Care and Life Science firms are in a nascent stage of investing in Big Data initiatives -- in sharp contrast to Financial Services firms.

The report summarizes the responses of the survey participants organized by these major themes and findings.

NewVantage Partners is once again pleased to have conducted this survey to learn from and to educate peer institutions in the large corporate world and beyond.

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Methodology

The 2013 executive survey posed a streamlined set of 23 questions designed to elicit and provide a useful benchmark for large corporations seeking to understand the state of Big Data initiatives among peer institutions.

The survey questions were organized around four principal themes:

I. **Investment in Big Data**
    a. Are you investing?
    b. How much are you investing – 2013, 2016?
    c. What initiatives are you investing in?

II. **Business Adoption and Sponsorship of Big Data**
    a. What are the keys to business adoption?
    b. Who is providing sponsorship?

III. **Business Value of Big Data**
    a. What are the primary benefits?
    b. Where is the business value?

IV. **Big Data Domains and Solutions**
    a. What data domains are of interest?
    b. Which solutions are you investing in?

This survey focused on industries that have traditionally been intensive users of data and analytics capabilities. Our 2012 survey was heavily represented by financial services firms. In addition to heavy financial services representation, our 2013 survey adds significant representation from emerging Big Data industries such as healthcare and the life sciences.

Close to 90 executives representing over 50 corporations or government agencies participated in the survey.

Definition of Big Data

To ensure a common definition was employed by all executive survey participants, the following definition was provided as a baseline description for Big Data:

Big Data is a term used to describe collections of data so large, complex, or requiring such rapid processing (sometimes called the volume/variety/velocity problem), that they become difficult or impossible to work with using standard database management or analytical solutions.

For the purpose of this survey, Big Data refers to new database management and analytical approaches developed for analyzing, storing, and manipulating large or complex data.

Investments in Big Data include those in human resources (e.g., data scientists), and in business and technology solutions, including database management platforms (e.g., Hadoop, EMC/Greenplum, Teradata/Aster, IBM/Netezza), analytics and visualization capabilities (e.g., Revolution R, Palintir, Tableau), or text-processing and real-time streaming solutions.

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Demographics

Survey participants included Chief Information Officers, Chief Analytics and Risk Officers, Chief Technology Officers, Chief Marketing Officers, Senior Line-of-Business Executives (EVP/SVP), Chief Architects, and Heads of Big Data and Analytics.

The breakdown of the 2013 survey respondents was as follows:

Figure 1
What is your role within the organization? (check one)
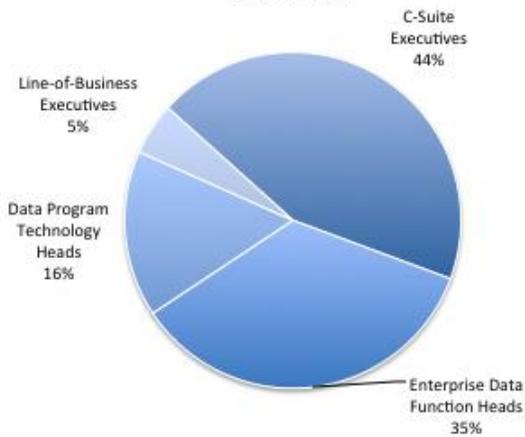
- **C-Suite Executives – 44%**
  CIO | CDO | CTO | CMO

- **Enterprise Data Function Heads – 35%**
  EVP | SVP | Head of Big Data | Head of Analytics | Head of Enterprise Information

- **Data Program Technology Heads – 16%**
  Chief Architect | Senior Technologist

- **Line-of-Business Executives – 5%**
  EVP | SVP | Enterprise Business Function Heads | Head of Innovation

The survey focused on organizations that traditionally make the largest investments in data initiatives, particularly financial services firms, as well as emerging new sectors such as healthcare and life sciences firms, which are making major new investments in data initiatives. Industry representation is summarized as follows:

Figure 2
In which industry would you characterize your organization? (check one)
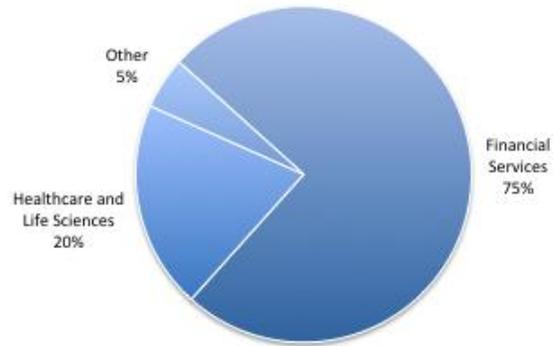
- **Financial Services – 75%**
- **Healthcare and Life Sciences – 20%**
- **Other Industries and Sectors – 5%**

The breakdown of executives representing business and technology functions was nearly evenly distributed:

Figure 3
What best describes where you sit within your organization? (check one)
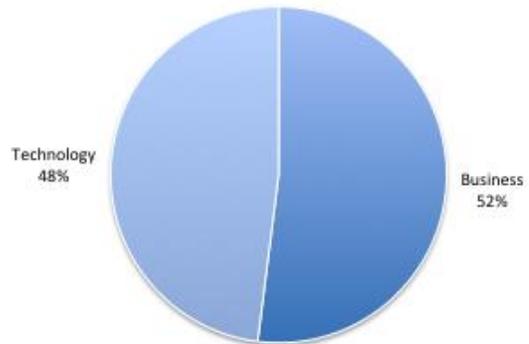
- **Business – 52%**
- **Technology – 48%**

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Participating Companies

Financial Services

AllState
American Express
Arbella Insurance
AXA | Equitable
Bank of America
Bank of New York Mellon
BB&T Bank
Blackrock
Capital Group
Charles Schwab
CitiGroup
Eaton Vance
Fidelity Investments
Freddie Mac
GE Capital
The Hartford
ING
JP Morgan
Liberty Mutual
MasterCard
MetLife
Morgan Stanley
Northwestern Mutual
Putnam Investments
RBS Citizens Financial
Regions Bank
State Street Bank
SunLife Financial
TD Ameritrade

Thomson Reuters
TIAA-CREF
Travelers
UBS
Wellington Financial
Wells Fargo

Health Care | Life Sciences

Aetna
AstraZeneca
Blue Cross of Rhode Island
Boston Children's Hospital
CRICO
Diagnostic Imaging Centers
CVS | Caremark
Harvard Pilgrim Health Plan
Healthways
Johnson & Johnson
Kaiser Permanente
Partners HealthCare
Sensitech

Other Industries and Sectors

EMC
SAP
Time-Warner
United States Navy
Veterans Administration

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Executive Summary

Big Data has achieved rapid adoption in the large corporate world. This is the principal finding of NewVantage Partners 2013 Big Data Executive Survey, conducted during July 2013.

The 2013 survey highlights that a robust 91% of executives responded that their organization has a Big Data initiative planned or in progress. Of these, 60% of executives report that at least one Big Data initiative has been <u>implemented</u>, with 32% of executives reporting that Big Data initiatives are fully operational, in production or have been operationalized across the corporation.   Clearly, Big Data is becoming a major reality within corporations.

"91% of executives report a Big Data initiative planned or in progress; 60% report an initiative has been implemented"

This report summarizes the principal findings of the 2013 survey, captured as a series of trends and themes that are borne out by the survey respondents:

Investment in Big Data is Accelerating. Organizations are getting behind Big Data, as evidenced by significant investment commitments. The 2013 survey indicates that 68% of executives expect that their organizations will invest greater than $1MM in Big Data in 2013, with this number rising steadily to 88% by 2016. Investments in Big Data of greater than $10MM are projected to rise sharply from 19% in 2013 to 50% by 2016, with investments in Big Data of greater than $50MM more than doubling from 6% in 2013 to 14% by 2016.

Executive sponsorship seen as critical to business adoption. Executive sponsorship is perceived as the single most important factor that will be critical to ensuring successful business adoption within large corporations, with 83% of executives citing this as a critical factor. When questioned about where executive sponsorship is coming from, executives cited Chief Information Officers, Chief

Technology Officers, and Chief Analytics and Risk Officers as the primary drivers within large corporations.

"Investments in Big Data of greater than $10MM are projected to rise from 19% in 2013 to 50% by 2016"

It's now about Variety, Volume, and Analytical Velocity. One year ago, most executives cited the need to integrate a greater variety of data sources as their primary requirement. The 2013 survey indicates a near equal distribution among integrating more data sources, analyzing larger volumes of data, and *analytical velocity* – the speed by which organizations can obtain answers to critical business questions.

Accelerating Time-to-Answer (TTA) is Key to Business Success. The biggest factor in ensuring business success, cited repeatedly by executive respondents, is the ability to make better, fact-based decisions, and to realize this ability by accelerating the speed with which organizations can gain insight and answer critical business questions. The ability to Accelerate Time-to-Answer (TTA) is a metric for business success.

Organizations are looking at New Roles and Processes to ensure Successful Adoption. Large corporations are defining or considering new roles, such as establishing a Chief Data Officer, with 48% established or considering, and implementing new processes and organizational structures to ensure successful business adoption.

New technologies are fast becoming essential to Big Data execution and utilization. Big Data database management technologies like Hadoop, Aster, and Netezza, and Analytics solutions like SAS, Tableau, and Revolution R are gaining adoption as corporations invest in a technology foundation to support their Big Data efforts.

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Investment in Big Data

Big Data is a Reality in Corporate America

Big Data is being adopted and implemented across the corporate world among leading Fortune 1000 companies. One year ago, such a statement might have sounded like hyperbole. In fact, it was hard at that time to escape prognostications heralding Big Data as the "next big thing."
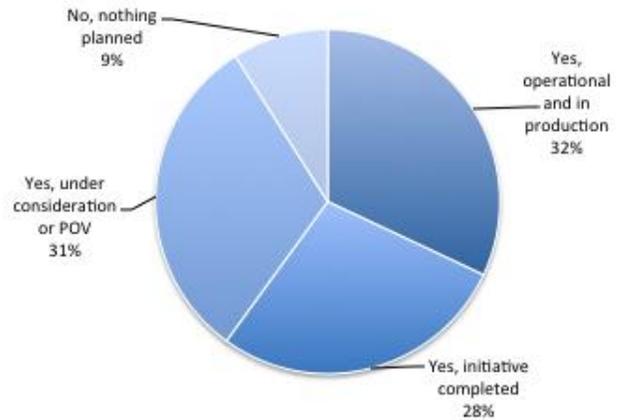
At that time, our 2012 survey indicated that 85% of executive respondents reported that their organizations were embarking on initial forays into Big Data initiatives, with just over one third of respondents noting Big Data investments of $1MM or more. The 2013 survey paints a dramatically more robust and evolved corporate commitment to Big Data in 2013 and the coming years.

"At the highest end of the investment spectrum, 6% of respondents reported investments in Big Data exceeding $50MM in 2013, with this investment level growing to over 14% by 2016."

Significantly, 91% of corporate executives who responded to the 2013 survey indicated that their firms were considering or had embarked on a Big Data initiative. Of these, 60% of executives reported that at least one Big Data initiative had been completed, with 32% of these executives reporting that Big Data initiatives had been operationalized and in production. Only 9% of executives reported that no Big Data initiatives are either planned or under active consideration. [Figure 4]

Further evidence of the commitment to Big Data among large corporations is shown in the 2013 levels of investment in Big Data, and anticipated investment levels by 2016.

Figure 4
Does your organization currently have a Big Data initiative underway? (check one)

No, nothing planned 9%

Yes, operational and in production 32%

Yes, under consideration or POV 31%

Yes, initiative completed 28%

In 2013, 68% of executive respondents report that their organizations are investing more than $1MM in Big Data initiatives, with 88% reporting that their organization plans to spend greater than $1MM on Big Data initiatives by 2016.   Of organizations investing in Big Data, 19% of respondents report that investments in Big Data will exceed $10MM in 2013, rising to a whopping 50% by 2016. [Figure 5]

Figure 5
What is your anticipated budget for Big Data initiatives in 2013-2016? (check one)
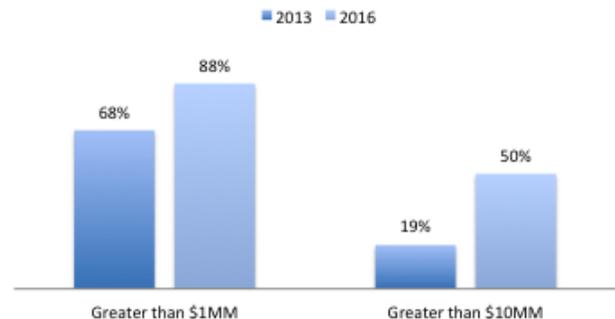
■ 2013 ■ 2016

68%   88%

Greater than $1MM

19%   50%

Greater than $10MM

At the highest end of the investment spectrum, 6% of respondents reported investments in Big Data exceeding $50MM in 2013, with this investment level growing to over 14% by 2016.

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On the low end of the investment scale, 32% of respondents reported an investment in Big Data of less than $1MM. By 2016, executives indicated that only 12% of firms planned to spend less than $1MM on Big Data initiatives for their organization.

How organizations plan to commit their Big Data investments highlights the business functions which are driving Big Data investment.

Externally focused customer business functions, as well as internally focused operational and risk function continue to be the primary business drivers of Big Data investments. Executives cited externally facing sales, marketing, and CRM initiatives, or internal risk management or operational management activities as the biggest drivers of investment.

While 76% of executives cited sales and marketing functions as a primary driver of Big Data investment, 68% of executives also cited risk as a principal driver of investment. [Figure 6]

Figure 6
What business functions within your organization are driving the investment in Big Data? (check all that apply)

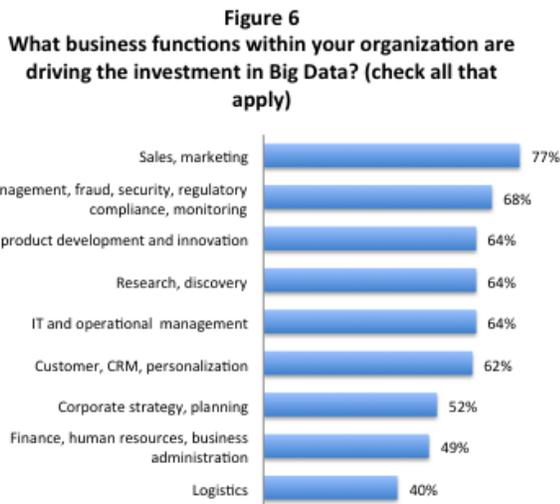| Business Function	%
Sales, marketing	77%
Risk management, fraud, security, regulatory compliance, monitoring	68%
New product development and innovation	64%
Research, discovery	64%
IT and operational management	64%
Customer, CRM, personalization	62%
Corporate strategy, planning	52%
Finance, human resources, business administration	49%
Logistics	40%

The survey responses suggest that there are a number of business functions that represent significant opportunity for Big Data investment, as highlighted by the range and frequency of business functions cited by survey participants.

Accelerating Time-to-Answer (TTA) Critical to Success

Corporations intend to invest heavily in enhancing their analytics prowess and capabilities as a means to compete more successfully and operate more effectively. When asked which Big Data initiatives they plan to invest in this year, over 70% of executives identified the need to accelerate analytical processes by improving time-to-answer (TTA), and development of more sophisticated Analytics. [Figure 7]

Figure 7
Which Big Data initiatives does your organization plan to invest in this year? (check all that apply)

Initiative	%
Acceleration of analytical processes (e.g. time-to-answer)	70%
Development of more sophisticated analytics	70%
More effective integration of existing sources of data	69%
Creation of analytical sandbox environments to support data discovery	65%
Migration of batch processes to Big Data platforms	57%
Improved fraud detection and risk analytics	54%
Deployment of advanced analytics (e.g., social network analysis, time-series)	53%
Integration of text data with transactional, financial, or patient data	49%
Improving monitoring, instrumentation, or surveillance	48%
Integration of behavioral data	48%
Enhanced research and development activities	44%
Enabling extreme personalization	44%

Roughly 65% of executives cited creation of analytical sandbox environments to support data discovery as an area where their organizations planned to invest.

Other Big Data initiatives that were cited frequently by executive respondents included more effective integration of existing data sources (70%) of respondents, migration of batch processes to Big Data platforms (57%), improved fraud detection and risk analytics (54%), and deployment of advanced analytics, such as social network analysis and time-series analysis (53%).

Overall, executive respondents painted a clear picture of a range of Big Data initiatives receiving investment in 2013.

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When asked about the focus of their data and analytics Big Data initiatives, executives also cited the need to accelerate analysis and answers to business questions through faster time-to-answer (TTA) as the focus of their data and analytics initiatives, along with the need to enhance their overall analytics capabilities to gain new insights. [Figure 8]

Figure 8
What is the primary focus of your data and analytics Big Data initiatives? (check all that apply)

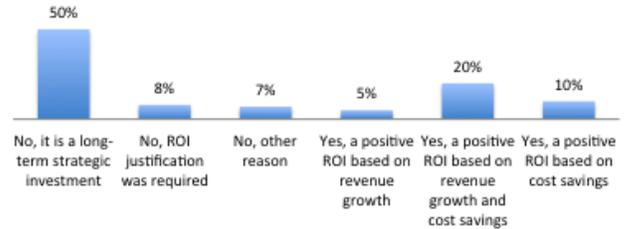| Focus	%
Enhance your overall analytics capabilities to gain new insights	85%
Accelerate analysis and answers to business questions (e.g. time-to-answer)	82%
Improve data discovery through approaches like analytic sandboxes	70%
Integrate existing sources of data more effectively	69%
Apply analytics to more business processes (e.g. test-and-learn)	65%
Integrate new sources of data (e.g. behavioral, social media, sensor)	64%
Reduce the time spent on data preparation and data engineering	62%
Reduce platform costs for data storage and analysis	61%
Support real-time streaming analytics	43%

Interestingly, most Big Data initiatives do not currently require an ROI payback analysis to justify their current investment.

When executives were asked whether an ROI or payback analysis had been conducted before Big Data investments have been approved, 65% indicated that an ROI justification was not required, with 50% indicating that investments in Big Data had been justified as a long-term strategic investment.

In those instances where an ROI analysis was performed, the justification was split between cost savings and revenue growth. [Figure 9]

Figure 9
Has an ROI or payback analysis been conducted before Big Data initiatives have been approved? (check one)

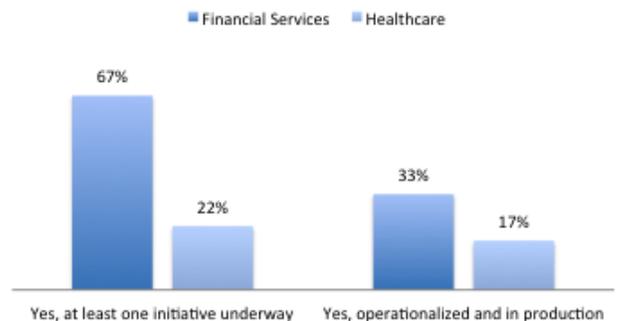| Response	%
No, it is a long-term strategic investment	50%
No, ROI justification was required	8%
No, other reason	7%
Yes, a positive ROI based on revenue growth	5%
Yes, a positive ROI based on revenue growth and cost savings	20%
Yes, a positive ROI based on cost savings	10%

Health Care and Life Science firms in a Nascent Stage
One clear result from executive respondents was that not all industries are at the same stage of investing in Big Data initiatives.

Whereas 67% of financial service executives indicated that a Big Data initiative had been completed, a much smaller 22% of health care and life science executives reported being at this same stage of adoption. While 33% of financial service executives reported that Big Data initiatives are operational and in production within their organization, only 17% of health care and life science executives reported Big Data systems operational and in production. [Figure 10]

Figure 10
Does your organization currently have a Big Data initiative underway? (check one)

■ Financial Services   ■ Healthcare

	Financial Services	Healthcare
Yes, at least one initiative underway	67%	22%
Yes, operationalized and in production	33%	17%

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When reporting investment in Big Data initiatives, 75% of financial service executives reported that their organization was investing greater than $1MM in Big Data initiatives, contrasted with 44% of health care and life science executives reporting these expenditure levels.
In 2016, by way of contrast, 94% of financial service executives reported Big Data investments of greater than $1MM, while 67% of health care and life science executives reported investments at this level. [Figure 11]

Figure 11
What is your anticipated budget for Big Data initiatives in 2013-2016? (check one)
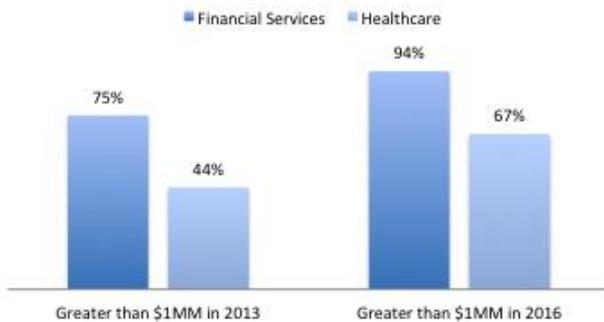
In contrast to financial services firms, where investment in Big Data is being driven by sales and marketing (81%), and risk initiatives (76%), investment in Big Data in health care and the life sciences is being driven by research and discovery (78%) and new product innovation (72%). Note that our focus on this industry is on clinical outcomes and membership effectiveness, areas that we expect to leverage Big Data going forward.

Clearly, Big Data has gained greater adoption within large financial services companies. We believe there are a variety of factors that account for these differences.

Financial service firms have undergone rapid consolidation in recent decades, resulting in a smaller number of very large institutions, operating at scale. Financial services companies have had a long tradition of being at the forefront of data and Analytics, due to the large volumes of customer account and transaction data that must be maintained.

This has led to the development among many financial services firms of highly sophisticated customer analytics and predictive behavior models. In addition, financial service firms have been required to collect and manage new sources of data to meet the new regulatory requirements of recent years – Basel, Sarbanes Oxley, and Dodd Frank, among other new regulations.

Health Care and Life Sciences firms appear to be in the early stages of embarking on Big Data adoption.

In contrast to the financial services industry, the health care and life sciences industry tends to be more diffuse and fragmented, with multiple sectors and many localized providers. The health care and life sciences industry is comprised of several large sectors, each with unique characteristics, implying different requirements and opportunities to leverage Big Data.

Health care "providers" are currently focused on implementing electronic medical and health record keeping systems to comply with government regulations and programs. This may explain the lack of Big Data activity to date within the "provider" sector. Once medical record systems are implemented however, it is expected that "providers" will quickly move to Big Data solutions to assist with increased demand to improve the quality and cost of care.

Health care "payers" are undergoing a major transformation due to factors such as minimum loss ratio requirements and health insurance exchanges, leading to an initial evaluation of Big Data capabilities. Payers are looking to Big Data to provide new operating efficiencies and competitive advantage in the rapidly increasing business-to-consumer (B2C) market.

Life Science firms have the ability to increase the speed of their Research and Development processes, as well as improve the revenue generation capabilities of their commercial operations.

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Business Adoption and Sponsorship

Executive Sponsorship Perceived as Key to Adoption

Executive sponsorship is perceived as the single most critical factor in ensuring business adoption of Big Data initiatives in the large corporate world, with 83% of executives identifying this as a critical factor and executives ranking this as the single most important factor in ensuring adoption. [Figure 12]

Figure 12
What are the factors most critical to business adoption of Big Data initiatives within your organization? (check all that apply)

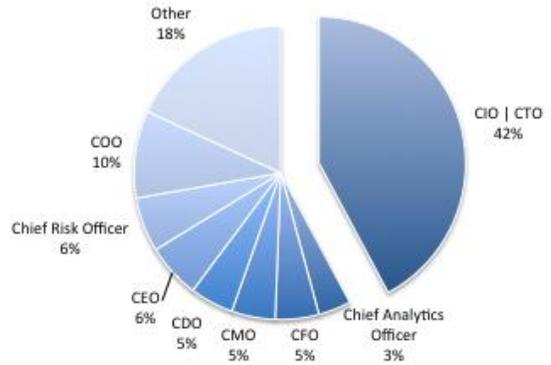| Factor	%
Executive sponsorship	83%
Clear definition of business questions and business objectives	82%
Recognition that data is a shared corporate asset	68%
Agreement on the importance of analytics	65%
Enterprise information management capabilities established	64%
Strong organizational alignment	64%
Successful implementation of technology capabilities	61%
Choosing the right technologies	53%
Effective change management function and processes	48%

"83% of executives cited executive sponsorship as the most critical factor ensuring business adoption"

Sponsorship Split between Business and Technology

Survey respondents indicated that executive sponsorship of Big Data initiatives was typically spread out within their organizations. When asked who is the primary most senior executive sponsor for their organizations Big Data initiatives, 42% of executive respondents indicated that the most senior executive sponsor within the organization was the Chief Information Officer or Chief Technology Officer. [Figure 13]

The remaining 58% of respondents indicated that sponsorship was being driven by c-executives representing the business organization, such as the Chief Operating Officer, Chief Executive Officer, Chief Risk Officer, or the Chief Financial Officer.
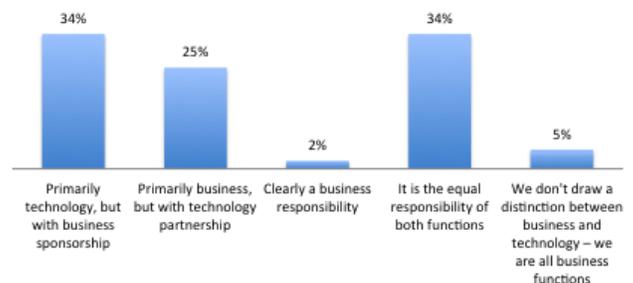
Figure 13
Who is the primary most senior executive sponsor for your organizations Big Data initiatives? (check one)

- Other 18%
- CIO | CTO 42%
- COO 10%
- Chief Risk Officer 6%
- CEO 6%
- CDO 5%
- CMO 5%
- CFO 5%
- Chief Analytics Officer 3%

For executives who responded that other senior business executives were the primary sponsors, sponsoring roles included Chief Clinical Officer, Chief Medical Officer, Chief Actuary, Chief of Research, and Head of Corporate Strategy.

Most organizations appear to view Big Data as a joint business and technical responsibility. When asked whether Big Data was primarily a business or a technical responsibility within their organization, 34% of executives indicated that Big Data was primarily a technical responsibility with business sponsorship, while 27% indicated that Big Data was primarily a business responsibility with technical partnership. [Figure 14] Another 34% indicated that Big Data was a shared responsibility.

Figure 14
Is Big Data primarily a business or technology responsibility within your organization? (check one)

Category	%
Primarily technology, but with business sponsorship	34%
Primarily business, but with technology partnership	25%
Clearly a business responsibility	2%
It is the equal responsibility of both functions	34%
We don't draw a distinction between business and technology – we are all business functions	5%

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Among health care and life science firms, a much greater percentage (44%) indicated that Big Data was primarily a business responsibility.

Big Data initiatives are frequently associated with other enterprise initiatives that are underway within their organizations.   The majority of survey respondents indicated that Big Data initiatives were linked to their organizations efforts to enhance their analytics capabilities, with 66% of executives citing *advanced analytics* initiatives, and another 54% of executives indicating that their Big Data efforts were linked to enterprise risk and analytics initiatives. [Figure 15]

Figure 15
Is Big Data associated with another enterprise-wide initiative within your organization? (check all that apply)

Advanced analytics	66%
Risk and analytics	54%
Customer experience and personalization	49%
Enterprise information management	43%
Operational efficiency and effectiveness	30%
Product development	29%
Business transformation	29%
Research and discovery	27%

Nearly 49% indicated that Big Data was associated with an enterprise customer experience and personalization initiative, and 43% indicated it was tied to an enterprise information management effort.
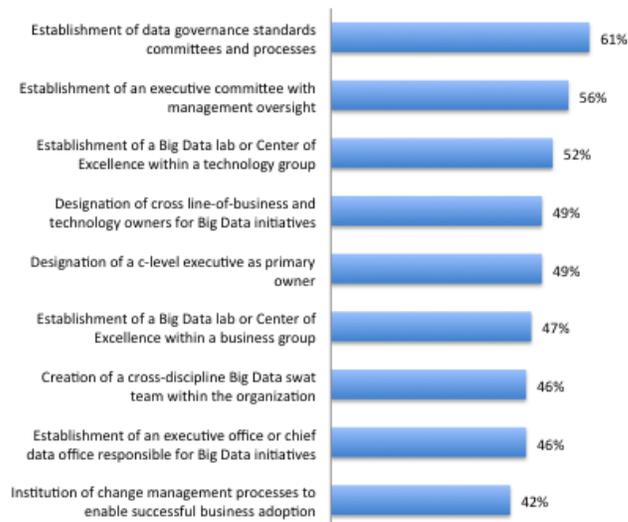
Adoption Requires New Processes and Roles
Successful business adoption of Big Data initiatives requires establishing new processes and roles within most organizations. Nearly two-thirds of executives indicated that their organizations were in the initial stages of determining how best to ensure successful business adoption of Big Data initiatives. But of those organizations that have quickly moved forward with Big Data initiatives, most have rapidly established new processes and roles to help them better manage the effectiveness of their Big Data initiatives.

"Over half of executives reported that their organization has established a Big Data lab or Center of Excellence under either technology of business leadership."

Of those organizations aggressively moving forward with Big Data initiatives, 61% of executives reported the establishment of data governance standards committees and processes. 56% reported the establishment of an executive committee with management oversight of Big Data initiatives, 49% reported designation of a C-level executive as primary owner for enterprise information and Big Data, and 49% indicated that cross line-of business and technology executives have been designated as owners for Big Data initiatives. [Figure 16]

Figure 16
What steps are being taken to ensure successful adoption of Big Data initiatives within your organization? (check all that apply)

Establishment of data governance standards committees and processes	61%
Establishment of an executive committee with management oversight	56%
Establishment of a Big Data lab or Center of Excellence within a technology group	52%
Designation of cross line-of-business and technology owners for Big Data initiatives	49%
Designation of a c-level executive as primary owner	49%
Establishment of a Big Data lab or Center of Excellence within a business group	47%
Creation of a cross-discipline Big Data swat team within the organization	46%
Establishment of an executive office or chief data office responsible for Big Data initiatives	46%
Institution of change management processes to enable successful business adoption	42%

In addition, over half of executives reported that their organization has established a Big Data lab or Center of Excellence under either technology of business leadership.

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Emergence of the Chief Data Officer

In recent years, as data is perceived as an increasingly critical corporate asset, we have witnessed the emergence of an important new role within many large corporations – the Chief Data Officer.   As noted previously, 8% of this year's survey respondents identified themselves as Chief Data Officers, making this role second only to the role of Chief Information Officer in terms of participating in this executive survey.

"48% of executive respondents indicated that their organization now has or is actively considering establishing a Chief Data Officer"

A significant 48% of executive respondents indicated that their organization now has or is actively considering establishing a Chief Data Officer, with nearly a quarter of all survey respondents indicating that their organization currently has a Chief Data Officer in place. Slightly over half of respondents indicated that responsibility for data still resides within another function with the organization. [Figure 17]

Figure 17
Does your organization have a Chief Data Officer? (check one)
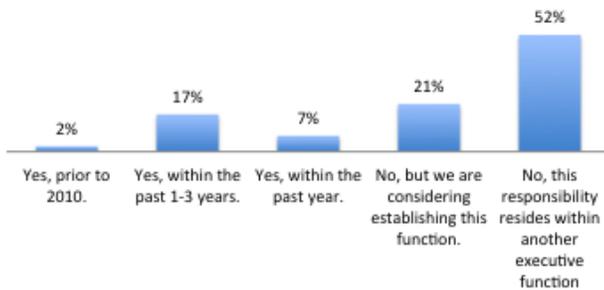
Again, we note a contrast between financial service firms and health care | life science firms. Whereas 32% of financial services firms report that their organization has established a Chief Data Officer function, no health care and life science firms reported that this role has been established. For some health care and life science firms, data remains a purview of the Chief Medical Officer, Chief Clinical Officer, or Head of Informatics.

Especially within financial services firms, we should expect to see and hear more as the role of Chief Data Officer continues to develop and expand in large corporations in the coming years.

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Business Value of Big Data
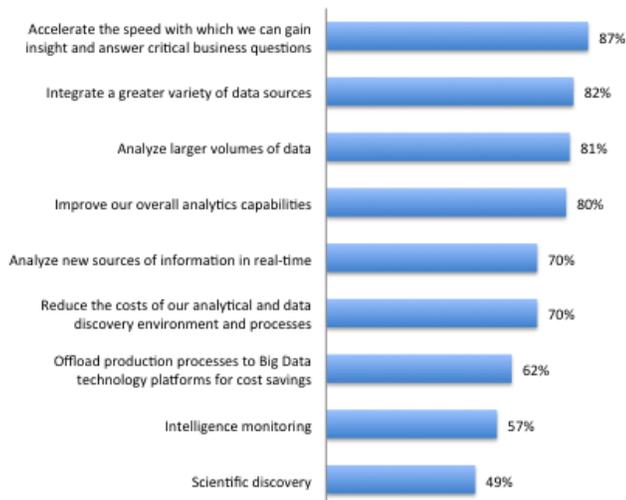
Companies Demand Better Answers Faster

Executives were asked to respond to what they see as the primary business benefit and value to their organizations resulting from investments in Big Data.

While executives were expecting multiple business benefits from Big Data, three primary benefits stood out:

1. Accelerate the _analytical velocity_ of delivering insights and answers to business questions
2. Integrate a greater _variety_ of data sources
3. Analyze larger _volumes_ of data.

These responses align with the often referenced benefits of Big Data – velocity, variety, and volume. Although velocity typically refers to the rapid processing of streaming data, the survey reveals the need for _analytical velocity_ -- the ability to rapidly correlate, interpret, analyze, and report on data. The speed at which organizations can gain insight and answer critical business questions was identified as the top business benefit to be gained from Big Data initiatives, cited by 87% of survey respondents. [Figure 18]
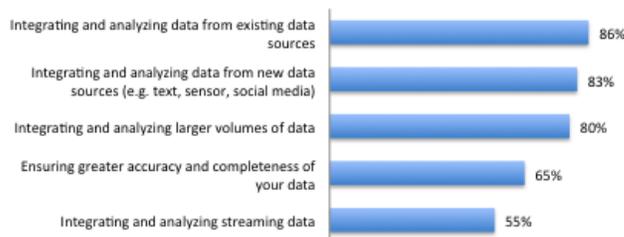
The ability to integrate a greater variety of data sources was cited as the primary business benefit by 82% of executives, and the ability to analyze larger volumes of data was cited by 81% of executive respondents.

"The speed at which organizations can gain insight and answer critical business questions was identified as the top business benefit to be gained from Big Data, cited by 87% of survey respondents"

When asked about the primary data requirements driving them to consider Big Data, executives several data requirements as their primary focus: [Figure 19]

1. Integrating and analyzing data from existing data sources
2. Integrating and analyzing data from new data sources (e.g. text, sensor, social media)
3. Integrating and analyzing large volumes of data.

Figure 18
What is the primary business benefit you expect to achieve with Big Data? (check all that apply)

Accelerate the speed with which we can gain insight and answer critical business questions	87%
Integrate a greater variety of data sources	82%
Analyze larger volumes of data	81%
Improve our overall analytics capabilities	80%
Analyze new sources of information in real-time	70%
Reduce the costs of our analytical and data discovery environment and processes	70%
Offload production processes to Big Data technology platforms for cost savings	62%
Intelligence monitoring	57%
Scientific discovery	49%

Figure 19
What are the primary data requirements driving you to consider Big Data? (check all that apply)

Integrating and analyzing data from existing data sources	86%
Integrating and analyzing data from new data sources (e.g. text, sensor, social media)	83%
Integrating and analyzing larger volumes of data	80%
Ensuring greater accuracy and completeness of your data	65%
Integrating and analyzing streaming data	55%

Accuracy and completeness of the data, which is sometimes referred to as Veracity -- the fourth "V' of Big Data – was identified as a driving factor by 65% of executive respondents.
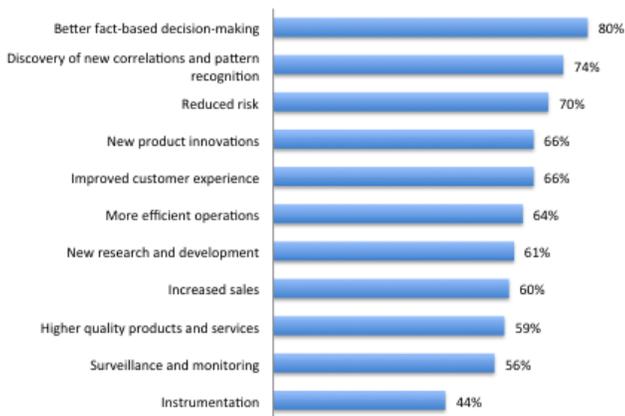
These responses further substantiate the importance that large organizations are attaching to Big Data as the means to addressing their velocity, variety, and volume requirements.

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Better Fact-Based Decision-Making Drives Value

The overwhelming majority of executive respondents identified better fact-based decision-making as the single greatest value that Big Data initiatives will bring to their organization, cited by 80% of executive respondents. [Figure 20]

Figure 20
What is the greatest value to your organization from Big Data? (check all that apply)

Category	Percentage
Better fact-based decision-making	80%
Discovery of new correlations and pattern recognition	74%
Reduced risk	70%
New product innovations	66%
Improved customer experience	66%
More efficient operations	64%
New research and development	61%
Increased sales	60%
Higher quality products and services	59%
Surveillance and monitoring	56%
Instrumentation	44%

The top areas from which executives expect to derive business value from their Big Data initiatives are:

1. Better fact-based decision-making
2. Discovery of new correlations and patterns
3. Improved customer experience
4. New product innovations.

"80% of executive respondents identified better fact-based decision-making as the single greatest value that Big Data initiatives will bring to their organization"

Executives continue to identify new opportunities for leveraging Big Data initiatives to enhance and drive business value from a range of business activities.

Big Data Domains and Solutions
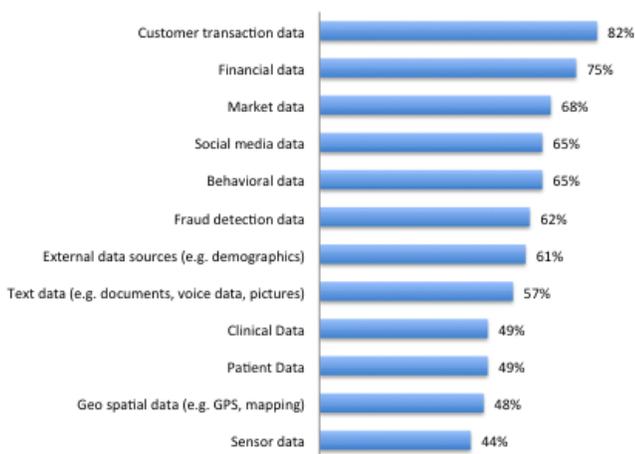
Investments in Big Data Solutions

Organizations are addressing a variety of business issues where Big Data is seen as providing business value. Respondents cited issues ranging from customer facing sales and marketing activities to internal risk and operational process effectiveness.

When asked to highlight what data domains are of most interest to their organization for Big Data, many areas of need and applicability were cited. Most commonly cited data domains include:

1. Customer transaction data
2. Financial data
3. Market data
4. Behavioral data.

Other data domains that were widely identified included external data sources such as demographic data, social media data, patient and clinical data, and fraud detection data [Figure 21].

Figure 21
Which data domains are of most interest to your organization for Big Data? (check all that apply)

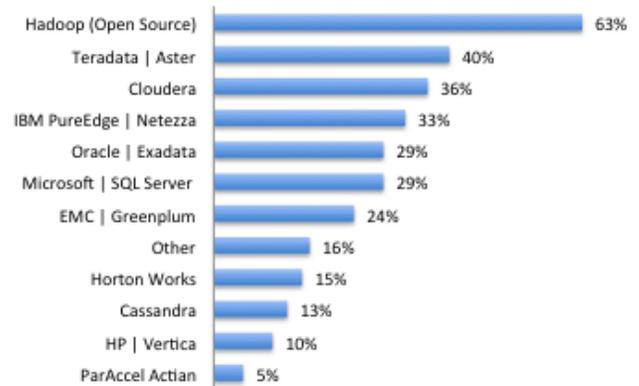| Data domain	%
Customer transaction data	82%
Financial data	75%
Market data	68%
Social media data	65%
Behavioral data	65%
Fraud detection data	62%
External data sources (e.g. demographics)	61%
Text data (e.g. documents, voice data, pictures)	57%
Clinical Data	49%
Patient Data	49%
Geo spatial data (e.g. GPS, mapping)	48%
Sensor data	44%

Among health care and life sciences executives in particular, patient data and clinical data were identified as the data domains of greatest interest by 93% of respondents.

Corporations are investing in a variety of new Big Data database management solutions to address the growing volumes and varieties of data that are being captured.

Database management solutions like Hadoop (open source), Cloudera, Teradata/Aster, and IBM/Netezza are among the solutions being most widely used or evaluated [Figure 22].

Figure 22
Which Big Data or database management solutions is your organization using or evaluating? (check all that apply)

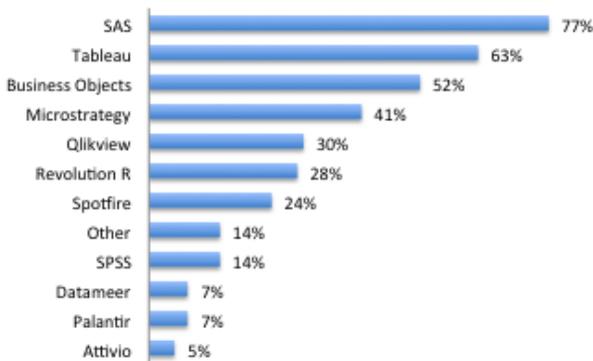| Solution	%
Hadoop (Open Source)	63%
Teradata	Aster	40%
Cloudera	36%
IBM PureEdge	Netezza	33%
Oracle	Exadata	29%
Microsoft	SQL Server	29%
EMC	Greenplum	24%
Other	16%
Horton Works	15%
Cassandra	13%
HP	Vertica	10%
ParAccel Actian	5%

Corporations are also investing in analytics and data visualization capabilities and solutions to support their Big Data analysis and reporting requirements.

Traditional solutions like SAS remain high in popularity with 77% of executives indicating that SAS is their analytical solution of choice.

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Newer analytics and visualization solutions are also gaining traction with purveyors of Big Data analytics.

New capabilities from firms such as Tableau, QlikView and Revolution R, as well as fresh offerings from traditional business intelligence firms such as Business Objects, Microstrategy, and Spotfire, all ranked highly in terms of interest and utilization.   [Figure 23]

Figure 23
Which analytics or visualization solutions is your organization using or evaluating? (check all that apply)

Solution	%
SAS	77%
Tableau	63%
Business Objects	52%
Microstrategy	41%
Qlikview	30%
Revolution R	28%
Spotfire	24%
Other	14%
SPSS	14%
Datameer	7%
Palantir	7%
Attivio	5%

A Future for Data Scientists?

Lastly, we posed a final question to survey respondents about the state of Big Data talent. One year ago, many organizations highlighted a critical need for Data Scientists. We wanted to revisit this need in light of their experience and activities during the past year. [Figure 24]

The majority of firms this year highlighted the need to leverage existing talent, with 68% of respondents indicating that they plan to support their Big Data initiatives through retraining and upgrading of existing staff. Another 19% responded that they have the expertise in-house to meet their needs.

Only 30% of executives responded that their firms were actively seeking to recruit Data Scientists. We believe that there are two reasons for this.

First, many Big Data applications are addressing data processing challenges, and don't require advanced data mining skills.

Second, as Big Data solutions mature, many firms are finding that existing technical and analytical staff can be trained and augmented with specialists to meet the skills needed, rather than creating specialized data scientist roles.

Figure 24
Characterize your organization's view of the talent required to support Big Data initiatives? (check all that apply)

View	%
We need to invest in retraining and upgrading the skills of existing staff	68%
We need to combine retraining with recruitment of data scientists	46%
We are actively seeking to recruit data scientists	30%
We have been successful at recruiting data scientists to augment our expertise	30%
We are extremely challenged in our ability to recruit data scientists	21%
We have the expertise in-house to meet our needs	19%
We do not perceive a major need for data scientists within our organization	4%

We expect the skill gap to be manageable in the coming years as solutions continue to mature and a growing number of academic programs are training the next generation on informatics and data mining. Perhaps this is a breath of good news for the many traditional Analytics folks within the corporate world who have been overwhelmed by the onslaught of Big Data initiatives and who have sought to redefine this role.

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Summary

The value of improved data and analytics is not new to most businesses. Organizations have been utilizing data and analytics for several decades in a quest to gain insight, identify correlations, and provide decision makers with timely answers to critical business questions.

Big Data differs from traditional approaches in the quantum leap in affordability, scale, and variety of analytics it can support. This leap lowers the "transaction cost" of using analytics and data, providing ready access to data and insights across the corporation.

Companies are radically expanding the scope, scale, and impact of data and analytics in their day-to-day business processes and decision-making, realizing the power of their information assets.

Big Data is not a panacea, however. While it can deliver more complete data and identify correlations, there will be many situations where experience and judgment are the deciding factor.

This survey reveals that the corporate world is rapidly adopting Big Data across a wide range of business, and scientific, applications, including customer experience, risk management, patient care, and product innovation. We expect the breadth and depth of adoption to continue in the coming years.

In conclusion, we offer some final counsel based on our interviews and work with the organizations who participated in this survey:

- Formulate your Big Data initiatives based on critical business questions – begin by identifying the five most critical business questions that would result in the greatest improvement and business value, where Big Data would make a critical difference in your business effectiveness

- Ensure strong business sponsorship and organizational alignment to ensure a common understanding of the business value and benefit to enhance the probabilities of meaningful business adoption and success

- Identify the key business processes that will benefit most directly from introducing and implementing Big Data capabilities and solutions, and focus your efforts on these high impact proof-of-value opportunities

- Use your imagination and creativity to consider where Big Data can make a radical difference and enable you to transform your business by changing a business paradigm or leapfrogging the competition – what great insights, what new products or capabilities, what new means of delivering your services, what dramatic and unintuitive new correlations and insight can be made possible by Big Data.

The capabilities of Big Data allow companies to revisit their assumptions about how data and analytics can improve – or even transform – their business.

A business-driven approach of rethinking existing processes – coupled with open-minded "what if" experimentation will likely reveal practical, actionable opportunities to create significant business value.

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About NewVantage Partners

Decades before the advent of "Big Data," a body of business leaders, technologists, and academic thinkers were engaged by the prospect of helping companies leverage their information assets to gain insights that would lead to more data-informed business decisions.

Founded in 2001, NewVantage Partners provides expertise and guidance to Fortune 1000 business and technology executives who are seeking to leverage Data and Analytics to gain business insights, derive business value, transform critical business processes, and ensure successful business adoption and results.

NewVantage Partners is based in Boston with operations in New York and San Francisco.

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