

"The reality is often that big data requires a priesthood of data scientists to implement and more mumbo jumbo than you'll find at the New York Witch Festival.

But a funny thing happened on our way to big-data heaven. The more we thought about it, the more we realized we didn't need to wait to get real, actionable audience and other insights. There really is data everywhere that you can tap into right now that will help you understand how customers, suppliers and others view you, your company and your products."

*"Oh, and don't expect big data -- even when you do get it all really working -- to be the holy grail, either. According to my friend Mark Anderson, CEO of Strategic News Service and one of the smartest analysts and futurists in the business, next year we'll be worrying more about Big Visualization. Or in other words, even once you've got all that data warehoused, you still need great systems to help you "see" inside and extract real, actionable knowledge."***What Calvin and Hobbes Can Teach Us About Big Data You Can Find Treasure Everywhere -- You Just Have to Start Digging** By: Jim Louderback



BIG DATA WHAT IT IS AND WHY IT IS IMPORTANT TO BUSINESS?



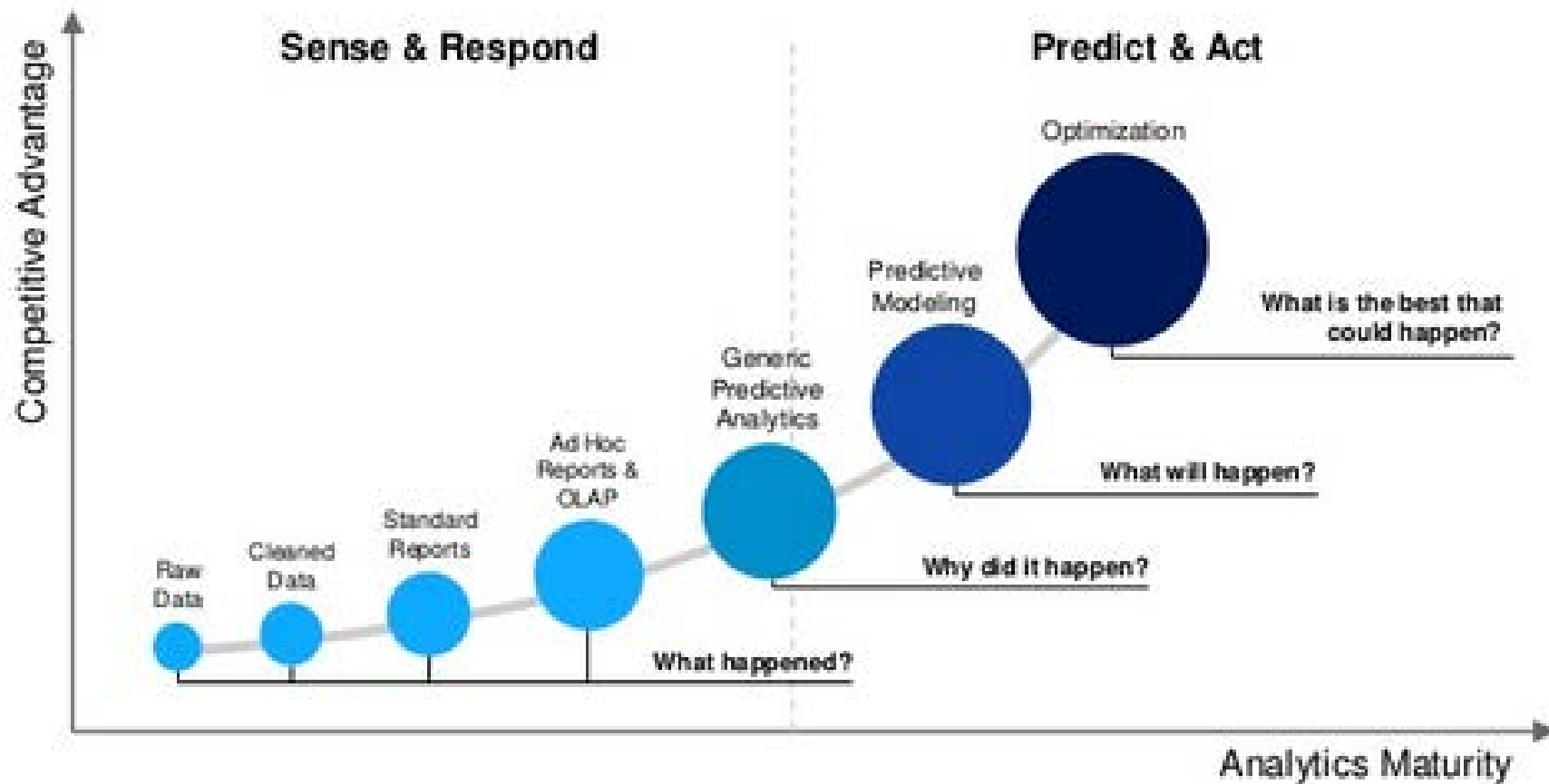
Acumen Analytics
insight beyond the data

WHO WE ARE

Acumen Analytics is a WBE certified, information management and analytics consulting firm focused on helping our customers leverage their data, technology and organizational assets to create strategies and deliver solutions that *Seize Innovation, Accelerate Business and Drive Successful Business Outcomes.*

Our consultants industry insight, unparalleled experience and comprehensive capabilities across many industries and business functions, provide information management strategy, data management and architecture, business intelligence, and advanced analytics that measure performance, identify opportunities, and forecast the future efficiently and more cost effectively, creating competitive advantage.

WHAT WE DO



WHO WE DO IT FOR



Are there areas in your organization with knowledge gaps?

Sales

Patient Management

Human Capital

Supply Chain

Procurement

Customer Sentiment

Forecasting

Cash Management

Marketing

Donor & Campaign Success

Churn Rates

- **Confident, fact-based decisions**
- **Creating Competitive Advantage**
- **Actionable insights**
- **Within the decision window**
- **Accelerating time-to-value**
- **A single version of truth**
- **Successful, measurable outcomes, repeatedly**



DATA & INFORMATION VS. KNOWLEDGE & INSIGHT

Data

From Wikipedia, the free encyclopedia

For data in computer science, see [Data \(computing\)](#). For other uses, see [Data \(disambiguation\)](#).

Data (/ˈdeɪtə/ *DAY-tə* or /ˈdætə/ *DA-tə*, also /ˈdɑːtə/ *DAH-tə*) is a set of [values](#) of [qualitative](#) or [quantitative variables](#); restated, data are individual pieces of [information](#). Data in [computing](#) (or [data processing](#)) are represented in a [structure](#) that is often [tabular](#) (represented by [rows](#) and [columns](#)), a [tree](#) (a set of [nodes](#) with [parent-children relationship](#)), or a [graph](#) (a set of [connected nodes](#)). Data are typically the results of [measurements](#) and can be [visualised](#) using [graphs](#) or [images](#).

Information

From Wikipedia, the free encyclopedia

For other uses, see [Information \(disambiguation\)](#).

Information, in its most restricted technical sense, is a [sequence](#) of [symbols](#) that can be interpreted as a [message](#). Information can be recorded as [signs](#), or transmitted as [signals](#). Information is any kind of [event](#) that affects the [state](#) of a [dynamic system](#) that can interpret the information.

Knowledge

From Wikipedia, the free encyclopedia

For other uses, see [Knowledge \(disambiguation\)](#).

Knowledge is a familiarity with someone or something, which can include [facts](#), [information](#), [descriptions](#), or [skills](#) acquired through [experience](#) or [education](#). It can refer to the theoretical or practical understanding of a subject. It can be implicit (as with practical skill or expertise) or explicit (as with the theoretical understanding of a subject); it can be more or less formal or systematic.^[1] In [philosophy](#), the study of knowledge is called [epistemology](#); the philosopher [Plato](#) famously defined knowledge as "[justified true belief](#)." However, no single agreed upon definition of knowledge exists, though there are numerous theories to explain it.

Insight

From Wikipedia, the free encyclopedia

Not to be confused with [INCITE](#), [InSight](#), [INSIGHT](#), or [Insite](#).

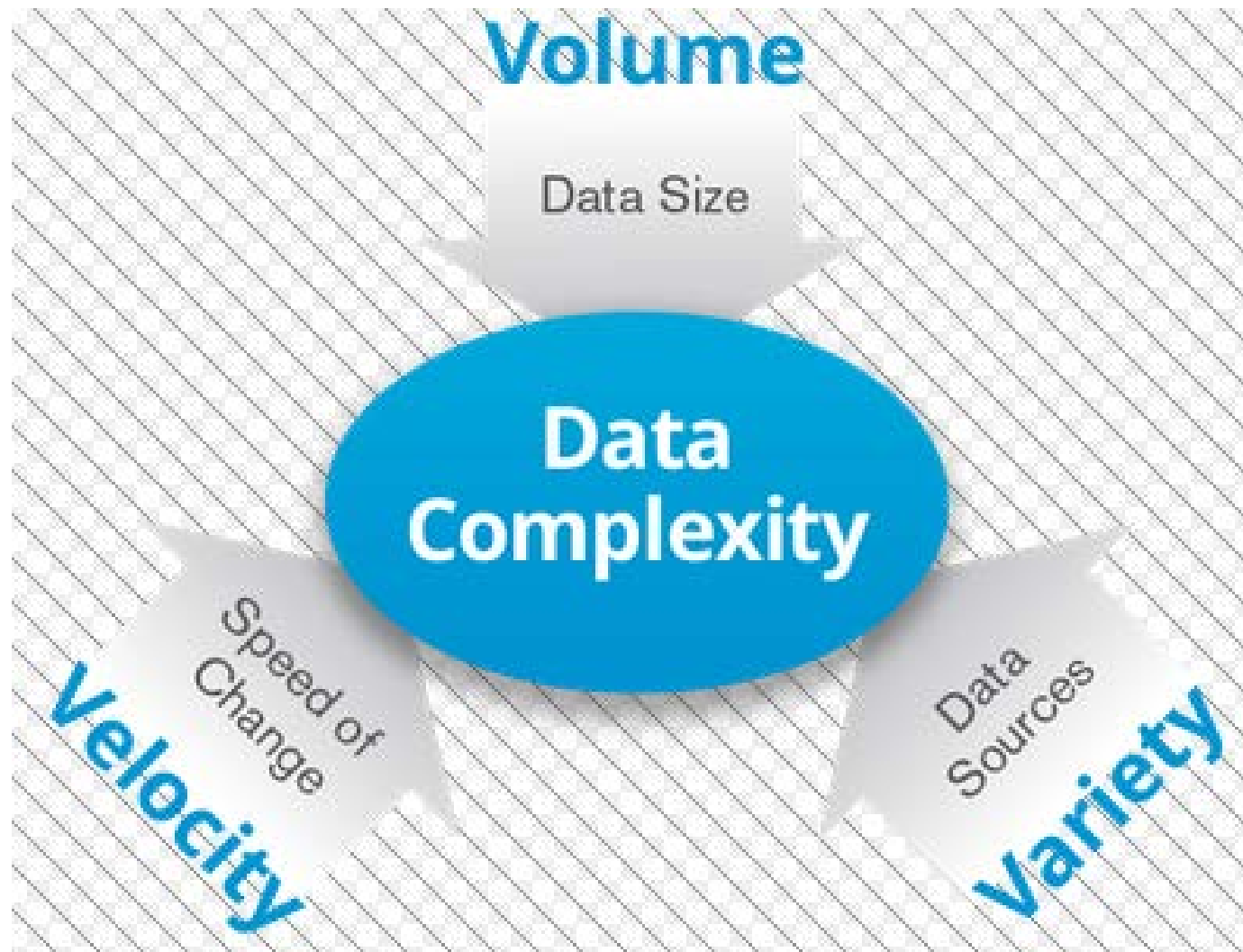
For other uses, see [Insight \(disambiguation\)](#).

Insight is the understanding of a specific [cause and effect](#) in a specific context. The term insight can have several related mean

- a piece of information
- the act or result of understanding the inner nature of things or of seeing [intuitively](#) in Greek called [noesis](#)
- an [introspection](#)
- the power of acute observation and [deduction](#), penetration, [discernment](#), [perception](#) called intellection or noesis
- an understanding of cause and effect based on identification of relationships and behaviors within a model, context, or scenario (see [artificial intelligence](#))



What is Big Data?



40 ZETTABYTES

(40 TRILLION GIGABYTES)
of data will be created by 2020, an increase of 300 times from 2009



Volume SCALE OF DATA

2.5 QUINTILLION BYTES

(2.5 TRILLION GIGABYTES)
of data are created each day



Most companies in the U.S. have at least
100 TERABYTES
(100,000 GIGABYTES)
of data stored

The New York Stock Exchange captures

1 TB OF TRADE INFORMATION
during each trading session



Modern cars have close to
100 SENSORS

that monitor items such as
fuel level and tire pressure

Velocity ANALYSIS OF STREAMING DATA

By 2016, it is projected
there will be

16.9 BILLION NETWORK CONNECTIONS

— almost 2.5 connections
per person on earth



The FOUR V's of Big Data

From traffic patterns and music downloads to web history and medical records, data is recorded, stored, and analyzed to unlock the technology and services that the world relies on every day. But what exactly is big data, and how can these massive amounts of data be used?

As a leader in the sector, IBM data scientists break big data into four dimensions: **Volume, Velocity, Variety and Veracity**.

Depending on the industry and organization, big data encompasses information from multiple internal and external sources such as transactions, social media, enterprise content, sensors and mobile devices. Companies can leverage data to adapt their products and services to better meet customer needs, optimize operations and infrastructure, and find new sources of revenue.

By 2015,
4.4 MILLION IT JOBS
will be created globally to support big data,
with 5.9 million in the United States.



As of 2011, the global size of
data in healthcare was
estimated to be

150 EXABYTES
(150 TRILLION GIGABYTES)



**30 BILLION
PIECES OF CONTENT**
are shared on Facebook
every month



Variety DIFFERENT FORMS OF DATA

By 2014, it's anticipated
there will be
**420 MILLION
WEARABLE, WIRELESS
HEALTH MONITORS**

**4 BILLION+
HOURS OF VIDEO**
are watched on
YouTube each month



400 MILLION TWEETS
are sent per day by about 200
million monthly active users



**1 IN 3 BUSINESS
LEADERS**

don't trust the information
they use to make decisions



Poor data quality costs the US
economy around

\$3.1 TRILLION A YEAR



**27% OF
RESPONDENTS**

In one survey, more than
one-third of respondents
said how much of their data was
inaccurate

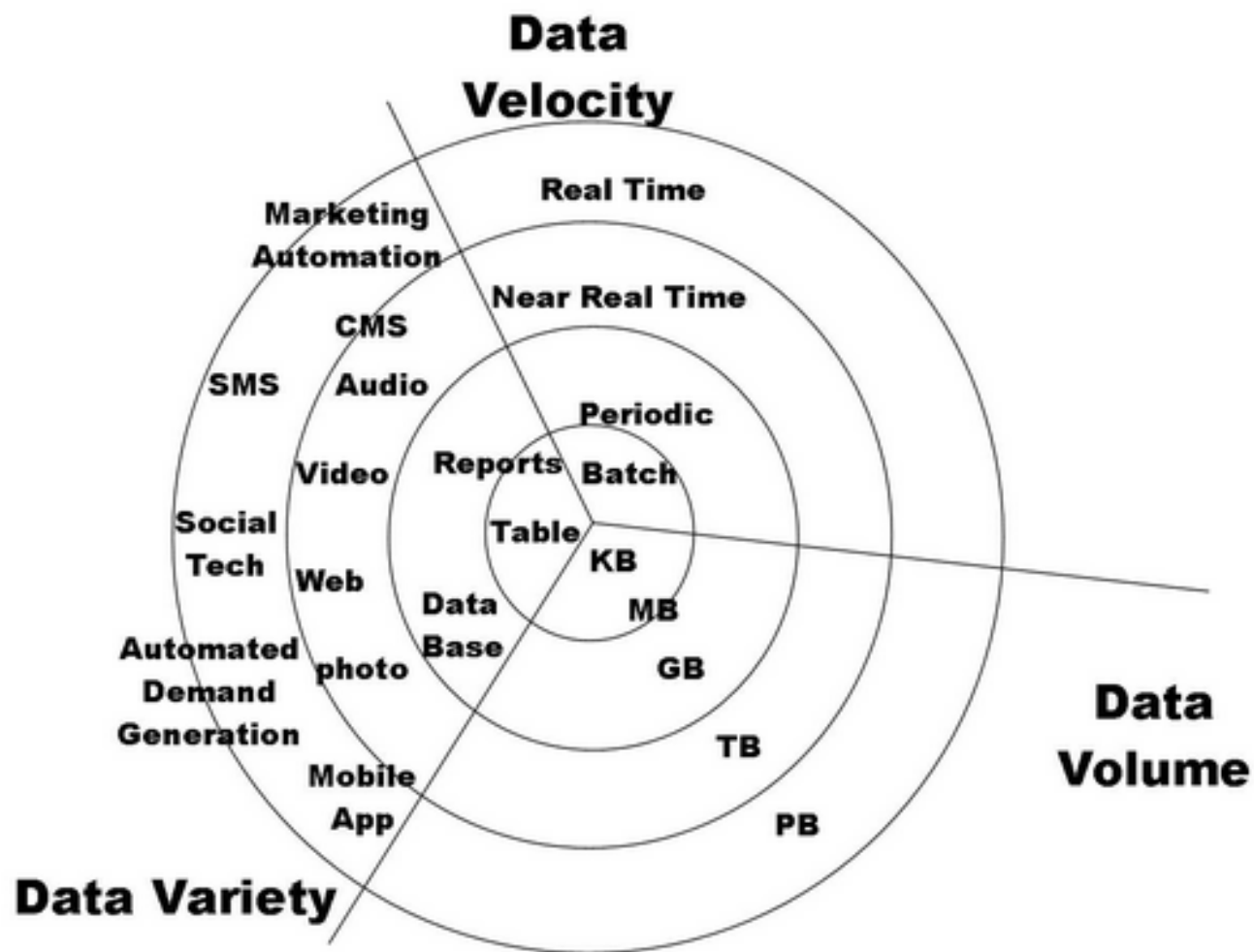
Veracity UNCERTAINTY OF DATA

Sources: McKinsey Global Institute, Twitter, Cisco, Gartner, EMC, SAS, IBM, NIST, GSA

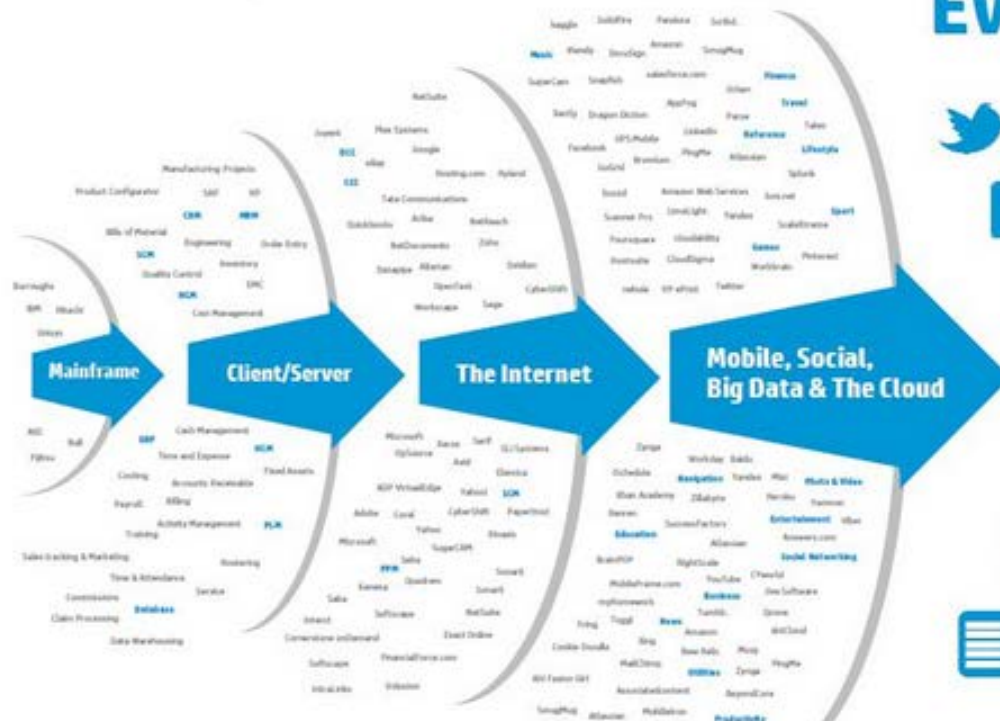
IBM



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A new style of IT emerging



Every 60 seconds



98,000+ tweets



695,000 status updates



11 million instant messages



698,445 Google searches



168 million+ emails sent



1,820TB of data created



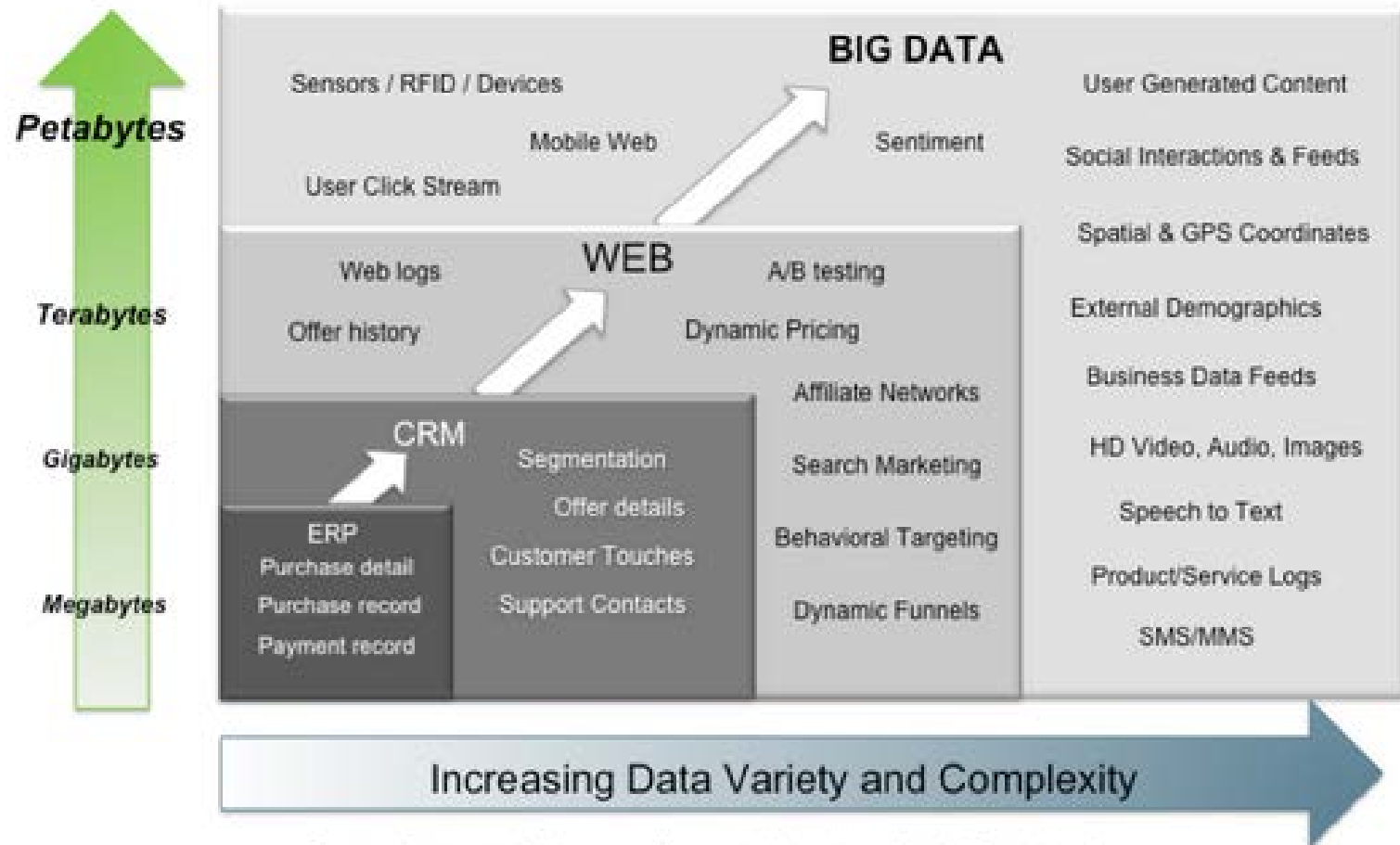
217 new mobile web users



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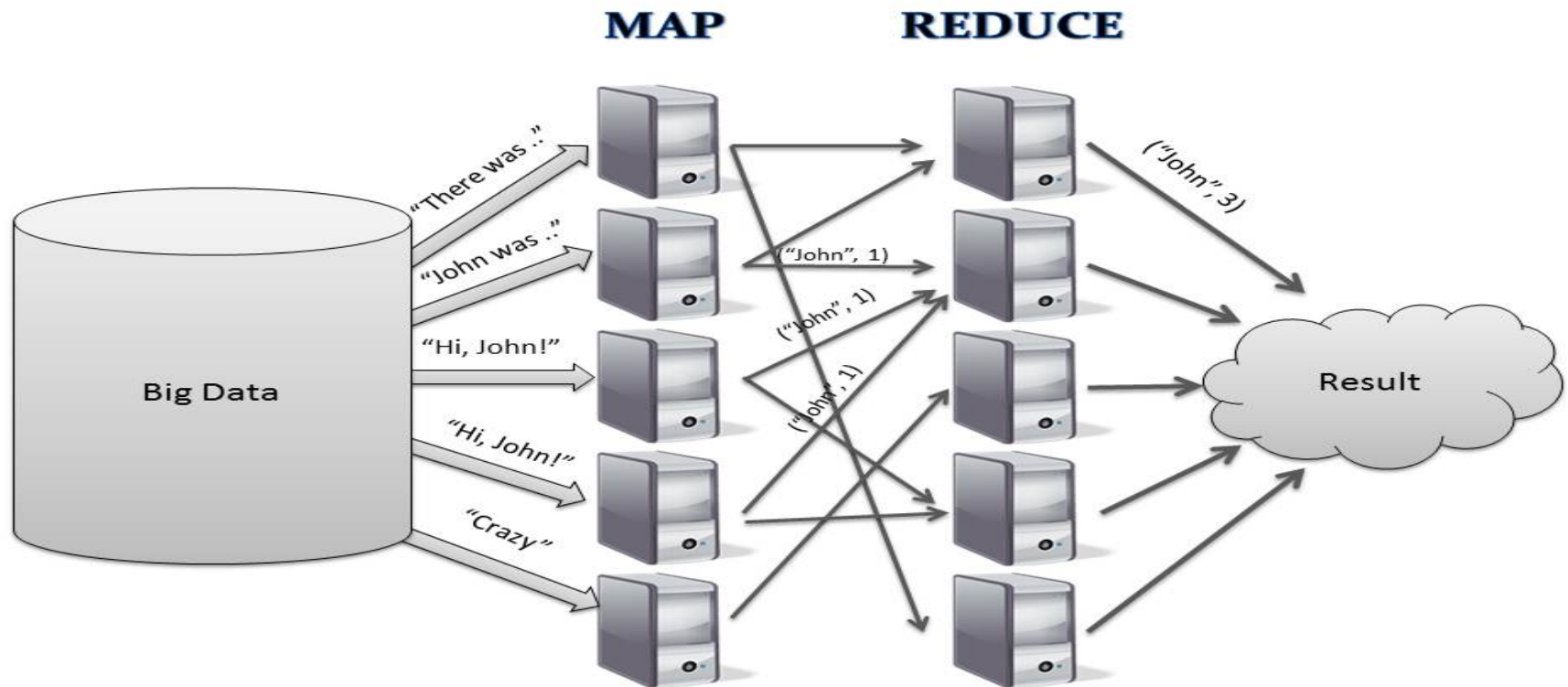


Big Data = Transactions + Interactions + Observations

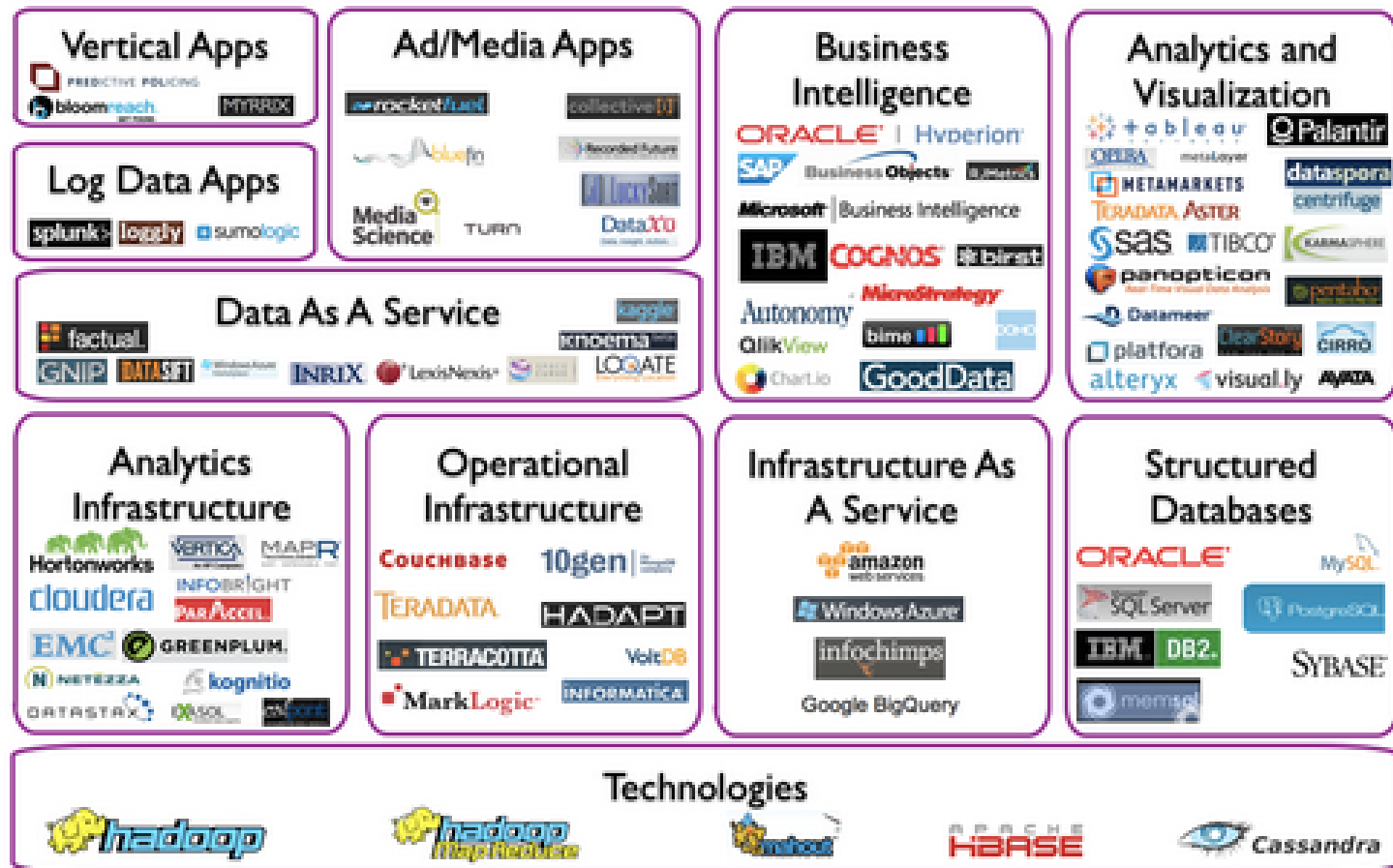


Source: Contents of above graphic created in partnership with Teradata, Inc.

Map Reduce



Big Data Landscape



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blogs.forbes.com/davefeinleib

Big data—a growing torrent

\$600 to buy a disk drive that can store all of the world's music

5 billion mobile phones in use in 2010

30 billion pieces of content shared on Facebook every month

40% projected growth in global data generated per year vs. **5%** growth in global IT spending

235 terabytes data collected by the US Library of Congress by April 2011

15 out of 17 sectors in the United States have more data stored per company than the US Library of Congress



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Big data—capturing its value

\$300 billion

potential annual value to US health care—more than double the total annual health care spending in Spain

€250 billion

potential annual value to Europe's public sector administration—more than GDP of Greece

\$600 billion

potential annual consumer surplus from using personal location data globally

60% potential increase in retailers' operating margins possible with big data

140,000–190,000

more deep analytical talent positions, and

1.5 million

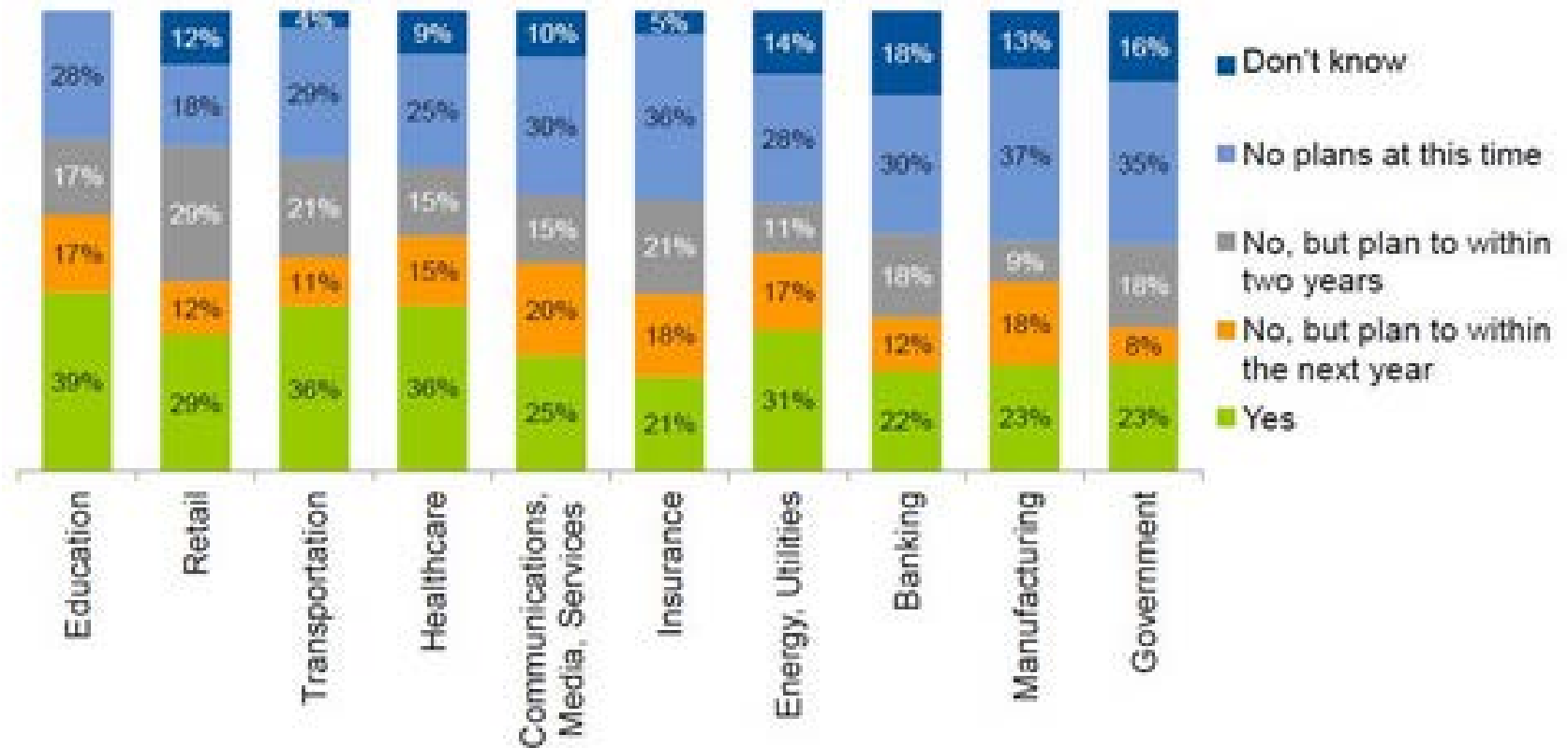
more data-savvy managers needed to take full advantage of big data in the United States



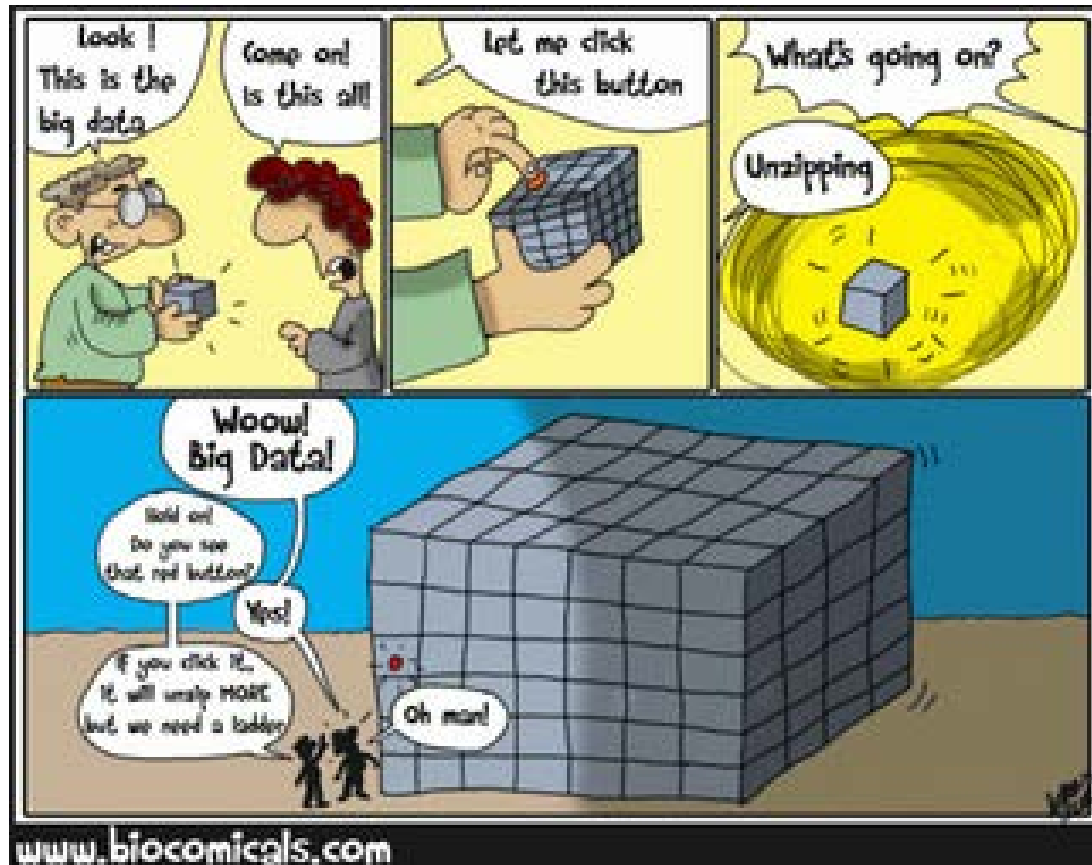
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Big Data Investments by Industry

Has your organization already invested in technology specifically designed to address the big data challenge?

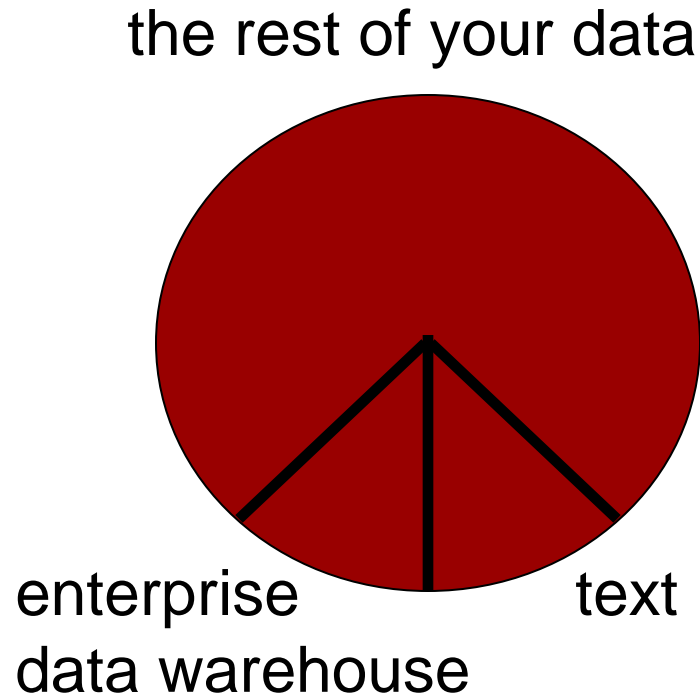


Source: Gartner (July 2012)



Where do we keep it?

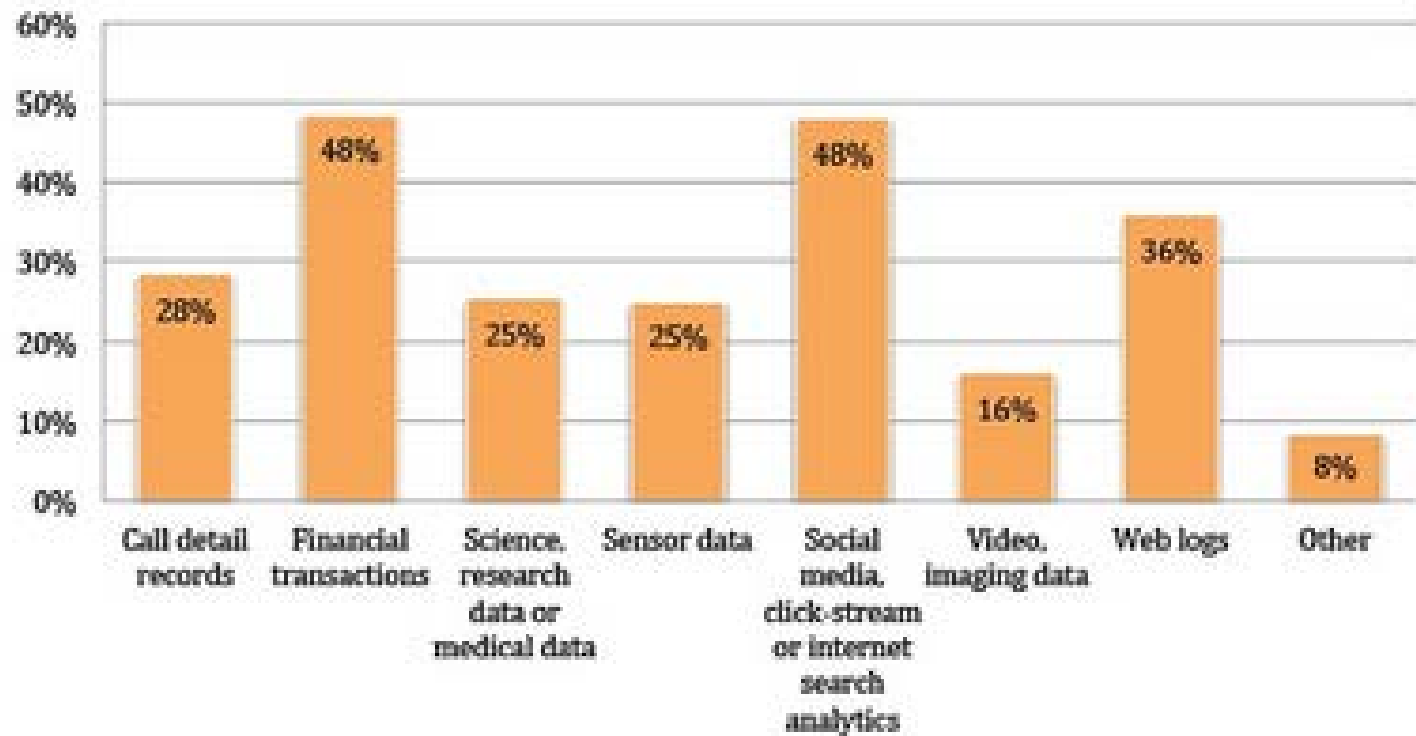
The World of Data Integration

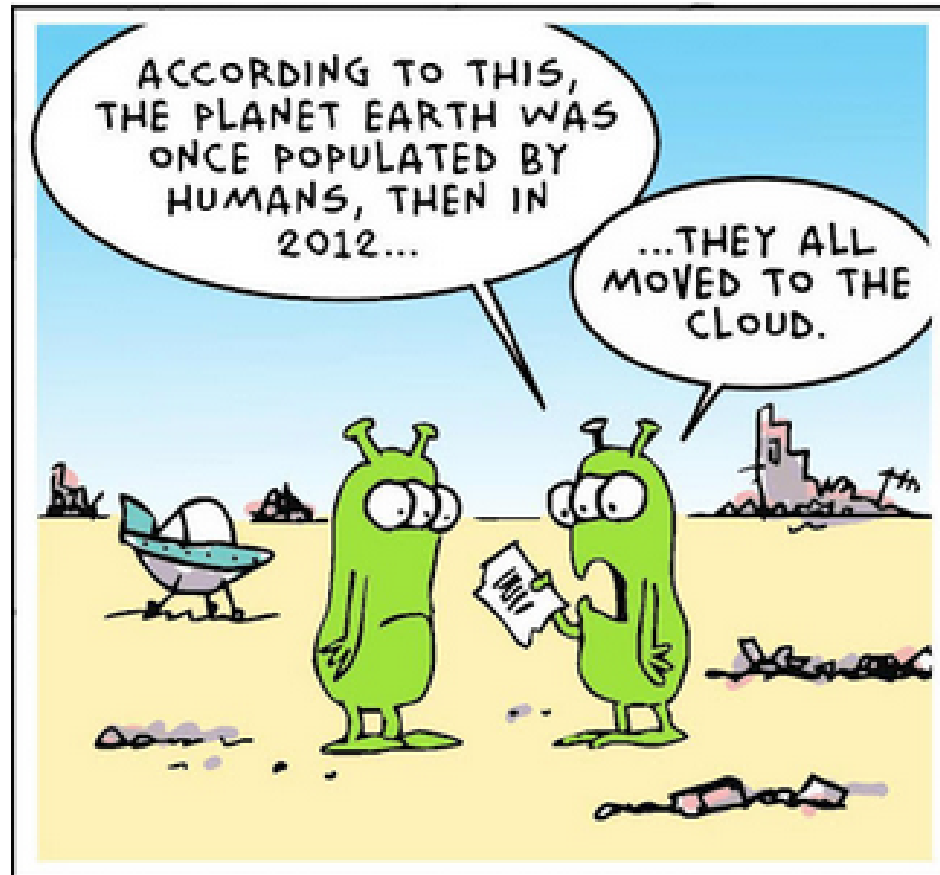


Big Data Ecosystem



Figure 7: Which applications are driving big data needs at your organization? (multiple responses)





examples

MARKETING

Table 2: The Best-in-Class PACE Framework

Pressures	Actions	Capabilities	Enablers
<ul style="list-style-type: none"> Need to deliver higher quality sales leads Pressure to deliver ROI on marketing spend 	<ul style="list-style-type: none"> Gain insight into effectiveness of specific marketing campaigns and channels Improve the targeting of marketing offers to optimize marketing ROI Optimize marketing activities at each touch-point along the customer lifecycle 	<ul style="list-style-type: none"> Track, measure and report on all marketing campaign results Key Performance Indicators (KPIs) are defined to track overall marketing performance Process to test effectiveness of campaign content Executive support of using customer analytics in marketing programs Defined process to disseminate knowledge on marketing campaigns to key decision makers/stakeholders Dedicated staff to collect and manage all campaign/resource data 	<ul style="list-style-type: none"> Website visitor tracking Web analytics Lead management solution Marketing content / asset management CMO dashboard Lead scoring Marketing automation Revenue performance management

Source: Aberdeen Group, July 2011

Table 3: The Competitive Framework

	Best-in-Class	Average	Laggards
Process	Process to test effectiveness of campaign content		
	64%	42%	25%
	Defined process to disseminate knowledge on marketing campaigns to key decision makers/stakeholders		
	59%	40%	22%
Organization	Dedicated staff to collect and manage all campaign/resource data		
	73%	64%	45%
	Executive support of using customer analytics in marketing programs		
	59%	52%	36%
Knowledge	Track, measure and report on all marketing campaign results		
	82%	57%	38%
	Single repository for all marketing campaign and program information		
	48%	38%	27%



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	Best-in-Class	Average	Laggards
Enabling Technology or Service	<ul style="list-style-type: none"> ▪ 86% Website visitor tracking ▪ 82% Web analytics ▪ 73% Dashboards ▪ 64% Lead management ▪ 59% Marketing content / asset management ▪ 52% Revenue performance management 	<ul style="list-style-type: none"> ▪ 77% Website visitor tracking ▪ 68% Web analytics ▪ 64% Dashboards ▪ 59% Lead management ▪ 35% Marketing content / asset management ▪ 43% Revenue performance management 	<ul style="list-style-type: none"> ▪ 68% Website visitor tracking ▪ 58% Web analytics ▪ 44% Dashboards ▪ 45% Lead management ▪ 29% Marketing content / asset management ▪ 39% Revenue performance management
Performance	Key Performance Indicators (KPIs) are defined to track overall marketing performance		
	64%	45%	27%
	Ability to identify which marketing channels drive offline sales		
	45%	25%	18%

Source: Aberdeen Group, July 2011

Biggest challenges to use of "big data" for marketing



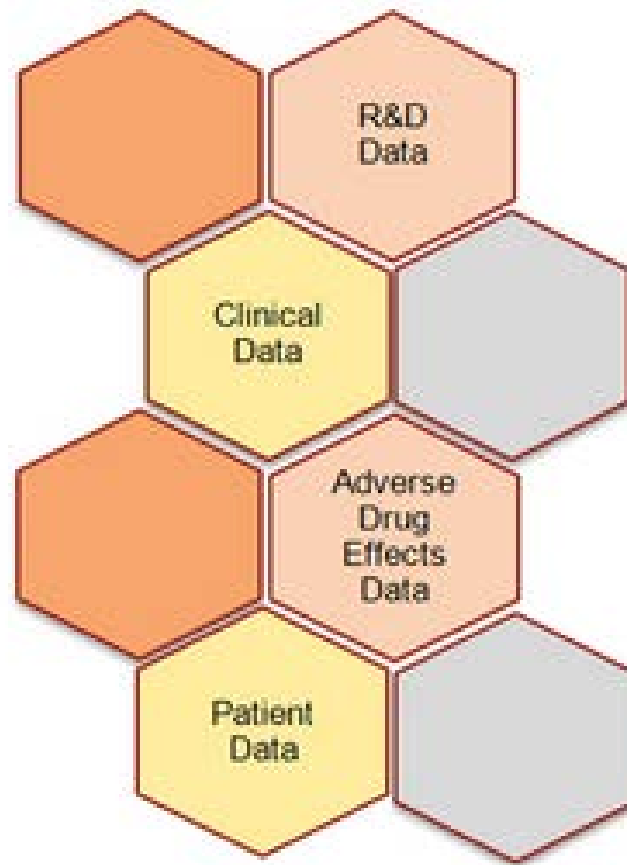
Marketing ROI in the Era of Big Data:

The 2012 BRITENYAMA Marketing in Transition Study

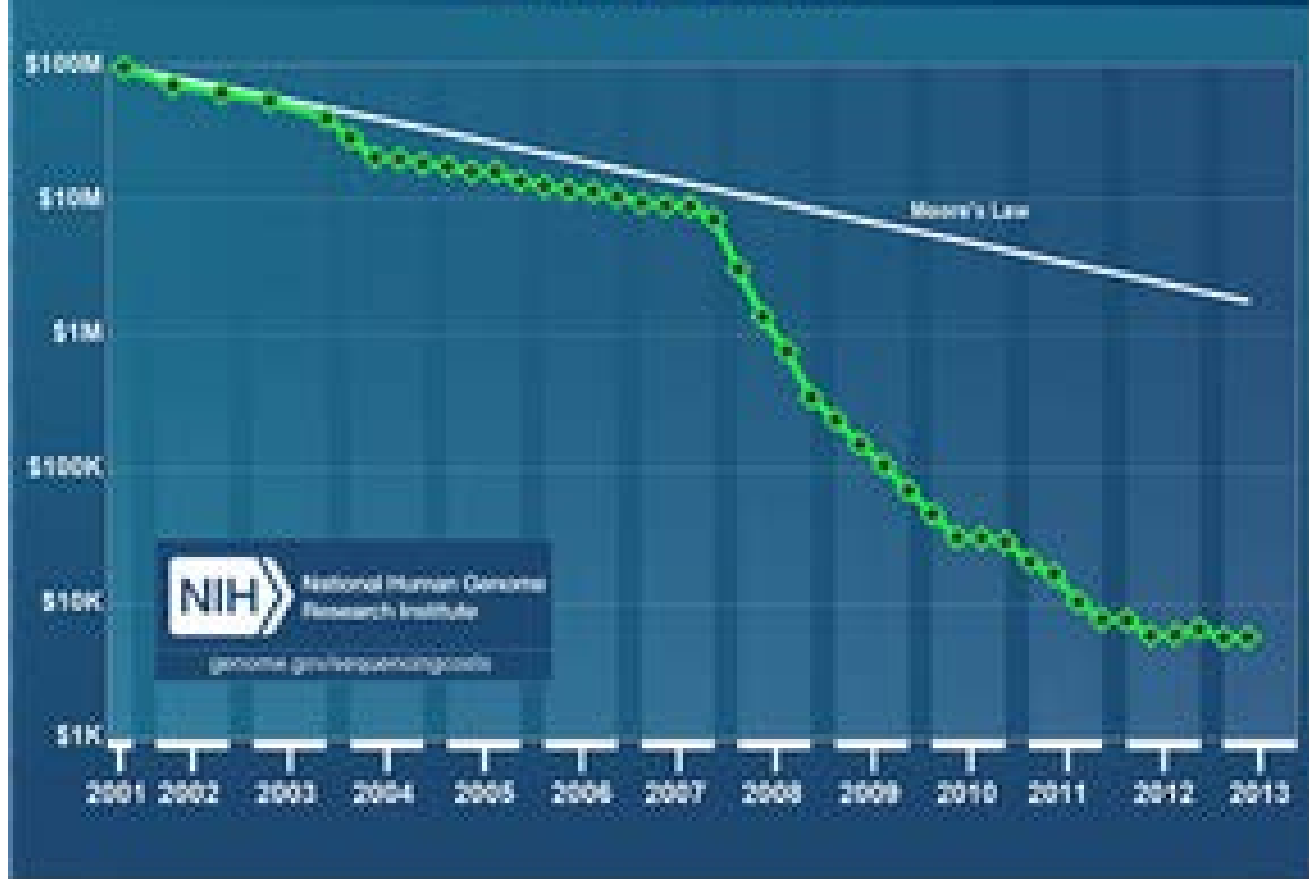


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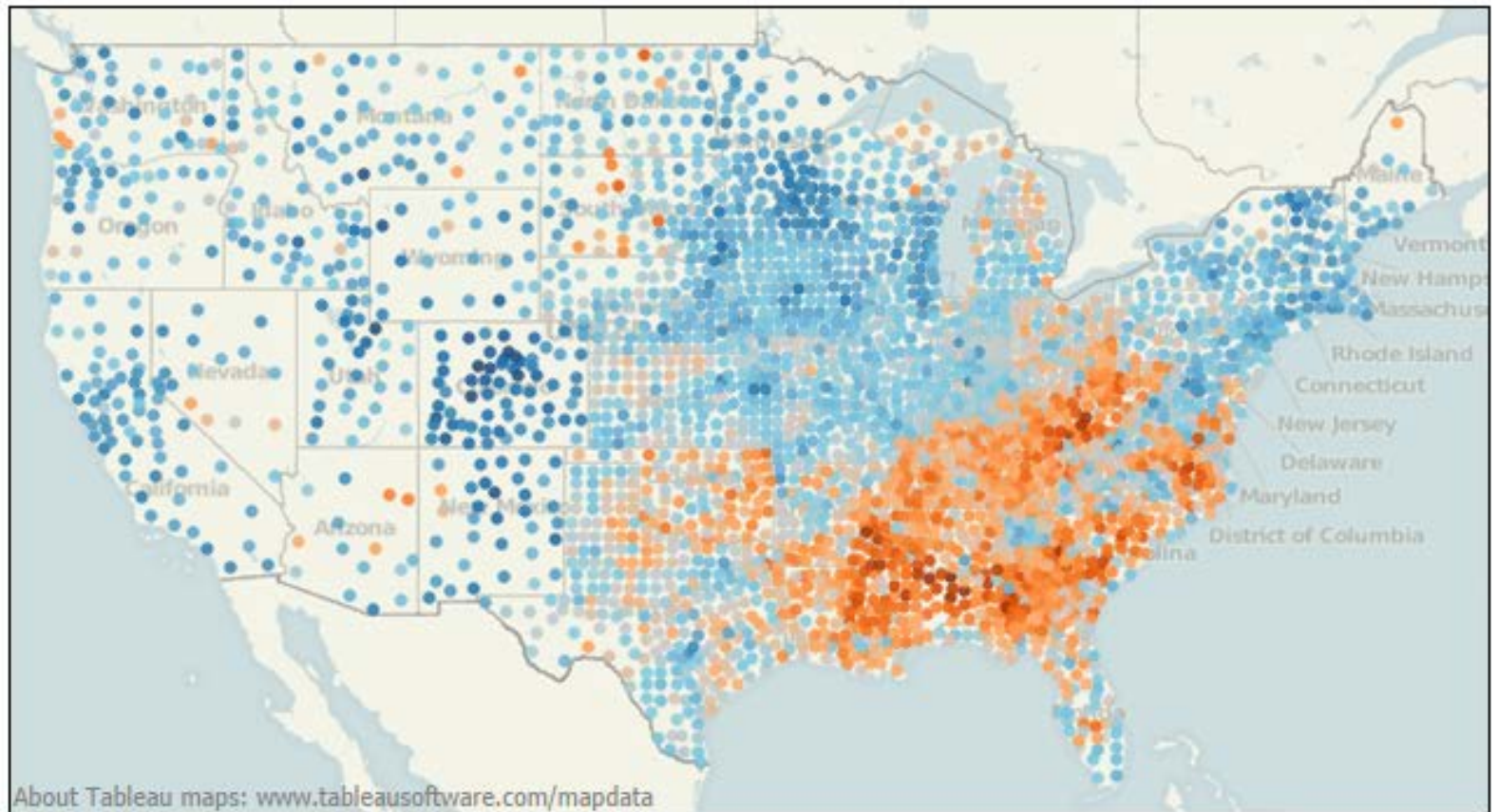
LIFE SCIENCE



Cost per Genome



The Geography of Diabetes



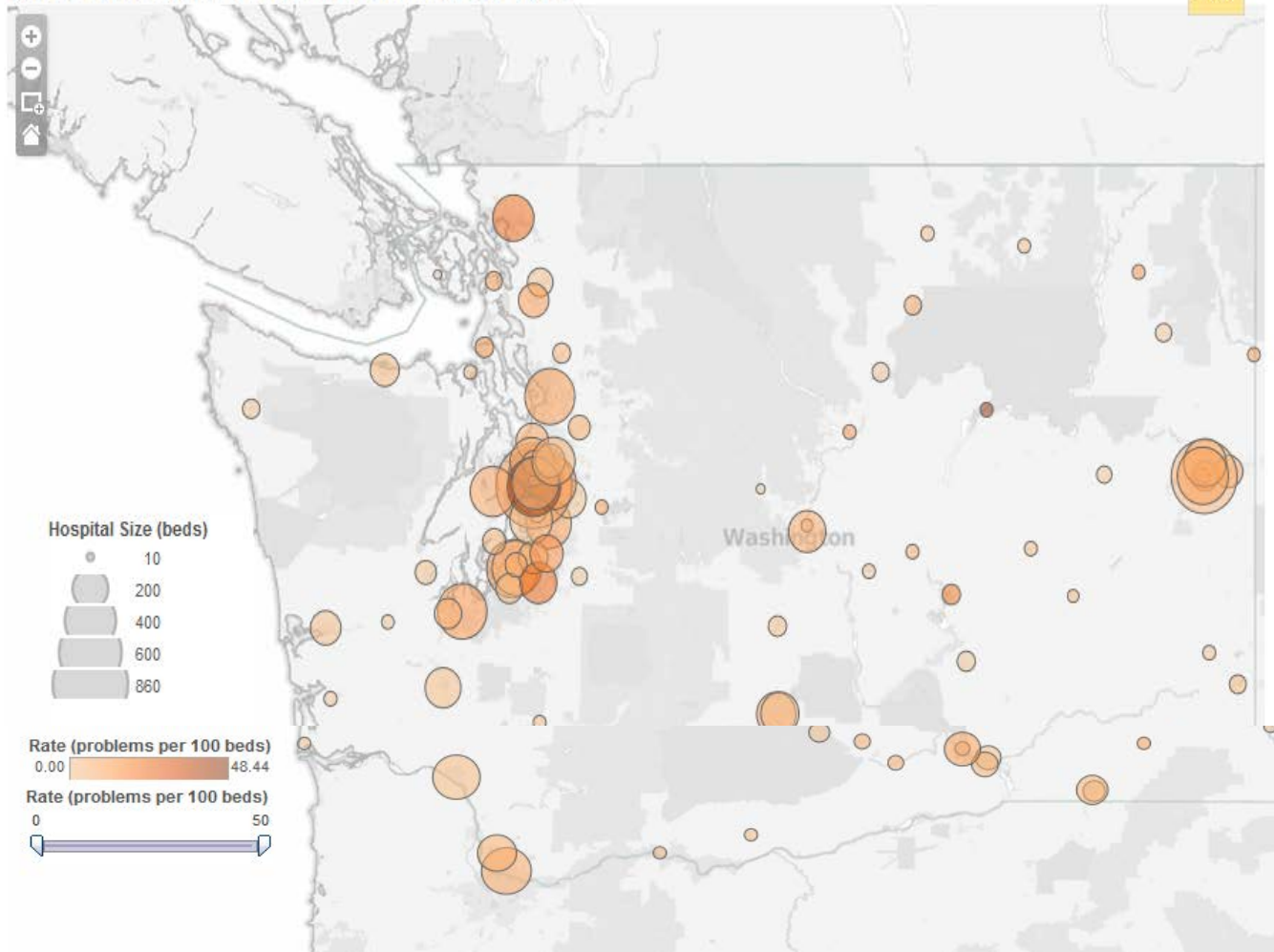
Hospital Map

Interactive Tables

Interactive Chart

Safety Problems at Washington Hospitals, 2006-2012

Help

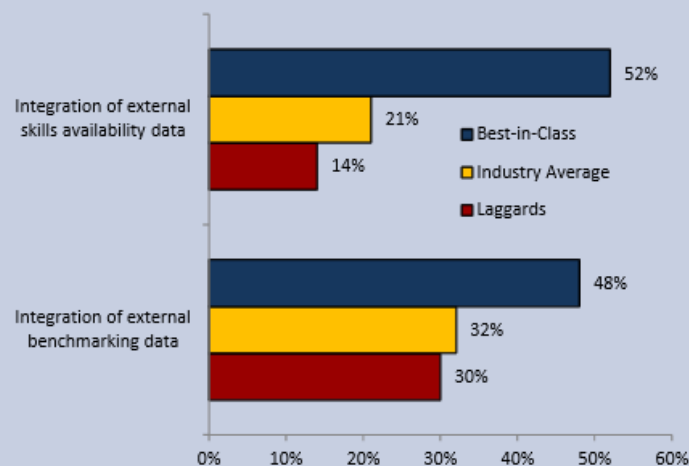


WORKFORCE

Aberdeen Insights — Strategy

Best-in-Class companies owe much of their success in workforce analytics and planning to their ability to integrate data in order to provide a more complete and coherent picture. This competence in integration - combined with a passion to over-perform - leads more Best-in-Class organizations than others to include external data in their analysis (Figure 5).

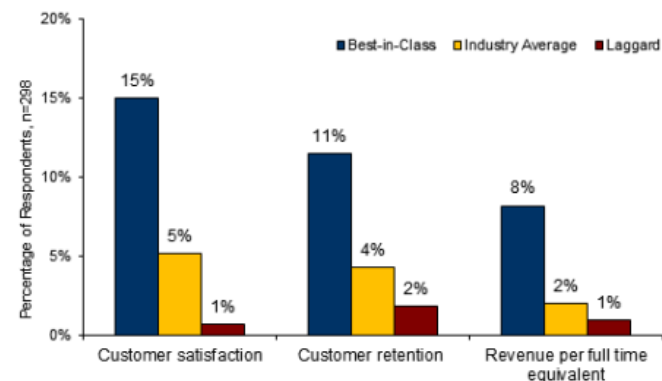
Figure 5: Integration of External Data



Fast Facts

- ✓ 46% of Best-in-Class organizations have been using HCM analytics for at least five years
- ✓ Only 35% of other survey respondents have the same level of experience

Figure 3: Business Impact of Best-in-Class HCM



Source: Aberdeen Group, December 2011

Making the Pay Gap Look Good

What's the gender salary gap in *your* job?

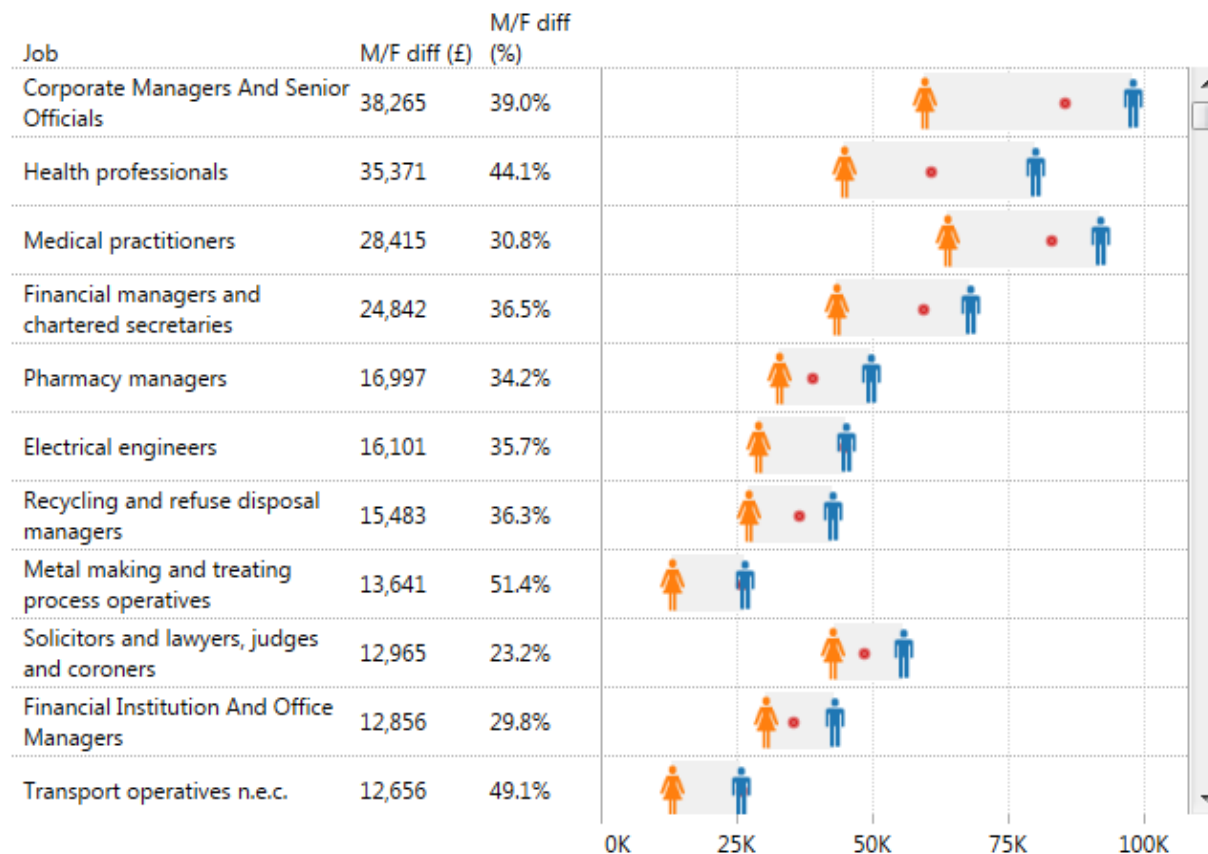
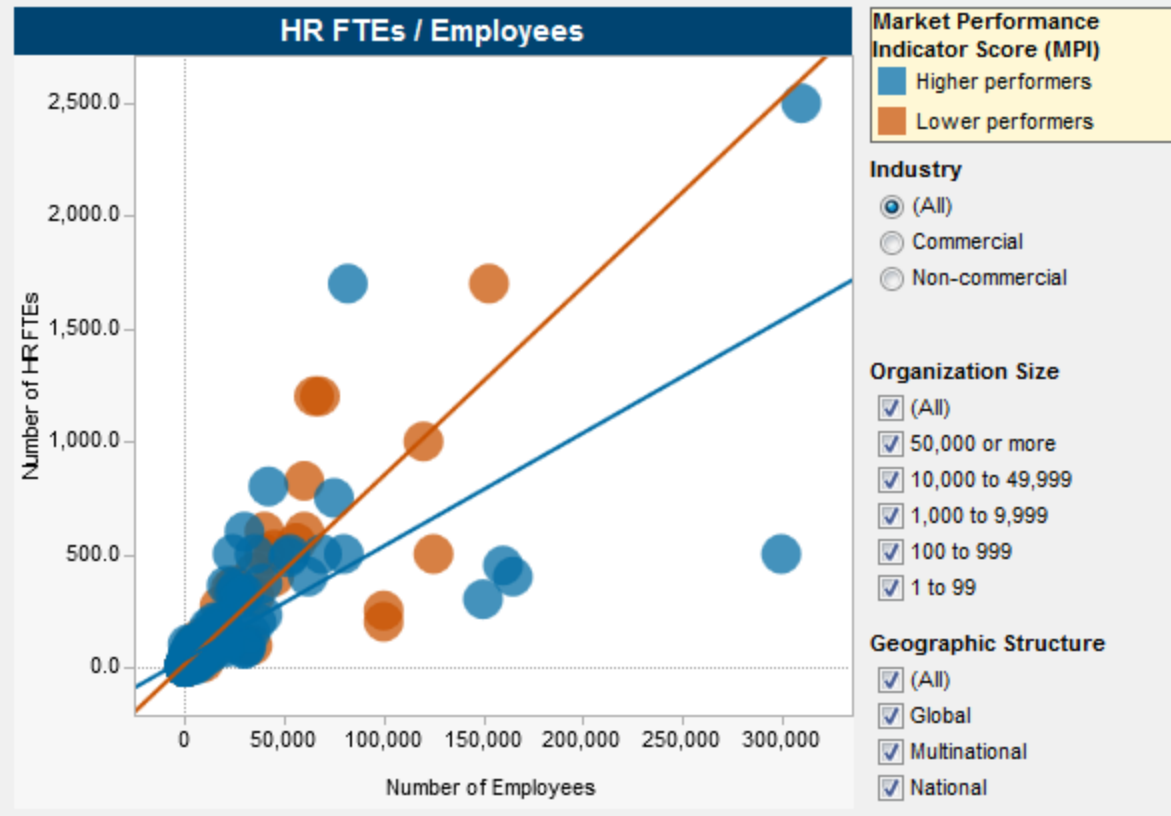


Chart shows median salaries for full-time employees on adult rates who have been in the same job for more than a year. The source data indicates that some values are more reliable than others (by means of calculating the coefficient of variation).

Source: Annual Survey of Hours and Earnings, Office for National Statistics.

HR FTEs / Number of Employees Ratio Dashboard (Outliers removed)



Ratio		
Higher performers	1.97 HR FTEs per 100 (1 for every 50.8 employees)	1.97
Lower performers	1.81 HR FTEs per 100 (1 for every 55.4 employees)	1.81

Enterprise Data Management for HR

72% companies find data management for HR important but only 25% have the necessary data management capabilities



Source: SAP EIM Performance Benchmarking 2012

• THE PROBLEM •

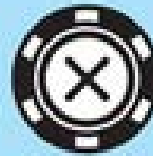


• BIG DATA SAYS •



PAY GRIPEs

Casino operator Caesars wants to know how much to pay prized employees to keep them from jumping ship.



GENEROSITY DOESN'T PAY

Increasing employee pay to the midpoint of what peers are paid is as effective as paying 10% above the midpoint.



QUICK EXITS

Printer and services company Xerox finds too many call-center workers quit soon after they're trained.



IGNORE THE RÉSUMÉ

Candidates' experience makes little difference to churn; but inquisitiveness, turned up by personality tests, can be a negative.



SICK TIME

Waste-disposal firm Richfield Management wants to screen for applicants most likely to get hurt on the job and stay out of work longest.



FOCUS ON ALCOHOL

Test applicants on attitudes toward drugs and alcohol with questions like, 'In the past four years I have not driven after I've been drinking.'



Big Data – Terms and Components

- Seven Definitions:
- <http://timoelliott.com/blog/2013/07/7-definitions-of-big-data-you-should-know-about.html>
- <http://data-informed.com/glossary-of-big-data-terms/>

