

The Value of Signal (and the Cost of Noise)

The New Economics of Meaning-Making

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Executive Summary

Nearly every aspect of our daily lives generates a digital footprint. From mobile phones and social media to inventory look-ups and online purchases, we collect more data about processes, people and things than ever before. Winning companies are able to create business value by building a richer understanding of customers, products, employees and partners – extracting business meaning from this torrent of data. The business stakes of “meaning-making” simply could not be higher.

It's a new era in business,
one in which growth will be
driven as much by insight
and foresight as by physical
products and assets.

To level-set this concept, we conducted primary research, including direct interviews with executives, to understand how business analytics is being applied to uncover new revenue sources and to reduce costs. The 300 companies we surveyed told us they achieved a total economic benefit of roughly \$766 billion over the past year based on their use of business analytics. Among those that participated in our research, investment in business analytics yielded an average 8.4% increase in revenues and an average 8.1% improvement in cost reduction in the previous fiscal year. Companies that generated the most value from business analytics expect to grow revenue faster and reduce costs more aggressively.

Leading companies also clearly recognize that success means winning the battle for talent with business analytics skills. Many companies – perhaps most – are missing the opportunity for significant economic benefit. If the companies we surveyed were to begin deploying best practices in analytics, we estimate they could create \$853 billion of value within the next 12 months.

It's a new era in business, one in which growth will be driven as much by insight and foresight as by physical products and assets. Importantly, as our research demonstrates, a roadmap for success is beginning to emerge.



From Business Data to Business Meaning: An Algorithm for Disruption

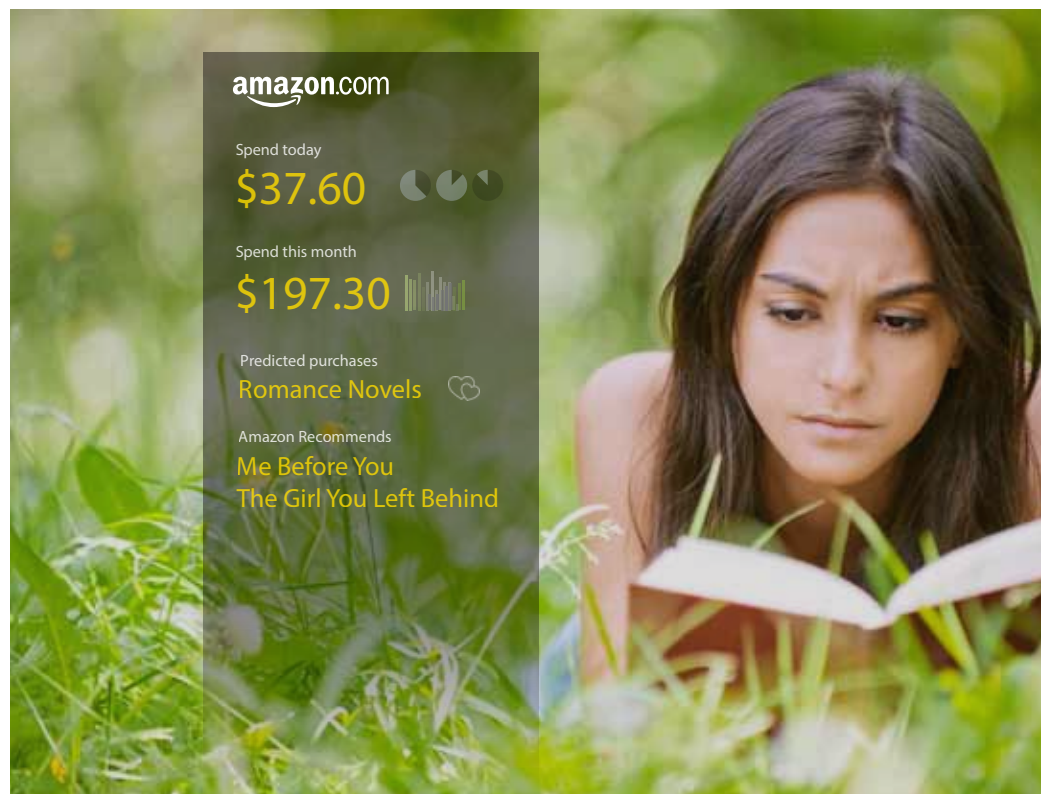
Big data is a big deal. You can't walk through an airport or train station without seeing magazine racks crammed with business publications touting the latest and greatest ways to create value from the ever-growing pools of information coursing through business. Software companies and consulting firms breathlessly pitch their newest magic tool to convert the zeros and ones of the digital world into fast-accumulating dollars, euros, rupees or pounds. It sounds promising, but it's not that simple, and the path forward is only starting to crystallize.

Some of the confusion is self-induced. The sheer volume of data generated by devices – smartphones, tablets and now wearables – can be overwhelming. For example:

- Global mobile data traffic reached 885 petabytes per month at the end of 2012, up from 520 petabytes per month at the end of 2011.¹
- In 2015, global IP traffic will reach 1.0 zettabytes per year, or 83.8 exabytes per month, and by 2017, global IP traffic will reach 1.4 zettabytes per year, or 120.6 exabytes per month.²
- Every day, we create 2.5 quintillion bytes of data – so much that 90% of the bits and bytes that exist today were created in only the past two years.³

And so on.

The reality is that today's digital age – compared with last century's industrial age – can be distinguished largely by our unprecedented ability to make business meaning from massive amounts of data. If you aren't "doing" big data, the story goes, you're in trouble, and terrible things will happen. But what does that mean, exactly? Are there tangible economic business impacts to conducting business analytics well (or not so well), or is big data merely the latest fad?



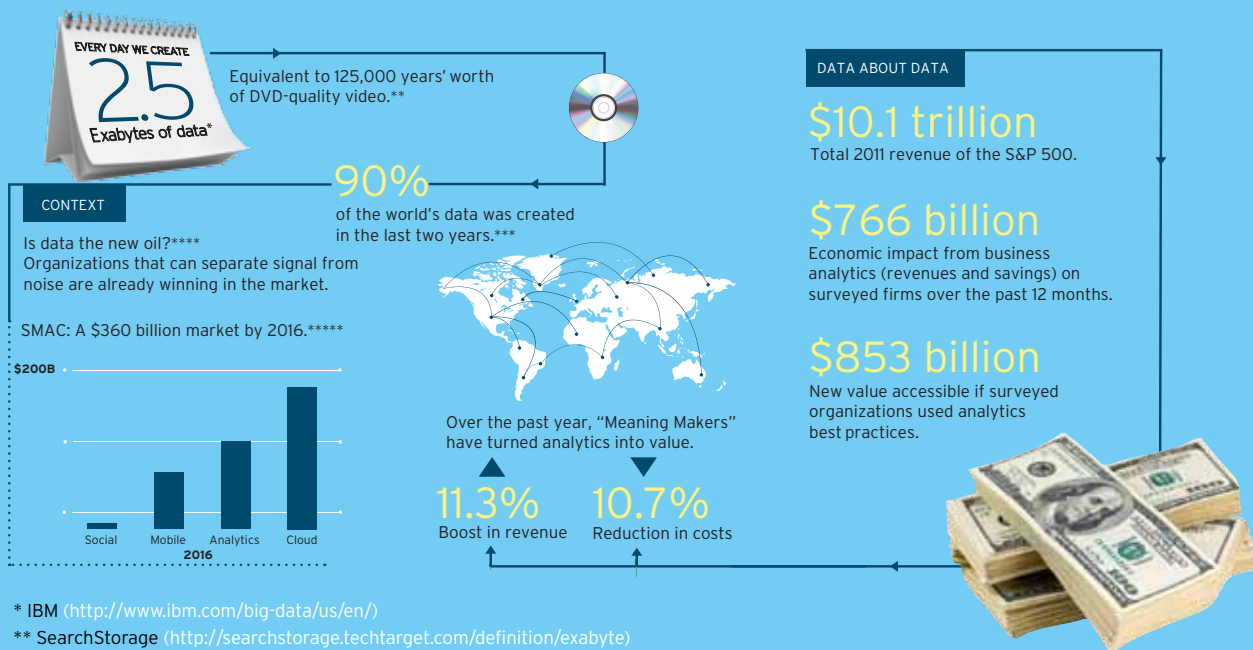
Our view is that understanding and applying data and insights from customers, partners and employees is already becoming a source of incredible competitive advantage. Companies such as Google, Pandora, Netflix, Amazon and many others are winning decisively in their markets because of their refined ability to mine insight from the digital information surrounding people, organizations and devices. This data – what we call Code Halos™ – accompanies people, organizations and devices and, when properly harnessed, contains a treasure trove of business value.⁴

But can we actually quantify how much value can be created by making meaning based on the sheer volume of data? To find out – and develop a better understanding of the real-world value of business analytics and Code Halos – we teamed with Oxford Economics and futurist Thornton May to survey 300 businesses and conduct dozens of interviews with representatives from multiple industries, including insurance, banking and financial services, healthcare, life sciences, technology, consumer goods/retail, manufacturing and communications/information/media/entertainment (CIME), across the U.S., the UK, Germany and France. (For a complete methodology, see page 30.)

We've concluded that the business stakes simply could not be higher (see Figure 1).

- **Business analytics contributes a huge percentage to a business's total value.** Companies we surveyed collected a combined total of roughly \$766 billion in economic benefits over the past year (including roughly \$399 billion in increased revenue and \$367 billion in cost reductions) as a result of their business analytics activities.
- **Companies are leaving billions on the table.** If the surveyed companies used all the analytics techniques currently available, respondents estimate they could release an additional 11.9% of economic value in the next 12 months. That's an additional \$91 billion compared with the returns expected if they maintained their existing investment plans.

The New Economics of Meaning-Making



* IBM (<http://www.ibm.com/big-data/us/en/>)

** SearchStorage (<http://searchstorage.techtarget.com/definition/exabyte/>)

*** Science Daily (<http://www.sciencedaily.com/releases/2013/05/130522085217.htm>)

**** Forbes (<http://www.forbes.com/sites/perryrotella/2012/04/02/is-data-the-new-oil/>)

***** Cognizant compilation of industry reports.

All other data is from the Cognizant/Oxford Economics study.

Figure 1

- **Some \$2.61 trillion could be unlocked in just four key markets.** If companies in banking, insurance, manufacturing and CIME deployed all best-in-class tactics, the overall gross value generated in just these markets would total an estimated \$2.61 trillion per year, 8.0% more than what is currently being extracted.

A healthy dose of skepticism is never a bad thing, but anyone who ignores the possibilities in play will miss one of the major stories of our time. While these projected impacts may seem enormous, they are well in line with other estimates. In 2012, McKinsey found that the application of analytics in the U.S. healthcare system alone could potentially unlock over \$300 billion in new value annually, of which over two-thirds (i.e., over \$200 billion) would be in the form of reductions to national healthcare expenditures.⁵ In fact, the results of our own analysis may well be conservative in comparison with this estimate.⁶

Don't 'Just Do Analytics;' Make Real Business Meaning

In our common business vernacular, “analytics” sometimes gets a bad rap. It’s taken on a mysterious quality – almost as if it’s handled by robe-wearing Druids – and often creates more business questions (and spreadsheets) than answers.

No data set will ever hold complete answers to every business question. But the key to cracking the code of business analytics is to find the story in the bits and bytes, and derive tangible, actionable business meaning.

Thomas Davenport – President’s Distinguished Professor in Management and Information Technology at Babson College, author and one of the leading thinkers in business and technology – has discussed the great divide between a flood of data and an informed business decision. He applies the term “business analytics” to encompass the tools, techniques, goals, analytics processes and business strategies used to transform data into actionable insights for business problem-solving and competitive advantage.⁷

“Meaning-making” is what organizations do when they convert information and data into useful business insights to improve operational results. Deciding what the data means is an essential element of the process of business analytics. According to our research, leaders believe that doing this well can help them outpace their competitors.

No data set will ever hold complete answers to every business question. But the key to cracking the code of business analytics is to find the story in the bits and bytes, and derive tangible, actionable business insight. The data – however it is derived, analyzed and communicated – must tell a meaningful story, and that narrative should matter to a real-life decision-maker. The story – and the business decisions it drives – is what making meaning is all about.



To put this into a real-world business context, consider how selling really works. Every person who ever sold anything started by getting to know the problem a potential customer was trying to solve. The Fuller Brush salespeople in mid-1900s America didn’t have smartphones or CRM systems.⁸ They traveled around and built personal relationships to understand how their company’s products could solve their customers’ cleaning problems. They understood what types of products clients might need, when they needed it and what they could pay. This seems rather quaint now, but they were effectively running their business with the tools at hand – mostly in their Rolodexes and in their heads.⁹

Fast-forward to today. The San Francisco Giants are pioneering the use of sophisticated analytics to develop a model for dynamic ticket pricing that changes as

audience demand for a particular game grows or shrinks. The Giants are scoring big with this strategy. They have sold out more than 230 straight games by using analytics to price tickets at market value. This use of analytics “has added tens of millions of dollars to our bottom line,” says Bill Schlough, the team’s CIO.

Dynamic ticket pricing may fill seats, but the Giants are not just aiming at customer wallets. They are also innovating by using social technologies – including a wired stadium and a social media café – to create a more intimate connection with a huge, and growing, fan base.¹⁰

Similar to the Fuller Brush sales team from decades ago, the Giants are developing a heightened level of customer intimacy to drive business results, and it’s all based on business analytics, emerging technologies and meaning-making.

Separating Signal from Noise Will Be Next Decade’s Killer Business Skill

Companies have applied some form of sales analytics forever, so what’s new? Social tools, mobile devices, analytics and cloud-enabled solutions – also known as the SMAC Stack™ – are helping to reform the buying experience for customers. When properly harnessed, these tools, data and algorithms supplement – not replace – our own human judgment to deliver knowledge, insight and an enriched customer experience. This works where people, processes and technologies intersect in a way to help distinguish business-critical insights from the cacophony of noise.¹¹

We all know that scanning a bar code at the cash register generates a stream of data. But data is also spawned by the rapid rotations of an electric turbine or a curveball thrown by a Major League pitcher or a driver’s acceleration profile on an expressway. For many companies, how to distinguish “signal” (the critical insight) from “noise” (the massive amount of unmanaged data) to distill wisdom remains a fundamental challenge – and a significant opportunity for the future.

“Big data has been with us forever,” explains Randy Krotowski, vice-president in the global information services division of Caterpillar, Inc. “The big change is that we are now instrumenting more things, so we are getting data from more stuff,” whether from a cell tower, a package, an assembly line or a credit card reader.

This same idea – that business analytics drives meaning-making – is playing out in multiple enterprise processes. As organizations grow more complex and tightly integrated, their ability to pan nuggets of real knowledge from rivers of data can transform the way they develop their strategic thinking, schedule preventative maintenance of plants and equipment, modify their supply chains, and improve the way they design and go to market with new products and services.

The economic benefits created by these investments can now be quantified. In the previous financial year, survey respondents’ analytics investments yielded an average 8.4% increase in revenues and 8.1% improvement in cost reductions.

In a broader sense, we found that true leaders in analytics have decided that meaning-making isn’t just a part of their strategy – it is their strategy. Or as Jack Levis, director of process management at United Parcel Service puts it, “We used to be a trucking company with technology. Now we are a technology company with trucks.”

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Wise Organizations Are Winning their Markets

To understand the results achieved by “cutting-edge” practitioners of business analytics, we sought to separate the high-performers – companies we call “Meaning Makers” – from the rest of the pack.

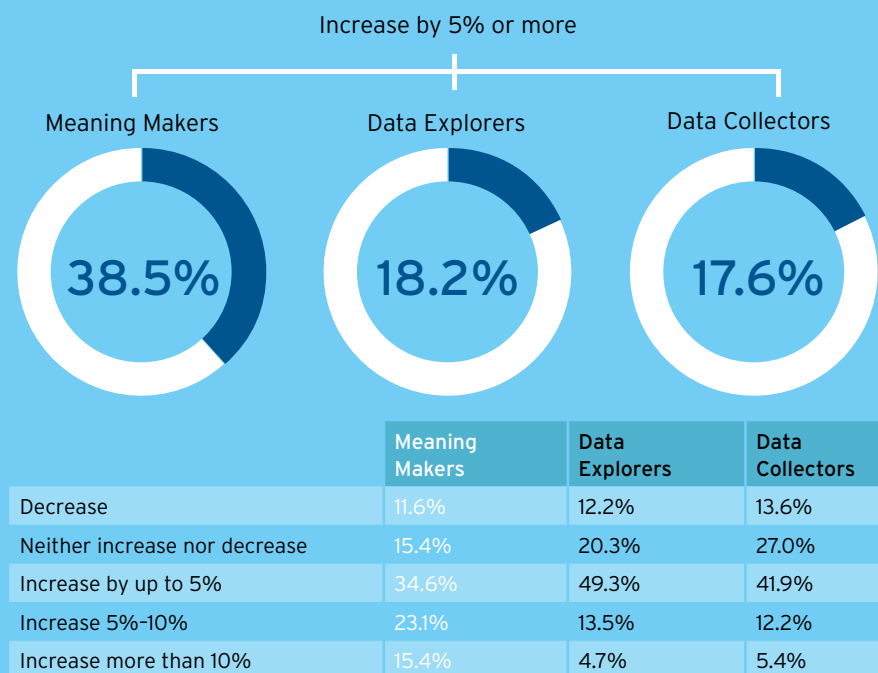
Meaning Makers, in our view, integrate business analytics more effectively into their daily work, are more effective at using analytics tools, create well-defined teams that focus on wringing value from data, and derive value in at least five of 10 key areas (ranging from basic financial reporting to sophisticated predictive modeling). These businesses also believe they are ahead of their industry peers in using data analysis.

In our survey, we identified 78 of 300 companies (26%) we consider to be Meaning Makers. We also identified “Data Collectors” – those that lag significantly behind industry leaders (24%). The remaining 50% – “Data Explorers” – are companies in the middle of the pack.

The implications for revenue growth across the different groups are striking (see Figure 2):

‘Meaning Makers’ Anticipate Outsized Revenue Gains

Estimated average annual revenue growth over the next 24 months.



Response base: 300

Prepared for Cognizant by Oxford Economics, March 2013

(Percent of respondents)

Figure 2

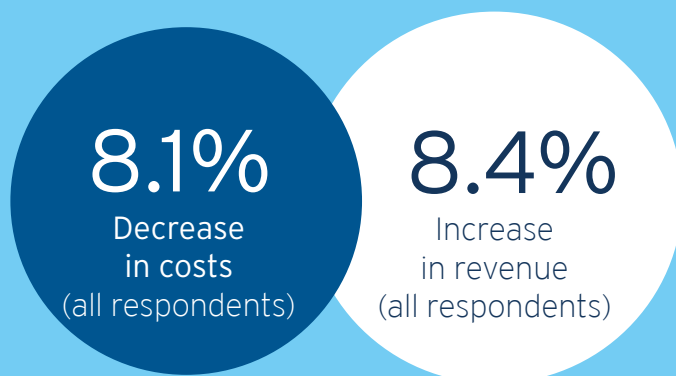
- **Meaning Makers anticipate outsized revenue gains.** In fact, over the next two years, 15% of Meaning Makers expect to see revenue growth of more than 10% (about three times more than average expectations).
- **Data Explorers expect solid growth but miss the potential upside.** Nearly half (49%) of these companies and 42% of Data Collectors anticipate a revenue growth rate of up to 5% over the next 24 months. But 15% of Meaning Makers anticipate sustained growth of greater than 10%, three times the rate of the other groups.
- **Data Collectors are missing this shift point (and paying for it).** Companies that lack capabilities in business analytics now have to face lower expectations. Only about 18% of Data Collectors anticipate revenue growth of 5% or more over the next two years (compared with 39% of Meaning Makers).

Business Analytics Drives Cost Containment and Revenue Growth

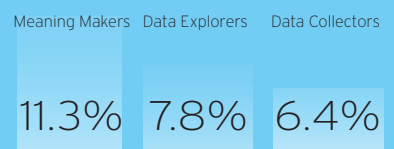
Some companies create value primarily by managing and manipulating data and information (such as banking, insurance, CIME, etc.). Others heavily rely on

Business Analytics' Impact on Top and Bottom Line

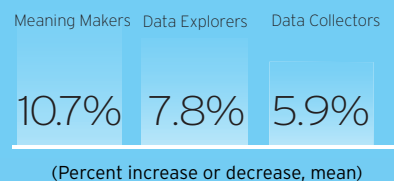
Estimated percentage impact of business analytics on revenue and costs over the last financial year.



Increased revenue



Decreased costs



	Insurance	Banking/ Financial Services	Life Sciences	Healthcare (payers and providers)	Communications/ Information/ Media and Entertainment	Technology	Consumer Goods/ Retail	Manufacturing
Increase in revenue	9.5%	10.0%	7.3%	7.7%	9.5%	6.9%	6.6%	9.2%
Decrease in costs	8.8%	10.1%	8.2%	7.3%	8.2%	7.3%	6.0%	8.9%

Response base: 300

Prepared for Cognizant by Oxford Economics, March 2013

(Percent increase or decrease, mean)

Figure 3



physical assets (manufacturing, automotive, shipping, retail, etc.). It's enticing to look at companies in the first category – which arguably should have an advantage in conducting advanced business analytics because they are built on digits – and conclude that their use of analytics tools and techniques would result in greater economic impact. But this did not turn out to be the case (see Figure 3).

- **Banking, financial services and insurance companies generate the most value.** Decision-makers in banking already clearly recognize the value potential from business analytics. Companies in the banking and financial sectors indicate that 10% of revenue and 10.1% of costs are directly affected by how well they make meaning from the business information available to them. Insurance is close behind in terms of the total economic impact resulting from the use of business analytics.
- **Heavy machines don't inhibit competing on meaning.** Perhaps counter-intuitively, manufacturing companies generate significant value by employing business analytics. Manufacturers say they use business analytics to grow revenue by improving sales, inform new product and service development, and carry out financial planning and reporting. Quite logically, 34% of manufacturing companies said they achieve significant cost savings by making meaning around their manufacturing processes.

When it comes to deriving value from meaning-making, the real action happens deep inside the business where the heavy lifting is done. It happens in line with core business processes.

- **Consumer goods and retail lag other sectors.** With only 6.6% of revenue and 6% of costs affected by business analytics, the retail and consumer goods space seems to offer a particularly ripe opportunity to create value. It's clear that front-runners in these sectors should take meaningful steps to catch up with other industries (many of which, such as banking and insurance, are more highly regulated).
- **Life sciences and CIME are out of balance.** Most industry sectors seem to have taken a balanced approach to making meaning to drive both revenue and cost savings. Life sciences and CIME show the biggest variance. CIME, in particular, has almost a 1.3% variance between revenue and cost savings benefits – several times the difference of other sectors. It's likely that both industries have an opportunity to balance their use of business analytics to create economic impact.
- **Meaning Makers are winning the profit war.** Last year across all markets, Meaning Makers said business analytics impacted about 22% of profit (including both cost reduction and revenue growth). For Data Collectors, only about 12.3% of profit was impacted. That's a full 40.1% (or 9.7 percentage points) lower impact than Meaning Makers. If the laggards merely caught up with Meaning Makers, their overall economic benefit would improve immensely.

Business Analytics Comes to Life at the Process Level

Think about the last three business books or research studies you've read. It's interesting and valuable to examine how C-level executives and board members lead

their enterprises and make business decisions. This is why most business books and studies focus on the very top of the shop. But most of us are not the CEO. When it comes to deriving value from meaning-making, the real action happens deep inside the business where the heavy lifting is done. It happens in line with core business processes.

The true economic value of meaning-making emerges when decision-makers apply these ideas to the granular process work of the enterprise. Every company is different, but there are some atomic-level processes that nearly every large company performs.¹²

- **Financial planning, tracking, analysis and reporting.** Every major company must monitor, manage and report its financials to ensure financial control and transparency.
- **Manufacturing/supply chain/service delivery.** Whether it's a physical product, such as an airplane or factory, or a virtual solution, like a healthcare policy or provider ecosystem, once a solution is identified and designed, it must be "built" and delivered.

The true economic value of meaning-making emerges when decision-makers apply these ideas to the granular process work of the enterprise.

- **Sales/marketing/customer service.** Selling is about connecting value-added goods and services to real-world business problems by managing transactions as well as ongoing relationships.
- **Operations management (such as HR, IT, alliances, legal, etc.).** Perhaps not considered as glamorous as other work processes, back-office operations keep every complex organization going.
- **New product/service development.** This includes organizing design communities of employees, external partners and consumers to create new products and services. Such is the lifeblood of the future of the company.
- **Strategy-setting (what to do) and implementation (how to get there).** This includes setting strategy and leading teams toward attaining those goals.

The goal of making business meaning is not merely to drive down costs and improve efficiencies, but to actually change the way companies make new products, serve their customers better and manage risk. This requires integrating next-generation analytics into the full range of business processes as outlined above. Done properly, the insights derived by linking previously disparate bits of data can become the sparks that ignite rapid innovation.

Across all industry sectors we studied, winning companies have already built business analytics into their company's operations so that Meaning Makers can derive insights into operations, uncover new business models and develop new revenue streams.

More than 60% of study respondents note that they currently derive business value by making meaning in line with sales/customer relationships, financial management, business operations, overall revenue growth and strategy-setting (see Figure 4 , next page).

Business Analytics + Enterprise Processes = Growth and Savings

There's a clear connection between specific business goals and current meaning-making activities, but even more explicit ties exist between business analytics, revenue growth and cost savings (see Figure 5, page 13).

- **Business analytics on customer relationships and product development drive growth.** Not surprisingly, more than 25% of respondents said that meaning-making impacted revenue growth most when it was embedded into the processes at the customer interface – sales, marketing and customer service. More than 26% pointed out that their companies are growing because they use business analytics to shape new product and service development.
- **Costs for core delivery and financial management are cut via business analytics.** Across all companies surveyed, more than 20% connected meaning-making to reducing core manufacturing, supply chain and service delivery costs in the enterprise. A similar number indicated they are using business analytics to control costs for financial planning, tracking, analysis and reporting.

Use of Business Analytics Adds Value to Core Processes

Percent of respondents reporting that analytics adds high value to specific business goals.*

Business Goal	All Respondents
Improving sales/new customers/marketing/customer relationships	65.2%
Improving financial planning, tracking, analysis, reporting	64.1%
Improving business operations (speed, productivity, effectiveness, etc.)	64.1%
Increasing revenue (open new markets, grow client base, add products/services, etc.)	60.7%
Improving strategy-setting (what to do) and implementation (how to get there)	60.6%
More effective risk management (decreasing – or helping manage – business risk)	58.6%
Cutting costs (improving business efficiency)	58.1%
Improving new product/service development (new ideas, creating new products/services, etc.)	54.9%
Improving manufacturing/supply chain/service delivery	54.4%
Improving operations management (such as HR, IT, alliances, legal, etc.)	52.2%

Response base: 300

Prepared for Cognizant by Oxford Economics, March 2013

*Respondents were asked to rank each item on a scale of 1 to 5, from “no value” to “very high value.”

Percentages reflect the top two rankings (4 and 5).

Figure 4

Meaning Makers Realize Value in Build, Count, Invent and Sell Processes

Percent of respondents reporting high impact on increasing revenues when applying analytics to specific business processes.*

Business Process	All Respondents	Meaning Makers	Data Explorers	Data Collectors
Sales/marketing/customer service	27.0%	39.7%	28.4%	10.8%
New product/service development	26.3%	44.9%	25.0%	9.5%
Financial planning, tracking, analysis and reporting	24.3%	42.3%	22.3%	9.5%
Operations management (such as HR, IT, alliances, legal, etc.)	19.3%	34.6%	16.2%	9.5%
Manufacturing/supply chain/service delivery	17.7%	29.5%	16.2%	8.1%
Strategy-setting (what to do) and implementation (how to get there)	14.3%	29.5%	10.8%	5.4%

Response base: 300

Prepared for Cognizant by Oxford Economics, March 2013

*Respondents were asked to rank each item on a scale of 1 to 5, from "no impact" to "very high impact."

Percentages reflect the top two rankings (4 and 5).

Percent of respondents reporting high impact on decreasing costs when applying analytics to specific business processes.*

Business Process	All Respondents	Meaning Makers	Data Explorers	Data Collectors
Financial planning, tracking, analysis, and reporting	21.3%	41.0%	15.5%	12.2%
Manufacturing/supply chain/service delivery	21.3%	35.9%	18.2%	12.2%
Sales/marketing/customer service	18.7%	32.1%	16.2%	9.5%
Operations management (such as HR, IT, alliances, legal, etc.)	17.7%	34.6%	12.8%	9.5%
New product/service development	16.7%	25.6%	16.9%	6.8%
Strategy-setting (what to do) and implementation (how to get there)	11.7%	25.6%	6.1%	8.1%

Response base: 300

Prepared for Cognizant by Oxford Economics, March 2013

*Respondents were asked to rank each item on a scale of 1 to 5, from "no impact" to "very high impact."

Percentages reflect the top two rankings (4 and 5).

Figure 5

Quick Take

UPS May Like Logistics, But It Loves Data Even More

United Parcel Service demonstrates how harnessing meaning can make a business run better. For UPS, this means applying business analytics to sort package loads, order and route delivery runs and even measure the efficiency of each delivery truck's engine.

The use of business analytics has helped UPS eliminate some 85 million miles per year from drivers' routes, and reduce fuel consumption by some 8 million gallons. For UPS, shaving one mile per driver per day is worth \$50 million in savings, annually.

The results are stunning. The use of business analytics has helped UPS eliminate some 85 million miles per year from drivers' routes, and reduce fuel consumption by some 8 million gallons. For UPS, shaving one mile per driver per day is worth \$50 million in savings, annually. And one minute saved per driver per day prevents \$14 million in unnecessary expense.

In fact, by analyzing historical data, UPS data scientists can excavate counterintuitive patterns, predict future probabilities and trends, and determine new ways to conduct business and prescribe better outcomes.

"You want to be able to make predictions," explains Jack Levis, director of process management at UPS. "You want to be able to say, 'Where am I headed?' Moving from data to information to knowledge – that is what is going on in the world around us."

UPS documents everything – *everything* – it does. In fact, drivers are given a 73-page manual describing "everything from coming in in the morning to starting their car," Levis says. This includes how best to start their engines, which routes to follow, and even which pocket should be used for pen storage. This may sound like a modernized form of Taylorism, but UPS employees take pride in being rigorous (and the company rewards its drivers for best-in-class service).¹³

In a terrific demonstration of a SMAC Stack innovation, each driver also carries a delivery information acquisition device (DIAD), pioneered by UPS. These are the tablets drivers use to make real-time decisions about how to make the most efficient deliveries. Since 1991, UPS drivers have used these devices to save time, cut costs, improve productivity and raise customer service levels. (Drivers also carried GPS devices long before they were commonplace.) Every drop-off is monitored and measured. "We track where every package is, every moment of the day," Levis says.

UPS has even made its package labels "smart." Each one informs sorting clerks on which exact shelf on each truck every parcel should be loaded, and tells drivers expected delivery times. The goal is to make the systems so efficient that any driver can turn around in his vehicle and immediately locate the next parcel he is expected to offload. "Little chunks of time cost a lot," Levis says.



- **Meaning Makers are miles ahead.** The performance differential between Meaning Makers and Data Collectors reveals a clear chasm when examined at the process level. Data Collectors are aligning their business analytics efforts with the customer interface, but on average, about 29% of those companies are seeing significantly less revenue benefit than Meaning Makers. A similar gap exists on the cost side of the equation.

Untapped Value Remains Out of Reach for Many Companies

“Leaving money on the table” is a threadbare business cliché. Our findings show that decision-makers are not just leaving a few coins – they are throwing bags of cash on the table every year.

Our research reveals that meaning-making is already reshaping the economic topography of the enterprise. The good news is that there is massive potential for many companies to generate value through bold deployment of business analytics.

Leaders we surveyed market-wide noted that if they immediately implemented all currently available business analytics capabilities, processes and technologies, they would have a significant positive impact on costs and revenues over the next 12 months.

Maximizing the business impact of meaning-making can change the entire shape of the income statement for many companies. Surveyed companies attributed \$766 billion of economic value to business analytics over the past 12 months, and they expect that their planned investments will yield \$762 billion of benefit over the next 12 months.

However, respondents believe they could access an astounding \$853 billion of benefit over the next 12 months if they were to fully implement all best practices.

High Value Potential for High Performers

Estimated impact over next 12 months on cost and revenue, assuming use of analytics best practices.

	All Respondents	Meaning Makers	Data Explorers	Data Collectors
Potential increase in revenue	9.2%	11.4%	9.4%	6.6%
Potential decrease in costs	8.2%	9.5%	8.3%	6.5%
Total	17.4%	20.9%	17.7%	13.1%

(Percent increase or decrease, mean)

Response base: 300

Prepared for Cognizant by Oxford Economics, March 2013

Figure 6

Quick Take

Netflix Makes Meaning to Create New Content, Delight Viewers and Reduce Risk

Netflix has driven business analytics and meaning-making deeply into the core of its product development process. With early roots as an innovative distributor of rented DVDs, Netflix has helped create an entirely new industry. Now it is evolving into a content creation engine, building on its vast wealth of information about customer preferences.

The decision to make a political thriller starring Kevin Spacey is attributable in no small measure to Netflix's ability to marshal its sophisticated knowledge of customer "likes" and usage in order to design a show that captures a wide audience.

Netflix scored a huge entertainment coup in 2013 when *House of Cards*, a political thriller it developed and produced, became the first show created for original screening on the Internet that included grade-A Hollywood talent. The show attracted a huge audience and fared better than many shows airing on cable networks, even receiving nine Emmy nominations¹⁴ and winning the "best director" award – the first victory in a major category for an online video distributor.

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When the proposal arrived to develop the project, explains Jonathan Friedland, Netflix's director of corporate communications, the company looked at "how many people watched David Fincher movies. We looked at how many people watch everything Kevin Spacey is in, no matter what it is. We looked at how many people watch political shows like *The West Wing*. And then we created basically a Venn diagram to see how big the sweet spot was." That process, he says, allowed Netflix to make a decision on the relative value of the show compared with its cost.



Quick Take

Scott's Miracle-Gro Makes Business Meaning for Strategic Customers

Naturally, better analytics also allows companies to gain better insights into the needs of their customers. The Scott's Miracle-Gro Company, which sells \$3 billion of lawn and garden care products each year, used to receive point-of-sale data from its three biggest customers once a week, and could only process all the information by Thursday afternoons – too late to allow its sales force to react before the upcoming weekend, when home gardeners typically crowd their local lawn care center or home improvement store.

Today, “we know by 8:00 AM what happened the previous day in every store, for every SKU for those three customers,” says David Judson, Scott's senior director of business intelligence initiatives. “By Monday afternoon, we have all the intelligence. We have the maps that we can provide to the sales teams, to the marketing teams, to the business development teams and the senior executives on what happened and what they can do about it.”

Deeper understanding helps business development specialists manage relations with the company's largest buyers. “Our goal is to know more about their own data than they do,” Judson says.



That means at least \$91 billion – 11.9% more than currently expected – is sacrificed by not conducting meaning-making more effectively.

As we've already seen, the current high performers stand to benefit the most. Meaning Makers have an almost 59.5% (or eight percentage points) higher potential for value than Data Collectors (see Figure 6, page 15).

Maximize Revenue by Recoding Customer Interaction and New Product Development

Decision-makers from multiple industries are clearly saying there is a huge opportunity (see Figure 7, page 19). But where to start? As with many things in business, the answer seems simple – although it's anything but.

- **Revenue potential starts – not surprisingly – with customers.** More than 30% of respondents indicated that improving meaning-making around the customer relationship can lead to a significant revenue increase. For Network Services Co., a member-owned organization that connects more than 75 member-distributors around the country and generates over \$12 billion in annual revenues, developing sophisticated analytics allowed the company to achieve a 2% to 4% price premium over competitors, according to Mike Hugos, the company's CIO emeritus.



Quick Take

At Toyota, Business Operations Data Means a Safer Drive

In 2010, Toyota Motor faced a sudden crisis. Reports of unintended acceleration in some of its cars forced Toyota to issue two separate safety recalls covering 7.5 million vehicles, and suspend sales of eight of its best-selling vehicles. The move cost the company and its dealers at least \$54 million a day in lost sales revenue.

As a result of the recalls, the number of inquiries to the Toyota call center rose from 3,000 a day to 96,000, while warranty claims soared six-fold, overwhelming Toyota's infrastructure.

The new data from the dashboard gave Toyota a far better understanding of the problem and eventually helped it win exoneration from the NHTSA and the National Aeronautics and Space Administration.



Toyota executives quickly realized to their horror that despite the enormous volume of inquiries coming into their call centers and warranty lines, and with data already residing within their operations, they could not get a good handle on how widespread the safety problem might actually be.

"The challenge was to disprove a negative" and conclusively demonstrate that the vehicles were indeed safe, says Zack Hicks, CIO of Toyota Motor Sales. "How do you do that? We have the data. We should be able to do something with that. The problem is that the data is unstructured. When does this become information?"

Hicks and his team built an entirely new "safety dashboard" to merge data from the National Highway Traffic Safety Administration (NHTSA) with Toyota's customer and parts databases, data from the call centers, customer buy-backs and other sources. This gave executives deeper insights into how well Toyota's cars performed and whether any patterns existed in reported safety complaints.

"It was incredible. To me, it was like adding navigation onto a car," Hicks says. The data showed when a single customer filed six separate warranty complaints, for instance, and whether more complaints came from one region of the nation than another, or from areas where there had been extensive news coverage of the acceleration problem. The new data from the dashboard gave Toyota a far better understanding of the problem and eventually helped it win exoneration from the NHTSA and the National Aeronautics and Space Administration, which found that neither software flaws nor mechanical problems caused unintended acceleration accidents.¹⁵

As a result, engineers and finance executives inside Toyota can now use the tool to better understand how cars are performing and anticipate problems before they arise. Managers who were accustomed to looking at only narrow slices of data from within their own divisions "now essentially can do a regression analysis against different types of data to see if there are new meanings, new relationships," Hicks says. "That is power. That is the opportunity."

Analytics-Driven Innovation Applied to Customers, Product/Service Development Could Drive Significant Revenue

Percent of respondents forecasting high revenue increases with the use of analytics best practices.*

Business Process	All Respondents	Meaning Makers	Data Explorers	Data Collectors
Sales/marketing/customer service	37.0%	43.6%	32.4%	21.6%
New product/service development	29.7%	46.2%	28.4%	14.9%
Manufacturing/supply chain/service delivery	24.3%	34.6%	22.3%	16.2%
Financial planning, tracking, analysis and reporting	22.0%	34.6%	19.6%	13.5%
Strategy-setting (what to do) and implementation (how to get there)	19.3%	34.6%	14.2%	13.5%
Operations management (such as HR, IT, alliances, legal, etc.)	17.3%	35.9%	12.8%	6.8%

Response base: 300

Prepared for Cognizant by Oxford Economics, March 2013

*Respondents were asked to rank each item on a scale of 1 to 5, from “no revenue increase” to “very high revenue increase.” Percentages reflect the top two rankings (4 and 5).

Figure 7

- **Executives also have an eye on the future.** A close second on the list of targets for business analytics alignment is new product and service development. This makes perfect sense. The future of any business depends on understanding what customers will need in the future, and then tuning the organization to deliver the value. Making meaning in line with new products and services helps ensure the company will have a long and healthy life.
- **Marketing opens doors, but delivery closes deals.** Perhaps most surprising, almost a quarter of respondents recognize that managing a customer relationship and building products in line with future demand are necessary but insufficient conditions for growth. As usual, better operational decisions can deliver cost savings, but they can also create a more competitive company and, therefore, drive revenue. Experienced managers know that while sales can get the organization in the right position, delivery capability closes deals.

High Hopes for Value, But the Two-Year Clock Is Ticking

The data about current and near-term value provides a clear picture of what's happening and the business transformation that could happen based on deploying best practices for meaning-making. We also asked companies to estimate the value

Quick Take

Ford Connects Customers, Sales, Engineers and Cars to Win

Ford Motor Co. demonstrates how the power of analytics can improve a wide range of business operations. Over time, the company has made substantial strides building analytics into an array of processes, from offering fleet managers the tools to remotely monitor engine performance in its inventory of pickup trucks to helping dealers determine the optimal assortment of car models – by options and color – to hold in their lots.

In 2004, Ford built a self-learning neural network system for the Aston Martin luxury brand it then owned. The system helped the automobile maintain proper engine function by recognizing misfires and specific driving conditions, and adjusted warnings and performance as warranted. More recently, that algorithm has been expanded and refined to create the Smart Inventory Management System, which allows dealers to maintain an optimal supply of vehicles and features.

By merging historical sales and inventory data with the neural network algorithm to uncover consumer buying patterns – and through close collaboration among marketing, IT, research and the automaker's dealer network – Ford improved its recommended product mix to dealers. In recognition of its efforts to use data science and predictive analytics to improve overall operations and performance, Ford

received the 2013 INFORMS Prize from the Institute for Operations Research and the Management Sciences.¹⁶

In addition, Ford is helping fleet supervisors monitor fuel consumption, engine performance and other data about their vehicles by offering a “Crew Chief” package on its line of Super Duty pickup trucks. This function can tell managers how much time the vehicle spends idling or whether water may have entered the fuel line. Going further, its Energi line of plug-in hybrid cars can inform drivers about their battery life and performance and advise them where to find the nearest charging station if their battery is running low. They can even send the reports to the driver's smartphone.



Quick Take

Clorox Cleans Data to Make Informed – But Counterintuitive – Decisions

Ralph Loura, Clorox Co.'s Chief Information Officer (CIO), says the packaged goods industry has been “radically transformed” as a result of social networking and mobile applications for consumers.

Today, sales and marketing decision-makers can dig into Facebook, Twitter and other social media to determine the extent to which a marketing message is resonating. The challenge, as Loura puts it, is “How do I turn a ‘like’ into an intent to purchase? How do I understand what brand message resonates in terms of intent to purchase vs. ‘I like you’?”

To answer that question, Clorox is beginning to mine social media data, using tools to parse unstructured

data. “If it echoes in a positive way, then it is making traction,” he says. “If it echoes back in a negative way or if it doesn't echo at all, then that's a signal to stop spending money on that message because it is not working.”

“You don't want to make decisions based on sentiment alone,” Loura says. “A ton of people will sell you sentiment analysis, but it doesn't really do you any good unless you can translate sentiment into buyers.” Combining data with human judgment is the key to true business insight, and that requires rich partnerships between IT and the business.

Huge Value Expectations from New Product/Service Development, Operations Management

Percent of respondents reporting high value from analytics today and in the future.*

Business Goal	All Respondents	
Improving new product/service development (new ideas, creating new products/services, etc.)	Today	54.9%
	Next 24 months	70.0%
	Growth	27.5%
Improving operations management (such as HR, IT, alliances, legal, etc.)	Today	52.2%
	Next 24 months	65.3%
	Growth	25.1%
Improving manufacturing/supply chain/service delivery	Today	54.4%
	Next 24 months	67.1%
	Growth	23.3%
Cutting costs (improving business efficiency)	Today	58.1%
	Next 24 months	71.4%
	Growth	22.9%
Improving strategy-setting (what to do) and implementation (how to get there)	Today	60.6%
	Next 24 months	73.6%
	Growth	21.5%
Increasing revenue (open new markets, grow client base, add products/services, etc.)	Today	60.7%
	Next 24 months	73.3%
	Growth	20.8%

Response base: 300

Prepared for Cognizant by Oxford Economics, March 2013

*Respondents were asked to rank each item on a scale of 1 to 5, from "no value" to "very high value." Percentages reflect the top two rankings (4 and 5).

Figure 8

they expect to gain from their investments in business analytics over the next two years. Two main points emerged.

- **Hopes are, to put it mildly, high (probably too high).** There are huge expectations for growth in value over what's currently delivered (by process). For five business goals, decision-makers feel there is at least a possible 20% value increase available by improving business analytics performance over the next 24 months. However, even if irrational exuberance accounts for 50% of that increase, it's still a massive potential of increased value (see Figure 8).
- **Succeed in the next two years, or plan on never catching up.** The clock is ticking. Decision-makers clearly recognize that the market is likely to punish those who fail to act. Perhaps more important, we now know how fast the window is closing, and respondents expect the competitive topography to shift at an alarming pace. Decision-makers see great potential over the next year, but over a two-year time horizon, the perspective becomes more modest – the consequence, it seems, of the realities of diminishing returns (see Figure 9, next page).



Economic Expectations Soar, Level Off

Estimated impact of analytics on revenues and costs.

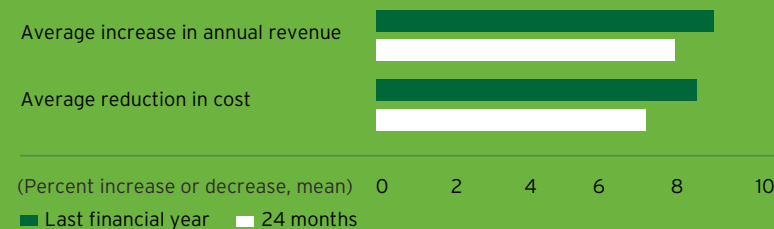


Figure 9

Growing Capabilities for the Foresight Era

Deriving meaningful insights from a torrent of bits will help transform the way companies develop their strategic thinking, schedule preventative maintenance of plants and equipment, modify their supply chains and improve the way they design and go to market with new products and services. Early winners are already using business analytics to become more predictive. They are building the right capabilities internally to pull this all together (without breaking the bank), and they are not ignoring the need for better tools.

The use of predictive modeling is expected to grow 49% over the next 24 months, especially in the insurance and banking sectors.

Leaders Become Mind Readers for Critical Business Processes

Changing the focus from the rear-view mirror to the windshield can help decision-makers and innovators drive the company to new levels. Anticipating future behaviors of customers, world events, supply chains and other factors allows companies to deploy resources more effectively, reduce downtime and adjust staff levels to match customer demand.

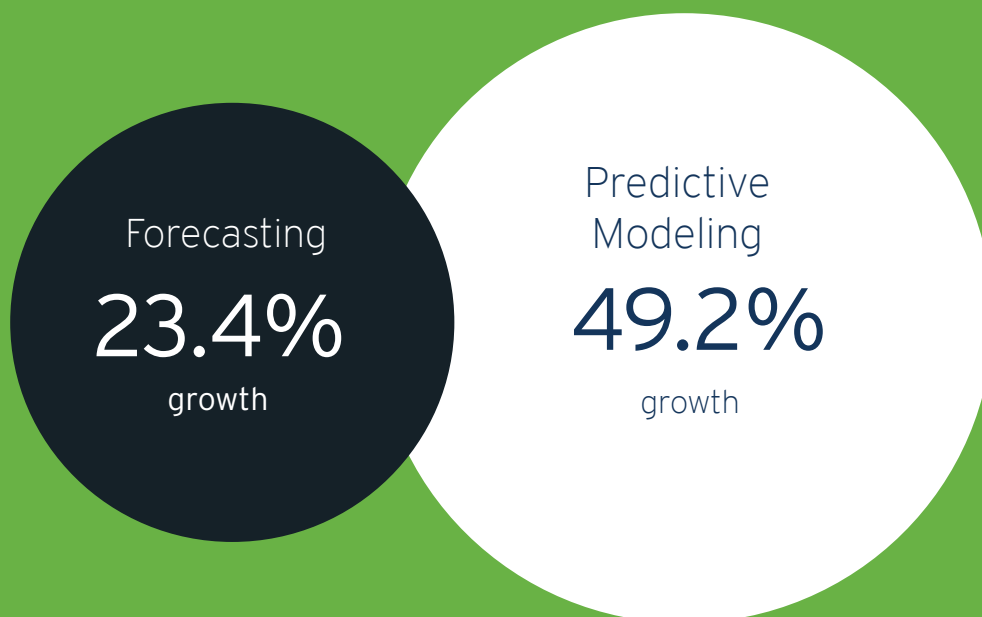
The use of predictive modeling is expected to grow 49% over the next 24 months, especially in the insurance and banking sectors, in which companies find these tools especially helpful in developing new products and pricing options (see Figure 10, next page).

Teams of 'Key-Makers' Go Mainstream

In this age of ubiquitous information, the cost of noise and the value of the signal are increasing exponentially. As companies transform their operations to be more nimble and gain more value from their use of SMAC technologies, they are finding that the next frontier of business competition entails wresting meaning from data. This requires the business to create or expand the necessary skill sets.

Surge Expected in Predictive Analytics

Growth in analytics approaches, today vs. in 24 months.



Analytics Approach	All Respondents	
Predictive modeling: Using data to create models that determine the probability of certain outcomes	Today	49.5%
	Next 24 months	73.8%
Forecasting: Using current and historical data to predict future trends	Today	68.6%
	Next 24 months	84.6%

Response base: 300

Prepared for Cognizant by Oxford Economics, March 2013

Figure 10



Meaning Makers Organize for Value

Use of dedicated teams with well-defined roles to analyze big data.

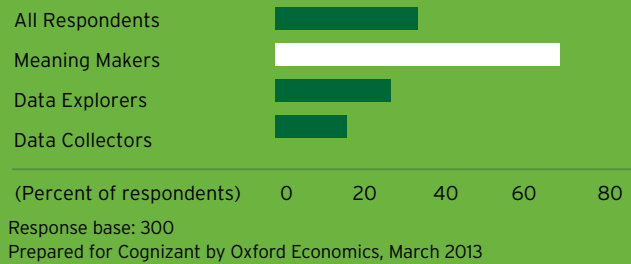


Figure 11

Study respondents know that success will ultimately mean winning the battle for talent.

- 65% of respondents already rely on technology experts who can help their companies bridge IT gaps and establish the right infrastructure to use analytics more effectively.
- 60% employ software developers who design and apply analytics software that boosts efficiency and effectiveness.

Here again, Meaning Makers clearly understand this and are investing for the future by dedicating teams to derive value from information (see Figure 11).

In the near future, however, demand for more sophisticated analytics will boost demand for new kinds of insights. Leading companies are also working innovatively to make hires that even five years ago might have seemed a bit odd. Our respondents indicate that the biggest growth in demand will be not for technical expertise but for behavioral scientists who research and explain human behavior (up 81%) (see Figure 12, next page).

Market winners will invest even more aggressively to bring behavioral scientists into the fold, as they strive to leverage meaning-making for competitive advantage. Behavioral scientists will be crucial as companies learn to develop more powerful tools to not only document “how customers acted,” but also to predict “how customers will react next.” Demand will also be high for analytics subject matter experts (up 31%) who can convert business challenges and key questions into analytics approaches that can be executed by statisticians.

Society is creating data far more quickly than the analytical talent that’s sophisticated enough to make sense of it all. As a result, not every company can attract sufficient talent to inform meaning-making. While many believe they can win the “war for talent” among analytics specialists, many will be left behind. A recent

Behavioral Scientists De-Code 'What Happens Next'

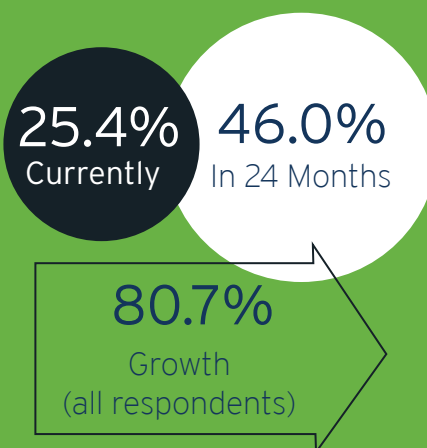
Use of behavioral scientists, today and in 24 months.
(Behavioral scientists research and attempt to explain human behavior.)

	Meaning Makers	Data Explorers	Data Collectors
Currently	39.7%	20.1%	20.9%
In 24 months	61.5%	40.1%	41.1%
Growth	54.9%	99.2%	96.7%

Response base: 300

Prepared for Cognizant by Oxford Economics, March 2013

Figure 12



survey of workforce skills conducted by Oxford Economics indicates that companies will face severe shortages in finding the needed big data talent.¹⁷

Yet not all companies seem to anticipate the likely crunch. Some 26% of respondents intend to reduce their reliance on external partners to help assuage their need for business analytics, and 19% have no plans at all to engage in external partnerships. Either these companies are especially good at recruiting big data experts, or they underestimate the competition they will inevitably face.

A Clear Path for Winning with Business Analytics Remains Elusive

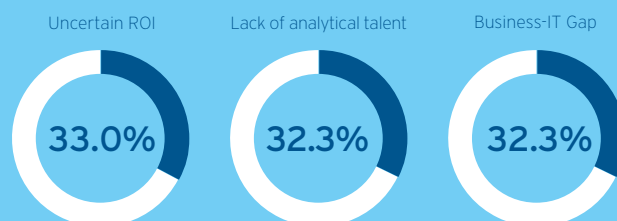
With economic benefits this dramatic, we're left to wonder why almost all companies aren't moving in this direction more rapidly. We found that it's not for lack of trying. The problem, as with any major new shift in business and technology, is that the path to success and the tactics for overcoming hurdles, are not yet completely clear (see Figure 13, next page).

- **The number-one obstacle to business analytics? Everything...** Decision-makers who want to advance business analytics in their companies are not at a loss for problems to solve. Sadly, since no single cause really emerged as a stand-out, the likely conclusion is that everything is seen as a problem. Uncertain ROI, lack of talent, a gap between IT and business operations – all of these scored nearly the same in the survey. To some extent, this is because many businesses find themselves in uncharted territory. Meaning Makers don't seem to possess any additional clarity; they're just forging ahead. Waiting for all of this to be fully sorted will mean missing the opportunity.
- **It takes smart people to overcome obstacles.** Respondents are clearly investing in people to capture opportunity. Tactics related to recruiting and training tend to slightly outpace tool acquisition and service procurement as ways to better deploy business analytics. Respondents see a required balance between people and tools to help derive value, but the equation is certainly not solved.



Organizations Face an Array of Analytics Challenges

Significance of obstacles in deploying analytics.*



	All Respondents
Uncertain ROI	33.0%
Lack of analytical talent	32.3%
Gap between IT and business operations	32.3%
Inability to connect analytical findings with real-world context	31.3%
Poor data quality	30.0%
Management support/corporate culture	29.3%
Lack of alignment of analytics investment to business objectives	29.3%
Ineffective software solutions	28.3%
Lack of overall strategy for business analytics	27.7%
Lack of technical ability	26.0%

* Respondents were asked to rank their responses on a scale of 1 to 5, from "no significance" to "very high significance."

Methods used to overcome challenges.*



	All Respondents
Recruiting analytics talent from within your industry	39.3%
Hiring consultants	39.0%
Training on business analytics and decision making	35.0%
New packaged software	32.7%
Recruiting analytics talent from outside your industry	29.3%
New homegrown software	25.7%
Buying outside services	20.7%
Identifying new vendors	13.0%
Acquisitions focused on business analytics	9.7%

Response base: 300

Prepared for Cognizant by Oxford Economics, March 2013

* Respondents were asked to choose three options from a list of methods.

Figure 13

Market Leaders Must Act Now to Compete on Information and Insight

Some are fond of saying that “data is the new oil” and that we will dramatically move into an era where physical value chains are suddenly supplanted by prescient machines.¹⁸ Others call that hogwash and say business analytics will never drive a change in business as dramatic and powerful as the physical economy.¹⁹

As with most debates about the future, the reality will certainly not adhere to such a neat either/or dichotomy. Business decision-makers have to live in reality, and in the real world, we are as unlikely to suddenly land in the dystopian nightmare of *WALL-E* or *Minority Report* as we are to revert to the horse and buggy.

So what to do tomorrow?

The good news is that studies like ours reveal not only a huge potential impact, but also that some companies are unlocking value by competing on the insights derived from Code Halos. The roadmap may not be completely clear, but the Meaning Makers in our study are clearly focusing both on the future of their own companies and how commerce itself will work.

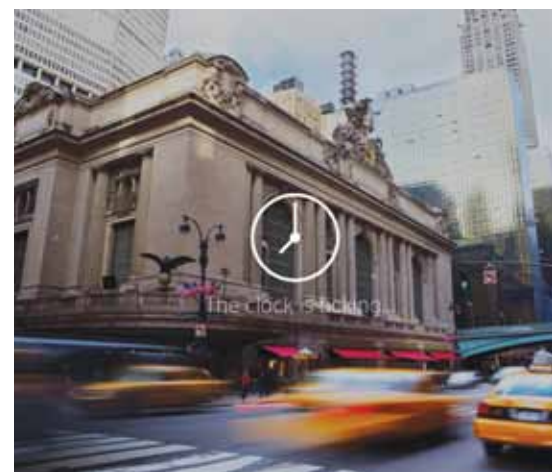
The San Francisco Giants are matching prices to demand. Toyota is becoming more predictive to keep potential problems out of its cars. UPS has become a technology company with trucks. Clorox is deriving counterintuitive meaning to better connect advertising spend to business results.

These are all different companies in different industries, but each is organizing to win in its market based on an increased level of insight, understanding and even wisdom aligned with key business process work.

Every company is different, so there is no single “right” answer, and it may seem daunting given everything that has to be done, but there are several very clear mandates for companies to succeed at this shift point.

- **Become a Meaning Maker (or pay the price).** There is no doubt that competing based on data and insight will develop efficiencies, identify new business models and help seize competitive advantage. Companies that learn to manage their information and use data to make meaning aligned with specific business processes can thrive. Companies that miss this inflection point, and do not act to become Meaning Makers, will undoubtedly face a tough journey – or even an “extinction event.” Executives should look at their businesses and decide where to apply the new economics of meaning-making in the near-term.
- **Leverage SMAC Stack technologies to fuel business analytics.** In an age where social, mobile, analytics and cloud technologies are coalescing into a new IT architecture capable of transforming virtually every business in every industry, companies face a new imperative.²⁰ Data from mobile devices, social tools and cloud-enabled solutions contains massive value if de-coded and harnessed. Business process owners and technology leaders should be proactive about finding ways to leverage them.

Whether it's your underwriting process, clinical drug trials, wealth management service, supply chain or customer relationship management process, focus on work that shapes at least 10% of your costs or revenues.



- **Reimagine work at the process level.** The imperatives to “do analytics” or “use big data” are just too broad to be meaningful. Instead, focus on a specific business process. Whether it’s your underwriting process, clinical drug trials, wealth management service, supply chain or customer relationship management process, focus on work that shapes at least 10% of your costs or revenues. To seize competitive advantage, look at the data that is – and could be – exchanged and used for value. This is exactly what companies such as Zappos, Netflix, UPS, Toyota, Pandora and others do around key processes.
- **Don’t overlook your small data problems.** For all the talk of tools, algorithms and seemingly magical devices, the reality is that most companies have tremendous wisdom locked up in spreadsheets, call centers and employees’ heads. You don’t always need a billion records to derive business meaning. Start by exploring the data you do have. Don’t go out and buy new tools or hire 10 data scientists. Just get the right people in the room and look at what you have. Ask your smart people to reimagine business processes: What do we already know? What else do we need to know? What could it be? This will help break the inertia and start people thinking about how to make business meaning.²¹
- **Build a business analytics ecosystem.** Most respondents recognize that winning based on knowledge will require a new set of skills in the enterprise, and they are planning to hire to close the gap, but the harsh reality is that there will not be enough supply to keep up with demand. The math simply doesn’t work. Most companies won’t be able to go it alone. Hiring and training will be part of the solution, as will tools. But savvy decision-makers know that building an ecosystem of consultants and service providers can help deliver the right capabilities to the company.

Looking Forward: Compete on Insight to Win

In summary, competing based on meaning and insight will be the biggest value lever in your business. The biggest question for you now is: How will you pull that lever?

The companies that win will be those who reimagine work, see business processes and customers as sources of insight, and find ways to keep human judgment and values embedded in real-world business decisions.

Our research shows that companies are already winning based on their ability to make meaning from business analytics. Organizations are already seeing significant rewards in terms of running better – improving process efficiency – and running differently – using insight to reimagine work. Decision-makers today expect that these types of investments will pay off in the near term. The power of insight is starting to shape markets and disrupt business processes.

The companies that ultimately win – those that de-code the new economics of meaning-making – will be the ones that link these pieces together. They will reimagine work, see business processes and customers as sources of insight, and find ways to keep human judgment and values embedded in real-world business decisions. This is already happening today. We’re well beyond theory building, and these trends will only accelerate in the coming quarters and years.

Footnotes

- ¹ "Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2012-2017," Cisco Systems, Inc., Feb. 6, 2013, http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11-520862.html.
- ² "The Zettabyte Era – Trends and Analysis," Cisco Systems, Inc., May 29, 2013, http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/VNI_Hyperconnectivity_WP.html.
- ³ "What is Big Data?" IBM Web site, <http://www-01.ibm.com/software/data/bigdata/>.
- ⁴ Today's high-flying companies – the outliers in revenue growth and value creation – are winning with a new set of rules. They are dominating their sectors by managing the information that surrounds people, organizations, processes and products – what we call Code Halos™ – to build new business and operating models. See "Code Rules," Cognizant Technology Solutions, June 4, 2013, http://www.unevenlydistributed.com/article/details/code-rules#.Uhr_uNK1E80.
- ⁵ James Manyika, Michael Chui, Brad Brown, Jacques Bughin, Richard Dobbs, Charles Roxburgh and Angela Hung Byers, "Big Data: The Next Frontier for Innovation, Competition and Productivity," McKinsey Global Institute, May 2011, http://www.mckinsey.com/insights/business_technology/big_data_the_next_frontier_for_innovation.
- ⁶ More specifically, our analysis estimated annual cost reductions of some \$78 billion to U.S. healthcare payers and providers over the past financial year compared with McKinsey & Co.'s estimate of \$226 billion in potential savings. Revenue gains for U.S. healthcare payers and providers for the past financial year (\$107 billion) were equivalent to those suggested by McKinsey (\$107 billion per year).
- ⁷ See Thomas Davenport's bio, <http://www.tomdavenport.com/about/>, and Thomas Davenport, "The New World of Business Analytics," International Institute for Analytics, March 2010, http://www.sas.com/resources/asset/IIA_NewWorldofBusinessAnalytics_March2010.pdf.
- ⁸ "Fuller Brush Company," Wikipedia, http://en.wikipedia.org/wiki/Fuller_Brush_Company.
- ⁹ Paul Roehrig and Ben Pring, "Build a Modern Social Enterprise To Win In The 21st Century," Cognizant Technology Solutions, June 2012, <http://www.cognizant.com/Futureofwork/Documents/Build%20a%20Social%20Enterprise%20for%20the%2021st%20Century.pdf>.
- ¹⁰ Jon Swartz, "San Francisco Giants Ride Techball to the Top," *USA Today*, March 31, 2013, <http://www.usatoday.com/story/tech/2013/03/31/giants-social-media-world-series-technology/2013497/>.
- ¹¹ Although the roots of separating meaningful signal from distracting noise are in science and engineering, Nate Silver is the latest thinker to apply and popularize the importance of this concept. See Silver's blog at <http://fivethirtyeight.blogs.nytimes.com/> and his bio at http://en.wikipedia.org/wiki/Nate_Silver.
- ¹² "Build a Modern Social Enterprise To Win In The 21st Century," Cognizant Technology Solutions, June 2012.
- ¹³ Taylorism is a business management system that emphasized granular work process breakdowns and task management. See <http://www.britannica.com/EBchecked/topic/1387100/Taylorism>.
- ¹⁴ Jon Weisman, "Emmy Nominations Announced: 'House of Cards' Makes History," *Variety*, July 18, 2013, <http://variety.com/2013/tv/news/emmy-nominees-2013-emmys-awards-nominations-full-list-1200564301/>.
- ¹⁵ "NHTSA-NASA Study of Unintended Acceleration in Toyota Vehicles," NHTSA, <http://www.nhtsa.gov/UA>.
- ¹⁶ Ford Wins 2013 INFORMS Prize for Company-Wide Efforts in Analytics and Data Science," Ford News Center, April 8, 2013, <http://corporate.ford.com/news-center/press-releases-detail/pr-ford-wins-2013-informs-prize-for-37903>.
- ¹⁷ "Global Talent 2021," Oxford Economics, 2012, <http://www.oxfordeconomics.com/Media/Default/Thought%20Leadership/global-talent-2021.pdf>.
- ¹⁸ Perry Rotella, "Is Data the New Oil?" *Forbes*, April 2, 2012, <http://www.forbes.com/sites/perryrotella/2012/04/02/is-data-the-new-oil/> and Chris Osika, "Riding the Big Data Wave," Cisco Blogs, Sept. 27, 2012, <http://blogs.cisco.com/sp/riding-the-big-data-wave-service-providers-can-accelerate-big-data-evolution-to-unlock-new-value/>.
- ¹⁹ "Gasoline made from oil made possible a transportation revolution as cars replaced horses and as commercial air transportation replaced railroads.... If anybody thinks that personal data are comparable to real oil and real vehicles, they don't appreciate the realities of the last century." Robert J. Gordon, economics professor, Northwestern University. See: James Glanz, "Is Big Data an Economic Big Dud?" *The New York Times*, Aug. 17, 2013, http://www.nytimes.com/2013/08/18/sunday-review/is-big-data-an-economic-big-dud.html?pagewanted=all&_r=0.
- ²⁰ Malcolm Frank, "Don't Get SMACKed," Cognizant Technology Solutions, November 2012, <http://www.cognizant.com/Futureofwork/Documents/dont-get-smacked.pdf>.
- ²¹ Data guru D.J. Patil refers to a critical process used at LinkedIn that he calls SSR (sit, shut up and read). The team there created – mandated, actually – a period of time to simply review and think about what the data could contain.

Appendix: Study Methodology

To quantify the economic value that companies achieve through analytics, Oxford Economics conducted an online survey of 300 senior executives employed in eight sectors: insurance, banking/financial services, life sciences, healthcare, communications/information/media/entertainment, technology, consumer goods/retail and manufacturing. All the companies had revenues in excess of \$500 million annually and were based in the U.S., UK, Germany or France. The survey was conducted during the first quarter of 2013.

To develop our economic analysis, we posed the following survey questions:

- **Q1:** Please estimate the percentage impact of business analytics on your organization's revenues and costs over the last financial year.
- **Q2:** How do you expect your actual plans to deploy business analytics will impact your business over the next 24 months? Please specify in terms of the average annual impact on revenues and costs over the next 24 months.
- **Q3:** If you were to immediately implement all currently available business analytics capabilities, processes and technologies, how would this affect your organization's costs and revenues over the next 12 months?

Responses were grouped in specified ranges, from 0% to over 35%. For modeling purposes, the midpoint¹ of these ranges was assumed to correspond with the actual company-level effect.

Oxford Economics produced two sets of results from the data:

- A survey model, which is an estimate of the economic value that respondents derive from their use of analytics.
- An industry model, which is an assessment of the value that analytics generates for all companies within the relevant sector.

Survey Model

The survey model estimates the monetary value derived from deploying analytics by multiplying the revenue gain each company reported by its annual revenue for the latest financial year. Cost savings were quantified by applying respondents' reported annual percentage of costs saved to our estimate of total costs (calculated based on the company's reported profit margin).

Companies reported their revenues for the latest financial year and expected growth in gross revenue over the next two years. This data was used to generate an estimate of expected revenue for the next two years. Future costs were quantified by assuming that the reported profit margin in the latest financial year would remain constant during the next two years.

Survey responses were "banded," and we used the midpoint of each range to estimate values. In cases where the range was unbounded, we assumed an average value of 50% higher than the threshold value.

These processes allowed us to establish estimates for each company's revenue and costs. The responses to questions 1-3 were then applied to these values and aggregated (by sector and by country) to obtain the headline figures in the main body of this report.

Respondent Demographics

Where is your organization headquartered?

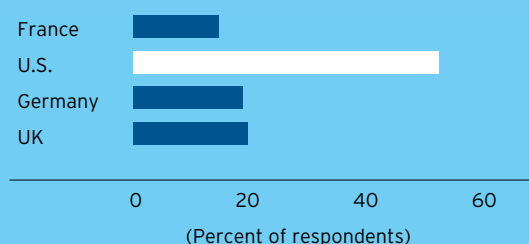


Figure A

Industry Model

Oxford Economics also extrapolated from the survey findings to better understand the broader impact of analytics on the four economies (U.S., UK, France and Germany). One challenge was to determine the extent to which the survey results could be used to represent other companies in the relevant industry. As all surveyed firms had at least 100 employees, we excluded all small businesses with less than 100 employees from our extrapolations and assumed none used analytics.

Instead, we generated estimates (and forecasts) of industry-wide revenue and costsⁱ of companies with 100 employees or more for 2012, 2013 and 2014. Scaling factors were employed to account for firms with fewer than 100 employees across the relevant industries.ⁱⁱ These scaling factors were then applied to estimates and forecasts of industry gross output in 2012, 2013 and 2014, taken from the Oxford Economics Global Macroeconomic and Industry models. In order to generate estimates of total industry-wide costs, revenue figures were scaled back based on an estimate of the average industry profit margin, employing data from country-specific input-output models.

Industry and country-specific responses to questions 1-3 were then applied to these industry-wide estimates of total revenues and costs (of firms with at least 100 employees) to obtain the headline figures presented in the main body of the report.

Appendix Footnotes

- ⁱ At the top-end of the range, the response was unbounded. For this, the assumed value was set at the lower bound of that threshold in order to be conservative. However, given the very low proportion of responses in this band, the impact on the results is negligible.
- ⁱⁱ With costs defined as turnover less gross profits (i.e., the sum of labor and procurement costs).
- ⁱⁱⁱ For most sectors, data on turnover was readily available, but where this was not the case, a relevant proxy such as payroll or employment was used instead.

About the Authors

Paul Roehrig, Ph.D., co-leads Cognizant's Center for the Future of Work. Prior to joining Cognizant, Paul was a Principal Analyst at Forrester Research, where he researched and advised senior IT leadership on a broad range of topics, including sourcing strategy, trends and best practices. Paul also held key positions in planning, negotiation and successful global program implementation for customers from a variety of industries, including financial services, technology, federal government and telecommunications for Hewlett-Packard and Compaq Computer Corp. He holds a degree in journalism from the University of Florida and graduate degrees from Syracuse University. Paul can be reached at Paul.Roehrig@cognizant.com | [Linkedin: www.linkedin.com/pub/paul-roehrig/0/785/20/](https://www.linkedin.com/pub/paul-roehrig/0/785/20/).



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Oxford Economics

Oxford Economics is one of the world's foremost independent global advisory firms, providing reports, forecasts, thought leadership and analytical tools that cover some 190 countries, 100 industrial sectors and over 2,600 cities. Founded in 1981 with its headquarters in Oxford, England, and with regional centers in London, New York and Singapore, Oxford Economics uses its team of professional economists, industry experts and editorial specialists to advise corporate, financial and government decision-makers and develop evidence-based thought leadership. Its worldwide client base now comprises over 700 international organizations, including leading multinational companies and financial institutions; key government bodies and trade associations; and top universities, consultancies and think tanks.

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Thornton May is Futurist, Executive Director and Dean of the IT Leadership Academy. His extensive experience researching and consulting on the role and behaviors of boards of directors and C-level executives in creating value with information technology has won him an unquestioned place on the short list of serious thinkers on this topic. Previously, Thornton served as Futurist and Researcher at the Center for Advancing Business through Information Technology at the W. P. Carey School of Business at Arizona State University; Faculty and Executive Director of the CIO Institute at Haas School of Business at the University of California at Berkeley; Co-founder and Director of the CIO Solutions gallery at the Ohio State University; and Director of the Olin Innovation Lab at the Olin College of Engineering. Thornton's insights have appeared in the Harvard Business Review; the Financial Times; the Wall Street Journal; the MIT Sloan Management Review; American Demographics; USA Today; BusinessWeek; and on National Public Radio. A graduate of Dartmouth College and Carnegie-Mellon University, his book *The New Know: Innovation Powered by Analytics* maps the intersection of data and value creation. Thornton is a columnist at Computerworld and has served as an advisor to the Founding Editors of Fast Company Magazine.

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