

IBM Institute for Business Value

Analytics: The speed advantage

Why data-driven organizations are winning the race in today's marketplace

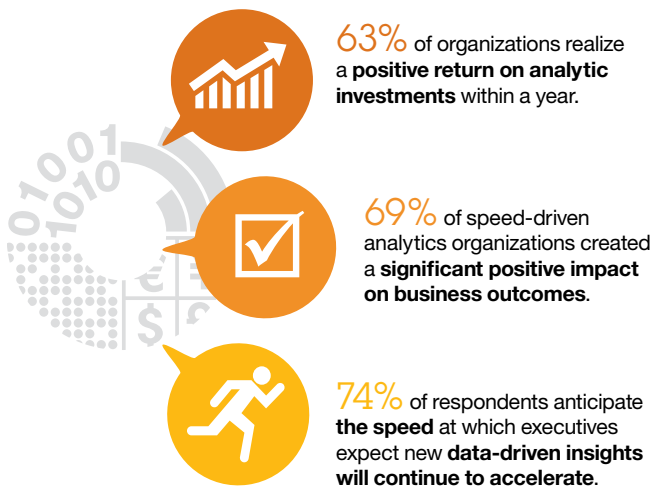


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By Glenn Finch, Steven Davidson, Christian Kirschniak, Marcio Weikersheimer, Cathy Reese and Rebecca Shockley

In 2014, several important shifts occurred in the world of big data—shifts that business executives around the globe cannot afford to ignore. The most significant shift is that velocity is now the competitive differentiator for big data. Our sixth annual analytics study reveals a group of organizations differentiating themselves with speed-driven data and analytics practices that significantly impact business performance and competitive position. To compete in today's digitally infused marketplace, other organizations need to emulate these outperformers by acquiring, analyzing and acting on data with a focus on speed to action.



Introduction

Capabilities that enable an organization to consume data faster—to move from raw data to insight-driven actions—are now the key differentiator to creating value through analytics. In addition to this focus on speed, our latest analytics research reveals several significant evolutions in the era of big data.

Based on survey responses of more than 1,000 business and IT executives from more than 60 countries, our 2014 analytics research revealed four transformative shifts affecting the fast-paced digital marketplace:

1. A solid majority of organizations are now realizing a return on their big data investments within a year.
2. Customer centricity still dominates analytics activities, but organizations are increasingly solving operational challenges using big data.
3. Integrating digital capabilities into business processes is transforming organizations.
4. The value driver for big data has shifted from volume to velocity.

Shift 1:**A solid majority of organizations are now realizing a return on their big data investments within a year.**

Most organizations (63 percent) realize a positive return on their analytic investments within one year, and more than one-in-four respondents (26 percent) realize a positive return within six months. This marks the start of a trend toward positive returns, with a 10 percent year-to-year uptick over the 57 percent that reported a return within a year in 2013.¹

Moreover, 49 percent of organizations that have implemented one or more big data technologies reported that returns met or exceeded their expected returns; another 45 percent of implementations were under evaluation. Only 6 percent reported that returns failed to meet expectations.

Shift 2:**Customer centricity still dominates analytics activities, but organizations are increasingly targeting operational challenges.**

While customer-centric objectives are still the primary focus for a majority of organizations, more are starting to integrate big data technologies into back-office and operational processes. In more than half of all organizations, business executives are demanding data insights primarily to create stronger relationships with customers: 31 percent are working to improve customer acquisition through the use of data and analytics, while the other 22 percent are targeting improvements in customer experience (see Figure 1).

But it's not all about the customer. Two out of five organizations—40 percent—are focusing data and analytics on operational objectives, a significant increase from 2013 when only 25 percent of organizations were focused on operations.² In the past year, as executives have seen front-office analytics deliver powerful results, they have started to apply these new technologies to manage operational costs even more tightly.

One surprise was the low level of focus on financial and risk management objectives. Given the increased levels of data management required by CFOs, as well as the broad applicability of anti-fraud efforts, we expect analytics use in this area to increase in the coming year.

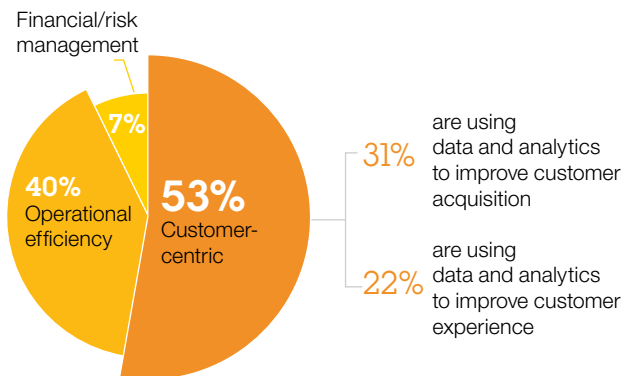
Organizational objectives for use of data and analytics

Figure 1: Respondents are primarily focused on customer-centric objectives for the use of data and analytics, but the focus on operational objectives has seen a significant uptick since 2013.

Source: IBM Institute for Business Value 2014 Analytics Study. n= 1036.

Shift 3**Integrating digital capabilities into business processes is transforming organizations.**

A near majority of organizations (46 percent) are re-inventing business processes by integrating digital capabilities. By transforming processes, these organizations are creating the agility, flexibility and precision that enable new growth. And they are using digital capabilities—like social and mobile technologies—to change the way people connect, transact and engage with companies, institutions and governments, as well as how they create mutual value (see Figure 2).

In a digital transformation, organizations are focused on ways to better leverage the available data to either to grow revenues or cut costs, although the majority of digital transformations are focused on customer-centric outcomes. Meanwhile, new forms of data and advanced analysis methods have opened up new avenues of cost reduction and agility within business processes.

Focus on analytic transformation

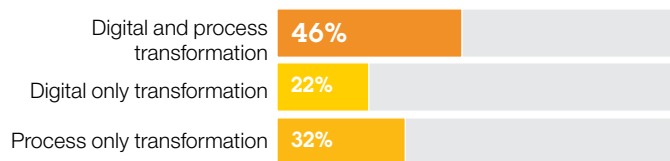


Figure 2: A near majority of respondents are integrating digital capabilities into business processes to create an end-to-end transformation.

Source: IBM Institute for Business Value 2014 Analytics Study, n= 1036.

In a combined digital and process transformation, organizations examine the end-to-end process or experience and both integrate analytics into the business process and streamline its operations simultaneously.

Shift 4:

The value driver for big data has shifted from volume to velocity.

Big data's initial impact on organizations came in 2012 as the deluge of data crossed its tipping point. Organizations initially aimed big data investments at managing the often overwhelming amount and types of data suddenly available. In our 2012 analytics study, "Analytics: The real-world use of big data," we identified the characteristic that differentiates organizations the most as a scalable and extensible infrastructure.³ But just managing the volume and variety of data is no longer enough to outperform competitors.

Now we find the components that differentiate organizations most are those capable of creating an agile and flexible infrastructure, one designed to manage data efficiently and move it through the analytics process quickly. Organizations using big data technologies broadly throughout their business functions—capabilities that enable business functions to consume the data rather than just absorb it—are creating the greatest impacts on business performance.

And business executives are starting to take notice. In fact, we discovered that executives in India, North America and South America have been demanding delivery of action-oriented data-driven insights at an accelerating pace during the past 12 months, with the most significant acceleration in areas outside the United States.

This upsurge is just the beginning. Respondents from almost all the 67 countries represented in our survey anticipate the demand for data-driven insights will accelerate in the next 12–18 months, with most expecting a significant increase in the pace of demand. Even the Nordics, the area along with Japan that reported a slower pace in the past 12 months, are expecting a significant increase in executive appetite for insights in the coming 18 months.

The need for speed

Given this shift toward speed, we sought to identify the organizations most capable of delivering and consuming insights quickly based on their survey responses.

To effectively meet accelerating demands, organizations need capabilities that enable speed to action and minimize the lag time between raw data and insight-driven actions. This requires both a pervasive adoption of analytics throughout the organization and the technical capabilities to quickly act on insights.

- Pervasiveness of analytics
 - Broader usage of analytics generates an enterprise-wide ability to act with speed and precision
 - Data diversity enables organizations to create more robust and meaningful insights, increasing the likelihood of greater business impact
- Technical capabilities to support analytics
 - Speed-driven organizations must be able to manage the volume, variety and velocity of the data available
 - Agility and flexibility within the data architecture is a key speed-enabling characteristic

Strengthening both of these capabilities is a cultural acceptance of the use of analytics, which requires executive support, leadership and funding.⁴

Four clusters of capabilities

Through organic clustering based on 31 data points reflecting analytics capabilities, we identified four distinct groups of organizations: Front Runners, Joggers, The Pack and Spectators (see sidebar, “About the research”).

- **Front Runners**, representing 10 percent of respondents, are data-driven organizations using analytics to drive business processes within most business functions.

- **Joggers**, representing 14 percent of respondents, primarily use analytics to automate and optimize operations, but do not use analytics pervasively.
- **The Pack**, representing 45 percent of respondents, are analytically minded organizations using analytics to drive or inform some business processes within multiple business functions.
- **Spectators**, representing 31 percent of respondents, use only the bare minimum of analytics within business processes, yet have aspirations — often unrealistic — to increase their analytic capabilities in the near future.

About the research

The IBM Institute for Business Value’s 2014 analytics survey was a comprehensive look at the use of data and analytics by companies, governments and other organizations around the globe. We surveyed more than 1,000 business and IT executives from 67 countries (see figures in this sidebar).

The survey was available online for eight weeks in 2014 (July through August) and offered in six languages: English, Simplified Chinese, French, Japanese, Russian and Spanish. Some respondents self selected based on interest in the topic, and additional invitations were sent based on IBM relationships. Survey topics included executive activities, business process activities, data management practices, human resources management, competency measures, software usage and hardware implementation.

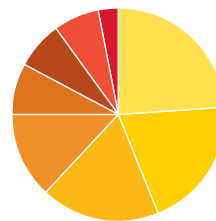
The questions were designed to help us understand how and why organizations are using data and analytics today. To identify which capabilities were most responsible for value creation through the use of data, we started with a wide ranging survey to examine more than 50 analytic processes, as well as understand the collection level of 18 types of data; the competency level of data and analytics skills for key analysis techniques; and implementation levels of hardware, software and data management components.

Using the survey data, we performed organic clustering to identify the sets of key capabilities that differentiate those organizations creating the greatest value from analytics.

Cluster analyses, and especially k-means partitioning clustering methods, stand as the foremost tools in social science and business research today for developing functional, post hoc performance segments.

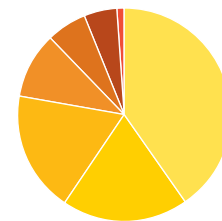
The objective of cluster analysis is the development of functional segments—that is, groups of respondents who, as a group, responded differently to the measurement instrument than did other respondents. The user base is no longer viewed monolithically, but transcendentally, as respondents are grouped, not by a priori descriptions (gender, marriage status, income, etc.), but by their salient responses to the research instrument.

Geographic distribution



- North America
- Asia Pacific
- Europe
- Central & Eastern Europe
- Japan
- China
- Latin America
- Middle East/Africa

Functional demographics



- Information technology
- Executive management/strategy
- Digital channels/marketing/customer service/sales
- Research and product development
- Operations/supply chain/logistics
- Finance/risk management/fraud
- Human resources

To better understand these clusters, we plotted them on a speed-to-action matrix. The horizontal axis represents the pervasiveness of analytics usage, an indication of the breadth of analytics usage within the organization. The vertical axis represents the technical capabilities to support analytics. At the intersection of “pervasiveness” and “technical capabilities,” we find an organization’s analytic speed-to-action level, an indication of the organization’s ability to create speed-to-action within its data lifecycle (see Figure 3).

Most able to meet the need for speed are Front Runners, and they are creating significant business value:

- 69 percent report a significant impact on business outcomes.
- 60 percent report a significant impact on revenues.
- 53 percent report a significant competitive advantage.

Yet another group emerged that should not be overlooked. Whereas Front Runners have deep technical capabilities and use them broadly across their organizations, a second group—Joggers—has similarly deep skills yet only within a narrow set of business functions. Joggers may not match Front Runners in the ability to impact business outcomes (48 percent report a significant impact) and revenues (49 percent), but they do report the highest level of impact on profitability: 43 percent report a significant impact, compared to 40 percent of Front Runners.

Slightly more than 40 percent of the The Pack and slightly less than 40 percent of Spectators report positive performance impacts or a competitive advantage from analytics, both indicating a sub-optimization of the resources invested in analytics.

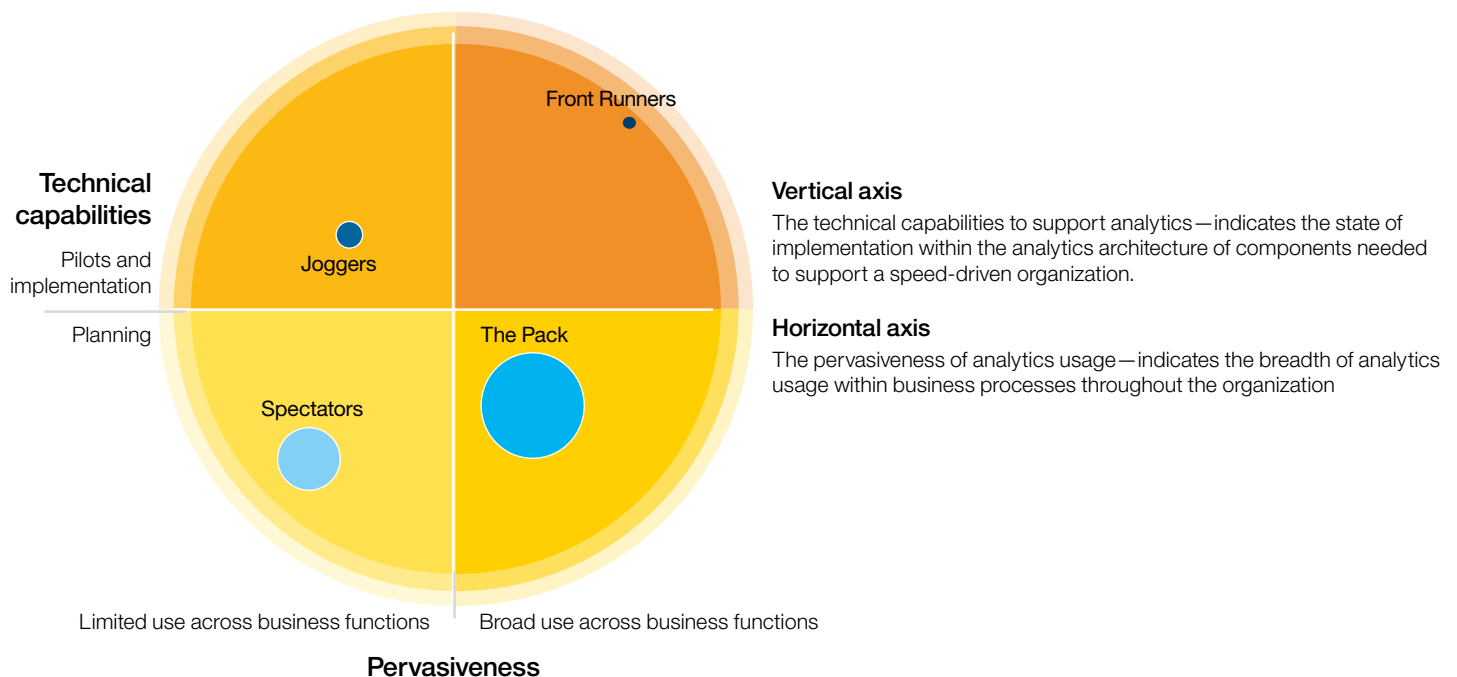


Figure 3: Organizations align to four clusters based on their readiness to manage data and analytics at speed.

Source: IBM Institute for Business Value 2014 Analytics Study. n= 1086.

Becoming a speed-driven organization

Our research clearly reveals that the speed at which an organization is able to transform the volume and variety of data available from raw bits and bytes into insight-driven actions is the key differentiator in creating value from data and analytics today. Underpinning this speed is the use of big data technologies.

While big data adoption in the broader marketplace has remained flat since 2012 (the first year it was measured in our survey), leading organizations—69 percent of Front Runners—are rapidly adopting big data, piloting and implementing technologies to support speed-accelerating capabilities throughout the analytics lifecycle.

We believe other organizations should follow the lead of the top performers by ensuring they have the capabilities needed to become a speed-driven organization. It's important to understand that creating analytics speed within an organization is not a single step; organizations must excel at each key stage within the analytics lifecycle: Acquire, Analyze and Act.

- **Acquire:** Source and manage data more quickly by blending traditional data infrastructure components with newer big data components.
- **Analyze:** Focus on analyzing the data and identifying the insights most likely to create a positive business impact.
- **Act:** Use the insights derived from data to create value for the organization.

While a clear majority of Front Runners report strong capabilities in each of these areas, Joggers are also strong competitors: Close to a majority report very strong capabilities in acquiring, analyzing and acting on data. Joggers don't report as pervasive a use of analytics as Front Runners do, which may dampen their confidence; however, like Front Runners, they are focused on optimizing the value that can be extracted from big data (see Figure 4).

In the following three chapters, we use the analytics lifecycle—Acquire, Analyze, Act—to outline how leading organizations are outpacing the competition. We explore how they are accelerating the end-to-end data process to consume data more quickly and act with agility and speed.

Percentage of organizations that excel at these analytic processes

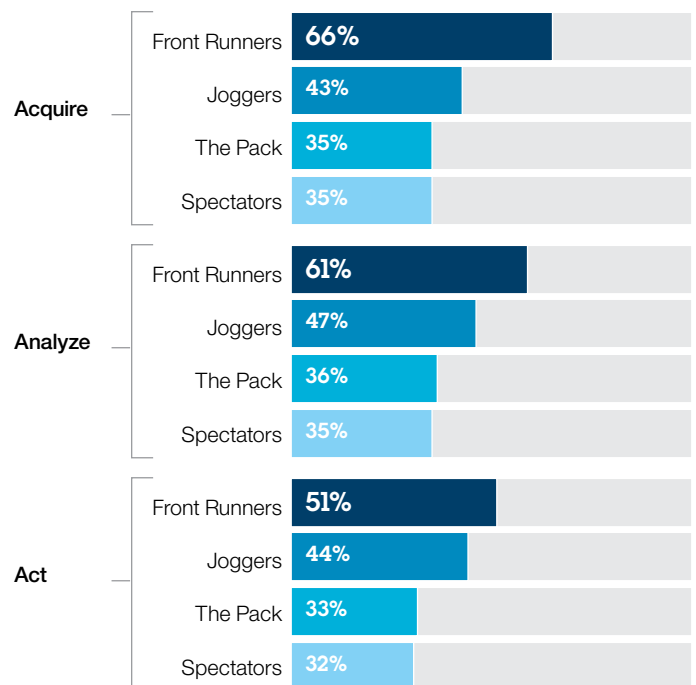


Figure 4: Front Runners excel at acquiring, analyzing and acting on data and analytics, significantly outpacing organizations in other clusters.

Source: IBM Institute for Business Value 2014 Analytics Study. n= 1067.
Note: Chart only shows percentage of respondents who indicated (4) well or (5) very well.

Chapter 1: Acquire

The ability to acquire and integrate data quickly is foundational to creating a speed advantage. Organizations must be able to source and manage data in ways that create flexibility and agility in how and when the data is used. We identified three capabilities that most differentiate Front Runners in terms of their ability to ingest data quickly. Front Runners:

- Blend traditional data infrastructure components with newer big data components
- Use real-time data processing and analysis to act in the moment
- Implement information governance to accelerate trust, integration and standardization within their data environments.

Blend traditional and new components

Front Runners source and manage data more quickly by integrating traditional and big data infrastructure components.

In the traditional approach, business users determine what questions to ask, and their IT departments structure the data to answer those questions. This is well suited to many common business processes and recurring reports, such as monitoring sales by geography, product or channel, and remains a key part of a speed-driven data infrastructure. Integrated data warehouse developers are indoctrinated to believe the data must be pristine, integrated, aggregated, properly documented and modeled. This makes sense for a vast majority for reports, dashboards and OLAP-based analyses.

But preparing data for advanced analytics requires very different practices: data is seldom made widely available within an organization and doesn't carry the same reuse and publication requirement. Rarely does big data initially meet the full brace of data cleansing, data quality, metadata and modeling associated with a traditional data warehouse.

In the big data approach, IT delivers a platform that consolidates all sources of information and enables creative discovery. Business users can then utilize that platform to explore data for ideas and possibly see brand new solutions to existing problems.

In examining the data landscape across organizations, we find four data acquisition components that most differentiate Front Runners from other clusters (see Figure 5):

Components currently within data architecture

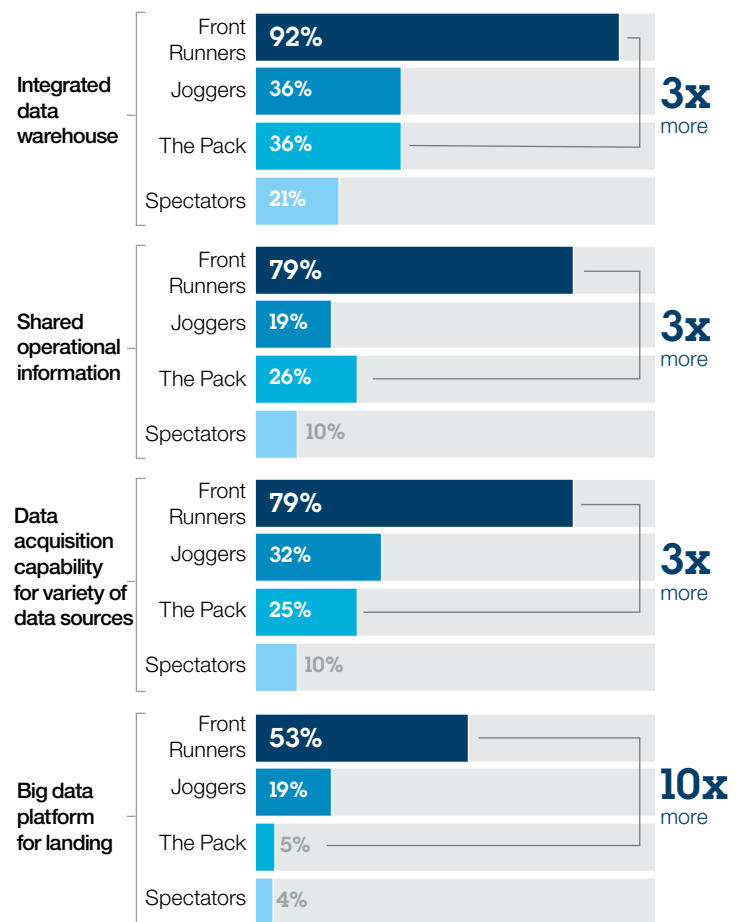


Figure 5: Front Runners leverage both traditional and newer technologies to acquire and manage data with flexibility and agility.

Source: IBM Institute for Business Value 2014 Analytics Study. n= 541, 517, 526, and 512, respectively.

Note: Chart only shows percentage of respondents who indicated the component was implemented within their architecture, either as a stand-alone or integrated component. Additionally, the question was only presented to those respondents with some level of technical knowledge of the organization.

- Almost all Front Runners have an *integrated data warehouse* to consolidate and analyze the structured transactional and operational data used to run the business. An integrated data warehouse is foundational to an organization's ability to effectively leverage data across the enterprise.
- More than three-quarters of Front Runners use a *shared operational data* store, accelerating their ability to ingest and analyze data.
- More than three-quarters of Front Runners have invested in *data acquisition capabilities* to support sourcing the wide assortment of data they are ingesting, which is in varying formats, standards, structures and speeds.
- Front Runners are 10 times more likely than The Pack to have a *big data landing platform*, which expands the availability of structured and unstructured data and augments more traditional storage structures.

While we do not see the same level of integration between the traditional structures and new components among the Joggers, we do see a solid start to the adoption of big data components, with one-third implementing data acquisition capabilities and one-in-five implementing a big data landing platform.

Use real-time data processing and analysis

As business and IT professionals accelerate the demand for speed-to-action from insights, consumers are increasingly engaging digitally with companies and with one another. It's not surprising then that a majority of organizations refresh the data within business functions at least daily.

But Front Runners are significantly more likely than other clusters to be using real-time data processing and analysis, which enables them to act in the moment and keep pace with customer demands. In fact, a majority of Front Runners are using real-time analytics processing and real-time event analysis to manage, analyze and act on data as it streams into the organization (see Figure 6).

Implement information governance

To create speed within an organization, data needs to be viewed as an enterprise asset, one that can be used throughout the organization with confidence. Reflecting this need for confidence, the top three data priorities for the next 12 months selected by each cluster were "trustworthiness," "standardization" and "integration," although Front Runners were the most emphatic in their choices. Part of data governance, thus, should involve policies that promote trust, standardization and integration:

Real-time capabilities within data architecture

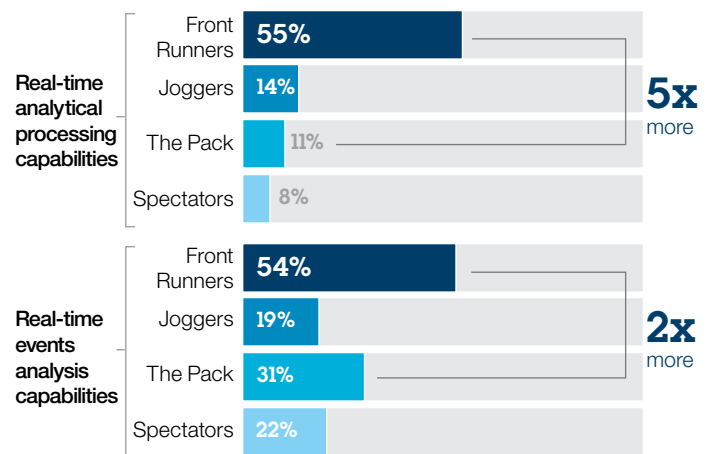


Figure 6: A majority of Front Runners have real-time capabilities, technology that significantly differentiates them from other organizations.

Source: IBM Institute for Business Value 2014 Analytics Study. n= 518 and 550, respectively.

Note: Chart only shows percentage of respondents who indicated the component was implemented within their architecture, either as a stand-alone or integrated component. Additionally, the question was only presented to those respondents with some level of technical knowledge of the organization.

- The ability to *trust* data from disparate sources, as well as trust between the people who manage and analyze that data, is key to business-driven information governance and the ability to create value from data.⁵
- *Standardization* enables various facets within an organization to speak the same language.
- *Integration* is the data foundation for collaboration, and it enables an enterprise to work together to achieve its business outcomes.

Another function of information governance is to oversee access to data, both to help employees who need data get to it and prevent those who don't need access from getting it. Reflecting the challenges of this function, a majority of survey respondents still believe they do not have access to the timely data they need to perform their job, a statistic that has been flat since 2011.⁶ Forty-one percent of this year's respondents said they only have access to the data they need some of the time, and another 17 percent reported they rarely or never have access to the data they need.

An unsettling finding was that all clusters rated data protection lowest on the list of data priorities; only 11 percent of respondents identified it a "top three" priority. Given the proliferation of large-scale data breaches in recent years, organizations risk the loss of customer and business partner confidence if adequate precautions are not taken to safeguard data, as well as legal and remediation fees. Moreover, business leaders should thoughtfully consider how their organizations use data to minimize any potential backlash in perceived privacy infringement.

Case study: Acquire

Pharmaceutical distributor invests in data management capabilities to support near-real-time analysis

A pharmaceutical wholesale distributor based in Tokyo strives to maintain a reliable, flexible and secure distribution system for a wide range of brand-name and specialty drugs. It also seeks to minimize distribution costs so that it can offer products at competitive prices, maximize its business profitability and support domestic drug manufacturers in developing new treatments.

Previously, the company was managing huge volumes of historic sales data stored on numerous disparate databases, while continuing to accumulate daily sales performance figures from more than 5,000 sales representatives. It needed a solution that would help it rapidly extract information from its vast data treasures and analyze it for use in more accurately forecasting demand, appropriately adjusting inventories and ultimately increasing sales. It also wanted representatives to have quick access to sale reports so they could tailor sales strategies to individual customer needs and minimize lost sales opportunities.

The resulting analytics solution allows users to obtain precise, near-real-time insight into sales performance and apply the information toward generating more sales and keeping inventory costs in check. The company can now analyze sales trends by variables such as product brands, regions and hospitals and quickly share the results with sales representatives through easily accessed dashboards.

The solution significantly reduces the time required to process queries on one year of sales data (approximately 70GB) from more than 400 minutes to 4.6 seconds. It also allows the company to process 20 years' worth of sales data in approximately 5.8 seconds, adding only 1.2 seconds to the processing time for one year of data. The company anticipates that within its first two years, the solution could help increase sales by 9 percent and operating profits by 140 percent.

Recommendations/practical actions

To acquire and manage data at the speed necessary to create value, organizations need to focus on flexibility and agility.

Develop solutions that support data diversity.

- *Support a wide variety of data*, both in motion and at rest, by integrating newer technologies with the traditional data infrastructure currently in place. The first step for many organizations is to create an enterprise data warehouse, the foundation for strong management of structured data. Then, extend or augment traditional infrastructure with new capabilities, such as a big data platform for landing a variety of data quickly. Creating two stand-alone systems decreases the value of both.
- *Focus on agility rather than conformity* by creating landing platforms and data lakes to quickly ingest data and stash it until it's needed. Break the habit of immediately trying to force everything into the warehouse; instead use the structured, unstructured and unformatted data together to accelerate speed to action.

Let data fuel your organization.

- *Provide access to relevant information* to empower customer-facing employees and inform back-office operations. Collecting and analyzing data are fruitless activities if data is not delivered in a timely manner to those who most benefit from it.
- *Foster rapid data consumption* by recognizing that some data comes with an extremely short shelf life and must be dealt with immediately. For example, a customer's public complaint can quickly compound discontent, while a sensor's alert of a malfunction could quickly turn into an equipment failure if not addressed quickly.

Contrary to popular belief, governance equals acceleration.

- *Instill governance to improve quality and minimize rework.* Business-driven information governance often appears to make data efforts slower, but without it, data integration becomes an even more arduous task. The upside of information governance is so powerful—the ability to contribute reliable, consistent and quality data to the analysis process—that organizations simply can't ignore it if they want to stay competitive.
- *Enable enterprise consistency through a common business language.* The first step to effective information governance is standardizing common definitions, codes and identifiers across functions, geographies and systems. The ability to quickly integrate data is stalled if data means something different to each user group or common tasks use inconsistent codes to capture data.

Chapter 2: Analyze

Once a solid data foundation is in place to source and manage data, organizations striving for speed-to-action need to focus on analyzing the data and identifying the insights most likely to create a positive business impact.

To provide meaningful, timely insights, organizations must quickly analyze robust datasets. We identified three capabilities that differentiate Front Runners in their ability to accelerate data analysis. Front Runners:

- Analyze diverse datasets to create more meaningful insights
- Use advanced analysis approaches pervasively
- Harness talent that combines business knowledge and analytics.

Analyze diverse datasets

Front Runners differentiate themselves by analyzing robust, often external, datasets to create business-driven insights that impact organizational performance. We identified nine out of 18 data sources that Front Runners are twice as likely to analyze (see Figure 7).

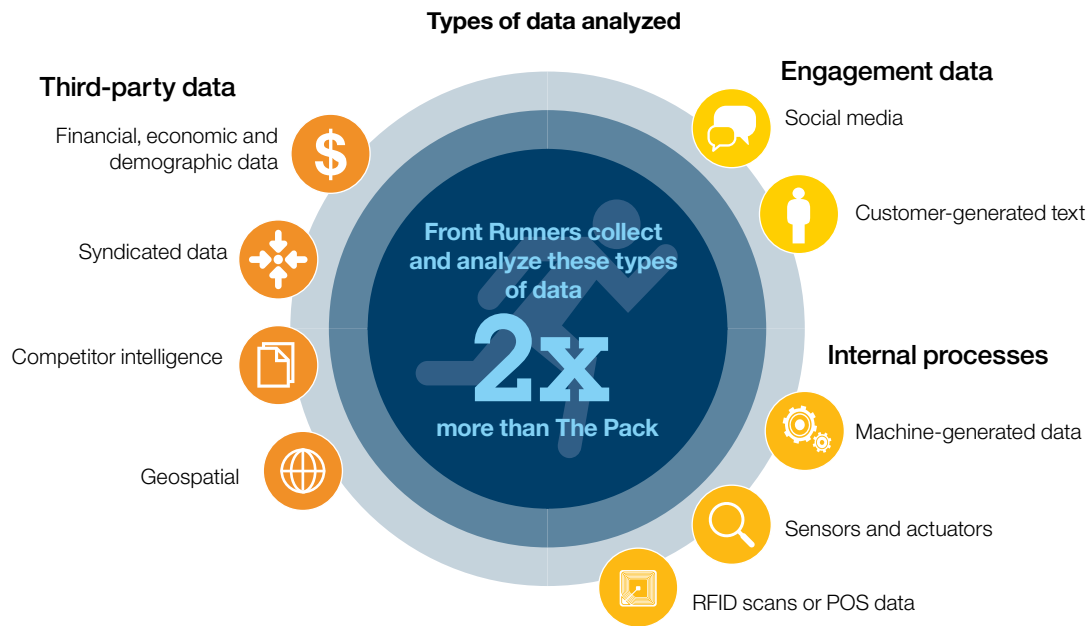


Figure 7: Front Runners collect and analyze a much broader set of data than other organizations.

Source: IBM Institute for Business Value 2014 Analytics Study, n= average 525 for each type of data.
Note: For each source, The Pack had the second highest percentage of collection and analysis.

These sources fall into three categories:

Engagement data

This data provides a richer context for customer interactions, marketing and product development by providing sentiment, product and service feedback, as well as crowd-sourced innovation at both the individual and aggregate levels. Integrating this information into product and service development can boost the customer experience.

Third-party data

This data creates a more robust version of internal datasets, enabling a deeper level of insights to support marketing and sales tactics, operational efficiencies and financial forecasts. It may also reduce risks from external forces, such as competitor moves and weather.

Internal processes

This data enables in-depth analysis on operations within an organization, which can lead to cost reductions, cost avoidance, and increases in productivity and efficiency. This data also creates the agility needed to meet the needs of today's ever more demanding customers.⁷

Use advanced analysis approaches

Speed-driven organizations accelerate data analysis not only by using more advanced analytics, but by using them more extensively and broadly across the organization. This pervasive use of advanced analysis methods differentiates Front Runners from Joggers.

These advanced analysis techniques can be broken into four types: descriptive, diagnostic, predictive and prescriptive. Each of these types of data has a particular use within an organization's analysis, depending on the business challenge to be solved (see Figure 8).




	Descriptive What HAS happened?	Diagnostic WHY did this happen?	Predictive What COULD happen?	Prescriptive What SHOULD happen?
Three major processes	 <ul style="list-style-type: none"> • Increase revenue • Decrease operational costs 	<ul style="list-style-type: none"> • Explain root cause in decreasing revenue and increasing costs 	<ul style="list-style-type: none"> • Predict new trends and sources of new revenue • Forecast operational expenses 	<ul style="list-style-type: none"> • Increase revenue • Optimize operational expenses
	 <ul style="list-style-type: none"> • Revenue and expenses • Historical operational cost comparison 	<ul style="list-style-type: none"> • Why is revenue decreasing • Why are operational costs increasing 	<ul style="list-style-type: none"> • How to anticipate changes in marketplace • When to make operational process changes 	<ul style="list-style-type: none"> • How to increase revenue via new products • Which operational changes provide highest long-term benefit
	 <ul style="list-style-type: none"> • Standard reporting • Query/drill down • Ad-hoc reporting • Alerts • Dashboards 	<ul style="list-style-type: none"> • Root cause analysis • Visualizations • Content and natural language processing • Business intelligence 	<ul style="list-style-type: none"> • Predictive modeling • Forecasting • Simulation • Alerts • Propensity scoring 	<ul style="list-style-type: none"> • Optimization • Random variable optimization • Business rules • Comparisons

Figure 8: Various types of analysis are used to solve different business challenges.

A majority of respondents from each cluster use the four key types of analysis methods at some level within their organizations, but none use them as extensively as Front Runners. Two-thirds of Front Runners use descriptive analytics extensively, compared with less than half of Joggers and even fewer in the other two clusters. Similarly, a majority of Front Runners use diagnostic analytics extensively versus only one-third of other clusters. Front Runners also outpace others in the use of forward-looking predictive analytics with more than one-third using them extensively throughout a variety of business processes, while more than one-third of Joggers use prescriptive analytics to drive and automate processes.

Harness talent

In each annual IBM Institute for Business Value analytics survey since 2010, the top challenge for organizations—no matter how we asked the question—has been “the ability to understand how to use data and analytics to impact” business performance, business outcomes or competitive advantage. This is true again in 2014, with 56 percent of all respondents ranking this inability as their biggest challenge.⁸

This challenge continues due to the difficulty in finding individuals who can combine business and analytics knowledge to create insight. Front Runners acutely feel this gap in talent, with more than two-thirds identifying it as a one of the top three skills gaps, and slightly more than one-third also selecting skills for business analysis and data analysis separately (see Figure 9).

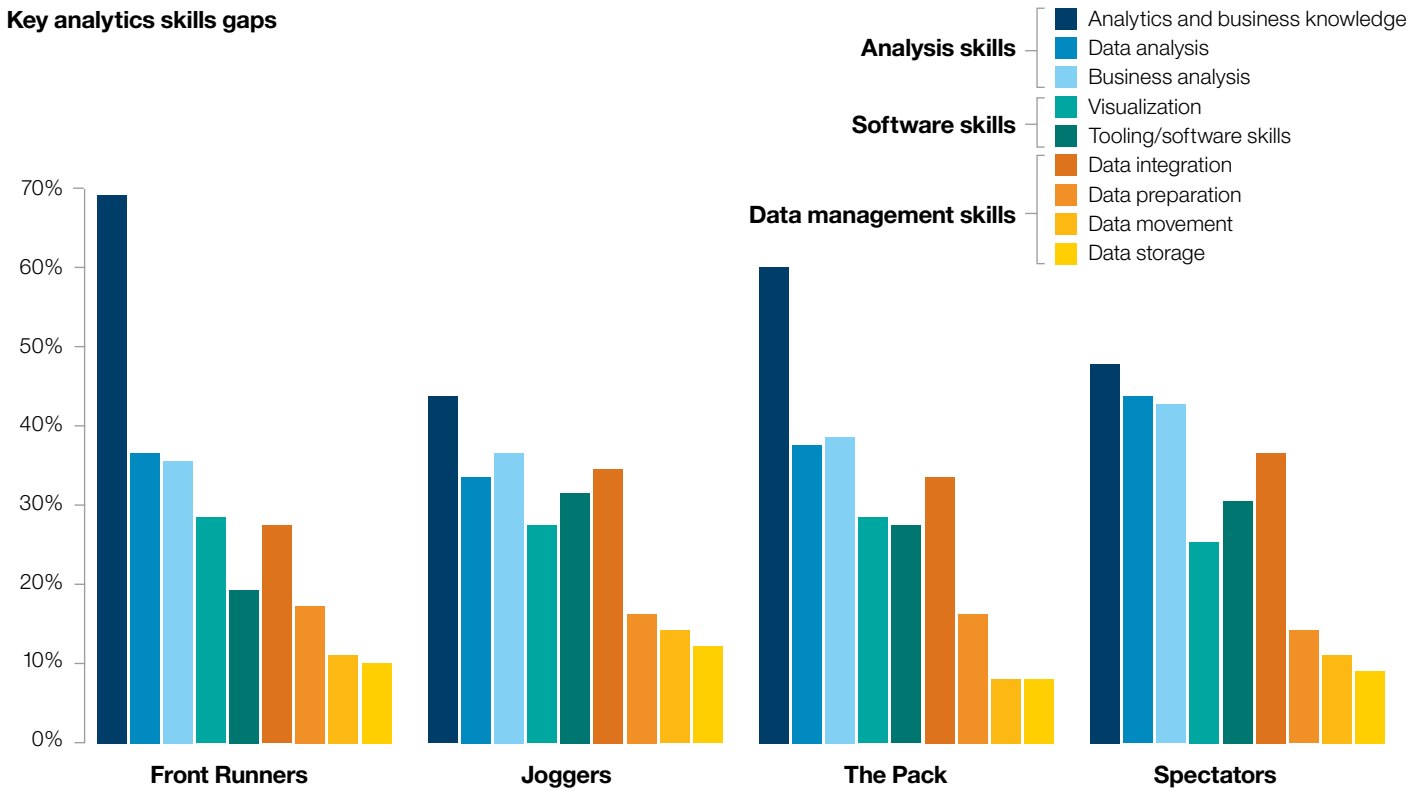


Figure 9: The need for individuals whose skills combine data analysis and business knowledge becomes even more important as organizations pursue a speed-driven approach to analytics.

Source: IBM Institute for Business Value 2014 Analytics Study, n= 1086.

But the talent shortage of those who can combine data and business analysis is felt most by every other cluster. The data suggests, however, that as organizations move to broaden their skills across the enterprise, the need for the combined skills becomes more apparent. This makes sense, as the combination

of business and analytics skills is critical within speed-driven organizations, enabling a quicker translation of insights into actions based on a deeper knowledge of the business drivers—and the related data to understand them—that are most likely to impact performance.

Case study: Analyze

Speeding up hospital approvals to save time and potentially lives⁹

According to the Institute of Medicine, 30 percent of the trillions of dollars spent on healthcare in the United States annually is wasted.¹⁰ While there are many factors contributing to this statistic, one step toward reducing waste is improving the utilization management (UM) process, which governs the preapproval of healthcare insurance coverage for many medical procedures.

Executives at WellPoint, one of the nation's leading health benefits companies, pinpointed utilization management as a way to help providers make healthcare decisions more quickly and consistently. Its goals were to accelerate processing of physicians' treatment requests, save members' time and improve efficiencies in the approval process, while continuing to base decisions on medical evidence and clinical practice guidelines.

Relying on the cognitive system IBM Watson to provide approval suggestions to nursing staff based on clinical and patient data, WellPoint now uses hypothesis generation and evidence-based learning to generate confidence-scored recommendations that help nurses make decisions about utilization management. The new system provides responses to all requests in seconds, as opposed to 72 hours for urgent pre-authorization and three to five days for elective procedures with the previous UM process.

"An extraordinary power of Watson is the ability to quickly analyze vast amounts of up-to-date scientific and clinical research and patient data, extracting the most relevant and personalized information to inform and assist decision making," explains Dr. Sam Nussbaum, WellPoint chief medical officer.

Recommendations/practical actions

Organizations striving for speed-to-action should focus on the data and insights most likely to create a positive business impact.

Get insights from the outside.

- *Add depth to customer profiles, interactions and operations by integrating external data.* Knowing basic account details about your customers or operations is no longer enough. Organizations need to augment this basic data with external details. For customers, this may mean adding preferences, behaviors, socioeconomic factors and influencers; for operations, it may be external financial and economic data or internal sensors and actuators. These details provide a depth of understanding most organizations today ignore. Being among the first to spot new trends in the market or preventing operational downtime can facilitate growth, even in low-growth markets.
- *Tap into behavior patterns, trends and sentiments using social media and customer-generated text.* Use these outlets to quickly understand customers' preferences and habits better, and identify product and service strengths and weakness. A rapid response to product flaws or service disruptions is critical to keeping competitors at bay. But social analytics involves more than just customer patterns; it also includes data on trends and events. For example, analysis of trends relating to hospital check-ins and status updates could help more quickly identify disease outbreaks or emergency service needs in the event of a disaster.

Make pervasive use of deeper analytics.

- *Make pervasive use of predictive analytics a priority.* Gut instincts and history alone are poor predictors of the future in today's rapidly changing marketplace. Using analytics to spot fraudulent behaviors, forecast outcomes and guide actions reduces the likelihood of marketplace missteps, lost opportunities and unidentified risks.

- *Use prescriptive analytics to empower the workforce.* Few things are more frustrating—for both customer and employee—than a service representative who either cannot act on a request or who offers only generic responses. Empower employees by embedding analytics into frontline processes, enabling them to act quickly and precisely at each opportunity. The same is true for back-office personnel, often confronted with a myriad of choices and little guidance on the course of action most likely to create value.

Confront the skills gap; it is not going away.

- *Learn from the best within your organization.* Tap into the pockets of talent within the organization—those few using predictive or prescriptive analytics—to expand the skills of others. Create a strong internal professional program to arm analysts and executives who already understand the organization’s business fundamentals with analytics. Sharing resources and knowledge is a cost-effective way to build skills and helps limit the need to seek talent elsewhere.
- *Externally supplement skills based on business case.* Not all organizations need a data scientist full time; the same is true for niche analytics skills that may be used only to solve specific challenges. Organizations should invest in the talent and skills they need to solve the majority of their analytics demands, and consider vendors to supplement critical niche skills that are hard to find and expensive to employ.

Chapter 3: Act

The final step necessary to create the speed-to-action demanded today is to actually act—and act quickly—on the data. While this may sound simple, it is in many ways the hardest part about using analytics to create a competitive advantage, and one where many organizations stumble. Even the Front Runners are less confident about their capabilities here, although not as uncertain as other clusters.

Collecting, managing, storing and analyzing data are valueless activities unless an organization is prepared to act on those insights. In our 2013 study, “Analytics: A blueprint for value,” we identified the nine levers needed for an organization to create value; only two of them reference the data management or technical capabilities of the organization.¹¹ Successfully creating value depends heavily on the culture, people and management processes of the organization itself.

Front Runners understand that once an organization decides to act on analytics, the results can be transformative. They understand that the insights derived from data can create new opportunities to engage with customers and new ways of doing business. We find three characteristics that differentiate Front Runners most in the ability to act on data insights quickly. Front Runners:

- Integrate digital and process transformations to create end-to-end speed that drives business outcomes
- Embed analytics within business processes to enable precise, quick actions
- Use comprehensive visualization techniques to quickly understand and act on large or dynamic datasets.

Integrate digital and process transformations

While there are numerous case studies of analytics driving incremental change within organizations, the speed at which Front Runners drive change enables them to realize the transformative power of analytics as well.

Analytic transformations can be divided into two focal areas: digital interaction and process re-invention:

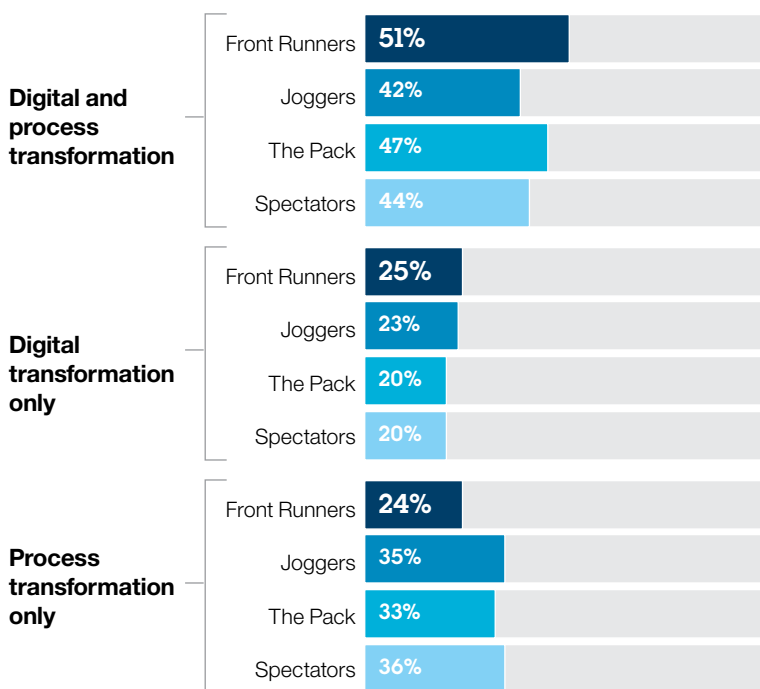
- *Digital interaction:* Reimagining everything about the way people connect, transact and engage with companies,

institutions and governments—and how they create mutual value.

- *Process re-invention:* Transforming the organization for agility, flexibility and precision to enable new growth.

A majority of Front Runners are focused on creating an end-to-end transformation, incorporating both digital interactions and process re-invention, while the majority in the other three clusters are more likely to undertake either a digital or a process transformation (see Figure 10).

Key objectives for analytics



Examples of transformation

Digital and process transformation

“Next best action” algorithms use predictive and prescriptive analytics to optimize interactions with customers and prospects and empower employees to take action.

Threat and fraud analytics enable investigators to act quickly by using predictive analytics to anticipate threats and to detect suspicious behavior, crime or fraud.

Digital transformation

Social media sentiment analysis uses real-time and text analysis to anticipate customer needs, identify key influencers and manage online brand reputation.

Predictive maintenance optimization analyzes data from sensors embedded within machinery to anticipate equipment failure and reduce maintenance costs.

Process transformation

Business process analysis uses embedded analytics to continuously monitor, measure, manage and refine the decisions that drive organizational operations.

Financial analysis uses techniques such as variance analysis, scenario modeling, and what-if analysis to target the drivers of profitability and performance.

Figure 10: A majority of Front Runners are using data and analytics to create an end-to-end transformation that integrates digital capabilities within business processes.

Source: IBM Institute for Business Value 2014 Analytics Study.

With a digital transformation, organizations are focused on ways to better leverage the available data either to grow revenues or cut costs, although the majority of digital transformations are focused on customer-centric outcomes. Developing new social and mobile capabilities to engage both customers and employees with “anywhere access” to the organization are the focus of many digital transformations today.¹²

Data has been an integral part of operations for decades, with many organizations investing in ongoing efforts to streamline and optimize business processes with traditional analytics. Front Runners, however, are collecting and analyzing new forms of data and using more advanced analysis methods to create new avenues of cost reduction and efficiency within business processes. Finance, supply chain and operations are among the business processes undergoing transformation from the infusion of big data capabilities.

In a combined digital and process transformation, organizations examine the end-to-end process or experience, and both integrate analytics into the business process and streamline operations simultaneously. For example, we see complex algorithms helping guide customer service interactions to make them more mutually beneficial, the result of structured and unstructured data analyzed offline and then integrated into context-aware front-end dashboards to create personalized marketing and service solutions.

Embed analytics within business processes

One of the key components of both a digital and process transformation is integrating analytics into the targeted business processes. While not all business processes require the same level of integration, Front Runners and the process-minded Joggers recognize the speed advantage of using analytics to automate, drive or inform key business processes within their organizations (see Figure 11).

Level of analytics integration in business processes

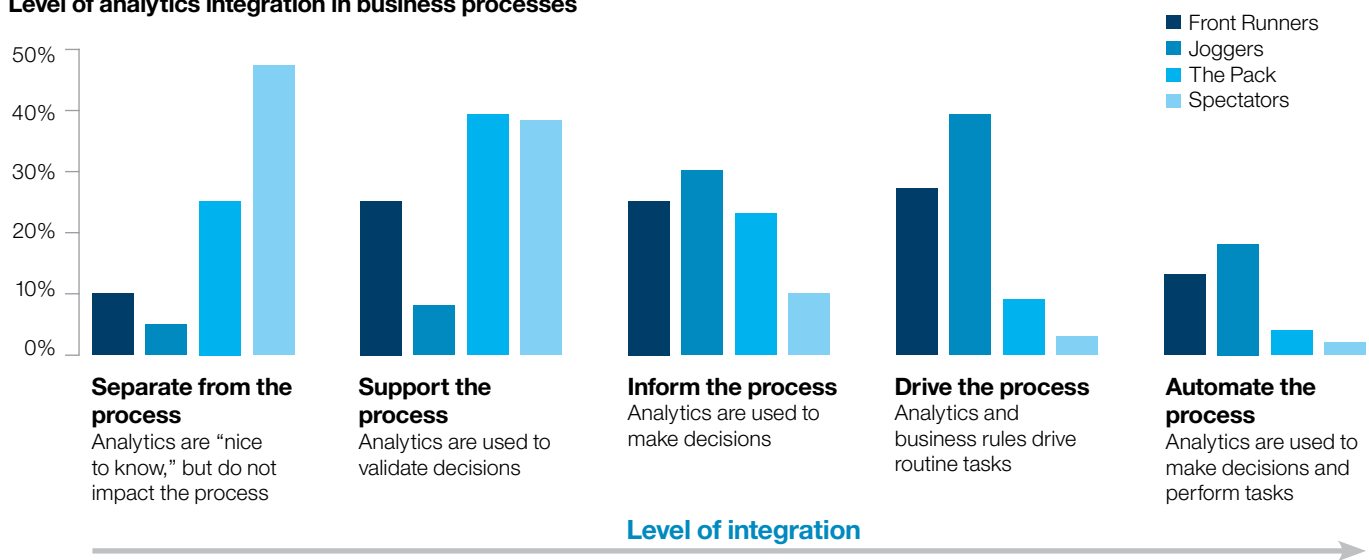


Figure 11: Front Runners and Joggers embed analytics within business processes more than other clusters, creating business processes that can operate with speed and precision.

Source: IBM Institute for Business Value 2014 Analytics Study. n= 1036.

For Front Runners, the use of analytics to inform back-office business processes like finance is sufficient. But for customer-facing processes like call centers or online interactions and operational processes like manufacturing, Front Runners also recognize the benefits of using algorithms and predictive models actions to optimize and drive the process.

A majority of Joggers, who hail from more process-centric industries and cultures, embed analytics directly within business processes to enable precise, efficient actions. These organizations use business rules to direct processes and more prescriptive algorithms, machine learning and artificial intelligence to automate them.

Use comprehensive visualization techniques

In addition to embedding analytics into business processes, Front Runners and Joggers share another characteristic that helps them quickly act on insights: visualization. Front Runners use advanced visualization techniques to quickly comprehend and act on large or dynamic datasets, while Joggers use animation to visualize operational processes.

Analytics can help reduce the size and complexity of big data to a point where it can be effectively visualized and understood. In the best scenario, the visualization and analytics are integrated into an emerging field known as “visual analytics,” wherein visualization not only supports interpretation of data but is used to analyze it. We see this in the Front Runners’ use of techniques such as visual data mining and exploratory visual analytics (see Figure 12).

Use of advanced visualization techniques

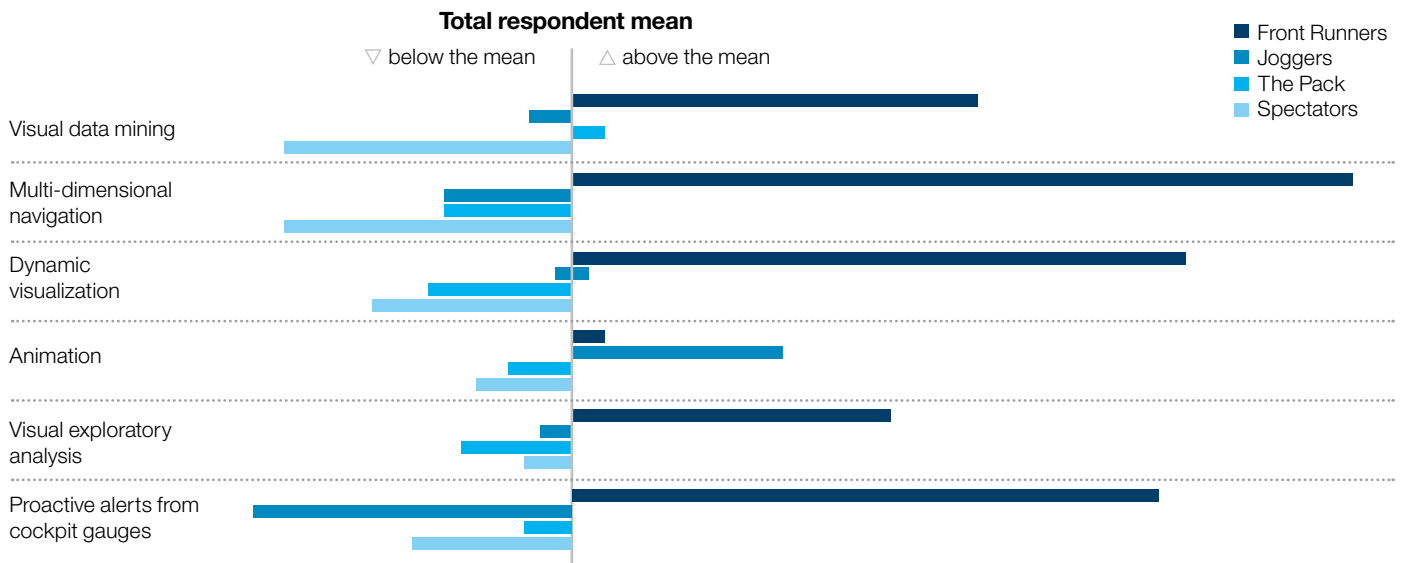


Figure 12: Front Runners are using advanced visualization techniques to enable quicker decision making and action.

Source: IBM Institute for Business Value 2014 Analytics Study. n= 620.

Case study: Act

B2B distributor uses dashboard to act on data insights¹³

A business-to-business distributor of electrical industrial supplies, Rexel UK Ltd. has adopted a new strategy known as “Energy in Motion,” which aims to put the customer at the center of its operations and create greater value for all stakeholders: customers, suppliers, employees and investors. To support this strategy by providing decision makers with deep, accurate and timely operational insight, the company needed to transform its approach to business analytics.

Rexel rebuilt its business intelligence platform from the ground up, developing an agile environment that is closely aligned with user needs. Previously, many employees were overwhelmed by the sheer volume of reports on the system and didn’t have time to utilize all the information. Rexel transformed its reporting processes, trimming the number of reports by 90 percent through the use of techniques such as dashboards. Decision makers can now access highly meaningful, on-time information in a format that is easy to understand.

“Now it’s quick and easy for users to drill down to the relevant areas and get the information they need. Instead of spending hours in front of a screen, they’re in and out in minutes, and spending more time doing what they’re paid to, which is selling products and interacting with customers on the shop floor,” says Simon Short, Head of Business Intelligence for Rexel.

“We are in business intelligence heaven right now,” he said. “It has taken a lot of time and effort to get to where we are today, but it’s important to recognize that business intelligence isn’t just a one-off project, it’s a journey. We will continue to fine-tune and develop our environment so that Rexel can extract even better value out of business intelligence in the years to come.”

Recommendations/practical actions

Organizations seeking to create value from information need to pervasively use data insights to positively influence outcomes.

Create end-to-end speed by integrating digital and process outcomes.

- *Embrace digital interactions* as a way of business. Customers and suppliers are rapidly adopting a digital lifestyle, raising the expectation that the companies and organization they interact with are also onboard. Ignoring global digitization not only reduces speed-to-action, but alienates those looking for convenience, simplicity and consistency in today’s overly complex world.
- *Infuse digital capabilities into business processes* that still rely on twentieth-century technologies and philosophies. Digital technologies can be used to streamline and modernize even the most fundamental business process. For example, claims inspectors can spend their time more effectively investigating suspicious claims as opposed to randomly selected ones by running fraud algorithms prior to the start of the process. Reducing manual processes and automating routine tasks create an environment where employees can focus on creating value rather than managing the routine. Amplify analysis activities by visualizing critical data to enable employees to digest it more quickly, thereby identifying value-driving actions faster.

Make analytics consumable for employees and executives.

- *Create a mobile strategy* that outlines the key business and IT requirements for enabling near-term and future-state mobile needs. This strategy should define the recommended mobile architecture, as well as the recommended mobile application development, testing, deployment, and support approach. Another critical component of the strategy is a mobile governance model that defines common mobile application principles, policies and guidelines with particular focus on enterprise mobile security and privacy concerns.

- *Empower employees to access insights anywhere.* Not all employees work in a cubicle with routine hours, so enable the entire workforce to access the analytics they need to make decisions and take actions regardless of where the work is performed. Tap into new ways of socially enabled working to help fine tune the performance of the operating model.

Match insight delivery to insight demand.

- *Align the speed of insights to the business objective.* Understanding the difference between business objectives that need to be solved with a real-time solution and those that do not is critical; misalignments can be costly.
- *Embrace new ideas based on less-than-perfect business cases.* Part of staying ahead of the competition is doing uncommon—sometimes risky—things. These innovative ideas rarely carry the same level of certainty or proven track records required by more traditional business case evaluation processes. But it's often bold, swift moves that generate the greatest value, especially now that the majority of organizations realize a return on their investments in less than a year. Organizations must become more comfortable accepting less-than-perfect or riskier actions to realize the market-first rewards that come with them.

Conclusion

Analytics provide the fuel for an organization to make better decisions faster. In the realm of big data, the “winners” are those that manage the data deluge and turn it into value-generating insights ahead of the competition. These organizations are dedicated to the speed advantage, a competitive strategy that enables the rapid acquisition and analysis of data to create agile, precise moves in the marketplace.

Creating a speed advantage does not necessarily require a real-time solution, but it does require streamlining decisions made within business processes. It also requires enabling the organization to extract the most from its data assets to deliver outcomes that matter.

Organizations that successfully achieve the speed advantage can transform data from something to be managed into a strategic tool that fuels digital interactions and re-invents business processes for the modern world. These organizations will differentiate themselves based on their ability to adapt, survive and thrive as the pace of society continues to accelerate.

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