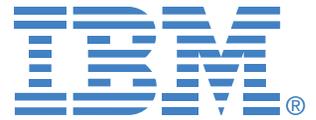


**MIT Sloan**  
Management Review

**RESEARCH  
REPORT**

FALL 2010

In collaboration with  
IBM Institute for Business Value



**FINDINGS FROM THE 2010 NEW INTELLIGENT ENTERPRISE  
GLOBAL EXECUTIVE STUDY AND RESEARCH PROJECT**

# Analytics: The New Path to Value

How the Smartest Organizations Are  
Embedding Analytics to Transform  
Insights Into Action

By *MIT Sloan Management Review* and  
the IBM Institute for Business Value

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# Executive Summary

As the well-documented “data deluge” deepens, many executives have shifted from feeling overwhelmed (60% say they “have more information than we can effectively use”) to recognizing that the smartest organizations are already capitalizing on increased information richness and analytics to gain competitive advantage.

To understand better how all organizations are attempting to capitalize on information and apply analytics today and in the future, *MIT Sloan Management Review* in collaboration with the IBM Institute for Business Value conducted a study that included a survey of nearly 3,000 executive managers worldwide, as well as in-depth interviews with leading researchers.

## Among the top-line survey findings:

### Top performers view analytics as a differentiator:

Top-performing companies are three times more likely than lower performers to be sophisticated users of analytics, and are two times more likely to say that their analytics use is a competitive differentiator.

**The biggest obstacle is not the data:** Despite the enormous challenge felt by most organizations to “get the data right,” that’s not what executives name as the key barrier to achieving the competitive advantage that “big data” can offer — the top two barriers are “lack of understanding of how to use analytics to improve the business” and “lack of management bandwidth.”

**Where are the leaders headed? Toward making information “come alive”:** Over the next 24

months, executives say they will focus on supplementing standard historical reporting of data with emerging approaches that convert information into scenarios and simulations that make insights easier to understand and to act on.

Based on data from our survey, case studies and interviews with experts, we have identified a new, five-point methodology for successfully implementing analytics-driven management and for rapidly creating value. This report describes that emerging methodology and its five critical recommendations.

- ▶ **Focus on the biggest opportunities first.** Attack one big important problem that can demonstrate value and catalyze the organization toward action.
- ▶ **Start with questions, not data.** Understand the problem — and the insights needed to solve it — before working on the data that will yield the insights.
- ▶ **Embed insights to drive action.** Ensure end-result impact by making information come to life, articulating use cases and expressing data-driven insights in ways that even nonexperts can understand and act upon.
- ▶ **Keep existing capabilities while adding new ones.** Even as centralized analytics oversight grows, keep distributed, localized capabilities in place.
- ▶ **Build the analytics foundation according to an information agenda.** Opportunistic application of analytics can create value fast, but it must be part of an enterprise-wide information-and-analytics plan.



# Analytics: The New Path to Value

How the smartest organizations are embedding analytics to transform insights into action

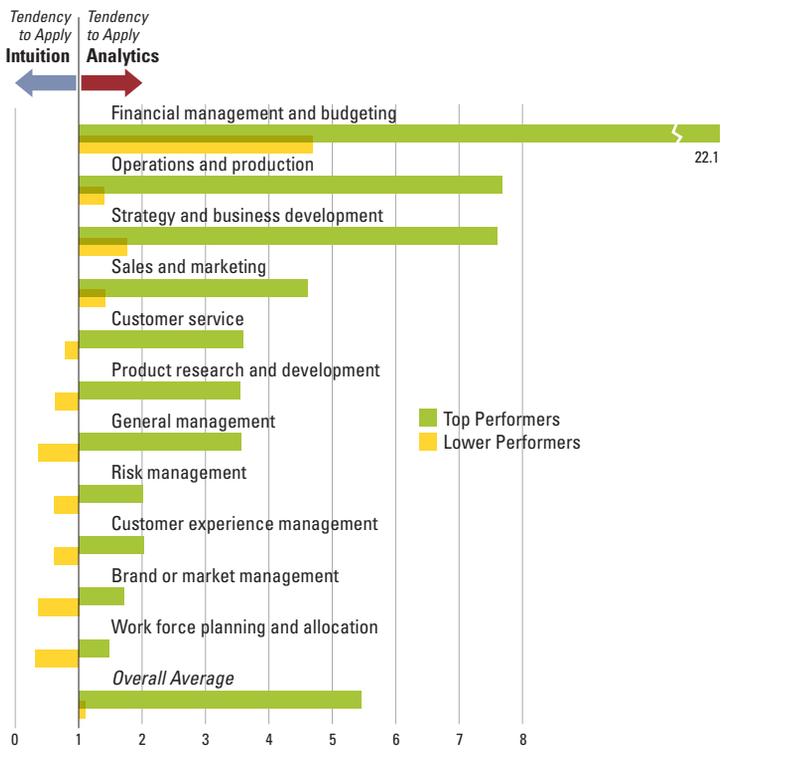
*The combination of an increasingly complex world, the vast proliferation of data and the pressing need to stay one step ahead of the competition has sharpened focus on using analytics within organizations. To understand better how organizations are applying analytics today, prioritizing their future investments and transforming insights into action, MIT Sloan Management Review in collaboration with the IBM Institute for Business Value surveyed a global sample of nearly 3,000 executives, managers and analysts. Based on our analysis of survey results, combined with interviews with academic and subject matter experts, this study offers recommendations on how organizations can bolster their analytics capabilities to achieve long-term advantage.*

**A**t organizations in every industry, in every part of the world, senior leaders wonder whether they are getting full value from the massive amounts of information they already have within their organizations. New technologies are collecting more data than ever before, yet many organizations are still looking for better ways to obtain value from their data and compete in the marketplace. Their questions about how best to achieve value persist.

Are competitors obtaining sharper, more timely insights? Are they able to regain market advantage neglected while focusing on expenses during the past two years? Are they correctly interpreting new signals from the global economy — and adequately assessing the impact on their customers and partners? Knowing what happened and why it happened are no longer adequate. Organizations need to know what is happening now, what is likely to happen next and what actions should be taken to get the optimal results.

To help organizations understand the opportunity provided by information and advanced analytics, *MIT Sloan Management Review* partnered with the IBM Institute for Business Value to conduct a survey of nearly 3,000 executives, managers and analysts working across more than 30 industries and 100 countries (see “About the Research”).

Among our key findings: Top-performing organizations use analytics five times more than lower performers (see Figure 1). Overall, our survey found widespread belief that analytics offers value. Half of our respondents said that *improvement of information and analytics was a top*



**FIGURE 1**  
The tendency for top-performing organizations to apply analytics to particular activities across the organization, as compared to lower performers. A likelihood of 1.0 indicates an equal likelihood that the organizations will use either analytics or intuition.

priority in their organizations. And more than one in five said they were under intense or significant pressure to adopt advanced information and analytics approaches.

The source of the pressure is not hard to ascertain. Six out of 10 respondents cited *innovating to achieve competitive differentiation* as a top business challenge. The same percentage also agreed that their organization has more data than it can use effectively. Organizational leaders want analytics to exploit their growing data and computational power to get smart, and get ahead, in ways they never could before.

Senior executives now want businesses run on data-driven decisions. They want scenarios and simulations that provide immediate guidance on the best actions to take when disruptions occur — disruptions ranging from unexpected competitors or an earthquake in a supply zone to a customer signaling it may switch providers. Executives want to understand optimal solutions based on complex business parameters or new information, and they want to take action quickly.

These expectations can be met — but with a caveat. For analytics-driven insights to be consumed — that is, to trigger new actions across the organization —

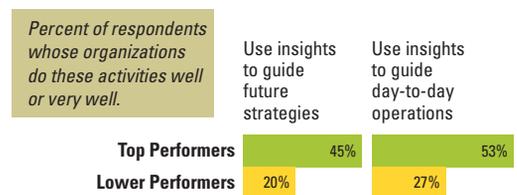
they must be closely linked to business strategy, easy for end users to understand and embedded into organizational processes in order to take action at the right time. That’s no small task. It requires painstaking focus on the way insights are infused into everything from manufacturing and new product development to credit approvals and call center interactions.

### Top Performers Say Analytics Is a Differentiator

Our study clearly connects performance and the competitive value of analytics. We asked respondents to assess their organization’s competitive position. Those who selected “substantially outperform industry peers” were identified as top performers, while those who selected “somewhat or substantially underperforming industry peers” were grouped as lower performers.<sup>1</sup>

We found that organizations that strongly agreed that the use of *business information and analytics differentiates them within their industry* were twice as likely to be top performers as lower performers.

Top performers approach business operations differently from their peers. Specifically, they put analytics to use in the widest possible range of decisions, large and small. They were twice as likely to use analytics to guide future strategies and twice as likely to use insights to guide day-to-day operations (see Figure 2). They make decisions based on rigorous analysis at more than double the rate of lower performers. The correlation between performance



**FIGURE 2**  
Top performing organizations were twice as likely to use analytics to guide day-to-day operations and future strategies as lower performers.

and analytics-driven management has important implications to organizations whether they are seeking growth, efficiency or competitive differentiation.

### Three Levels of Capabilities Emerged, Each with Distinct Opportunities

Organizations that know where they are in terms of analytics adoption are better prepared to turn challenges into opportunities. We segmented respondents based on how they rated their organization’s analytics prowess, specifically how thoroughly their organizations had been transformed by better uses of analytics and information. Three levels of analytics capability emerged — Aspirational, Experienced and Transformed — each with clear distinctions (see Figure 3).

**Aspirational.** These organizations are the farthest from achieving their desired analytical goals.

Often they are focusing on efficiency or automation of existing processes, and searching for ways to cut costs. Aspirational organizations currently have few of the necessary building blocks — people, processes or tools — to collect, understand, incorporate or act on analytic insights.

**Experienced.** Having gained some analytic experience — often through successes with efficiencies at the Aspirational phase — these organizations are looking to go beyond cost management. Experienced organizations are developing better ways to effectively collect, incorporate and act on analytics so they can begin to optimize their organizations.

**Transformed.** These organizations have substantial experience using analytics across a broad range of functions. They use analytics as a competitive differentiator and are already adept at organizing people, processes and tools to optimize and differentiate. Transformed organizations are less focused on cutting costs than Aspirational and Experienced

**FIGURE 3**  
Three capability levels — Aspirational, Experienced, and Transformed — were based on how respondents rated their organization’s analytic prowess.

	ASPIRATIONAL	EXPERIENCED	TRANSFORMED
<b>Motive</b>	<ul style="list-style-type: none"> <li>•Use analytics to justify actions</li> </ul>	<ul style="list-style-type: none"> <li>•Use analytics to guide actions</li> </ul>	<ul style="list-style-type: none"> <li>•Use analytics to prescribe actions</li> </ul>
<b>Functional proficiency</b>	<ul style="list-style-type: none"> <li>•Financial management and budgeting</li> <li>•Operations and production</li> <li>•Sales and marketing</li> </ul>	<ul style="list-style-type: none"> <li>•All Aspirational functions</li> <li>•Strategy / business development</li> <li>•Customer service</li> <li>•Product research / development</li> </ul>	<ul style="list-style-type: none"> <li>•All Aspirational and Experienced functions</li> <li>•Risk management</li> <li>•Customer experience</li> <li>•Work force planning / allocation</li> <li>•General management</li> <li>•Brand and market management</li> </ul>
<b>Business challenges</b>	<ul style="list-style-type: none"> <li>•Competitive differentiation through innovation</li> <li>•Cost efficiency (primary)</li> <li>•Revenue growth (secondary)</li> </ul>	<ul style="list-style-type: none"> <li>•Competitive differentiation through innovation</li> <li>•Revenue growth (primary)</li> <li>•Cost efficiency (secondary)</li> </ul>	<ul style="list-style-type: none"> <li>•Competitive differentiation through innovation</li> <li>•Revenue growth (primary)</li> <li>•Profitability acquiring / retaining customers (targeted focus)</li> </ul>
<b>Key obstacles</b>	<ul style="list-style-type: none"> <li>•Lack of understanding how to leverage analytics for business value</li> <li>•Executive sponsorship</li> <li>•Culture does not encourage sharing information</li> </ul>	<ul style="list-style-type: none"> <li>•Lack of understanding how to leverage analytics for business value</li> <li>•Skills within line of business</li> <li>•Ownership of data is unclear or governance is ineffective</li> </ul>	<ul style="list-style-type: none"> <li>•Lack of understanding how to leverage analytics for business value</li> <li>•Management bandwidth due to competing priorities</li> <li>•Accessibility of the data</li> </ul>
<b>Data management</b>	<ul style="list-style-type: none"> <li>•Limited ability to capture, aggregate, analyze or share information and insights</li> </ul>	<ul style="list-style-type: none"> <li>•Moderate ability to capture, aggregate and analyze data</li> <li>•Limited ability to share information and insights</li> </ul>	<ul style="list-style-type: none"> <li>•Strong ability to capture, aggregate and analyze data</li> <li>•Effective at sharing information and insights</li> </ul>
<b>Analytics in action</b>	<ul style="list-style-type: none"> <li>•Rarely use rigorous approaches to make decisions</li> <li>•Limited use of insights to guide future strategies or guide day-to-day operations</li> </ul>	<ul style="list-style-type: none"> <li>•Some use of rigorous approaches to make decisions</li> <li>•Growing use of insights to guide future strategies, but still limited use of insights to guide day-to-day operations</li> </ul>	<ul style="list-style-type: none"> <li>•Most use rigorous approaches to make decisions</li> <li>•Almost all use insights to guide future strategies, and most use insights to guide day-to-day operations</li> </ul>



organizations, possibly having already automated their operations through effective use of insights. They are most focused on driving customer profitability and making targeted investments in niche analytics as they keep pushing the organizational envelope.

Transformed organizations were three times more likely than Aspirational organizations to indicate they *substantially outperform their industry peers*. This performance advantage illustrates the potential rewards of higher levels of analytics adoption.

While our findings showed that organizations tend to wait until they have gained some experience before they apply analytics to growth objectives, this may be more a common practice than a “best practice.” Our experience indicates that analytics, applied wisely to an organization’s operational capabilities, can be used to accelerate a broad range of business objectives, even at the earliest stages of analytics adoption.

### Data Is Not the Biggest Obstacle

Despite popular opinion, getting the data right is not a top challenge organizations face when adopting analytics. Only about one out of five respondents in our survey cited *concern with data quality or ineffective data governance* as a primary obstacle (see Figure 4).

The adoption barriers organizations face most are related to management and culture rather than being

related to data and technology. The leading obstacle to widespread analytics adoption is *lack of understanding of how to use analytics to improve the business*, according to almost four of 10 respondents. More than one in three cite lack of *management bandwidth due to competing priorities*. Organizations that use analytics to tackle their biggest challenges are able to overcome seemingly intractable cultural challenges and, at the same time, refine their data and governance approaches.

### Information Must Become Easier to Understand and Act Upon

Executives want better ways to communicate complex insights so they can quickly absorb the meaning of the data and take action on it. Over the next two years, executives say they will focus on supplementing standard historical reporting with emerging approaches that make information come alive. These include data visualization and process simulation, as well as text and voice analytics, social media analysis, and other predictive and prescriptive techniques.

New tools like these can make insights easier to understand and to act on at every point in the organization, and at every skill level. They transform numbers into information and insights that can be readily put to use instead of relying on further interpretation or leaving them to languish due to uncertainty about how to act.

## IBM CASE STUDY: Analytics, Not Best Guess, Drive Ad Decisions

Executives have long been accustomed to a degree of imprecision and uncertainty when making decisions critical to their growth — and survival. For some companies, like consumer electronics retailer Best Buy, their “best guess” was no longer good enough; hard facts were needed.

In an industry where the optimal allocation of advertising dollars is top of mind, and

in a time when new digital media outlets are emerging almost daily, Best Buy decided to augment its traditional advertising-mix assessment with a new analytical approach — exploiting widely sourced customer data and new models for predicting behavior.

The answers Best Buy discovered were surprising. The one medium that everyone knew was waning — televi-

sion — turned out to be an important one for its target customers. As a result, the company ended up shifting its investment from newspaper inserts to television — a decision that paid off handsomely.

Executives at Best Buy acted on new insights that defied their initial expectations. “We already have 80 to 90 percent of what we need to know about a customer somewhere in the

system,” Bill Hoffman, senior vice president for customer insight, told us. It was important, however, to get analytics-driven insights out to where they were needed. “The power plants were up, but the lines were down.”

No longer. Adopting an analytic approach to decisions, Best Buy exemplifies the new data-driven management practices emerging in leading organizations.

## What Leaders Can Do to Make Analytics Pay Off — A New Methodology

It takes big plans followed by discrete actions to gain the benefits of analytics. But it also takes some very specific management approaches. Based on data from our survey, our engagement experience, case studies and interviews with experts, we have been able to identify a new, five-point methodology for successfully implementing analytics-driven management and for rapidly creating value. The recommendations in the following pages are designed to help organizations understand this “new path to value” and how to travel it. While each recommendation presents different pieces of the information-and-analytics value puzzle, each one meets all of these three critical management needs:

**Reduced time to value.** Value creation can be achieved early in an organization’s progress to analytics sophistication. Contrary to common assumptions, it doesn’t require the presence of perfect data or a full-scale transformation to be complete.

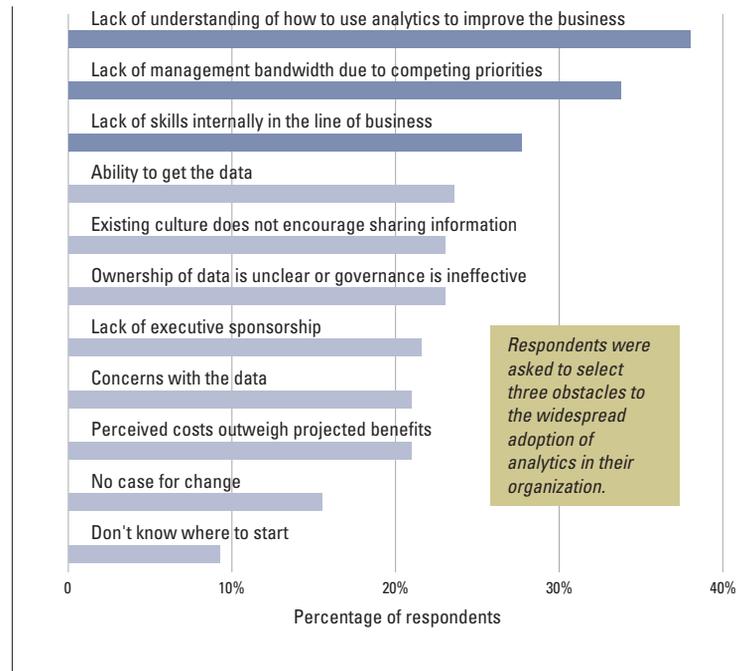
**Increased likelihood of transformation that’s both significant and enduring.** The emerging methodology we’ve identified enables and inspires lasting change (strategic and cultural) by tactically overcoming the most significant organizational impediments.

**Greater focus on achievable steps.** The approach being used by the smartest companies is powerful in part because each step enables leaders to focus their efforts and resources narrowly, rather than implementing universal changes. This makes every step easier to accomplish with an attractive return on investment.

Whether pursuing the best channel strategy, the best customer experience, the best portfolio or the best process innovation, organizations embracing this approach will be first in line to gain business advantage from analytics.

### Recommendation 1 Focus on the Biggest and Highest Value Opportunities

**D**oes attacking the biggest challenge carry the biggest risk of failure? Paradoxically, no — because big problems command attention and incite action. And as survey



participants told us, management bandwidth is a top obstacle. When the stakes are high, the best talent will leap at the opportunity to get involved.

It’s extraordinarily hard for people to change from making decisions based on personal experience to making them from data — especially when that data counters the prevailing common wisdom. But upsetting the status quo is much easier when everyone can see how it could contribute to a major goal. With a potential big reward in sight, a significant effort is easier to justify, and people across functions and levels are better able to support it.

A sharp focus on major opportunities can excite an organization with new possibilities. “Where are the best places to advertise to get consumers into our store?” was the looming, time-critical challenge for Best Buy. “How can we reduce the fraud and abuse that are draining scarce money and resources?” is a common refrain among government agencies around the globe.

Conversely, don’t start doing analytics without strategic business direction, as these efforts are likely to stall. Not only does it waste resources, it risks creating widespread skepticism about the real value of analytics.

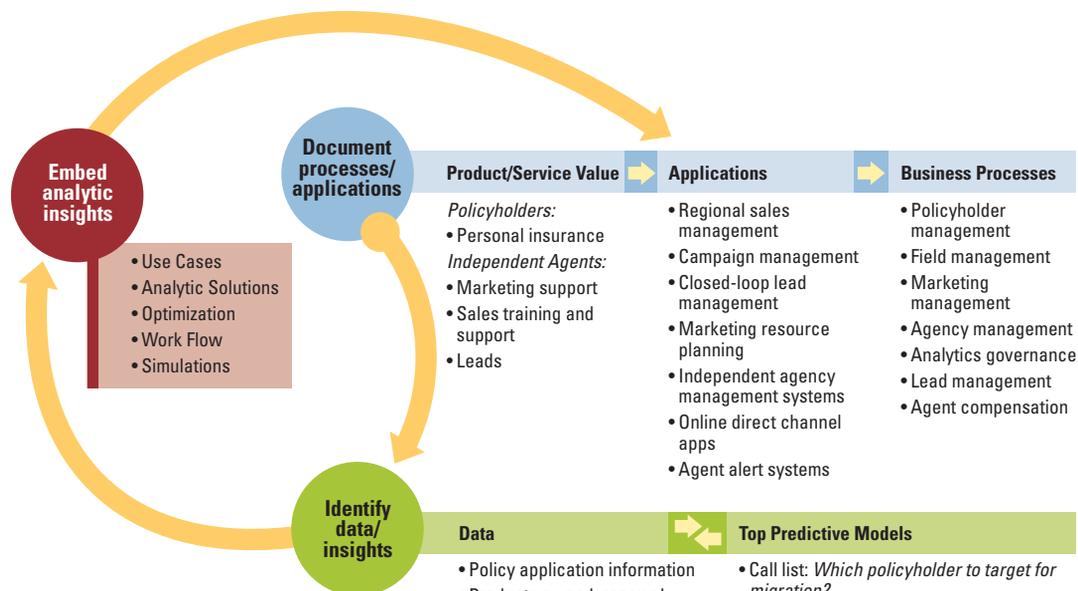
In our discussions with business executives, we have repeatedly heard that analytics aligned to a sig-

**FIGURE 4**  
The adoption barriers organizations face most are managerial and cultural rather than related to data and technology.

## Introducing the PADIE Technique for Operationalizing Analytics

The PADIE (process-application-data-insight-embed) technique is a simple means by which a company can operationalize insights drawn from data. It's a three-step process: First, document the processes and the applications that automate them; second, use analytics techniques — descriptive, predictive, prescriptive — to gain insights from data; third, select the most appropriate approaches to embed insights into your operations.

This PADIE example from the insurance industry addresses a major partnership challenge: the need to revitalize the role of independent insurance agents who had lost large portions of their business when customers began going directly to the company's Web site to buy policies.



**FIGURE 5**  
The PADIE technique is executed in three steps:

**Step 1 — Document existing processes and applications.** Organizations must first identify the value they deliver to customers, the applications they use to drive the business and their core processes, including management systems and metrics, operational and transactional processes, and touch points with external parties.

**Step 2 — Identify data and insights that can solve pain points and create value.** Next, the organization must identify the questions — who, what, where, when, why and how — that will address pain points and create revenue, cost or margin value. The goal here is to give business direction to the modelers to drive their analytic inquiries into your data. Organizations also need to identify the sources of data that will be used during the analysis.

**Step 3 — Embed analytic insights.** Lastly, but most importantly for value creation, the organization needs to determine its best approach to embedding the insights into its operations. Organizations have multiple options, including use cases that describe how applications should be enhanced, new analytic solutions that can be introduced, optimization logic added to rules engines, new work flows and simulations to help management understand varying scenarios. Success with embedding insights into processes determines the ultimate success of the initiative.

nificant organizational challenge makes it easier to overcome a wide range of obstacles. Respondents cited many challenges, and none can be discounted or minimized: Executive sponsorship of analytics projects, data quality and access, governance, skills and culture all matter and need to be addressed in time. But when overtaken by the momentum of a single big idea and potentially game-changing in-

sight, obstacles like these get swept into the wake of change rather than drowning the effort.

**A process for inspiring change** Despite analytics opportunities that are as close as the nearest data warehouse, the inability to understand how analytics can solve business challenges is the most daunting obstacle to adoption. And with management attention

focused on other priorities, valuable analytics opportunities can be crowded out by business as usual.

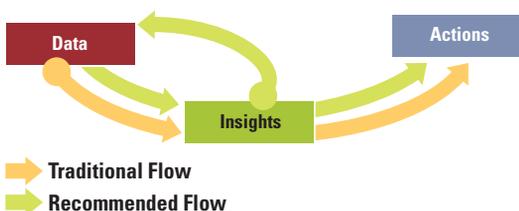
The single greatest opportunity — and challenge — to speed adoption of analytics is to embed them into daily operations. Organizations that use analytics to answer big, make-it-or-break-it challenges have the greatest opportunity to meet their business goals. The answer needs to be simple and unambiguous to work for time-pressed managers. Based on our analysis, we recommend the process-application-data-insight-embed technique (see Figure 5). It is a simple means by which an organization can operationalize insights drawn from data.

The PADIE technique helps users across the organization understand from the start the full initiative as it applies to a specific business challenge. This technique enables business and analytic teams to work together to create analytic models based on use cases that show analytics in action.

## Recommendation 2 Within Each Opportunity, Start With Questions, Not Data

**T**raditionally, organizations are tempted to start by gathering all available data before beginning their analysis. Too often, this leads to an all-encompassing focus on data management — collecting, cleansing and converting data — that leaves little time, energy or resources to understand its potential uses. Actions they do take, if any, might not be the most valuable ones (see Figure 6). Instead, organizations should implement analytics by first defining the insights and questions needed to meet the big business objective and then identify those pieces of data needed for answers.

By defining the desired insights first, organizations can target specific subject areas, and use readily avail-



## IBM CASE STUDY: Tackling Health Care Fraud Leads to Sweeping Reforms

With healthcare costs spiraling, the North Carolina Department of health and human services resolved to curb suspected fraud and abuse. After an analytics pilot of the state's Medicaid records revealed numerous anomalies, the state moved quickly to deploy an advanced mathematical model to detect Medicaid problems within its system of two million users.<sup>2</sup> A new "Medicaid SWAT team" of special investigators is beginning to review cases flagged as suspicious by the analytic models.<sup>3</sup>

Legislative budget officials estimated that the state could recoup \$37 million in the program's first year, which easily offset its initial investment several times over. While most of the money would be reimbursed to Medicaid, the penalties would add needed dollars to North Carolina public schools.<sup>4</sup>

The state is now mobilizing resources to pursue the unexpectedly large volume of fraud and abuse cases uncovered. Prompted by the results, the governor announced plans for a full suite of anti-fraud moves, including tougher laws, a public awareness campaign to encourage people to report fraud and abuse, and funding to increase the state's staff of investigators.<sup>5</sup>

able data in the initial analytic models. The insights delivered through these initial models will illuminate gaps in the data infrastructure and business processes. Time that would have been spent cleaning up all data can be redirected toward targeted data needs and specific process improvements identified by the insights, enabling iterations with increasing levels of value.

Companies that make data their overriding priority often lose momentum long before the first insight is delivered. By narrowing the scope of these tasks to the specific subject areas needed to answer key questions, value can be realized more quickly, while the insights are still relevant.

Organizations that start with the data or process change first often end up with unintended consequences — such as data that is not extensible or processes that are ultimately eliminated — that require rework and additional resources to solve.

### Speeding insights into business operations

Compared with other respondents, Transformed organizations are good at data capture (see Figure 7).

**FIGURE 6** Organizations should start by pinpointing the insights to be leveraged, then use readily available data to test the analytic models. Actions based on those insights will help define the next set of insights and data needed. The traditional approach of starting with a comprehensive data program creates too much lag time before insights can be put into action.

## IBM CASE STUDY: Shifting Gears From Vehicle-centric to Customer-centric Marketing

As turbulence struck the auto industry, a small group of executives at one automotive company decided to focus its attention on orphaned owners — customers whose current car brands were being discontinued. They determined to use analytics to try to salvage these customers, who were at risk for significant attrition.

A marketing approach focused more on the life cycle of

the vehicle — service reminders, warranty notices and upgrade reminders — meant that the company knew very little about what could impact these customers' future buying decisions. In a tough market environment and constrained by competing priorities, the company quickly fielded a new analytics approach. Instead of organizing and sifting

through the terabytes of data across the organization, it quickly identified a relatively small number of key data needs, created a customer sample, then used analytic algorithms to forecast attrition probabilities, pinpoint at-risk customers and recommend precise retention strategies. Analysts uncovered a double-digit retention opportunity within a single brand worth

hundreds of millions of dollars.

This prototype, initiated to uncover a specific customer insight, set off an analytics revolution. Brand managers across the organization quickly signed on to an enterprise effort to leverage analytics to shift from vehicle-based life cycle marketing to a customer-centric approach, targeted at improving both loyalty and retention.

Additionally, Transformed organizations are much more adept at data management. In these areas, they outpaced Aspirational organizations up to 10-fold in their ability to execute.

Enterprise processes have many points where analytic insights can boost business value. The operational challenge is to understand where to apply those insights in a particular industry and organization. When a bank customer stops automatic payroll deposits or remittance transfers, for example, who in the organization should be alerted and tasked with finding out whether the customer is changing jobs or planning to switch banks? Where customer satisfaction is low, what insights are needed and how should they be delivered to prevent defections?

To keep the three gears moving together — data, insights and timely actions — the overriding business purpose must always be in view. That way, as models, processes and data are tested, priorities for the next investigation become clear. Data and models get accepted, rejected or improved based on business need. New analytic insights — descriptive, predictive

and prescriptive — are embedded into increasing numbers of applications and processes, and a virtuous cycle of feedback and improvement takes hold.

### Recommendation 3 Embed Insights to Drive Actions and Deliver Value

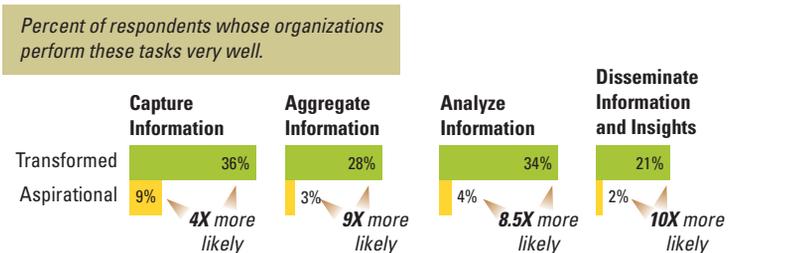
New methods and tools to embed information into business processes — use cases, analytics solutions, optimization, workflows and simulations — are making insights more understandable and actionable. Respondents identified trend analysis, forecasting and standardized reporting as the most important tools they use today. However, they also identified tools that will have greater value in 24 months. The downswings in “as-is” methods accompanied by corresponding upswings in “to-be” methods were dramatic (see Figure 8).

Today’s staples are expected to be surpassed in the next 24 months by:

1. Data visualization, such as dashboards and scorecards
2. Simulations and scenario development
3. Analytics applied within business processes
4. Advanced statistical techniques, such as regression analysis, discrete choice modeling and mathematical optimization.

Organizations expect the value from these emerging techniques to soar, making it possible for

**FIGURE 7**  
Transformed organizations felt more confident in their ability to manage data tasks than Aspirational organizations, which seldom felt their organizations performed those tasks “very well.”



**FIGURE 8**

**Organizations expect that the ability to visualize data differently will be the most valuable technique in two years. Other techniques and activities that are currently delivering the most value today will still be done, but will be of less value.**

data-driven insights to be used at all levels of the organization. Innovative uses of this type of information layering will continue to grow as a means to help individuals across the organization consume and act upon insights derived through complex analytics that would otherwise be hard to piece together. For example, GPS-enabled navigation devices can superimpose real-time traffic patterns and alerts onto navigation maps and suggest the best routes to drivers.

Similarly, in oil exploration, three-dimensional renderings combine data from sensors in the field with collaborative and analytical resources accessible across the enterprise. Production engineers can incorporate geological, production and pipeline information into their drilling decisions.

Beyond 3D, animated maps and charts can simulate critical changes in distribution flow, or projected changes in consumption and resource availability. In the emerging area of analytics for unstructured data, patterns can be visualized through verbal maps that pictorially represent word frequency, allowing marketers to see how their brands are perceived.

**New techniques and approaches transform insights into actions** New techniques to embed



insights will gain in value by generating results that can be readily understood and acted upon:

- ▶ Dashboards that now reflect actual last quarter sales will also show what sales could be next quarter under a variety of different conditions — a new media mix, a price change, a larger sales team, even a major weather or sporting event.
- ▶ Simulations evaluating alternative scenarios will automatically recommend optimal approaches — such

## IBM CASE STUDY: A Beverage Company Makes the Case

After fast growth through acquisitions and mergers, executives in a global beverage company were hampered by a complex array of data sets that limited their ability to make timely and fact-based decisions. Solving this problem required a standardized platform that would enable a global view of information while supporting their rules-driven, exception-based

process for making decisions.

But executives knew that they needed more than just the facts; they needed to model scenarios to understand the impact of prospective decisions. The organization settled on a global key performance indicator dashboard to help users visualize relevant data and model decisions, based on key dimensions like geography, unit, brand, profitability, costs

or channel. But first, to attain funding for the new platform and drive adoption, the dashboard needed wide support within the executive ranks.

To make the business case for the new approach, organization executives threw out the customary spreadsheets and instead gave executives an interactive prototype that mimicked the visual displays and functionality of the proposed

dashboard. The prototype depicted the key elements of the business case, including business value and technology requirements. But, most importantly, it gave executives a taste for the proposed user experience. Executives then rallied to support the new interactive dashboard, which when implemented became a strategic part of how decisions were modeled and made in the company.



as which is the best media mix to introduce a specific product to a particular segment, or what is the ideal number of sales professionals to assign to a particular new territory.

- Use cases will illustrate how to embed insights into business applications and processes. For the direct-channel to agent-channel migration illustrated in Figure 5, automated work flows include initial communication with prospective insurance policyholders, timed to take place before leads are sent to the agent. In that way, permission is secured before the agent makes a call, helping to ensure a smooth channel transition and a superior customer experience.

New methods will also make it possible for decision makers more fully to *see* their customers' purchases, payments and interactions. Businesses will be able to *listen* to customers' unique wants and needs about channel and product preferences. In fact, making customers, as well as information, come to life within complex organizational systems may

well become the biggest benefit of making data-driven insights real to those who need to use them.

### Recommendation 4 Keep Existing Capabilities While Adding New Ones

When executives first realize their need for analytics, they tend to turn to those closest to them for answers. Over time, these point-of-need resources come together in local line of business units to enable sharing of insights. Ultimately, centralized units emerge to bring a shared enterprise perspective — governance, tools, methods — and specialized expertise. As executives use analytics more frequently to *inform day-to-day decisions and actions*, this increasing demand for insights keeps resources at each level engaged, expanding analytic capabilities even as activities are shifted for efficiencies (see Figure 9).

Sophisticated modeling and visualization tools, as we have noted, will soon provide greater business value than ever before. But that does not mean that spreadsheets and charts should go away. On the contrary: New tools should supplement earlier ones, or continue to be used side by side, as needed.

There are other ways that capabilities grow and deepen within an organization. Disciplines like finance and supply chain are inherently data intensive, and are often where analytics first take root. Encouraged by early successes, organizations begin expanding analytic decision making to more disciplines. (See “How Analytics Propagates Across Functions.”) In Transformed organizations, reusability creates a snowball effect as models from one function are repurposed into another with minimal modifications.

Over time, data-driven decision making branches out across the organization. As experience and usage grow, the value of analytics increases, which enables business benefits to accrue more quickly.

**Add value with an enterprise analytics unit** Organizations that first experience the value of analytics in discrete business units or functions are

## IBM CASE STUDY: Bridging Business and Analytics Skills Across the Organization

As is often the case, analytics success raises the bar to do more. As demand for useful insights has grown, a leading big-box retailer developed a sophisticated analytics environment, in which each layer — enterprise, business unit and point of need — complements rather than duplicates the specialized skills each location delivers.

Determined to leverage the structures already in place, but push them to the next level, the retailer set out to strengthen both the analytics and business skills of its practitioners. Already, analysts were working within the lines of business, knowledgeable enough to supply timely answers to ad hoc queries raised by business executives. An enterprise-wide unit also provided complex computational skills as needed, created common data definitions and crafted analytics approaches that could be duplicated across the business units.

The central unit housed the advanced analytics skills, but it was the analysts in the business units who had the advanced business knowledge and a deep understanding of the operations, objectives and economic levers required to run the business. Still lacking was the ability to bridge these two domains.

Business unit analysts now rotate into the enterprise unit, partnering with high-tech analysts to provide the business knowledge that fuels new analytics models and working collaboratively to analyze and interpret results that will be meaningful to business. At the end of the rotation, business unit analysts return with a standardized tool kit to create consistency and rigor in analysis and facilitate sharing.

likely soon to seek a wider range of capabilities — and more advanced use of existing ones. A centralized analytics unit, often called either a “center of excellence” or “center of competency,” makes it possible to share analytic resources efficiently and effectively. It does not, however, replace distributed and localized capabilities; rather, the central unit is additive, built upon existing capabilities that may have already developed in functions, departments and lines of business.

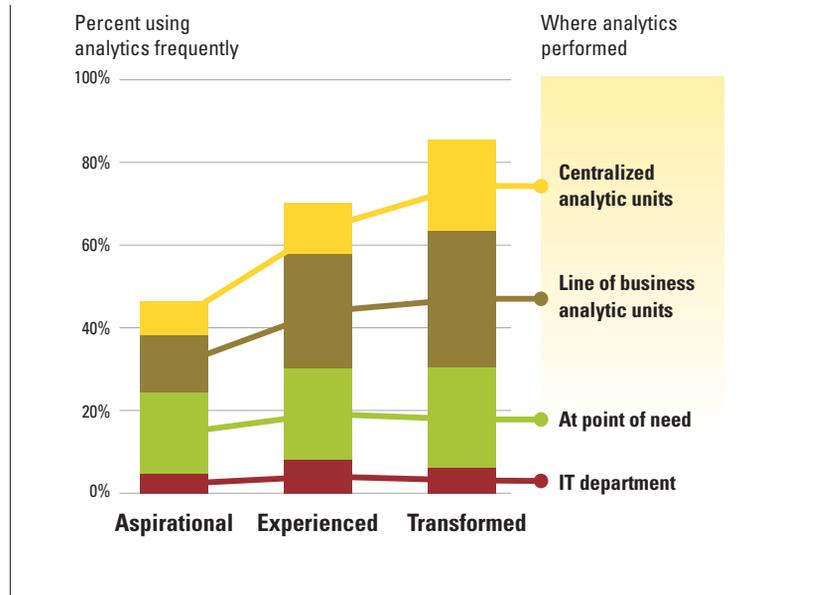
We found that 63 percent more Transformed organizations than Aspirational organizations use a *centralized enterprise unit as the primary source of analytics*. A centralized analytics unit can provide a home for more advanced skills to come together within the organization, providing both advanced models and enterprise governance by establishing priorities and standards by:

- ▶ Advancing standard methods for identifying business problems to be solved with analytics
- ▶ Facilitating identification of analytic business needs while driving rigor into methods for embedding insights into end-to-end processes
- ▶ Promoting enterprise-level governance on prioritization, master data sources and reuse to capture enterprise efficiencies
- ▶ Standardizing tools and analytic platforms to enable resource sharing, streamline maintenance and reduce licensing expenses.

In three distinct areas — application of analytic tools, functional use of analytics and location of skills — we found that adding capabilities without detracting from existing ones offers a fast path to full benefits from analytics-driven management.

## Recommendation 5 Use an Information Agenda to Plan for the Future

**B**ig data is getting bigger. Information is coming from instrumented, interconnected supply chains transmitting real-time data about fluctuations in everything from market demand to the weather. Additionally, strategic information has started arriving through unstructured digital channels: social



**FIGURE 9**  
The frequency with which analytics is used to support decisions increases as organizations transition from one level of analytic capability to the next. At the same time, analytics migrate toward more centralized units, first at the local line of business level and then at the enterprise level, while the portion of analytics performed at points-of-need and with IT remain stable.

media, smart phone applications and an ever-increasing stream of emerging Internet-based gadgets. It’s no wonder six out of 10 respondents said the organization *has more data than it knows how to use effectively*.

All this data must be molded into an information foundation that is *integrated, consistent and trustworthy*, which were the leading data priorities cited by our respondents (see Figure 10). Every phase of implementation needs to align the data foundation to an overall information agenda. The information agenda accelerates the organization’s ability to share and deliver trusted information across all applications and processes. It sets up information to serve as a strategic asset for the organization.

The information agenda identifies foundational information practices and tools while aligning IT and business goals through enterprise information plans and financially justified deployment road maps. This agenda helps establish necessary links between those who drive the priorities of the organization by line of business and set the strategy, and those who manage data and information.

A comprehensive agenda also enables analytics to keep pace with changing business goals. An executive at one company, for example, told us it had it down to a science when it came to understanding the impact of price changes on single products and single channels. But the company

## IBM CASE STUDY: Insurer Limits Risk by Establishing an Agenda for Today and Tomorrow

Under pressure from increasing competition, a financial firm recognized that growth — and survival — depended upon gaining a better understanding of its business quickly. For this, it needed an analytic foundation for strategic subject areas — first finance, then operations, then customers.

The firm completed a series of tightly scoped projects to increase analytic capabilities over

time, with each wave realizing value to help fund the next. Business needs determined the order in which enterprise data would be reported to the analytic warehouse. To speed the efforts and time to value, business users assessed precisely which data elements were needed most. Common data definitions were negotiated to create a language across product lines and business units.

The organization took a phased approach to building its data environment. For finance and operations, this meant selecting data that supported an enterprise-wide set of KPIs. All other data was put on hold. To decide which customer data was most important, the organization determined which questions they most needed to answer, first by business unit and

then across the enterprise — to find those with the greatest organizational overlap. Again, all other data would have to wait.

In this way, the organization was able to fast-track development of a robust data warehouse. As early projects produced a return on their investments and more resources became available, the data warehouse could grow.

was blindsided when it shifted to a customer-centric strategy, restructuring around bundled products and dynamic pricing across channels. Because its data marts had been developed de facto over time, the company found itself struggling to understand which tools and information were needed to go forward.

Lastly, building the analytic foundation under the guidance of a forward-looking information agenda enables organizations to keep pace with advances in mathematical sciences and technology. Without an enterprise-wide information agenda,

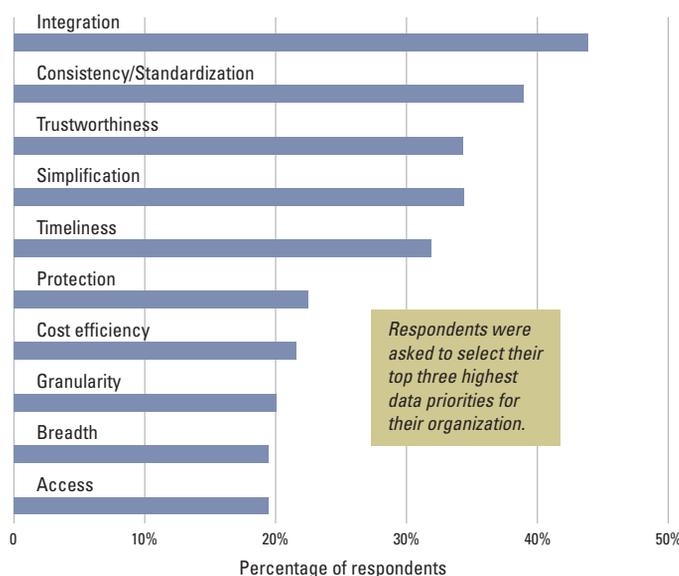
units are likely to explore these new developments independently and adopt them inconsistently, a difficult path for gaining full business benefits from analytics.

**Outline for an information agenda** The information agenda provides a vision and high-level road map for information that aligns business needs to growth in analytics sophistication with the underlying technology and processes spanning:

- ▶ Information governance policies and tool kits — from little oversight to fully implemented policies and practices
- ▶ Data architecture — from ad hoc to optimal physical and logical views of structured and unstructured information and databases
- ▶ Data currency — from only historical data to a real-time view of all information
- ▶ Data management, integration and middleware — from subject area data and content in silos to enterprise information that is fully embedded into business processes with master content and master data management
- ▶ Analytical tool kits based upon user needs — from basic search, query and reporting to advanced analytics and visualization.

The information agenda is a key enabler of analytic initiatives by providing the right information and tools at the right times based upon business-driven priorities.

**FIGURE 10**  
Organizations want data that is integrated, consistent and trustworthy, which were the leading data priorities cited by our respondents.



## Set Yourself up for Success

**A**ware that analytics-driven opportunities are central to growth and success, organizations seek to capture the value. They want to find the best place to begin, but for many, that entry point is elusive.

**If you are Aspirational:** Assemble the best people and resources to make the case for investments in analytics. To get sponsorship for initial projects, identify the big business challenges that can be addressed by analytics and find the data you have that fits the challenge.

**If you are Experienced:** Make the move to enterprise analytics and manage it by keeping focus on the big issues that everyone recognizes. Collaborate to drive enterprise opportunities without compromising departmental needs while preventing

governance from becoming an objective unto itself.

**If you are Transformed:** Discover and champion improvements in how you are using analytics. You've accomplished a lot already with analytics, but are feeling increased pressure to do more. Focus your analytics and management bandwidth to go deeper rather than broader, but recognize it will be critical to continue to demonstrate new ways of how analytics can move the business toward its goals.

## Techniques to Get Started

**Pick your spots.** Search for your organization's biggest and highest priority challenge, and create a PADIE diagram to describe it. Show available data sources, models to be built, and processes and applications where analytics will have an impact.

## How Analytics Propagates Across Functions

Typically, organizations begin with efficiency goals, then address growth objectives, and lastly, design finely tuned approaches to the most complex business challenges. As this occurs, adoption both spreads and deepens. This contributes to a predictable pattern of analytics adoption by function (see Figure 11). Specifically, we found the following:

**Aspirational.** About one-half used analytics for financial management, about one-third each for operations, and sales and marketing. These selections reflect the traditional path of adopting analytics in inherently data-intensive areas.

**Experienced.** Analytics used for all of the above, and at greater levels. For example, the proportion of respondents likely to use it for finance increased from one-half to two-thirds. New functions, such as strategy, product research and customer service, emerged. Growth and efficiency were both met with analytics approaches.

**Transformed.** Analytics was used for all the same functions as above — and more, as the branching pattern spread within organizations. Fine-grained revenue and efficiency usage of analytics emerged, such as customer experience, to build on customer service and marketing capabilities.

These patterns suggest that success in one area stimulates adoption where analytics had not previously been considered or attempted. That is, in fact, how organizations increase their level of sophistication. Successful initiatives in supply chain functions, for example, encourage the human resources function to institute a pilot for data-driven work force planning and allocation.

While these findings describe the typical path, they are not necessarily the best or only one. Analytic leaders may want to advance their organization's capabilities more quickly using nontraditional routes.



*Percent who stated their organization performs these functional analytics "well" and "very well."*

**FIGURE 11**  
Analytic adoption spreads through organizations in a predictable pattern, as all respondents gained proficiency with functional analytics in the same order. The rate of adoption, as shown through proficiency, increases steadily and threshold levels support the analytic capability tiers.



Create multiple diagrams if you're selecting from a strong list of possible initiatives. Keep in mind that your biggest problems, such as customer retention, anti-fraud efforts or advertising mix, are also your biggest opportunities. Change is hard for most, so select an initiative worthy of sustained focus that can make the biggest difference in meeting your most important business goals. Remember that focus is critical during these initial efforts. Do not get distracted once the targeted area is identified.

**Prove the value.** With your PADIE diagram in hand, use reason and benchmarks for initial executive sponsorship, but use a proof-of-value pilot to keep sponsors engaged. Estimate how much revenue can be gained, how much money can be saved and how much margins can be improved. Employ techniques to embed analytics to illustrate and prioritize the types of organizational changes that are needed to achieve the value. Pull it all together using an implementation road map with a clear starting point and a range of options for future opportunities.

**Roll it out for the long haul.** The challenge should be big, the model insightful and the business vision complete. However, the first implementation steps can be small, as long as they fit your agenda. Reduce your rework by using business analytic and process management tools that you have selected for the long haul — information governance, business analytics and business rules. As you make progress, don't forget to analyze feedback and business outcomes to determine where your analytics model and business vision can be improved.

### **Make Analytics Pay Off**

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It takes big plans followed by discrete actions to gain the benefits of analytics. But it also takes some very specific management approaches. Each of our recommendations meets three critical management needs:

- ▶ Reduced time to value
- ▶ Increased likelihood of transformation that's both significant and enduring
- ▶ Greater focus on achievable steps.

To start on the fastest path to value, keep everyone focused on the big business issues and select the challenges that analytics can solve today within an agenda for the future. Build on the capabilities you already have. And always keep pressing to embed the insights you've gained into business operations.

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5. "Perdue Begins Medicaid Fraud, Waste Prevention Effort."

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For more information about this study, The New Intelligent Enterprise initiative and additional interviews, you may contact *MIT Sloan Management Review* at [smrfeedback@mit.edu](mailto:smrfeedback@mit.edu) or visit the MIT SMR Web site: [sloanreview.mit.edu/tnie](http://sloanreview.mit.edu/tnie)

For more information about this study, you may contact the IBM Institute for Business Value at [iibv@us.ibm.com](mailto:iibv@us.ibm.com), or visit the IBM IBV Web site: [ibm.com/gbs/bao](http://ibm.com/gbs/bao)



# The Survey: Questions and Responses

How are organizations using information and analytics? (Results from the 2010 New Intelligent Enterprise Global Executive Survey.)

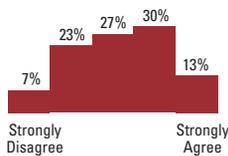
**Q1. What are the primary challenges facing your organization in the next two years? (Please select your top three.)**



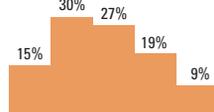
**Q2. How well do the following statements describe your organization?**

(Please rate on a scale of 1 to 5, where 1 = Strongly disagree and 5 = Strongly agree)

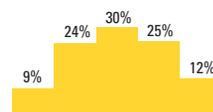
The organization predicts and prepares for the future by proactively evaluating scenarios or potential trade-offs



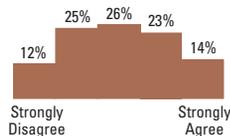
The organization makes decisions based on rigorous analytic approaches (e.g., quantitative modeling, simulation)



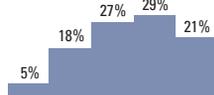
The organization manages data to enable the ability to share and aggregate data across departments or business units



Business information and analytics differentiate us within the industry



Improving our information and analytics capability is a top priority in our organization



Employees are encouraged to challenge current practices and approaches



The organization has more data than it knows how to use effectively

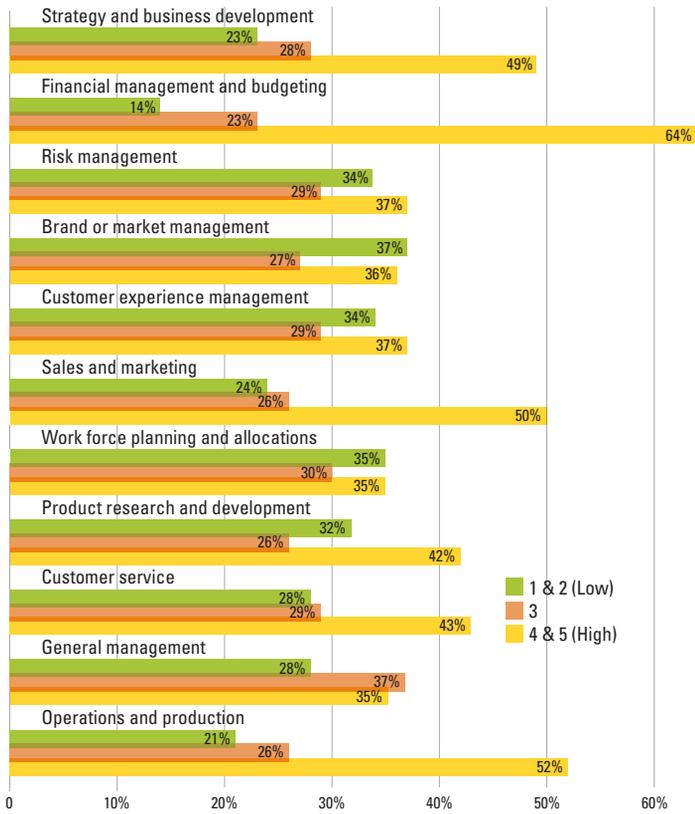


## About the Research

To understand the challenges and opportunities associated with the use of business analytics, *MIT Sloan Management Review*, in collaboration with the IBM Institute for Business Value, conducted a survey of more than 3,000 business executives, managers and analysts from organizations located around the world. The survey captured insights from individuals in 108 countries and more than 30 industries, and involved organizations of various sizes. The sample was drawn from a number of different sources, including MIT alumni and *MIT Sloan Management Review* subscribers, IBM clients and other interested parties.

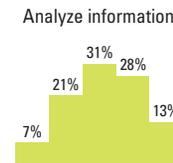
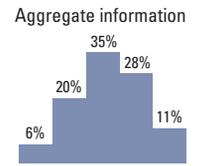
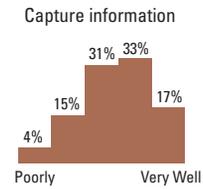
In addition to these survey results, we also interviewed academic experts and subject matter experts from a number of industries and disciplines to understand the practical issues facing organizations today. Their insights contributed to a richer understanding of the data, and the development of recommendations that respond to strategic and tactical questions senior executives address as they operationalize analytics within their organizations. We also drew upon a number of IBM case studies to illustrate further how organizations are leveraging business analytics and illuminate how real organizations are putting our recommendations into action in different organizational settings.

**Q3. To what extent does your organization apply analytics to the following activities?**

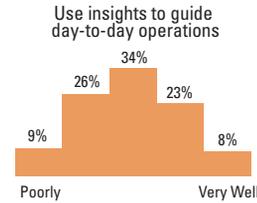


**Q4. How well does your business unit or department perform the following information and analytic tasks?**  
(Please rate on a scale of 1 to 5, where 1 = Poorly and 5 = Very well)

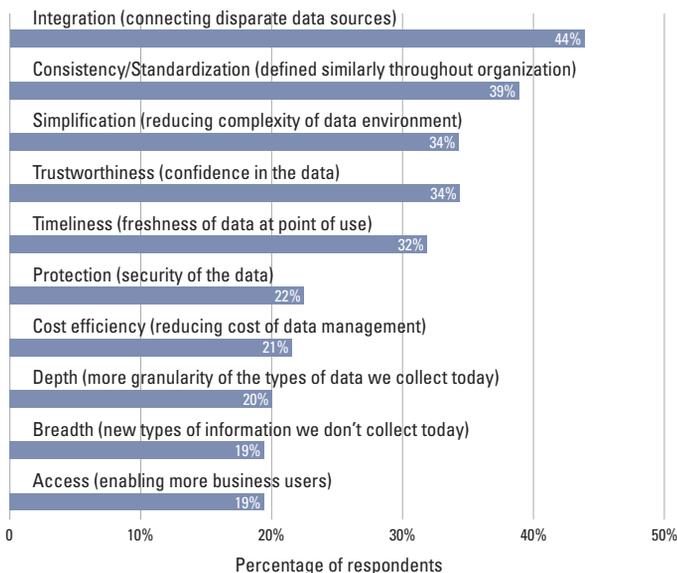
**Ability to perform data management functions**



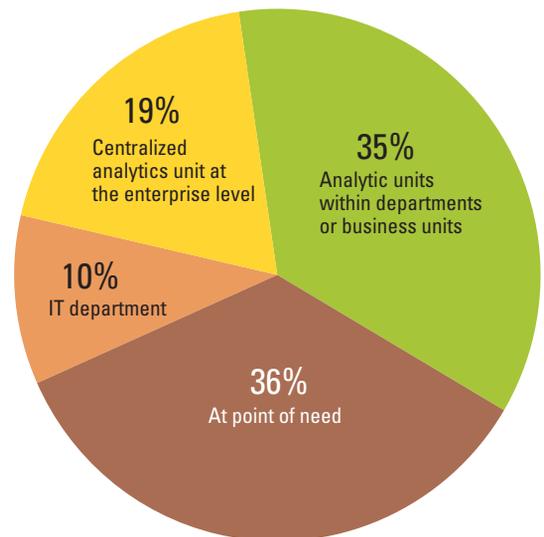
**Ability to apply insights**



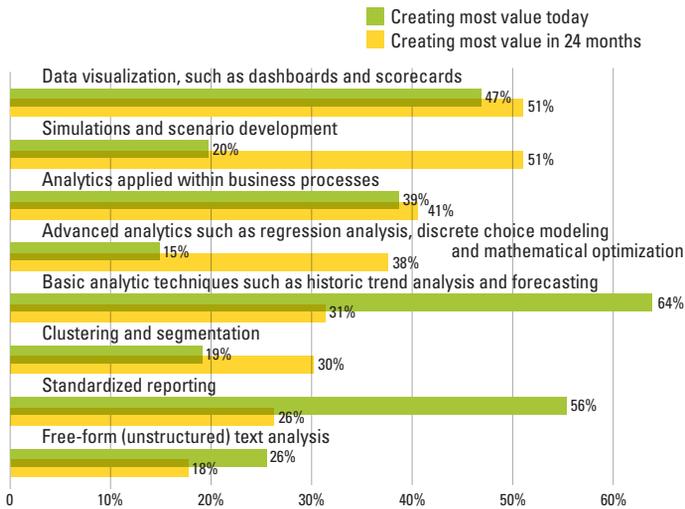
**Q5. What are the highest data priorities for your organization?**  
(Please select up to three.)



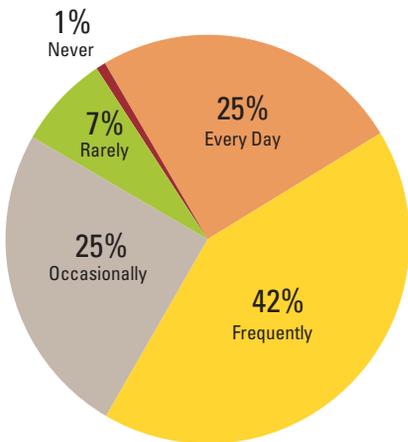
**Q6. Where are analytics primarily performed within your organization?**  
(Please select one.)



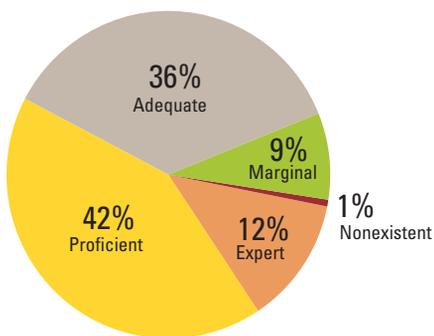
**Q7. Select the type of analytics creating the most value in your organization today and in 24 months.**



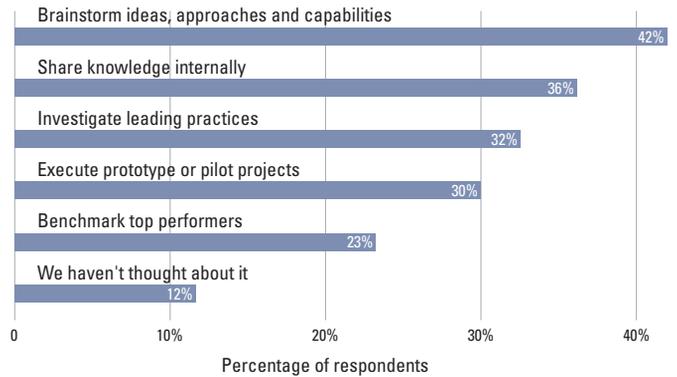
**Q8. How often do you use information and analytics to inform your actions and support decision making in your day-to-day role?**



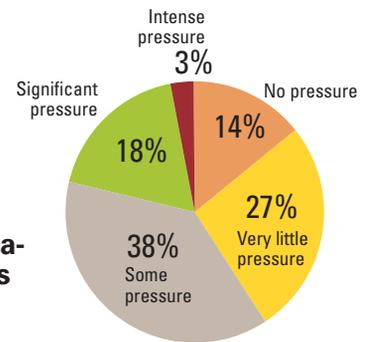
**Q9. How would you rate your personal analytic skill level?**



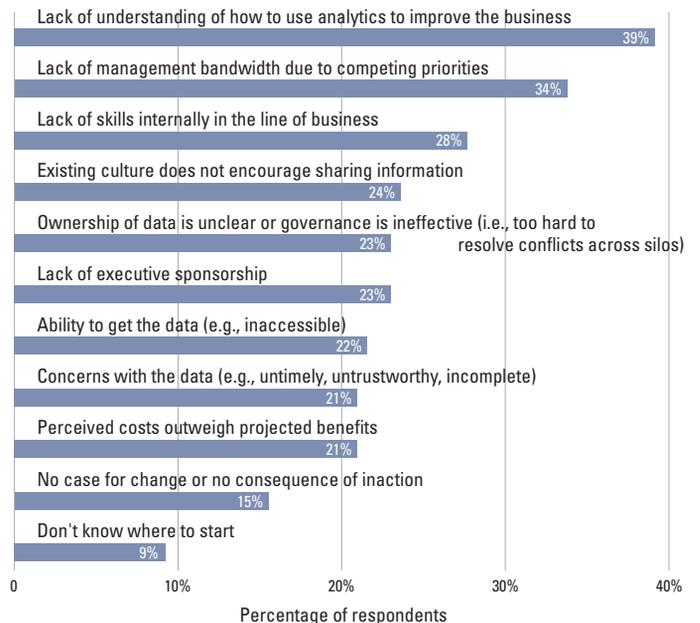
**Q10. How is your organization most likely to explore new uses of analytics? (Please select up to two.)**



**Q11. To what extent is your business unit or department under pressure to adopt new/advanced information and analytics approaches?**

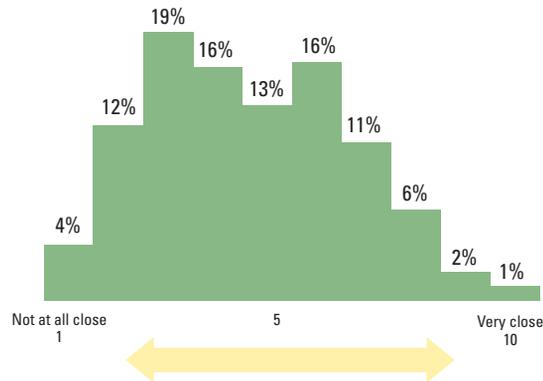


**Q12. What are the primary obstacles to widespread adoption and use of information and analytics in your organization? (Please select up to three.)**



**Q13. Imagine an organization transformed by better ways to collect, analyze and be prescriptively guided by information. How close are you to that ideal?**

(Please rate on a scale of 1 to 10, where 1 = Not at all close and 10 = Very close)

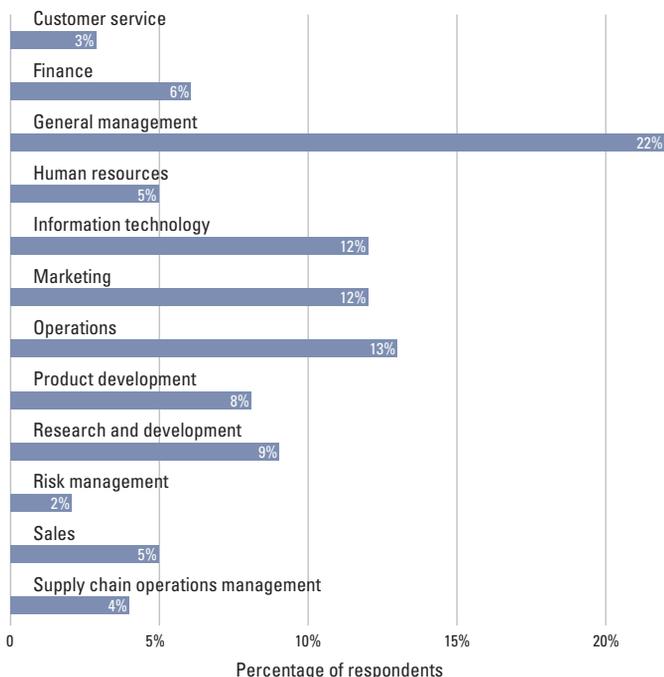


(TEXT RESPONSES)

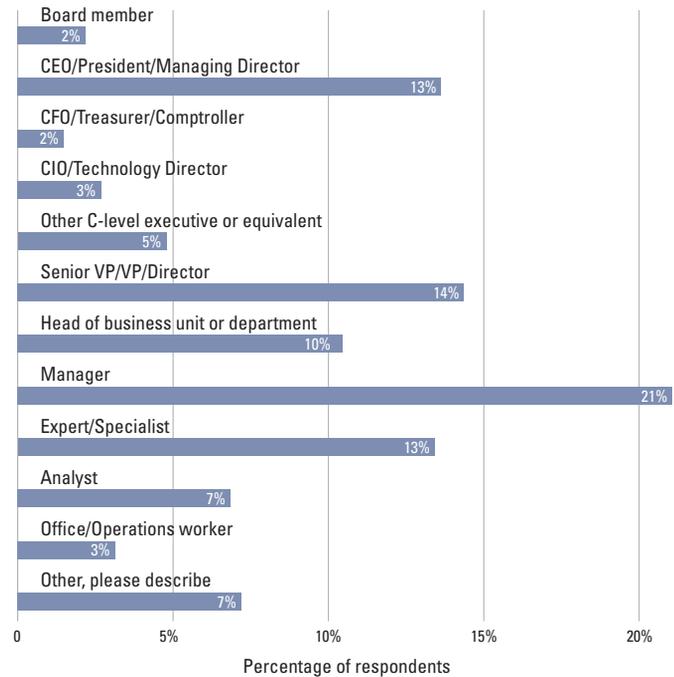
**Q14. Where do you think the greatest opportunities with analytics lie for your function, organization or industry?**

**Q15. May we contact you further about your answer to this question? (If yes, you'll be asked to give us your contact information at the end of the survey.)**

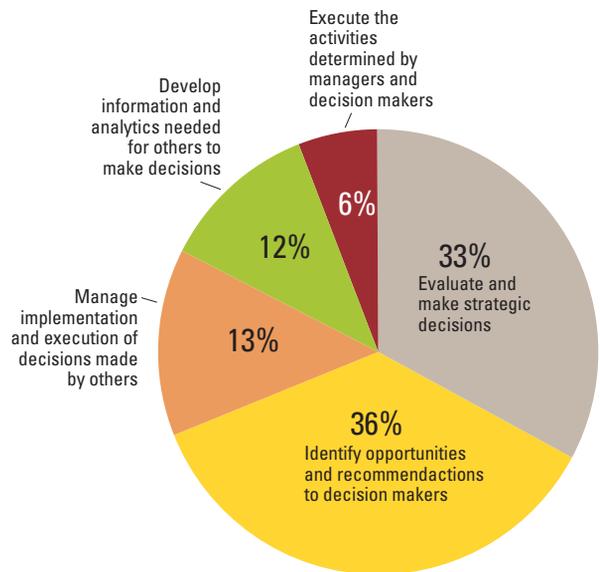
**Q17. What is your main functional area?**



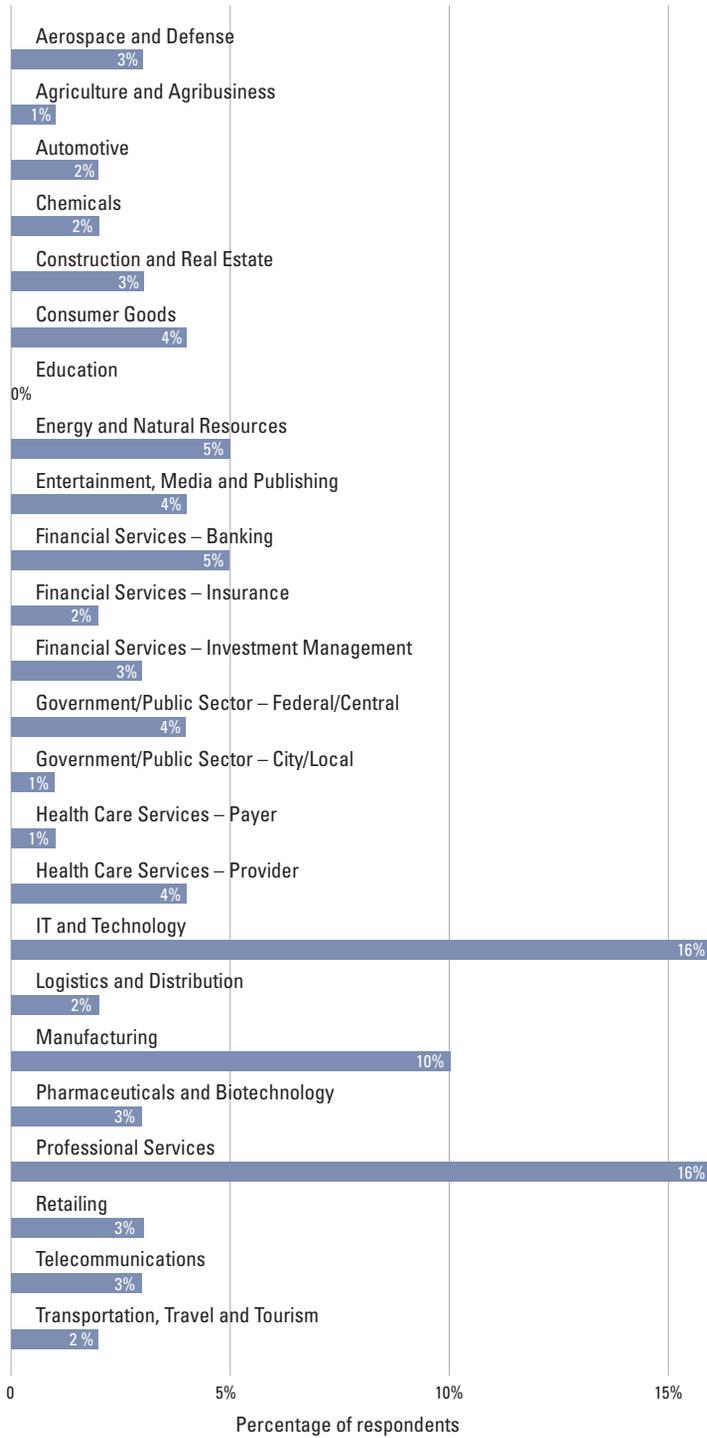
**Q16. Which of the following best describes your role?**



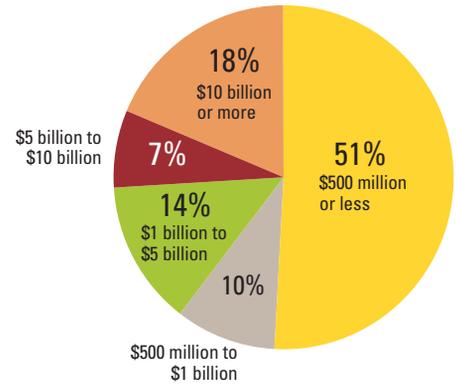
**Q18. Which of the following best describes the activities involved in your day-to-day role?**



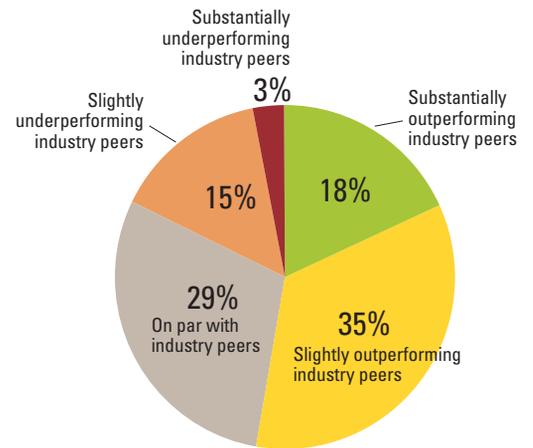
**Q19. What is your primary industry?**



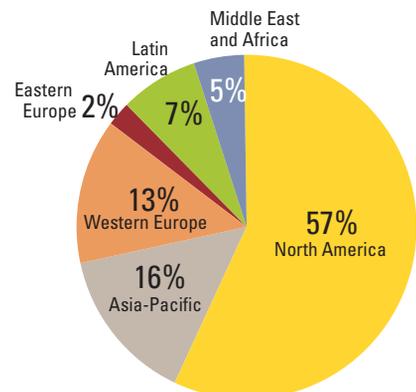
**Q20. What is your organization’s global annual revenue in U.S. dollars?**



**Q21. How would you describe your organization’s competitive position?**



**Q22. In which geographic region are you personally located?**



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