IBM Global Business Services
Business Analytics and Optimization
Executive Report

In collaboration with *MIT Sloan Management Review*

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IBM Institute for Business Value

Analytics: The new path to value

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

Findings from the 2010 New Intelligent Enterprise Global Executive Study and Research Project

IBM Institute for Business Value

IBM Global Business Services, through the IBM Institute for Business Value, develops fact-based strategic insights for senior executives around critical public and private sector issues. This executive report is based on an in-depth study by the Institute's research team. It is part of an ongoing commitment by IBM Global Business Services to provide analysis and viewpoints that help companies realize business value.
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MIT Sloan Management Review is a website, quarterly journal, and community that explores and reports on the most important new ideas in management innovation. It focuses on the trends in the competitive landscape that are the chief drivers of coming change in management practice and strategy – and brings research-based insights about those changes to the executives and managers who need them.
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By Steve LaValle, Michael Hopkins, Eric Lesser, Rebecca Shockley and Nina Kruschwitz

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 better understand 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 executive 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.

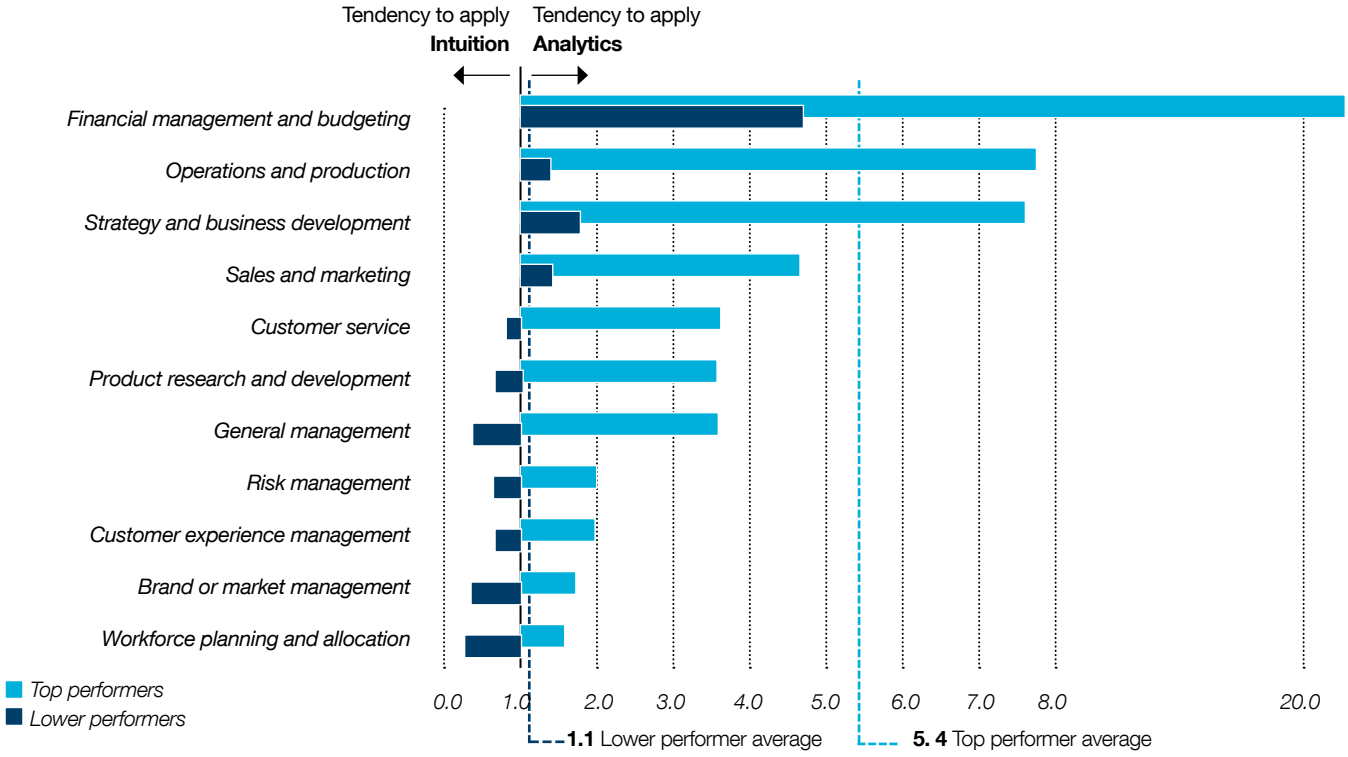
At organizations in every industry, in every part of the world, senior leaders wonder whether they are getting full value from the massive amounts of information they already have within their organizations. New technologies are collecting more data than ever before, yet many organizations are still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

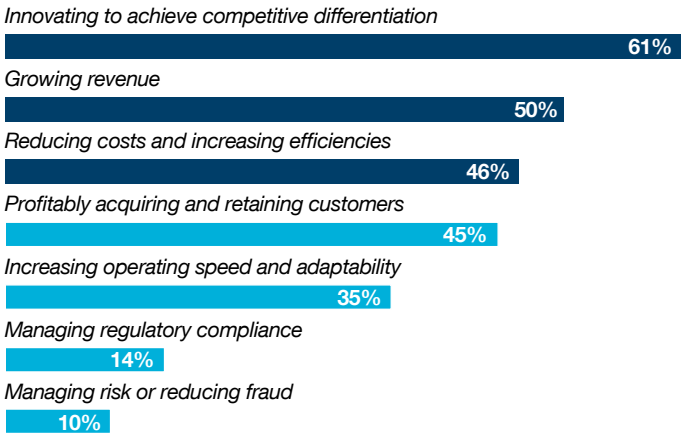
Among our key findings: top-performing organizations use analytics five times more than lower performers (see Figure 1). Overall, our study found widespread belief that analytics offers value. Half of our respondents said that *improvement of information and analytics was a top priority in their organizations*. 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 ten 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 need analytics to exploit their growing data and computational power to get smart, and get ahead, in ways they never could before (see Figure 2).



Note: Respondents were asked about their organization's application of analytics to the activities listed above. A score of 1.0 indicates an equal likelihood of applying either analytics or non-analytic methods, while a score of 0.0 indicates a tendency to use non-analytic methods.
Source: Analytics: The New Path to Value, a joint MIT Sloan Management Review and IBM Institute for Business Value study. Copyright © Massachusetts Institute of Technology 2010.

Figure 1: **The tendency for top-performing organizations to apply analytics to particular activities across the organization, as compared to lower performers.**



Note: Respondents were asked "What are the primary challenges facing your organization in the next two years? Please select your top three."
Source: Analytics: The New Path to Value, a joint MIT Sloan Management Review and IBM Institute for Business Value study. Copyright © Massachusetts Institute of Technology 2010.

Figure 2: **The top business challenge is achieving innovation to drive competitive differentiation.**

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 – from entry of unexpected competitors to 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.

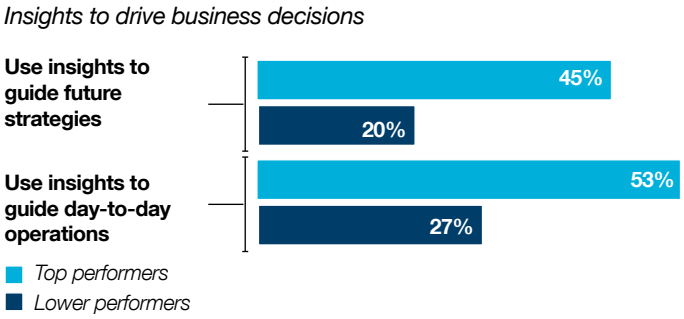
These expectations can be met – but with a caveat. For analytics-driven insights to be *consumed* – that is, to trigger new actions across the organization – they must be closely linked to business strategy, easy for end users to understand, and embedded into organizational processes to take action at 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.

We found that organizations who 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 3). They *make decisions based on rigorous analysis* at more than double the rate of lower performers. The correlation between performance and analytics-driven management has important implications to organizations whether they are seeking growth, efficiency or competitive differentiation.



Note: Respondents were asked to rate how well their business unit or department performed the noted tasks. Chart represents answers from those who selected "very well" using a five-point scale from "not well at all" to "very well."
Source: Analytics: The New Path to Value, a joint MIT Sloan Management Review and IBM Institute for Business Value study. Copyright © Massachusetts Institute of Technology 2010.

Figure 3: **More than twice as many top performers as lower performers used analytics to guide day-to-day operations and future strategies.**

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 4).

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 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 ones 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.

	Aspirational	Experienced	Transformed
Motive	• Use analytics to justify actions	• Use analytics to guide actions	• Use analytics to prescribe actions
Functional proficiency	• Financial management and budgeting • Operations and production • Sales and marketing	• All Aspirational functions • Strategy / business development • Customer service • Product research / development	• All Aspirational and Experienced functions • Risk management • Customer experience • Workforce planning / allocation • General management • Brand and market management
Business challenges	• Competitive differentiation through innovation • Cost efficiency (primary) • Revenue growth (secondary)	• Competitive differentiation through innovation • Revenue growth (primary) • Cost efficiency (secondary)	• Competitive differentiation through innovation • Revenue growth (primary) • Profitability acquiring / retaining customers (targeted focus)
Key obstacles	• Lack of understanding how to leverage analytics for business value • Executive sponsorship • Culture does not encourage sharing information	• Lack of understanding how to leverage analytics for business value • Skills within line of business • Ownership of data is unclear or governance is ineffective	• Lack of understanding how to leverage analytics for business value • Management bandwidth due to competing priorities • Accessibility of the data
Data management	• Limited ability to capture, aggregate, analyze or share information and insights	• Moderate ability to capture, aggregate and analyze data • Limited ability share information and insights	• Strong ability to capture, aggregate and analyze data • Effective at sharing information and insights
Analytics in action	• Rarely use rigorous approaches to make decisions • Limited use of insights to guide future strategies or guide day-to-day operations	• Some use rigorous approaches to make decisions • Growing use of insights to guide future strategies, but still limited use of insights to guide day-to-day operations	• Most use rigorous approaches to make decisions • Almost all use insights to guide future strategies, and most use insights to guide day-to-day operations

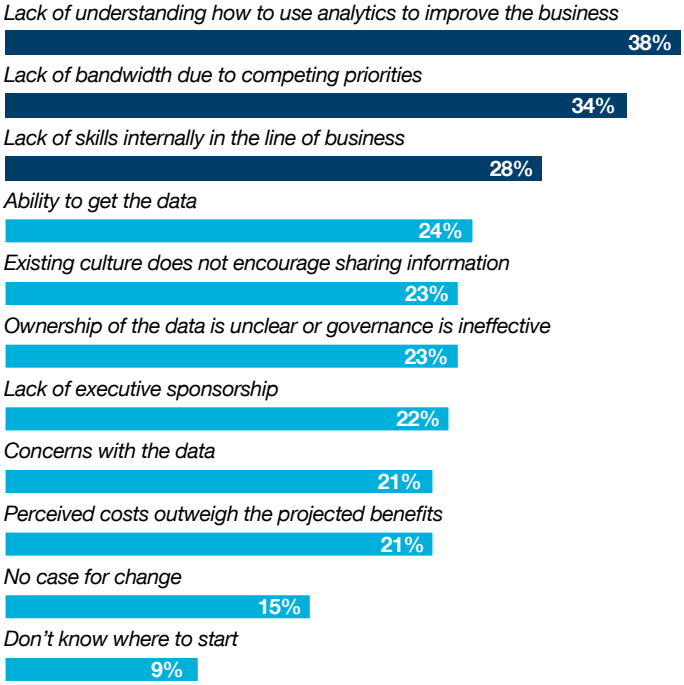
Note: Respondents were asked to rate how well their business unit or department performed analytics activities. Transformed organizations, for example, were those who selected "very well" on a five-point scale from "poorly" to "very well."
Source: Analytics: The New Path to Value, a joint MIT Sloan Management Review and IBM Institute for Business Value study. Copyright © Massachusetts Institute of Technology 2010.

Figure 4: **Three capability levels – Aspirational, Experienced and Transformed – were based on how respondents rated their organization's analytics prowess.**

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 of respondents in our study cited *concern with data quality* or *ineffective data governance* as a primary obstacle (see Figure 5).

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



Note: Respondents were asked "What are the primary obstacles to widespread adoption and use of information and analytics in your organization? Please select up to three."
Source: Analytics: The New Path to Value, a joint MIT Sloan Management Review and IBM Institute for Business Value study. Copyright © Massachusetts Institute of Technology 2010.

Figure 5: **The adoption barriers organizations face most are related to management and culture rather than data and technology.**

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 guesses, 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 they discovered surprised them. The one medium that everyone knew was waning – television – turned out to be an important one for their 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 study, 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 ROI.

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

Does 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 big, 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.

"There is too much focus on the use of information for immediate needs, the 'day job,' and not enough on the strategic future, real customer focus, and differentiation."

Construction business

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.

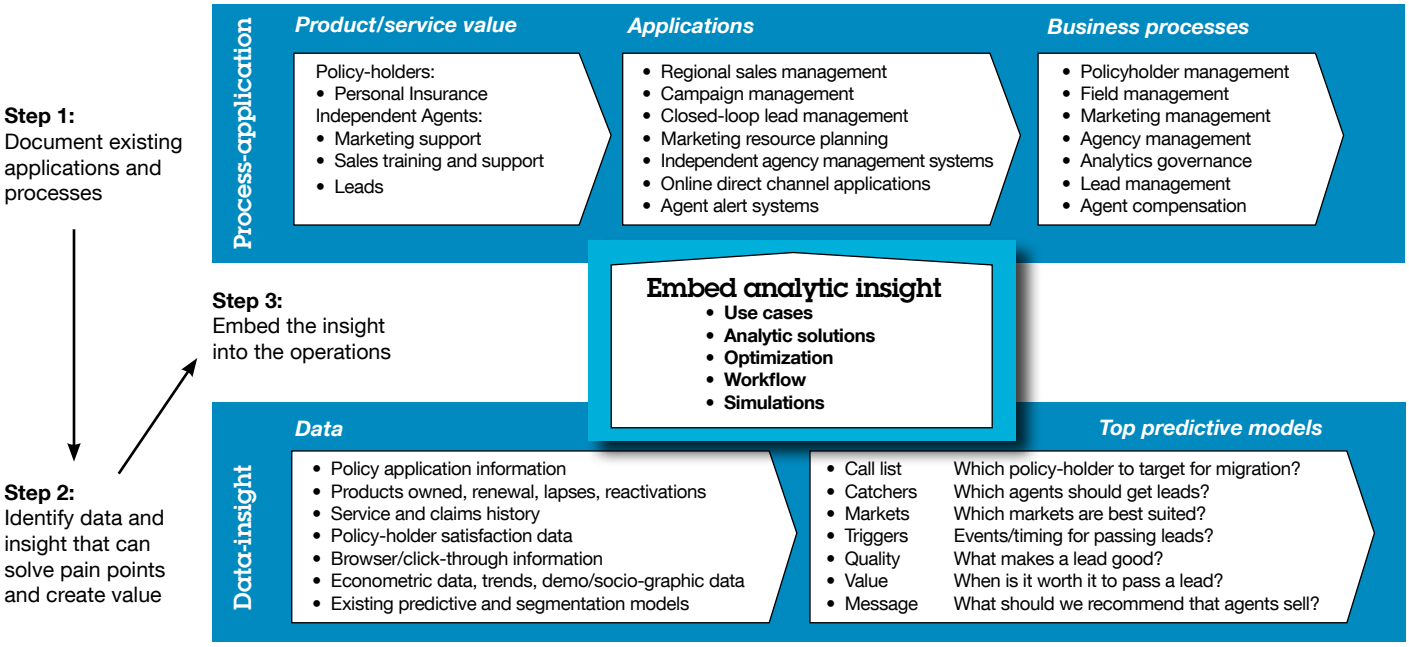
In our discussions with business executives, we have repeatedly heard that analytics aligned to a significant organizational challenge makes it easier to overcome a wide range of obstacles. Respondents cited many challenges, and none can be discounted or minimized: executive sponsorship of analytics 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 insight, obstacles like these get swept into the wake of change rather than drowning the effort.

A process for inspiring change

Despite analytic 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 analytics 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 (PADIE) technique (see Figure 6). It is a simple means by which an organization can operationalize insights drawn from data.

Process-Application-Data-Insight-Embed technique



Source: IBM BAO Services methodology.

Figure 6: **PADIE (Process-Application-Data-Insight-Embed) technique is a three-step process by which a company can operationalize insights drawn from data: first, document processes and applications; second, use analytic techniques to gain insight from data; and third, select the most appropriate ways to embed insight into operations.**

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.

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 insight 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 these issues 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 insight*. Lastly, but most importantly for value creation, the organization needs to determine its best approach to embedding the insight 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 workflows and simulations to help management understand varying scenarios. Success with embedding insight into processes determines the ultimate success of the initiative.

IBM Case Study

Tackling healthcare fraud leads to sweeping reforms

In a time when spiraling healthcare costs frustrated many, the North Carolina Department of Health and Human Services resolved to curb the fraud and abuse that erodes a scarce resource. 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 fraud and abuse within its system of two million users.[2] A new "Medicaid SWAT team" of special investigators is beginning to review cases flagged as suspicious by the analytic models.[3]

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.[4]

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 to stop medical company kickbacks to providers who refer patients for Medicaid services, a public awareness campaign to encourage people to report fraud and abuse, and funding to increase the state's staff of investigators.[5]

Recommendation 2

Within each opportunity, start with questions, not data

Traditionally, 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 – with little time, energy or resources to understand its potential uses. The actions taken, if any, might not be the most valuable ones (see Figure 7). 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 available 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.

"We sit on a ton of very useful information but don't use it to drive action. Just using what we have and converting it to action will yield millions of dollars in additional revenues."

Financial services institution

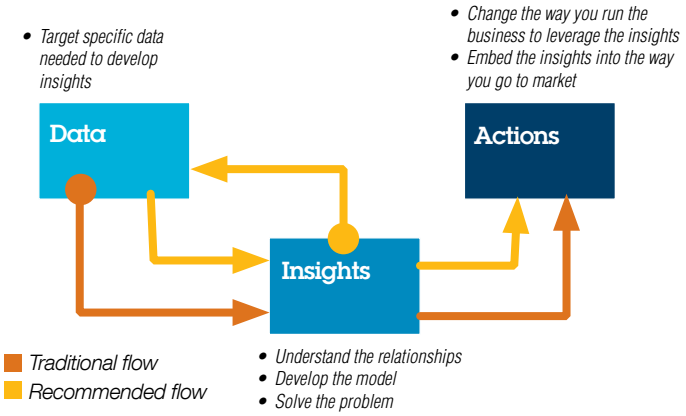


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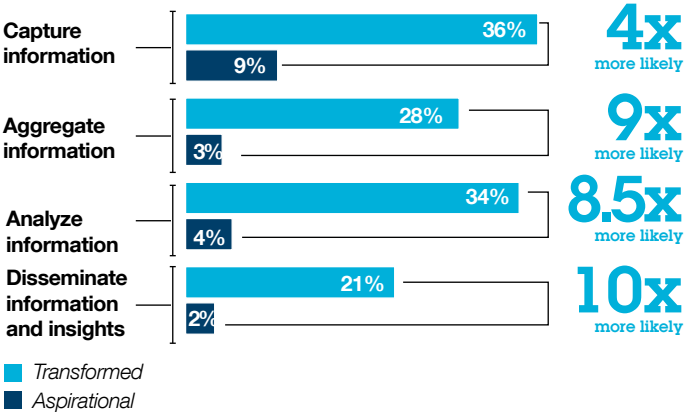
Figure 7: **Organizations should first pinpoint insights to be leveraged, use available data to test analytic models, then the actions based on those insights can help define the next set of insights and data needed.**

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 to other respondents, Transformed organizations are good at data capture (see Figure 8). Additionally, Transformed organizations are much more adept at data management. In these areas, they outpaced Aspirational organizations up to tenfold 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



Note: Respondents were asked "How well does your business unit or department perform the following information and analytic tasks?" on a five-point scale from "poorly" to "very well." Chart shows those who selected "very well."
Source: Analytics: The New Path to Value, a joint MIT Sloan Management Review and IBM Institute for Business Value study. Copyright © Massachusetts Institute of Technology 2010.

Figure 8: Transformed organizations felt much more confident in their ability to manage data tasks than Aspirational organizations, who seldom felt their organizations performed those tasks "very well."

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.

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 tera-bytes of data across the organization, it quickly identified a relatively small number of key data needs, created a customer sample, then used ana-lytic algorithms to forecast attrition probabilities, pinpoint at-risk customers and recommend pre-cise retention strategies. Analysts uncovered a double-digit retention opportunity within a single brand worth hundreds of millions of dollars.

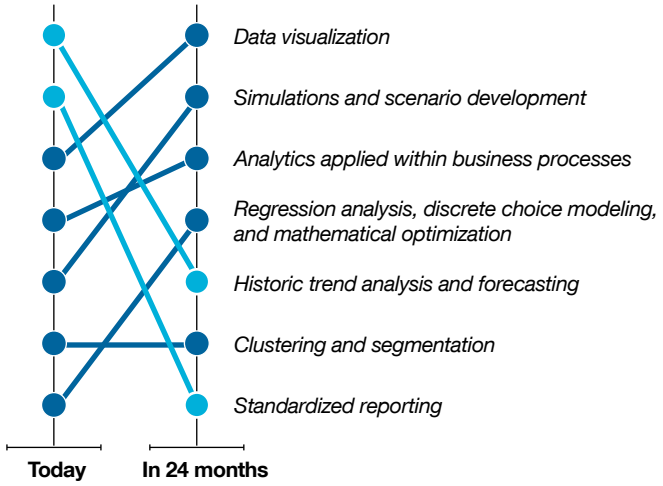
This prototype, initiated to uncover a specific cus-tomer insight, set off an analytics revolution as brand managers across the organization quickly signed on to an enterprise effort to leverage ana-lytics to shift from vehicle-based lifecycle market-ing to a customer-centric approach, targeted at improving both loyalty and retention.

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 9)

Relative value of tools



Note: Respondents were asked to "Select the type of analytics creating the most value in your organization today, and which types you believe will create the greatest value 24 months from now? (Select up to three in each timeframe.)"
Source: Analytics: The New Path to Value, a joint MIT Sloan Management Review and IBM Institute for Business Value study. Copyright © Massachusetts Institute of Technology 2010.

Figure 9: **Organizations expect that the ability to visualize data differently, and to use it for scenarios and simulations that will help strategies and decision making, will be the most valuable in two years.**

"We could develop the newer workforce much faster if we allowed them to access past information. This would give them broader exposure to the business and data for predicting current trends."

Diversified industrial manufacturer

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 regression analysis, discrete choice modeling and mathematical optimization.

Organizations expect the value from these emerging techniques to soar, making it possible for 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 already superimpose realtime 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 as which is the best media mix to introduce a specific product to a specific 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 6, automated workflows 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 to more fully *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.

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 (KPI) 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, they 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.

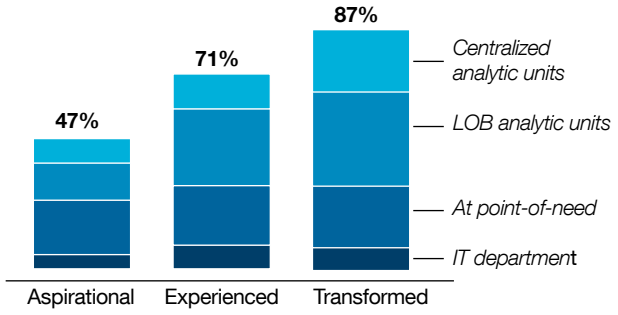
Recommendation 4

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 executive 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 10).

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.

Uses information and analytics either every day or frequently to inform actions and support decisions in day to day role



Note: Chart combines responses to two questions. Percentage figures at top of bars reflect respondents who answered "frequently" or "every day" to the question, "How often do you use information and analytics to inform your actions and support decision making in your day-to-day role?" The height of colored segments within each bar reflect respondents' answers to the question, "Where are analytics primarily performed within your organization?"
Source: Analytics: The New Path to Value, a joint MIT Sloan Management Review and IBM Institute for Business Value study. Copyright © Massachusetts Institute of Technology 2010.

Figure 10: **The frequency of using analytics to support decisions increases as organizations transition from one level of analytic capability to the next.**

"If we can get to a point where we can share results with everyone - good or bad - it will cause processes and business to run more efficiently and effectively. We won't have to worry about reinventing the wheel because we know what works and what doesn't."

Financial services company

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.

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 predicable pattern of analytics adoption by function (see Figure 11). Specifically, we found the following:

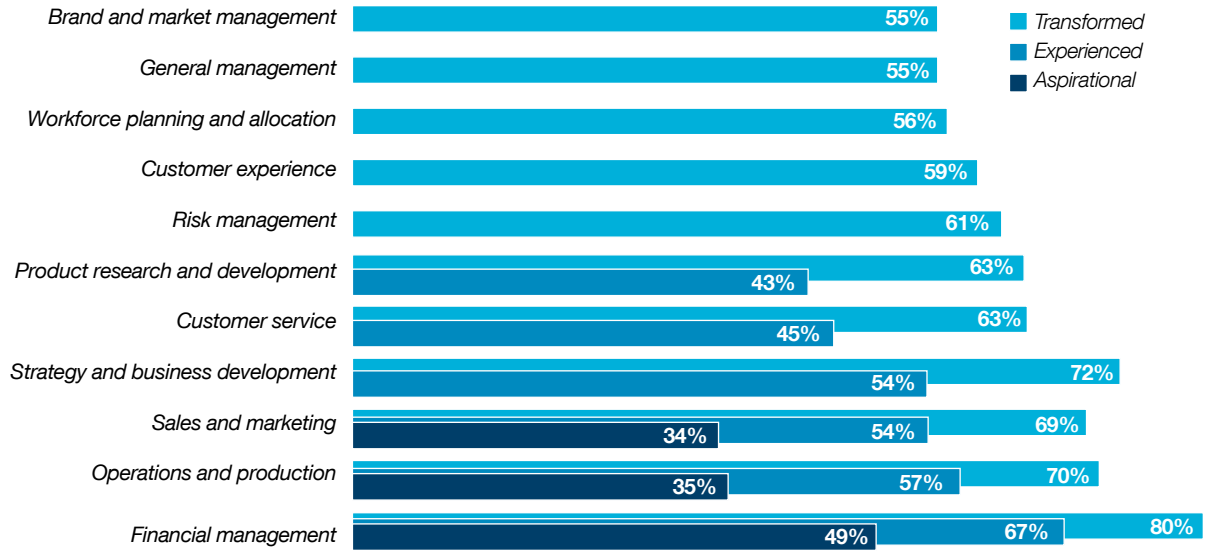
Aspirational. About one-half used analytics for financial management, about one-third each for operations, and sales and marketing. These selections reflect the traditional path of adopting analytics in inherently data-intensive areas.

Experienced. Analytics was 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 workforce 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 non-traditional routes.



Note: Respondents were asked "To what extent does your organization apply analytics to the following activities?" on a five-point scale from "not at all" to "very much."
Source: Analytics: The New Path to Value, a joint MIT Sloan Management Review and IBM Institute for Business Value study. Copyright © Massachusetts Institute of Technology 2010.

Figure 11: With greater proficiency, analytics spreads in a predictable pattern: usage increases in functions where analytics has been already adopted, while at the same time analytics is adopted by a greater number of functions.

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 likely to soon 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* that can provide a home for more advanced skills to come together within the organization. It provides both advanced models and enterprise governance by establishing priorities and standards in these ways:

- 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 re-use 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.

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, create 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 together to analyze and interpret results that will be meaningful to business. At the end of the rotation, business unit analysts return with a standardized toolkit to create consistency and rigor in analysis and facilitate sharing.

Recommendation 5

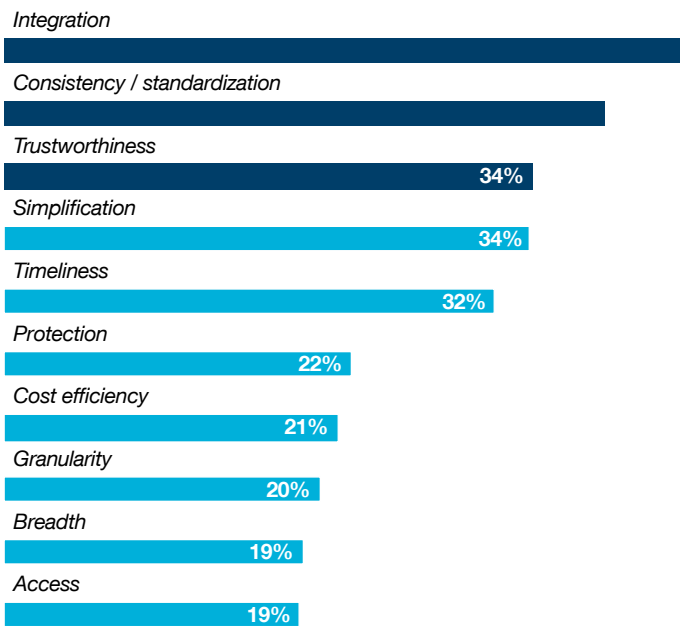
Use an information agenda to plan for the future

Big data is getting bigger. Information is coming from instrumented, interconnected supply chains transmitting realtime data about fluctuations in everything from market demand to the weather. Additionally, strategic information has started arriving through unstructured digital channels: social media, smart phone applications, and an ever-increasing stream of emerging Internet-based gadgets. It's no wonder six out of ten 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 12). Every phase of implementation needs to align the data foundation to an overall information agenda that accelerates the organization's ability to share and deliver trusted information across all applications and processes. Only with an information agenda is it possible to establish information 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 roadmaps. This agenda helps establish necessary links between those who set the priorities and strategy of the organization by line of business, and those who manage data and information.

A comprehensive agenda also enables analytics to keep pace with changing business goals. One executive, for example, told us his organization "had it down to a science" when it came to understanding the impact of price changes on single products and single channels. But they were blindsided when the company shifted to a customer-centric strategy, restructuring around bundled products and dynamic pricing across channels. Because their data marts had been developed *de facto* over time, they found themselves struggling to understand which tools and information were needed to go forward.



Note: Respondents were asked "What are the highest data priorities for your organization?" and allowed to select up to three.
Source: Analytics: The New Path to Value, a joint MIT Sloan Management Review and IBM Institute for Business Value study. Copyright © Massachusetts Institute of Technology 2010.

Figure 12: **Organizations want data that is integrated, consistent and trustworthy, which were the leading data priorities cited by our respondents.**

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.

"To facilitate global visibility, we need to apply consistent and appropriate standards."

Consumer packaged goods company

Outline for an information agenda

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

- ***Information governance policies and toolkits*** – 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 realtime 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 toolkits 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.

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 ported 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.

Set yourself up for success

Aware 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. 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 embedded analytics techniques to illustrate and prioritize the types of organizational changes that are needed to achieve the value. Pull it all together using an implementation roadmap 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

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.

For more information about this study, you may contact the IBM Institute for Business Value at *iibv@us.ibm.com*, or visit our Web site:

ibm.com/gbs/bao

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*, or visit the MIT SMR Web site:

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About our research

To understand that challenges and opportunities associated with use of business analytics, the *MIT Sloan Management Review*, in collaboration with the IBM Institute for Business Value, conducted a survey of nearly 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 from a variety of 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 further illustrate how organizations are leveraging business analytics and illuminate how real organizations are putting our recommendations into action in different organizational settings.

Related publications

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