Harvard Business Review
ANALYTIC SERVICES

Pulse Survey

UNDERSTANDING WHY ANALYTICS STRATEGIES FALL SHORT FOR SOME, BUT NOT FOR OTHERS

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The opportunities created by digital transformation are fueling unprecedented change. It is changing industries across the world, evolving established ways of working, and shifting the competitive landscape.

Transformative insights powered by cloud, data, and AI are at the heart of this digital transformation. The actions generated from these insights are enabling organizations to fundamentally re-imagine how they engage customers, transform products, optimize operations, and enable employees.

The retail industry, as an example, is reinventing itself with new customer experiences that integrate across traditional channels, online sales, in-store sales, and merchandising. The manufacturing industry is innovating with streamlined production and "connected" products while the financial services industry is enabling "always on" digital experiences as customers demand access to their assets 24x7, from any location, and from any device.

As organizations leading this transformation become data-driven and embark upon their digital transformation journey, they must address challenges related to how investments across cloud, data, and AI need to be interwoven in a fluid manner. Organizations need to:

- **Overcome divisional and system data silos in the face of exponential data growth to obtain a holistic view of their businesses**
- **Ensure data privacy and security is at the forefront, with robust organizational policies supported by system controls**
- **Deliver insights from these systems to everyone in the organization in an easy-to-use, yet performant and cost-effective manner**

This report outlines why business leaders are pursuing a data-driven culture to enable digital transformation and how they are overcoming these challenges to get the best value from all their data. As you will see in the report, a common quality among these businesses is their ability to deliver timely insights to everyone in their organization from all their data, while ensuring accuracy and trust.

UNDERSTANDING WHY ANALYTICS STRATEGIES FALL SHORT FOR SOME, BUT NOT FOR OTHERS

As the drive for digital transformation continues to gain steam, global executives are seeing market upheaval follow in its wake. Traditional retailers are expanding digital storefronts and backing them with "showrooming" at physical locations. Commercial realtors are becoming facilities managers for environmentally optimized smart buildings. And insurance companies are rewriting rate structures based on the actual driving habits of individual customers. No matter how they see it affect their organizations individually, nearly all (93%) of the senior leaders responding to a new survey by Harvard Business Review Analytic Services report that significant volatility has impacted their industry over the past two years.

How are these organizations addressing market change? While many factors go into successful responses to market upheaval, executives in the survey agree that data and analytics strategies will play a key role. Ninety-one percent say that in the next two years, effective data and analytics strategies will be essential for successful business transformation initiatives. FIGURE 1 Similarly, 87% believe that analytics proficiency will be a competitive differentiator in their industry over the next two years. The reason: executives are seeing a direct link between business performance and decisions based on high-quality data.

Across the entire survey sample, many respondents show they understand the importance of analytics for arriving at successful business outcomes, not just for gauging results at the end of a project. For example, more than half (54%) say data and analytics have the most value at the earliest stages of development processes for products, services, and internal initiatives. Only 11% say the greatest value comes from measuring the outcome of initiatives.

Based on responses from 456 senior executives from throughout the world and across a mix of industries, the survey identified widespread commitments to modern data strategies and the widespread use of analytics throughout organizations. But the data also shows that maturity in this area is hard to achieve. In fact, only 20% of the respondents consider their organizations to be mature in terms of technology adoption, decision-making processes, and employee skill levels.

HIGHLIGHTS

91%
OF GLOBAL EXECUTIVES SAY EFFECTIVE DATA AND ANALYTICS STRATEGIES ARE ESSENTIAL FOR BUSINESS TRANSFORMATION.

80%
OF RESPONDENTS SAY THEIR ORGANIZATIONS ARE STRUGGLING TO BECOME MATURE USERS OF DATA AND ANALYTICS.

55%
OF ORGANIZATIONS NAME DATA SILOS AND DATA MANAGEMENT DIFFICULTIES AS THE BIGGEST CHALLENGES TO DATA AND ANALYTICS STRATEGIES.

51%
OF EXECUTIVES RANK SELF-SERVICE ANALYTICS FOR BUSINESS USERS AT THE TOP OF THEIR INVESTMENT PRIORITIES.

Fifty-nine percent of executives report that **their staffs turn to data** each day, or even multiple times a day, when making decisions.

While the latest technologies, such as self-service business intelligence, artificial intelligence, and machine learning, are essential components for becoming a data-driven organization, getting the basics right is crucial to analytics success. For example, organizations also must leverage more traditional technologies, such as data warehouses, to bring together data from different formats, sources, and applications to derive insights that are richer than the single source. That takes an integrated approach that also includes improved data governance, the development of new skills for the business staff, cultural change, and updates to organizational management.

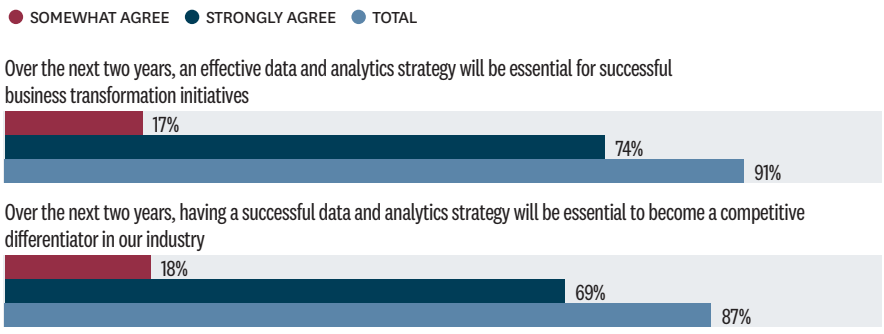
Now is the time to put an integrated strategy into play. "The volume of data is increasing exponentially—not just every year or every month, but literally every day," says Randy Bean, chief executive officer of NewVantage Partners, a management consulting firm that specializes in data and analytics strategies for business transformation. "Companies that successfully combine human judgment with systems that put data and insights at their fingertips are in the strongest positions to compete successfully in the marketplace."

FIGURE 1

BUSINESS SUCCESS IS DIRECTLY LINKED TO DATA STRATEGIES

Data-driven enterprises are positioned to become market leaders

Rate the extent to which you agree or disagree with the following statements



SOURCE: HARVARD BUSINESS REVIEW ANALYTIC SERVICES SURVEY, JULY 2019

Data Takes Hold

For purposes of the survey, mature enterprises were defined as having three key attributes. First, they utilize self-service business intelligence tools and advanced analytics, including cloud-based analytics, modern data warehouse and data lake platforms, and artificial intelligence technology. Second, they leverage various forms of advanced analytics, such as real-time and big data analytics for decision making. And finally, they have employees in multiple business units across the company with skills to understand, embrace, and learn from data analyses.

Even though only 20% of the executives rank their organizations as mature, the rest aren't sitting on the sidelines.

Many organizations are taking important steps toward integrating data and analytics into routine business operations. Nearly two-thirds (61%) of the executives in the entire survey report that their organization has data strategies that cover multiple business units. Another 29% use more ad hoc, department-by-department approaches, while only 10% have no formal strategy.

Executives also say analytics are becoming a standard business practice. FIGURE 2 Fifty-nine percent report that their staffs turn to data each day, or even multiple times a day, when making decisions.

Executives from some high-performing departments report even higher rates of data and analytics use. Eighty-two percent of the respondents who

are part of strategic planning draw on data insights at least once a day. In addition, daily data consultations happen among the 72% of respondents from a combination of customer-facing groups that include marketing, public relations, and communications, along with business development and sales.

As executives assess the value of data and analytics, they're focusing on strategic benefits. Fifty percent expect new insights from information will yield improved customer satisfaction rates. In addition, 43% of leaders are eyeing improved quality for products and services through enhanced use of data.

Executives may rank some benefits lower, such as responding to competitive threats at 18%, because they feel attention to customers, products, and operations lays the foundation to maintaining and expanding market share. The low ranking of cybersecurity (at 4%) might reflect the business focus of the survey respondents and their desire to identify returns outside of the IT department.

Drilling into the data, it's clear that the select group of mature data users is seeing significant business benefits from its status. FIGURE 3 For example, 62% of executives from mature companies say data insights are directly linked to better customer experience. This percentage is impressive considering that while half of the survey respondents name improved customer satisfaction as the top goal, only 15% of organizations that aren't mature report improved customer satisfaction rates. Similarly, 16% of less mature organizations are seeing data-fueled gains in revenue performance, while 13% are improving profits.

Changing Business Models

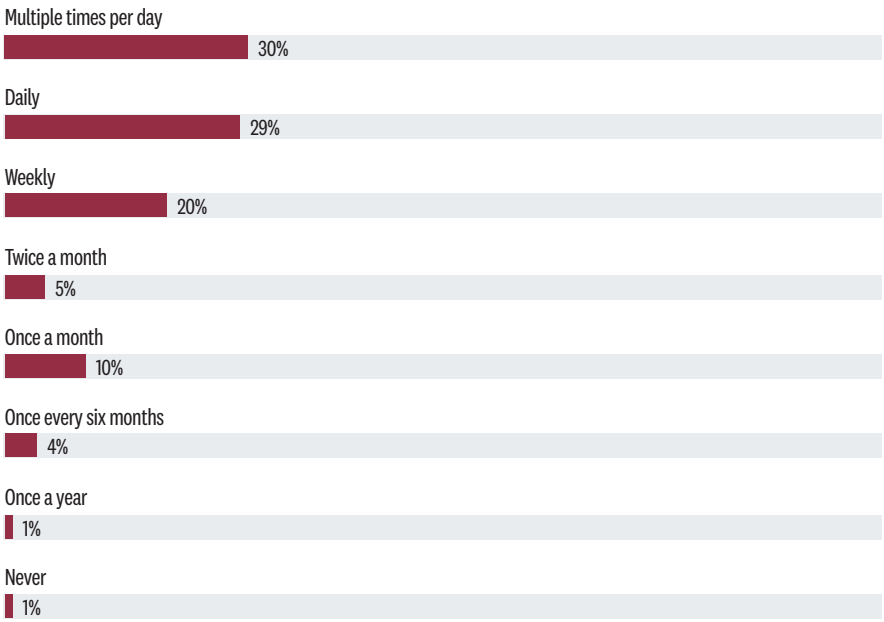
In practice, data-driven transformation is changing business models throughout industrial sectors. "When people in the telecom industry think of analytics, the first thing they typically think of is predicting churn rates—which customers may be in danger of going to other service providers. But the value of data and analytics

FIGURE 2

ANALYTICS BECOME EMBEDDED IN BUSINESS PROCESSES

Mature organizations frequently turn to data resources to support decision making

Frequency of use of data and analytics in the department respondents work within



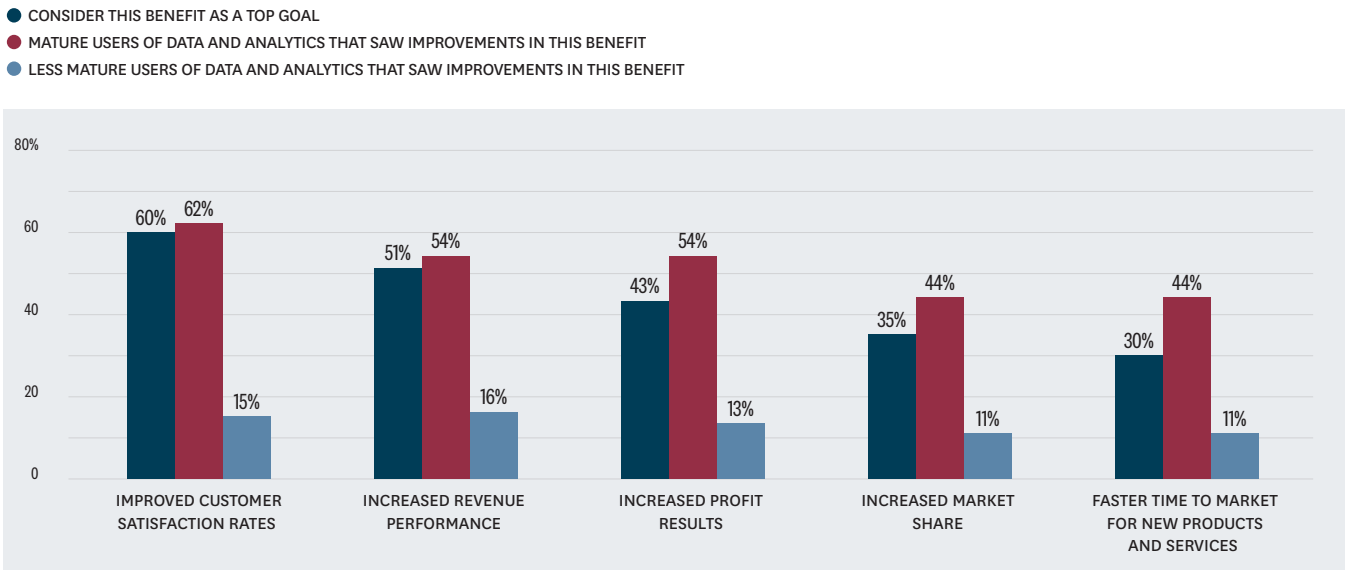
SOURCE: HARVARD BUSINESS REVIEW ANALYTIC SERVICES SURVEY, JULY 2019

SIXTY-TWO PERCENT OF EXECUTIVES FROM MATURE COMPANIES SAY DATA INSIGHTS ARE DIRECTLY LINKED TO BETTER CUSTOMER EXPERIENCE.

FIGURE 3

ANALYTICS MATURITY IS CRUCIAL TO ACHIEVE BUSINESS OUTCOMES

Mature organizations see improved customer satisfaction and business performance as a result of their analytics investments



SOURCE: HARVARD BUSINESS REVIEW ANALYTIC SERVICES SURVEY, JULY 2019

goes far beyond that," says BK Vasan, executive director of data engineering, cloud, and advanced analytics at T-Mobile, the wireless carrier. "The biggest opportunities come from enabling business people to think differently based on the insights they're getting from data."

For example, one of T-Mobile's most advanced users of analytics is the customer support desk, where data helps representatives provide enhanced customer service. One data-related initiative analyzes the long-term value of customers who contact the company. "As of the first contact with a customer, representatives see the relevant information about the person so they know how to respond appropriately to each caller," Vasan says.

With the help of data and AI-based analytics, the company is also forecasting demand each fall when Apple introduces its latest wireless products. The analysis tool compares buying data from previous years, predicts the impact of new marketing programs from both Apple and T-Mobile, and determines how many phones will be needed to support demand both online and in stores.

Other sectors are also more fully capitalizing on data resources. Staffing agencies, for example, are transitioning from linear transactional processes that begin when clients ask talent scouts to find someone with a particular set of skills. Data and predictive modeling are flipping that model so that search firms can more actively work with both employees and job candidates. The traditional role continues while agencies can also act as personal agents for workers by pushing job listings to them and digitally managing their careers, says Tomas Chamorro-Premuzic, chief talent scientist at a staffing firm and a professor of business psychology at University College London and at Columbia University.

Meanwhile, video streaming services have primarily used data to decide what content to license from movie and television production studios for subscribers. After developing a deeper, data-driven understanding of consumer preferences, some services

"THE BIGGEST OPPORTUNITIES COME FROM ENABLING BUSINESS PEOPLE TO THINK DIFFERENTLY BASED ON THE INSIGHTS THEY'RE GETTING FROM DATA." BK VASAN, EXECUTIVE DIRECTOR OF DATA ENGINEERING, CLOUD, AND ADVANCED ANALYTICS, T-MOBILE

"**The biggest barriers aren't related to technology;** they're all the other issues surrounding the transformation, from being a traditional legacy business to becoming a data-driven organization," says Randy Bean, CEO at NewVantage Partners.

are now producing original content themselves to better match customer preferences. Music streaming services are creating new revenue streams by licensing consumer data to help artists determine the best performance venues and song lists for new recordings, Chamorro-Premuzic says.

Hospitals are turning to data to make decisions that may literally be a matter of life and death. For example, Dutch Hospital Data (DHD) is a public foundation in the Netherlands that collects, manages, and processes data from about six million patient encounters a year at the country's 85 hospitals and university medical centers. "Our data analysts and epidemiologists work with people in hospitals to get answers to questions that are relevant for individual institutions," says DHD CEO Gert-Jan van Boven.

Authorized users can slice and dice their hospitals' data and public records via electronic dashboards created by DHD. Large organizations with staffs of data analysts, such as university medical centers, can also download information for use with their in-house business intelligence tools. Administrators and clinicians can investigate problems associated with therapies flagged for higher-than-expected complications and mortality rates, van Boven says. The analyses also help hospitals run more cost effectively by avoiding expensive treatments that haven't demonstrated improved results. "Data helped detect that giving endoscopy exams when someone reports heartburn doesn't offer additional value for 99% of the people with that complaint," he explains.

In addition, DHD's analyses have helped hospitals save money by showing clinicians which generic drugs are as effective as their more expensive counterparts. "We can estimate how many euros a hospital is losing by not adopting generics," van Boven adds.

Roadblocks to Data Maturity

Many organizations, however, are still searching for ways to better capitalize on their investments in data and analytics.

The gap between mature and emerging users of data and analytics demonstrates that while the potential business benefits of using data and analytics may be significant, organizations need a multifaceted approach to yield successful outcomes. "The biggest barriers aren't related to technology; they're all the other issues surrounding the transformation, from being a traditional legacy business to becoming a data-driven organization," Bean says.

Problems that contribute to disappointing outcomes typically fall within four categories: data management, staffing and culture, technology, and organizational misalignment. FIGURE 4

More than half (55%) of the executives say the root cause of disappointing results stems from data silos and difficulties managing data coming from multiple new systems. Siloed data locks information within individual departments and can block efforts to develop deeper, more insightful analyses into shifting customer expectations and market opportunities.

Questionable data, leading to untrustworthy analyses, is another stumbling block. More than half (52%) of the survey sample blame inaccurate or insufficient information for hurting their results. Other survey data uncovered additional problems. For example, 51% report that poor data governance leads to conflicting definitions of key categories, such as "customer" or "sales." Without clear, consistently applied definitions, companies can't accurately determine essential details, such as which clients are most profitable and how well a new product sold in the last quarter.

A significant number of respondents also identify people-related problems. Fifty-eight percent acknowledge that their company's employees don't have the training or skills to make informed business decisions based on data analyses. In addition, 54% say skills gaps and costs arise from their enterprise's complex mix of data and analytics tools. The result: investments in the latest analytics tools may go unused or underutilized because front-line workers simply don't know how to utilize them.

Then there's the issue of legacy technology, which blocks organizations from becoming more data-driven. Forty-seven percent of the survey respondents say their company can't cost-effectively scale its internal IT systems for expanded use of data and analytics. In addition, 45% of the organizations operate on-premises IT systems that are at or near performance capacities. All these factors combine to make it difficult for internal data centers to handle the increased processing demands of data and analytics systems.

Perhaps the least known factor that contributes to poor analytic outcomes is organizational, namely that the will for wider adoption of data and analytics still flows from the top down. Senior executives, ranging from the C-suite to IT managers, still call the investment shots for 64% of organizations. Less than a third of enterprises see department heads and end-users as the primary drivers for new investments. While it isn't unusual for senior leaders to make final decisions about funding, organizations must give end-users channels for clearly communicating their needs and the types of tools that will improve their work.

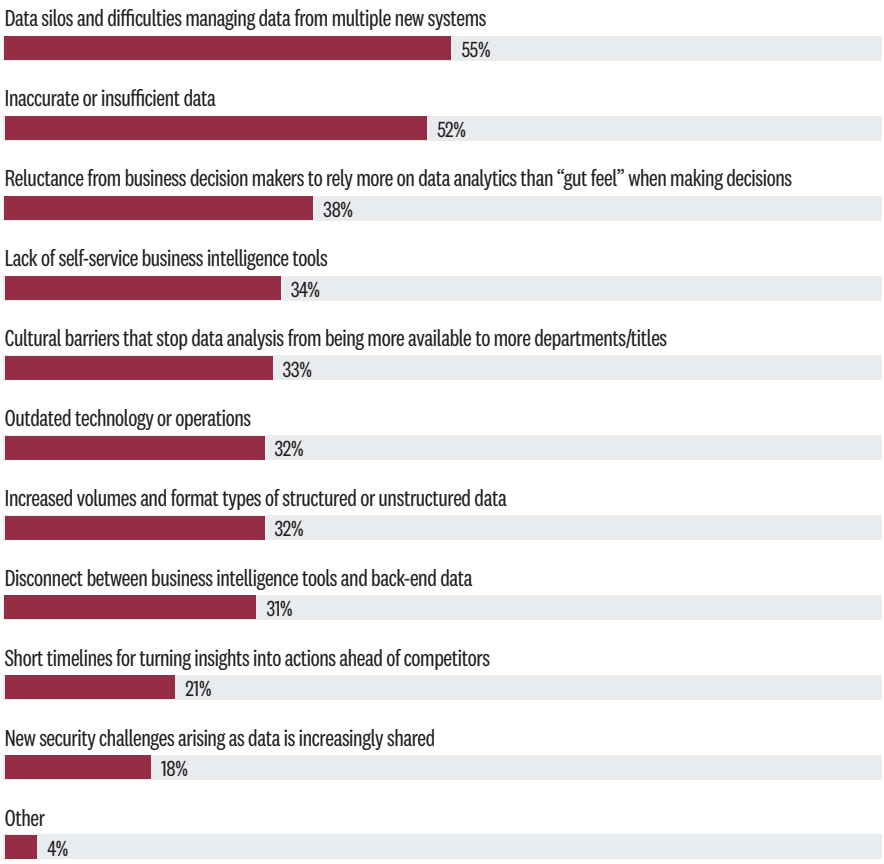
Decision-making breakdowns also arise because of poor collaboration between two key groups. Only 27% of the survey respondents say business and IT staffs work together effectively. By contrast, more than a third describe these interactions as only "slightly" or "not at all" effective. Better interactions between technology and employees will help ensure that new digital tools will support business goals.

FIGURE 4

DATA MANAGEMENT PROBLEMS DERAIL SUCCESS

Breaking down data silos ranks as a top priority

The biggest challenges companies face for effectively using data and analytics for business decisions



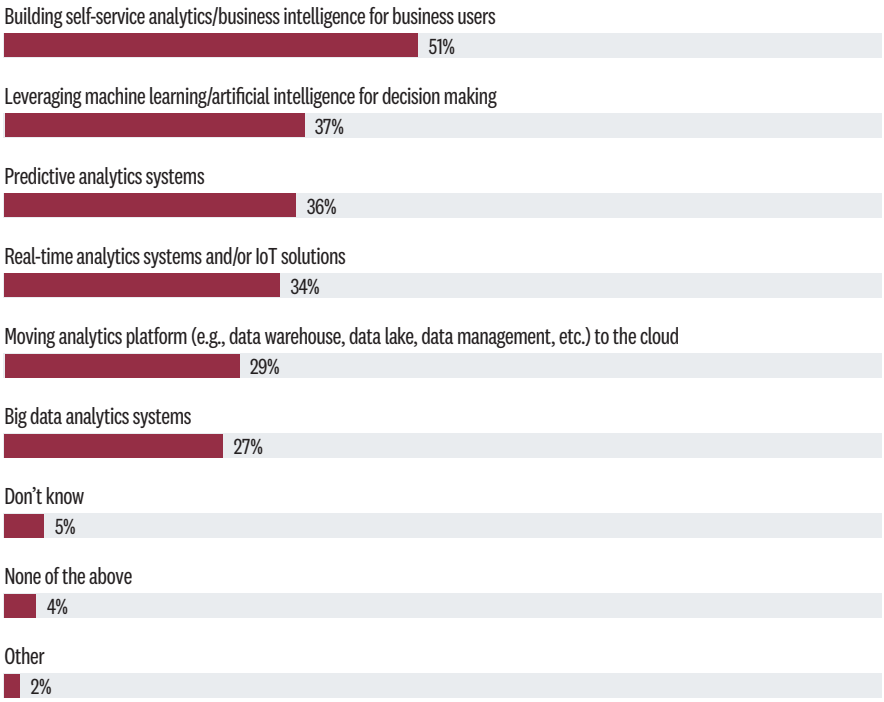
SOURCE: HARVARD BUSINESS REVIEW ANALYTIC SERVICES SURVEY, JULY 2019

FIGURE 5

TOOLS FOR DATA DEMOCRATIZATION

Executives are eyeing investments in analytics that support users throughout organizations

Of the below technology efforts, which, if any, are or are soon to be the biggest investment priorities for your company?



SOURCE: HARVARD BUSINESS REVIEW ANALYTIC SERVICES SURVEY, JULY 2019

Unchecked, those four problem areas—data management, staffing and remaining problem areas will keep organizations from becoming more mature users of data and analytics, but best practices are emerging to help organizations overcome these hurdles. Naturally, to move forward on the maturity continuum, senior leaders must begin with realistic expectations. "Firms that expect a quick journey to becoming data-driven are setting themselves up for failure," Bean warns. "Organizations will have the highest probability of success when they recognize this is a process that must be continually modified based on changes in their markets, their businesses, and in technology."

DHD is one such organization. Its philosophy is to promote change by focusing on potential business benefits. "We rely on user stories and on our business ambassadors to demonstrate what benefits hospitals have actually realized with data," van Boven says. "This lets others consider whether something similar might work in their organization, and if so, see a model for ensuring success."

How to Advance on the Maturity Spectrum

Most respondents are at organizations that aren't as far along the maturity spectrum as DHD, and as the survey shows, forward-looking executives must accelerate their journey to data maturity with plans that comprehensively address the full range of data governance, cultural, technological, and organizational challenges.

The survey results illustrate how mature organizations see data and analytics as part of a larger effort that combines investments in cloud-based data-management and analytics platforms, the elimination of data silos for broader dissemination of information by leveraging established technologies such as the data warehouse, and the addition of business intelligence (BI) tools that address the needs of end users. This combination is yielding a significant return: nearly two-thirds (63%) of executives from mature organizations say decision makers can quickly access the data they need, when they need it, versus 39% of less-mature firms. What's more, this three-pronged approach provides a model for how less mature users of data can move forward.

Consider that 55% of respondents overall say they will invest to create an effective framework for reliable data management. A close look at the survey data shows that mature organizations have already invested in this area. Fifty-nine percent are running cloud-based analytics platforms along with data warehouses and data lakes. This, in part, contributes to the result that 61% of mature organizations aren't naming data silos as a top challenge to their analytics strategies.

55%

OF RESPONDENTS SAY DATA SILOS AND DIFFICULTIES MANAGING DATA FROM MULTIPLE NEW SYSTEMS ARE THE BIGGEST CHALLENGES COMPANIES FACE FOR EFFECTIVELY USING DATA AND ANALYTICS FOR BUSINESS DECISIONS.

"The key is to **identify three or four specific business goals** to focus on and then understand **what data will be needed** to support those efforts," says Randy Bean, CEO at NewVantage Partners.

Data-management platforms address a range of tasks, from enforcing rules for sharing information across departments to monitoring the accuracy of new records being created in business systems. "Success from an analytics point of view hinges on the quality of the data," says Thomas C. Redman, president of Data Quality Solutions, a consulting firm that focuses on data and analytics initiatives. "The old adage, 'garbage in/garbage out,' is being replaced with 'big garbage in/big garbage out.'"

Data problems often stem from inaccuracies created in one department that ripple throughout the organization, he adds. For example, if someone in marketing enters an erroneous name for a prospect, the error will distort sales department records when the prospect places an order. "Improving data quality comes down to getting everyone in the company to understand they have two roles: one being a data creator, the other being a data customer," Redman explains.

Quality improves quickly once people understand their dual roles, he adds. Customers clarify what information is most important for their work, and creators find and eliminate root causes of errors. "The role for leadership is to make sure people understand these roles and provide the tools and training people need to carry them out," Redman adds.

Mature organizations are seeing another payoff from already having invested in data-management systems—they're now better-positioned to add advanced analytics technologies. Nearly half (46%) of mature companies say their biggest technology investments over the next two years will be for machine learning and artificial intelligence to support decision making, while only about a third (35%) of the rest are ready to do so. DHD is among the organizations that are already piloting the use of machine learning. It's using the technology to apply medical codes to define diagnoses and patient categories. Early results are showing encouraging signs of improved data quality through a more accurate application of codes for each medical encounter, van Boven says. Machine learning may also save money through coding automation that reduces personnel demands. "We will still need coding specialists, but they'll perform more specialized roles, such as ensuring we are maintaining medical standards," he says.

Since people, and not just data, are involved in the maturation process, staffing and culture must be refined, too. To ensure staff members have the necessary skills to use data effectively, 57% of the organizations surveyed will increase training and hire new talent.

Forty-three percent of executives across the entire sample say they will promote greater collaboration among IT and business users. This is another area where mature organizations are excelling. Fifty-three percent of data leaders report that their business and IT work together effectively, compared to only 20% of the rest.

The skills needed to help organizations use analytics more effectively ranges from data science and social science to so-called soft skills, such as critical thinking and curiosity, says Chamorro-Premuzic. People need to go outside of their comfort zones and learn how to use data to tell stories and offer insights relevant to key stakeholders, he explains.

In addition, senior executives should make sure they have the right balance of skill sets. "Data scientists alone won't make an impact; they need to be complemented with people from other backgrounds and profiles," Chamorro-Premuzic says. "Organizations should leverage cognitive diversity by bringing different people together."

More than half (51%) of executives responding to the survey say self-service analytics and BI applications for employees are or will soon be investment priorities, namely when it comes to technology. FIGURE 5

A focus on the business staff marks what some observers call a democratization of data, by putting more information and analytics tools into the hands of end users. "The best dashboards are those that are developed by end users to help them perform what-if analyses," van Boven says.

For longer-term investments—spanning a two-year timeframe—a solid majority (60%) of respondents say they're earmarking cloud-based analytics platforms, including data warehouses, data management systems, and data lakes. Cloud-based resources not only help organizations store information and process analytics requests, but also provide tools for freeing information that's been traditionally locked within departmental boundaries. Some cloud platforms offer data integration capabilities for cleaning and combining disparate information into central databases and data warehouses. Forty-one percent of the companies surveyed will invest in new resources like these to help eliminate data silos and enable more seamless coordination between business intelligence tools and analytics platforms. By contrast, only 36% plan to invest in on-premises versions of these resources. "The cloud has been the most impactful technology we've seen in recent years," says Kees de Waard, IT manager at DHD. "The cloud helps us manage costs by letting us expand or shrink services as our needs change."

He adds that analytics tools that come with some cloud platforms give executives at DHD greater insights into usage rates and security trends. "These are out-of-the box tools that we would otherwise have to build ourselves," de Waard says.

Lastly, most organizations responding to the survey (58%) plan to launch or expand company-wide strategies for making data and analytics an integral part of all decision-making processes. "Don't start from the perspective of, 'We have to build a comprehensive data environment so somebody may use some of our data at some point in time,'" Bean explains. "The key is to identify three or four specific business goals to focus on and then understand what data will be needed to support those efforts."

With an approach focused on core use cases, organizations position themselves to demonstrate quick wins that validate analytics strategies and build momentum for follow-on projects. "We are seeing a number of organizations establishing a solid data environment for a particular line of business and then building it out as a broader production environment as other business units see results and begin to sign on to the data strategy," Bean says.

FOR LONGER-TERM INVESTMENTS—SPANNING A TWO-YEAR TIMEFRAME—A SOLID MAJORITY (60%) OF RESPONDENTS SAY THEY'RE EARMARKING CLOUD-BASED ANALYTICS PLATFORMS, INCLUDING DATA WAREHOUSES, DATA MANAGEMENT SYSTEMS, AND DATA LAKES.

METHODOLOGY AND PARTICIPANT PROFILE

A total of 456 respondents drawn from the HBR audience of readers (magazine/ enewsletter readers, customers, HBR.org users) completed the survey.

SIZE OF ORGANIZATION

19% FEWER THAN 100 EMPLOYEES

25% 100 – 499 EMPLOYEES

9% 500 – 999 EMPLOYEES

17% 1,000 – 4,999 EMPLOYEES

6% 5,000 – 9,999 EMPLOYEES

25% 10,000 OR MORE EMPLOYEES

SENIORITY

32% EXECUTIVE MANAGEMENT/ BOARD MEMBERS

39% SENIOR MANAGEMENT

19% MIDDLE MANAGEMENT

12% OTHER

KEY INDUSTRY SECTORS

OTHER INDUSTRIES WERE LESS THAN 7% OF THE TOTAL

11% FINANCIAL SERVICES

11% TECHNOLOGY

9% BUSINESS/ PROFESSIONAL SERVICES

9% EDUCATION

9% GOVERNMENT/ NOT-FOR-PROFIT

9% MANUFACTURING

7% HEALTH CARE

JOB FUNCTION

OTHER FUNCTIONS WERE LESS THAN 6% OF THE TOTAL

23% GENERAL/EXECUTIVE MANAGEMENT

8% CONSULTING

7% IT

7% MARKETING/PR/ COMMUNICATIONS

7% STRATEGIC PLANNING

6% R&D/INNOVATION/ PRODUCT DEVELOPMENT

REGIONS

37% NORTH AMERICA

26% EUROPE

21% ASIA/PACIFIC

7% LATIN AMERICA

5% MIDDLE EAST/ AFRICA

3% OTHER

Figures may not add up to 100% due to rounding.

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