IDC
Analyze the Future

Authors:
Dan Vesset
Henry D. Morris
John F. Gantz

May 2014

Business Value Highlights

The Increase in the Data Dividend to Leaders:

Increased revenue:
69%

Improved productivity:
43%

Lowered costs:
66%

Capturing the $1.6 Trillion Data Dividend

EXECUTIVE SUMMARY

In recent years, the promise and, in some cases, the hype of big data have produced plenty of critics who doubt the benefits of big data or point to the potential pitfalls facing organizations engaged in big data and analytics projects. These critics make some valid points. For example, not every organization has big data or needs to manage and analyze big data. A more pragmatic approach would be to look at not just big data but also small data, long data, dark data, or any other metaphors that have surfaced in recent years — in other words, *all* data.

Where these critics fall short, however, is in their discussion of the benefits of these projects to the average organization. IDC's recently conducted research commissioned by Microsoft shows that better outcomes from data and analytics projects correlate with greater competitiveness of an organization in its industry or a better ability to fulfill its mission in the public sector. Although correlation does not equate to causation, a growing body of research shows financial and productivity benefits directly linked to better data-driven decision making enabled by business analytics solutions.[1, 2]

In addition, one cannot view the investment in data and analytics as a binary choice — an organization invests, or it doesn't. Several prior research studies available in the market have looked at the benefits of *any* investment in data and analytics over no investment at all. Recognizing that an ever-growing number of organizations have already invested in a base level of business analytics technology and capabilities, IDC set out to identify the difference between those organizations and others that have invested in using more diverse data types and sources, using more diverse analytical tools and methods, and distributing information

1. Erik Brynjolfsson, Lorin M. Hitt, and Heekyung Hellen Kim, "Strength in Numbers: How Does Data-Driven Decisionmaking Affect Firm Performance?" Massachusetts Institute of Technology Sloan School of Management and University of Pennsylvania, 2011.
2. Thomas H. Davenport and Jeanne G. Harris, *Competing on Analytics: The New Science of Winning*, Harvard Business School Publishing Corporation, 2007.

IDC
Analyze the Future

to a more diverse audience of end-user types — at the right time. In short, our goal was to identify and quantify the *additional* financial value, or what we called the *data dividend,* that is gained from investing in a more comprehensive set of data management and analytics capabilities. Today, success is determined not by whether an organization invests in business analytics solutions but how it invests in them.

For this study, we defined two types of organizations: *Leaders* and *Others.* Leaders are organizations that invested in more new capabilities — such as new data types and new sources, new analytics and new metrics, and sharing information with new users — while investing in technology that enables right-time access to the freshest available data. Others embraced none or significantly fewer of these capabilities.

The results of our analysis, which included a survey of more than 2,000 organizations and an economic model based on reported benefits and IDC IT spending trends and other macroeconomic variables, showed a clear difference between Leaders and Others.

At the worldwide level, Leaders will capture $1.6 trillion more in value from their data and analytics investments over the next four years. This represents a 60% higher *data dividend* for Leaders — an opportunity that exists for any individual organization looking to maximize its return on data assets and reap ongoing data dividends.

<div align="center">

**(Diverse Data Types and Connections + New Analytics +
New Users and Insights) @ the Right Time =
60% Greater Data Dividend**

</div>

To achieve such benefits, organizations will need to embrace the new realities of our data-driven society and break from the status quo of limited data and analytics availability as well as narrow user participation with business analytics technology and processes.

In This White Paper

This white paper provides the results of an IDC study that examined the economic benefits that accrued to organizations that made base investments in individual areas of data management and analytics compared with the economic benefits that accrued to organizations that made a broader, more diverse set of investments. While previous studies have looked at the benefits of *any* point investment in data and analytics over no investment at all, this study compared the returns of a comprehensive approach with the returns of making more limited investments in a range of data and analytics capabilities.

Methodology

For this study, IDC surveyed 2,020 large and midsize organizations in 20 countries across a range of private and public sector industries, including financial services, retail, manufacturing, healthcare, government, and communications and media. Seventy-three percent of survey respondents were from line-of-business or executive functions, and 27% were from the IT function; 62% of respondents had the title of manager or above. IDC also developed an economic net benefits model based on GDP, IDC forecasts for IT spending, labor and operational costs as a percentage of revenue, and spending by country on big data and business analytics hardware, software, and services.

For a more detailed description of the study methodology, see the Appendix.

What's New in the Era of (Big) Data and Analytics?

(Big) data and analytics is about exploiting technologies that are affordable and available to enterprises to collect, process, store, and use diverse data on an unprecedented scale. It is about monitoring fast-moving data in motion. It is also about combining structured and unstructured data. It is about a full range of data preparation, analysis, and distribution processes that are driven by the increasingly digitized interactions among people, organizations, and physical things.

More than anything else, big data, as a concept and a market movement, is about change. It is about asking new questions, using new data and new analytics, and delivering new insights to new users at the right time. Today, there is an opportunity to combine existing and new technologies, data sources, and analytics to embrace change and drive innovation.

As our society becomes increasingly digitized, the volume and the variety of data that organizations need to manage and analyze continue to grow. Data from customer communications, transactions, social interactions, devices, and sensors (as part of the emerging "Internet of Things" trend) is now available to most organizations; however, generating a return on this data asset is not trivial. To make sense of, and drive maximum value from, this data, organizations are spending on relevant information management, access, and analysis technologies and services at unprecedented levels, which IDC estimated to be $113 billion worldwide in 2013. But even as data and analytics are fundamentally transforming the business, many organizations are struggling with how to articulate, calculate, and maximize the value of their investments.

Organizations must consider the value that analytics projects provide by helping reduce costs, enhance revenue, and improve employee productivity. Compounding the challenge, organizations need to develop the most rational investment approach to data and analytics, whether that consists of investing broadly to improve analytics capabilities in multiple areas simultaneously or consolidating their investments and focusing on a more narrow set of analytics tools and capabilities. This study helps organizations understand the value that data and analytics can offer and provides a "rule of thumb" for calculating the value associated with making a broader (versus more narrow) set of investments in data and analytics capabilities.

Driving Value from (Big) Data and Analytics Projects

Organizations are continually reevaluating their investment options for improving decision support and decision automation solutions. In this context, they can allocate their investments to four key variables:

» **New data.** This involves expanding the number of data types and/or sources being analyzed, such as supplementing transactional data with customer behavior and/or demographic data and data from machines or sensors, geolocation applications, mobile devices, social media, or document management systems.

» **New analytics.** This constitutes expanding the number and/or type of analytic techniques or methods used, such as using more predictive analytics or using techniques such as MapReduce to supplement SQL.

» **New metrics.** This entails identifying and developing new key performance indicators, such as introducing new ways of measuring enterprise risk or employee performance, introducing a new performance management methodology, or introducing new ways of looking at operations.

» **New users.** This consists of expanding the number and type of users (internal or external) who have access to the organization's data and analytics solutions and/or outputs generated from them.

Confirming findings from earlier studies, this IDC study found that each of these investment choices, applied individually, delivers value to organizations and can improve the success of data and analytics projects. For example, organizations that expanded the number of data types and sources achieved analytics project outcomes that exceeded their expectations 50% more frequently than organizations that made no expansion in the number of data types and sources. Similarly, organizations that expanded the number and type of analytics techniques, incorporated new metrics, and expanded the number of users of analytics solutions achieved

Organizations that expanded the number of data types and sources achieved analytics project outcomes that exceeded their expectations 50% more frequently than organizations that made no expansion in the number of data types and sources.

IDC
Analyze the Future

project outcomes that exceeded their expectations 100%, 33%, and 78% more frequently, respectively.

These are great results in their own right, but what is the difference in benefits of investing in any one of these new efforts versus two, three, or all four of them?

Leaders Achieved Significant Economic Gain over Others

IDC classified organizations taking part in our research into two categories, Leaders and Others, and defined them as follows:

» Leaders were organizations that invested in three or all four of the investment choices described in the previous section. They expanded their investments to include new data sources and types, new analytics, new metrics, and new users (or three of these four options).

» Others were organizations that invested in only two or fewer of these options or that maintained the status quo and invested in no new data and analytics efforts.

We then assessed the benefits derived by both groups of organizations from their data and analytics projects. Research results showed that the broader the investment in introducing new data and analytics capabilities, the greater the benefits to an organization. For example, among organizations that introduced all four new capabilities — new data, new analytics, new metrics, and new users — 20% achieved project results that exceeded expectations. This ability to beat project outcome expectations decreased to 13%, 9%, and 8% for organizations investing in three, two, or only one of these new capabilities, respectively. Organizations that maintained the status quo and did not introduce any new data and analytics capabilities had zero chance to beat project benefit expectations.

In other words, each additional investment in new data, new analytics, new metrics, or new users results in increased chances of exceeding data and analytics project benefit expectations. But how big was that benefit, and what was the difference between Leaders and Others?

IDC found that Leaders are able to achieve a significant economic gain over Others. IDC calls this set of additional gains the *data dividend* and calculates the *data dividend* to be 60%; that is, Leaders are able to achieve 60% greater value from their data and analytics projects than Others. This 60% translates into a projected worldwide *data dividend* of $1.6 trillion over the next four years (see Figure 1).

FIGURE 1

Four-Year Data Dividend

Source: IDC's Data Dividend Survey, March 2014

The data dividend is not simply a theoretical benefit; rather, it is derived from a combination of revenue growth, cost cuts or containment, and productivity improvements. It is applicable to organizations of different sizes and also across all regions and industries (see Table 1).

TABLE 1

Four-Year Data Dividend by Industry

Industry	Data Dividend (Over 4 Years)
Financial services	$309 billion
Manufacturing	$371 billion
Retail	$94 billion
Healthcare	$109 billion
Government	$206 billion
Communications	$235 billion
Other	$230 billion

Source: IDC's Data Dividend Survey, March 2014

Investing to Capture the Data Dividend

The *data dividend* is composed of multiple areas of value creation. In our study, we considered four types of business processes and three classes of benefits (lowered costs, increased revenue, and improved employee productivity) as follows:

» **Customer facing.** This category includes customer acquisition, retention, service, and support as well as pricing optimization, with benefits of:

- Lowered costs to acquire, retain, or service customers
- Increased revenue
- Improved customer-facing employee productivity (output per employee)

» **Operations.** This category includes process or operations optimization; plant, facilities, and equipment maintenance or utilization; demand or supply chain management/logistics; and operational, fraud, and malicious risk management. It also contains many of the processes for managing and maintaining devices and sensors that make up the "Internet of Things," with benefits of:

- Lowered operational costs (e.g., faster inventory turns, less fraud, optimized logistics, fewer equipment outages)
- Increased revenue
- Improved non-customer-facing employee productivity (output per employee)

» **Innovation.** This category includes product or service improvement or innovation and research and development (R&D) innovation, with benefits of:

- Lowered costs to achieve innovation
- Increased revenue
- Improved R&D or other relevant employee productivity (output per employee)

» **Support.** This category includes strategic planning, human capital management, IT optimization, enterprise performance management, and regulatory compliance, with benefits of:

- Lowered operational costs (e.g., lower employee turnover, faster response to compliance requirements, optimized utilization of IT assets)
- Increased revenue
- Improved relevant employee productivity (output per employee)

(Big) data and analytics projects should be assessed under a broader enterprise strategy, but rarely if ever is there such a thing as a single enterprisewide data and analytics project or solution. Leaders always approach these projects incrementally under the guidance of a broader strategy. They achieve initial benefits, which they use not only to enhance projects but also to expand projects to new areas within the organization.

Lessons Learned

As the preceding data and analytics investment categories assessed by IDC show, these projects are not about just one type of benefit or one business process, nor are they about one type of data. That's one of the key lessons learned from this IDC study.

1. Big data and analytics isn't all about unstructured social media data. Breaking out the *data dividend* by process type, we found the greatest net benefits in support and operations processes, followed by innovation and customer-facing processes (see Figure 2). While efficiencies are still to be gained from customer-facing processes like social CRM, companies that undertake "Internet of Things"-related initiatives in operations or drive better regulatory compliance, for example, would appear to achieve the greatest return on their data. Each organization needs to prioritize its data and analytics projects but shouldn't be confined to any of these potential areas for investment.

FIGURE 2

## Four-Year Data Dividend by Process
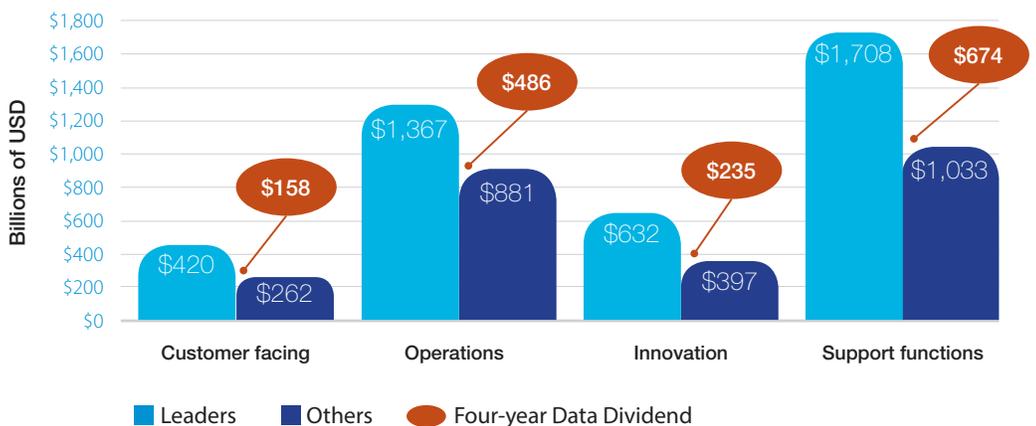
Source: IDC's Data Dividend Survey, March 2014

2. Data and analytics benefits can be derived from multiple sources. While the greatest driver of the *data dividend* comes in the form of cost reductions ($864 million), the *data dividend* also extends to improving productivity ($315 million) and the ability to increase revenue ($375 million) (see Figure 3). Thus, while many organizations seek to use data to become more efficient in their operations or infrastructure, others would be wise to consider new markets or new lines of business coming out of their data projects.

FIGURE 3

Four-Year Data Dividend by Benefit
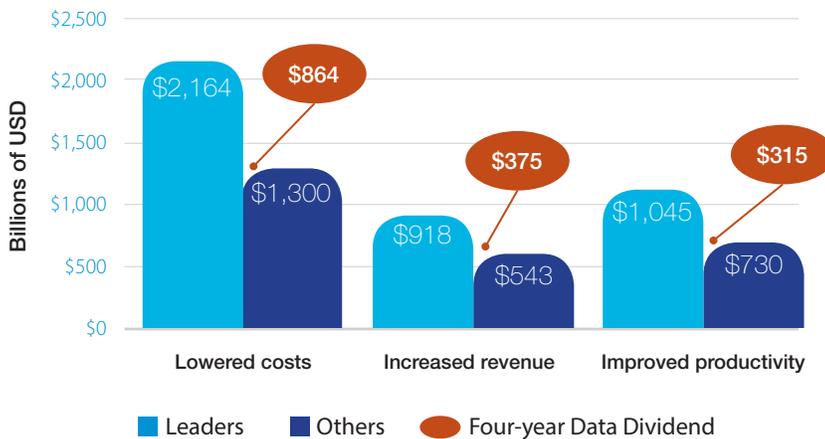
Source: IDC's Data Dividend Survey, March 2014

3. Optimal data and analytics project investment requires a focus on technology, people, and processes. It is important to recognize that the optimal investment in new data, new analytics, new metrics, and new users requires a combination of technology, people, and processes. For example, much of the success of various data and analytics projects hinges on the ability to deliver the right information to the right people at the right time. In our study, Leaders stated three times more frequently than Others that they completely agree that the data available in their organization to support decision making is available at the right time for all stakeholders. Of course, data timeliness depends on the needs of users and processes, but it is being enhanced significantly by the adoption of in-memory and streaming data management technology.

Leaders also stated 1.4 to 2 times more frequently than Others that their data and analytics solutions support the requirements of the various users to the fullest extent possible. The range of the difference between Leaders and Others varies depending on the specific role of users addressed. Our research showed that customer-facing and operational employees are least well-supported by today's data and analytics solutions (or their outputs). Any organization looking to maximize its data dividend should consider the broad range of users and their requirements for the various business intelligence and analytic tools and applications.

Conclusion

The pace of change in IT across the board — and in data and analytics in particular — is breathtaking, and it is not always easy for businesses to decide on the optimal approach to invest in new approaches and technologies. In this first-of-its-kind study, IDC found that while organizations will certainly obtain benefits by investing in any of the four primary areas of data and analytics — new data, new analytics, new metrics, and new users — the greatest benefits occur in organizations that invest in at least three areas or, ideally, all four areas. These cutting-edge organizations are better able to deliver more timely data to the enterprise and better meet user expectations. By investing in a comprehensive approach to data and analytics, any organization has the opportunity to realize 60% greater value from its data — that is, a 60% greater *data dividend*.

Appendix: Methodology

Overall Approach

IDC conducted this study to develop a picture of the financial advantage certain users of data and analytics have over others. For this study, we defined two types of organizations: *Leaders* and *Others*. Leaders are organizations that invested in more new capabilities — such as new data types and new sources, new analytics and new metrics, and sharing information with new users — while investing in technology that enables right-time access to the freshest available data. Others embraced none or significantly fewer of these capabilities. Our goal was to identify and quantify the *additional* financial value, or what we called the *data dividend*, that is achieved by Leaders versus Others.

The approach was to use economic data, IDC market size and forecast data, and survey responses to develop a model that looked at current and potential gains for Leaders versus Others.

Global Survey

In March 2014, IDC conducted an online survey of 2,020 big data and analytics user companies across 20 countries, with a minimum of 100 usable responses per country. Table 2 highlights the countries surveyed.

TABLE 2

Countries in Survey

Region	Country	Number of Respondents
Asia/Pacific	Australia	100
	China	101
	India	100
	Japan	100
	Singapore	100
	South Korea	100
	Thailand	103
Central/Eastern Europe	Poland	100
	Russia	100
Latin America	Brazil	103
	Colombia	103
	Mexico	101
North America	Canada	100
	United States	103
Western Europe	Denmark	101
	France	100
	Germany	100
	Netherlands	100
	Spain	101
	United Kingdom	104

Source: IDC's Data Dividend Survey, March 2014

IDC set quotas for the financial services (banks, capital markets, securities, insurance), manufacturing, retail, healthcare (payers and providers), government, and communications and media industries. Two-thirds of respondents came from these sectors. Responses were limited to companies with more than 500 employees; the mean number of employees was 10,100, and the median was 3,000.

Respondents had to be key decision makers, on a decision-making team, key influencers, or users of big data and analytics. Twenty-two percent were in general management, and the remainder were from a mix of marketing, sales, operations, finance, IT, product development, and R&D. Seventy-three percent of survey respondents were from line-of-business or executive functions, and 27% were from the IT function; 62% of respondents had the title of manager or above.

Classification of Organizations: Leaders Versus Others

IDC classified organizations taking part in our research into two categories, Leaders and Others, and defined them as follows:

» Leaders were organizations that invested in three or all four of the investment choices described in the following section. They expanded their investments to include new data sources and types, new analytics, new metrics, and new users (or three of these four options).

» Others were organizations that invested in only two or fewer of these options or that maintained the status quo and invested in no new data and analytics efforts.

Data and Analytics Investment Options

In this study, we defined four key variables in which organizations can make investments as part of their data and analytics projects:

» Expansion in the number and/or type of **analytic techniques** used (e.g., started using more predictive analytics or techniques such as MapReduce or graph analysis to supplement SQL)

» Expansion in the number of **data types and/or sources** being analyzed (e.g., supplemented transactional data with customer behavior and/or demographic data and data from machines or sensors, geolocation applications, mobile devices, social media, or document management systems)

» Introduction of **new metrics or key performance indicators** (e.g., introduced new ways of measuring enterprise risk or employee performance, introduced a new performance management methodology, or introduced new ways of looking at operations)

» Expansion in the **number of users** (internal or external) who have access to big data and analytics solutions and/or outputs generated from them

Economic Model

IDC developed an economic model to provide a view of each country's or industry's spending on data and analytics technology and benefits for Leaders and Others. Inputs to the model included:

» GDP (from The Economist Intelligence Unit)

» Gross output as a proxy for revenue (from the U.S. Bureau of Economic Analysis)

» IDC external IT spending forecasts by country

» IDC total software; business analytics software; and big data and analytics hardware, software, and services revenue forecasts

» Previous IDC studies on return and payback for business analytics investment

Other inputs included operational and labor costs as a percentage of revenue, IT labor costs as a percentage of external IT spending, and IT spending as a percentage of revenue.

Using spending on big data and analytics as a baseline, we incorporated data from our global survey and past IDC research into the model to develop a view of benefits to Leaders and Others. No attempt was made to determine actual or expected percentages for each type of organization. The intent was only to measure the potential gap between the two types of organizations.

IDC considered 12 benefit categories, three for each of the four types of data and analytics projects. The data and analytics project types were:

» **Customer facing** (including customer acquisition, retention, service, and support; pricing optimization)

» **Operations** (including process or operations optimization; plant, facilities, and equipment maintenance or utilization; demand or supply chain management/logistics; and operational, fraud, and malicious risk management)

» **Innovation** (including product or service improvement or innovation; R&D innovation)

» **Support** (including human capital management, IT optimization, strategic planning, enterprise performance management, and regulatory compliance)

For each project type, IDC considered three classes of benefits:

» Lowered costs (to obtain new customers, streamline operations, etc.)

» Increased revenue (lower churn, faster new customer acquisition, faster deployment of new products or services, etc.)

» Improved productivity (more output per employee)

Within the economic model, the benefit figures were input for 2013 and extended to 2017 to develop a four-year view of the aggregate potential opportunity for each type of organization and the gap between them.

About IDC

International Data Corporation (IDC) is the premier global provider of market intelligence, advisory services, and events for the information technology, telecommunications and consumer technology markets. IDC helps IT professionals, business executives, and the investment community make fact-based decisions on technology purchases and business strategy. More than 1,100 IDC analysts provide global, regional, and local expertise on technology and industry opportunities and trends in over 110 countries worldwide. For 50 years, IDC has provided strategic insights to help our clients achieve their key business objectives. IDC is a subsidiary of IDG, the world's leading technology media, research, and events company.