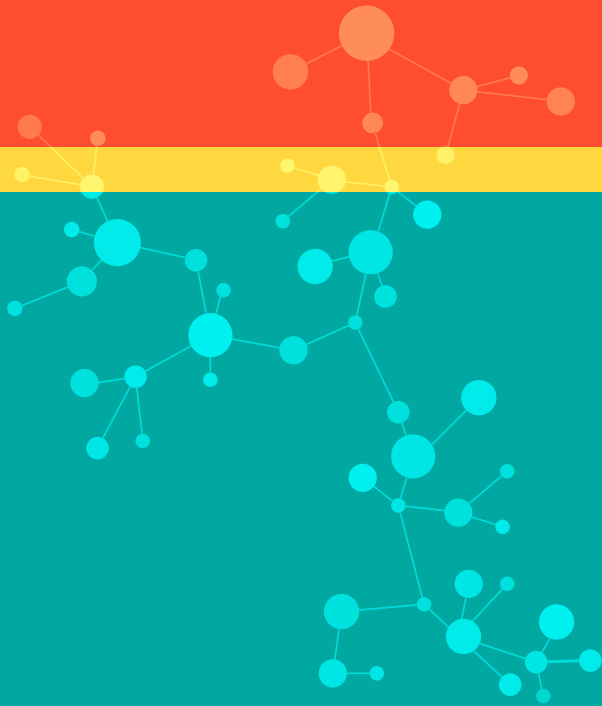# Analytics for a cognitive business

POWERING A NEW ERA OF INSIGHT TO IMPROVE BUSINESS PROCESSES, ACCELERATE INNOVATION AND OUTTHINK LIMITATIONS

IBM

New digital intelligence powered by a new way of thinking

Disruption from digital businesses has arrived in virtually every industry. The ability to build immediacy and responsiveness into business models in new, unconventional ways helps organizations meet and even change customer expectations—perhaps forever. Existing marketplace categories fuse, new ones emerge and the competitive landscape for entire industries shifts beyond recognition overnight. Today, the world's largest taxi company owns no vehicles. The world's most popular media owner creates no content. The most valuable retailer has no inventory. And the world's largest accommodation provider owns no real estate.[1]

54 PERCENT

54 PERCENT OF CXOS EXPECT MORE COMPETITORS FROM OUTSIDE THEIR INDUSTRY.[2]
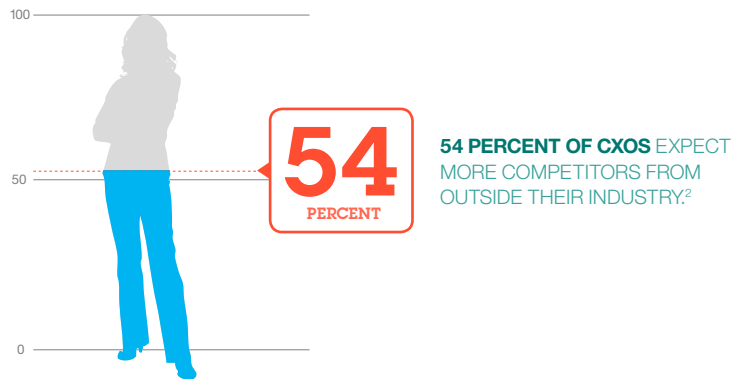
Perhaps more than ever, digital intelligence, fueled by information and insight, is key to competitive advantage and long-term business viability. But to get and stay ahead, organizations will need the ability to access, analyze and act on increasingly more data. They'll need to dig deeper to unlock new ideas and discoveries from disparate sources—including the Internet of Things (IoT), video and weather data—than they did in the past. And they'll need to empower more people in more ways to act on those opportunities with confidence and certainty.

2

TO COMPETE EFFECTIVELY, ORGANIZATIONS NEED THE ABILITY TO "THINK" IN NEW WAYS

As humans, we have the ability to think both analytically and creatively. The same should be true for your organization, with technology that helps you hypothesize by connecting fact to possibility. That is a defining trait of cognitive business: a new relationship with technology that empowers people by shifting technology's role from enabler to advisor. Business technologies that automate and detect can now also advise and enhance human expertise, contributing to exponential increases in productivity and improved efficiencies across your organization.

**Cognitive business = digital business + digital intelligence**
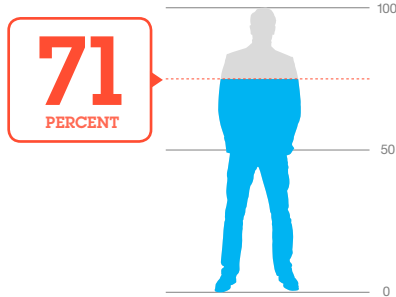
71 PERCENT

71 PERCENT OF SURVEYED BUSINESS LEADERS SAY THEY ARE CREATING NEW FORMS OF ECONOMIC VALUE FROM INSIGHTS.[3]
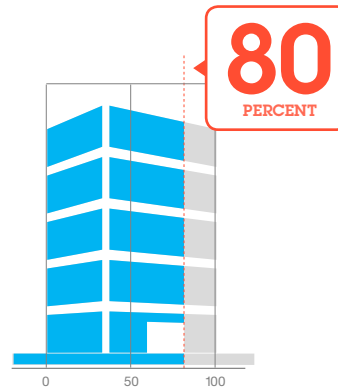
80 PERCENT

LEADING CEOS HAVE TOLD GARTNER THAT THEIR DIGITAL REVENUE WILL INCREASE BY MORE THAN 80 PERCENT BY 2020. 125,000 LARGE ORGANIZATIONS ARE LAUNCHING DIGITAL BUSINESS INITIATIVES NOW.[4]

When people and technology are able to think together in this way, analytics becomes an even more powerful tool for your organization, closing the gap between data and insight, and insight and action. People seek and cultivate more insights with greater ease, leading to better decisions and improving ongoing performance. Understanding and awareness are amplified, and inspired, informed collaboration brings more ideas to fruition faster.
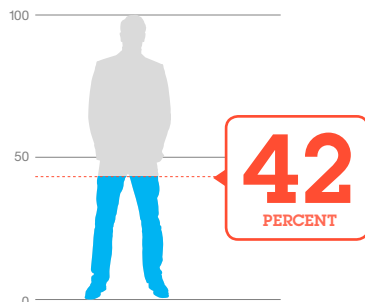
42 PERCENT

42 PERCENT OF SURVEYED BUSINESS LEADERS SAY DATA-DRIVEN INSIGHT WILL BE A SIGNIFICANT CONTRIBUTOR TO COMPANY REVENUES OVER THE NEXT THREE YEARS.[5]

Outthink limitations
with data made easy

Data is powerful and pervasive. It fuels just about every aspect of your business, including back-office systems of record, systems of insight that inform decision making and new systems of engagement that shape customer relationships. However, few organizations have the ability to harness its full potential.

The reality is that limitations of current technology keep most data out of sight and out of reach for many organizations—including unstructured data from books, emails, social media posts, blogs, images, sound and videos as well as machine and sensor data from the IoT. Siloed systems restrict the amount, type and sources of data people can access and correlate as well as curb their ability to share it across the organization. What's more, programmed systems that are designed to handle specific scenarios and data sets can limit efforts to discover new insights. And that costs valuable time few organizations can afford when trying to keep up with demand for greater business efficiency and stay ahead of disruptive trends.

To realize the promise of cognitive business, you need to remove the current challenges around data so that it is easy to access, analyze and use no matter where it comes from or what form it takes. You need the ability to infuse those insights into systems, processes and apps to elevate business efficiencies and results. And you need the ability to make sense of all that data to change how different roles across your organization work—and work together.

88
PERCENT

88 PERCENT OF ALL AVAILABLE DATA
IS DARK TO MOST ORGANIZATIONS.[6]

4

BUILD ON YOUR DIGITAL BUSINESS FOUNDATION WITH COGNITIVE SYSTEMS

When you have the ability to engage in new ways with technology, you can build on your foundation of digital business. Cloud, data and analytics become more powerful when combined with cognitive systems, which have the ability to understand, reason, learn and interact with people in human terms.

Unlike technology that is programmed, cognitive systems employ probabilistic thinking to extract new data from unstructured sources and pose hypotheses from the patterns that emerge. As a result, you're able to explore and monetize virtually all types of information and cultivate insights that fuel digital intelligence.

Cognitive businesses combine the strengths of these technologies to enable the real-time collection and analysis of expanding volumes of data while providing an agile, efficient foundation to rapidly share insight across multiple platforms and devices.

85 PERCENT

100

50

0
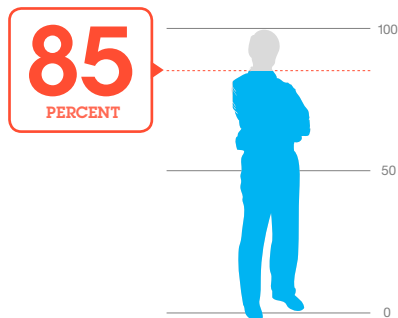
85 PERCENT OF OF LEADING HYBRID CLOUD DECISION MAKERS REPORT THAT HYBRID CLOUD IS ACCELERATING DIGITAL TRANSFOR-MATION IN THEIR ORGANIZATION.[7]

Breaking through the barriers that currently keep so much of today's data in the dark for your organization is key to gaining the digital intelligence of a cognitive business. You're able to more easily augment existing, structured information from inside your company with external data, such as social media and weather data, to sharpen insight. And you're able to understand all data in more meaningful context that is informed by new dimensions of perception and understanding to remove ambiguity and clarify relevance.

Significant sharing has to happen for us to remain competitive. If we spend too much time worrying about controlling information and prevent key stakeholders from having visibility, we'll impede innovation and defeat what we're trying to accomplish.

—*Global logistics company advisor*[8]

Empowering people in new ways to achieve digital intelligence

As more data becomes available, more people across the organization want the ability to put it to work, to access and analyze data on their own to find patterns and insights that drive better business outcomes. To empower these individuals, you first need to understand how and why these different roles interact with data and each other. You can then draw on the strengths of your digital business to operationalize these learnings into more effective processes and experiences that fuel digital intelligence across the flow of information and analytics.

At the core of these new consumers of insight is a new generation of data professionals that are critical to enabling self-service and collaboration. They include business professionals, IT architects, and new and emerging roles such as data scientists, data engineers and application developers. Some organizations have even appointed new roles to lead these teams. Chief data officers, for example, are emerging as powerful strategic leaders who are helping drive new possibilities that span data integration and exploration, business optimization, and transformative marketplace innovation.
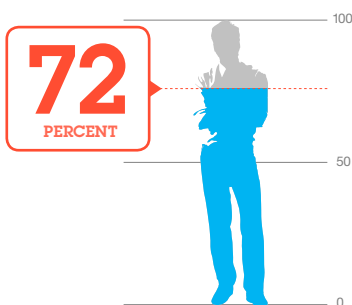
72 PERCENT

72 PERCENT OF SURVEY RESPONDENTS SAY ORGANIZATIONAL SILOS ARE THE NUMBER ONE INHIBITOR TO DECISION MAKING.[9]

Learn more **about how IBM is helping chief data officers shape their roles within their organizations.**

By removing the traditional constraints of data and analytics as well as the limitations in how these roles interact with technology, you can empower more people and teams across your organization to outthink limitations and what's possible for your business.
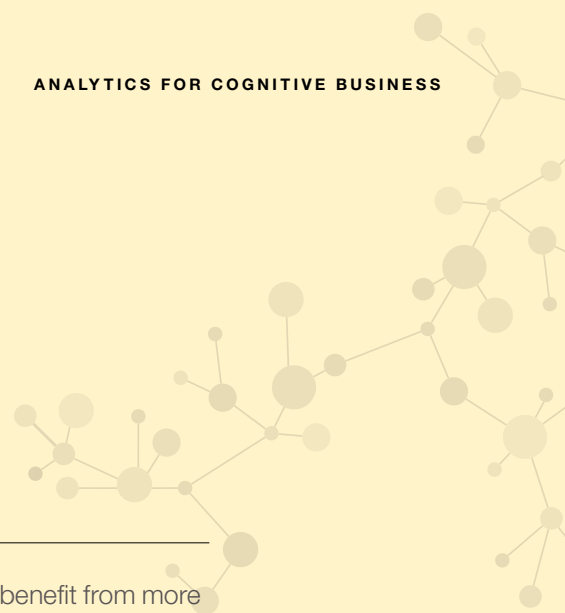
Business professional
I think more creatively.

When I have the ability to put analytics to work on my own, I can benefit from more data and decisions based on insight, not gut. As a result, I can make decisions and take action with greater speed and confidence than ever before because I know my decisions are backed by a huge volume and variety of data and content from sources I trust. I can find more answers and ask new questions using natural language and without concern of the underlying technology. I can use data and analysis to strengthen ideas and redefine existing data models or create business models, so my colleagues and I can take action to monetize our insights. Together, we are more right, more often.

Enabling business professionals in a cognitive business

| IDENTIFY THE BUSINESS NEED	ACQUIRE THE RIGHT DATA	DETERMINE THE RIGHT TECHNOLOGY	ASSESS THE BENEFIT	DRIVE BUSINESS OUTCOMES
Construct an insight-driven, agile culture.	Identify new data sources, such as weather and social media, that can be combined with internal data for unexpected insights.	Identify self-service tools that enable smart data discovery, adaptive planning, and performance and risk management capabilities.	Ask questions (in natural language) of data with no bias; work with systems that suggest alternative thought processes and activate insights in enterprise-scale processes.	Prepare the organization to transform with new business models; be a disruptor—don't be disrupted.

CASE STUDY
Benco Dental

Benco Dental is one of the largest privately owned, full-service distributors of dental supplies, equipment and services in the United States. Unsure whether its current volume discount pricing model was effective, the company's marketing team used IBM Watson Analytics to answer key questions, debunk false assumptions and develop a more efficient, data-based pricing model.

[Learn about predictive analytics and data exploration](#) made easy for business professionals with IBM® Watson™ Analytics™ technology.
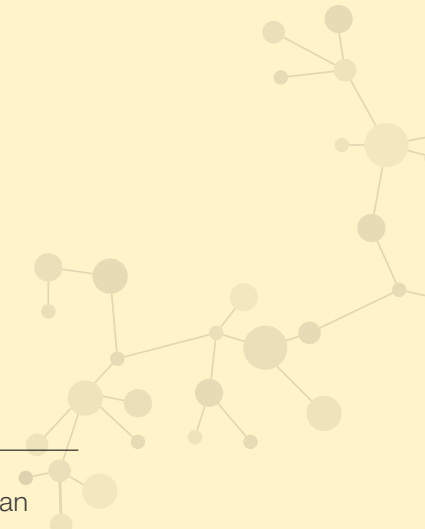
CIO and IT architect
I put the right technologies in place.

When I have an efficient, resilient, responsive and scalable infrastructure, I can facilitate better decision making across our organization. I can give my business crucial pathways to innovation because I open doors to data and empower individuals to confidently pursue insight on their own. The hallmarks of my architecture are interoperability and integration across internal and external sources of information and a cohesive, security-rich data delivery system that works for just about everyone. I deliver on where we're taking our company by providing the technology foundation and roadmap for us to move forward.

Enabling CIOs and IT architects in a cognitive business

IDENTIFY THE BUSINESS NEED	ACQUIRE THE RIGHT DATA	DETERMINE THE RIGHT TECHNOLOGY	ASSESS THE BENEFIT	DRIVE BUSINESS OUTCOMES
Put the right technology in place.	Work with business, IT and executive management to understand strategy, processes and technology requirements.	Define technical standards, and put in place the tools that users need most.	Provide trusted, integrated access to a wide variety of data.	Create a technology roadmap that capitalizes on the newest trends.

CASE STUDY
Boston Children's Hospital

One of the largest pediatric medical centers in the country, Boston Children's Hospital had outgrown its previous data environment, which slowed the delivery of vital information needed to inform treatment decisions at the point of care. With IBM dashDB™ software, the hospital is able to speed the turnaround time on reports and provide physicians with a more unified view of individual patient care—all while lowering database maintenance and management costs.

Learn about dashDB software, which offers a simple and performant data warehouse with the scale and agility of the cloud.

Data scientist
I can share my insights with more people.

When I have the ability to access and explore data quickly, I can spend more time on insight discovery and less time hunting for data. I want to surface opportunities by applying models to data. I want to develop trusted, actionable insights that I can share confidently with the business. These capabilities make it possible for me to be undaunted by big ideas and even bigger data. I have immediate access to internal and external data whenever I need it. A full spectrum of predictive analytics and cognitive tools allows me to easily mix and match different data sets, fail fast and bring new ideas to achieve real results for the business. I share my insights and knowledge with others to cultivate the next big idea for the business.

Enabling data scientists in a cognitive business

IDENTIFY THE BUSINESS NEED	ACQUIRE THE RIGHT DATA	DETERMINE THE RIGHT TECHNOLOGY	ASSESS THE BENEFIT	DRIVE BUSINESS OUTCOMES
Identify patterns and insight quickly.	Locate and curate data, identify types of analysis required to be performed, and link analysis to business goals.	Work with high-performance modeling tools of my choice that unlock dark data and enable collaboration and sharing of assets.	Iterate quickly on models to identify patterns and new insights.	Build a platform that can scale to support rapid deployment of new models.

CASE STUDY
Roskilde Music Festival and Copenhagen Business School

Copenhagen Business School relies on dashDB, IBM SPSS® and Watson Analytics software to process, store and analyze huge volumes of data to help managers of the 10-day annual Roskilde Music Festival in Denmark keep 130,000 guests safely entertained, fed, watered and informed in a sustainable way. The data reveals vital insight into where people go and what they buy, contributing to smarter decisions in crowd safety and service provision.

[Explore the IBM Data Science Experience](#) environment to learn, collaborate and build.

Developer
I build more apps that ignite change.

I am a composer, codifying ideas into new mobile, web and enterprise apps using a broad range of services. When I have the ability to access a wide variety of data and services, it's easier for me to build apps with high-value capabilities. I can work at a speed that gets apps to the marketplace or in production in time to exceed user expectations. And I can easily work with multiple data sources and tools across multiple projects. I get to use the tools I like and expand my ideas with advanced capabilities that use data in new ways to make my solutions more intelligent, more adaptive and massively scalable. I can easily access advanced analytics and leverage the latest in open source technologies for my apps.

Enabling developers in a cognitive business

IDENTIFY THE BUSINESS NEED	ACQUIRE THE RIGHT DATA	DETERMINE THE RIGHT TECHNOLOGY	ASSESS THE BENEFIT	DRIVE BUSINESS OUTCOMES
Build apps for cognitive business designed to use all data.	Establish your data ecosystem containing both internal and external data sources.	Select the appropriate tools, including open source tools, to build your app.	Experiment with new data and analytic services and deploy.	Master new technologies and services to support business innovation as new apps are required.

CASE STUDY
SeniorAdvisor.com

One of the nation's largest reviews and ratings websites for senior housing and care, SeniorAdvisor.com is using the IBM Cloudant® platform to manage a vast repository of unstructured reviews and rapidly launch new, revenue-generating services. The robust, highly scalable platform allows the company to focus on innovation that helps families make more informed and confident decisions.

Learn about the IBM Cloudant platform, a managed NoSQL database service that moves application data closer to all the places it needs to be for uninterrupted data access, offline or online.

Data engineer
I harness more data.

I need tools to extract, wrangle, mine and integrate disparate sources of structured and unstructured data and the ability to determine which data is most relevant and insightful. I am aware of the urgent need to put the expanding universe of data from inside and outside my organization to work. I have the means to tame, curate and safeguard all sources of data so it's easier to use, relevant and available to every-one in our organization who needs it.

Enabling data engineers in a cognitive business

IDENTIFY THE BUSINESS NEED	ACQUIRE THE RIGHT DATA	DETERMINE THE RIGHT TECHNOLOGY	ASSESS THE BENEFIT	DRIVE BUSINESS OUTCOMES
Make every system insight-driven.	Identify and extract structured and unstructured data from disparate sources to speed and simplify access to the right, most relevant data at scale.	Integrate systems of record and systems of engagement where data can be curated and governed.	Publish data, and make it available for self-service users.	Provide scale and agility through on-premises and hybrid cloud deployments.

CASE STUDY
NASA Ames Research Center and SETI Institute
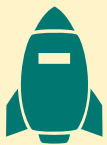
IBM, NASA's Ames Research Center and the SETI Institute are working together to analyze more than six terabytes of complex, deep space radio signals to hunt for patterns that might identify the presence of intelligent extraterrestrial life. Using IBM Analytics on Apache Spark, available through the IBM cloud, the team has developed tools for extracting pertinent features from millions of observations, including machine learning classification techniques that filter out interfering human signals. The team has also launched a new Stellar Pair Eavesdropping campaign to capture multiterabyte data streams that reach beyond our own solar system to detect communications from distant stellar systems.

Learn about IBM DataWorks, a fully managed self-service data preparation and movement service that enables you to access, combine and transform your data.

Powering transformation in a new era, with a new approach

The opportunities opened up by cognitive business don't require your organization to change course or shift strategic priorities. In fact, they allow you to get where you're already headed, faster.

Building on your existing data and analytics capabilities can empower more people in more ways while enabling smarter systems, processes and apps to improve business outcomes. You'll do this with more integrated, cohesive solutions that allow you to support and extract virtually all possible value from today's expansive sources and types of data. You'll employ new tools and capabilities that support individual roles while fostering collaboration and collective knowledge. We call this approach Insight Ops, and it's designed to create an organizational environment for you to be more agile and open, so you can embrace new opportunities and capabilities that fuel innovation, productivity and new possibilities

To realize the promise of cognitive business, you need to remove current barriers around data so that it is easy to access, analyze and use, no matter where it comes from or what form it takes. And you need the ability to make sense of all that data to empower and connect different roles throughout your organization.

IBM DELIVERS ON THE PROMISE OF COGNITIVE BUSINESS

With a next-generation platform that can deliver comprehensive data, analytics and cognitive capabilities in the cloud, IBM puts the digital intelligence you need well within reach. Built on an open foundation, the platform offers powerful, composable services through an integrated fabric that can flex according the needs of different business and data professionals. Available on the cloud, on premises or in hybrid deployments, a tailored set of user experiences enables each role to learn, create and collaborate in the most productive ways.

At the core of the IBM Analytics portfolio, the cloud data and analytics platform:

• Offers comprehensive data, analytics and cognitive services that enable data engineers, developers and data scientists to collaborate to cultivate data and ideas in new ways

• Supports a robust ecosystem of data and insight designed to make it easier to access, govern and use information from inside and outside the organization, allowing you to tap into insights from a rapidly growing ecosystem of more than 250 open data sources—including The Weather Company and Twitter

• Powers cognitive solutions that embed our industry, domain and implementation expertise to help solve business problems and automate next-best-actions for targeted industries, roles and challenges such as the IoT

• Has open source at its core and connects community innovation for shared progress. Our core offerings are built with leading open source data and analytics technologies such as Apache Spark and Apache Hadoop, and we actively work with developer communities to drive innovation.
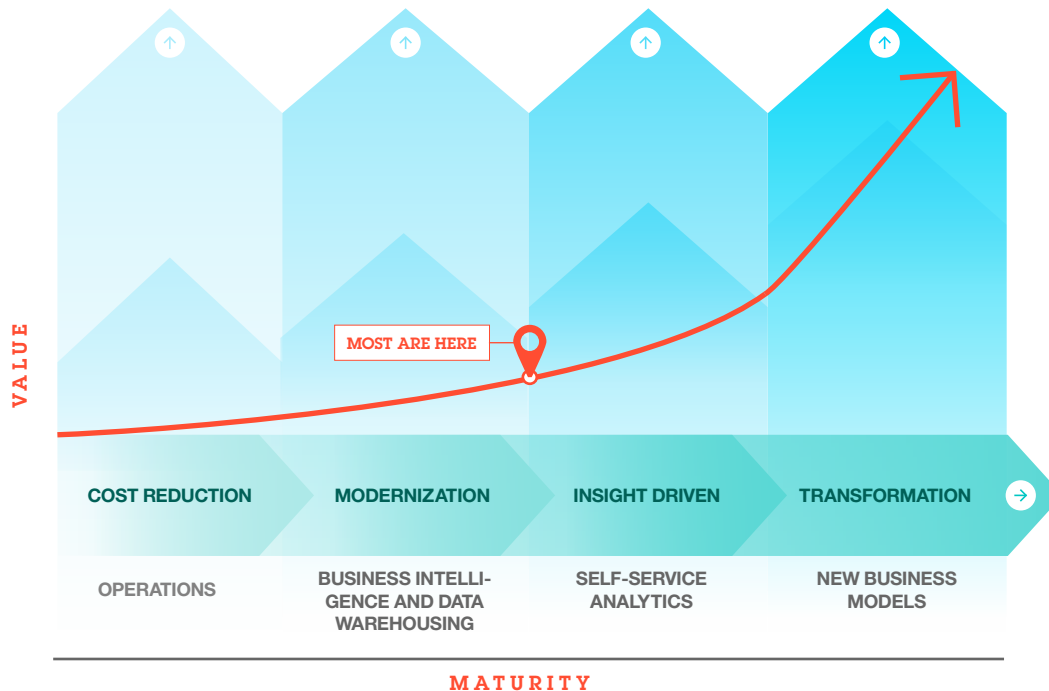
The path there starts here

The journey to become a cognitive business is different for every company, but IBM makes it easier to help you identify and pursue the right path to success.

EVALUATE THE OPPORTUNITY

A pragmatic data and analytics strategy is a prerequisite to transform your organization and become a cognitive business, giving you the solid foundation you need to build trust in your data and confidence in the data-driven decisions you make. From this strategic groundwork, you can expand the depth and breadth of your data sources through cognitive capabilities. IBM has developed a maturity model to help you assess your current strategy based on the initiatives you have in place and your overall approach to data within your organization. Understanding where you are on this curve can help you evaluate how much business value your strategy delivers now and how to evolve it to realize the full potential of cognitive business.

VALUE

MOST ARE HERE

COST REDUCTION	MODERNIZATION	INSIGHT DRIVEN	TRANSFORMATION
OPERATIONS	BUSINESS INTELLIGENCE AND DATA WAREHOUSING	SELF-SERVICE ANALYTICS	NEW BUSINESS MODELS

MATURITY

The business value of data increases as you become more sophisticated in your use of data (storing transaction data versus using it to fuel a mobile app that generates real-time personalization offers for customers) and your approach to it (moving from siloed self-service analytics to integrated self-service on a common data platform).

ACCELERATE YOUR SUCCESS

IBM has developed a methodology that includes strategy, expertise and a game plan to accelerate your data and analytics success as a cognitive business. Called the DataFirst Method, this detailed approach offers a clear roadmap to steadily enhance your capabilities to realize significant business value while delivering specific value offerings such as workshops, services, training and blueprints to support your efforts along the way.

Learn more about the DataFirst Method, and advance your journey toward becoming a cognitive business.

FOOTNOTES

1 TechCrunch "The Battle Is For The Customer Interface," Tom Goodwin, March 3, 2015, https://techcrunch.com/2015/03/03/in-the-age-of-disintermediation-the-battle-is-all-for-the-customer-interface/
2 IBM, *Redefining Boundaries: Insights from the Global C-suite Study*, November 2015.
3 Harvard Business Review, *Competing in the Insight Economy*, 2015.
4 Gartner press release: "Gartner Says It's Not Just About Big Data; It's What You Do with It: Welcome to the Algorithmic Economy," October 5, 2015, http://www.gartner.com/newsroom/id/3142917
5 Harvard Business Review, *Competing in the Insight Economy*, 2015.
6 IBM Research
7 IBM, *Growing up hybrid*, February 2016.
8 Harvard Business Review, *Competing in the Insight Economy*, 2015.
9 Harvard Business Review, *Competing in the Insight Economy*, 2015.