Seizing the data advantage

Chief Executive Officer insights
from the Global C-suite Study

IBM

This report is based on input from the 2,131 Chief Executive Officers (CEOs) who participated in IBM's fourth Global C-suite Study—the 20th edition in the ongoing IBM series of CxO studies conducted by the IBM Institute for Business Value (IBV). We have now completed more than 15,000 interviews with CEOs during 15 years of research. We have drawn on various statistical techniques, including exploratory factor analysis, regression analysis, and correlation analysis, to produce our report. We also used IBM Watson AI technologies to perform sentiment analysis on thousands of qualitative responses and IBM Watson Project Debater to identify how prevalent themes were viewed from multiple perspectives.

Introduction

Our latest Global C-suite Study explores what it takes to lead in a world brimming with bytes. We asked more than 13,000 C-suite executives around the globe about the value they derive from data, how they intend to turn data into a differentiating advantage, and how far they have progressed with their plans.

We identified a small group of enterprises that stand head and shoulders above the rest. The CEOs who run these organizations aren't daunted by data; on the contrary, they're using it to make smarter business decisions, build stronger ecosystems, and experiment with new business models. They've mastered a cosmos in which there are now 40 times more bytes than there are stars in the observable universe.[1]

The results say it all. Such organizations are markedly more flexible, more innovative, and more profitable than their industry peers.

From bytes to insights

In fact, CEOs generally recognize the importance of technology. They say it's the single most significant external force impinging on their organizations—as they did in four of our five most recent C-suite Studies. But technology now tops other outside influences by a wide margin: 62 percent of CEOs identify it as a major factor, with market dynamics trailing behind at 54 percent.

Our conclusion? CEOs reason that we have entered an era in which data's full potential can be realized. Earlier, data was primarily used for the purposes of manufacturing, distribution, and business management. Today, with the advent of artificial intelligence (AI), the Internet of Things (IoT), and cloud computing, we finally possess the means with which to turn bytes into insights and generate contextualized, predictive knowledge (see Figure 1).

In all, 87 percent of the CEOs who took part in our study regard data as a strategic asset that can be used to support deeply nuanced, personalized experiences powered by sophisticated, intelligent operations. When companies access vast quantities of customer data, "people become individuals again, not members of a community or elements of a marketing segment," notes the CEO of a travel business in France. Similarly, the CEO of an energy, environmental, and utilities company in Singapore stresses the benefits of "pairing traditional engineering techniques with data" to improve the productivity of its plant.

Torchbearers light the way

So how are the most successful CEOs realizing the strategic value of data? During the course of our research, we identified four distinct kinds of enterprises, each at a different stage on the path to data leadership (see Figure 2).

Figure 1

The insights era

Humanity has entered an age in which data's full potential can be realized

	Manufacturing era	Distribution era	Information era	Insights era
	• Mass production • Factory data • Mainframe computing	• Market penetration • Factory and market data • Desktop computing	• Information processing • Business intelligence • Network computing	• Insights generation • Contextual, predictive knowledge • AI, IoT, cloud computing
	1905–1955	**1955–1985**	**1985–2015**	**Today**

• Characteristic of era
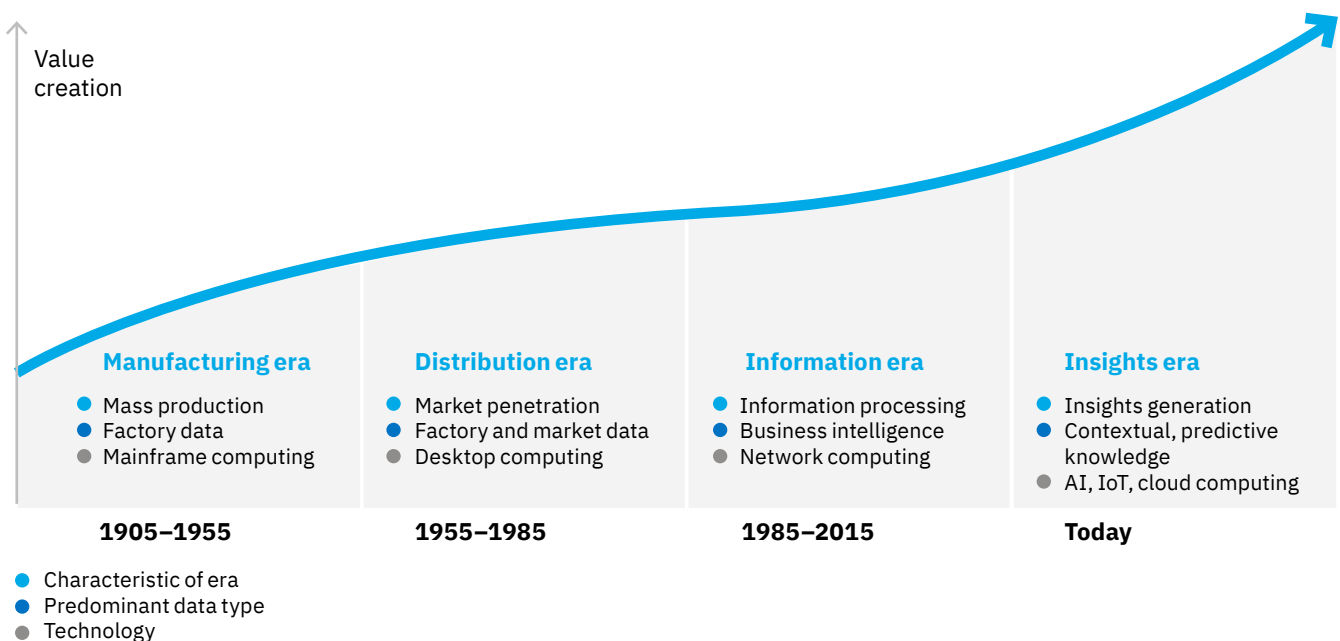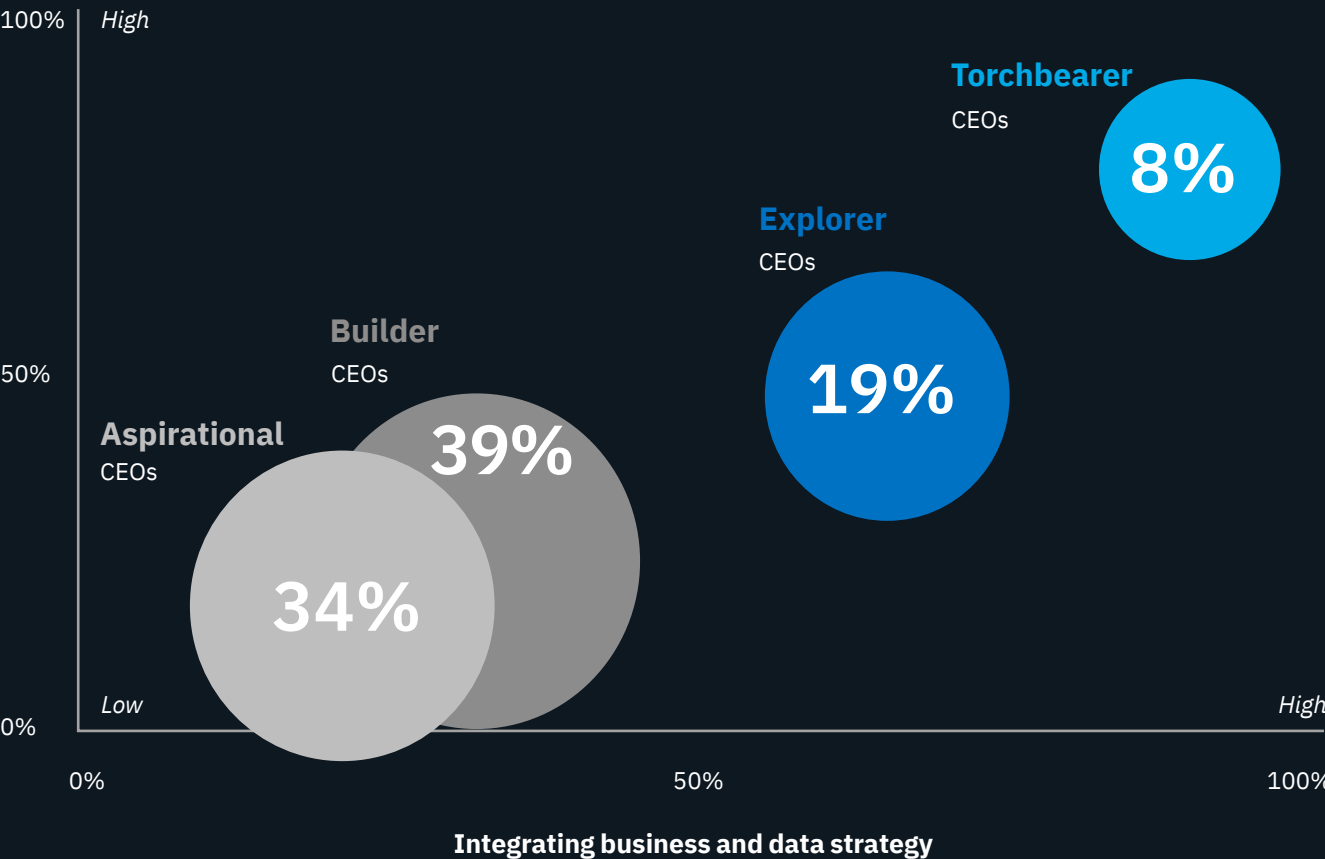• Predominant data type
• Technology

Figure 2

Data infusion

Torchbearers have established a new path to value by integrating data into their strategies, operations, and culture

Creating value from data

"Approximately 40 percent of my time is now dedicated to promoting technology and data initiatives, which definitely wasn't the case three years ago."

CEO, Healthcare, Argentina

Aspirational organizations are just setting out on the journey. They're beginning to integrate their business and data strategies, but they don't have a data culture in place. Moreover, they're not very effective at extracting value from data. *Builders* have made greater headway in aligning their business and data strategies and creating a data culture. Nevertheless, they still can't capitalize properly on data.

Explorers, by contrast, are halfway there. They've either aligned their data strategy with their business strategy or managed to create considerable value from the data they collect. But they haven't yet succeeded in doing both. *Torchbearers*, alone, have attained this ideal. They've fused their data strategy with their business strategy, operate in a data-rich culture, have high expectations of the value data can deliver, and typically exceed their targets.

Comparing Torchbearer CEOs with Aspirational CEOs—as we'll refer to them here for ease of reading—reveals pronounced variations in the performance of the enterprises they run. Take innovation: 79 percent of Torchbearer CEOs head organizations with a history of operating at the leading edge, versus just 25 percent of Aspirational CEOs. There's a similar gulf between the two groups when it comes to managing change effectively.

These strengths have paid off handsomely: 64 percent of Torchbearer CEOs have presided over superior revenue growth, and 66 percent have delivered outsized profits. But only 23 percent and 22 percent, respectively, of Aspirational CEOs can make the same claim.

The disparities between the two cohorts don't end there. As we analyzed Torchbearer CEOs' responses to more than 100 questions, three key areas of differentiation emerged:

– AI and intelligent automation
– Ecosystems
– New business models.

We'll address each of these areas in more depth in the following three chapters.

Chapter 1

Automate—intelligently
Making data deliver

The World Economic Forum estimates that the combined value—to society and industry—of digital transformation across industries could be more than USD 100 trillion by 2025.[2] Torchbearer CEOs are already considering how to better harness these technologies and earn a share of the rewards. A full 84 percent expect to automate many of their decision-making processes over the next few years, in sharp contrast with the 63 percent of Aspirational CEOs who envisage making the transition.

"The whole game is about cognition in order to cross-connect intelligence."
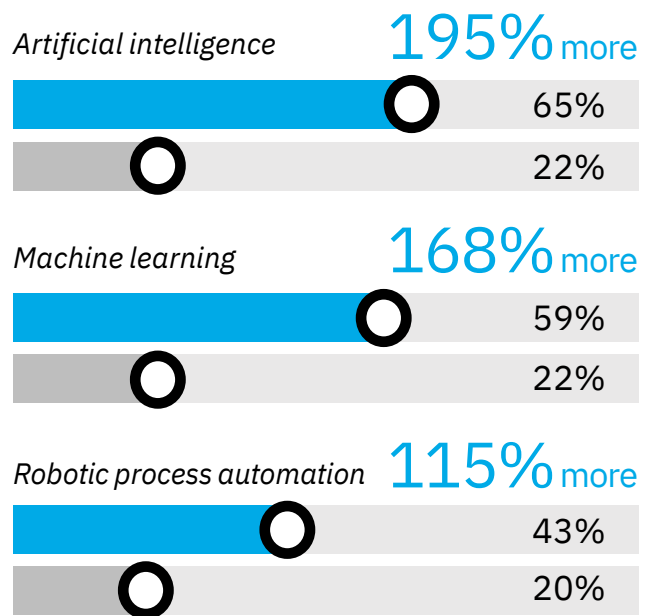
CEO, IT and Professional Services, United Arab Emirates

Torchbearer CEOs are also preparing to invest more heavily in the technologies that will help them automate their operations (see Figure 3). AI—including its subset, machine learning—features particularly prominently in their plans (see sidebar on page 10, "Korean Air: Flying high with AI"). "AI and analytics will enable us to create customized risk profiles," explains the CEO of an insurance company in Ecuador. A CEO from India's electronics industry is equally convinced of AI's merits. "We want to tap the data from the thousands of customers visiting our website and our stores and process it, using analytics and machine learning to make better decisions," he notes.

Figure 3

Automate and accelerate

Torchbearer CEOs plan to spend big bucks on AI and robotics

Artificial intelligence — 195% more

65%

22%

Machine learning — 168% more

59%

22%

Robotic process automation — 115% more

43%

20%

Torchbearer CEOs
Aspirational CEOs

One reason why Torchbearer CEOs are embracing AI is that they're far more confident than Aspirational CEOs about the returns AI-associated investments can produce. This is partly, perhaps, because they possess a stronger foundation on which to build. Torchbearer CEOs are four times more effective than Aspirational CEOs at leveraging data, advanced analytics, and AI to help them make business decisions.

"Modern-day analytics can help institutes make data-oriented decisions using 'what-if' scenarios, forecasts, and the like," a CEO in New Zealand's education sector tells us. A CEO in the media and entertainment industry in Poland clearly feels the same way. "Publishers often make decisions based on intuition, which means we may lose good business opportunities," he notes, ruefully recalling how, at one time, "Nobody wanted to publish the Harry Potter books in Poland." Proof of the bespectacled young wizard's popularity might well have conjured a change of mind. "With the right data, we can all make smarter business decisions," the same CEO adds.

Of course, the key word here is "right"—the right data made available in the right ways—and Torchbearer CEOs make strenuous efforts to help ensure their enterprises have both. They place great emphasis on gathering germane intelligence, making it accessible, and integrating it with information from other sources to enhance its value. Eight in ten Torchbearer CEOs focus on both collecting accurate, pertinent data and linking different data sets to detect patterns or connections. By contrast, these two objectives are priorities for just three in ten and four in ten Aspirational CEOs, respectively.

"We're aiming to use AI to analyze unstructured data, including video and voice-to-text."

CEO, Education, Singapore

Korean Air: Flying high with AI

Korean Air has many years' worth of historical maintenance records for the hundreds of aircraft in its fleet. The problem? This critical data was virtually unsearchable—until recently. So the airline's maintenance technicians had to diagnose and fix issues without being able to reference documented experience.[3]

Today, AI-powered algorithms trawl through vast amounts of structured and unstructured data from numerous sources, including technical guidelines, non-routine logs, inventory, trouble-shooting records, and in-flight incident histories, to identify the root causes of issues and recommend solutions. Equipped with this information, Korean Air's maintenance engineers have managed to cut diagnostic lead times by 90 percent on more than 200,000 maintenance cases per year.[4]
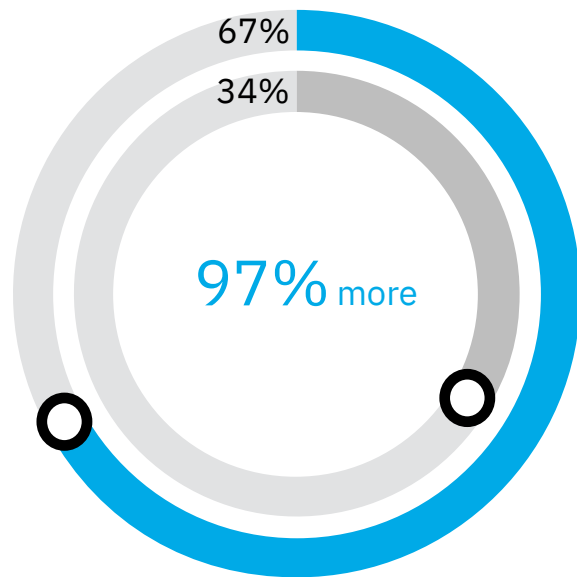
Using AI also helps Korean Air's maintenance staff uncover hidden connections and recurring patterns of equipment failure, helping them predict potential glitches and undertake preventative maintenance. All in all, that means the airline can spend more time getting its 25 million passengers to their destinations promptly and safely.[5]

Torchbearer CEOs are also much better than other respondents at combining unstructured data with structured data to generate insights that neither would provide in isolation (see Figure 4). Social media postings, data streaming from smart sensors, and other such resources can produce a more comprehensive picture of an organization's customers, helping it create more intimate, humanized customer experiences.

Figure 4

Mix and match

Torchbearer CEOs use both structured and unstructured data to serve their customers more successfully

67%

34%

97% more

Torchbearer CEOs
Aspirational CEOs

Lastly, Torchbearer CEOs take a much more rigorous approach to quality control. Twice as many of them lead organizations that curate and cleanse their data—and purge it, when appropriate. These CEOs understand that more data doesn't necessarily translate into more intelligence. Quite the reverse: too much data can bog a business down, impeding management's ability to make speedy, well-informed judgments. So it's essential to establish a strategy for discarding data when it becomes obsolete, rather than hoarding it in increasingly crowded data vaults.

As with other advanced technologies, however, skills in data science and analytics are an equally important part of an organization's ability to make the most of AI. And, again, Torchbearer CEOs occupy pole position: 55 percent—more than double the percentage of Aspirational CEOs—say their workforce is *already* extensively skilled in data science and analytics. Similarly, 77 percent of Torchbearer CEOs report that they are actively planning to increase their organization's data capabilities, specifically to take advantage of AI. Only 34 percent of Aspirational CEOs, by contrast, are investing in the development of additional analytical skills.

Of course, empowering the workforce to operate in a data-rich environment isn't easy—and the issue isn't just a shortage of people with the relevant talents, although CEOs say that's certainly a challenge. It's also a matter of guiding employees through the transition. "Many of the people in my organization are apprehensive about the changing roles and skills that are required," the CEO of a consumer products company in Switzerland observes. A banking CEO in Canada agrees: "We have a greater responsibility to re-skill employees now."

Action guide
How to automate—intelligently

1. Create a Cognitive Enterprise™

Build a robust technological infrastructure, based on hybrid clouds, 5G, the IoT, and edge capabilities.[6] Redesign your operational processes and workflows to become more adaptive. Develop a data-powered AI strategy, with a clear migration plan.

2. Re-think your data strategy

Put data at the heart of every business decision. Keep the data current, clean, and curated—and purge data you no longer require. Leverage AI, including machine learning, and analytics to inform key processes and interactions.

3. Re-align your workforce with your workflows

Assess the impact of re-engineering your workflows on your workforce. Engage proactively with employees to help them acquire the necessary skills, and to source new talent and manage legacy staff. Reward teamwork, agility, and creativity to foster a culture of continuous, exponential learning.

Chapter 2

Strategize with ecosystems
Flexing the muscle of the many

There's an old, purportedly African proverb that says it takes a village to raise a child. In other words, an entire community is needed to contribute to the child's education, health, experiences, and overall welfare. Increasingly, in the 21st century, it takes an ecosystem—be that a supply chain or various entities working on a common platform—to run a successful business.

The top-performing CEOs in our study obviously recognize as much. Rather than keeping data closely confined, either within a specific business unit or within the enterprise as a whole, they are letting it loose (see sidebar on page 14, "BMW: Wheeling out a connected car ecosystem"). A full 67 percent of Torchbearer CEOs encourage the sharing of data freely across their organizations, versus only 16 percent of Aspirational CEOs.

This willingness to share data has helped many Torchbearer CEOs position powerful ecosystems as a core part of their business strategy (see Figure 5). And that, in turn, brings multiple benefits. Several CEOs in the life sciences industry emphasize the value of collaboration in developing new medicines, for example. Similarly, a CEO in the Swiss transportation sector notes that his industry's supply chain has become very fragmented, making it all the more important to form networks with suitable partners. The CEO of a professional services firm in Australia is even more trenchant. "Brands are becoming less relevant," he comments. What customers care about are "solutions and ecosystems."
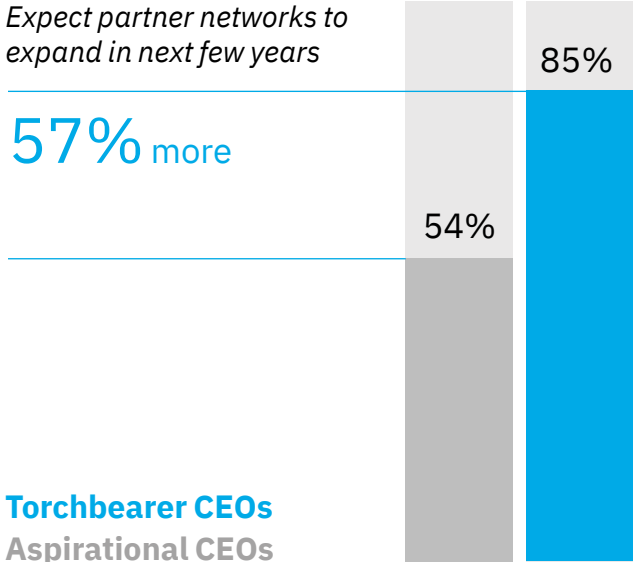
"We're linking up with our partner ecosystem to share data and craft value propositions for our clients."

CEO, Banking and Financial Markets, South Africa

Figure 5

All together now

Torchbearer CEOs see ecosystems
as central to their business strategy

Expect partner networks to expand in next few years

57% more

85%

54%

Torchbearer CEOs
Aspirational CEOs

BMW: Wheeling out a connected car ecosystem

German automaker BMW is building a data-driven ecosystem of partners and service providers, using a platform called CarData, to offer its customers a range of third-party services. More than 8 million BMWs worldwide are now equipped with permanently active SIM cards that collect diagnostic data—including *maintenance* attributes such as battery voltage, error messages, coolant temperature, fluid levels, and mileage; and *usage* attributes such as trip distance, charging status, and fuel consumption.[7]

Once BMW has obtained a customer's permission, it shares the diagnostic data with its dealers and with independent repairers and parts resellers that are registered on the platform, enabling them to send service reminders, offer parts changes before components wear out, and much more. Fleet managers, insurance companies, and other authorized third parties can also register with CarData, provided that they have a signed consent form from their drivers or customers.[8]

BMW recently expanded its ecosystem with the launch of a "car-as-a-service" business and a "mobility-as-a-service" business. It's currently developing mobility payment services, with the aim of reaching 100 million customers by 2025. While many automakers are still trying to keep control over the data generated by the vehicles they manufacture and develop their own services, BMW has figured out that customers prefer transparency and choice.[9]

Our research shows more than half of all Torchbearer CEOs place great weight on sharing data with their network partners. For all but a quarter of Aspirational CEOs, by contrast, it's a relatively low priority.

However, Torchbearer CEOs also understand that some data simply can't be shared—either because it provides a proprietary advantage or because it's too sensitive to put in other hands. While 67 percent of Torchbearer CEOs head organizations that are very good at collecting, using, and sharing data, only 52 percent share data completely transparently across their ecosystems.

"The members of our network have different stakes and interests," the CEO of a life sciences company in Belgium points out. "It's a question of using customers' data to build trust and drive the conversation with us as an organization," adds the CEO of a media and entertainment company in the UK. Pooling confidential customer data with other enterprises would defeat that goal.

Hence the fact that most Torchbearer CEOs have clearly defined rules for the collection, use, and sharing of data, whereas very few Aspirational CEOs are equally well prepared (see Figure 6). "I sit on various data and governance boards and work closely with our IT architecture teams," notes a banking CEO in South Africa. The CEO of an energy company in Denmark also stresses that he is "personally involved" in governance.
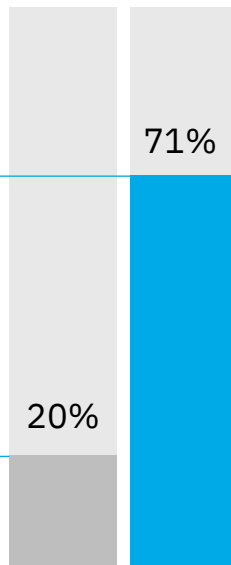
Figure 6

Rules of engagement

Torchbearer CEOs practice good governance
to support partnering across ecosystems

*Have clearly defined rules
for the collection, use, and
sharing of data*

71%

255% more

20%

Torchbearer CEOs
Aspirational CEOs

In short, Torchbearer CEOs know they have to find a
balance. If they share too much, they could forfeit the
value of proprietary intelligence and the trust of their
customers. If they share too little, they could miss out
on exciting new business opportunities. These CEOs
have accordingly formulated carefully calibrated
policies for sharing data—and getting it, like Goldilocks,
"just right." Aspirational CEOs, by contrast, head
organizations that are typically neither very skilled at
collecting and sharing data, nor very open to sharing
that data with their partners.

Action guide
How to strategize with ecosystems

1. Harness the power of network effects

Look for new opportunities to create or participate
in platforms and ecosystems. Define how the risks
and rewards will be allocated among the respective
participants. Identify collective gaps where you and
your partners need to invest to enhance your
competitive edge.

2. Put proper governance in place

Establish enterprise- and ecosystem-wide rules for
collecting, using, and sharing data—both data you
gather directly and data you acquire from second
or third parties. Specify where responsibility and
accountability for different data sets lies. Use digital
ledgers to provide end-to-end transparency.

3. Carefully calibrate your data sharing

Decide what data you are willing to share and what
data to keep within your own enterprise. Implement
strong policies and processes for sharing data
ethically and securely with the other members of
your ecosystem. Quantify the value of proprietary
data, and develop a roadmap for realizing that value.

Chapter 3

Extract value through new models

Reinventing the enterprise

Thirty years ago, most commercial enterprises fell into one of four fundamental categories: manufacturers, distributors, retailers, and franchisees. Variations depended on the particular sector in which they operated. Today, digital technologies and ecosystems have jointly facilitated totally new ways of doing business. In the process, they have birthed new industries, obliterated others, and transformed the competitive landscape.

Rising consumer expectations have played a part in fueling this "creative destruction" and reinvention. The underlying economics of bricks-and-mortar retailing are shifting. Fewer consumers visit shopping malls and inflexible leases drive up operating costs in an environment that demands agility, notes a retail CEO in the US. "It's a combination that requires significant business model innovation to stay relevant. Retailers will have to think about how best to leverage their assets, advocates, and store associates across multiple touchpoints, so that the brand promise lives beyond the stores," he elaborates.

But for Torchbearer CEOs, the new commercial landscape is more opportunity than threat. They anticipate greater emphasis on business model innovation over the next few years, and many of them are poised to make the leap with their own organizations. Indeed, almost two-thirds of the Torchbearer CEOs in our sample say new business models lie at the heart of their data strategy (see Figure 7).

"Technological innovations are completely subverting traditional business models."

CEO, IT and Professional Services, China

Figure 7

Designed to disrupt

New business models play a key role in shaping the data strategies Torchbearer CEOs adopt

Data strategy is focused on changing current business model

64%

60% more

40%

Torchbearer CEOs
Aspirational CEOs

"We've set up a dedicated digital team to define business models for data monetization."
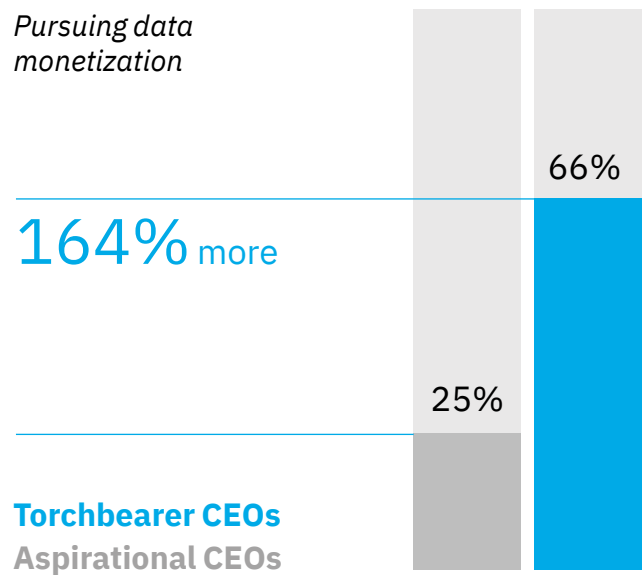
CEO, Life Sciences, Switzerland

The majority of Torchbearer CEOs are also looking for ways to monetize the data their enterprises hold (see Figure 8). Most of them are rather vague about their plans, possibly because they haven't yet figured out precisely what to do. "Turning data into an asset that can be sold is difficult," the CEO of an industrial products company in Finland observes. The CEO of an IT firm in South Africa is equally circumspect, albeit for different reasons. "What is legal is not necessarily ethical," he cautions.

Figure 8

From data to dollars

Torchbearer CEOs are incorporating new forms of monetization in their data strategies

Pursuing data monetization

164% more

66%

25%

Torchbearer CEOs
Aspirational CEOs

However, the ultimate objective for many CEOs isn't to sell the data they collect; it's to create a strategic advantage by using data to define and test new business models. The CEO of one consumer products company is considering whether to set up a direct-to-consumer operation, for example. He reasons that retailers only have information on their own customers, which they are increasingly reluctant to share. But his organization has extensive sales data from numerous retailers and is thus better placed to see the big picture.

Other CEOs are investigating the potential of platforms—hoping either to build their own or carve a role for themselves as essential participants on platforms operated by third parties. Yet others are exploring how to offer mobility-as-a-service, fill gaps in the sharing economy, and the like (see sidebar, "Savvy: Helping patients 'wise up' to the worth of their data").

Savvy: Helping patients "wise up" to the worth of their data

US cooperative Savvy has come up with a novel way of monetizing health data—ethically. Historically, when clinical researchers wanted to know what patients with a specific medical condition need, they didn't ask patients; they asked doctors. Savvy gives patients a voice. Launched in 2017 as a social network for people with certain diseases, it has now evolved into a platform that bridges the gap between patients and practitioners. Patients share their experiences with healthcare organizations and get paid for their insights.[10]

So how does the platform work? Medical researchers and healthcare professionals looking for information about a specific community of patients contact Savvy, which then reaches out to its network for people who can help. Patients can assist in various ways, such as completing surveys, testing digital products or services, contributing to focus groups, or participating in one-on-one interviews.[11]

Savvy charges practitioners a fee for this service and uses the money to pay patients, based on the number of projects they have participated in. Whenever patients visit a doctor or input information on a medical app, they are providing the healthcare community with a valuable resource—their data—but they don't get compensated for it. Savvy operates on the principle that patients should get something in return.[12]

"Those who capture the digital gateway—the contact point with the customer—are in a position of strength."

CEO, Transportation, Japan

Action guide
How to extract value through new business models

1. Work backwards from the business case

Identify potential use cases and applications, and ascertain the data you will need to operationalize them. Start with the applications that are easiest to implement to generate early wins. Apply DevOps and agile methodologies to test prototype models rapidly and shorten the development lifecycle.

2. Look for the cash buried in the data

Conduct a comprehensive review of your existing data to assess the opportunities for monetizing it. Determine whether new types or sources of data could help you increase the value of data you already hold. Focus on turning your organization into a data steward—a trusted enterprise that monetizes data in a safe, principled, and accountable fashion.

3. Draw on data to develop a strategic lead

Position new, data-driven business models and operations as part of a wider Digital Reinvention® strategy.[13] Map your data and analytical resources to each of your long-term business goals. Democratize the data by putting it in the hands of the people who actually use it.

Conclusion

The data dividend

New business models—combined with intense competition and consolidation in certain industries—are hitting some companies hard. "It's a world in which the weak won't be able to win, even if they work together," the CEO of an electronics enterprise in Japan tells us. The only way to succeed is to invest in technological innovation and learn how to use data effectively, he concludes.

The CEOs we spoke with are in broad agreement. "The winner will be the company that gets the data, analyzes it quickly, and makes the right decisions," the CEO of a media company in Poland notes. In the past, "management had to make trade-offs between strategies that drove top-line revenue and bottom-line profits. It was one *or* the other," a retail CEO in the US remarks. "With connected technologies and data facilitating new forms of customer engagement, we now have the 'and' model, where growth-oriented strategies can also be margin-enhancing."

Yet the vast majority of business leaders are still struggling to reap the data dividend. "We have plenty of data," the CEO of one enterprise in the United Arab Emirates says. The trouble is, "it's sitting there, doing nothing—and we're not even sure if it's accurate." A US executive expresses similar concerns. "Our customer and enterprise data is not in just one database. It's all over the place," he laments. Even worse, "No one has any idea how to use the data."

The Torchbearer CEOs in our study show what it takes to become a data leader. These CEOs use AI and intelligent automation to inform their decisions. They promote a culture of belief in data. They make ecosystems a core part of their business strategy. They share data judiciously to gain the benefits of networking without giving away their competitive edge. And they use data to develop new business models with the potential for outsized returns. Torchbearer CEOs have seized the data advantage and primed their organizations to prosper in the Insights era.

Notes and sources

1   Desjardins, Jeff. "How much data is generated each day?" World Economic Forum. April 17, 2019. https://www.weforum.org/agenda/2019/04/how-much-data-is-generated-each-day-cf4bddf29f/

2   Cann, Oliver. "$100 Trillion by 2025: the Digital Dividend for Society and Business." World Economic Forum press release. January 22, 2016. https://www.weforum.org/press/2016/01/100-trillion-by-2025-the-digital-dividend-for-society-and-business/

3   "Korean Air is using Watson to search vast amounts of data to improve operational efficiency and on-time performance." IBM case study. Accessed January 15, 2020. https://www.ibm.com/watson/stories/airlines-with-watson/

4   Ibid.

5   Ibid.

6   Foster, Mark. "Building the Cognitive Enterprise: A blueprint for AI-powered transformation." IBM Institute for Business Value. January 2020. https://ibm.co/cognitive-enterprise

7   "BMW CarData: a sign of things to come for all OEMs." Ptolemus Consulting Group. November 29, 2017. https://www.ptolemus.com/insight/bmw-cardata-a-sign-of-things-to-come-for-all-oems/

8   Ibid.

9   Ibid.

10 Anzilotti, Eillie. "This co-op lets patients monetize their own health data." *Fast Company*. July 27, 2018. https://www.fastcompany.com/90207550/this-co-op-lets-patients-monetize-their-own-health-data

11 Ibid.

12 Ibid.

13 Berman, Saul J., Ph.D., Peter J. Korsten, and Anthony Marshall. "Digital Reinvention® in action: What to do and how to make it happen." IBM Institute for Business Value. May 2016. ibm.biz/draction

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