

# The intelligent operations advantage

Chief Operations Officer insights  
from the Global C-suite Study



This report is based on input from the 2,099 Chief Operations Officers (COOs) 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 drawn on various statistical techniques, including exploratory factor analysis, regression analysis, and correlation analysis, to complete 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've progressed with their plans.

We identified a small group of enterprises that stand out from the rest. The COOs who help run these organizations use data to explore new business opportunities, reach the market as efficiently as possible, and forge closer links with their customers. They've mastered the ability to transform information into intelligence and operationalize the insights it provides. They also understand how the digital economy is redefining value. Data is an asset, but trust determines what it's worth.

The result? The organizations represented by this elite corps of pioneering COOs are more flexible, more innovative, and more profitable than their industry peers.

**Tech-tonic forces**

The data deluge is, of course, a product of technology, as COOs recognize. They say technology is the single biggest external force affecting their enterprises, where previously market factors topped the list. Indeed, technology has so outstripped other issues that 61 percent of COOs regard it as a major outside influence, while only 52 percent point to market conditions.

Technological advances are transforming the business landscape, and some of the changes COOs foresee will probably cause the flood of data to swell even further. Nearly two-thirds of them anticipate that the trend toward collaborative working will accelerate, for example, as organizations expand their ecosystems to capitalize on new ways of creating value. But working with a network of partners is more complex than working alone and involves sharing considerable amounts of data.

Similarly, half of the COOs we interviewed predict that there will be more emphasis on the customer experience, as distinct from product innovation. Again, this means dealing with more ones and zeros. Goods and services form the core element of an organization’s offerings, but the customer experience is the sum total of what a customer wants, sees, does, thinks, and feels. It encompasses the entirety of the customer’s interactions with the enterprise, many of which involve operations. Order management, delivery, post-sales customer service and, in some instances, the co-creation of new products all fall within the COO’s domain. Optimizing every interaction entails collecting, analyzing, and acting on vast swathes of customer intelligence.

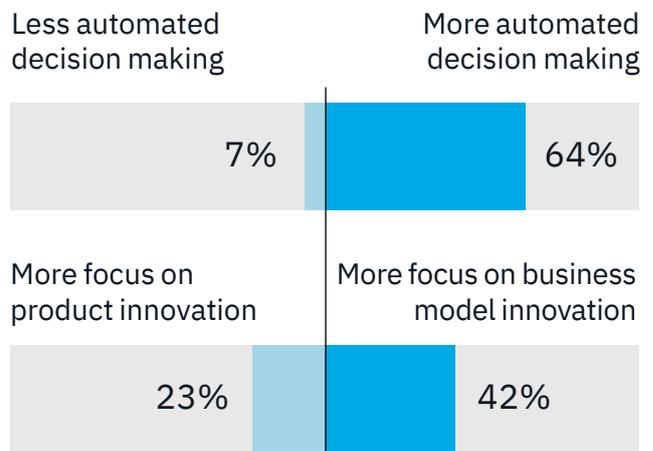
**The good, the bad, and the ugly**

Understandably, perhaps, COOs see the rising tide of data as a mixed blessing. On the upside, they note, data is powering the development of a new operational paradigm and new forms of creativity (see Figure 1). It’s facilitating the automation of many decisions—both decisions involving customers and decisions involving routine business processes. Algorithms, for instance, can be used to make product recommendations, personalize the prices of big-ticket items, and nudge customers’ purchasing choices. Meanwhile, workflows can be automated, and bots can perform mundane, recurring activities, liberating the workforce to spend more time on things that add greater value.

Figure 1

**Automate and innovate**

Data is opening up entirely new ways of doing business



*Direction of business landscape change in the next two to three years*

**All COOs**

Data is, likewise, supporting the design of different business models. Platform orchestrators—organizations that operate platforms—are one such case. Connecting suppliers directly with consumers enables these organizations to harness huge network effects, with correspondingly large returns. Recent evidence suggests that platform orchestrators can grow more rapidly and generate more profit than any other kind of business.<sup>1</sup>

However, there's a downside, too. While data undoubtedly opens up new opportunities to automate and innovate, using it in this fashion also presents new challenges—or exacerbates existing risks. Take security: “We invest in more technology to get more data,” a banking COO in India remarks. “But that opens another window into our business and increases our vulnerability, as it increases the access points to our data.” Moreover, the price of a lapse in security can be very high. Other research by IBM shows that the average total cost of a data breach has now climbed to USD 3.92 million, and the long-tail effects last for years.<sup>2</sup>

Customer privacy is a second key concern, particularly as the public begins to realize the full extent of the digital surveillance some governments and corporations have conducted. For obvious reasons, many individuals are becoming more reluctant to share their personal data—and, if they think an organization has crossed the line, they're prepared to invoke the law. Witness the fact that during the first 12 months after the European Union's General Data Protection Regulation (GDPR) took effect, more than 144,000 complaints about data privacy were logged.<sup>3</sup>

Credibility is yet another serious issue. Growing numbers of customers are questioning who's truly benefiting from their personal data—and increasingly suspicious that it's *not them*. In one recent survey, for example, the majority of respondents had little or no idea how much governments and companies knew about them, didn't trust governments or companies to handle their data “properly,” and didn't believe that they were getting a fair trade for the data they shared.<sup>4</sup>

*“We are entering our consumers' space. If we don't give them value back, they won't share data. We need to offer them a delightful experience every time.”*

Jacek Olczak, COO,  
Philip Morris International,  
Switzerland

These changes—good, bad, and ugly—have profound implications for COOs. We asked the C-suite executives who participated in our study which business leaders play the most influential role in crafting their organization’s data strategy. They tell us there’s a core triumvirate: The CIO and CEO typically predominate, while the COO serves as the third member of the triad.

In a few instances, the COO even takes the lead. “I’m responsible for developing our data strategy and plan to execute that strategy in order to get the most value from our data,” the COO of an energy, environment, and utilities company in Ireland explains. A COO in Hong Kong’s financial services industry has also been tasked with “devising a comprehensive data strategy that’s aligned with the needs and priorities of the business, establishing governance policies and processes in compliance with the regulatory requirements, and ensuring the security of the data.”

### **Torchbearers illuminate the way**

But not all COOs—or, more accurately, the organizations they represent—are equal. 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).

*Aspirational* organizations are just setting off on the journey. They’re beginning to integrate their business and data strategies. But they don’t have a data culture in place, and they’re not very good at extracting value from data. *Builders* have made greater progress in aligning their business and data strategies and creating a data culture. Nevertheless, they’re also struggling to capitalize on their data.

*Explorers*, by contrast, are halfway to their destination. 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 reached this point. 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 COOs with Aspirational COOs—as we’ll refer to them here for ease of reading—reveals significant variations in the performance of the enterprises they help supervise. Three-quarters of all Torchbearer COOs work in organizations with an excellent record of innovation, for example, whereas less than a quarter of Aspirational COOs can make the same claim. Similarly, eight in ten Torchbearer COOs work in organizations that are very effective at managing change, while only three in ten Aspirational COOs reckon their organizations are nimble. These strengths have paid off handsomely: 71 percent of Torchbearer COOs have helped to preside over superior revenue growth, and 74 percent have seen their enterprises deliver outsized profits, where only 25 percent of Aspirational COOs have enjoyed equal success on either count.

So what are Torchbearer COOs doing to reap the benefits of data? Our analysis shows three core areas where they diverge from other COOs. Torchbearer COOs:

- Create a culture of true data devotees
- Build intelligent supply chains
- Develop a strategy for sharing data wisely.

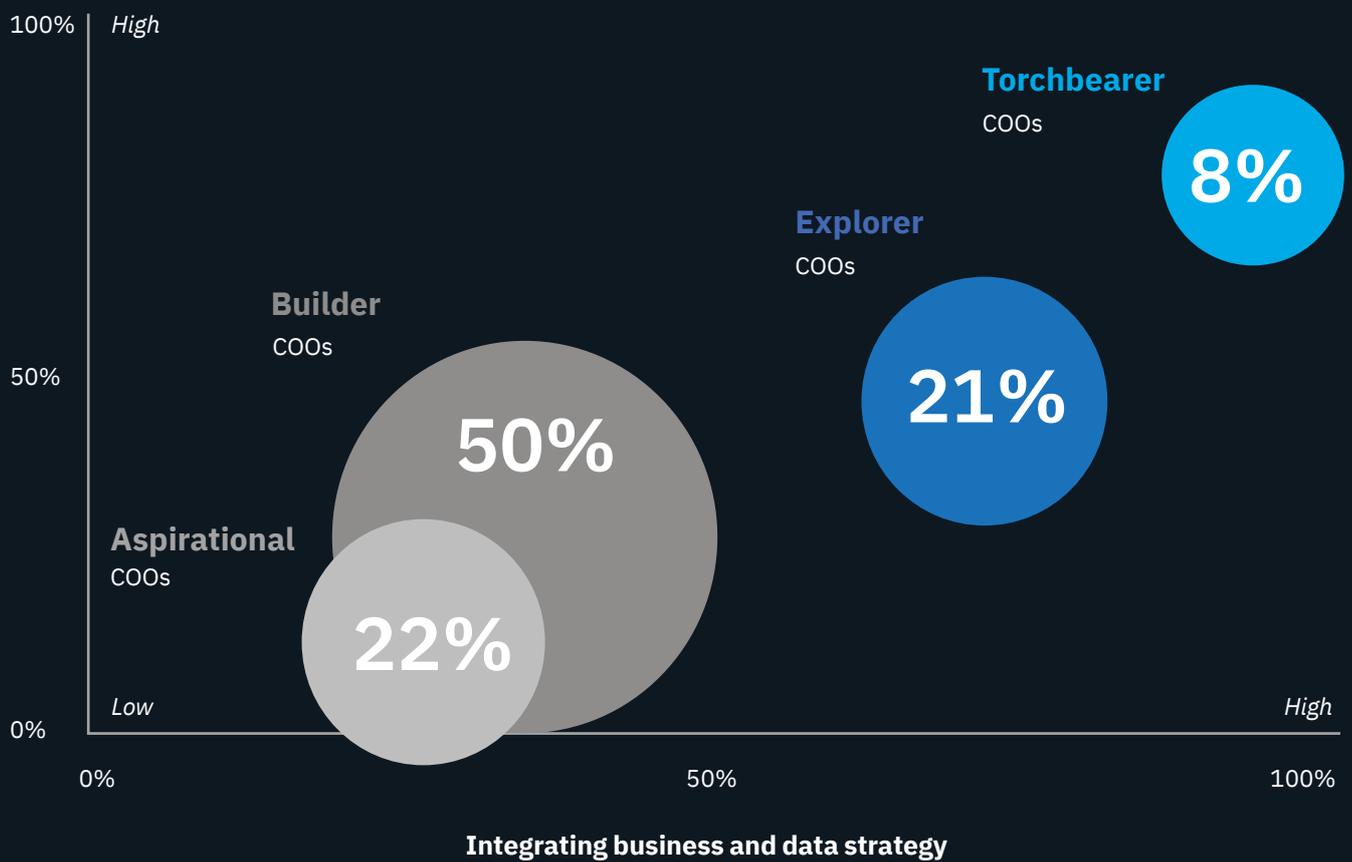
We’ll explore each of these themes in more detail in the following three chapters.

Figure 2

## Dividends from data

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

### Creating value from data



## Chapter 1

# Belief in bytes

## A culture of data devotees

One of the distinguishing attributes of Torchbearer COOs is the faith they place in data to help them move forward. Eight in ten say they and their fellow C-suite executives are predisposed to draw on data when they have to make significant decisions. And nearly as many say their enterprise focuses extensively on collecting the necessary data to inform the decision-making process (see Figure 3).

Torchbearer COOs don't dismiss the value of experience, but they insist that the facts should come first. And the truth may be counterintuitive, as the COO of a Japanese retailer learned the hard way. "We had some preconceived ideas that informed our marketing decisions. With more data, we realized that the validity of these preconceptions is, at best, arguable," he observes.

Recognizing that assumptions, unsupported by proof, can be risky, Torchbearer COOs encourage the sharing of information across functional boundaries. A full 70 percent work in enterprises in which data circulates freely. The vast majority of Aspirational

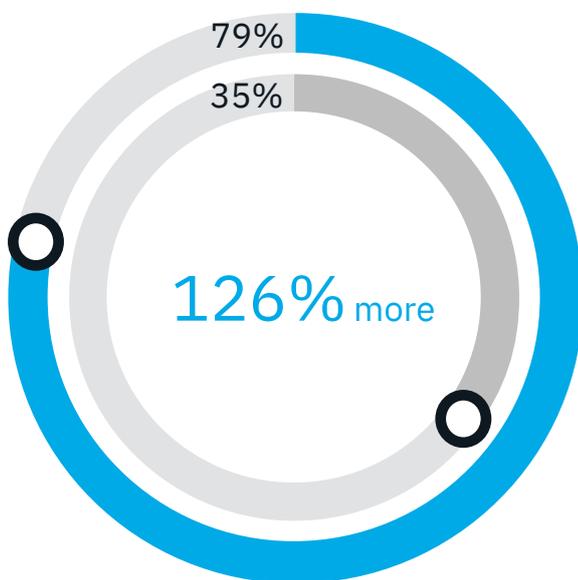
COOs, by contrast, are still struggling to overcome data siloes; only 14 percent work in organizations where data is unfettered from functional chains.

Equally importantly, Torchbearer COOs empower their employees to crunch the numbers. Seven in ten work closely with their C-suite colleagues to provide employees with the necessary tools and training to delve into data, where only three in ten Aspirational COOs and their fellow CxOs show the same commitment. These efforts are already bearing fruit; the organizations Torchbearer COOs represent are more than twice as likely to have a workforce that is skilled in data science and analytics.

Figure 3

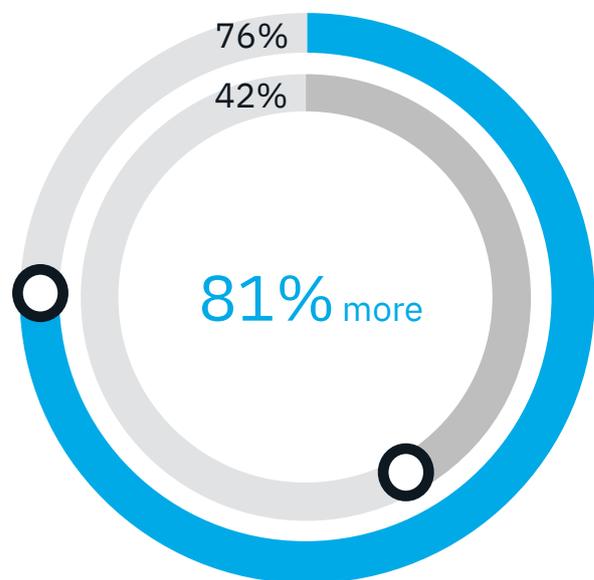
### Faith in facts

Torchbearer COOs and their C-suite colleagues place great trust in data to help them make decisions



*The C-suite team has the data mindset needed to improve the quality of decision making*

### Torchbearer COOs Aspirational COOs



*The enterprise focuses on collecting the right types of data to help it make informed decisions*

## More data, more skill, more insight

So how do Torchbearer COOs actually use the data and analytical talents they've acquired? There are three activities, in particular, where they say data pays off. More than half (54 percent) look to data to help reduce costs. Almost as many (52 percent) use data to identify new market and revenue opportunities. And almost half (45 percent) see data as indispensable in enabling them to examine the big picture and define their enterprise's strategy and vision.

The majority of Torchbearer COOs also report that data is critical in getting to market as smoothly and swiftly as possible. Indeed, 81 percent rely heavily on data to improve their organization's operational efficiency, compared to just 55 percent of Aspirational COOs. Similarly, 71 percent—nearly double the percentage of Aspirational COOs—use data to accelerate their speed-to-market.

In short, Torchbearer COOs realize that operational efficiency is central to the customer experience. It's the COO's job to make sure the organization can deliver on its promise: that, together with its business partners, it can provide customers with the products and services they desire, in the manner they desire. Any enterprise that fails to fulfill its promise will rapidly forfeit customers' confidence. So, as the individual in charge of managing operational risks across the ecosystem, the COO plays a vital part in earning—and retaining—customers' trust.

For Torchbearer COOs, integrating data to obtain immediate operational insights is thus a top priority (see Figure 4). They strive to create a single repository for collecting, analyzing, and applying supply chain data and controlling risks in real time. They also emphasize the importance of using predictive analytics and actual demand signals to manage every supply chain process and utilize resources such as plant, inventory, and energy as efficiently as possible.

Figure 4

### Fast forward

Torchbearer COOs combine real-time insights from multiple sources to preempt problems and create agile supply chains

**Torchbearer COOs**  
Aspirational COOs



Importance of data initiatives to operations

## From add-on to must-have

Creating a culture of data devotees—a culture in which data underpins every operational decision—is difficult, as COOs repeatedly observe. “Our company sees data analytics as an add-on. We need to change our business model so that we make data-driven decisions based on real-time information,” the COO of an Australian bank comments.

The COO of a consumer products business in Switzerland makes much the same point. “We’re a top-down company that often makes decisions based on opinions and experience. We need to rely more heavily on data,” he states. “The leaders will also have to let go, and the lower levels will have to step up to make more decisions...[which] will be a culture shock,” he adds. But the benefits to be gained from building an organization of data evangelists more than justify the effort required, as the Torchbearer COOs in our study demonstrate.

## Action guide

### *How to create a culture of data devotees*

#### **1. Turn data into a strategic asset**

Identify how data can create a competitive advantage by opening up new market opportunities, improving operational efficiencies, and/or enhancing the customer experience. Map your data and analytical resources to each of your business goals. Assess where—and to whom—data can deliver the most valuable insights, and prioritize your efforts accordingly.

#### **2. Put data in the hands of the people who use it**

Give employees the technologies they need to delve into data, even if they aren’t data scientists. Invest in analytics and data visualization tools, as well as training and skills development. Encourage—and reward—collaboration.

#### **3. Fuse and fix**

Collect real-time operational data from every interaction—whether it’s human-to-human, human-to-device, device-to-device, or device-to-human. Integrate the data in a single repository. Empower employees to determine the best course of action, based on the insights the data yields, and take the initiative.

## Chapter 2

# Intelligent operations

## Smart, self-directed systems

If a culture of data believers is essential to realize data's value, so is the technological infrastructure required to share and analyze data and access new data sources. Here, too, Torchbearer COOs stand out from the crowd. They're investing particularly heavily in cloud, advanced analytics, and the Internet of Things (IoT), although mobile apps and robots also feature quite prominently in their plans (see Figure 5).

These technologies are the key building blocks of intelligent automation. Hybrid clouds enable applications and components to interoperate across boundaries. IoT sensors and mobile apps capture vast quantities of structured and unstructured data in real time. Pattern-recognition algorithms analyze the data, creating instant visibility and transparency, while predictive analytics provides a window onto the future. Robots then apply the data to learn and make autonomous decisions.

Torchbearer COOs also have their eyes on several emerging technologies for automating and authenticating repeat tasks. More than half of them intend to invest extensively in robotic process automation—where bots perform many of the digital, as distinct

from manual, activities previously performed by human beings. But only a quarter of Aspirational COOs express the same level of interest.

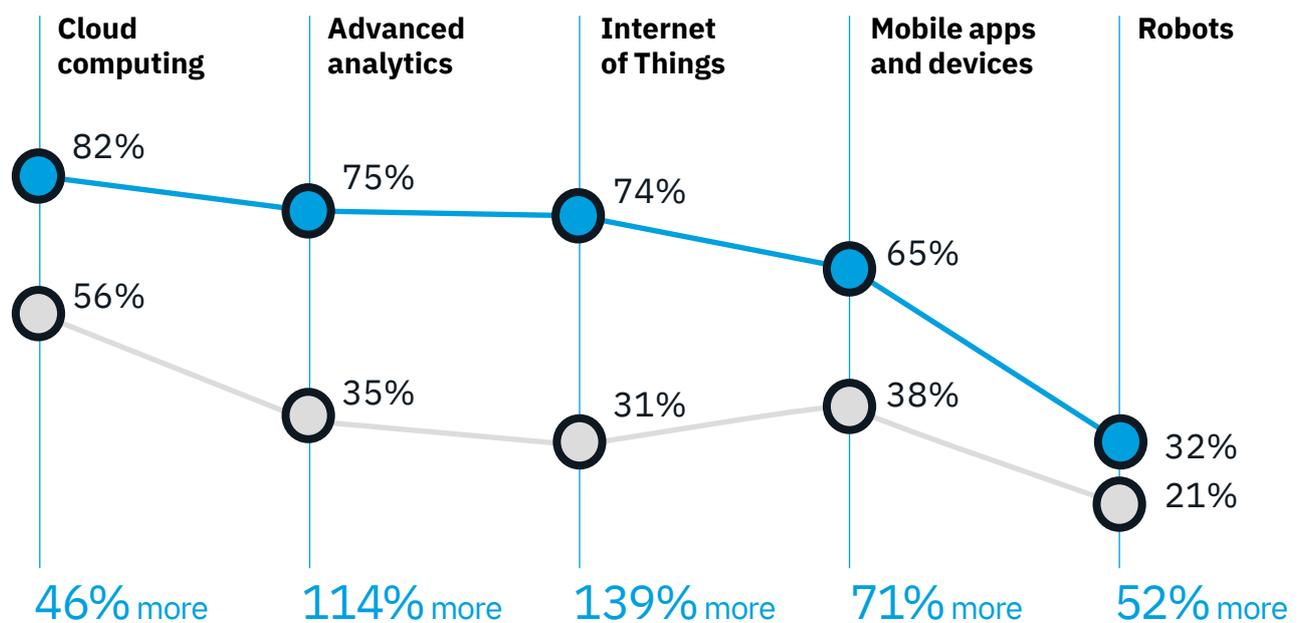
Similarly, 26 percent of Torchbearer COOs plan to invest in blockchain and 21 percent in 5G mobile technologies, compared to just 9 percent and 10 percent, respectively, of Aspirational COOs. “Blockchain will make it easy to authenticate transactions, policies, and consumer complaints,” the COO of an insurance company in Taiwan notes. The COO of a Canadian telecom operator is even more excited about the supersonic speed at which 5G networks will transmit data. “The player who best utilizes the IoT and 5G is going to win *big* on so many levels,” he declares.

Figure 5

## Big spenders

Torchbearer COOs plan to invest heavily in the building blocks of intelligent automation

**Torchbearer COOs**  
**Aspirational COOs**



*Large level of investment planned in the next two to three years*

## From digital aid to digital apprentice

However, Torchbearer COOs are reserving their chief bets for artificial intelligence (AI). A full 78 percent of them intend to invest heavily in AI or its subset, machine learning, whereas only 38 percent of Aspirational COOs have such ambitions. Machine learning is, in many respects, the pinnacle of intelligent automation. Where analytics helps human beings make decisions, machine learning enables systems to learn from data, paving the way for them to make decisions on behalf of other, autonomously functioning devices. This can reduce the need for human intervention or eliminate it altogether.

Combined with other technologies, AI and machine learning have numerous operational applications. For example, they can be used to detect changing patterns of demand, optimize inventory levels, oversee production scheduling, predict supply chain disruptions, and identify solutions to unplanned events. They can augment human intelligence by allocating resources, managing and monitoring recurring activities, and providing recommendations when problems arise.

Obviously, no organization can simply buy the right apparatus, plug it in, and then leave robots to run the business. In reality, working with smart machines is far more complex, and establishing a solid IT infrastructure is just the first step. Nevertheless, intelligent automation will revolutionize the way many activities are performed, as the COO of a professional services firm in Japan is already discovering. “AI and the cloud have reduced the many man-hours we used to spend on certain operational tasks. We’re using the time that’s been freed up to do more planning,” he observes.

## Clear, clean, curated

More than half of all Torchbearer COOs are confident that their organization’s expenditure on exponential technologies will pay off. Perhaps that’s partly because—unlike Aspirational COOs—they have a strong foundation on which to build. Twice as many report that the data their organization collects is available instantly, in real time, and three times as many say their organization has clearly defined rules for the collection, use, and sharing of data.

Torchbearer COOs are also set apart by their ability to parse unstructured data. Most organizations have a lot of valuable information buried in contracts and transactional systems that can be used to improve their procurement processes. Moreover, news feeds and social networks can serve as an early warning system, if a supplier is struggling. Redundancy announcements, asset sales, sudden changes in working patterns, or complaints from employees may be telltale signs of trouble.

Lastly, Torchbearer COOs work hard to upgrade the quality of the data their enterprises hold. Three-quarters of them devote considerable effort to cleansing or curating data, compared to less than half of all Aspirational COOs. And 69 percent of Torchbearer COOs place equal weight on purging data, whereas only 34 percent of Aspirational COOs focus on decluttering their data vaults.

The upshot? Torchbearer COOs are much more effective than Aspirational COOs at drawing on data and AI to guide their operational decisions (see Figure 6). They use data to manage demand and inventory levels, automated process controls to oversee production, and predictive analytics to project failure rates and warranty liabilities.

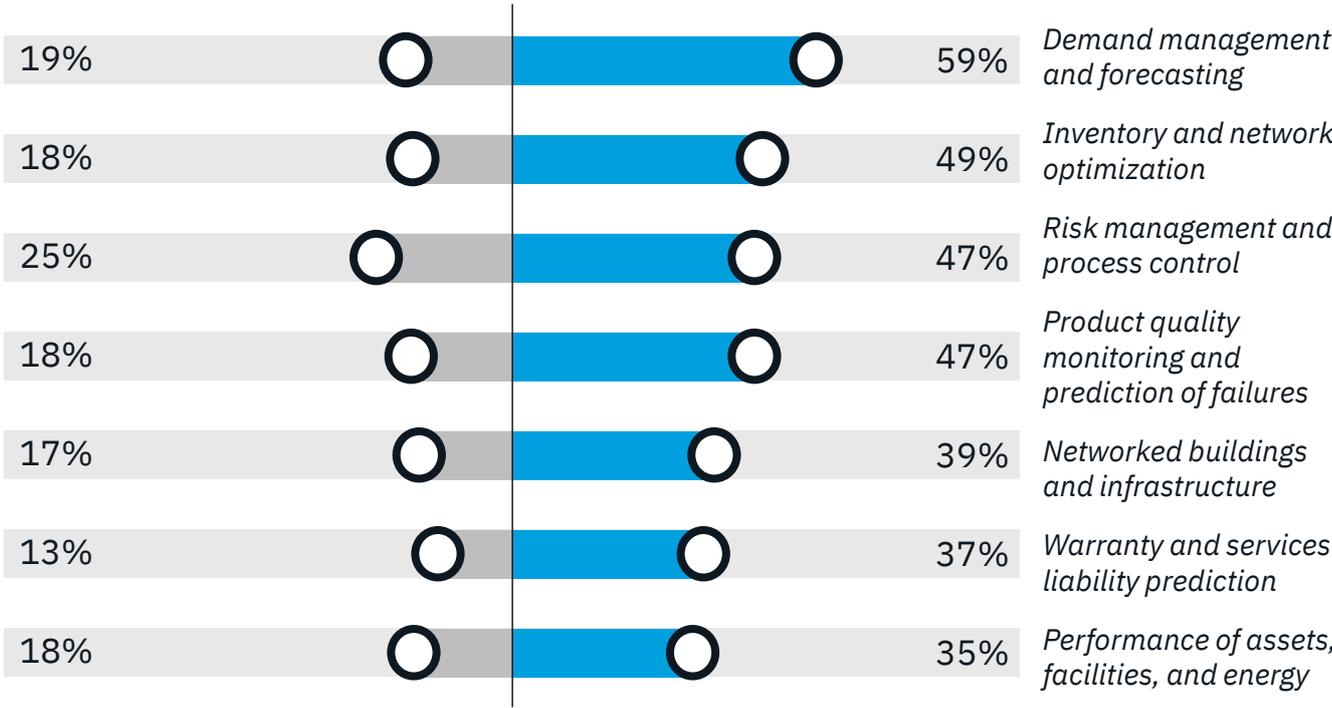
That, in turn, enables them to forestall problems, as well as optimize their asset utilization and energy consumption. Torchbearer COOs are well on the way to building supply chains that are self-learning and self-correcting.

Figure 6

### Smart workflows

Torchbearer COOs are much better than Aspirational COOs at using data to make operational decisions

**Torchbearer COOs**  
**Aspirational COOs**



*Effectiveness in leveraging data and advanced analytics or AI within operations to assist with decision making*

*“Drones, the Internet of Things, and augmented intelligence will change the way we all work.”*

COO, Industrial Products,  
Denmark

## Action guide

*How to build intelligent operations*

### 1. Automate and innovate

Capitalize on the potential of intelligent automation, with smart products and processes that can reason and learn with the support of AI. Invest in machine learning and other cognitive solutions to detect patterns that might otherwise be impossible to perceive or predict. Foster a culture of speed, agility, and innovation.

### 2. Put proper rules in place

Work closely with the CIO and CEO to develop an enterprise-wide data strategy and security plan. Create clear rules for acquiring, storing, and using data. Keep the data current, clean, and curated—and purge any data you no longer need.

### 3. Use data to guide operational decisions

Explore new ways of applying intelligence in operational functions. Identify opportunities to redesign tasks and processes, using intelligent automation. Iteratively evaluate all automated operational activities to refine your approach.

## Chapter 3

# Open and closed

## A strategy for sharing wisely

In fact, Torchbearer COOs are not only better at using data to make decisions, they have a better grasp of what customers want: 68 percent of them work in C-suites that already have an accurate, actionable, 360-degree view of the customer, whereas only 21 percent of Aspirational COOs can draw on such a reservoir. Torchbearer COOs are using that information to enhance the customer experience by identifying unmet customer needs and building the processes required to deliver value at every customer touchpoint (see Figure 7).

Many Torchbearer COOs are also seeking other ways to turn data into revenues, although they freely admit that this is a big challenge. “How do you monetize data? It looks simple, but it’s actually very difficult to do,” the COO of a travel company in Malaysia observes. A COO in the U.S. healthcare sector is similarly cautious. “Two of our C-level executives are exploring the opportunities to monetize our data—and the boundaries in doing so,” he notes, mindful of the potential for abuse.

Some COOs are investigating the prospects for selling data directly. “We plan to collect more data from sensors, IOT devices, and drones. Our goal is

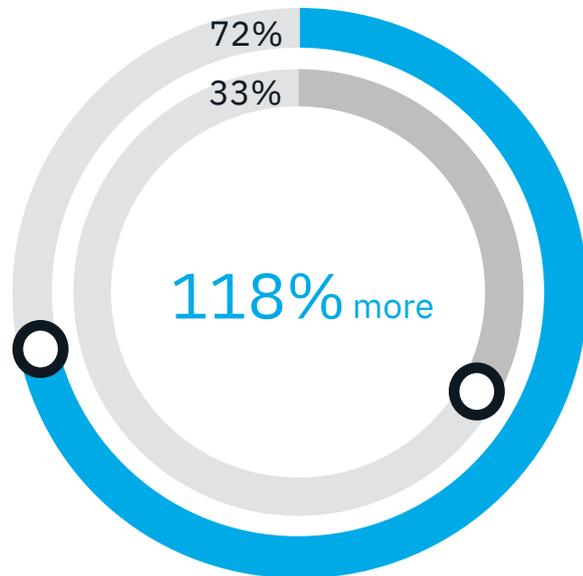
direct—and possibly also indirect—monetization of the data. We’re focusing, in particular, on buildings data, weather data, and environmental data,” the COO of an industrial products company in Denmark explains.

However, other COOs are more interested in using data to develop new business models or fill gaps in the on-demand economy. Hence the fact that 54 percent of the Torchbearers in our sample—more than double the percentage of Aspirational COOs—are concentrating on sharing information with their business partners and thus strengthening the ecosystems in which their enterprises operate.

Figure 7

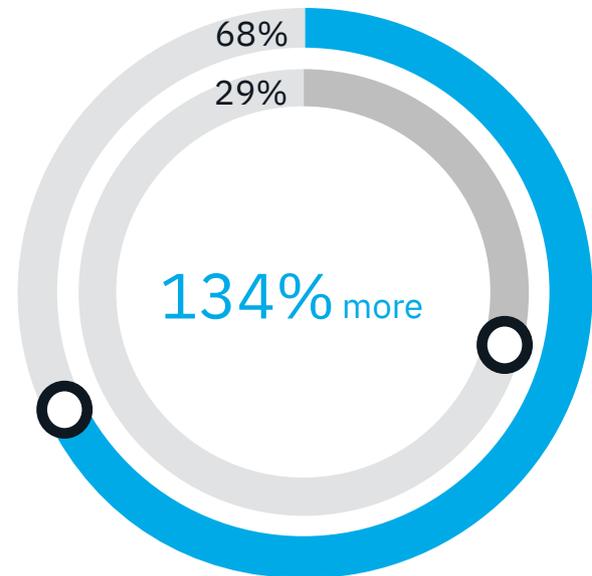
## Engaging practices

Torchbearer COOs use data to provide a richer customer experience



*Using data to identify undefined or unmet customer needs*

## Torchbearer COOs Aspirational COOs



*Building the processes to deliver value at every customer touchpoint and moment-of-truth*

## Profiting from probity

That said, Torchbearer COOs realize it’s crucial to treat the customer data their organizations collect in a principled fashion—and they’re optimistic that data can solve the very problem it poses. Used unethically or irresponsibly, data fuels people’s fears about big-brother surveillance, manipulation, and unfair treatment as a result of biased algorithms. Used responsibly, though, data can help to forge sincere, mutually beneficial bonds and earn trust, rather than eroding it.

A full 81 percent of Torchbearer COOs say data helps their enterprise strengthen the level of trust that customers place in it, compared to just 43 percent of Aspirational COOs. More than four in ten Torchbearer COOs also point to data privacy as a key source of competitive advantage in the future (see Figure 8).

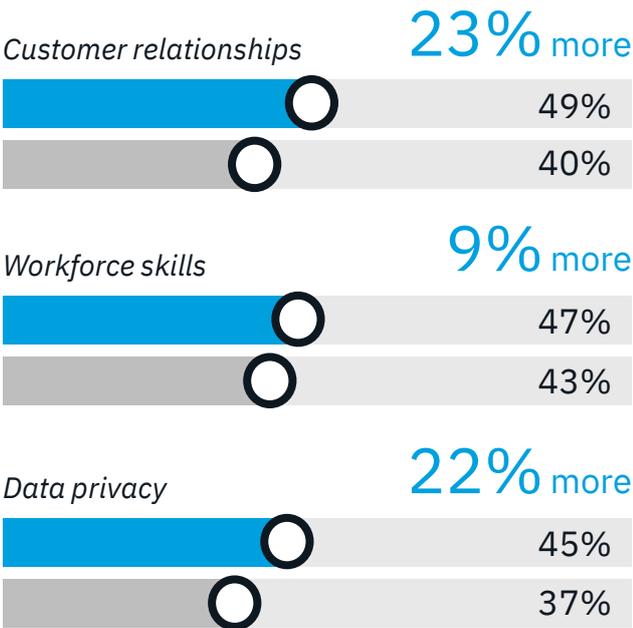
*“We want to create valuable experiences for customers, but only with their consent and when it’s in their best interests. If we don’t look after our customers’ best interests, they won’t trust us.”*

*COO, Banking and Financial Markets, Australia*

Figure 8

### Off the record

Respect for customers’ privacy is one of the three biggest sources of competitive differentiation



Key drivers of competitive advantage

**Torchbearer COOs**  
Aspirational COOs

The acid test is, of course, what customers—not executives—think. Still, it’s clear that some C-suites regard behaving well as a precondition for doing well and take their duty of care very seriously. “The governance of data and how we govern AI models—how they’re validated and used—are now board-level issues. So, too, is the ethical use of data,” a banking COO in the Netherlands tells us.

## Open—up to a point

Torchbearer COOs, likewise, understand the inherent tension between sharing data freely and keeping it confidential for proprietary gain. They appreciate that when data is shared, it can grow greatly in value—business platforms, where data flows among multiple parties, being one obvious example of this effect. However, proprietary information can also be an organization’s leading edge.

Although 72 percent of Torchbearer COOs work in organizations that are very competent at collecting, using, and sharing data, only 53 percent say their enterprise shares data completely openly with the rest of its ecosystem. In other words, Torchbearer COOs recognize that there’s a distinction between what *can* be shared and what *should* be shared. Some information *ought* to be kept close, either because it provides a proprietary benefit or because imparting it to others would violate customers’ personal space.

## Action guide

### *How to share data wisely*

#### **1. Go for gold**

Assess how new business models and network communications are influencing customer loyalty and perceptions of your brand. Evaluate the implications for your processes and outputs, as well as your current organizational structure, mix of ecosystem partners, and skills. Look for opportunities to use intelligent automation to improve the customer journey and enhance your brand.

#### **2. Develop a data-sharing road map**

Decide what data you are willing to share and what data you need to keep in-house. Engineer your workflows to share data that isn’t too sensitive to release with the members of your ecosystem securely and transparently. Quantify the value of proprietary data, and develop a blueprint for realizing its full worth.

#### **3. Prove that you merit customers’ trust**

Strengthen your data privacy policies and programs. Identify where customers draw the line on privacy—and honor their expectations. Give customers explicit assurances about how their personal data will be used and protected, and show that your organization keeps its word through your ongoing actions.

## Conclusion

# A winning combination

COOs everywhere are grappling with a world saturated in data. Some speak of the managerial and social challenges associated with operating in this new world. “We need to change our culture to become more data-savvy,” a COO in the Swiss banking industry notes tersely, while the COO of a consumer products company in the United States stresses the importance of becoming “more transparent about how we use data and what our customers can expect in return.”

Other COOs focus on the technical obstacles. “We’re not very good at exploiting the data we already have. Much of it gets lost because processes aren’t tracked, systems are transactional, or it’s unstructured data that we can’t access,” the COO of a financial markets firm in Italy reports.

He’s not alone in this regard. “One of the biggest issues is being able to explore the data with deep analysis so that we can become more accurate in our offerings, anticipate any problems, and become more effective and efficient—all while preserving the privacy of personal data,” the COO of an energy, environment, and utilities company in Portugal comments.

Nevertheless, COOs are convinced that using data—with and without human mediation—to drive their operational activities will yield huge returns. “We’ll be in a position to innovate much more rapidly and we’ll have a much more intimate relationship with our customers. We’ll be able to give them what they actually want, rather than pushing what we think they want,” the COO of a consumer products company in Switzerland concludes.

The Torchbearer COOs in our study demonstrate what’s required to become a data leader. These COOs promote a culture of data devotees. They use data, analytics, and robotics to inform their operational decisions—or to make decisions for them. And they share data judiciously to secure the benefits of working in ecosystems without breaching their customers’ privacy or giving away their competitive edge. Torchbearer COOs have positioned their organizations to prosper in the age of intelligent automation and turn man plus machine into a winning combination.

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