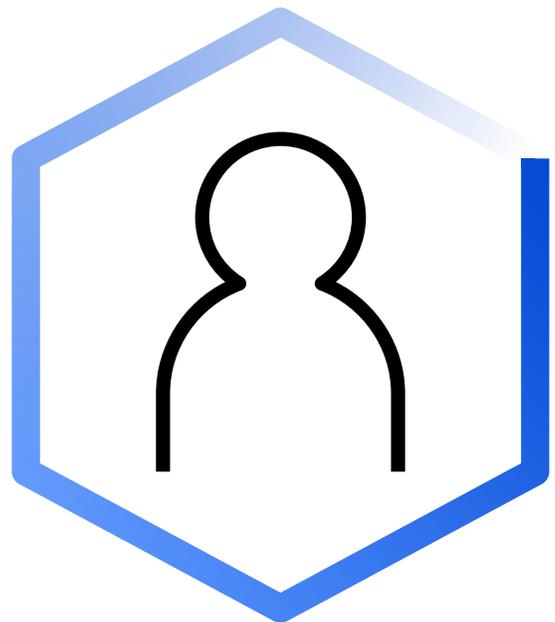


# Greater than the sum of their parts

How chief technology officers  
use cloud and AI to drive results

In collaboration with:



# Introduction

Chief Technology Officers (CTOs) will play a key role in positioning their organizations for cloud- and AI-driven transformation, especially as the global pandemic makes efficiency and flexibility more critical than ever.

Oxford Economics and IBM recently surveyed 6,000 senior IT executives in six industries, including 2,000 Chief Technology Officers, to better understand strategies for cloud and AI adoption. Key findings from our analysis of CTO responses include:

- Innovation—not just the technology that helps enable it—is top of mind for CTOs. Our research shows that leading digital transformation and innovation are top priorities for the role, along with ensuring security.
- CTOs see cloud and AI strategies as interwoven, and the pandemic has made both technologies more important. Like their peers across the IT function, CTOs see cloud as critical to the success of AI applications, and over half say investing in the technologies has become more important in the wake of COVID-19.
- Many barriers to cloud and AI adoption are non-technical. Difficulty deploying an action plan and managing change are top obstacles to adoption efforts, and performance around employee satisfaction and retention—critical to successful implementation—could be better.
- Business and technical returns remain siloed. CTOs report the most business ROI from operations and customer satisfaction efforts; technical ROI comes mostly from IT operations and process automation.

## About the CTO respondents

**Sample size:** 2,000 Chief Technology Officers or equivalent role; total sample includes 6,000 CIOs, CTOs, VPs of IT, and equivalent titles from organizations using cloud and AI in some capacity

**Sectors covered:** Manufacturing, retail, telecommunications, financial services, and healthcare providers and payers

**Countries covered:** Argentina, Australia, Brazil, Canada, Chile, China, Colombia, Costa Rica, France, Germany, India, Italy, Japan, Mexico, New Zealand, Panama, Peru, Puerto Rico, Saudi Arabia, Singapore, South Africa, South Korea, Spain, United Arab Emirates, United Kingdom, and the United States

**Organization size:** Roughly even split between organizations with \$200 m to \$999 m in revenue, those with \$1 bn to \$5 bn in revenue, and those with \$5 bn or more

**Dates fielded:** May through August 2020

# The transformative CTO

**The role of the CTO goes well beyond managing IT infrastructure. Executives in our sample prioritize leadership for digital transformation and innovation—and strategize around technology investments accordingly.**

When we asked CTOs about their top priorities for their role, leading innovation and digital transformation efforts accounted for two of the top three goals, only behind ensuring consistent security.

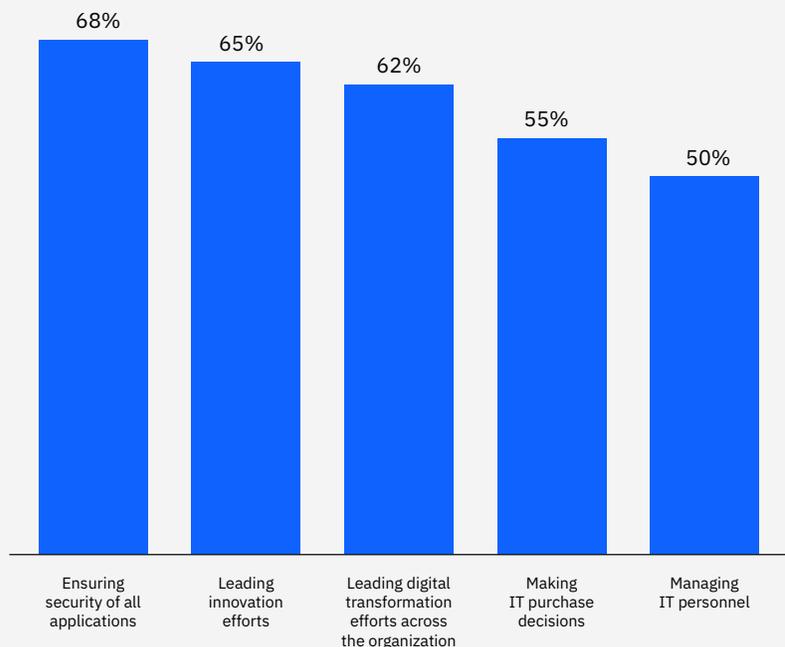
This focus on innovation informs CTOs' perception of corporate strategy and digital investments. They are more likely than executives in other roles to say that innovation is a top strategic goal for their organization (16% choose it as the top priority, vs. 12% of other IT executives). They also tend to be more likely than others to count the modernization of business processes and of products and services as top motivators for implementing AI. To some extent, these priorities vary by sector: telecom CTOs, for example, are more likely than others to say their organization is focused on innovation, and CTOs from healthcare providers are more likely to say a top goal is solving big-picture challenges.

**Fig. 1: Innovation and transformation are top priorities**

**Q:** Which of the following are main priorities for your role? Top 3 ranked

Base = 2,000

*Security is most likely to be ranked among CTOs' top three priorities, but innovation and transformation both are more likely to be the first priority.*



Motivations for digital investments may change in response to the pandemic, which has shifted organizational priorities around the world and across sectors. Over half of CTOs say investing in cloud, meeting sustainability targets, cutting costs, and reskilling employees for work with advanced technologies have become more important to their organization in the wake of COVID-19—all factors that will require a holistic approach to IT leadership.

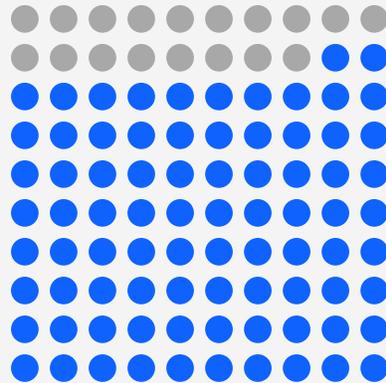
More than three-quarters (82%) believe their leadership has had an effect on overall strategy and business outcomes. These trends are consistent across sectors, though CTOs from manufacturing are somewhat more likely than the cross-industry average to say they struggle to communicate digital investment strategies with the rest of the leadership team (18% say so, vs. 14% of the total).

**Fig. 2: The move to hybrid cloud**

**Q:** To what extent do you agree with the following statements about your role? “Strongly agree” and “Agree” responses.

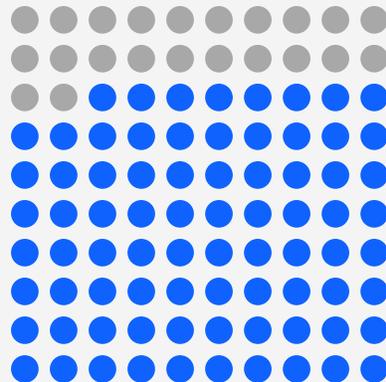
Base = 2,000

82%



My leadership has an effect on overall strategy and business outcomes

78%



The rest of the C-suite shares my vision for the future of the organization

# The big shift to cloud for AI

**CTOs are at the helm during a massive IT infrastructure transformation. Companies across sectors and around the world have been on a steady path to cloud adoption, with many turning to hybrid or hybrid multicloud environments.**

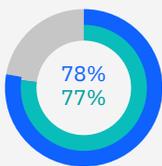
The shift in cloud hosting environments is well under way. While the CTOs in our sample say just 22% of applications, on average, were in the cloud two years ago, that number has risen to 39% today and is expected to reach 57% by 2022. Many are increasingly turning to hybrid or hybrid multicloud environments, especially those from larger organizations.

CTOs and their peers see a range of potential payoffs from cloud, especially around AI transformation. Nearly half say their use of cloud is substantially important or critical to areas like determining which AI projects to pursue, facilitating data-sharing, scaling AI applications, and the overall success of AI applications.

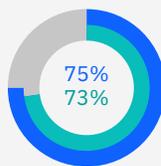
**Fig. 3: Cloud supports AI**

**Q:** To what extent do you agree with the following statements about your organization's use of artificial intelligence, cloud, and other advanced technologies in the next 3–5 years? "Strongly agree" and "Agree" responses

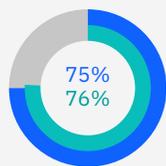
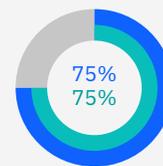
■ CTOs  
■ All others



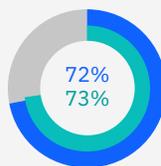
A unified platform for cloud, data and AI is critical to my organization's success in the long term



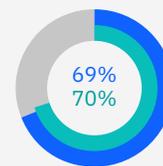
Cloud is critical to successful development of AI applications



Cloud is a critical foundation for data management and AI



Cloud is critical to the use of other advanced technologies



Some CTOs stand out from the rest of the IT function for their focus on AI in the cloud. Among the small group of CTOs who noted they are dissatisfied with their cloud hosting environment in some way, nearly one-fifth are unhappy because the cloud environment does not support AI applications. (Customer support improvements and security concerns are also important.)

Many obstacles to cloud and AI adoption are non-technical, underscoring the importance of the CTO's broadening strategic leadership role. Difficulty managing change and creating and deploying an adoption plan are cited as top challenges to AI implementation and are reported as barriers to cloud as well.

Gus Shahin, Chief Information Officer of Flex Ltd., the \$25 bn Singapore-based manufacturer, says his company has run into challenges when changing the way things have usually been done. Whether dealing with contract changes

with legal teams or supply-chain issues with operations teams, Mr. Shahin says the key to success is "defining a process together with the teams, not in isolation. Let them know that whatever they did in the past wasn't wrong, but we're going to help them do something better."

Of course, technology is still top of mind for CTOs, who also cite security and regulatory compliance, difficulty determining where applications should be hosted, and data governance issues as challenges. (Budget issues and a lack of workforce skills tend to be bigger issues for the smaller organizations in our sample, a consistent trend across industry sectors.)

# The path to value

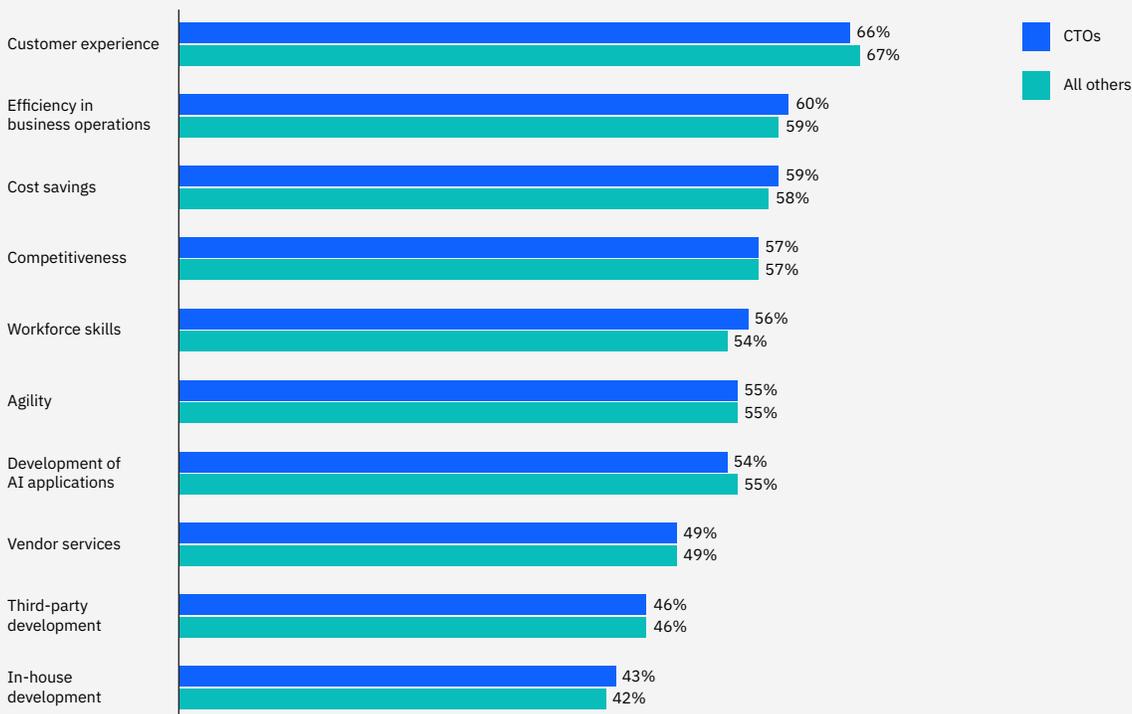
**Some organizations already report return on investment from their combined cloud and AI investments, with those furthest ahead in adopting the technologies most likely to say their use of cloud is accelerating that ROI. In these early days for this holistic approach to cloud and AI strategy, even those furthest along in adopting the technologies have work left to do before they realize value across business and technical operations.**

ROI is already being realized for many of the CTOs in our sample. Business operations, customer satisfaction rates, and customer service are among the top areas of business ROI; IT operations and process automation are the most common areas of positive technical ROI. Nearly two-thirds of CTOs say their use of cloud has accelerated ROI in terms of customer experience, and 60% say it has accelerated efficiency improvements.

**Fig. 4: How cloud accelerates ROI**

**Q:** To what extent has your organization's use of cloud enabled or accelerated your positive return on investment (ROI) in the following areas? "To a significant extent" and "Meaningfully" responses; top six responses shown

Base = 1,200



Returns look different across sectors. For example, telecom firms are more likely to report ROI in terms of IT operations, while healthcare payers and financial services firms are more likely to see value in risk and compliance, and manufacturing companies are more likely to say process automation has improved.

One potential barrier to realizing business and technical value more broadly: infrastructure and technology operations that need modernization. Roughly two-thirds of CTOs say their infrastructure, security, and integration operations are effective in terms of delivering business and technical value, but a much smaller percentage consider themselves highly effective.

Workforce issues remain a challenge as well, as CTOs are less likely to say their performance in terms of employee retention and satisfaction is strong than they are to rate their customer satisfaction highly. One-quarter (24%) of CTOs say that a top use of cloud for building and hosting AI applications includes better employee experiences.

# Conclusion

Chief Technology Officers will be critical to managing the ongoing transformation around cloud and AI—and ensuring that the technologies are implemented as part of an overarching digital strategy aimed at realizing ROI in critical areas. The perspective most CTOs bring, regardless of their industry, is essential to applying a balance of IT needs and customer needs to an organization, especially in how to bring the opportunity cloud and AI offer into reality for their business.

As the data show, while adoption isn't at peak yet for most organizations, many are finding success with applying both cloud and AI solutions to the specific needs of their industries. CTOs are in the middle of these decisions, understanding how to apply cloud to bring AI to drive insights or innovation, but also in how to use AI automation features to power cloud to use fewer resources and streamline processes.

For more information about how IT executives are adopting cloud and AI, and best practices for implementing the technologies, [see the full research report](#).

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IBM Corporation  
New Orchard Road  
Armonk, NY 10504

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