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ECONOMICS

Greater than the sum of their parts

How cloud and AI work together

In collaboration with:



Executive summary

Cloud and AI adoption have seen significant growth over the past year as executives increasingly focus on strategic imperatives such as automating business processes, modernizing applications, and streamlining development. When implemented in concert—and supported by a strong data strategy—cloud and AI provide value that is greater than the sum of their parts.

Companies that lead the way in cloud adoption tend to outperform their competitors against a variety of important business metrics. Adding artificial intelligence to cloud as part of a coherent digital strategy can lead to even better results in key areas, including a more agile response to the challenges of the coronavirus pandemic.

Oxford Economics and IBM surveyed 6,000 CIOs, CTOs, and senior IT leaders from organizations that are using cloud services in some capacity and at least experimenting with AI. Our analysis of the survey data, which covered six industries and 26 countries, shows that data strategies, AI and cloud—especially hybrid cloud—are increasingly effective and intertwined.

Cloud has become the essential environment for business applications, and AI (which is becoming more critical for automation, advanced analytics, and customer interactions) is best developed and deployed in the cloud, according to our survey results.

At the start of 2020, successfully adopting cloud and AI was a priority. Today it can be a survival-level challenge, as the global pandemic and resulting economic uncertainty accelerate change and foster disruption. In fact, the top-performing organizations in our survey—split into two groups we call Cloud Strategists and Cloud and AI Unifiers—are doubling down on their cloud and AI strategies.

About the survey

Sample: 6,000 CIOs, CTOs, VPs of IT, and equivalent titles

Sectors covered: Retail, manufacturing, financial services, telecommunications, 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 United States

Dates fielded: May through August, 2020

Key findings

Cloud and AI are already delivering value.

Many respondents report value from their combined cloud and AI projects, with ROI coming most often in business operations, IT operations, and customer service.

Organizations that are further along in cloud and AI adoption outperform their peers.

Our leader segments are distancing themselves from the pack in important ways, including stronger reported effectiveness across a range of technology and business areas. Those furthest along in their use of AI and cloud—who also are somewhat more likely to be in a hybrid cloud environment—are more likely than others to see cloud as an accelerant of their ROI.

Cloud is becoming a foundational technology for the emerging AI era.

Modernizing the business, automating decisions and workflows, and improving customer experiences are top motivators for AI adoption. The joint development of cloud and AI-enabled applications is a priority for executives, who are focused on how these technologies support strategy, tactics, and performance. Nearly three-quarters (74%) agree that cloud is critical to the successful development of AI applications. Hybrid cloud users are more likely than others to say the effective use of AI will be critical to their organization's long-term success (80%, vs. 67% of those in all-public or all-private environments).

AI depends on data, and that data is increasingly complex.

For 77% of respondents, a unified platform for cloud, data, and AI is seen as critical to long-term success, and a similar number say cloud is a critical foundation for data management and AI. Respondents further along in adopting cloud and AI are more likely than others to see cloud as critical for data management and AI, along with other advanced technologies.

Complex business needs demand a tailored approach to cloud.

Executives are increasingly focused on building diverse cloud portfolios by using multiple types of hosting environments to support different needs and opportunities. This momentum is expected to accelerate in the next two years, and many are shifting to hybrid multicloud environments.

The research reveals key insights into the relationship between hybrid cloud and AI relevant to both senior technology and business executives. The full white paper will consider some of the strategies that underpin the success of organizations around the world—including how they make decisions about cloud, progress toward implementation of AI applications, and the people, process and platform strategies of the organizations furthest along in this transformation journey.

How AI in the cloud pays off

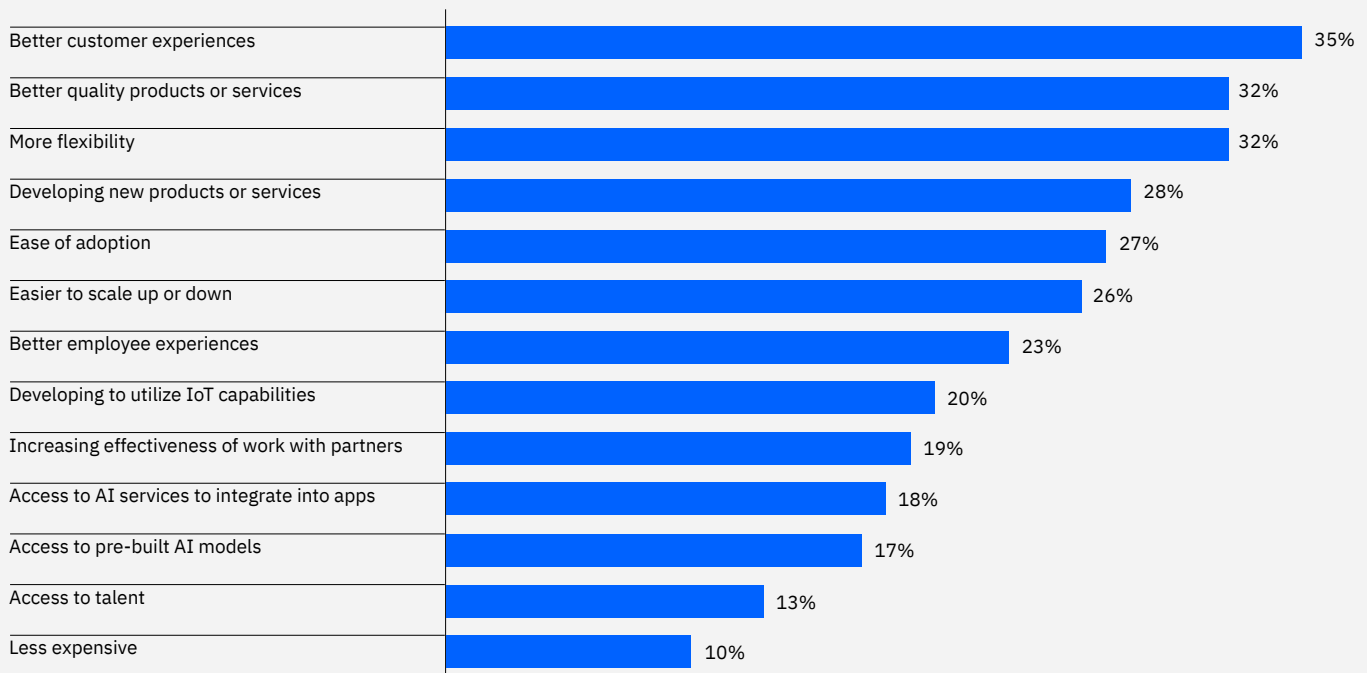
An integrated strategy for cloud and AI can deliver benefits in several different areas. Asked to name the biggest advantages of using cloud to build, modernize, and host applications that incorporate artificial intelligence, respondents are most likely to cite external business drivers such as better customer experiences, better-quality products or services, and more flexibility.

The use of cloud is already accelerating returns across a range of measures. Customer service and customer satisfaction rates are cited as top areas of business ROI; customer experience is also an area where over two-thirds say their use of cloud is contributing meaningfully to returns. Efficiency in business operations, cost savings, competitiveness, and agility are also among the operational line-item benefits from cloud investments.

Fig. 1: Advantages of cloud for AI

Q: What are the biggest advantages of using cloud environments to build, modernize and/or host applications that incorporate artificial intelligence?

Respondents could select all that apply.



Combining cloud and AI is paying off for survey respondents who are further ahead in their adoption of the technologies. Looking for high-performance organizations among our survey population, we analyzed the data to identify two subsets of respondents who stand out from their peers in terms of progress toward cloud adoption or cloud and AI adoption—and in the performance they report across a range of critical metrics.

Companies in these two groups are likely pursuing the AI and cloud strategies they believe will best allow them to achieve their specific goals. One group, which

we call **Cloud and AI Unifiers**, combines cloud and AI in a strategic way, and boasts the highest levels of ROI in several important areas. These organizations have a substantial and fast-growing number of applications in the cloud, incorporate AI into a meaningful percentage of applications, use cloud and AI in tandem, and believe that a unified platform for cloud, data, and AI is critical to their organization's success in the long term. A second group, **Cloud Strategists**, is less focused on AI but still stands out from other respondents as early adopters of cloud. (See “Assessing cloud and AI maturity” for a full definition of our leader segments.)

Assessing cloud and AI maturity

Respondents who lead their peers in terms of progress toward cloud adoption or cloud and AI adoption met the following criteria:



Qualification criteria for Cloud and AI Unifiers (highest maturity)

n=809 respondents, 13.5% of respondents

- Must have had at least 20% of applications in the cloud two years ago
- Must have at least 40% of applications in the cloud today
- 21% or more of new apps incorporate AI
- Must use cloud in combination with AI
- "Agree" or "Strongly agree" that a unified platform for cloud, data, and AI is critical to their organization's success in the long term



Qualification criteria for Cloud Strategists

n=1,589 respondents, 26.5% of respondents

- Must have had at least 20% of applications in the cloud two years ago
- Must have at least 40% of apps in the cloud today

Cloud Strategists and Cloud and AI Unifiers report stronger performance than others in a range of vital areas, including revenue and budget growth over the past two years. These two outperformer groups are more confident in their organizations' effectiveness in terms of innovation, efficiency, customer satisfaction rates, and the ability to respond to disruption in real time.

The most mature group—Cloud and AI Unifiers—are also more likely than all others to say their use of cloud has accelerated ROI in a number of areas. The Cloud

Strategists group is much less likely—even compared with those who do not qualify for either leader group—to report accelerated ROI in these areas.

Cloud and AI Unifiers and Cloud Strategists pursue their different strategies around people, processes, and platforms, toward somewhat different ends.

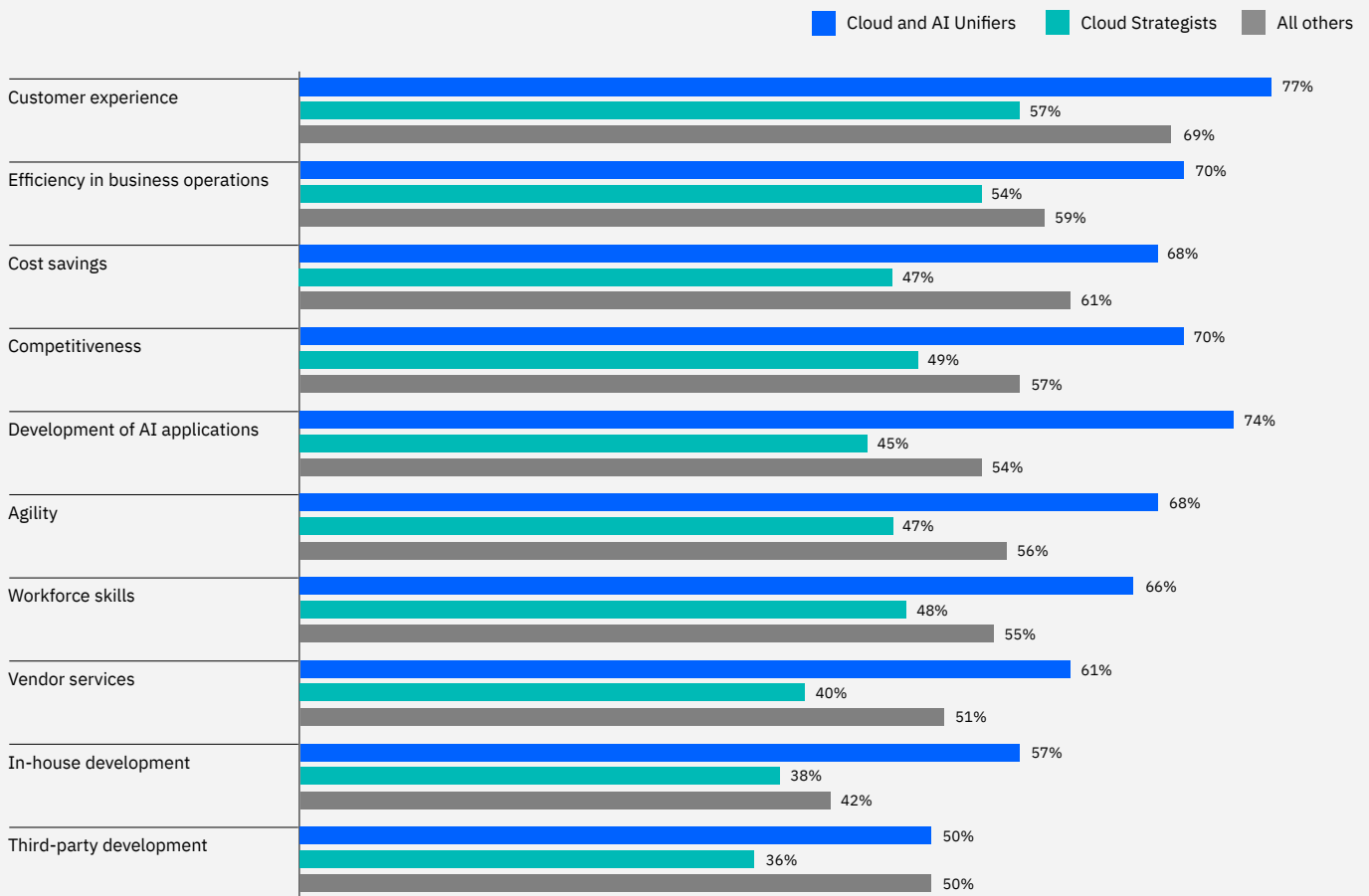
For example, both Cloud and AI Unifiers and Cloud Strategists segments are more likely than others to say they have changed hiring strategies to focus on AI (36%

Fig. 2: Cloud accelerates ROI for leaders

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

Cloud and AI Unifiers = 809 | Cloud Strategists base = 1,589 | All others base = 3,602



and 34%, vs. 26% of others), and the most mature group is more likely to say that reskilling employees to work with advanced technologies has become significantly more important as a result of COVID-19.

AI and cloud integration demands process change, too. Cloud and AI Unifiers are most likely to have redesigned business processes for AI (44% have done so), followed by Cloud Strategists (35%) and all others (30%). They also are more likely to have increased data-sharing across the organization (41%, vs. 35% and 30%) and developed teams to explore new applications of AI (39%, vs. 33% and 29%).

Those data-sharing and AI strategies also inform choices around cloud hosting environments as IT executives seek to balance efficiency, reliability, innovation, and other priorities. Like other respondents, Cloud and AI Unifiers

and Cloud Strategists take varying approaches to cloud hosting environments: 69% of the most mature group are in a hybrid or hybrid multicloud environment today, vs. 65% of Cloud Strategists and 62% of all others—but a solid number remain in private or public environments.

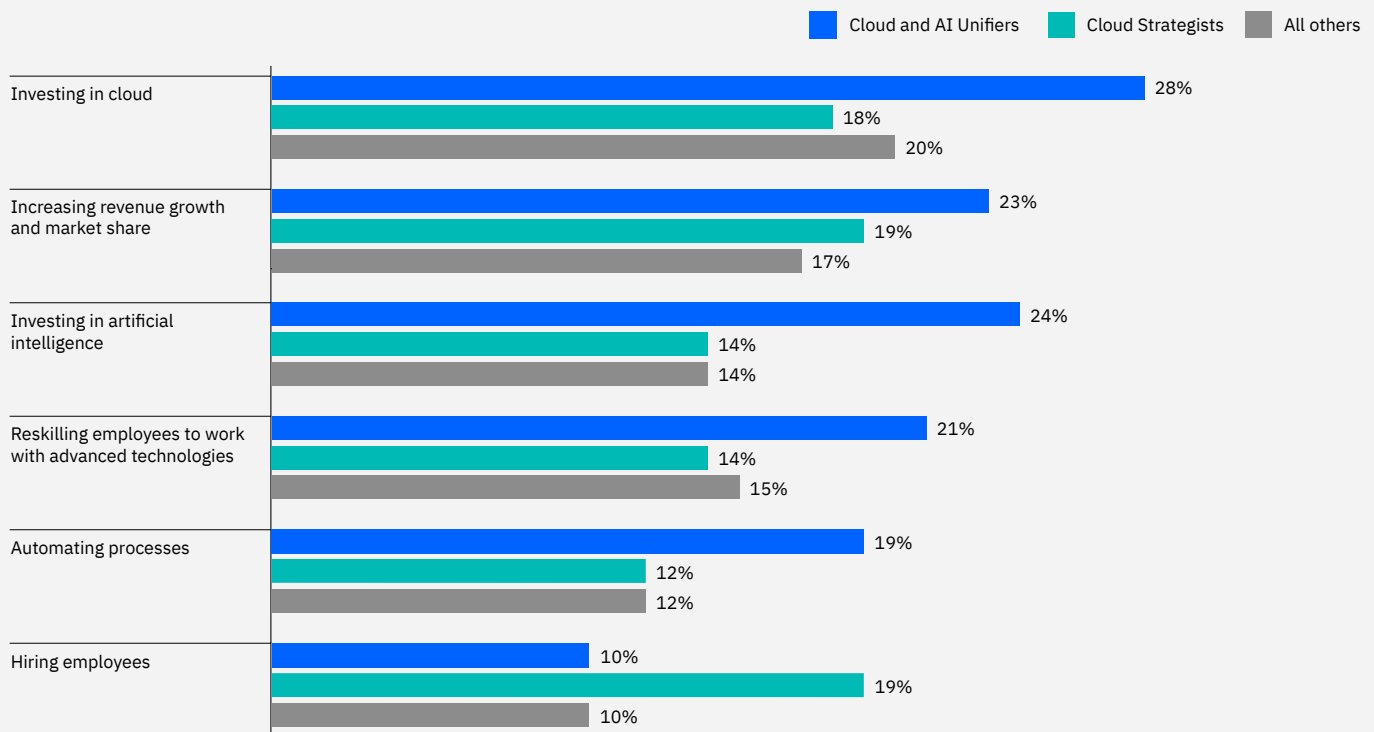
When we asked respondents what factors determine how their organization hosts, builds, or manages work in the cloud, vs. on-premises, Cloud and AI Unifiers were more likely to consider a number of factors, including robustness of technology infrastructure (39%, vs. 26% of Cloud Strategists and 30% of all others), access to AI services and models (32%, vs. 24% and 21%), and criticality of the business application to core operations (31%, vs. 23% and 25%). Cloud and AI Unifiers and Cloud Strategists also are less likely to have increased their focus on cost-cutting in response to COVID-19.

Fig. 3: An increased emphasis on cloud in the COVID-19 era

Q: How have the following strategies and plans changed as a result of COVID-19 and the resulting economic downturn?

“Significantly more important than before COVID-19” responses; only select answer choices are shown

Cloud and AI Unifiers base = 809 | Cloud Strategists base = 1,589 | All others base = 3,602



An emphasis on AI adoption

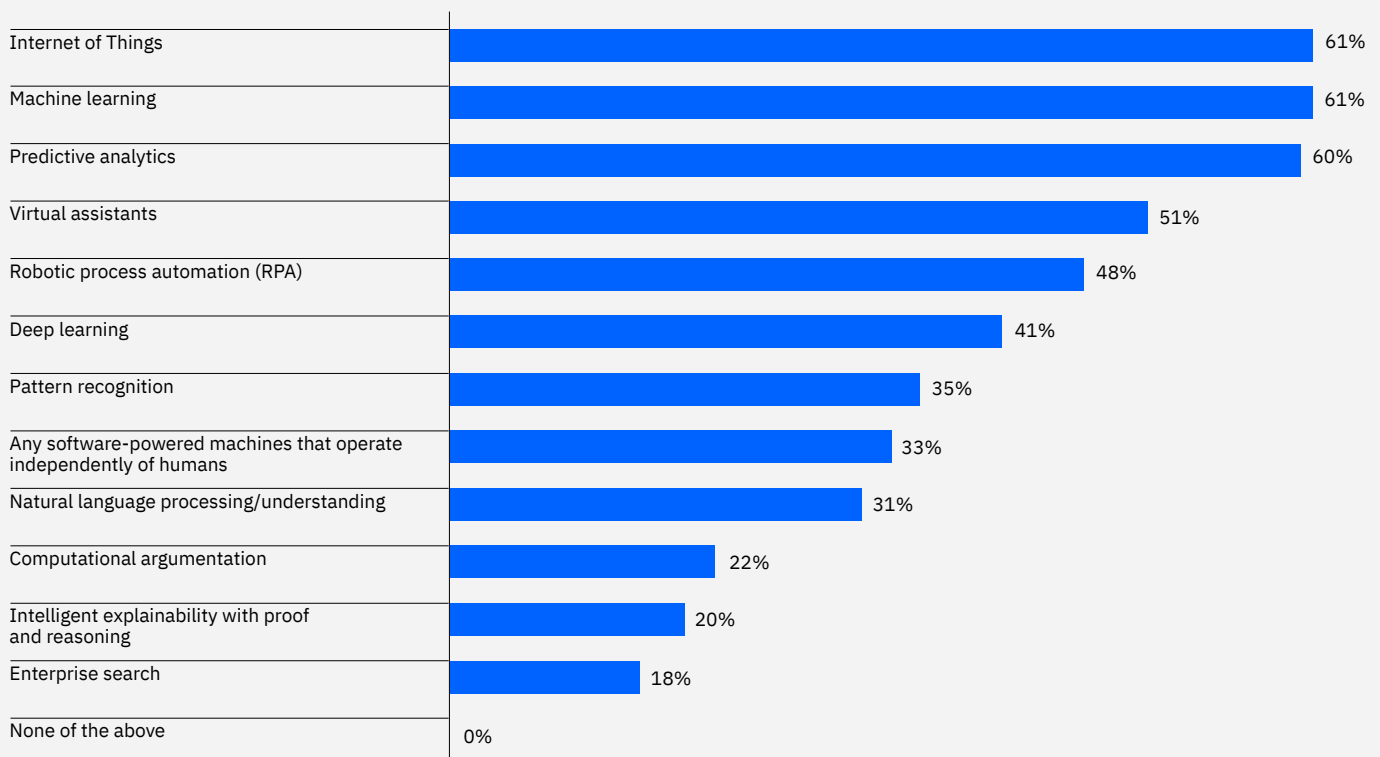
Adoption rates for artificial intelligence are steadily growing, and the technology's move into the mainstream is well under way, with early adopters seeing measurable results from their investments. The number of new applications that incorporate AI is relatively high—about 20% on average across our survey respondents—with a small subset of that group incorporating AI into more than 30% of new applications.

Respondents are also investing in specific AI-powered applications, or other technologies that might incorporate or depend on AI. A majority of respondents are investing in predictive analytics (60%), IoT (61%), and machine learning (61%); adoption rates are also high for virtual assistants (51%), robotic process automation (RPA) (48%), and other areas.

Fig. 4: Investment in AI takes many forms

Q: In which of the following AI domains is your organization investing?

Base = 6,000



Decision-makers across industries are looking to AI to address a variety of business issues, with deployment furthest along in the customer service function (a finding in line with recent econometric analysis done on a different dataset by Oxford Economics and the IBM Institute for Business Value), along with IT and business operations.

Top reasons for implementation include modernizing business processes, products, and services; automating decision-making and workflows; improving customer experiences; and becoming more agile. Those respondents who agree that a unified platform for data, AI, and cloud is critical to future success are even more likely to emphasize modernizing business process and automating decision-making.

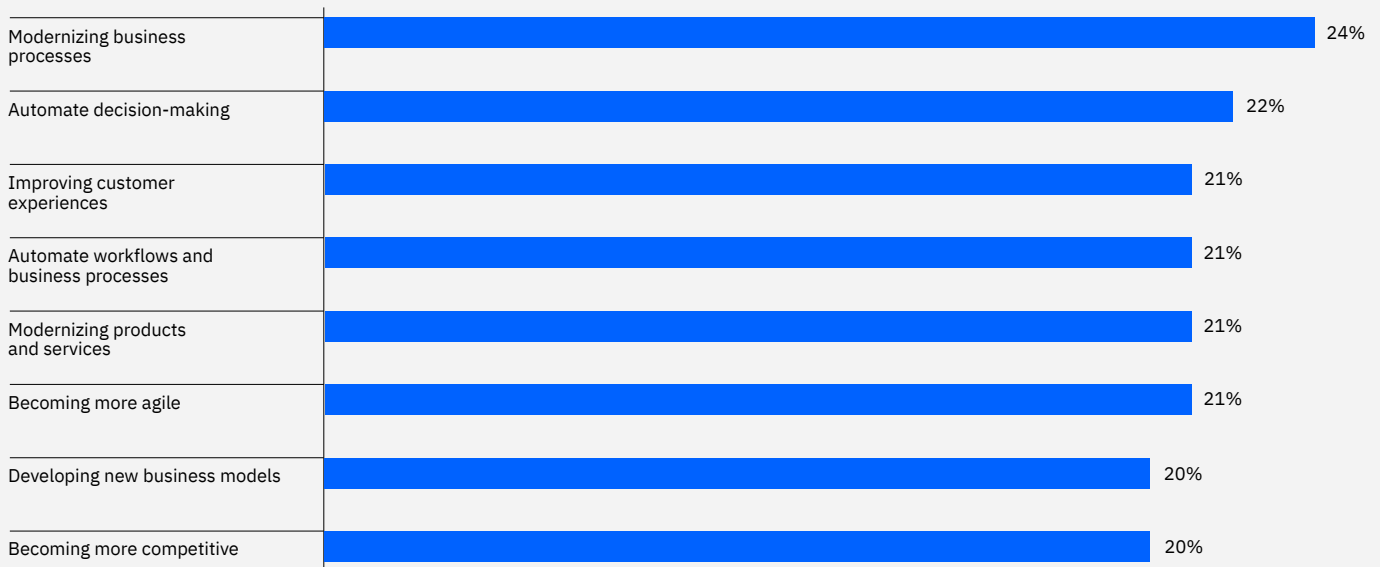


Fig. 5: Modernization, efficiency, and agility among top motivators for implementing AI

Q: What are your organization's top motivators for implementing artificial intelligence?

Respondents could select all that apply; top seven responses shown

Base = 6,000



When we asked the executives in our survey what kind of customer or employee experience they would design and build if money, people, and time were no object, automation for the sake of efficiency and improved support came up as a hot topic, with some citing digital assistants to improve decision-making, RPA to decrease time spent on routine tasks, and real-time data to personalize experiences and respond dynamically to changing market needs.

Using cloud environments for various phases of AI-enabled applications yields a range of advantages for our

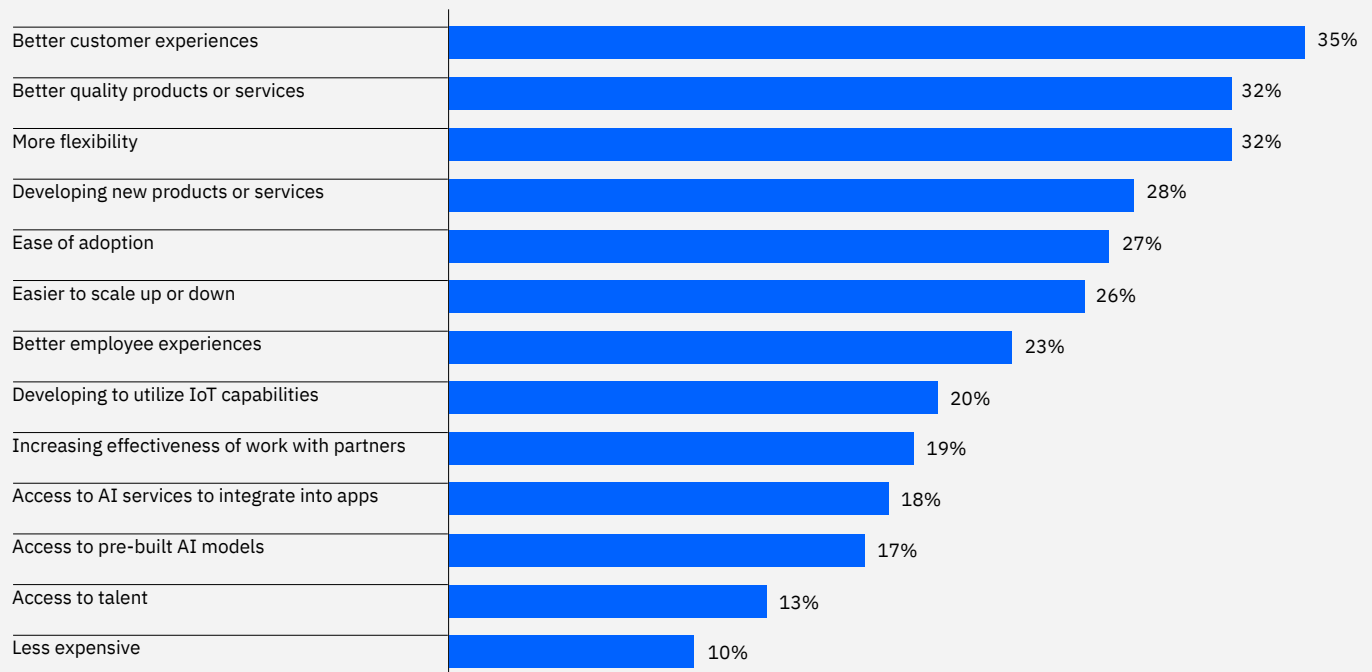
respondents, led by better customer experiences, higher-quality products or services, and increased flexibility. Yet AI in the cloud is not addressing every business need: for example, access to pre-built AI models or AI services to be built into apps are not widely seen as a top benefit of using cloud for AI. Other strategic uses of cloud have yet to surface as a top advantage: while these cloud environments for AI may someday increase access to talent through developer platforms and broader partner ecosystems, just 13% cite it as a primary advantage today.

Fig. 6: How cloud enables AI value

Q: What are the biggest advantages of using cloud environments to build, modernize and/or host applications that incorporate artificial intelligence?

Respondents could select all that apply.

Base = 6,000



No major technology implementation is easy, and challenges are multiplied early in the game. These challenges go beyond technical details—in fact, difficulty managing change and difficulty creating and deploying an adoption plan are the top-cited barriers by our respondents, followed by determining where data and applications should be hosted. One area that is not a challenge: finding support from the executive suite and from employees, the two lowest-ranked obstacles, each cited by only about 10% of respondents.

relatively slow to make these types of changes across the board: only about one-third have redesigned business processes for compatibility with AI, increased data-sharing within the organization, or reskilled talent to focus on AI. Another looming risk: only 36% have defined and communicated ethical standards for AI use, which could lead to unintended consequences as decisions that affect the lives of customers and employees are increasingly automated. (See another report from the IBM Institute for Business Value, [“Advancing AI ethics beyond compliance,”](#) for more detail.)

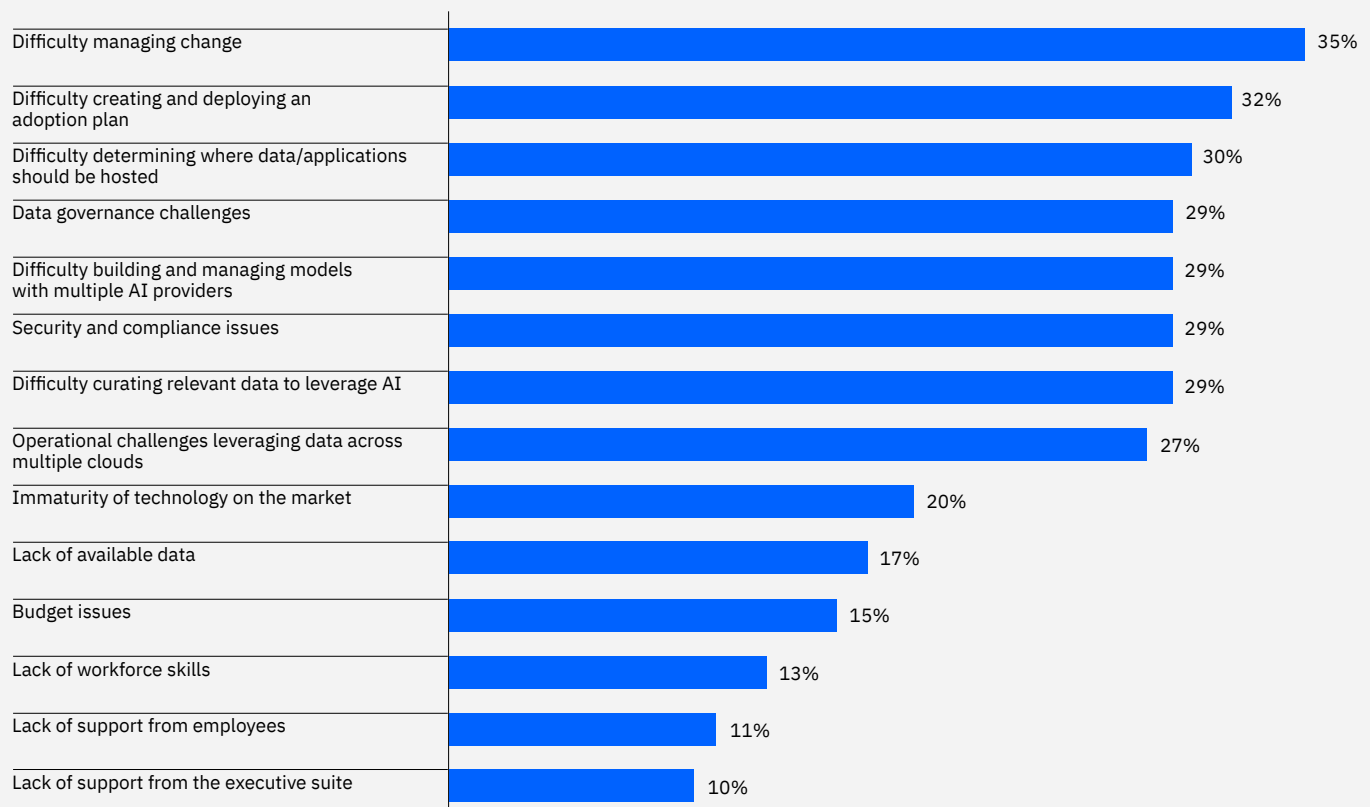
Leaders may be able to circumvent some of these barriers by changing organizational tactics. Yet many are

Fig. 7: Barriers to AI adoption go well beyond IT

Q: Which of the following barriers has your organization faced in your AI adoption efforts?

Respondents could select all that apply.

Base = 6,000



Data: The essential fuel

Unifying cloud and AI development requires a solid foundation of data management, and survey respondents are focused on combining their strategies around cloud, AI, and data. More than three-quarters (77%) say a unified platform for cloud, data, and AI is critical to their organization's success in the long term, and 75% say cloud is a critical foundation for data management and AI.

Good results require good data

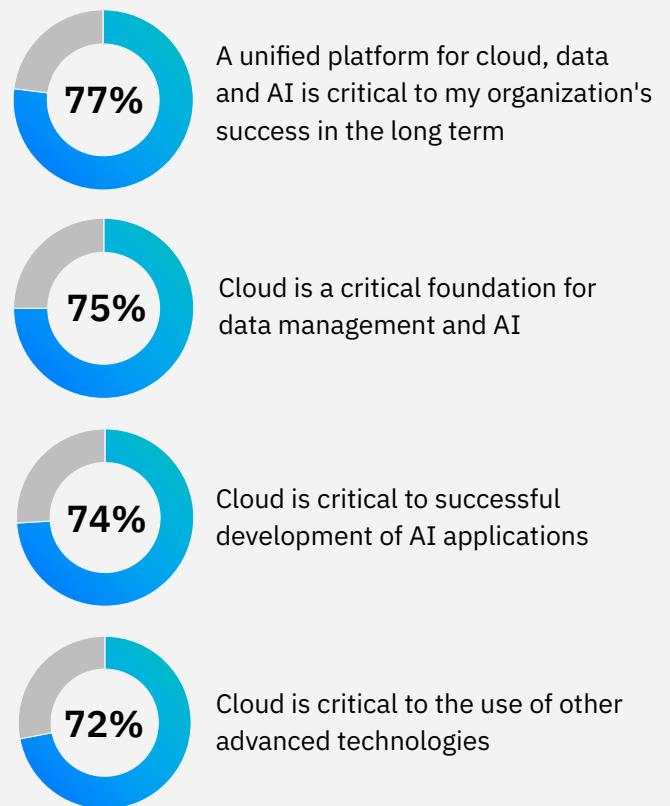
“You can only have good AI or good results if you have tons of data, and the cloud providers are the ones with the most data for sure,” says **Gus Shahin, chief information officer at Flex**, the \$25 billion electronics manufacturer with operations around the world. “So they’re going to take the lead in coming up with better intelligence. There’s no doubt, because they’re sitting on tons and tons of data.” Some types of data still typically reside in on-premise or private clouds, including sensitive information around financial reporting and intellectual property—but these types of data still need to integrate with others in order to support advanced analytics, automation, and collaboration across functions.

As unified platforms for cloud, data, and AI increasingly define maturity in these areas—and the ability to leverage them in combination—respondents who agree that such platforms are critical to their organization’s long-term success are relatively evenly distributed across the industries and countries surveyed, although they are somewhat more likely to be among the larger organizations in our sample. These platform-focused respondents are more likely to say their organization is effective or highly effective in delivering business and technical value and to rate the effectiveness of their technology operations more highly than other respondents.

Fig. 8: The platform mindset

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?

Base = 6,000



Strong proponents of a unified platform strategy are particular about the clouds they use and often opt for the flexibility of multiple clouds; two-thirds describe their current hosting environment as hybrid multicloud or hybrid cloud (vs. 55% of others). They also are more likely than others to say their Big Data and machine learning workloads are in a hybrid or hybrid multicloud environment today (63%, vs. 51% of others); the same is true of infrastructure and web applications (59% are in a hybrid or hybrid multicloud environment, vs. 48% of others) and AI application development (65% vs. 55%). All respondents—not just those that are enthusiastic about cloud and AI platforms—seem to be moving to hybrid environments to manage workloads, which will require strong data management practices.

Availability of data is no longer a major problem for most companies—just 17% cite it as a barrier to AI adoption—but managing it is. Data governance and difficulty curating relevant data to leverage AI are each cited by 29% of respondents as a barrier to AI adoption, and roughly one-quarter say similar challenges hinder their cloud adoption. Respondents who agree that a unified platform for data, cloud, and AI is critical are more likely than all others to say their cloud environment is critical to efforts in facilitating data-sharing (21% vs. 11%) and facilitating analytics/machine learning (17% vs. 10%), among other areas.

Data strategies resonate beyond internal operations, but our research points to a capability gap for many respondents when it comes to sharing data beyond the firewall. Nearly three-quarters say they are effective or highly effective in terms of data-sharing within the organization, with far fewer (58%) confident in their data-sharing with external partners. Among survey respondents who noted they are dissatisfied with their cloud environment in some capacity, nearly one-third say a primary reason is difficulty accessing and securing data.

"You can only have good AI or good results if you have tons of data, and the cloud providers are the ones with the most data for sure, so they're going to take the lead in coming up with better intelligence. There's no doubt, because they're sitting on tons and tons of data."

Gus Shahin

chief information officer
Flex

The rise of hybrid cloud

More than a decade into the cloud era, the market continues to expand and evolve. On average, less than one-quarter of our respondents' applications were in the cloud two years ago (22%), a number that has almost doubled today (39%); within two years, well over half (56%) of applications are expected to be in the cloud. Cloud strategy is increasingly focused on finding the right mix of environments for different purposes, rather than choosing between public and private clouds.

Hybrid cloud and hybrid multicloud are expected to be the dominant environments for a variety of workloads within two years: nearly two-thirds of our respondents expect to host customer-facing applications, back-office applications, Big Data or machine learning workloads, and AI application development in these hybrid environments within two years' time.

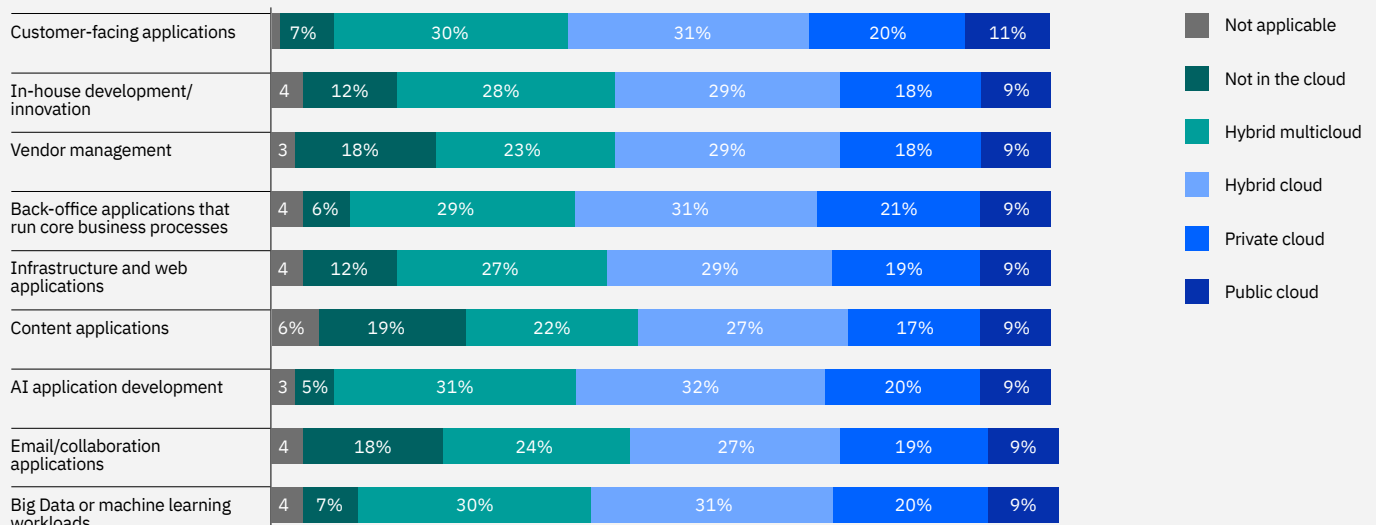
Defining hybrid cloud

We asked survey respondents to differentiate between multiple types of hybrid cloud environments:

- Hybrid refers to a technology environment that mixes public cloud, private cloud and on-premises.
- Hybrid multicloud is a combination of running applications on all types of environments, including multiple public clouds and at least one private cloud.

Fig. 9: Across workloads, a focus on hybrid

Q: Which types of workloads are in the cloud today at your organization, and where are they hosted?
Base = 6,000



While several variables may drive the pace of AI adoption, our data suggest that hybrid multicloud may be the most AI-friendly of cloud environments. Hybrid multicloud users are more likely to have deployed artificial intelligence in several areas, including process automation and business operations, compared with their peers in hybrid, private, or public environments. Hybrid users in general are happier with their hosting environment, with more than eight in 10 saying they are satisfied or highly satisfied.

The right cloud environment allows organizations to innovate and operate more efficiently, perhaps especially when it comes to AI development. Many see their use of cloud as vital to the overall success of AI applications (46%), determining which AI projects to pursue (47%), scaling AI applications (44%), and expanding their network of developers for AI projects (42%).

Flex uses a hybrid multicloud model, in large part because of the flexibility it provides.

“Our strategy is dynamic. At the end of the day, it’s got to be quality of the solution, and of course, total cost of ownership.”

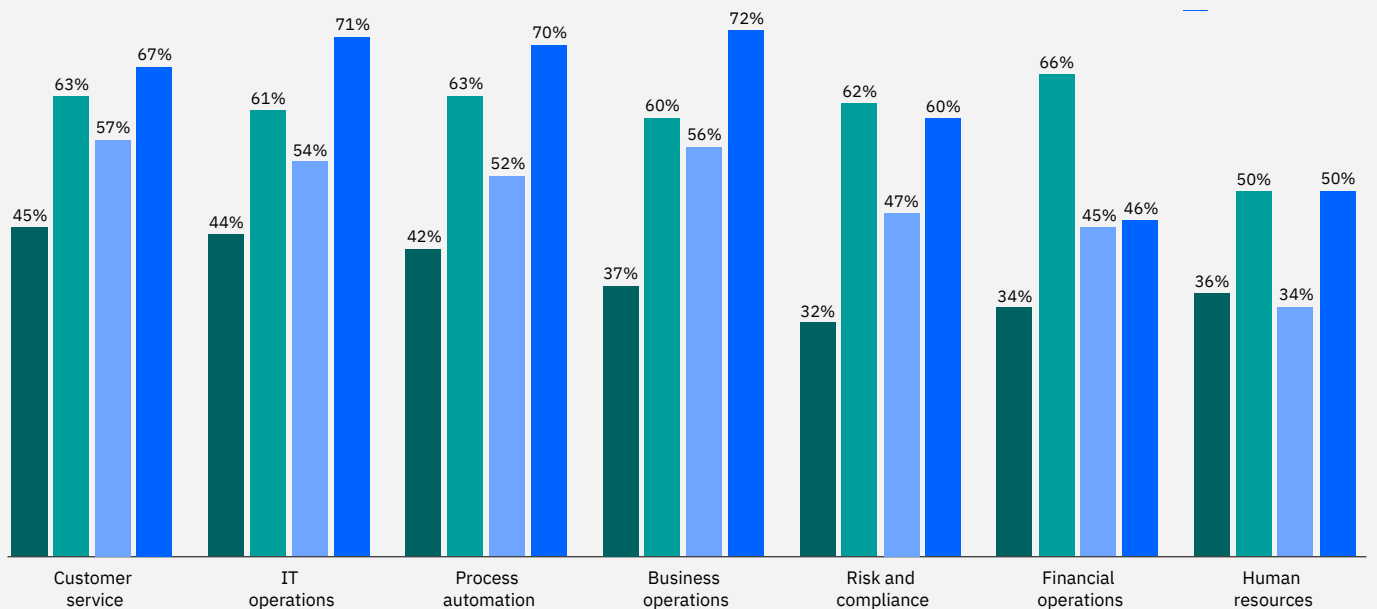
Gus Shahin
Chief Information Officer
Flex

Fig. 10: Cloud environment informs AI deployment decisions

Q: In which of the following areas has your organization deployed AI?

“Already deployed” responses

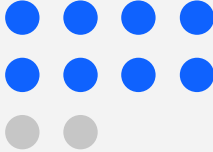
Base = 6,000



Decisions as important as cloud adoption require a strategic approach, and this takes work: top challenges to adoption for our respondents include difficulty creating and deploying an adoption plan (32%), difficulty determining which applications should be hosted (29%), change management across the organization (29%), and security or regulatory compliance issues (29%).

How are organizations making these strategic decisions? The top-cited factors determining how our respondents decide where to build, host, and manage work in the cloud are potential ROI, complexity of the business application in question, relative need for scalability, and data accessibility.

8 in 10

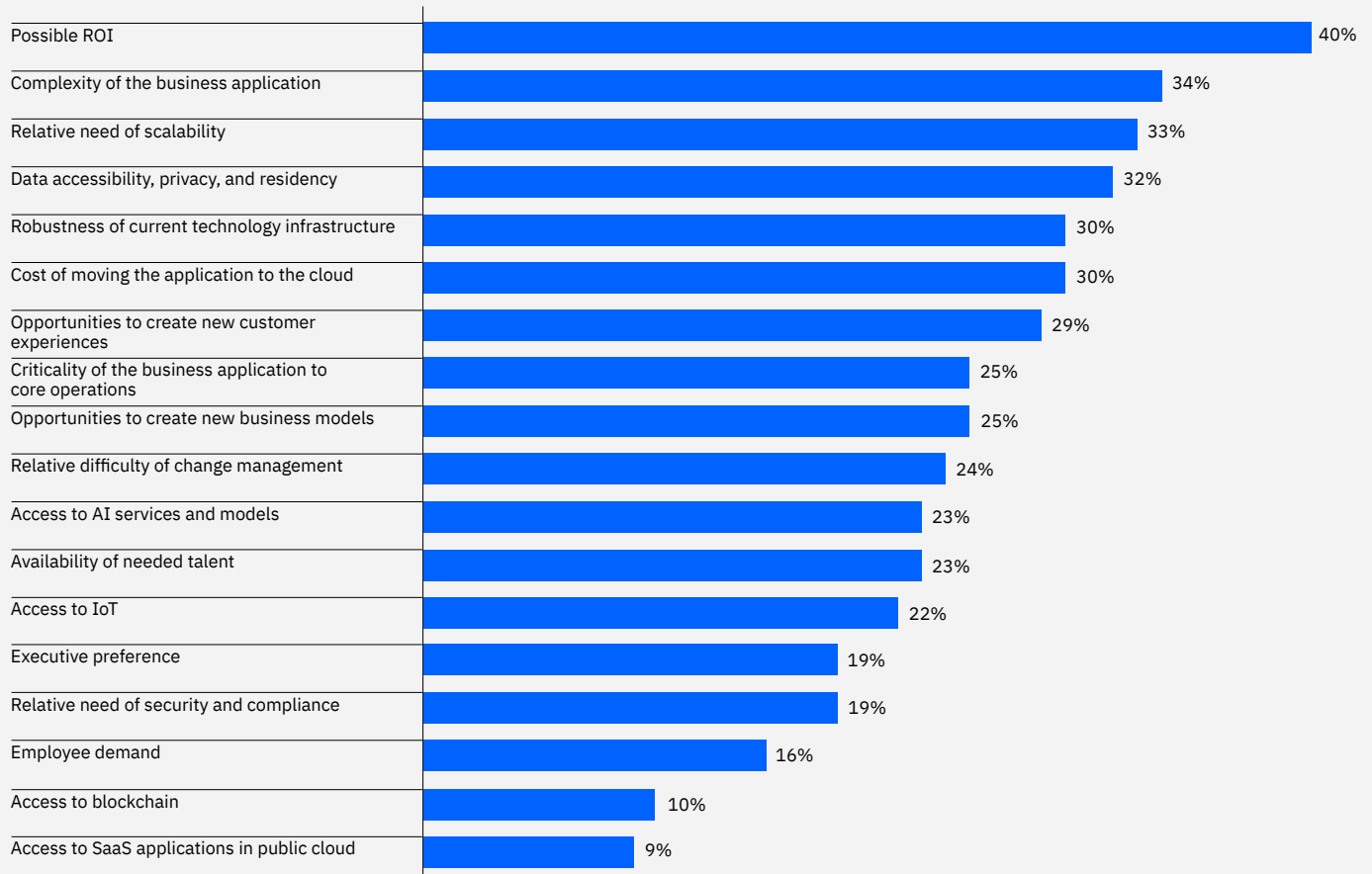


Hybrid users in general are happier with their hosting environment, with more than **8 in 10** saying they are satisfied or highly satisfied.

Fig. 11: Factors influencing hosting environments

Q: In general, which factors determine how your organization hosts, builds, and/or manages work in the cloud, vs. which it keeps on-premises?

Base = 6,000



Cloud and AI adoption around the world

Our survey included representation from 26 countries in North America, Latin America, EMEA, and Asia Pacific. The results point to relative consistency to cloud and AI strategies, effectiveness, and outcomes around the world, with some trends emerging:

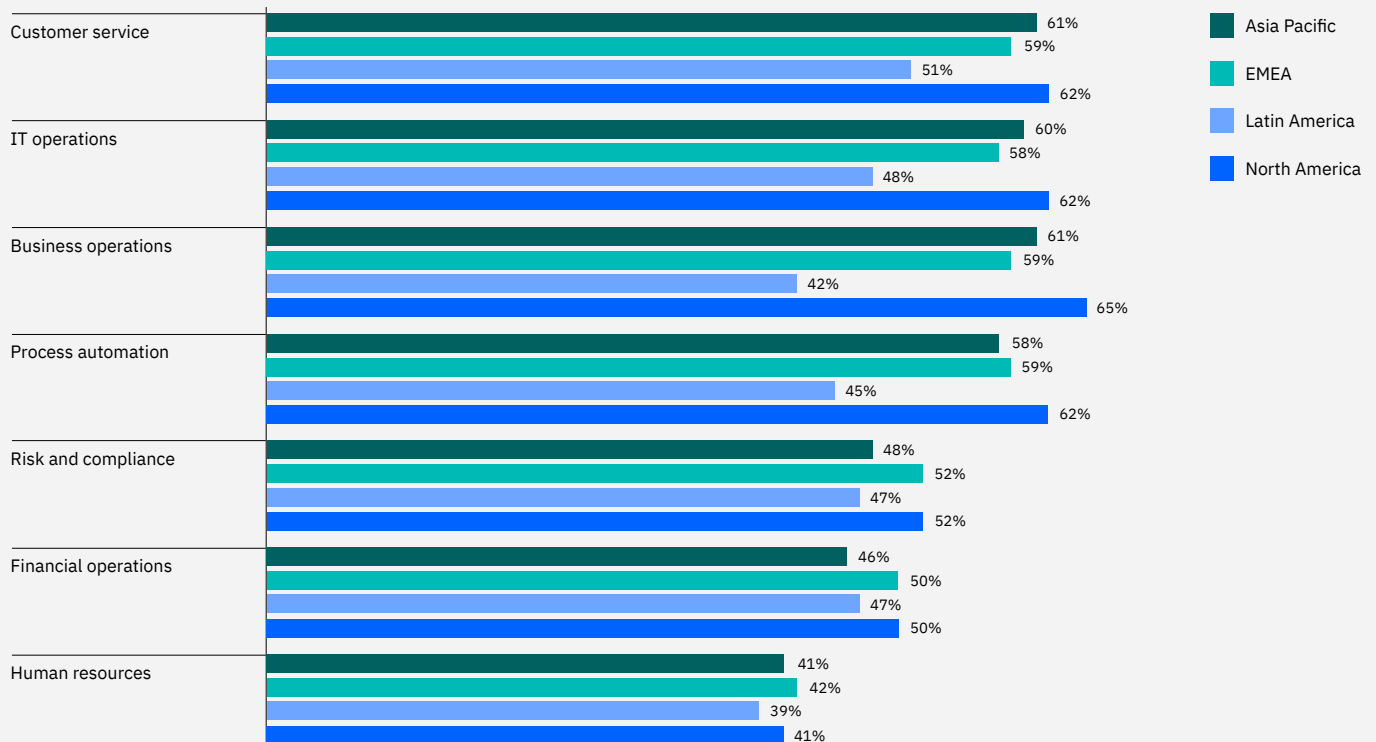
– North American respondents in our sample tend to be slightly more confident than others in the effectiveness of technology operations, like data and applications; meanwhile, Latin American respondents are consistently somewhat less confident in these areas.

Fig. 12: Progress toward AI deployment around the globe

Q: In which of the following areas has your organization deployed AI?

“Already deployed” responses

Asia Pacific base=1,500 | EMEA base = 1,500 | Latin America base=1,500 | North America base=1,500



- Around the world, respondents are shifting to hybrid multicloud environments and investing in artificial intelligence, though Latin American organizations are consistently least likely to say they have deployed AI across the business.
- Respondents from North America and EMEA tend to be more likely than their peers in Asia Pacific and Latin America to be investing in AI domains like IoT, machine learning, and predictive analytics.
- Reports of ROI from combined cloud and AI projects are fairly consistent across the regions surveyed, with business and IT operations the most frequent beneficiaries. Customer satisfaction rates are another top area of improvement, though North American respondents are less likely than those in other regions to have seen payoffs in this area.

Conclusion

Every organization has its own needs and capabilities, but our research points to some clear strategies and steps that are relevant for any leader interested in harnessing the power of AI-enabled applications and building the next-generation IT cloud-based infrastructure needed to support innovation, efficiency, and growth. Below are three recommendations for strategic reviews or projects to include in your 2021 planning.

Recommendation #1: Take a holistic approach with people, process and technology

The companies in our survey furthest along in cloud and AI adoption see cloud as their critical foundation for data management and AI, and have a unified strategy for all three. These companies outperform other respondents in terms of data-sharing, automating processes, and the pace of upgrades to technology infrastructure—but also understand that success requires going beyond technology to include cultural changes.

These organizations are more focused on attracting and retaining talent, organizing teams, and partnering with other organizations. They are also more likely to say reskilling employees to work with advanced technologies has become more important in the wake of COVID-19. This attention to detailed people and process changes flows into AI strategies, with the most advanced organizations more likely to have redesigned business processes for AI, developed teams to explore new AI applications, and increased data-sharing across the organization.

Learn how IBM Garage can [help power digital transformation](#) with new ways of working, leading technologies and multidisciplinary experts.

Recommendation #2: Choose your cloud strategy carefully

When such a wide variety of workloads, data, and applications are in the cloud, there is no one-size-fits-all cloud strategy. A majority of our survey respondents are on a long-term migration path to fully cloud-based environments for their applications, and increasingly seeing a need to shift to more diverse and flexible cloud environments along the way. This is especially true given the fact that increasing in-house and third-party development, which requires careful management of clouds, as a barrier to expanding their cloud footprint.

Advanced companies tend to take more factors into account when they make their cloud choices: they are more likely to identify important elements, such as the complexity of the business application involved, the robustness of their current technology infrastructure, opportunities to create new customer experiences, and the relative difficulty of change management. ROI is the primary driver of these hosting decisions overall, as all organizations seek to balance efficiency and need of their workloads and applications with the right cloud provider and are challenged to find the exact right fit with any single provider for every purpose.

As more workloads and applications move to cloud, more organizations will likely continue to bring more clouds into their infrastructure mix, adding complexity to decisions and process changes—especially when it comes to making choices around AI. Hybrid and hybrid multicloud are emerging as the preferred options for AI development and hosting, especially among the most advanced companies in our survey.

Learn how to [gain flexibility and portability for applications and data](#) across cloud and on-premises resources.

Recommendation #3: Align technical and financial ROI goals to maximize performance

Most organizations are not yet getting uniform returns on investment from combined cloud and AI investments in terms of business and technical performance: our respondents tend to see the strongest ROI for technical performance in IT operations and process automation, while financial ROI is realized more often from customer-facing operations. When both are considered in tangible terms for recognizing business value, the overall business will succeed.

Even those furthest along in cloud and AI adoption are still struggling to meet both business and technology objectives, but the most advanced companies are somewhat more likely to report financial ROI in business, finance, and human resources operations, and technical ROI in customer satisfaction rates—and to say their use of cloud plays a key role in realizing value.

Data is important, too: it ranks as the most effective means of delivering technical and business value, with more advanced companies even likelier to say so.

Ideally, technical ROI should ultimately support financial ROI—and will be pursued in tandem as part of a cohesive strategy. Other research from IBM’s Institute for Business Value studies—“[The Hybrid Platform Advantage](#)” and “[Proven Concepts for Scaling AI](#)”—shows results and recommendations to drive ROI and value, that the way to scale cloud and AI most effectively relies on a cloud platform and management approach, and that AI engineering and processes discipline to guide AI initiative to production at scale. (Review each paper for their individual recommendations for implementing a cloud platform approach and building a world class AI capability.)

Learn more about proven value-driving methodologies for [IBM’s hybrid cloud](#) and the [journey to AI](#).

About the research

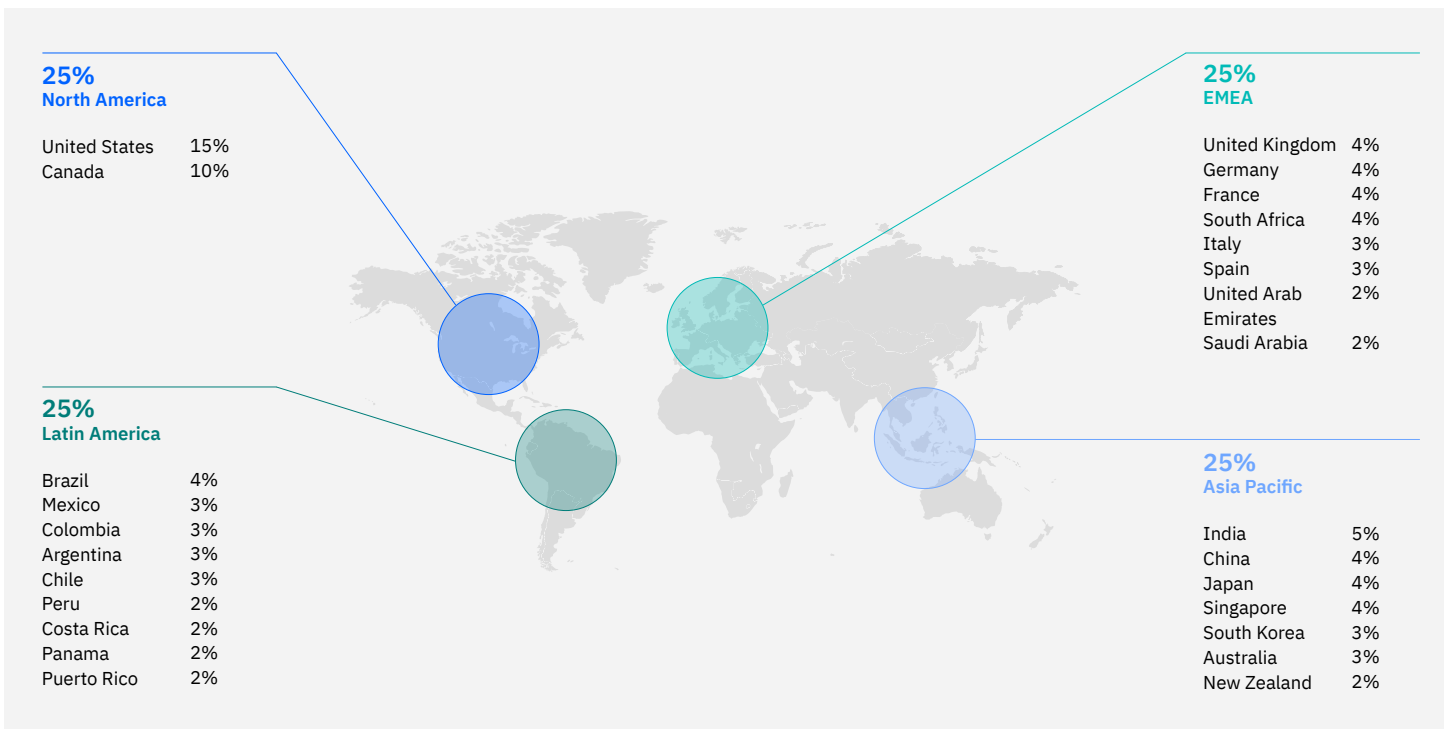
Oxford Economics and IBM surveyed 6,000 executives in May through August 2020 at organizations around the world and across industries about their use of cloud and artificial intelligence. Survey respondents were asked about a number of areas relating to their company's technology strategies and performance, including:

- Progress toward cloud adoption
- Progress toward AI adoption
- Motivations for implementing cloud and AI
- Return on investment from business and technology points of view
- Company performance

Respondents are evenly distributed across a half-dozen sectors: retail, manufacturing, financial services, telecommunications, and healthcare providers and payers.

Companies represented come from around the world.

We also asked respondents some open-ended questions about their AI strategies, and are in the process of conducting in-depth interviews with a handful of senior executives.



Sponsor statement

As you just read, another wave of business transformation—driven by hybrid cloud and AI—is just ahead. Through our client work and R&D across more than 20 industries, IBM sees this transformation driven by three major shifts: 1) the modernization of critical workloads to build scalable applications at speed; 2) the adoption of Kubernetes to orchestrate applications across any environment; and 3) the growing use of operational AI and edge applications that shape business outcomes with data-driven insights.

Only a unified cloud, data and AI architecture—which 77% of the respondents in the study cited as critical to their organization’s success in the long term—can provide a consistent, standards-based approach to development, security, and operations. A smarter architecture is a hybrid cloud architecture that allows for workload portability, orchestration, and management across multiple environments.

At IBM, we believe this is best achieved with Red Hat OpenShift, which is built on the open technologies of Linux, containers and Kubernetes. It provides a unifying layer—a standard open platform designed to integrate the features and functionality on premise, on all clouds, and on the edge. And it provides a strong basis for business and institutional innovation—by creating a lingua franca for data, applications, and workflows—where an ecosystem of ideas from customers, suppliers and partners can be brought together.

IBM provides you with the most comprehensive and consistent approach to development, security and operations across hybrid environments, with complete software solutions for business and IT operations, development, data science, security, and management. With IBM, you also have access to new skills and

methods, governance and management approaches, and a deep ecosystem of industry experts and partners.

- **Industry expertise in mission critical business processes.** IBM experts can help your business to increase the speed and confidence in how decisions are made, empower people to do higher-value work, and make customer and employee experiences more meaningful and relevant. And IBM’s strong technology partner ecosystem delivers added value to industry-specific business process transformation.
- **Proven security, compliance, and governance.** Trust can be built into every interaction through IBM’s robust portfolio of data protection and security services—that have been embedded into our hybrid cloud architecture—to protect your processes, applications and cloud services, while managing compliance requirements.
- **Build and run anywhere with consistency.** At the heart of IBM’s hybrid cloud architecture is Red Hat, the world’s leading provider of enterprise open source solutions. It is the leading hybrid cloud, enterprise container platform and the de facto standard trusted by 90% of the Fortune 500. And IBM Cloud Satellite’s fully managed, cloud-native application services can be distributed to any environment to help you develop, release and improve applications with speed, quality, and single-pane-of-glass centralized control.
- **Automate, predict, and modernize workflows.** IBM’s leading automation, data and integration capabilities can help you fully implement intelligent workflows in your business. They include advanced technologies—such as Watson,

encryption, IoT, and Edge—and can be consumed as-a-service on a modular architecture, with subscription licensing.

- **Leverage the world’s innovations.** With a hybrid cloud approach, you can access and deploy a wide range of innovations and technologies to achieve your goals. Tap the unmatched pace and quality of innovations from the open source community. Choose a deployment option tuned for specific business needs. And incorporate new industry-specific capabilities that address the unique security and regulatory compliance requirements for sensitive data and complex workloads that aren’t addressed by the average public cloud.

The convergence of two powerful forces—the need for profound business innovation and hybrid cloud architecture—leads us to a strategy that is simple and clear and consistent with IBM’s mission: to lead the adoption of hybrid cloud and to work with you to fully exploit it.

[Learn more about how IBM and Red Hat can help you unlock your full potential with Cloud and AI.](#)

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