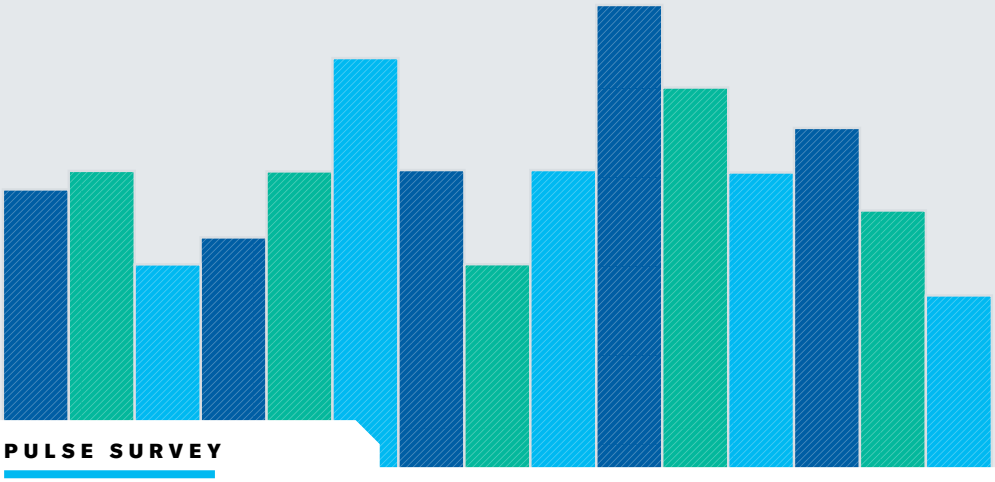
Harvard Business Review
ANALYTIC SERVICES



PULSE SURVEY

The State of Cloud-Driven Transformation

Keys to Accelerating and Capitalizing on Cloud Adoption

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SPONSOR PERSPECTIVE

From the realities of remote work to the increased focus on digital commerce, organizations are facing new challenges to their IT and security infrastructure—not to mention their general viability as a business. In response, many are rethinking their strategies and accelerating changes to their technology stacks to best confront the new future—primarily through the cloud.

The cloud has become a necessity for survival as many organizations seek to accelerate the pace of their digital transformation, both to innovate and to keep up with competition. We're seeing this firsthand at Splunk. We have a unique view into the business and technology challenges organizations face today, and this report backs up what our customers have experienced. It's never been more important to get cloud right, with 83% of executives surveyed by Harvard Business Review Analytical Services agreeing that cloud is very or extremely important for their organizations' strategy and growth. This increased focus on cloud has led to new strategies, teams, workflows, and end-user experiences.

Most organizations have defined a cloud strategy to best tackle their digital evolution. They're changing their business operating models to be more agile, innovative, and adaptive through cloud tools and services—and many are going all in on cloud-native approaches.

But while diving into the cloud headfirst may offer immediate value, it also introduces its own share of obstacles and operational complexity. New tools, workflows, and resulting data streams can slow organizations down as they try to speed up. There is also the inherent complexity of multi-cloud environments, which have become the norm as organizations adopt cloud-native tools and integrate them with their public cloud and on-premises environments. Ultimately, failure to adopt cloud with the right strategies will lead to failed digital transformation projects. Leaders should take new approaches to harness all of the data generated by cloud-driven digital transformation in order to realize the promises of the cloud and thrive in this more complex environment.

At Splunk, we're building a platform and associated solutions that enable cloud transitions and make it easier to operate in a multi-cloud and hybrid environment. We've gone cloud-native ourselves, making fundamental changes to the feature sets, operating models, and architecture of our system so that our customers can succeed in their digital initiatives. We've undertaken the largest architectural change in our history to ensure we meet the data needs of our customers.

Our aim is to remove the barriers between data and action. Whether it's optimizing existing apps and services, moving them to the cloud, refactoring to take advantage of cloud services, or going all in on becoming cloud-native, we're here to solve the modern, complex problems existing tools can't. Splunk, the Data-to-Everything Platform, has been designed so our customers can execute the best data strategy for their cloud strategy.

It's the only way to see across the multi-cloud hybrid world, control a unified security posture across disparate systems, predict and prevent issues, and make observability a reality across an organization.

I hope this report will give you insight into how your peers are faring and how you can better manage costs, complexity, security, and end-user experience with the cloud and the right data and platform to harness what it has to offer.

Sendur Sellakumar
Chief Product Officer
Splunk

The State of Cloud-Driven Transformation

Keys to Accelerating and Capitalizing on Cloud Adoption

Many organizations are expanding their use of cloud at an accelerated pace to transform their interactions with customers, employees, and partners. The Covid-19 pandemic has further increased the speed and scale of cloud adoption as organizations seek to create a foundation for greater agility and support for collaboration, cost reduction and flexibility, and increased insight and innovation.

Indeed, a Harvard Business Review Analytic Services survey of 260 respondents familiar with their organizations' cloud adoption found that the vast majority (83%) say that cloud is very or extremely important to their organizations' future strategy and growth.

"Everyone is increasingly aware of the significance of the cloud. It absolutely should be an essential part of business strategy," says Dion Hinchcliffe, vice president and principal analyst at technology research and advisory firm Constellation Research. "The economies of scale that come with cloud are enormous; you get access to this incredibly agile and very elastic modern architecture at the cost of an incremental dollar."

But while the potential benefits of increasing cloud adoption are numerous, so, too, are the challenges. "The 'why' aspect of the cloud—all of the benefits—are mostly what is promoted, but that gets you away from the details and heavy lifting involved in creating your own digital capability," Hinchcliffe says. "The 'how' aspect of the cloud is growing more difficult."

One of the most fundamental enablers of cloud-driven transformation is a holistic data approach. While a slight majority of organizations have a comprehensive cloud data strategy today, there is significant room for improvement in how well those strategies are serving them.

HIGHLIGHTS

83% of survey respondents say that **cloud** is very or extremely important to their organizations' **future strategy and growth**.

69% say that 60% or more of their organizations' **infrastructure and applications will be in the cloud** in two years.

66% say that **leveraging real-time data analytics** (enabled by artificial intelligence or machine learning) is very or extremely important to monitoring and **gaining insights across cloud services**, applications, and infrastructure.

Organizations are contending with significant complexity as they manage multiple cloud approaches (from simply "lifting and shifting" legacy systems to replacing or rebuilding them entirely) while still maintaining on-premises systems and architecture.

Many companies are at an inflection point. As they hasten to increase their cloud adoption, they should take time to reassess their approaches and build the capabilities necessary to reap the full benefits of their cloud investments. In some cases, though, organizations have not built or altered their systems to take advantage of cloud-specific models. In addition, few organizations have been able to leverage fully the real-time analytics that can accelerate cloud adoption and underpin the cloud-driven transformational benefits they are seeking. The next two years will be critical as these organizations focus on optimizing their cloud environments and investments to drive greater transformation.

Cloud Adoption Accelerates

The adoption of cloud computing has been increasing in recent years, and—boosted by a greater need for agility and speed amid the pandemic—is poised to expand even more rapidly in the years ahead. "We talk about two types of transformation: digitization (the use of digital technology to improve operational excellence within an organization) and 'becoming digital' (the use of digital technology to rapidly innovate and create new offerings). Cloud plays a role in both," says Martin Mocker, professor of information systems at the Germany-based Reutlingen University Business School and research affiliate at the MIT Sloan Center for Information Systems Research. "By now, cloud is so essential, it's hard to think of transformation without it."

While cost reduction or flexibility remains an important driver of cloud adoption, organizations are also seeking a number of other business benefits, from agility to innovation. "Whereas once organizations had to choose between quality, cost, and time when investing in new technology, the cloud operating model enables them to be more aspirational," says Yugal Joshi, vice president of digital, cloud, and application services research for strategic IT consultancy and research firm Everest Group. "They can achieve the holy trinity of technology benefits. Organizations today want it all."

"By now, cloud is so essential, it's hard to think of transformation without it," says Martin Mocker, professor at the MIT Sloan Center for Information Systems Research.

The pandemic has stimulated even faster and greater cloud adoption. "One important aspect of cloud, especially during this pandemic, is its ability to scale suddenly," says Mocker. "When companies had to send all their employees home to access applications online, many self-operated data centers just weren't going to work. There's no way to do that by yourself in an economically viable way." More than half (53%) of survey respondents agree, saying that Covid-19 is accelerating the adoption or implementation of already planned cloud applications, services, or infrastructure. And about one-third (31%) say they are increasing investment in new cloud applications, services, or infrastructure in response to the pandemic. Meanwhile, around one-quarter (26%) are focusing on new or different use cases for cloud as a result of Covid-19. **FIGURE 1**

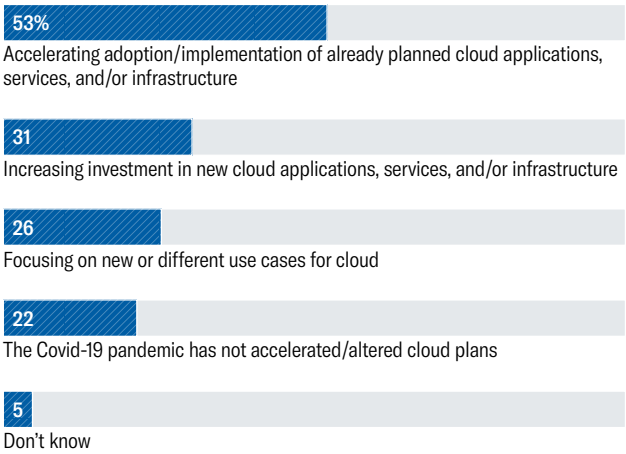
Geoff Woollacott, senior strategy consultant and principal analyst at Technology Business Research, a global IT, telecom, and professional services advisory firm, likens the effect of Covid-19 on cloud investments to a scene from the movie The Dirty Dozen. One of the characters in the movie, an army private, struggles to get up a rope-climbing tower,

FIGURE 1

Covid-19 Fuels Cloud Implementation

The pandemic is driving faster and greater implementation of cloud.

In which of the following ways has the Covid-19 pandemic accelerated or altered your organization's cloud adoption plans, if at all?



Source: Harvard Business Review Analytic Services Survey, September 2020

Few organizations have been able to leverage fully the real-time analytics that can accelerate cloud adoption and transformational benefits. The next two years will be critical as these organizations focus on optimizing their cloud environments and investments to drive greater transformation.

complaining that he just can't make it. The major in charge grabs a machine gun to take out the end of the rope leading to the ground, at which point the private quickly shimmies to the top of the tower. "Covid-19 is that machine gun," Woollacott says. "Companies are now sprinting ahead with [cloud plans]. And I don't think we'll see a boomerang back once the pandemic abates."

There's no doubt organizations realize that they must become nimbler, says Joshi of Everest Group. "What will separate the winners from the laggards will be which organizations can sustain their cloud adoption long term beyond the pandemic's effects," Joshi says.

Indeed, more than two-thirds of respondents (69%) indicate that most (over 60%) of their IT portfolio will reside in the cloud within two years, which is 39 percentage points higher than today (30%). A total of 86% said at least 40% would be in the cloud by 2022, 35 percentage points higher than today (51%).

"Digital transformation is the most important priority in organizations. Workers have moved to work remotely, and customers have radically new demands," Constellation Research's Hinchcliffe says. "When you have to change your business this much, you want to run an environment with maximum cloud."

Destination Cloud: A Range of Routes

To date, organizations have been taking a variety of approaches to cloud adoption. In some cases, they are replacing or rebuilding legacy applications from scratch in order to take advantage of the full benefits of cloud. In others, however, they may simply be lifting and shifting existing applications as is or with limited changes, which can restrict the transformational value of the migration. "Lifting and shifting is how lots of organizations got to the cloud. Short term, that gives them mature systems that have often been finely tuned," says Hinchcliffe. "However, it preserves most of your technical debt: the largest off-balance sheet liability most organizations have."

Half of respondents (50%) say retiring a legacy application and replacing it with a new cloud-native application is one of their organization's most common approaches to leveraging the cloud. Four out of 10 are replatforming (moving applications to the cloud with limited changes), 37% are rehosting (lifting and shifting applications to the cloud as is), and 26% are refactoring (rearchitecting the internal code of the application to break it down into modular components in order to better take advantage of cloud features). Just 17% say they are extensively rebuilding applications from scratch to take advantage of cloud-specific models such as application containerization or serverless computing. **FIGURE 2**

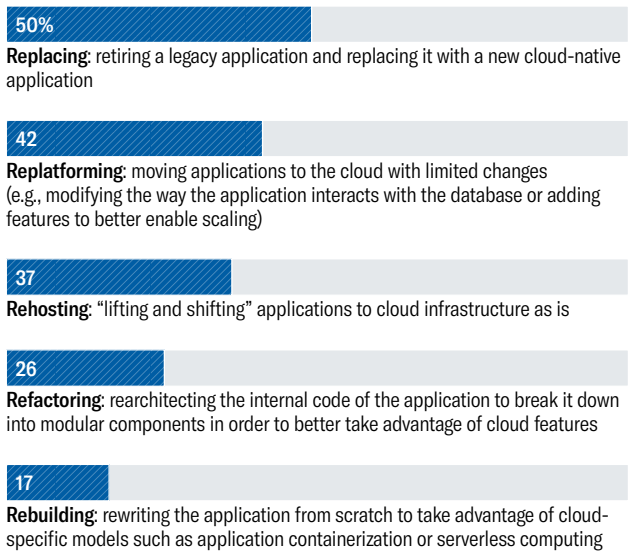
Those organizations that are willing to make the investment in rearchitecting or replacing their systems have "by far the most benefits long term," Hinchcliffe says. It takes more effort and money, though, and many organizations have

FIGURE 2

A Variety of Paths to Cloud

Organizations are most often replacing, replatforming, or simply rehosting applications.

Which of the following approaches has your organization taken most often when moving applications to the cloud? [SELECT UP TO THREE]



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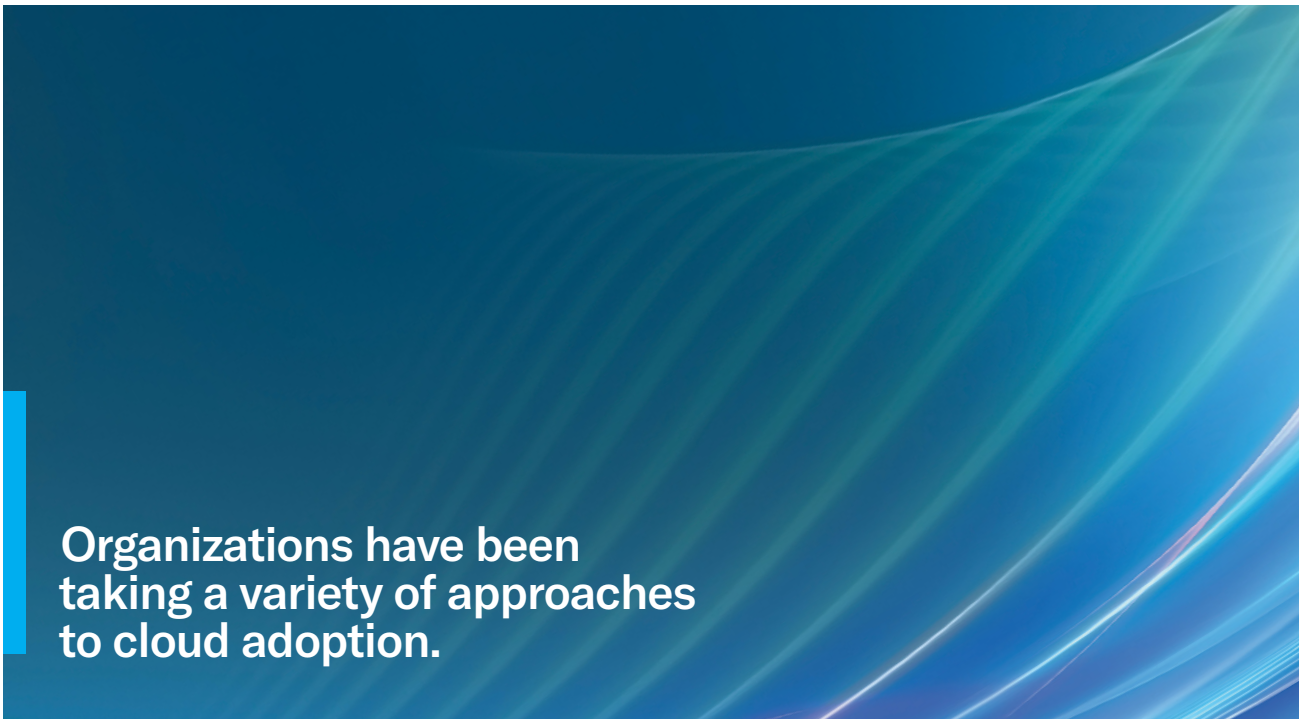


been reticent to invest. But doing so gives them access to new models like containers and orchestration systems or serverless computing. "It's not simply that they're on a stronger architectural foundation that's easier to maintain. They can also adapt to the changing marketplace because these systems are designed to turn on a dime," he adds.

In many cases, organizations that opted to lift and shift legacy applications or make limited changes to them have done so in anticipation of more fundamental changes down the road. "It's often a temporary placeholder," says Woollacott.

The good news? Now is a great time to reexamine these approaches with an eye toward transformation. "Cloud migration with real depth is easier than it ever has been," says Hinchcliffe, noting that cloud providers are currently offering their expertise to help organizations make these more fundamental shifts. "Those [organizations] that did this a few years ago had to do it all by themselves," he adds. "Now you can do it faster, with better practices and far more robust resources."

Data Strategy: The Linchpin for Cloud at Scale

When it comes to the transformational power of cloud, having a comprehensive data strategy for how to collect, store, manage, share, and use data is critical. Data is "what drives business value," says Joshi. The inability to access data, as well as siloed data ownership and use, has long held organizations back from achieving the full value of their cloud investments. "There's a lot of data ownership and many functions or individuals in the business may have a hard time letting that go," explains Hinchcliffe. "Data is an organization's most valuable asset and they hold on to it so tightly that it's greatly underleveraged."

In many cases, an increase in cloud adoption throughout the enterprise—without an enterprise cloud data strategy—only further thwarts transformation. "Cloud solutions alone will not deliver data clarity. In fact, they may create even less clarity because the data may be more dispersed," Hinchcliffe says. "But this is something organizations can now address."

The majority of survey respondents say that they do have an enterprise vision for how to collect, store, manage, share, and use data. Sixty-four percent of respondents say their organization has a comprehensive cloud data strategy while a quarter say they don't (and 12% do not know, which may indicate that they don't have one).

"Data is the biggest issue. The only thing that cloud can do without global data governance is potentially reduce IT operating expenses," says Woollacott. "That isn't delivering business value. Without [a comprehensive cloud data strategy], you're not going to be agile. And you are not going to gain a time to insight advantage over your competition."

However, even for those organizations that do have a comprehensive cloud data strategy, there is room to improve their strategies' effectiveness. "There's a big gap between data strategy and execution in most organizations," Hinchliffe says. Just over half of respondents (54%) say their cloud data strategy is very or extremely effective (an 8, 9, or 10)

at ensuring a unified security posture. Slightly fewer (49%) say their strategy is very effective at maintaining visibility and control across the total IT environment. Around four out of 10 say their cloud data strategy is very effective at helping them deliver a seamless customer experience (42%) or accelerating innovation (43%). Meanwhile, only a third indicate that their cloud data strategy is very effective at helping them rapidly detect and troubleshoot the root cause of issues across environments. **FIGURE 3**

The maturity of cloud data strategies varies. Organizations tend to fare better when they understand the value of data and its governance, have executive-level ownership, and adopt enterprise data platforms and solutions that enable them to fully leverage cloud to drive transformation.

"Businesses that are more data centric have a better stance," Hinchcliffe says. "Those that have created senior management roles for data, such as a chief data officer, tend to be addressing data strategy most effectively, thanks to C-level visibility and oversight. They have enough power to drive the execution steps."

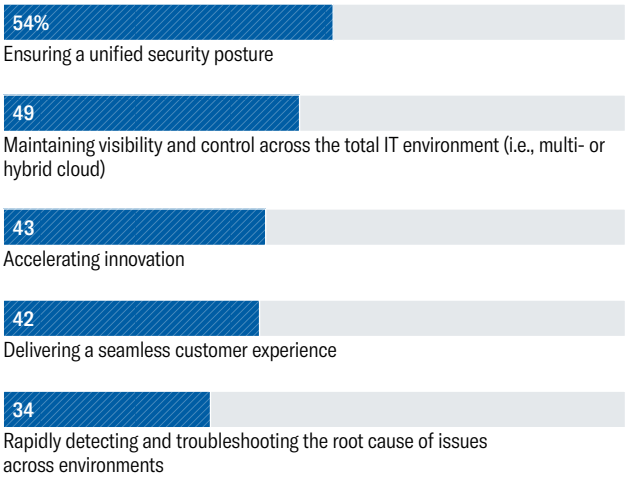
The emergence of robust data platforms—end-to-end solutions for ingesting, analyzing, and taking action on the data generated by an organization's systems, processes, and infrastructure—is helping organizations master the data issue. "With a data platform, the data is governed and secure, and the platform gives them control," says Hinchcliffe. "You can then set the data free—with those guardrails—and know that the value comes back to you."

FIGURE 3

The State of Cloud Data Strategies

Less than half of organizations say their strategies are effective in key areas such as IT management, customer experience, and innovation.

How effective would you say your organization's cloud data strategy is at: (percentage of respondents answering 8, 9, or 10 on a scale of 1 to 10)



Source: Harvard Business Review Analytic Services Survey, September 2020

The Cloud Execution Gap

While cost reduction or flexibility remains a key source of that potential value organizations are seeking, cloud adoption is no longer simply a play to reduce IT costs. Affordability and scalability are now givens, as organizations are seeking more strategic business benefits from their cloud dollars.

"With a data platform, the data is governed and secure, and the platform gives them control." says Dion Hinchcliffe, vice president and principal analyst at Constellation Research.

When it comes to the outcomes businesses seek most from their cloud investments, 60% are looking for increased business agility; 51% for cost reduction or flexibility; 38% for accelerated innovation; 37% for the ability to access, analyze, and act on data or provide insights; and 35% for better systems reliability.

There are some gaps, however, between the outcomes organizations are seeking most from their cloud investments and their results thus far. Forty-nine percent report increased business agility; 38% cost reduction or flexibility; 29% accelerate innovation; 32% ability to access, analyze, and act on data, or provide insights; and 32% better systems reliability. Comparing these results to the earlier question, the percentage of respondents saying each is a most-desired outcome is higher than the percentage saying they've realized this outcome.

"One of the reasons for this gap is that a lot of enterprises have inflated expectations from cloud. In addition, they do not understand what operating model challenges they have to overcome to truly take advantage of cloud," Joshi says. "They just assume that because they're using a cloud service, things will change overnight. They may get the first bout of value

“A lot of enterprises have inflated expectations from cloud. In addition, they do not understand what operating model challenges they have to overcome to truly take advantage of cloud.”

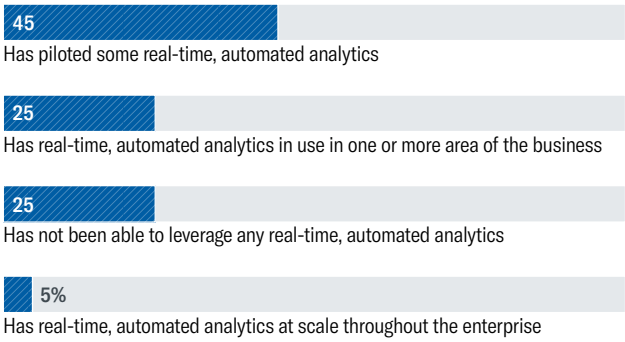
Yugal Joshi, vice president of digital, cloud, and application services research at Everest Group

FIGURE 4

An Opportunity to Get More Value from Data

Two-thirds say real-time analytics are important to gaining insights across cloud, but few organizations have them at a large scale.

To what extent has your organization been able to leverage real-time data analytics (enabled by artificial intelligence or machine learning) to monitor and gain insights across cloud services, applications, and infrastructure?



Source: Harvard Business Review Analytic Services Survey, September 2020

cost saving. But beyond that—to achieve business agility—they have to do a lot of process transformation and operating model changes to get all the enterprise value they seek."

Indeed, ineffective cloud data strategies may be why organizations are struggling in a number of areas when it comes to expanding their use of cloud. If an organization's customer data is spread across several public cloud providers or software-as-a-service applications, for example, that can thwart the delivery of seamless customer experiences. "Data strategy is essential there," says Mocker. "Without an effective data strategy, you can't get a complete customer view across the environment." The same holds true for accelerating innovation. "If you are experimenting and piloting across all these different platforms and don't have a clear strategy, you're just accelerating the creation of a mess—and not just in your own internal processes but with your customer offerings," he explains.

In fact, integration complexity is the biggest challenge respondents say their organizations face when scaling cloud implementation across the enterprise (40%), followed by the diverse skill sets required (37%), service integration and management (36%), data governance and management (34%), regulatory compliance (26%), and lack of standardization for cloud management tools and configuration (27%).

"Integration is a top challenge; that's huge. Although technology is evolving to address that," Joshi says. "Most enterprises want to become multi-cloud but know building the skills for it can be difficult, as they can't afford so many skilling initiatives."

Optimizing the Cloud for Transformation

Ultimately, what organizations hope to achieve with their future cloud models is a more automated and intelligent method for managing multi- and hybrid-cloud environments. Real-time data analytics, enabled by artificial intelligence (AI), can help organizations better manage their complex cloud environments and create the foundation for the full value of cloud-based technologies. "Nirvana is 'push-button' management" for the hybrid or multi-cloud IT environment, says Woollacott.

Indeed, two-thirds of respondents (66%) say that leveraging real-time data analytics—enabled by AI or machine learning—is very or extremely important (8, 9, or 10 on a 10-point scale) to monitoring and gaining insights across cloud services, applications, and infrastructure.

"In the continued consumerization of IT, we've gotten to the point of 'add to cart' IT consumption," says Woollacott. Buying more computing power or a cloud application is hardly more difficult than buying a book online or streaming a movie. But organizations also need more ease when it comes to managing the cloud sprawl (or excess machines or workloads running, oftentimes without the company's knowledge) that can result. "AI-enabled analytics can give organizations that single pane of glass: alerts and remediation that does it for them," Woollacott explains.

However, most organizations are in the early stages of adopting AI-enabled analytics that can accelerate cloud adoption and facilitate greater cloud-driven business transformation. Forty-five percent of respondents say their organization has piloted some real-time, automated analytics and 25% have real-time analytics in use in one or more areas of the business. Just 5% have real-time analytics at scale

"Most enterprises want to become multi-cloud but know building the skills for it can be difficult, as they can't afford so many skilling initiatives," says Yugal Joshi, vice president of digital, cloud, and application services research for Everest Group.

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throughout their enterprise. And one-quarter (25%) say their organization has not been able to leverage any real-time analytics.

"Most of the time IT is still run with reports and KPIs [key performance indicators] that are backward looking," says Joshi. "Real-time analytics can give you more insight into issues, but the challenge is to do something with that." Analytics are necessary, but without execution on them, they are not sufficient.

"That is the holy grail—no question," says Hinchcliffe. "Analytics produce far more insights than humans can act upon." AIOps—the application of AI to monitor and manage IT operations—can learn the patterns of systems, detect variances, and even bring systems back into compliance. "That's a better operations manager than a human can ever be," Hinchcliffe says. "We have the insight into what's not working. We can even predict it now. But then we need to go and do something about it. Closing the loop is important; that's the hard part. The only sane solution is automation."

Looking ahead, organizations expect to prioritize the optimization and implementation of their cloud strategies, with AI-enabled analytics at the top of the agenda. "That's no surprise," says Mocker. "Data and the analytics, in combination with the cloud, is powering everything—from internal digitization to new digital product offerings."

The areas respondents expect to be their organizations' top focus over the next two years include AI-enabled analytics (30%), rearchitecting existing applications to take advantage of cloud-native approaches (containers, microservices, and dynamic orchestration) (29%), security of cloud resources (27%), and cost optimization of cloud resources (27%).

Conclusion

Now is the time for organizations to reassess and, in many cases, readjust their approaches to take full advantage of the agility, speed, scalability, and availability of cloud at a time when such capabilities are more important than ever. Because initial cloud adoption is relatively easy, organizations continue to pursue cloud solutions often in the absence of a greater strategy for transformation. "Over time, they've realized that's not the right way to do it and are now doing some good work around it," Joshi says. "Vendors have tools and proactive solutions for reducing cloud sprawl that is difficult to govern."

Looking ahead, leading organizations will be intentional about architecting their cloud solutions for transformation. "They will invest more on architecture and people who understand these systems to optimize their cloud solutions," Joshi says.

IT order takers will give way to technology functions embracing and overseeing cloud-specific business models. "There are so many things you can do with cloud when you have your data in an actionable place," says Hinchcliffe. "IT should be educating the business that all this data could provide value to new and existing customers. This is the time to innovate and do something with it—especially in times of great change when demands are significantly shifting. The whole point of building this out in an agile and actionable way is to seize new business opportunities. The biggest cost that most organizations face right now is the cost of lost opportunity."

METHODOLOGY AND PARTICIPANT PROFILE

A total of 260 respondents drawn from the HBR audience of readers (magazine/ enewsletter readers, customers, HBR.org users) completed the survey.

Size of Organization

49%
10,000 or more employees

12%
5,000 – 9,999 employees

28%
1,000 – 4,999 employees

11%
Fewer than 999 employees

Seniority

17%
Executive management/ board members

49%
Senior management

21%
Middle management

4%
Other grades

Key Industry Sectors

20%
Technology

14%
Manufacturing

12%
Financial services

All other sectors less than 8% each.

Job Function

25%
IT

14%
General/executive management

All other functions less than 8% each.

Region

50%
North America

20%
Asia Pacific

15%
Europe

8%
Latin America

5%
Middle East/ Africa

All other regions less than 2% each.

Figures may not add up to 100% due to rounding.

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