



Tailoring hybrid cloud

Designing the right mix for innovation, efficiency and growth

Executive Report

Technology strategy

How IBM can help

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Crafting a unique cloud solution

Organizations are steadily increasing their use of cloud technologies to address wide-ranging requirements. The particular needs and business conditions of each enterprise help define its optimal hybrid solution: most often, a blend of public cloud, private cloud and traditional IT services. Finding the right cloud technology mix starts with deciding what to move to the cloud and addressing the challenges affecting migration. In this study, executives achieved the strongest results by integrating cloud initiatives company-wide, and by tapping external resources for access to reliable skills and greater efficiency.

Executive summary

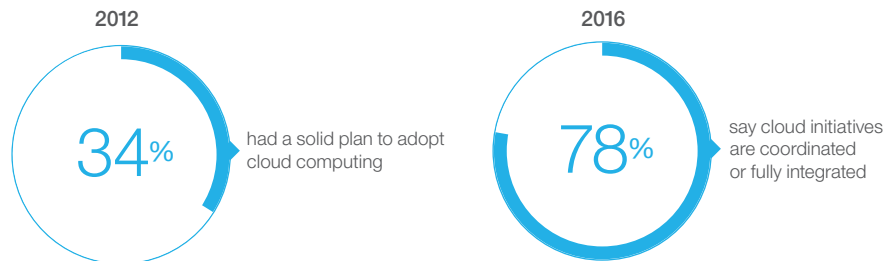
Cloud has evolved from a technological innovation to an integral part of business enablement. In 2012, only 34 percent of senior business leaders in our study “The power of cloud,” said they had a solid plan for adopting cloud computing.¹ But in 2016, 78 percent of the executives we spoke with describe their cloud initiatives as coordinated or fully integrated (see Figure 1).

Even with the rising use of cloud overall, almost half of computing workloads are expected to remain on dedicated, on-premise servers. Given this ongoing need, it is imperative that organizations determine and regularly re-assess which combination of traditional IT, public cloud and private cloud best suits their needs.

Executives in this study rated their own organizations based on both revenue/effectiveness and profit/efficiency. Sixty-eight percent more high-performing organizations report having fully integrated their cloud initiatives into an overall strategic transformation compared to the full survey sample (57 percent versus 34 percent, respectively).

Figure 1

Cloud use matures: Since our 2012 study, cloud technology has become much more mainstream



Source: IBM Institute for Business Value analysis



92% of surveyed executives said their most successful cloud initiative **enabled creation and support of new business models**



Executives said they expect **45% of workloads to stay on dedicated, on-premise servers**, even as cloud adoption expands



83% of high-performing organizations said their cloud initiatives **are coordinated or fully integrated within the organization**

Creating new value with cloud entails three major steps:

- Decide which IT and business functions to deliver through cloud
- Identify and address challenges in adopting cloud
- Realize operational, financial and innovation benefits.

To tailor the best-fitting cloud solutions, organizations must understand cloud computing's business and financial implications; improve their abilities to manage complex ecosystem partnerships; and expand internal capabilities while exploring external solutions.

Evolution of cloud

Beyond its impact as a technological innovation, cloud computing has expanded significantly. Cloud computing is now a substantial part of new IT spending. According to IDC, worldwide spending on public cloud services is expected to grow from USD 96.5 billion in 2016 to more than USD 195 billion in 2020.²

Even as cloud adoption matures and expands, surveyed organizations expect that about 45 percent of their workloads will continue to need on-premise, dedicated servers – nearly the same percentage as both today and two years ago (see Figure 2).

Hybrid cloud solutions – which by definition include a tailored mix of on-premise and public cloud services intended to work in unison – are expected to be widely useful across industries. Each organization's unique business conditions and requirements will define its optimal hybrid technology landscape.

Figure 2

Steady reliance: Nearly half of workloads are expected to remain on dedicated, on-premise servers

2 years ago



Today



2 years from now



- Third-party hosted cloud
- Self-hosted private cloud
- Dedicated, on-premise servers

Source: IBM Institute for Business Value analysis

Figure 3

Getting it together: High-performing organizations focus more on overall strategic cloud transformation



Source: IBM Institute for Business Value analysis

So, how sophisticated are today's organizations in identifying cloud opportunities and implementing integrated solutions? More than twice as many high-performing organizations report fully integrating their cloud initiatives than low-performing organizations (see Figure 3).

Implementing cloud initiatives in an *ad hoc* fashion reinforces siloes among different business units in the organization. Siloes result in numerous disadvantages and risks, including the use of diverse, incompatible technologies, deviations from enterprise architecture principles and funding duplicate functions, all of which contribute to ongoing technology integration challenges.

Using the more mature approach of combining multiple related cloud initiatives into a coordinated program enables: reusability of shared functions, elimination of deviations from design principles, and cost savings by avoiding duplicates and reducing future maintenance. Stronger integration of cloud projects becomes transformative, in part through centralized, coordinated efforts.

Creating new value with cloud

In previous studies, decision makers have stated that they'll always have a blend of traditional IT and cloud.³ Cloud computing has enabled organizations to increase their overall utilization of existing IT assets without significant incremental investment.⁴ We discovered four main reasons why organizations are strategically combining cloud and traditional IT into tailored hybrid solutions (see Figure 4).

Fifty-four percent of surveyed executives cited the most popular reason for implementing hybrid cloud solutions: lowering the total ownership cost of technology. Cost can be reduced by avoiding equipment refresh that comes every few years and letting another party bear the associated data center expenses, including facility and power.

Operational efficiencies can stem from selecting the most compatible infrastructure and middleware. Cloud-based applications can also mask the complexity of some business processes. For example, organizations can use a third-party, cloud-based API service to check user background/identity during online financial transaction validations.

Cloud accelerates innovation by enabling quick prototyping of new ideas for faster experimentation and easy decommission of allocated resources if an idea does not “take off.” To meet customer expectations, cloud’s agile and composable attributes enable faster time to market for new products and services, as well as less downtime with high availability and disaster recovery. Rapid, seamless bug fixes come when developers can quickly deploy new code into production via cloud-enabled DevOps platforms.

Figure 4

Growing business with cloud: Why organizations said they'll strategically adopt hybrid cloud solutions



Source: IBM Institute for Business Value analysis

“Our customers come to us for cloud services for different reasons: CFOs are focused on cost and ROI, business leaders are all about speed and agility, and IT staff are concerned about resources and practicality.”

Director, IT Services, North America

“We save money and headaches by leveraging third-party facilities.”

Senior IT Manager, Consumer Products, North America

Making tailored cloud decisions

Since not everything needs to be or should be moved to the cloud, organizations have important decisions to make. Which functions should they migrate and which should stay within an organization's domain?

The optimal hybrid environment will differ by individual enterprise. First, executives need to decide which IT and business functions are “cloudable” – that is, which can be delivered through cloud computing with a projectable, positive business outcome. Cost, compliance requirements and speed to market are the top criteria in evaluating cloudable initiatives (see Figure 5).

To reduce costs, organizations often look at how to operate their IT activities more cheaply and lower the expense associated with non-core activities. A well-established juice and beverages company is leveraging a third-party co-location facility and cloud-based services to reduce its spend on IT utility functions. This approach also enables the company to redistribute internal human capital to core, value-adding business activities. Third-party vendors, through their specialization and economies of scale, provide IT utility functions at lower rates.

New solutions are being developed rapidly to address security and compliance requirements. Many cloud vendors provide comprehensive metrics and consumption activities, as well as tracking/monitoring capabilities. A company's consumption pattern reports can often be used for audits as evidence of compliance. These vendor-maintained functions incent some enterprises to choose cloud as an effective option.

Cloud enables organizations to quickly provision resources needed for rapid development of new products and services. Companies can leverage micro services and other composable cloud-based components to assemble tailor-made solutions. This greatly reduces development time and enhances the agility of enterprises in responding to constantly shifting marketing demands.

Figure 5

Assessing "cloudability": Executives cited financial, audit-related and timing to market among their top criteria



Source: IBM Institute for Business Value analysis

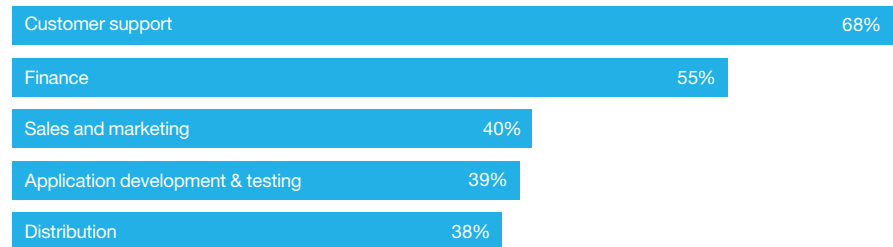
When organizations pay as they go

Moving to a software-as-a-service (SaaS) consumption model lets organizations implement new market-leading solutions quickly with minimal impact to existing infrastructure. In two years, most organizations plan to use SaaS with a variety of applications (see Figure 6).

The top two responses – customer support and finance applications – are mostly viewed as non-core, utility functions that can be more effectively owned and managed by specialized vendors. From a sales and marketing perspective, a SaaS model can provide anytime, anywhere access and enablement to sellers and marketers. The end-user engagement level can also increase with more front-end application support that makes interaction with customers easier.

Figure 6

Moving to software-as-a-service models: Organizations plan to migrate many types of applications in the next two years



Source: IBM Institute for Business Value analysis

Identify potential challenges when adopting cloud

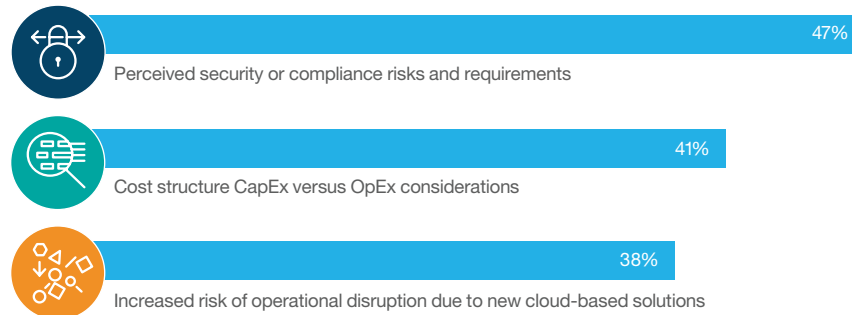
Despite clear potential benefits, many organizations said their adoption of cloud could be restrained by three major challenges: security and compliance requirements; cost structure considerations; and risk of operational disruption (see Figure 7).

Security and compliance requirements

Security and compliance requirements are restricting certain categories of workload to be migrated to cloud. A cloud-based system is not by definition less secure. When breaches do occur, they are often due to human error. Security elements and software-defined protection checkpoints can be architected into cloud-based solutions to mitigate this challenge. Many large vendors offer GxP-compliant cloud and technological solutions such as blockchain, targeting HIPAA, HITECH, and other security and compliance concerns.

Figure 7

Recognizing hurdles: Top challenges include perceived risks and cost considerations



Source: IBM Institute for Business Value analysis

“As much as we all wish it could happen, security environments can’t just be ‘magic-wanded’ into a cloud environment.”

Co-founder, IT Services, Europe

“More constraints are on licensing and contract terms than technology.”

IT Director, Telecommunications, North America

“Users tend to hang on to their traditional applications forever.”

IT Director, Energy and Utilities, North America

Cost structure considerations

Increased complexity of cloud-based cost structure and contract terms is curbing the extent of cloud adoption. High costs can hinder cloud adoption by some organizations.

To deal with this complexity, organizations need to understand the tradeoffs between capital expense (CapEx) and operating expense (OpEx) models, including the corresponding effects on their financial and business strategies.

Risk of operational disruption

Potential operational disruptions are also dampening companies' enthusiasm to replace less-efficient IT functions with new cloud-based solutions. Thus, it is even more important today to coalesce both business and IT priorities and expertise to increase operational transparency and collaboration across the organization.

Creating something new from tailored hybrid cloud

Despite challenges, successful companies are delivering business value through hybrid cloud in three areas: operations, finance and innovation. Seventy-six percent of surveyed executives said their most successful cloud initiative has significantly achieved expansion into new industries (see Figure 8). Close behind were the creation of new revenue sources and new business models.

How operations can benefit from cloud

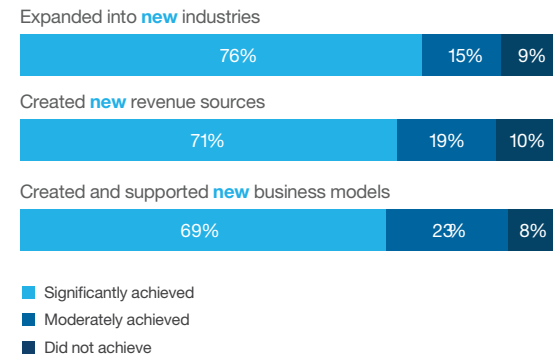
Hybrid cloud is improving operations through greater business agility and speed, more effective reallocation of internal resources and better linkage between IT and the business. For example, building solutions in-house can be slow, and it can be hard to keep pace with rapidly changing digital market requirements and demands.

Out-of-the-box solutions can often meet most business requirements within weeks. The ability to quickly assemble multiple composable cloud-based components into an enterprise solution can increase responsiveness and agility. The North American CEO of a Consumer Services organization said, “Using cloud gives us great agility and faster response time in pushing out new services.”

Freeing up internal resources to focus on value-adding core business activities is another key benefit. Instead of having internal staff with business domain knowledge perform a basic utility function, an external specialized resource can do so more effectively (see example, “International spirits company shifts focus off non-core activities”). Through their specialization and economies of scale, vendors may provide cost-effective essential functions, such as utility IT services.

Figure 8

What's new with cloud: Industry expansion, revenue sources and business models



Source: IBM Institute for Business Value

“We want to minimize our effort of maintaining non-core activities such as IT services.”

CIO, Consumer Products, Europe

With many external cloud-based solutions available, internal IT is no longer the sole technology solution provider to the business. On the other hand, the large variety of cloud-based solutions prompts business to rely on IT for advice to make sound choices. Organizations must cultivate strong alignment between business and IT to operate effectively in the cloud era. As the Vice President of IT in a North American Consumer Products company said, “It is more important than ever to have IT folks in the business to help advise as new ideas are generated.

International spirits company shifts focus off non-core activities

This large, privately-held company has a product portfolio of more than 200 brands and labels. It used to own most IT components in-house, with diverse and decentralized IT organizations around the globe.

To concentrate on its core skills, the company centralized IT under one enterprise-wide organization. By moving its global infrastructure to cloud, the effort of maintaining IT services was substantially reduced. Sourcing IT solutions with a technology vendor helped to reduce headcount by 30 percent in two years, with a cost savings of approximately 10 percent per year.

Lines-of-business leaders are empowered by merging business and IT priorities and expertise that comes through external access to technological solution options. IT functions are increasingly evolving from playing traditional solution provider roles into crucial roles as technical advisors to the business. Stronger connections between business and IT can increase both operational transparency and collaboration across an organization.

How financial benefits can accrue from cloud

Surveyed executives realized significant financial benefits by cutting infrastructure costs, increasing financial visibility and accelerating return on investment (ROI). IT infrastructure is a major expense item for most organizations. Fifty-seven percent of executives from high-performing organizations identified cost as the most important criterion in deciding which workloads should be moved to cloud. Effective organizations extract great value out of each dollar they spend. Many of them leverage large-scale cloud vendors for consistent, reliable cloud-based IT infrastructure at lower cost.

True IT costs in a traditional IT environment are notoriously difficult and expensive to measure but an accurate view is crucial to an organization's financial vitality. Maintenance-free, centralized, cloud-based dashboards with auto-log metrics help attain such visibility. The Senior IT Manager of a North American Consumer Products company said, "They monitor and collect data. We can access the metrics anytime on any device with zero maintenance cost."

Additional financial benefits come when organizations accelerate ROI and mitigate risks by using subscription-based cloud resources. The upfront capital investment for on-premise solutions can be too high, especially for startups. Further, subscription-based, dynamically scaled cloud resources can lessen up-front costs and align future spending to demands. And quick-provisioned cloud resources can also shorten a company's time to market (see sidebar, "South American customer loyalty infrastructure handles higher volumes").

South American customer loyalty infrastructure handles higher volumes

Created by a new business entity of a major financial services company, the online customer loyalty program platform supports two of the country's largest banks. But time and resources were limited to address the need for scalable solutions to serve the more than 45 million customers using those banks.

With the help of a leading cloud provider, the platform provider secured the infrastructure resources it needed. Within weeks, they built a front-end application layer on cloud and a back-end database on dedicated servers, establishing a hybrid environment with a scalable, cloud-based user interface and a high-performing, on-premise customer database. This enables the banks to serve potentially high volumes of bank customers when needed, without tying up capital to excess capacity.

“Push out your idea fast, then get the truth as the customers see it.”

CEO, Consumer Services, North America

How cloud can increase innovation

Our study also found that innovation advantages can be gained through rapid experimentation, strategic application programming interfaces (APIs) and extended access to external talent and technologies. Conducting rapid experimentation gives innovative organizations the crucial ability to test and fail quickly. Cloud, with its on-demand and scalable attributes, enables this sort of nimble development and testing. What’s more, quick and automated resource provisioning can shorten development time and reduce time to market.

Revealing strategically selected data through APIs is another way that cloud supports innovation and the cultivation of new opportunities. Sharing enterprise insight and intelligence among ecosystem partners facilitates innovation throughout the ecosystem. And co-innovation can propel companies toward new market opportunities. The global cloud program manager, mining company in South America said, “Partnerships with vendors allow us to learn and gain deep access to their information and knowledge.”

Taking advantage of hybrid cloud extends access to external talent and technologies. One respondent noted that today, a company doesn’t want to be defined by the number of engineers it employs. It can instead rely on technology partners to provide expertise on recent industry trends, methodologies and frameworks while it deals directly with its core business. External subject matter experts can boost the organization’s intellectual capacity to expedite innovation.

Recommendations

Deepen understanding of business and financial implications of cloud, then apply the knowledge to steer future cloud initiatives

Cloud can be the centerpiece of an overall organizational transformation. Potential business impacts – and the associated financial implications – need ongoing scrutiny. During each stage of cloud adoption, combine the insights of business and IT. A tailor-made environment for your organization will be possible when IT employees truly understand what the business needs and LOB employees know what technologies/IT can do for them.

- Identify key business stakeholders of cloud initiatives, select target improvement areas, and establish a current performance baseline for comparison.
- Set improvement targets and financial equivalents, determine total cost of cloud initiative investment, and calculate return on investment (ROI).
- Compare the achieved ROI with improvement targets, identify refinement opportunity and incorporate ROI results in future decision-making process of cloud adoption.
- Mitigate the risk of possible business disruption by coalescing IT and business guiding principles through an enterprise governance model to support decision processes regarding cloud adoption.
- Strengthen service portfolio management for the new hybrid environment with industry best practices and internal disciplines.

Strengthen your ability to manage the complexity of multiple cloud ecosystem partners

The ecosystem will be in continual development as you collaborate with value chain participants. Managing a dynamic and interdependent environment will require both a new mindset and new skills within your organization.

- Foster the next generation business and IT hybrid talent with both business acumen and technological skills.
- Be cognizant of the increased complexity of cloud-based software licensing cost structures, especially for large-scale ERP systems.
- Build strong relationships with cloud providers to gain insights into their cost structures and available pricing options, including how much must be paid up front, the timing of payments and more.
- Embrace the cloud ecosystem as an orchestrated environment in which participants can deliver more value acting together than acting alone.⁵
- Establish interdependent and collaborative long-term relationships with ecosystem partners through mutually beneficial opportunities.

Expand internal capabilities and understand the security and compliance features of external solutions

Companies' legacy data model and architecture design might limit their abilities to fully exploit cloud. By decoupling secure data and operational components from non-secure components, companies will have more flexibility to migrate data – less-sensitive data, for example – to cloud.

- Re-architect operations to build data protection and security measures into system design and IT infrastructure.
- Select cloud vendors with security and compliance focus; implement additional security and compliance measures specific to your needs.
- Establish strict control policies in-house and educate employees to avoid human risk, which is often the most uncontrollable type of risk.
- Verify that your providers can adhere to the same standards as you impose on premise.
- Expand your use of cloud by continuing to explore new technological solutions that address security and compliance requirements for additional categories of workloads.

Related publications

Brown, Doug, Justin Chua, Nate Dyer, Eric Lesser and Jacqueline Woods. "New technology, new mindset: Strategic IT infrastructures to compete in the digital economy." IBM Institute for Business Value. November 2015. <http://www.ibm.com/services/us/gbs/thoughtleadership/technologymindset/>

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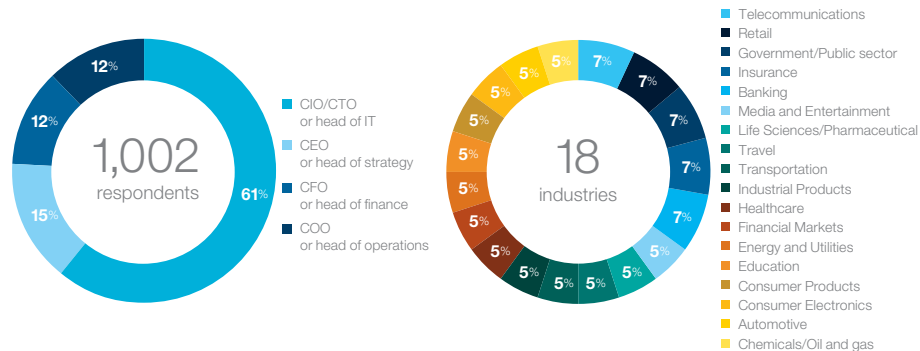
IBM Institute for Business Value. "Cloud for industries: Charting the path for cloud adoption that transforms business." <http://www.ibm.com/services/us/gbs/thoughtleadership/cloud-industry-series/>

Are you ready to tailor cloud to suit your organization?

- How is your organization planning to incorporate hybrid cloud into your overall transformation strategy?
- What is the optimal combination of cloud and on-premise IT investments for your organization? What factors will you regularly monitor to identify needed changes over time?
- How effective are you in tapping into external resources in assessing and implementing cloud-based solutions?

How we conducted our research

To learn how organizations differentiate themselves using cloud, in 2016 we interviewed 30 executives and surveyed 1,000 global respondents from 18 industries. Sixty-one percent of respondents held the title of CIO, CTO or Head of IT. To analyze differences among the study sample, each respondent did a self-assessment based on organizational performance. A “high-performing organization” is one that rated itself as “5” on a scale of 1 (low) to 5 (high) in both revenue/effectiveness and profit/efficiency performance. “Low-performing organizations” rated themselves as “1” on that scale.



For more information

To learn more about this IBM Institute for Business Value study, please contact us at iibv@us.ibm.com. Follow @IBMIBV on Twitter, and for a full catalog of our research or to subscribe to our monthly newsletter, visit: ibm.com/iibv.

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