



© Vaniatos/Getty Images

BUSINESS TECHNOLOGY OFFICE

Leaders and laggards in enterprise cloud infrastructure adoption

Investments in organizational capabilities rather than specific technology choices separate the leaders from the laggards.

Nagendra Bommadevara, James Kaplan, and Irina Starikova

There is a lot of hype and hoopla about the cloud but few reliable facts and benchmarks about the adoption of this technology. CIOs, CTOs, and heads of infrastructure at large enterprises have shared with us their frustrations about adopting cloud-based platforms and migrating processing workloads to virtual environments. To address those frustrations, between 2014 and 2016 we surveyed senior business and technology leaders in more than 50 large organizations in Europe and North America to find out about their adoption of cloud and next-generation infrastructure.¹ We focused on the structure and management of their cloud programs, the technical capabilities they've implemented to this point, the benefits realized, and their future plans.

The results indicate that while almost all respondents are continuing to build sophisticated cloud programs, there is a clear gap between the leaders (those who have migrated more than 50 percent of their processing workloads) and the laggards (those who have moved less than 5 percent). We identified four best practices that differentiate the two groups—in short, the leaders pay more attention to the organizational capabilities that facilitate cloud adoption than to specific cloud technologies.

Findings on cloud adoption

Most of the companies in our survey are from regulated industries, such as banking, insurance, and healthcare. All are under significant pressure to introduce digital capabilities, such as online

Takeaways

Cloud programs have become a priority for IT organizations because of the benefits they are expected to provide: automating systems-management tasks, routing work flow more efficiently, and significantly streamlining the application-development process.

Survey results indicate that while most companies are experimenting with cloud-based technologies and platforms, a group of cloud-savvy leaders is emerging.

The leaders have set a clear migration path for *all* applications and rigorously execute on it. They have changed performance measures and operating models and have adopted agile approaches to accommodate the use of cloud platforms.

and mobile banking applications that allow customers to make payments, check transactions, receive quotes, or update personal information. A cloud-based infrastructure is critical for enabling such digitization. Here is what we learned from respondents about the status of their cloud programs.

1. They have spent significant time and resources building complex private-cloud platforms.

Almost all participants in our survey told us they have been developing cloud programs for five years or more, and this area of development remains one of the top priorities for IT. The majority of participants say they plan to significantly ramp up the technical capabilities of their cloud programs and have sizable cloud-engineering teams working on this effort. Additionally, most say they are building cloud-based platforms with an eye toward flexibility; these are being set up initially as private-cloud platforms so that companies can avoid the security and compliance risks associated with the public cloud. But companies are also building capabilities to facilitate the eventual migration of workloads to public-cloud servers.² Their ultimate goal is to develop cloud platforms that can meet all the diverse requirements of critical enterprise systems. Only a few survey participants are taking a more conservative approach: they are not building in-house cloud platforms. Instead, they are relying on vendors to supply “good enough” cloud environments.

2. Some companies are emerging as cloud-savvy leaders while others continue ‘science projects.’

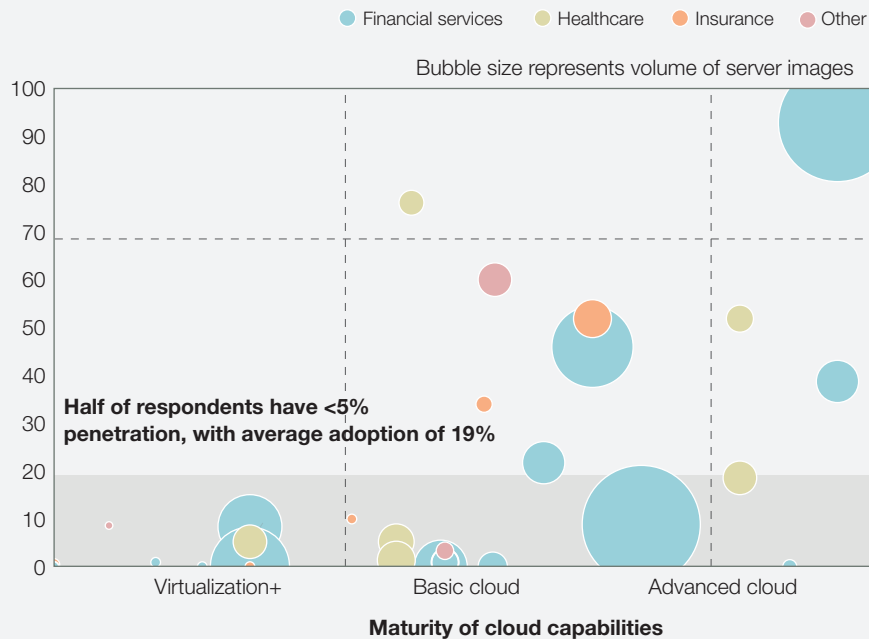
Despite their high-priority, highly visible, multiyear efforts to implement cloud programs, half of the participants in our survey say they have moved no more than 5 percent of their x86 processing workloads to cloud environments (private or public). The difference between the laggards and the leaders is stark: the laggards have migrated fewer than 5 percent of their processing workloads, while cloud-savvy leaders have moved more than 50 percent (Exhibit 1).

When analyzing the gap between leaders and laggards, we found no correlations involving particular industries. And the sophistication of the cloud platform being developed also did not seem to matter: some of the cloud-savvy leaders in our survey have undertaken large reengineering efforts and advanced the adoption of cloud technologies that way. Other leaders’ cloud programs have succeeded because IT and business leaders were focused on simpler sets of cloud capabilities and pilot projects. Similarly, the age of cloud programs was not a critical factor to explain the gap: cloud-savvy leaders seemed to outpace the laggards fairly early in their journeys, according to our data, and the gap seemed to grow quickly rather than shrinking the longer that cloud programs were under way.

So what accounts for this dispersion? There are still some significant barriers to adoption

Exhibit 1 The average adoption rate for x86 workloads in the cloud is less than 20 percent.

% of server images deployed in private or public cloud¹



¹ 2015 responses shown where 2016 adoption data are not available.

Source: Horizon360 by McKinsey; McKinsey Enterprise Cloud Infrastructure Survey

of cloud platforms—for instance, the cost and complexity of moving workloads from in-house data centers to cloud-based servers, and a shortage of tools and standards that would facilitate that migration. Meanwhile, survey participants also voiced particular concerns relating to the public cloud, including issues with security, regulatory compliance, and vendor lock-in.

3. The leaders in cloud adoption are already seeing significant benefits.

Most of the participants in our survey cited faster time to market as a core reason to adopt cloud-based infrastructure. They noted the ability to speed up the application-development process, provision servers more quickly, and meet end users' needs more flexibly—thereby ensuring successful digital transformations of business processes and

operating models. The survey participants also said that cost reductions and quality improvements would be critical benefits from the use of cloud technologies, but both those benefits took a clear back seat to time-to-market factors.

We compared respondents' objectives with the outcomes realized, and we saw a big difference in the results leaders and laggards achieved in time to market and cost reduction. The leaders' time to activate servers was two to three times faster than average capabilities in this area. Cost savings were also almost two times higher (Exhibit 2).

4. There has been a massive change in openness to the public cloud.

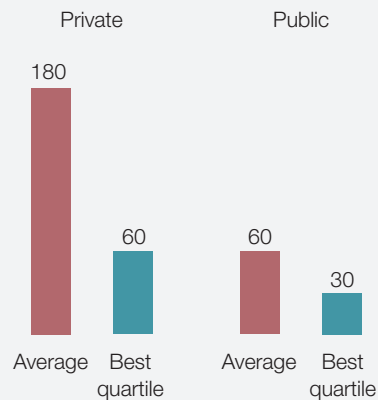
The participants in our survey have become much more open to the public cloud. The

Exhibit 2

Cloud-savvy leaders have already achieved significant benefits from their adoption of this technology.

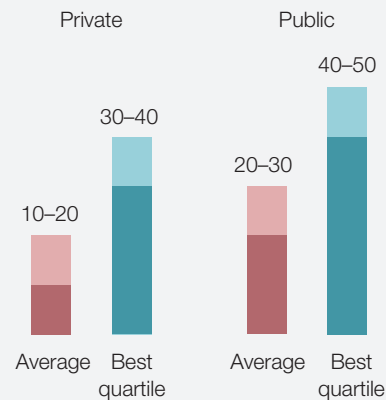
Time to market

Provisioning time of x86 server images in cloud environment, minutes



Cost reduction

Average savings in total cost of ownership of server images from cloud over legacy, % of total cost of ownership



Source: Horizon360 by McKinsey; McKinsey Enterprise Cloud Infrastructure Survey

share of participants who see themselves moving entire workloads (of various types) to a public infrastructure-as-a-service (IaaS) model or platform-as-a-service (PaaS) model is up 15 to 20 percent compared with previous years' findings.³

In part, this is because cloud vendors are more aggressively marketing their services to companies. Additionally, the economics of hosting applications on the public cloud are becoming comparable to those of some of the most efficient private environments, and security standards are emerging for the public cloud. Survey participants also acknowledged that the public cloud can enable a number of business scenarios not feasible with traditional or private-cloud infrastructures. For instance, companies could ramp up processing capacity on demand, allowing them to conduct R&D simulations or other labor- and resource-intensive activities

that would be costly if attempted within a traditional processing environment.

At the same time, the overall share of enterprise workloads in the public cloud is still in the low single digits. The application migrations that are happening now mostly tend to involve private clouds (including both on-premises and off-premises dedicated public-cloud options). However, our survey results indicate this situation will continue to change significantly over the next few years, with some types of workloads moving more quickly than others (Exhibit 3).

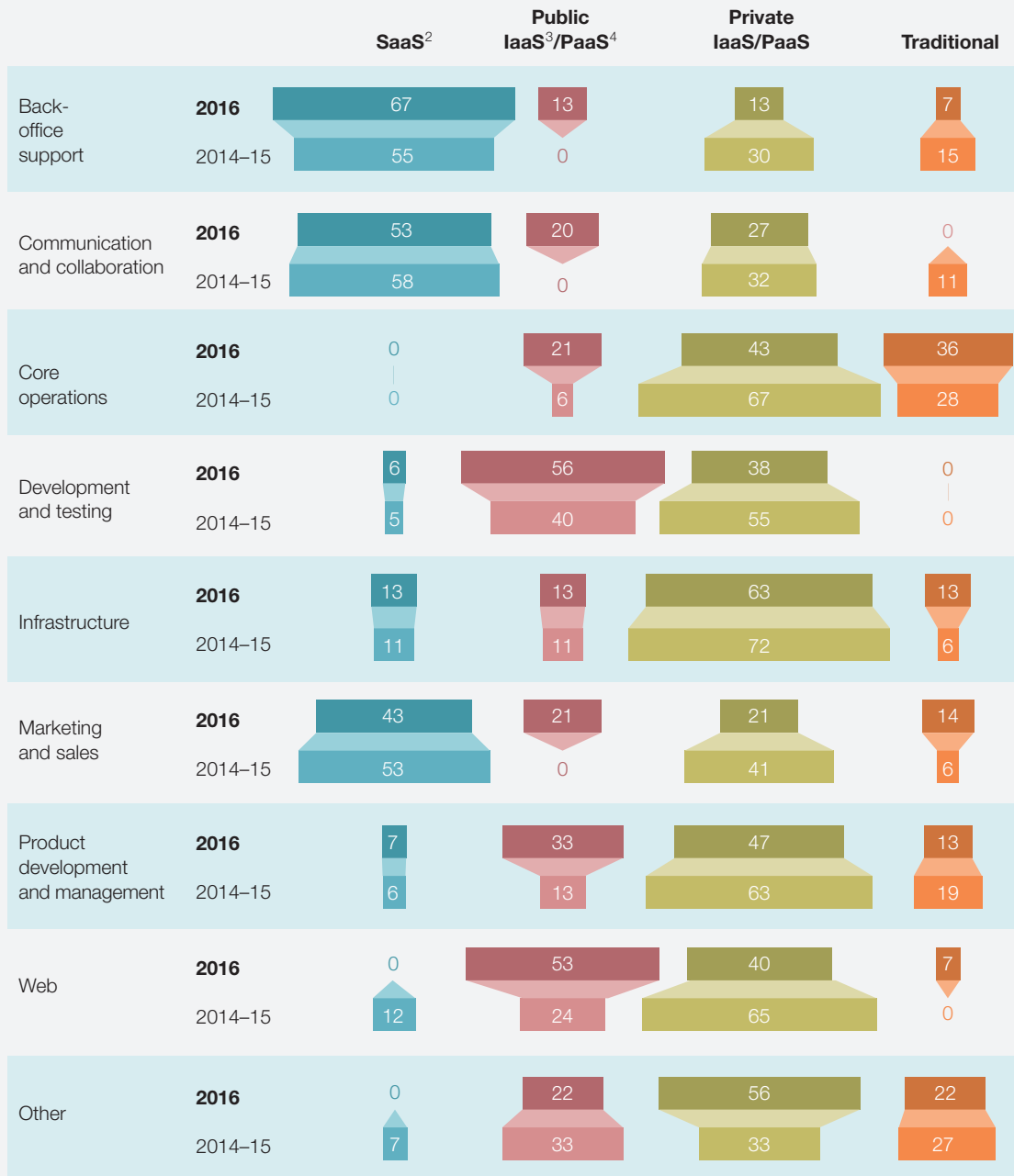
Strategies of cloud leaders

The survey results pointed to a clear gap between cloud-savvy leaders and laggards. What accounted for the gap? We found that investment in organizational capabilities—rather than technology choices—is what truly sets leaders apart. Cloud-savvy leaders in

Exhibit 3

Survey participants are becoming more open to shifting workloads to the public cloud.

Primary choice by workload in 1–2 years, % of respondents¹



¹ Figures may not sum to 100%, because of rounding.

² Software as a service.

³ Infrastructure as a service.

⁴ Platform as a service.

Source: Horizon360 by McKinsey; McKinsey Enterprise Cloud Infrastructure Survey

our research are taking a balanced approach to workload migration. They aren't striving to create a perfect technology solution before moving a meaningful share of their workloads to the cloud. They are testing and learning and adjusting their cloud programs accordingly. Additionally, these cloud-savvy leaders continually focus their efforts in four areas.

The migration road map and execution.

The cloud-adoption leaders in our survey approached the migration of applications to the cloud from the mind-set of “legacy by exception”—that is, they set a clear migration path up front for all applications, not just new or significantly updated apps but also all existing legacy applications, which might need to be retrofitted for the cloud. The migration road map was clear—and followed rigorously. Developers who were seeking exceptions for various application migrations found it difficult to get approval; they were made to feel “uncomfortable” if an application did not make it to the cloud.

To create a successful cloud-first culture, these companies sought full support from the business units that owned various applications; they shared the migration road map to create a sense of transparency, and they established incentives, such as faster time to deployment of new applications and lower cost of infrastructure services, to get the business units to collaborate with cloud developers. These companies also identified benefits the business units might gain beyond just the initial migration task. For instance, cloud-adoption leaders took inventory of the applications in their portfolios, assessed them for duplication or overlap of features, and got rid of some when possible. This exercise helped them reduce the size of the cloud environments needed for migration, as well as the business-unit costs required to maintain these environments.

Finally, these companies have adopted a factory approach to migration—using fast, repeatable processes (made possible by automation technologies) to move batches of applications to the cloud in a cost-effective way.

The application-development experience.

The cloud-adoption leaders in our survey focused a lot of attention on the application developers' experience—for example, guiding them on how to provision servers and other resources and update applications across different environments. These companies used virtualization and automation technologies to improve production and maintenance processes. They also emphasized cross-organizational development of cloud-based services.

An agile approach proved successful for several participants: the IT operations group would define jointly with product developers what new infrastructure services should look like and how the development of new services and cloud capabilities should be prioritized. Because both sides were involved in discussions early on, it was easy for developers to come up with prototype services and process steps that everyone could agree on quickly. The joint team then applied a test-and-learn approach to roll out new automated capabilities and services, launching good-enough ones quickly and tweaking elements along the way. One of the respondents in our survey said this approach delivered instant benefits for product developers—three hours less of work a week—and made them want to collaborate with their IT counterparts more often.

The business case and economics of the cloud.

Nearly all participants in our survey built an initial business case for investing in cloud capabilities. The cloud-adoption leaders, however, were disciplined about tracking the benefits of the cloud against the stated

business case throughout the rollout of the program. They instilled a commercial mind-set in the product-development groups, one that was grounded in an understanding of cloud economics. For example, the early cloud adopters carefully managed “sticky” legacy costs—that is, they recognized that despite their cloud-computing efforts and investments made in that area, the overall budget still would be primarily affected by existing multiyear hardware and software contracts; multiuse, multifunction data-center configurations; and even head count, all of which represent costs that can be hard to ratchet down quickly. They sought to reduce these expenditures where possible and balance those costs against efficiencies gained through cloud programs.

The cloud-adoption leaders were also clear about the thresholds that initial deployments of applications to the cloud needed to reach to create meaningful return on initial investments. They modeled a number of adoption scenarios to determine the level at which the economics made sense (and at which they failed to). They used other IT transformation programs within the company to improve the economics of cloud migration—for instance, piggybacking on audit-remediation projects, data-center consolidations, or investments in hardware refreshment. They renegotiated contracts with vendors to control software-licensing costs and avoid large increases due to cloud migrations.

Finally, these companies emphasized transparency; for instance, they created rigorous charge-back mechanisms so that all stakeholders would understand the costs associated with the cloud program and the business rationale for it. Not surprisingly, this level of discipline in measuring their cloud programs (plus the

demonstrated results) helped these leading-edge companies build credibility with and support from C-level leaders in their companies.

The cloud operating model. All the participants in our survey noted that to roll out cloud programs, they needed to make significant changes to their IT operating models. Even those participants who anticipated the need for these changes said they were unprepared for the complexity and scale of the transformation. However, the cloud-adoption leaders in our survey took a systematic approach to change management. They took time to assess and then rebuild critical processes and governance models, they rebalanced and reorganized teams, and they invested in developing new skills and encouraging new mind-sets. For example, they hired a few critical additions to the IT organization and application-development teams and aggressively implemented new training for existing employees who would be delivering cloud services. They established commercial-style engagement models to manage cloud services and interact with business and application-development teams. For instance, they introduced new service catalogs (or updated existing ones) to better reflect the technology services and offerings available in the company; encouraged cross-functional, agile work teams that would continually refine cloud services being offered based on user feedback; and implemented charge-back mechanisms for services rendered.

The cloud-adoption leaders in our survey all noted how critical it was to secure executive support for cloud migration efforts and to engage a range of stakeholders from across the organization. These companies brought C-suite leaders under the tent early in the planning stages and routinely shared the results from early migration efforts. As one of the leaders noted, a cloud migration requires

changing “a lot of old habits” across many groups, and so communication and transparency are critical.



The story of corporate adoption of cloud platforms is a nuanced one, with multiple challenges—some relating to technology, but many others relating to how companies invest in and organize themselves for digital transformation. CIOs and heads of infrastructure and cloud programs will continue to feel the pressure to adopt the cloud as more industries go through digital disruption. Those that take their cue from the leaders in our study can accelerate the pace of change in their own organizations (and their industries). They can ensure the success of their own cloud programs, realizing significant value from their investments in the form of cost savings and agility. ■

¹ Most companies in our sample are Fortune 100 companies with large infrastructure budgets. They have been among the earliest adopters of cloud technologies. They come from a range of industries, regulatory environments, and geographies. The survey process started in 2014 and ended in the first half of 2016.

² For this research effort, we defined the private cloud as both on-premises private-cloud and dedicated public-cloud environments in contrast to other off-premises offerings.

³ We saw a similar shift in our research on the use of IT-as-a-service platforms. For more information, see Arul Elumalai, Irina Starikova, and Sid Tandon, “IT as a service: From build to consume,” September 2016, McKinsey.com.

Nagendra Bommadevara and **James Kaplan** are partners in McKinsey’s New York office; **Irina Starikova** is a partner in the Silicon Valley office.

Copyright © 2016 McKinsey & Company.
All rights reserved.