

Multi-Cloud Adoption Accelerates

Authors: Blair Hanley Frank & Stanton Jones

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Contents

- 1 Summary and Guidance
- 2 Cloud Context
- 4 IT Leaders Need to Address Four Key Questions
- 4 Cloud Entry Framework: A Key and Underappreciated Component
- 6 The Application Environment Spectrum
- 7 Platform Evolution Through Adoption of Emerging Technologies
- 8 Cost Management and TCO Variance
- 9 Evaluating and Integrating Service Providers in Cloud Transformation
- 10 Key Regional Trends
- 11 The Bigger Picture: How the Cloud Fits into Digital Transformation
- 12 Recommendations

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SUMMARY AND GUIDANCE

After years of discussion about whether cloud environments are suitable for enterprise workloads, it's clear now that, for most organizations, adoption of the public cloud is a matter of how and when, rather than if. This ISG research shows accelerating adoption of cloud computing using a hybrid, multi-cloud approach, with most enterprises pushing to move the majority of their applications into software-as-a-service (SaaS) offerings as quickly as possible.

Enterprises also are looking to adopt the latest public-cloud services as quickly as possible. These emerging technologies, including the internet of things (IoT), artificial intelligence (AI), microservices architecture and blockchain, tend to be well-suited for use with public cloud environments.

Because it's easy to adopt cloud services, enterprises do face some risks, including harming their future by bringing in new services with little control. Though it may appear to just be a business unit making an architectural choice by adopting a new SaaS offering for a one-off application, those decisions can ripple through an enterprise's infrastructure for years to come. One team might select a component that locks an entire company into a particular piece of software that leaders didn't plan to adopt at all.

To solve that problem, enterprises need to take a considered approach to adopting public cloud services, driven by understanding of business needs, combined with a focus on building a robust and adaptable technology platform. IT leaders need to balance competing impulses by controlling adoption of new services to avoid technology sprawl, while allowing teams the flexibility to take advantage of new and powerful technology. The investments in cloud computing made today will lay the foundation for an enterprise's digital backbone, a critical component of its overall digital transformation.



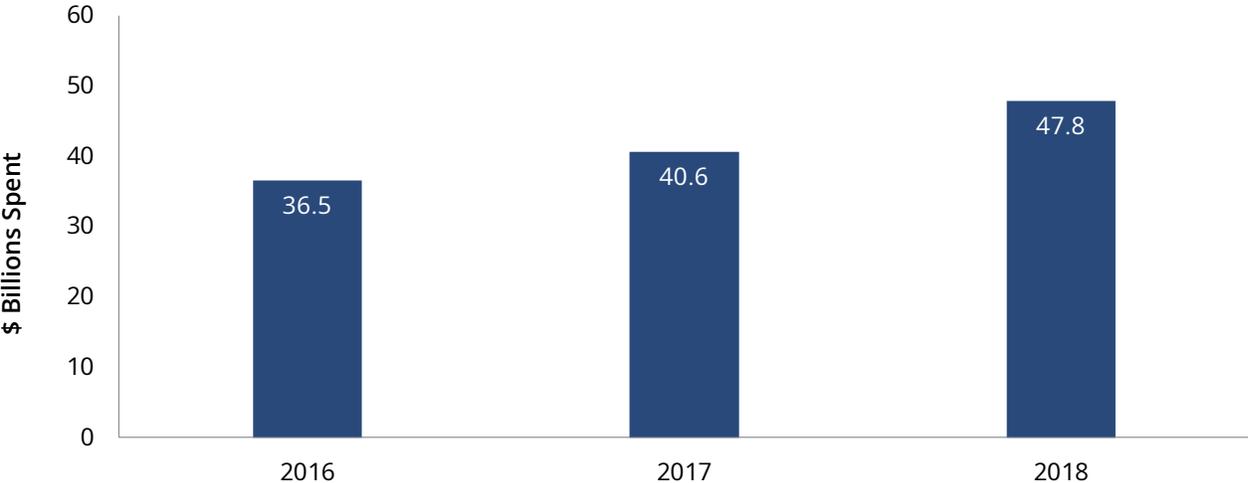
CLOUD CONTEXT

As businesses increasingly focus on software and data-centric business models, they need a digital backbone that can rapidly adapt to changing market conditions. Combining this with the rapid rise of on-demand and elastic cloud services means that IT leaders are now faced with the need for a platform that accommodates both legacy and new workloads, is located both on-premises and in the cloud, and managed by both internal staff and external service providers.

Consider the following:

- Over 80 percent of IT leaders in manufacturing, financial services, telecom, consumer services, energy and chemicals indicate their IT spending will increase over the next 24 months.
- While spending on traditional IT managed services remains solid, spending on cloud services is skyrocketing. Cloud now accounts for nearly 45 percent of the total annual contract value (ACV) of the combined sourcing and cloud markets, up from 22 percent in 2014 (Figure 1).
- Over 90 percent of IT leaders suspect that the majority of their application portfolio will be delivered via a software-as-a-service model by 2021.
- Public cloud service adoption beyond virtual machines and storage is surging, with 65 percent of IT leaders indicating they are piloting cloud database services while 72 percent plan to use cloud-based blockchain services.
- While digital spending is skyrocketing, it's important to remember existing investments. Over 70 percent of IT leaders indicate that they will not change the application architecture or hosting model for key systems of record such as GL/AP/AR and budgeting/planning through 2021.

Figure 1: As-a-Service Spending Is Steadily Rising

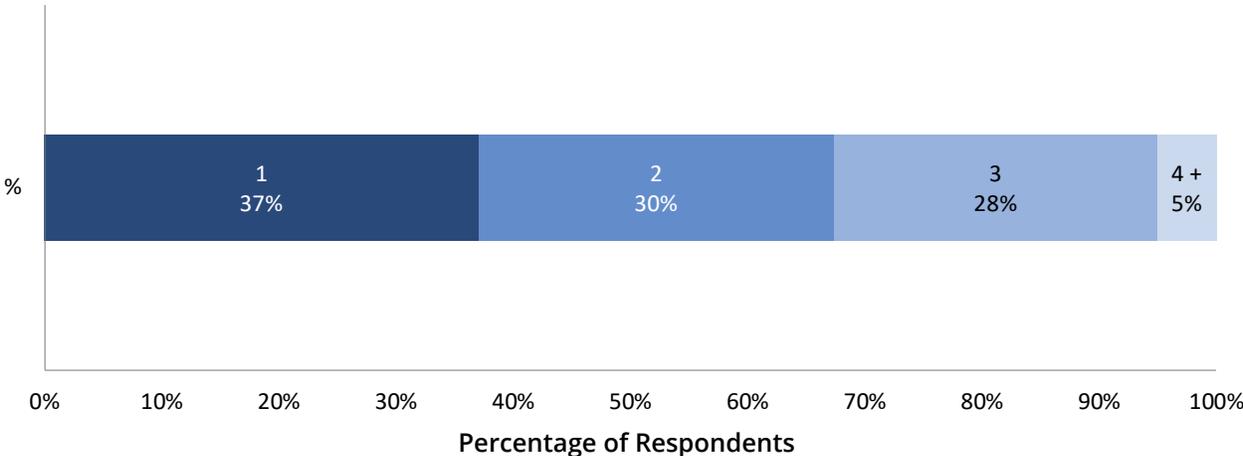


Values in billions of USD.
Source: ISG Research, ISG Index Q4 2018

To better understand the trends impacting this market, ISG conducted a survey of more than 300 enterprise IT decision makers in the U.S. and Europe. The study asked about their cloud operations, adoption and expectations for the future.

All 300 enterprises in the study said they use at least one cloud provider with hybrid, multi-cloud IT rapidly becoming the norm. On average, enterprises are using two different public cloud infrastructure vendors for their applications, in addition to a complement of SaaS vendors. Companies increasingly are taking an application-centric view to infrastructure operations and are distributing their application portfolios across traditional environments, on-premises private clouds, hosted private clouds, colocation facilities and public cloud infrastructure.

Figure 2: Number of Cloud Infrastructure Vendors Used



Source: ISG Research, Enterprise Cloud Transformation Study, 2018, n=301

Companies are using a multi-cloud strategy to:

- Maintain independence from any single public cloud vendor, its offerings and strategic direction.
- Mitigate risk of outages of entire regions, particularly if the client faces regulatory limitations in certain regions.
- Increase competitive pressure and choose from multiple service offerings, pricing models and prices.
- Avoid cloud vendor lock-in by maintaining and operating alternative fallback options.

Enterprises use multi-cloud strategies based on capabilities inherent in the various vendors as well as their geographical footprint and regulatory compliance with various workloads. They don't make these decisions based purely on costs as they likely did when outsourcing their data center.

IT LEADERS NEED TO ADDRESS FOUR KEY QUESTIONS

Enterprises must address several concerns as they adopt public cloud capabilities. ISG recommends that these four questions serve as guideposts in a cloud transition and digital transformation:

1. How do we engineer, maintain, retire and upgrade enterprise technology stacks, including all forms of cloud?
2. How will we put guardrails on what services employees adopt to ensure compliance, security and cost control?
3. How will we scale the use of new technologies that pose technical challenges, like machine learning and blockchain, while maintaining quality of service?
4. How can we adapt applications to new technologies and migrate them to foundational platforms?

IT has a key role to play in building and maintaining core platforms that form the backbone for enterprises' technology use. In a digital business context, IT must adapt and update these platforms to support new functionality as the enterprise needs them. No two enterprises will have identical platforms. Each organization has to contend with its own mix of legacy technology, compliance needs, business imperatives and desired technical investments. As such, IT teams will need robust management and governance capabilities that span private and public cloud environments, linking infrastructure as a service (IaaS), platform as a service (PaaS) and SaaS options together.

CLOUD ENTRY FRAMEWORK: A KEY AND UNDERAPPRECIATED COMPONENT

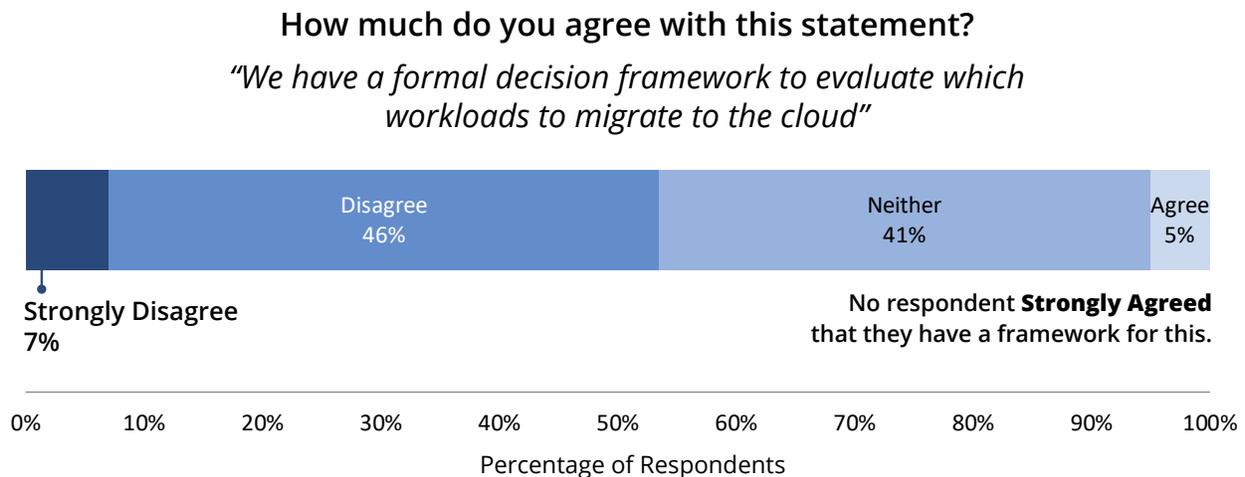
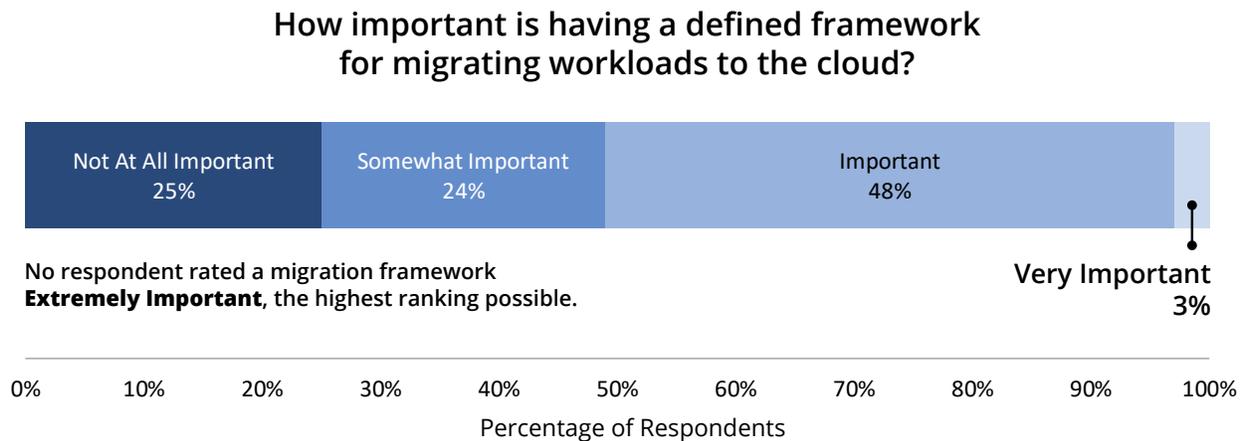
By using cloud vendors, companies are making decisions on the stacks they plan on using for a long time, even though those choices are not conscious ones.

Therefore, enterprises introduce risk if they fail to take a thoughtful approach to workload transformation and migration. A key part of this process is a cloud entry framework (CEF) that defines how workloads move to the cloud. This framework, which will differ for each enterprise and will evolve over the course of a cloud transformation as the business learns which choices are right for it, should address the following questions:

- Which workloads should move?
- Where do they move?
- When do they move, if at all?
- How should we handle them? Lift, shift and transform?
- What special considerations exist for different workloads?

Less than six percent of enterprises we surveyed agreed or strongly agreed that they have a CEF or equivalent. Less than one percent said a CEF is very important or extremely important for their business.

Figure 3: Enterprise Perceptions of Cloud Entry Frameworks



Source: ISG Research, Enterprise Cloud Transformation Study, 2018, n=301

A CEF provides a foundation upon which IT and business users can understand when and how different applications will migrate to the cloud. Laying out clear guidelines gets everyone on the same page and provides clarity for a complex process. The last thing that enterprises want to do is approach their cloud transformation in an ad-hoc manner. Enterprises that don't structure cloud ingress could end up prioritizing the wrong workloads or risk runaway cloud costs by failing to control migration.

A CEF also mitigates tool proliferation, since enterprises can lay out what environments they plan to use when migrating workloads to the cloud. This way, they're not left with a sprawling mass of different tools used by different teams with minimal security controls.

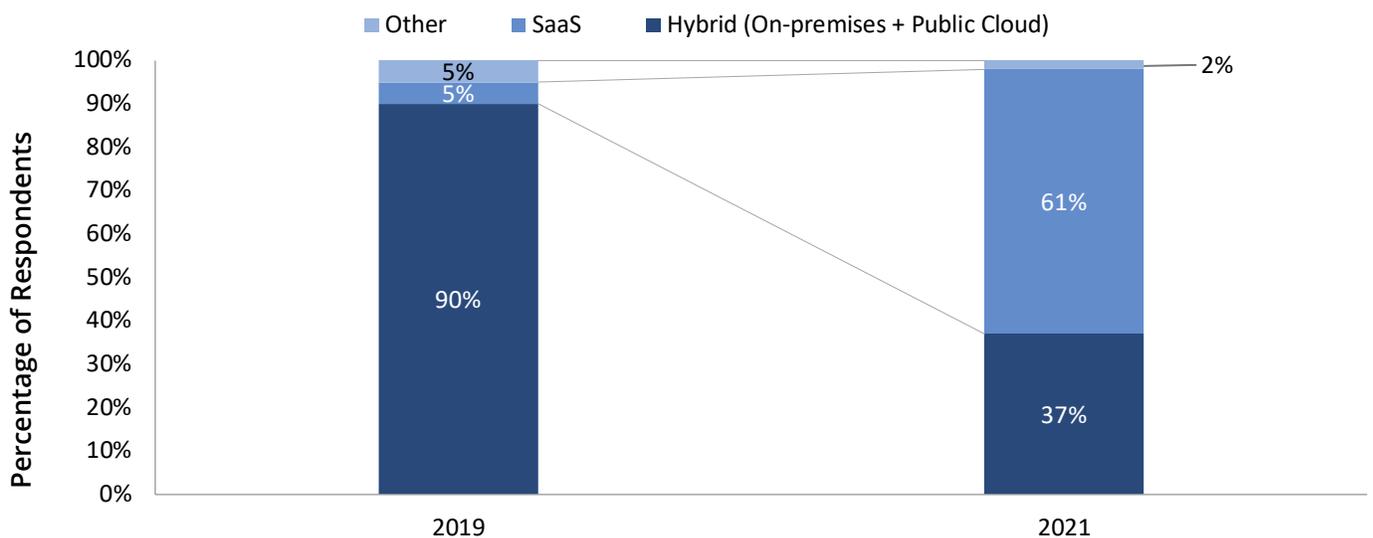
The sort of critical thinking about workload migration that a CEF requires is beneficial because enterprises need to make the most out of the money they're choosing to spend on the cloud. Moving a workload from a private data center into the public cloud confers marginal benefits, at best. For the most part, "lift and shift" style migrations transform infrastructure spending from a capital expense

to an operating expense, with minimal additional benefit. While cloud vendors often highlight the simplicity of migrating workloads from a private data center to a public one, technical pitfalls still can accompany even seemingly straightforward moves.

THE APPLICATION ENVIRONMENT SPECTRUM

The overwhelming majority of enterprise IT decision-makers run their applications in a hybrid mode, with some workloads in the public cloud and others in private data centers. Interestingly, most of those same IT professionals expect that the majority of their workloads will be running in software-as-a-service environments by 2021.

Figure 4: Where will the majority of your applications be running in 2019 & 2021?



Source: ISG Research, Enterprise Cloud Transformation Study, 2018, n=301

Making the move to SaaS brings with it several benefits. First, IT teams are no longer responsible for maintaining the foundation for core business applications that have moved to SaaS — vendors do that for them. Because of the subscription payment model, vendors are incentivized to constantly innovate, and customers gain ongoing benefits from that. Enterprises also find the total cost of ownership (TCO) for SaaS more predictable compared to other cloud options. However, we believe it's optimistic for enterprises to expect the majority of their application estates to move to SaaS environments within the next two years.

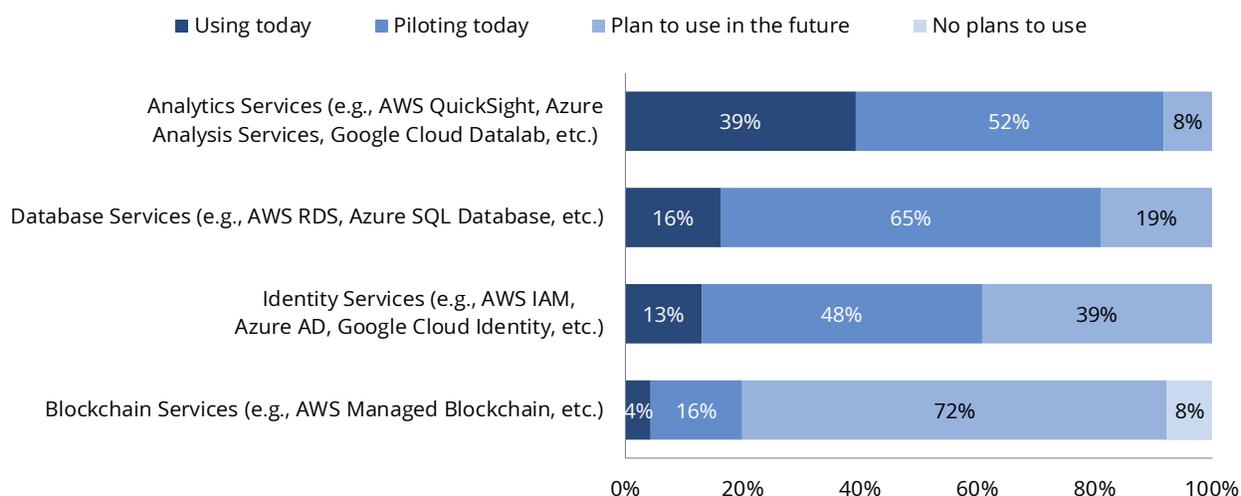
It can take significant work to adapt existing applications and integrations to SaaS platforms, which slows enterprises' ability to migrate applications. That means applications will exist in a spectrum of environments – from on-premises to SaaS – and enterprises will need to manage all of them simultaneously.

In this model, IT's role is as platform manager, to help create and manage the integrations between these applications as they move through their lifecycle. This is why defining an entry framework is so important: IT must determine when and how workloads move between different environments, from private data centers to public clouds and vice versa.

PLATFORM EVOLUTION THROUGH ADOPTION OF EMERGING TECHNOLOGIES

Adoption of microservices architecture, blockchain, service mesh and other emerging technologies remains nascent (Figure 5).

Figure 5: Implementation of Emerging Technologies



Source: ISG Research, Enterprise Cloud Transformation Study, 2018, n=301

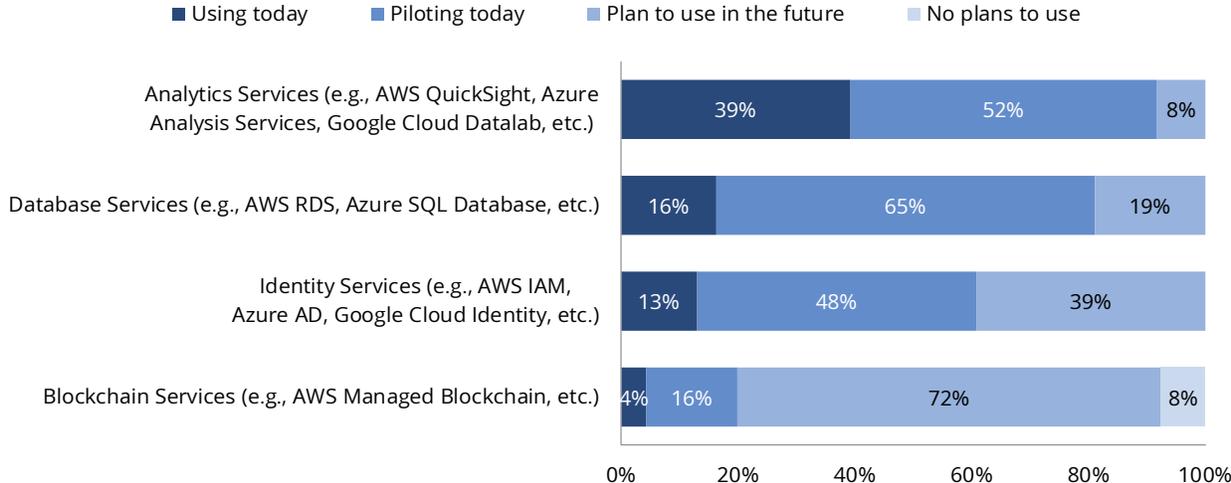
Containers, microservices and service mesh garner headlines, but deploying these technologies in production is still in the planning stages. Part of that is a matter of prioritization: service mesh technology is most useful when enterprises have a proliferation of applications across multi-container environments, and most enterprises are still early in the implementation of those patterns.

ISG recommends that enterprises focus on solving their immediate business problems while planning for the future. It's tempting to chase the most technically interesting solution, but many of the development patterns and best practices within the cloud-native development ecosystem are still emerging. Instead, it makes sense to tackle things as they come. For example, enterprises should decompose monolithic applications as needed to recognize benefits like improved performance and greater adaptability. At the same time, they should avoid undue complexity.

The technologies discussed above are foundational to an overall enterprise technology platform, so it's important that businesses understand and experiment with them.

Similarly, enterprises should take a thoughtful approach to adopting new services from hyperscale cloud vendors. These tech companies constantly roll out new capabilities to address enterprise needs and attract additional spending from both new and existing customers. Most enterprises are – at the very least – piloting use of database, analytics and identity services from one of these vendors. Figure 6 illustrates the varied (and fairly low) levels of adoption of many of these services, but also highlights enterprise interest in each of the categories we asked about.

Figure 6: Where are you in the adoption of these public cloud services?



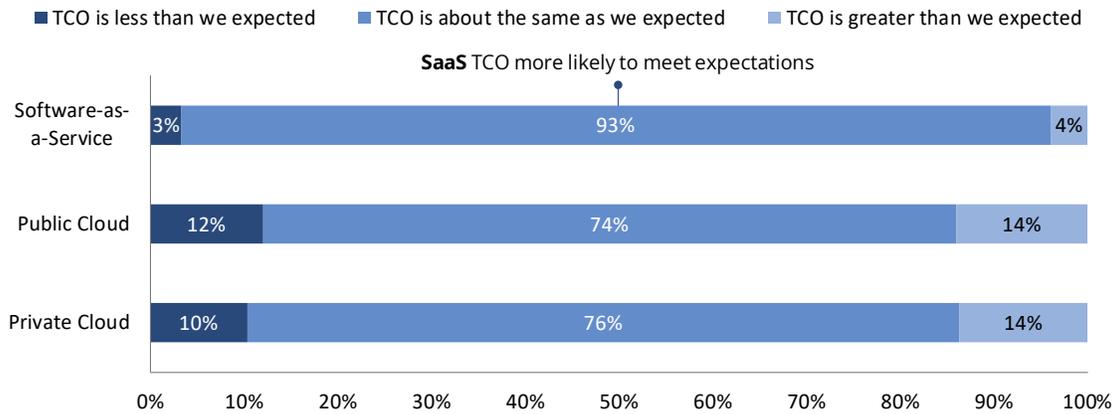
Source: ISG Research, Enterprise Cloud Transformation Study, 2018, n=301

There’s a trade off when using services like these: on one hand, enterprises can frequently offload much of the management responsibility for critical functionality that would otherwise require the time of IT and development staff. On the other, these services can imply a greater risk of lock-in. Whether or not this exchange is a smart investment depends on each company’s perspective and may even vary on a workload-by-workload basis.

COST MANAGEMENT AND TCO VARIANCE

Enterprises feel that the TCO for SaaS products is in line with their expectations, while IaaS TCO is generally higher than their expectations. This doesn’t mean TCO for IaaS is higher or lower than SaaS overall, but just that SaaS is more predictable than IaaS.

Figure 7: Cloud TCO Versus Enterprise Expectations



Source: ISG Research, Enterprise Cloud Transformation Study, 2018, n=301

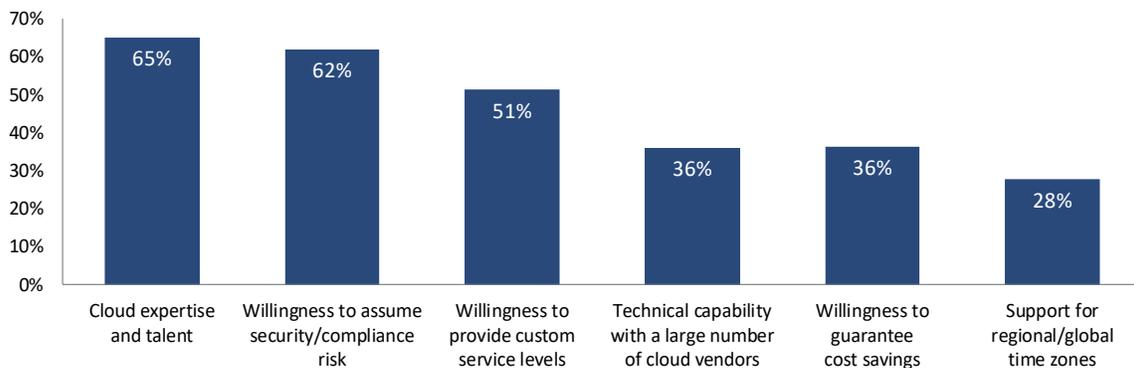
One of the biggest differences between IaaS and SaaS is that enterprises have much more control over cost with the former, because they manage all the compute, networking and storage requirements for applications running in an IaaS context. That means the greatest cost reduction will only come from deep knowledge of the workloads being migrated (see need for cloud framework, above) and there may be hidden costs that companies don't anticipate.

This doesn't mean enterprises should avoid using IaaS and PaaS offerings — quite the contrary. They just need to be aware of the cost complexities involved and figure out how their management of those costs fits with their overall cloud transformation plan. As noted above, ISG expects enterprises will have workloads running in IaaS, PaaS and SaaS environments for the long term.

EVALUATING AND INTEGRATING SERVICE PROVIDERS IN CLOUD TRANSFORMATION

Service providers fit into this operating model in a number of ways. First and foremost, enterprises may choose to work with a provider to create a management layer or to help it move to the cloud. When moving to the cloud, organizations seek service providers with cloud expertise and talent, willingness to assume security and compliance risk, and willingness to provide custom service levels.

Figure 8: Key Service Provider Characteristics



Source: ISG Research, Enterprise Cloud Transformation Study, 2018, n=301

It's worth noting that the majority of respondents want service providers to offer custom service levels. This shows one of the critical benefits that can emerge from working with a provider: they can offer customized services for hyperscale public cloud platforms that would otherwise be unavailable to enterprises. Technology vendors often take a "take it or leave it" approach to their services, and while we see some degree of customizability with cloud vendors, most stick close to their existing product roadmap when it comes to helping clients.

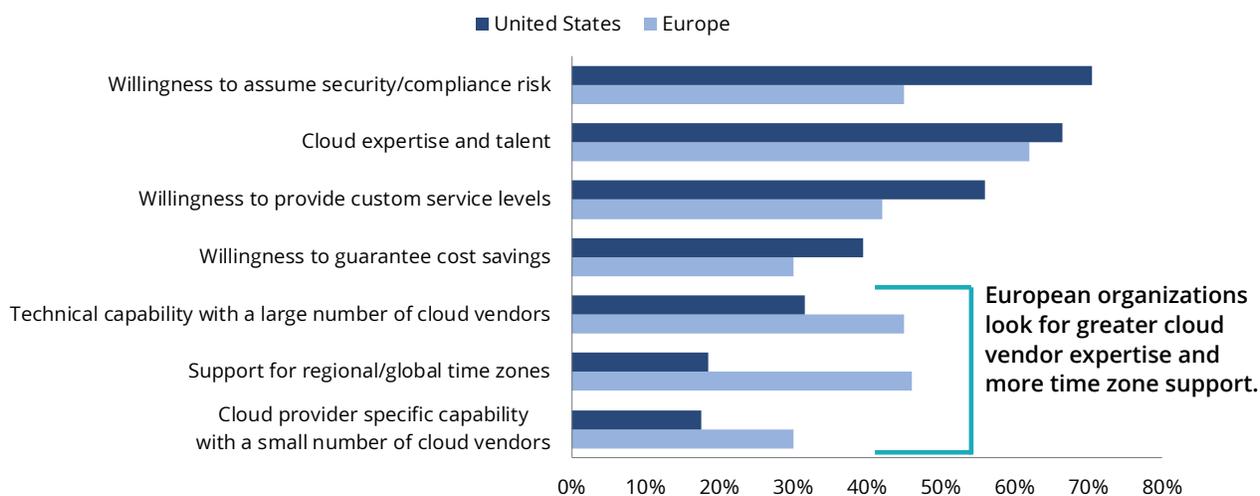
Enterprises also consider it critical for their providers to assume security and compliance risks. In ISG's experience, service providers are less willing to assume unlimited liability, especially with the growth of cybersecurity threats. Enterprises will need strong governance to ensure they are getting the most out of their provider relationship.

Enterprises consider it important for providers to demonstrate cloud expertise, though only a minority consider vendor-specific expertise to be important. ISG finds that most of the major providers today are cultivating multi-cloud capabilities to better meet enterprises' needs.

KEY REGIONAL TRENDS

We see strong regional divides between IT professionals in the U.S. and Europe when it comes to their evaluation of service providers for cloud deals. American firms are more likely to prioritize providers that assume security and compliance risks, compared to their European counterparts. European companies have a much stronger preference for providers that can support global time zones.

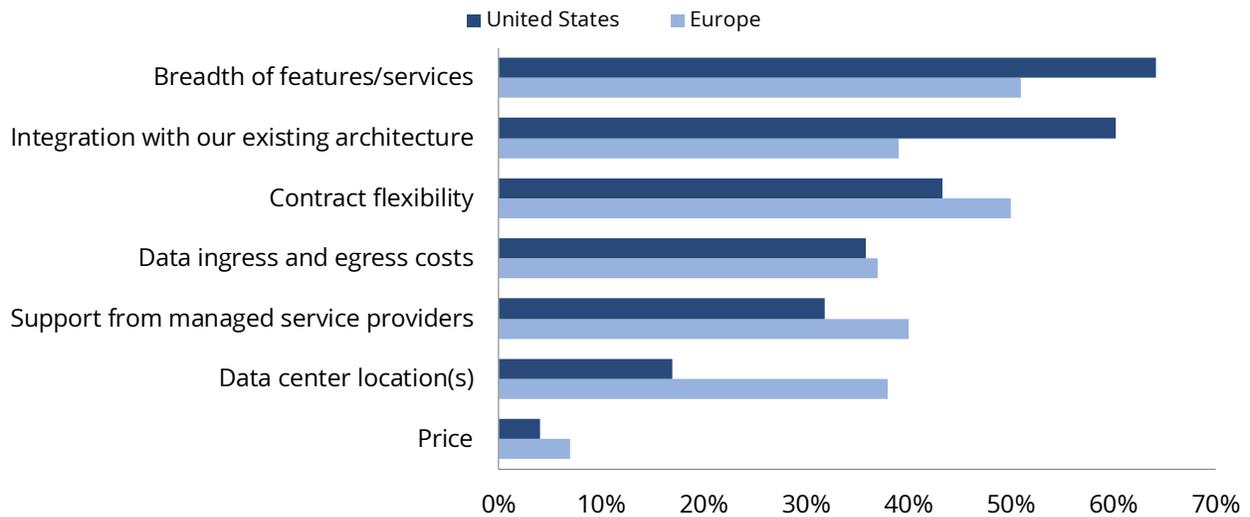
Figure 9: Service Provider Characteristics by Region



Source: ISG Research, Enterprise Cloud Transformation Study, 2018, n=301

Another key difference we see between European and American companies is how they evaluate cloud vendors. European firms are more likely to prioritize data center locations, managed service provider support and contract flexibility, while American companies are more focused on breadth of features and integration with existing technical architecture.

Figure 10: What are the top three most important characteristics when evaluating cloud vendors?



Source: ISG Research, Enterprise Cloud Transformation Study, 2018, n=301

It makes sense that European firms are more concerned with the location of data centers because they have to worry about data protection laws that often mandate data be stored within a particular national boundary. What's more, these firms are less likely to have public cloud infrastructure that meets their exact geographic needs, compared to American companies, which are already well served by the major cloud vendors, each with multiple regions around the country.

In ISG's experience, American companies have been using cloud services for longer on average, which likely contributes to their focus on the breadth of features available from different vendors.

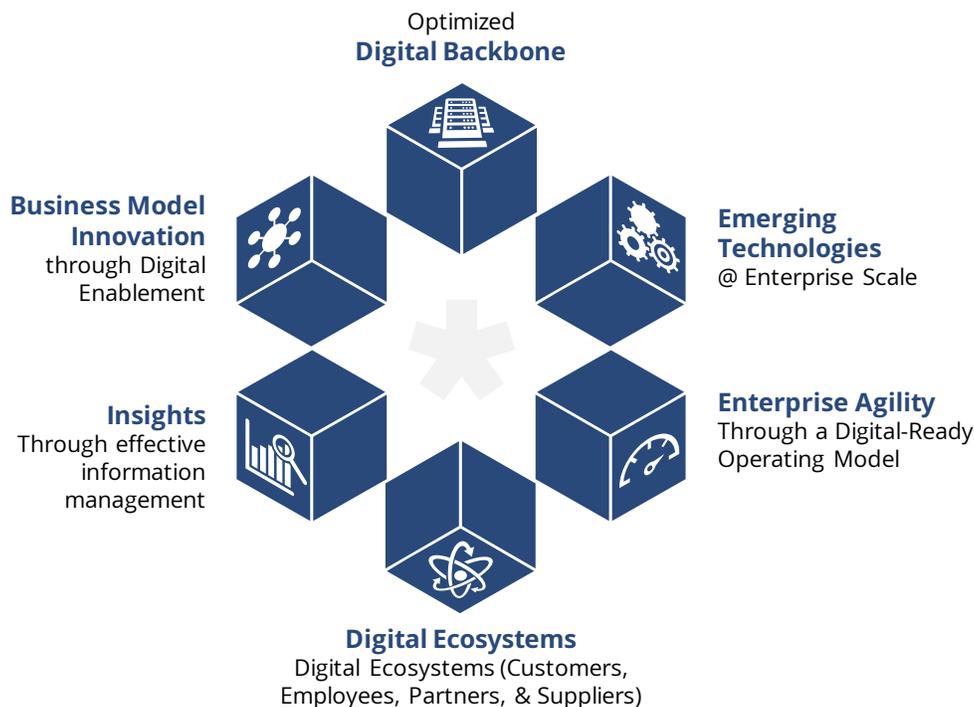
THE BIGGER PICTURE: HOW THE CLOUD FITS INTO DIGITAL TRANSFORMATION

Based on our extensive work advising over 700 global enterprises, and our ongoing digital transformation-focused research, ISG has identified six key disciplines that we believe enterprises must have in place to enable business model innovation while keeping existing people, process and technology humming.

- **Business model innovation** enables an organization to build competitive differentiation in today's digital economy.
- **Predictive analytics and insights** derived from robust data and information management enables effective decision-making and proactive digital security and risk management.
- A **digital ecosystem** of partners, suppliers and customers enables an organization to leverage market innovation at scale.
- **Enterprise agility** is about applying the right delivery model at the right time, which enables an organization to adopt agile and adaptive operating models to accelerate innovation.

- At its core, the ability to adopt **emerging technologies at scale** enables an organization to increase innovation and productivity through a seamless physical-digital integration of humans, processes, systems and machines.
- A **digital backbone** is the adoption of modern microservices-based architectures, including cloud services, with a focus on creating a secure, scalable and agile business platform. This report focuses on how organizations can create an operating model that will enable their backbone to scale as digital business adoption drives spending outside the data center and into the cloud.

Figure 10: ISG Digital Transformation Framework



Source: ISG

RECOMMENDATIONS

The future of enterprise technology is in the cloud. As such, IT leaders need to take a thoughtful and methodical approach to how they and their organizations adopt services and transform their infrastructure. Without considering the consequences of adopting different services and tools, enterprises risk locking themselves into technologies they don't want to use and exposing themselves to unnecessary risk. This transition will likely define the next decade or more of technology architecture within an enterprise.

One of the most underappreciated components of this approach is a CEF, which helps answer questions about how workloads are prioritized for migration and where they will end up. We recommend enterprises focus on developing this competency as part of their cloud transformation.

While enterprise technologists expect they will be moving the majority of their workloads to SaaS in the very near future, it's important to remember that SaaS alone will not replace all the functionality an enterprise currently requires. In addition, the transition will take significant time to complete, and enterprises will likely continue to operate in a hybrid mode for the foreseeable future, with some workloads moving very late or not at all from their current homes on-premises to the cloud.

As enterprises make this transition, it's critical that they think about how service providers can play a role. While the underlying services enterprises consume may be delivered by technology vendors, service providers can provide a level of customization and assistance that is unavailable from the hyperscale vendors themselves.

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