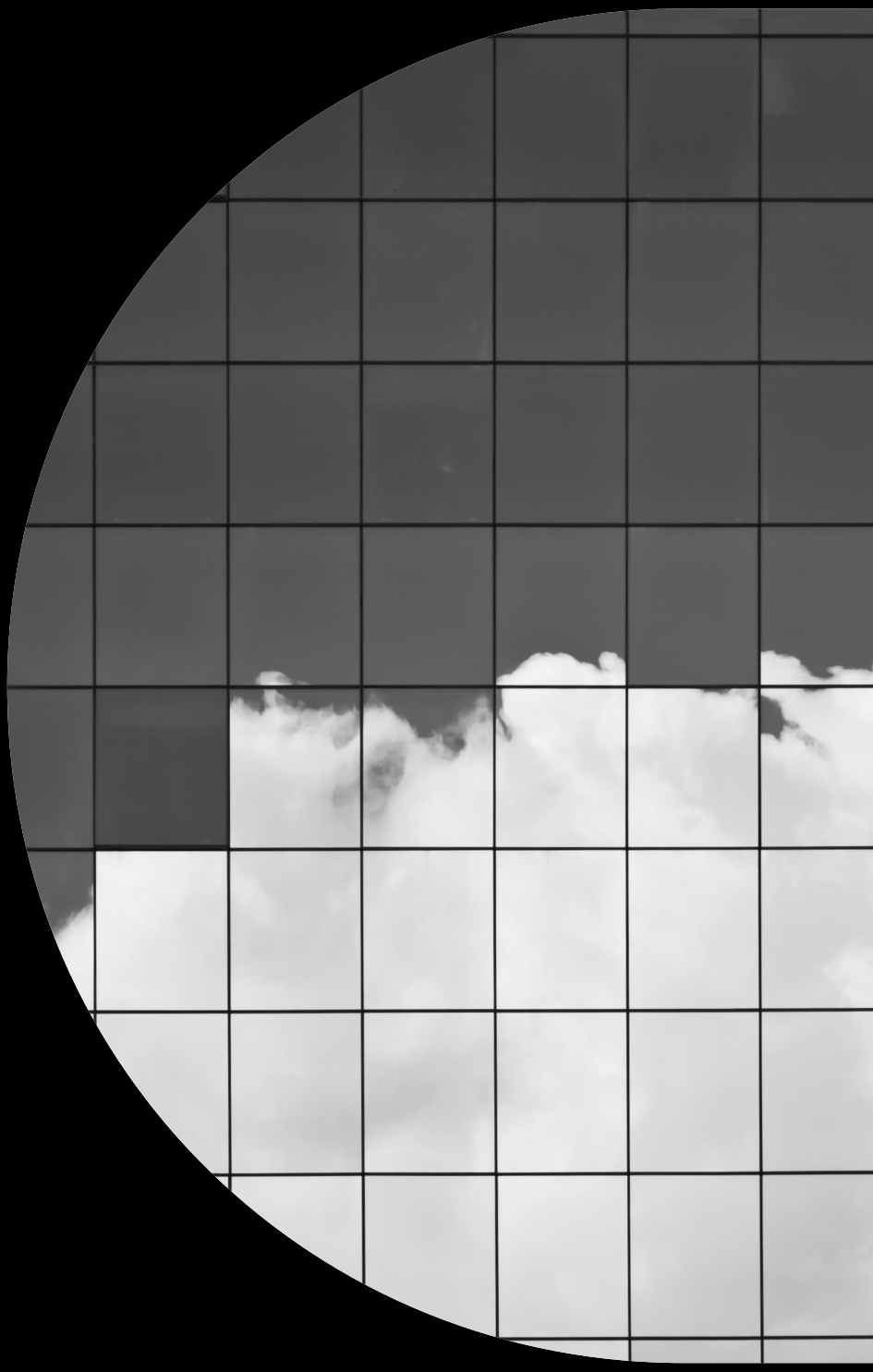


DXC.technology

Enabling the Enterprise Through Hybrid Cloud

Transforming to a Digital Enterprise

Traditional IT environments can't match the pace of change in modern enterprises, and that's why the hybrid cloud platform is a key element in the digital transformation journey. Combining the capabilities available in the public cloud environment with a modern, on-premises cloud platform eliminates the restrictions of a traditional IT approach, creating a business-relevant infrastructure to meet the demands of business stakeholders, end users and developers. Hybrid cloud environments enable organizations to rapidly develop, deploy, execute and protect next-generation applications through a flexible, policy-driven software-defined platform that reinforces the value IT brings to the business.

IT has a tradition of building silos of technology. Sometimes IT builds silos because the organization has discrete functional requirements. Sometimes it builds them because of budgetary cycles, software licensing, hardware scalability or a convincing sales message. Whatever the cause, organizations often end up with many data repositories and a complex, inflated IT estate.

Even as walls go up between applications and data, however, businesses need to tear them down. New channels require new applications. Market windows open and close in a matter of months, even weeks. As a result, application needs have undergone a dramatic shift. Today, the table stakes for new applications include the ability to interface with loosely coupled services, to implement infrastructure as code and to tolerate failures. Application developers, data scientists, business analysts, and infrastructure service providers must work together collaboratively to meet the dynamic needs of the digital enterprise. These requirements fundamentally change the infrastructure that serves them.

The limitations of traditional IT environments, once state of the art, are not sufficient to meet the needs of the digital enterprise. Scaling or provisioning infrastructure to meet dynamic demand takes too long, takes too much space, costs too much and limits flexibility. Business leaders pressed to answer urgent needs have been going outside IT to buy services directly, a practice known as “shadow IT.”

As cloud architecture has taken root in IT strategy, some businesses have adopted a public cloud-first approach. In certain circumstances, however, a public cloud may not be appropriate or desired for a particular workload, due to regulatory compliance, architecture constraints, software licensing and data sovereignty requirements.

A hybrid cloud platform provides a compelling option to address many of these business challenges. A hybrid cloud is a computing resource that automatically manages and monitors the execution of workloads across a combination of computing environments, on- and off-premises, according to the specific needs of the workload. It provides for policy-aligned resources that can be consumed at the point of use. And it employs software-defined APIs using a centralized management, orchestration and governance framework. Successful hybrid cloud platform implementations dramatically reduce lead times, enable the deployment of new features and functions more frequently, reduce failure rates for changes, and improve application resiliency.

By 2020, cloud will be where secure and trusted IT services live: Cloud-based encryption, threat analytics, user and entity behavior analytics, blockchain, and compliance services will proliferate. Enterprises not leveraging the cloud for security services will be viewed as unsecured.

Source: IDC FutureScape: Worldwide IT Industry 2017 Predictions, Doc #US41883016, November 2016

The Cybersecurity Opportunity

Cloud for the win. As businesses embrace the cloud, the components in the enterprise shift from being boxes to services provided by clouds. The future enterprise consists of clouds interconnecting with clouds, which are themselves built out of virtual components such as virtual firewalls, specified and spun up in real time in response to a client's key and mouse clicks.

Robotic processes will deploy and update services based upon digital recipes with embedded security controls and monitoring. This will eliminate user error and provide consistent implementation of key services in multiple cloud environments.

Services will scale automatically to workload requirements and will recover seamlessly through the built-in resiliency of the cloud platform.

Security needs to support this dynamic environment.

Cloud providers — whether hybrid services provided by DXC directly, or services from AWS, Azure and SaaS providers such as **Salesforce.com** — can all provide security add-on services. These services are professional, comprehensive and continually improving. However, they are not enough on their own.

The threat. We are in a world where no one can forecast the shape, direction, source or sophistication of the next attack, and users don't always adhere to security policies, whether accidentally or otherwise. Further, as the cloud services become larger, the rewards available to cybercriminals for a successful attack increase in a never-ending spiral of one-upmanship.

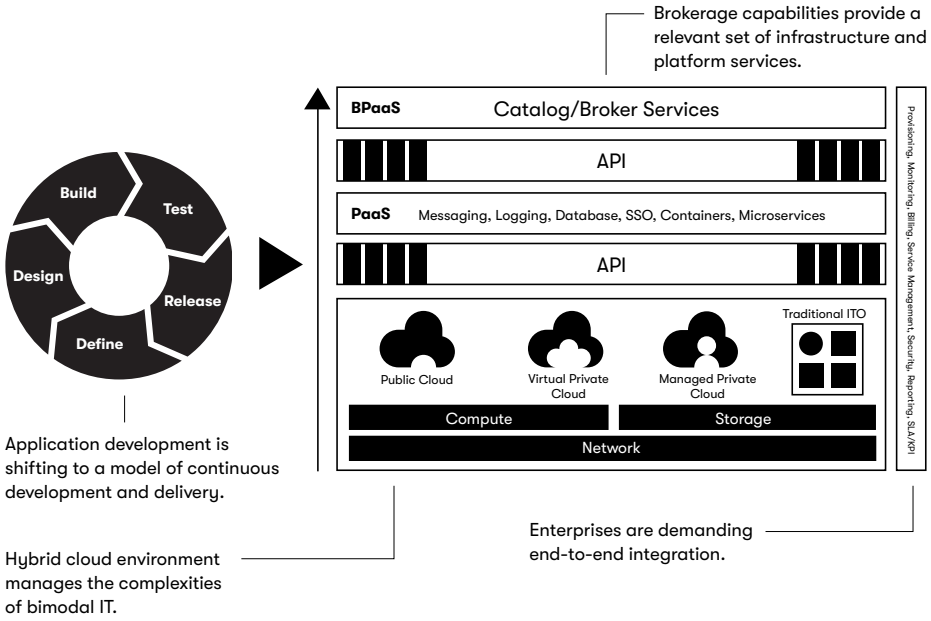
To create a comprehensive security offering, the events and the telemetry generated by cloud-based security services need to be collated, monitored and analyzed. The technical element is mainly done; it is the so-what that needs to be addressed. An organization's security service needs to understand the risk to its individual business, from any security event or breach, and recommend — if not directly take — remedial action.

Standalone solutions inflate IT estate

Any business generates and holds a technical debt. Older systems and applications remain necessary to continue operations and are likely to remain in use into the future — even if the replacement budget is not a constraining factor — because of the number of internal and external changes that would be required across all aspects of the business to update them. Many applications have been intricately woven into the fabric of the enterprise, and the cost to reengineer or replace them may outweigh the benefit.

This leaves the enterprise with elements of its architecture that cannot be transformed easily. However, the organization can make certain components more efficient without instigating an enterprise-wide change program.

Hybrid Cloud Enables the Digital Enterprise



Infrastructure provisioning for legacy applications has traditionally been part of a capital outlay and maintenance expense cycle that was repeated every three to five years, with equipment sized to peak requirements, due as much to the procurement and deployment process as to the scale of the workload. This led to oversized and suboptimal workload placement and an unwieldy block of purpose-locked infrastructure.

The very architecture of software and the way it's developed is changing radically in ways that dedicated stacks can't support. Modern software architectures are designed to inherently manage hardware failure through the loose coupling of components, increasing scalability, availability, data protection and disaster recoverability. Business solutions often become a web of smaller services that require multiple data sources inside and outside the enterprise, rather than large monolithic blocks of code designed to maintain availability through intelligent infrastructure that accesses dedicated data sources.

Over the next 3 years, 30% of surveyed companies plan to increase their use of public clouds, 28% plan to increase their use of hybrid clouds, and 27% plan to increase their use of private clouds.

Source: Global Digital Enterprise Survey 2016-2017, conducted by the Economist Intelligence Unit and sponsored by DXC Technology.

What Can You Do with a Hybrid Cloud?

Most industries are using intelligent machines to discover something new and do something better than human beings are doing it now. In energy and technology, algorithms are anticipating driver behaviors that could lead to loss and predict the degraded performance of the power infrastructure. Intelligent machines are extending healthcare beyond the walls of the hospital by using environmental factors (such as ozone levels) to predict spikes in emergency room visits. There are even digital worlds that simulate and predict flaws, cost and performance in manufacturing.

The power of machine learning grows as more data becomes available. And we are producing new data at an astounding rate. It is entirely possible that within the next 3 years every human being on the planet will create about 1.7 megabytes of new information every second. And we are far from putting this data to good use. By some analyst estimates, we may be capturing only 20% to 30% of the value of our manufacturing data, 10% to 20% of the value of our public-sector data, and 10% to 20% of the value of our healthcare data.

All

- Perform real-time anomaly detection and preventive maintenance
- Plan and optimize asset maintenance
- Create standard proven blueprints
- Enable rapid versioning and recovery

Banking and Capital Markets

- Understand customer segments
- Predict trade risk
- Personalize financial advice

Energy and Technology

- Anticipate driver behaviors that will lead to loss
- Predict outages and degraded performance of IT infrastructure
- Predict service support requests for IT infrastructure

Healthcare

- Predict and reduce hospital lengths of stay
- Use environmental factors to predict emergency room admissions
- Predict community health risk and create outreach plans

Insurance

- Discover the root cause of claims and warranty labor requests
- Predict the incidence of new claims and warranty labor requests

Manufacturing

- Perform real-time anomaly detection and preventive maintenance
- Predict equipment performance prediction
- Simulate and predict flaws, costs and performance

Retail

- Cluster analysis and market segmentation
- Model and predict buyer propensity
- Optimize logistics and supply chain

If you combine the power and flexibility of the cloud with a strong Analytics IQ, you can add intelligence to just about any part of your business.

In every industry, the barriers to capturing the full value of the data we create are nearly the same. Data is locked away in silos. Getting a machine to spot meaningful insights typically takes a lot of processing power and data storage capacity. The enterprise has yet to be shown a convincing demonstration of the data's potential.

These are all challenges that can be met with a strong **Analytics IQ** and the proper deployment of hybrid cloud technology. The cloud is the fastest and least expensive way to integrate data. The cloud brings sophisticated algorithms, fast computing platforms and massive storage capacity within reach. It lowers the barriers to adoption and makes it easier for enterprises to get their feet wet with inexpensive experiments. Cloud services make it easier to build compelling applications quickly by delivering in small, meaningful chunks.

Intelligent machines are producing data at an astounding rate. Hybrid cloud platforms enable enterprises to capture value from the data to further their business goals through digital transformation.

— Jerry Overton, Data Scientist, Senior Principal, DXC Technology

Application development is shifting to a model of continuous development and delivery, which is built on a model of tight collaboration between IT and the business. That's a positive step, but it's a model that runs most effectively on open, dynamically and instantaneously delivered IT stacks. Workloads can then be shifted between private and public infrastructure for policy, flexibility and scale.

Addressing the inherent restrictions of traditional platforms through tactical application rewrites and basic cloud enablement can be expensive and may only paint over the cracks. It is ideally targeted at the short-term life extension of an application. Even when appropriate, it can be a complex, lengthy process, and the investment and effort are better expended elsewhere.

Technology Platforms: The LEF Perspective

The cloud is a platform that is continually unlocking new areas of value for business. With the emergence of machine intelligence, the internet of things (IoT) and 5G networking — collectively what we call the "Matrix" — the amount of data to move, store and process can only be managed effectively on a cloud platform. That's why the Leading Edge Forum, the independent research and advisory arm of DXC Technology, is adamant that all businesses need to be well on their way to adopting cloud-based technologies, as this is just the first step in a long journey that will enable them to unlock the value the Matrix offers.

Just as the cloud itself can be seen as a platform, 21st century organizations are learning how they themselves can become a platform business. They are taking an outside-in approach to their business and technology architecture, embracing ecosystems, becoming important players in external value chains and finding new opportunities to monetize existing assets, while finding new areas where their businesses can play and add value. This all comes with the complexity of having to evolve to new operating models, embrace new technology and create new relationships, all while ensuring that the business is secure and protected, and keeping up with compliance and regulatory issues.

Adopting the cloud is hard and requires investment, as does any large organizational shift, but it should not be ignored. The value it is unlocking today is well documented, and we believe the future value it will unlock will make what we've already seen look like the tip of the iceberg. Choosing not to embrace it and invest in the change will not only leave you behind in exploring new avenues of value, but will also leave you less able to protect your business. Bad actors are already embracing the cloud to find new and novel ways to exploit your business. Without the power the Matrix offers, you will be hard-pressed to defend yourself when the time comes.

More than 85% of enterprise IT organizations will commit to multicloud architectures by 2018, driving up the rate and pace of change in IT organizations.

Source: IDC FutureScape: Worldwide Cloud 2017 Predictions, Doc #US41863916, November 2016

Enabling digital transformation

The hybrid cloud platform recognizes and supports the two paces of digital transformation occurring in the industry: the aggressive adoption of social, mobile, analytics and cloud; and the tactical approach to solving distinct client challenges through digital technology.

A hybrid cloud platform allows enterprises to embrace full public cloud adoption with confidence and control — and for smaller-scale adoption, it provides accessible entry points into extensible and scalable managed services that can transcend the corporate boundary.

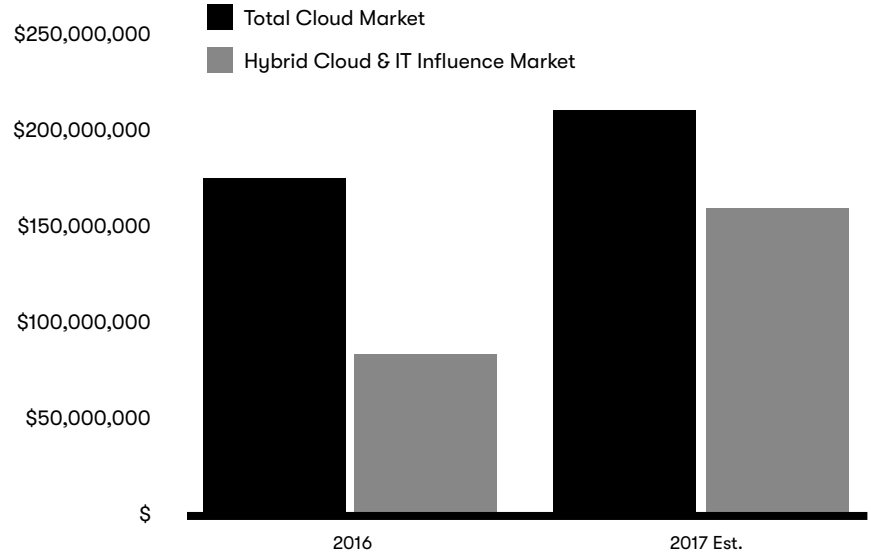
CIOs can cater to different groups of users by providing a flexible platform that exposes features compatible with industry-leading providers while allowing older systems to interact safely.

Meanwhile, expectations from users have never been higher, fueled by the ease of access of consumer-grade IT services from cloud providers, along with the pace of enrichment of users' personal technology mix. These expectations are now justifiably being placed at the CIO's door, and if IT cannot meet these expectations, the business will reach around internal IT. Transforming to an agile business requires an agile infrastructure, where services are provided, advertised and consumed by developers, information security and operations alike.

Expectations from IT for infrastructure as a service (IaaS) have evolved as well. Previously, the point-and-click provisioning of a virtual machine was enough to qualify as a private cloud service. But today's IT consumers expect coordinated and API-driven provisioning of services across multiple technology domains in any IaaS implementation. They expect blueprinting and recipe deployment through orchestration tools delivering layered application stacks. And they want granularity of abstraction, using container ecosystems and serverless computing. With the mining of vast telemetry sources, microservices are now emerging, which in turn fire an explosion of data into back-end billing and support systems as clients demand a higher-resolution view of their consumption habits.

Digital transformation of your business is not just about changing your infrastructure or implementing agile management techniques. It is about readying your business for the future, and for some, saving it from the past. Successful transformations recognize and carefully address the interlock among application modernization, integrated digital service management, secure digital networks and a hybrid cloud platform, leading to a business that can innovate freely and operate securely.

Total Cloud vs. Hybrid Cloud & IT Revenue



Source: TBR Estimates

Business benefits of the hybrid cloud platform

The hybrid cloud platform delivers value to the business by enabling your digital transformation, giving it the best from the public cloud and on-premises infrastructure services, and transcending the corporate boundary — all while keeping you firmly in control.

Advances in platform technology are helping organizations make strides toward long-standing goals of agility, simplicity and cost savings.

The transformation of platforms from complex and expensive stacks of hardware into flexible computing resources represents a major step toward enabling business agility. Given the ability to provision their own computing resources, through self-service and storefront-like interfaces, business units will be less tempted to turn to shadow IT. The complexity and scope of the IT estate will be greatly reduced. And with consistent control and governance policies applied, the security of the overall system — not just the individual instance — will be improved.

In addition, the hybrid cloud platform delivers these business benefits:

- An agile compute infrastructure spanning private and public cloud allows the selection of the right location for workloads.
- Brokerage capabilities provide a relevant set of infrastructure and platform services under a hybrid cloud delivery model, eliminating the challenges of shadow IT.
- Unified and granular visibility into resource consumption shows who, what, where and for how long. This helps address governance, risk and compliance, and leads to better workload analysis, placement and, ultimately, cost optimization.

- Computing resources and platform capabilities can be obtained as a service, which means they can be scaled to fit business needs on demand.
- Harmonized service characteristics across public and private cloud infrastructures provide a consistent experience and deliver the benefits of a managed service with the level of control your business needs.

A critical component of the hybrid cloud platform is establishing an on-premises or private cloud to bridge the gap between traditional IT delivery and a public cloud, for workloads that can benefit from a cloud delivery model but need to remain on-premises.

The private cloud helps ensure the public cloud is exploited for appropriate workloads while maintaining traditional IT delivery for business-critical legacy applications, which can be optimized in place as needed. Rather than create a "competing" platform, the establishment of a private cloud creates a new center of gravity designed to naturally shift demand from existing infrastructure and shadow IT to a faster, less expensive and more capable alternative.

The on-premises or private cloud provides a cloud-like experience, while removing the constraints of traditional service delivery. It has three characteristics that distinguish it from previous virtualized environments:

1. Infrastructure shifts to flexible converged and hyperconverged platforms and software-defined infrastructure services, replacing specialized, expensive servers and SAN infrastructures. Storage, computing and memory can be provisioned into blocks of computing resources via APIs as needed and can be billed on a usage basis.
2. Provisioning shifts from manual to automatic. Self-provisioning allows business units to request resources and build environments on demand. Automation and platform services make it possible to support important advances in continuous application development and delivery. DevOps, which requires tight integration between development and testing resources and the business, relies on the ability to rapidly deploy and maintain applications in different environments.
3. Workload management shifts from static to dynamic and elastic. A major advance in platform design is the ability to move workloads between clusters of computing resources based on rules or on conditions that are detected when a workload is running. This allows the system to strike just the right balance, providing the amount of computing resources and agility necessary to maintain a specified quality-of-service level without overcommitting resources during workload changes.

Enabling business success

The evolution of the hybrid cloud platform represents good news for IT departments that have found themselves perpetually on their heels as they attempt to address an accelerating pace of change with a sprawling, complex and aging IT estate.

The hybrid cloud platform represents a significant shift in infrastructure strategy — but it doesn't have to disrupt current systems, which means this approach can be a positive initial step as part of a digital transformation or can be deployed as a solution to a discrete business requirement.

DXC Technology offers industry expertise through consulting and advisory services to help businesses assess current strategy, re-platform current applications or take an entire enterprise on a digital transformation journey. Our approach allows you to start a new project quickly at a disruptive price point. It is extensible, allows self-service, and inherently supports continuous development, continuous integration, and continuous delivery.

The hybrid cloud platform is freeing businesses from the constraints of proprietary stacks of hardware and software. It's creating an environment where business users can get immediate access to the resources they need. It's eliminating cost through automation. It's enabling developers to embrace agile delivery. And it's helping take the "shadow" out of shadow IT.

How DXC and Its Partners Can Help

DXC Technology helps clients harness the power of innovation to thrive on change. For more than 60 years, we have successfully guided the world's largest enterprises and government agencies through successful change cycles. Our deep experience gives us a clear and confident vision to help clients navigate the future.

DXC Technology Managed Services for public cloud provide deployment, support and operational delivery of Microsoft Azure- and Amazon Web Services-hosted compute, storage and network cloud infrastructure components. With thousands of certified cloud professionals using the most advanced monitoring tools in the industry, DXC gives your organization more control and better visibility into your public cloud environments. Our comprehensive solutions, which include data center, network and hosting services, drive down the costs of traditional IT, enabling clients to apply those savings toward accelerating their digital transformation.

DXC's offerings are built in a collaborative approach with market-leading partners. Our extensive partner network helps us drive collaboration and leverage technology independence. We have established more than 250 industry-leading global Partner Network relationships, including these strategic partners: Amazon Web Services, AT&T, Dell EMC, HCL, Hitachi, HPE, HP, IBM, Lenovo, Micro Focus, Microsoft, Oracle, PwC, SAP and ServiceNow.

Together, DXC and our partners offer a wide range of solutions at significant scale, enabling us to accelerate innovation and serve clients more efficiently and effectively worldwide.

Authors

James Miller is DXC Technology's chief technology officer and vice president for Cloud, Platforms and IT Outsourcing. He builds key client relationships, advises senior leadership on technology trends and initiatives, and provides oversight and thought leadership to grow DXC and client business. Previously, Jim was the industry chief technologist for manufacturing, automotive, aerospace and defense, and strategic accounts at Hewlett Packard Enterprise. He was responsible for developing innovative solutions that were transformative for the client and for the industry.

▶ **jim.miller@dxc.com**

Eugene O'Callaghan is DXC Technology's senior vice president and general manager for Cloud, Workload Platforms and IT Outsourcing. Previously, Eugene spent 25 years at HPE and Electronic Data Systems, holding executive positions in general account management, strategy and architecture, development and operations. Most recently, as general manager of the HPE Enterprise Services Workload and Cloud Practice, he helped move clients' businesses to hybrid cloud, with overall responsibility for business performance, product strategy, partnerships, engineering and delivery.

▶ **eugene.ocallaghan@dxc.com**

Learn more at www.dxc.technology/digital_enterprise

DXC Technology's ResearchNetwork contributed to this paper.