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Empowering Workforces with Invisible IT

Transforming to a Digital Enterprise

With digital technologies, teams can work efficiently, collaborate easily and tap into resources instantly and from anywhere members choose to log on. Yet even with these advances, workers still want more of a consumerized experience — more choice, more convenience and more connectivity.

To meet these demands, IT must shift from a mindset of monitoring quality of service to actively monitoring quality of experience, predicting potential failures and providing easy-to-use self-service and self-healing capabilities. Emerging technologies such as artificial intelligence, embedded devices and real-time contextually aware analytics have the potential to drive further enhancements in user experience.

In this new world, users are changing, too. Regardless of industry or role, employees are blending their day-to-day work with that of an information worker. With digital tools, users are empowered with greater personal choice and unprecedented opportunities for outside-in collaboration. Business managers have the ability to differentiate experiences for workers, customers and partners. IT organizations, meanwhile, can leverage automation and a flexible, hybrid cloud infrastructure to make IT both invaluable and invisible to the user.

IT organizations that can't navigate this change risk being circumvented by users altogether. But those that successfully adopt these tools will evolve into a modern 21st century enterprise — one in which work is about more than occupying a desk. It's all about "me."

The growth of globalization and the outside-in digital enterprise has thoroughly disrupted the workplace. The company/employee equation is changing, with the task now becoming the primary focus. Collaboration is happening intuitively and digitally across boundaries — corporate, physical and geographical. As workers exercise more independence and pick jobs they're truly interested in, businesses reduce traditional employee benefits and brick-and-mortar office space to free up resources and gain the flexibility to contract with specialists as needed.

The result is what's known as the gig economy. Characterized by contract workers doing one or several temporary jobs as opposed to full-time work, the gig economy is expected to grow to $335 billion in the United States by 2025, according to the Brookings Institution. Taking advantage of the trend are new businesses with digital-first models. Companies such as Appirio and Upwork crowdsource developers and technical freelancers; Eden and TaskRabbit source local workers for everything from installing a printer to packing boxes. Even ride-sharing firms such as Uber and Lyft are attracting office workers who like the option of earning extra money while commuting to and from work — with the added benefit of using the high-occupancy vehicle lane on freeways.

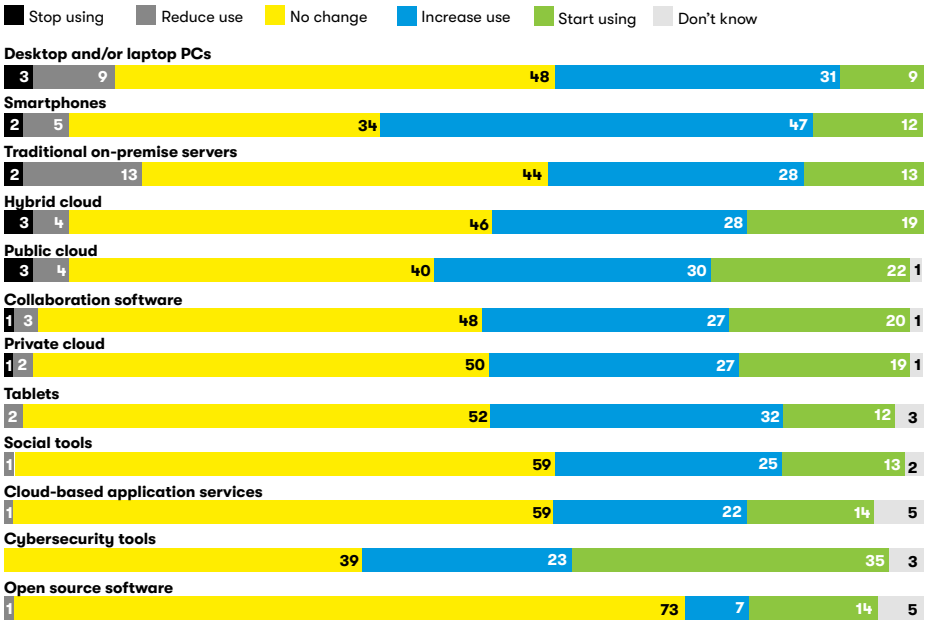
Technology enables this economy, offering employees new ways to create, connect, collaborate and communicate. Collaboration is easily becoming second nature as people (and organizations) focus on productivity. Freelancers can access the systems they need for each temporary gig. Teams can quickly and easily share content, tap into resources and synchronize for meetings, whether in the office or via Skype, with users calling in from anywhere with an internet connection. And as the possibilities grow, so too do employee expectations. In today's always-on, always-connected world, workers expect choice in the devices, apps and locations they use to work. In fact, the workplace has evolved into "my place," which is wherever I want it to be at the time. Systems, machines and people begin to interact more seamlessly; processes evolve, become more data driven and more event driven, leading to better alignment with how people want to work.

In this environment, IT organizations could choose to stay the course with traditional policies and approaches — but this wouldn't end well. Today's users won't think twice about bypassing IT in favor of preferred devices and channels. The rise of smartphones and the bring-your-own-device revolution illustrated this, and the trend continues today. In the IT support space, for example, users are more likely to Google the answer to a problem — or contact a friend — than to wait for the company's help desk to respond. This friction between IT and users can result in even greater levels of shadow IT and, ultimately, information silos and productivity loss. Even worse, the likelihood of security vulnerabilities increases.

What's needed instead is a richer experience — one in which IT is everywhere, seamlessly enabling the user. In the words of futurist Arthur C. Clarke, "Any sufficiently advanced technology is indistinguishable from magic." Today's IT organizations need to make "magic" by aligning technology with experience. With this approach, workers can focus on the task and become truly hyperproductive. Done right, IT will convert a huge base of true believers, rather than working to quell a rabble of rebellious stakeholders.

How, if at all, do you expect your company's use of each of the following technologies to change over the next 3 years in order to meet your strategic goals?

Select one in each row (% respondents)



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

New imperatives for the enterprise

Users are embracing digital and emerging technologies more readily, which could potentially result in a competitive edge. But, at the same time, organizations must ensure security and IT service management.

To compete effectively, enterprises must move away from the one-size-fits-all approach and embrace the user-centric service model of "it's all about me" to enable a productivity-optimized environment.

The enterprise must address these workplace imperatives:

- **Foundational capabilities based on IT as a service.** The new workplace platform is based on a dynamic hybrid infrastructure. Services are brokered from cloud providers across software-driven infrastructures and networks, delivering a high degree of automation while reducing the dependence and latency of human intervention. The workplace platform is more than dynamic infrastructure. Connectivity and sufficient bandwidth are essential in this impatient "now" world — particularly when collaboration spans traditional corporate boundaries.
- **Services, applications and products focused on creating a differentiated, consumer-like experience.** The experience must be tailored to the individual rather than forcing all users to accept a one-size-fits-all approach. With the right interaction model, users can adopt processes and tools themselves. Real-time data, machine learning, contextual insights and social analytics can help deliver information in the context of the task at hand.

By 2019, 70% of IT organizations will shift their culture to a startup-like work environment by embracing agile practices and open source communities.

Source: IDC FutureScape: Worldwide CIO Agenda 2017 Predictions, Doc #US41845916, November 2016

The Friction-Free Workplace

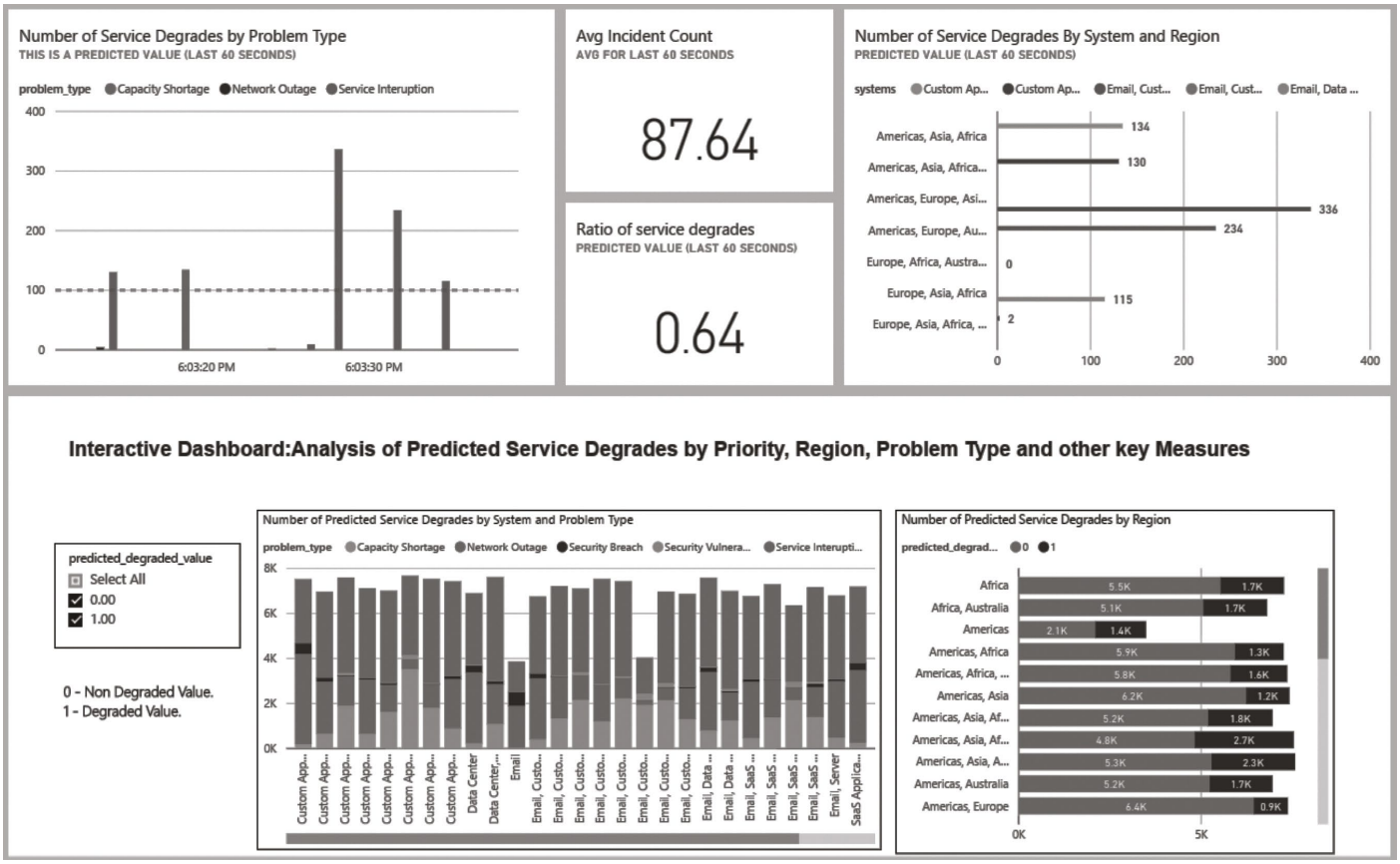
In building a productive workforce, the ultimate goal is to give workers tasks that harness their passion and talent. But when it comes to achieving this ideal, enterprises tend to fall somewhere along a sliding scale, and most workers still have to perform tasks they don't enjoy.

Take, for example, the task of resolving an IT issue. Often, the last thing a worker wants to do is reach out to enterprise help desk services. Most of us would rather solve the problem on our own and augment the task with intelligence gained from web searches. The most productive option is to fix the problem before it occurs and eliminate the task entirely.

Data generated from enterprise IT is more than a record of IT systems transactions; it is an early warning system for infrastructure problems. By integrating real-time streams of system logs, service call requests and remediation actions, we built and deployed machine learning algorithms capable of predicting degraded IT systems' performance. Our analytics sorted the results by actionable factors, such as system type, region and resolution effort. Administrators were alerted about likely problems, and issues were proactively resolved. Workers no longer had to resolve an IT service issue because that task had been eliminated.

This same approach can be applied to triaging email, streamlining meetings and optimizing staffing. By using advanced analytics to automate business operations, organizations can work smarter. Companies with a strong **Analytics IQ** can take the friction out of business, make workers more productive, and deliver a hard-to-match competitive advantage in the marketplace.

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



An example of real-time monitoring, predicting and reporting of degraded IT systems performance.

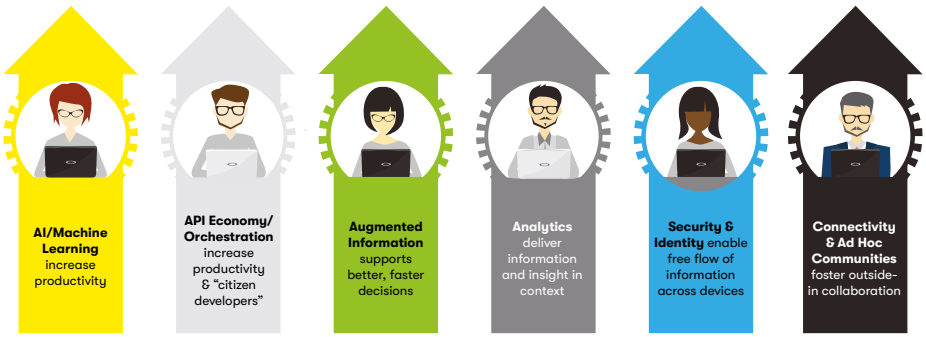
In delivering on these imperatives, organizations can ensure a higher-quality experience for users, as well as higher levels of productivity and increased agility in both IT and business services. They will realize an environment that is not limited to the physical office, but is contextual and augmented, enriched and data driven.

Consider, for example, the traditional new-employee onboarding process. For organizations with an enterprise app store, the onboarding process can be significantly streamlined. New employees can be notified a week before the job starts with an email and instructions about where and when to report, how to log on to the email system and what apps to download to access human resource systems, and travel and expense information. Employees arrive ready and able to be productive on day one, a rare occurrence in most businesses today.

Additional business benefits come from the use of analytics, which can have a dramatic impact on eliminating waste. Consider the Delve feature of Microsoft Office 365 cloud-based suite. One company applied Delve Analytics to review a weekly 30-minute executive meeting, only to discover that preparing for and attending these meetings took employees some 300,000 hours a year — at an annual cost of about $45 million. Imagine the benefit to the company (and users) if the system had automatically captured actions and made arrangements for the meeting. As virtual assistants are developed and integrated into productivity suites, this is a feasible real-world scenario.

Performance improvements can also be significant in the new workplace. For example, a calendar system could, over time, learn a user's preferences in preparing for major presentations and automatically schedule meetings, contact necessary collaborators and even book flights and hotel accommodations for team members. The system could also use preferences to create opportunities that might be unknown to the user. For instance, it could notice a key client of the user flying into the same city on the same weekend and automatically suggest a meeting place and time and, when accepted, schedule a meeting that meets both attendees' preferences.

Key Enablers for Successfully Meeting Worker Expectations



By 2019, 75% of workers whose daily tasks involve the use of enterprise applications will have access to intelligent personal assistants to augment their skills and expertise.

Source: IDC FutureScape: Worldwide Analytics, Cognitive/AI, and Big Data 2017 Predictions, Doc #US41866016, November 2016

Benefits to IT

By integrating systems in a highly automated manner, IT can build user-centric processes and composite solutions that, in turn, deliver agility and repeatability for the business while enabling self-service for the user. In this way, IT organizations benefit from the same philosophy embraced by today's employees.

Performance analytics can be embedded in services to proactively monitor for faults, substandard performance and dramatic changes in demand. Expensive resources such as specialized hardware and software licenses can be dynamically adjusted or removed, depending on usage and demand. Eventually, these services will monitor themselves, adapt to usage and threat-level changes, and heal themselves in the event of a breach.

Event-driven activities, such as service management, can be optimized and improved with machine learning and mobile applications. Aspects such as change control and install, move, add, change (IMAC) can be automated via software-driven infrastructure. IT can bring real-time insight into the business, and systems can give fine-grained command-and-control capabilities to spot opportunities for improvement, as well as finding anomalies before they impinge on productivity.

Emerging and enabling technologies

In addition to the digital tools entering the workplace now, several technologies and trends on the horizon have the potential to further transform the way we work and interact with others.

Artificial intelligence

Artificial intelligence (AI) is already in use throughout the web and increasingly within the enterprise, handling everything from initial call screening for sales prospects to scheduling.

Chatbots are evolving into more complex virtual assistants, interacting with humans to replace phone calls, emails and texts. Online virtual assistants, such as Amy or Andrew at x.ai, schedule meetings based on calendars and preferences, propose a range of times by email, negotiate with (human) administrative assistants as needed, and send invitations. This type of help has a high return on investment: x.ai estimates that it takes humans an average of 17 minutes to schedule one meeting, while virtual assistants cost less than $100 per month.

Eventually, this will evolve into virtual assistants speaking to each other, communicating and negotiating several orders of magnitude faster. Suddenly, being able to schedule a meeting with eight senior executives in three different time zones — all without interacting with a human being — will be easy and completely invisible to the human user.

Contextual insight

Sensors, embedded devices and wearables are steadily becoming ubiquitous in the enterprise, generating huge amounts of data that, if not managed well, can easily become noise. What's needed is a way to harness data "in context," to understand relevant factors, including location, activities, environment and even the emotional state of the user. The aggregation of information with context is extremely powerful, allowing organizations to move toward context or data-driven workflows rather than rigid processes. Information can be consolidated and tailored to the user's setting and device, with the right information being presented in the right way based on the context at hand.

Orchestration, APIs and the citizen developer

Architects and developers have been talking about APIs and orchestration for decades. Now, they are crucial to boosting business agility and enabling "citizen developers." If information and resources are exposed as a service across the organization, anybody can write, enrich and encode algorithms — creating new intellectual property for reuse. These citizen developers can make and manipulate what they need to enable agile processes, systems and composite solutions that can be created in a moment, for as long as needed.

As employees quickly adopt new technologies and collaborate globally, they're an unconstrained force of change. Workers will always look for tools, processes and approaches to improve efficiency and productivity. By empowering the user, IT takes the leash off this powerful resource — for the good of the enterprise.

Augmentation

Both augmented reality (AR) and augmented information sharing have been available to the enterprise for many years, but the entry point is becoming more accessible today. Tools such as Microsoft HoloLens are finding a home in manufacturing, healthcare, education and other fields. Similarly, AR brings capabilities such as user support, allowing experts to guide customers through the process of checking, repairing or installing an item via a remote view.

In the future, augmentation will be extended to larger groups, enabling multiple users to access augmented information with the touch of a finger. Groups will be able to simultaneously edit documents on a virtual whiteboard. Meetings will include real-time summaries of content and next steps, so all participants have a common base of understanding. Augmentation will become more dramatic, with contextual and adjacent information presented in real time and in view of all speakers, based on the context of the conversation. The interface will continue to be external, for now, but that could change. Instead of holding or wearing a device, users may one day become the device.

Security and identity

Security and identity management typically aren't thought to improve user experience or productivity, but a lack of security can bring productivity to a halt, especially in today's connected workplace. As we share more information — and share it dynamically — we need to make sure security protocols are baked into every system and every task.

This begins with federation and brokerage of identity. Since disparate systems are unlikely to be connected in a simple manner, organizations must negotiate between users, perhaps using virtual assistants, to verify identities, determine who has access and what can be shared. Further, security systems should be integrated with machine learning and intelligent systems that can identify and take action when an anomaly is spotted.

Connectivity and the rise of the ad hoc community

With plans already in progress to provide internet service via low-latency, low-Earth-orbit satellites, 5G and beyond wireless technologies and almost-unlimited cloud storage, the hyperconnected world is fast approaching. In fact many countries already consider internet connectivity a basic right, on a par with water and electricity. As users, we've known this to be true for a long time.

The so-called "six degrees of separation" that connect all living things is getting tighter, and we recognize the value of community more than ever. Instead of researching a topic, we now look for people working in similar fields or facing similar challenges and create an ad hoc community to complete the task. These project- or task-centered engagements — fueled by the gig economy — exist in the moment and, often, in the cloud. In this world, partners, suppliers and customers are the new collaborators.

By 2019, 10% of all web-based meetings will include an augmented reality component, driving disruption of the $3 billion web conferencing market.

Source: IDC FutureScape: Worldwide Wearables and Augmented Reality/Virtual Reality 2017 Predictions, Doc #US41864416, November 2016

Companies will pilot smartwatches to augment or replace enterprise-use smartphones in 2017 to communicate time-sensitive data.

Source: IDC FutureScape: Worldwide Wearables and Augmented Reality/Virtual Reality 2017 Predictions, Doc #US41864416, November 2016

Next steps

IT and business leaders face the daunting task of not only upgrading workplace technology and modernizing infrastructure, but also overcoming user resistance to new ways of working.

To ensure the workplace transformation delivers expected business benefits, organizations must address the "people" aspects of change (culture, behavior, ways of working, user resistance, etc.) and proactively consider potential lack of consensus among business leaders. Organizations cannot simply focus on the technology; in an age of digital automation and robotics, people still matter.

To start the process, organizations must consider all enabling and foundational technologies and how they affect the worker experience by asking these questions:

- **Outside-in:** Where do they work, and is that likely to change? Are they highly mobile? Do they ever work with outside partners?
- **Personalized choice:** What devices do they use now? And what devices might they use in the future? How are they using their devices for work, and how could that change? If users bring their own devices, who is liable for a breach? What if IT wipes the device due to a breach? Who is responsible for continuity of service?
- **Global collaboration:** Where are the silos in the organization? What impact do geographic and organizational factors have on these silos? Who will need to collaborate in the future, and where will they be located?
- **Social and connected:** What are the challenges associated with making connections throughout the organization? Across organizations? How can approaches to collaboration used on social media platforms be applied to the workplace? How will they engage with coworkers in the future? How will an organization handle employees with multiple jobs, identities and roles?
- **Contextual insight:** How can processes become data driven? How can productivity be increased with real-time information in context? Can data be enriched by consolidation and machine learning? What types of data are available, and what are the benefits of making it available in real time and in context?

- **Analytics and machine learning:** Could software agents, bots or intelligent machines (e.g., IBM Watson) help make tasks easier? How can user preferences be factored into the process?
- **Automation:** What processes can be improved through automation? Can the infrastructure be transformed to a more agile IT-as-a-service model? How can IT best meet the demands for a dynamically changing landscape of apps and devices?
- **APIs and service brokering:** What IT services are causing the most friction? How do users want to engage with IT today and in the future? Does IT support easy changing of providers? May an employee create a data-driven app?
- **Security and identity:** Does IT have a real-time view of the organization's assets, systems and business risks? Is data managed everywhere? How is access control managed when there is no external edge of the network (access might be from anywhere)? Is security a painful experience to users? How are applications and cloud services tested? Are they automated? How will IT handle data sovereignty when users are truly mobile and global?

By addressing these questions, enterprises can truly change the way employees work and make IT an invisible enabler of change. The result will be a better user experience, higher levels of productivity, increased speed and greater business agility. And IT will be assured a central role in the new workplace of "me."

How DXC Delivers the Modern Enterprise

DXC Technology is the world's largest provider of solutions for workplace and mobility. With 8.5 million user devices under management and more than 24,000 hands-on workplace technicians, DXC has the tools and services that help IT departments design, implement and run the systems that power the modern enterprise.

This work includes creating cloud delivery models and native cloud applications, modernizing older core applications and enhancing applications with mobility. DXC also helps IT departments integrate these applications and bolster them with high-level capabilities for cybersecurity, identity and access management, and governance.

As new data, applications and next-generation devices enter your world, integration and security are vital. So is being able to work the way you choose — wherever, however, whenever. That's why DXC MyWorkStyle™ is designed as an end-to-end solution, personalized for every way of working. It enables a productive and contextual experience.

DXC's extensive partner network includes Microsoft, VMware, Citrix, ServiceNow, Google, Apple, Dell EMC, HP Inc., Hewlett Packard Enterprise and other leaders. DXC consultants can help clients understand their business needs and assess user workstyles, devices, underlying infrastructures and global environments; identify and deploy the right solutions for their businesses; and train their workforces to take full advantage of DXC solutions.

DXC can help you build the modern enterprise, unlock your data and empower your employees, partners and customers to get answers to their most important questions. With DXC, the modern enterprise is here and now.

Authors

Marc Wilkinson, DXC Technology's chief technology officer for Workplace and Mobility, focuses on bringing innovation and consumer-like experiences to enterprise work to enable an organization's employees to be productive wherever and whenever they need, without compromising security or usability. Marc leads the development of technology strategy for support services, digital workplace, enterprise mobility services and productivity, unified communications and campus networking. He also collaborates with product management leaders on the transformative services and capabilities needed to enable organizations to become modern enterprises. He previously was responsible for the Enterprise Mobility, Managed Workplace and Networking Services portfolio for Hewlett Packard Enterprise.

▶ **marc.wilkinson@dxc.com**

Howard Hughes, DXC Technology's senior vice president and general manager for Workplace and Mobility, focuses on workplace services, virtual desktop services, mobile device management, productivity applications and trusted information services. Howard previously served as senior vice president, Global Client Transformations, for Hewlett Packard Enterprise (HPE). In that role, he delivered world-class global transformations, drove functional excellence and created a seamless and highly transparent transformation journey for clients.

▶ **howard.hughes@dxc.com**

DXC Technology's ResearchNetwork contributed to this paper.

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