IDC FutureScape

IDC FutureScape: Worldwide Cloud 2016 Predictions — Mastering the Raw Material of Digital Transformation

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IDC FUTURESCAPE FIGURE

FIGURE 1

IDC FutureScape: Worldwide Cloud 2016 Top 10 Predictions
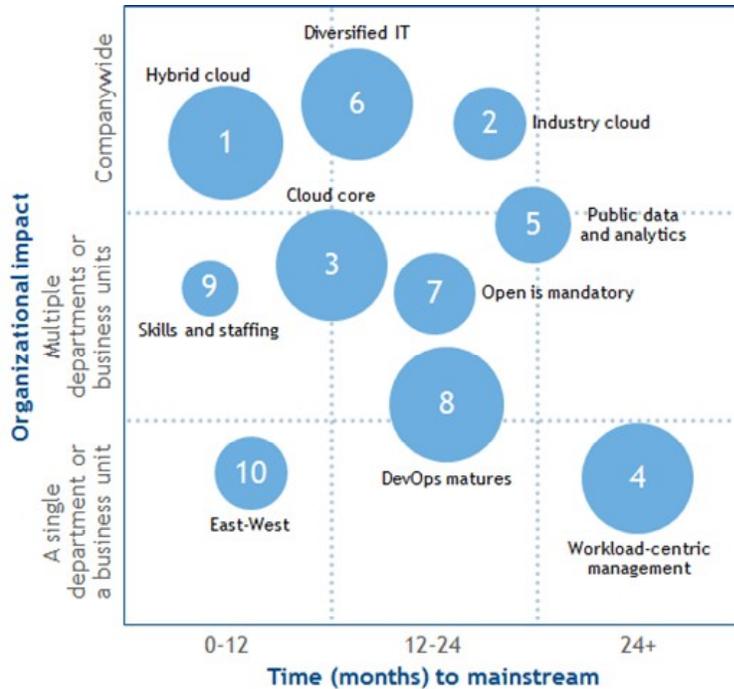
Note: The size of the bubble indicates complexity/cost to address.

Source: IDC, 2015

Figure 1 presents IDC's cloud top 10 predictions in terms of their likely impact across the enterprise and the time it will take for the predictions to reach mainstream. By mainstream, IDC means the broad middle of the bell curve of adoption (i.e., the 40-60% of enterprises that are neither the first movers and early adopters nor the last to act). Each bubble's size provides a rough indicator of the complexity and/or cost an enterprise will incur in acting on the prediction.

IDC OPINION

3rd Platform disruption — cloud, mobility, big data/analytics, and social business — obliges most businesses to transform. While IT organizations have worked hard over the years to learn how to cope with change, the current rate of acceleration and the order-of-magnitude increases in every measure of volume present the CIO with a seemingly impossible challenge. With traditional approaches, IT organizations are too slow, while business organizations need speed. Line-of-business (LOB) executives are taking control of their computing future because their business strategy, enabled by technology, is integral to their success; 43% of the business managers IDC surveyed reported that they are driving their own tech projects because they are comfortable with technology. Business funds 61% of technology projects — and whether those projects happen with or without the participation of their IT leaders is increasingly dependent on how "actualized" these companies are on a spectrum of "ad hoc" to "optimized" cloud maturity.

Based on results from IDC's *CloudView Survey,* more than 43% of organizations expect that within five years, the majority of their IT capability will be delivered through public cloud services, and that within three years, they will access 78% of IT resources through some form of cloud — public, private, or hybrid. IT departments will operate in an environment that is focused on service delivery and more predictable expenditures, and businesses will gain ready access to IT resources at defined service levels and cost.

This document crystallizes IDC's thinking around a set of key drivers and predictions relating to cloud computing that IDC believes have the potential to dramatically alter the business ecosystem for the next 12-24 months. It provides a basis for understanding some of the changes that will shape business and IT strategy in the coming years. For example:

- Hybrid cloud architectures will continue to dominate enterprise cloud strategies. Increasingly, the need to integrate traditional noncloud systems with modern cloud infrastructure and cloud-native application will create friction and operational challenges across many IT organizations. Investments in application and workload-aware management and analytics tools will help optimize integrations and maintain service levels.

- Digital business strategies will drive cloud strategies. Industry clouds will be formed through joint ventures or partnerships between business enterprises and one or more IT or cloud service providers. While every industry has a unique set of business and regulatory requirements, leading industrial firms have realized that offering these and other capabilities as a service both broadens their business opportunity and increases their market visibility and power. The development of industry clouds is occurring across all industries, and within the 6 primary verticals (financial services, energy, healthcare and life sciences, government, manufacturing, and retail) we cover, IDC expects roughly 100 industry clouds to exist by the end of 2015.

- Cloud is the catalyst for significant shifts in IT staff talent priorities and datacenter locations. By 2018, 65% of companies' IT assets are expected to be located offsite in colocation, hosting, and cloud datacenters, while one-third of IT "staff" are expected to be employees of third-party service providers.

IN THIS STUDY

This IDC study provides IDC's top 10 predictions for the 2016 IT buyers when it comes to understanding and investing in their own datacenter facilities and staff as well as SaaS and cloud infrastructure services offered by third-party service and network providers. These predictions provide the strategic context to enable enterprises to consider the overall impact of developments such as the digitalization of the economy cloud, shifts in populations and business activities, software-defined compute, and cloud storage. This document offers IDC analysts' collective understanding of major industry transitions and advice to IT buyers to consider in their strategic planning in relation to sourcing, consuming, and managing their internal and public (provider based) cloud services, as they grow and mature in the cloud world. We advise decision makers to approach each prediction in three steps:

- **Assess its relevance:** Should I pay heed to this prediction? Does this prediction apply to me? Can I reasonably enough ignore it? What do I risk if I ignore it? Strategy is, after all, as much about what you decide to do as what you decide not to do.
- **Assess its urgency:** Does this prediction apply to me now or in the future? If it applies in the future, when do I have to get started to deliver enabling capabilities as needed?
- **Assess its resource requirements:** What resources do I need and at what costs? What would I have to forego or postpone to achieve the capability? What do I have to speed up to achieve it? What priority does this prediction have relative to other projects consuming resources?

SITUATION OVERVIEW

Public IT cloud services spending will reach $57.8 billion in 2015 and over $112 billion in 2019, with a compound annual growth rate (CAGR) of 18.3% – about six times the rate of overall IT market growth. In 2019, public IT cloud services will drive nearly 20% of the $675 billion aggregate spending in applications, development and deployment tools, infrastructure software, storage, and servers, and they will account for 59% of spending growth.

Summary of Key Drivers

Many external factors have a direct or an indirect impact on technology operations and investments and on IDC's predictions for the future of cloud. They come from business, social, economic, and technological realms. IDC has identified seven drivers that represent significant forces affecting cloud sourcing and deployment decisions by enterprises:

- Business drivers:
  - DX: Accelerating business disruption from digital transformation
  - East-West: Shifting global economic power, balance, and influence
- Technology drivers:
  - Cloud platform gravity attracts IT energy and activity
  - Rise of DevOps accelerates cloud-native application development
  - Modular IT: Modularization of IT through convergence, SD(X), hyperscale, and containers
  - Talent quest: High demand for next-generation business/IT skills, but scarce supply
- Social driver:
  - Cloud life: The merging of real life with digital identity

Collectively, these drivers lead to the 10 predictions discussed in the sections that follow. A more detailed discussion of these drivers is provided in the Key Drivers section.

IDC FutureScape Predictions

Prediction 1: Hybrid Cloud — More than 80% of Enterprise IT Organizations Will Commit to Hybrid Cloud Architectures by 2017, Vastly Driving the Rate and Pace of Change in IT Organizations

Over 80% of enterprise IT organizations will commit to hybrid cloud architectures encompassing multiple public cloud services, as well as private clouds, community clouds, hosted clouds, and/or noncloud infrastructure resources, by the end of 2017. More than 60% of enterprise-class businesses will subscribe to more than 10 different public cloud services by 2017. 25% of public cloud services offered in 2015 will no longer be available in 2017. The availability of this spectrum of choice, and the uncertainty of an operable, dependable system of suppliers and capabilities, presents an enormous management challenge.

As the complexity of hybrid cloud environments expands to encompass a broad variety of legacy and cloud-native applications, open source infrastructure such as OpenStack, open API-based integrations, mobile and social human interactions, and software-defined and hyperconverged infrastructure, IT decision makers put a premium on processes and tools and can simplify operations, maintain end-to-end service levels, and ensure that resources adapt seamlessly to dynamic changes in workload, processing, storage, and network requirements. Cloud services become increasingly attractive options for deal with unpredictable resource demands and to provide rapid access to advance big data and development tools.

The performance and security requirements of individual applications, along with concerns about data sovereignty and regulatory compliance, will dictate which applications are deployed into public and private infrastructure-as-a-service (IaaS) environments versus traditional IT environments, which are shifted to SaaS and which are maintained in legacy development environments or built using PaaS platforms and modern languages. Information architectures that promote data sharing across multiple clouds become a priority as do risk management strategies to protect corporate interests if public cloud services fail or experience data breaches. The broad-based industry adoption of OpenStack APIs and open source container management technologies such as Docker makes multicloud integration and workload portability more feasible than in the past, but the imperative is for an overarching management regime that allows automated, policy-based access to all required IT resources, whether at a provider site or in the corporate datacenter.

Associated Drivers

- DX: Accelerating business disruption from digital transformation
- Modular IT: Modularization of IT through convergence, SD(X), hyperscale, and containers
- Rise of DevOps accelerates cloud-native application development

IT Impact

- Virtually all enterprise IT organizations will be expected to manage the delivery of consistent end-user experience SLAs and compliance with regulatory and corporate information management requirements and vendor risk management best practices as hybrid cloud architectures become more complex and dynamic.

- The majority of enterprise IT teams will need to gain up-to-date insight into the state of critical cloud-related open source standards and be able to evaluate how to best take advantage of these technologies across hybrid architectures during 2016.

- More than half of enterprise IT teams will need to create new cloud management roles with responsibility for leading policy discussions with major business stakeholders, vetting public cloud service selections, and auditing ongoing SLAs, vendor performance, and compliance with data protection and security requirements by the end of 2016.

Guidance

- Enterprise-class organizations will adopt a "cloud also" strategy that explicitly endorses hybrid cloud architectures and dictates that cloud sourcing decisions will be driven by workload requirements as identified and evaluated jointly across relevant business and IT teams.

- All enterprise IT leadership teams, in conjunction with major business stakeholders, must immediately review, and update as needed, corporate information management, data protection, and risk management protocols to ensure that confidential and critical enterprise data is appropriately managed across increasingly hybrid cloud architectures and diverse numbers of cloud service providers.

- Starting in 2016, CIOs need to begin to invest in training and development of existing staff to pick up new hybrid cloud management and governance responsibilities since there will be insufficient skills available industrywide. New hires will have little expertise beyond what CIOs can develop in-house with appropriate investment in training and tools.

Prediction 2: By 2018, Industry Cloud Creation Will Be Seen as a Top Market Entry Strategy for IT Providers and Industrial Firms as IT and Industry Domain Experts Team Up to Remove Barriers to Entry

The underlying concept of industry cloud is decades old, but the newly emerging opportunity behind the phenomenon, as both a business model and an IT strategy, is novel and innovative. With the proliferation of the 3rd Platform and a broad adoption of cloud technology, industrial companies now have an easily accessible avenue for standing up and delivering industry cloud services.

Industry clouds are typically formed and offered through joint ventures or partnerships between business enterprises and one or more IT or cloud service providers. While every industry has a unique set of business and regulatory requirements, leading industrial firms have realized that offering these and other capabilities as a service both broadens their business opportunity and increases their market visibility and power. The development of industry clouds is occurring across all industries, and within the 6 primary verticals (financial services, energy, healthcare and life sciences, government, manufacturing, and retail) we cover, IDC expects roughly 100 industry clouds to exist by the end of 2015.

Technology providers and industrial firms are quickly realizing that industry cloud formation is one of the best approaches for breaking into a new market, or even for greater expansion within an existing space. For any given market with high barriers to entry and/or mature established players, entry and disruption by a newcomer is now increasingly within reach and possible to pursue via partnering with a leading end-user organization in the space to create an industry cloud offering. The dependability, trustworthiness, and domain-specific expertise built into a new industry cloud service in a historically monopolistic or narrowly dominated space can quickly gain attention and challenge the status quo. We anticipate this competitive strategy to mushroom in the next few years as we are already seeing the beginning stages of it now.

For a fully detailed explanation of the industry cloud market, associated business models, and development trends, refer to *Industry Clouds – A Primer on the Storm Brewing "Above the Cloud"* (IDC #253002, January 2015).

Associated Drivers

- Cloud life: The merging of real life with digital identity
- Digital transformation (DX): Accelerating business disruption from digital transformation

IT Impact

- Line-of-business leadership is increasingly funding projects as more tech buys go around the CIO, leading to declining IT decision-making power.

- Industry cloud represents both an opportunity and a risk for traditional IT staff. IT focus is no longer about managing data but rather discovering and unlocking the value within it. Creating and running industry clouds represent an attractive new opportunity for IT organizations to help commercialize their corporate intellectual property (IP)/data, ultimately helping shift internal perceptions of the IT organization being a cost center to a group directly helping drive top-line revenue.

- As more regulatory compliance-oriented industry clouds emerge, companies will have increasing opportunities to contract out risk in return for increased organizational agility.

- Despite some divergence between IT and LOB surrounding technology purchasing, both groups are highly motivated to pursue industry cloud formation and participation, representing a unique opportunity to drive new revenue and capability desired by all.

Guidance

The industry cloud revolution will affect nearly all stakeholders in the IT hardware, software, and services markets. Each participant needs to start planning their strategy now so that they aren't blindsided as industry clouds pop up in their core markets:

- **Enterprise vendors:** Both hardware and software vendors will face stiff new competition from industry clouds. While the need for their software isn't necessarily going to diminish, the purchasing power of their customers is likely to converge exponentially. As a result, a hardware provider that has historically sold to hundreds of entities may soon face those buying decisions being consolidated into the hands of a select few that operate an industry cloud. Software vendors' experience with industry clouds will likely be similar. Those companies with solutions that are best suited for cloud deployment (easily scalable, multitenant design, simple standards-based integration, etc.) in each industry will be best positioned for selection to power each new industry cloud.

- **Cloud platform and network operators:** While positioned nicely for future growth, it is important that these companies develop vertical strategies beyond their current horizontal approach. Most companies have still not invested in specific industries, which soon may become an important competitive factor in winning the ability to become the backbone of emerging industry clouds.

- **Service providers:** A growing number of opportunities will arise surrounding the creation and ongoing maintenance of industry clouds. Service providers need to improve their visibility to the development of new industry clouds to get in the door early while each opportunity is still on the ground floor. IDC's industry cloud directory, which is part of its new industry cloud research service, is designed specifically to help on this front, by providing detailed profiles of all industry clouds as they arise.

Prediction 3: Cloud Core — By 2018, at Least Half of IT Spending Will Be Cloud Based, Reaching 60% of All IT Infrastructure, and 60-70% of All Software, Services, and Technology Spending by 2020

As we enter 2016, one thing is crystal clear to most IT and business executives: the cloud services model is no longer something enterprises need to develop "competency" in, they need to master the cloud.

In prediction numbers 1 and 2, we noted the rising tide of digital transformation business initiatives as CEO-level priorities and the resulting rise in 3rd Platform IT spending to support those DX initiatives. Let's be clear: virtually *none* of the other 3rd Platform technologies (big data analytics, mobile, social, IoT, cognitive, etc.) or major DX business initiatives is possible – in scaled-up implementations – without the cloud as the foundation.

This reality means that over the next several years, enterprises – especially the accelerating number pursuing DX strategies – will dramatically scale up their adoption of cloud services. By 2020, organizations' spending on cloud services, the hardware and software to support cloud services, and services for implementing and managing cloud services will exceed $500 billion – over three times what it is today. As noted previously, a majority of hardware, and a larger majority of software, that IT vendors make and sell will be "cloud first." Enterprises buying "noncloud" infrastructure or software will be in a rapidly shrinking minority.

This rapid shift of cloud services – from an "emerging" IT architecture to the preferred foundation for enterprise IT and digitally transformed businesses – has important implications for IT and business leaders.

Associated Drivers

- Cloud platform gravity attracts IT energy and activity
- Rise of DevOps accelerates cloud-native application development
- Cloud life: The merging of real life with digital identity

IT Impact

- "Cloud first" is the mantra for your favorite IT hardware, software, and services suppliers. Their best offerings will all be designed for the cloud. This means that enterprises looking for "the best" in IT will be drawn by default to the cloud.
- Dispersed "hybrid cloud" and "multicloud" IT environments will be the rule. By 2018, 65% of all IT assets used by companies will be housed offsite in colocation, hosting, and cloud datacenters, and one-third of IT "staff" will actually be employees of organizations' third-party managed service providers.
- The vast majority of the new generation of mission-critical apps, most of which are data intensive, are being developed and run in the cloud – resulting in massive growth of enterprise data in the cloud. Within the next three to five years, most large enterprises will have much more data in the cloud than in their own datacenters. This "data gravity" will hasten the migration of legacy systems and data to the cloud.
- Every enterprise will be a cloud service provider of innovative services to its own marketplace. Cloud capability is not just an IT issue – it's a core business operations issue.

Guidance

- "Cloud first" should be made as the mantra for enterprise IT. Don't wait for your vendors to master the cloud; your own organization's DX business priorities mean you'll need to master the cloud soon, even if your current vendors aren't yet ready.

- The integration and management of hybrid cloud and multicloud environments should be mastered; this will be a fundamental requirement for operating — not just as an IT group but as a business.

- All viable IT suppliers must shift to a nearly 100% cloud-architected portfolio by 2018. For software vendors, this means an all-SaaS portfolio (on-premise offerings built from their SaaS code base). For hardware vendors, this means offerings optimized for cloud service providers (including enterprises running their own clouds). For services companies, it means designing offerings that are heavily code (versus labor) based, delivered in large part as SaaS.

Prediction 4: Workload-Centric Management — By 2017, More than 60% of Enterprise IT Organizations Building Hybrid Clouds Will Purchase New or Updated Workload-Centric Cloud Management Solutions

As the percentage of enterprise workloads deployed into production of public, private, and hybrid clouds increases rapidly, management software and operational priorities move beyond the deployment of simple self-service infrastructure provisioning portals to promoting investment in end-to-end application performance management (APM) and availability management, capacity optimization, and IT operations analytics tools.

Seamless workload portability and automated migration, facilitated by OpenStack and container technologies, will allow IT teams to quickly shift workloads in the event of infrastructure failures. This drives management software spending toward workload-aware management solutions that can monitor, model, and predict performance and maintain SLAs using automation and orchestration to scale, migrate, patch, and update applications as needed.

Simultaneously, IT organizations move to implement unified hybrid cloud service management platforms that link application performance monitoring, IT operations analytics, and infrastructure control systems to business impact dashboards and policy-based orchestration engines. These will drive both end-user self-service access to the full range of IT services and resources — as well as runtime workload optimization based on machine-to-machine interactions and changes in demand. Customers will demand tools that can optimize and orchestrate application performance regardless of whether it runs in-house, on dedicated hosted assets, or in a public cloud.

Workload-centric management software and SaaS solutions will experience growth rates more than double those of traditional systems management tools. Increasingly, core system-level monitoring and optimization software is being shipped for free with hardware platforms. This trend accelerates the shift in purchasing priorities to emphasize the value of APM, IT operations analytics, cloud services catalogs, cloud service broker platforms, capacity optimization, and cloud business service management tools, along with integrated, standards-based automation and orchestration solutions.

Associated Drivers

- Rise of DevOps accelerates cloud-native application development
- Modular IT: Modularization of IT through convergence, SD(X), hyperscale, and containers
- Talent quest: High demand for next-generation business/IT skills, but scarce supply

IT Impact

- Effective management of hybrid cloud architectures requires clearly defined IT service definitions and policies including standard configurations, SLAs, security, and governance to ensure consistent service delivery and service levels regardless of the infrastructure resources supporting the workload. More than 60% of enterprise IT organizations that are implementing hybrid cloud strategies will begin to create standard service definition, policies, and SLAs by the end of 2017.

- Unified application, middleware, and infrastructure automation and orchestration solutions are critical to supporting rapid, cost-effective workload provisioning, migration, patching, and life-cycle support. More than 60% of enterprise IT organizations that are implementing hybrid cloud strategies will need to purchase new or updated automation and orchestration software and/or services to enable their plans by the end of 2017.

- Unified service catalogs and cloud broker platforms that include service-level monitoring, service cost modeling, and capacity analytics will be needed to manage hybrid cloud environments in near real time. More than 50% of enterprise IT organizations that are implementing hybrid cloud strategies will invest in workload and application-centric performance analytics and automation by 2017.

Guidance

- Within the next 12 months, enterprise IT and business leadership need to develop well-defined hybrid cloud service definitions, SLAs, security, and governance policies so that they can be implemented by the end of 2017.

- Within the next 12 months, IT teams need to evaluate the current use of automation, orchestration, and cloud standards and identify gaps so that gaps can be filled by the end of 2017.

- Within the next 12 months, IT teams in collaboration with business leaders must develop and implement proof-of-concept test beds for automated self-service provisioning, cloud service performance analytics, and life-cycle management spanning applications and middleware, as well as storage, network, and compute infrastructure across hybrid cloud architectures to complete production deployments by the end of 2017.

Prediction 5: By 2018, Cloud Becomes a Preferred Delivery Mechanism for Analytics, Increasing Public Information Consumption by 150% and Paving the Way for Thousands of New Industry Applications

We know that consumers and enterprises have and want increasing access to new data sources, and cloud will provide a practical mechanism for distributing that data more easily and to a wider audience. In addition, consumers of that data will also have access to some level of analysis of that data, — converting it to information and even relying on the cloud as a source of analytics, on those data.

For example, through the cloud, transportation agencies are providing travelers with information of emergency detours and available route information, and when the location of vehicles is known through automatic vehicle location (AVL), providing geographically tailored information to travelers.

Cloud technology also enables satellite imagery that tracks agricultural water use from space to be used in applications that produce field-scale maps of water consumption. For example, farmers can check water use maps in near real time on any mobile device that has Web access.

These are early examples of how cloud can give access to data and analytical capabilities, and this speeds and simplifies access and decision making. Furthermore, cloud means safer access to data

because then it's more deliberately controlled with detailed security requirements, and finally, cloud makes analytics more pervasive and analyzed data more available.

A recent example of this prediction also comes from The National Oceanic and Atmospheric Administration (NOAA), part of the U.S. Department of Commerce. The agency gathers over 20TB of environmental intelligence every day from a wide variety of sources, such as Doppler radar systems, weather satellites, buoy networks and stations, tide gauges, real-time weather stations, and ships and aircraft. Traditionally, only a small percentage of this valuable data was easily accessible to the public. Earlier in 2015, NOAA announced a cooperative research and development agreement with multiple cloud providers such as Amazon Web Services (AWS), Google Cloud Platform, IBM, Microsoft, and the Open Cloud Consortium. This agreement allows users to tap into NOAA scientists' weather, water, ocean, and climate data and take advantage of the cloud providers' big data processing, analytics, and storage services, as well as ecosystems of partners and developers that can develop apps that lead to new innovative products and services that provide insights into aquatic wildlife patterns, oceanic storm patterns, wind flow patterns, and geospatial mapping. Outcomes include better understanding our planet, making informed environmental decision, and keeping communities resilient from extreme events.

We expect other businesses and government entities with massive amounts of data will deploy similar agreements that lead to a sustainable, market-driven ecosystem that lowers the cost barrier of data access and publication and creates economic growth and job creation, all while providing far greater access and ability to analyze data created with public funding.

Future applications will combine data sources in new ways, such as better-informed transportation planning based on geospatial data, used with business and population growth data and even environmental data.

Associated Drivers

- DX: Accelerating business disruption from digital transformation
- Modular IT: Modularization of IT through convergence, SD(X), hyperscale, and containers
- Talent quest: High demand for next-generation business/IT skills, but scarce supply

IT Impact

- Reduces burden of private infrastructure to interact with data
- Shifts concentration of efforts from data access and data movement to analytics
- Increases the value of data assets through improved data life-cycle management

Guidance

- Create sustainable private/public partnerships for cloud service providers to ultimately deliver vast amounts of public data at low or no cost for the public good or for the development of value-added services.
- Prioritize scale and access to data via the cloud based on demand and value, allowing market forces to impact the size of investment.
- Expect the policies around the use of public information to evolve, especially data that is coming from sensors on products and devices in the hands of the consumers.

Prediction 6: Diversified IT — By 2018, 65% of Firms' IT Assets Will Be Offsite in Colocation, Hosting, and Cloud Datacenters, While One-Third of IT Staff Will Be Those of 3rd Party Service Providers

This prediction crosses both cloud IDC FutureScape and datacenter IDC FutureScape.

Service providers are building out datacenters and points of presence to support their customers' demand for IT facilities optimized to support fast-growing systems of engagement and systems of insight. Balancing the use of internal and external datacenters and IT resources, as well as leveraging service providers for expertise, becomes the norm for IT organizations. The next three years can best be described as the time when companies began the FROM hybrid cloud TO diversified IT.

While a number of industry players (software and hardware suppliers as well as integrators and service providers) position "hybrid cloud" as a generic service deployment model, it is more accurately described as a vendor-specific product/service extension strategy. For most IT organizations, hybrid simply "happens" as a consequence of past and current cloud and noncloud IT investments. It doesn't represent a specific prescribed architecture or optimal IT end state, rather it represents a transition point on a cloud maturity journey.

IT organizations will operate diversified IT environments encompassing a range of deployment models (on-premise and off-premise) and a broad portfolio of SaaS and IaaS cloud services. IT organizations must manage distributed assets across multiple internal and third-party datacenters. Finally, IT departments must be able to implement hybrid/diversified IT operations and governance models that bring in the assets, technology capabilities, and expertise of external managed services providers. Many IT departments will struggle in this new role and will increasingly look to service partners for the requisite support.

Associated Drivers

- DX: Accelerating business disruption from digital transformation
- Cloud platform gravity attracts IT energy and activity
- Modular IT: Modularization of IT through convergence, SD(X), hyperscale, and containers

IT Impact

- The role of IT department shifts from procurement to administration and orchestration of internally and externally sourced IT assets and functionality with increasing degrees of comanagement along with third-party service providers.
- Internal datacenter-based IT assets become increasingly software defined, providing IT organizations with more flexible services-oriented capabilities abstracted from asset ownership and physical hardware.
- Service provider and enterprise datacenters adopt low-cost, modular designs that are energy efficient and offer superior automation and standardization.

Guidance

- Develop and continuously refine best practices for service provider selection, governance, and performance while identifying and incentivizing key internal staff that can minimize reliance and dependence on a specific service provider skill sets, should shifts in partner be required.
- Implement a consistent management, security, and governance framework for IT environments featuring diversified and distributed IT assets, capabilities, and service providers.

- Seek service providers that can act as digital transformation partners offering cloud and hosted services with a range of resource tenancy and management options as well as transition assistance related to financing, network rationalization, and integration across diverse IT environments.
- Regularly engage with third-party service providers to assess the compatibility of their business and product strategy road maps with your IT transformation objectives.

Prediction 7: Open Becomes a Mandatory Cloud Evaluation Criterion — By 2017, Over 60% of Enterprises Will Embrace Open Source and Open APIs as the Underpinning for Cloud Integration Strategies

Over the next few years, OpenStack, Cloud Foundry, and Docker will help standardize critical elements of the IaaS and PaaS tiers of the cloud, making it easier for enterprises to integrate and move workloads across private, public, and hybrid clouds. Open APIs allowing powerful machine-to-machine interfaces and data exchanges will become major sources of cloud monetization and will drive the volume of cloud-based application processing requirements to new levels.

IT buyers will expect vendors to take full advantage of all things open and will value solutions that are built on open technologies and interfaces. The resulting ecosystem of vendors, professional services firms, and enterprises agreeing on standards of operations and interoperability will help accelerate adoption of cloud-native applications and software-defined infrastructure approaches to building and managing clouds.

Cloud service providers, cloud infrastructure providers, and cloud customers will look to open technologies and interfaces to ensure workload portability and to act as a hedge against vendor lock-in. The vendor community will continue to support critical open source communities and publish open API interfaces to extend their addressable markets.

Associated Drivers

- Rise of DevOps accelerates cloud-native application development
- Cloud platform gravity attracts IT energy and activity
- Modular IT: Modularization of IT through convergence, SD(X), hyperscale, and containers

IT Impact

- Enterprise IT buyers will increasingly require vendors and service providers to support open API ecosystems and standards activities and to leverage open source technology innovation wherever possible.
- Large enterprises looking at cloud architecture as strategic will pilot and deploy Cloud Foundry and OpenStack to test what it takes to build their own clouds using these standards.
- Open API management and integration skills will be in demand.

Guidance

- In 2016, IT buyers will require vendors and cloud service providers to provide solid evidence of support for a broad range of open source cloud, configuration, and automation technologies.
- API ecosystems will become a critical evaluation criterion as IT buyers plan for modular, pluggable architectures that can evolve quickly and flexibly.
- Vendors that have formerly made little effort to engage with and support open source and open standards will find they need to invest aggressively to catch up with buyer expectations.

Prediction 8: DevOps Matures — By 2018, Over 60% of New Apps Will Use Cloud-Enabled Continuous Delivery and Cloud-Native Application Architectures to Enable Faster Innovation and Business Agility

Cloud-native applications are built using stateless, scale-out, distributed, microservice-based architectures that are optimized for public and/or private cloud infrastructure. They are often, but not necessarily, built using cloud-based development environments such as Cloud Foundry and OpenShift.

DevOps is a methodology, or a set of practices, that unifies a team consisting of business leadership, development/testing, and IT operations to be responsible for the creation and delivery of business capabilities. It is often enabled by automated self-service tools for the configuration, provisioning, and life-cycle management of development infrastructure and platforms. The same automation templates and workflows can be applied to application release and production system control to ensure consistency between development and production datacenters. At its heart, DevOps represents a significant process transformation about how IT goes about its business of deploying and managing software and infrastructure, from inception to release and service management.

Together, DevOps methodologies and cloud-native architectures create an environment where applications can rapidly move from concept to production. Updates and new features can be published without impacting runtime performance, resulting in minimal downtime – which is critical in always-on digital businesses. Self-service cloud infrastructure and automated production release processes ensure that system and software configurations are consistent across the application life cycle.

The adaptive infrastructure offered by a cloud architecture and cloud services provides organizations with the ability to create virtual production environments and leverage service and network virtualization as part of the life-cycle process. This flexibility drives productivity for development, quality, and life-cycle management for deployment across 3rd Platform environments. Emerging combined development and life-cycle management options in the cloud also enable productivity for end-to-end deployment.

Associated Drivers

- DX: Accelerating business disruption from digital transformation
- Modular IT: Modularization of IT through convergence, SD(X), hyperscale, and containers
- Rise of DevOps accelerates cloud-native application development

IT Impact

- Self-service provisioning and automation to support public cloud-, private cloud-, and hybrid cloud-based development teams will become required – not optional. Organizations that have been slow to embrace self-service will find their development teams are falling behind.
- Once DevOps is a working discipline, many of the other change initiatives thrown at IT will be either already implemented as a by-product or much easier to achieve if even needed. The IT organization will also be far more integrated into the business as a critical partner, which relies on DevOps strategies for multimodal software deployments across emerging platforms.
- IT is barraged with ideas about how to change IT. DevOps is a big idea. Any kind of transformation that is built around cultural change is fraught with risk. IT management is likely to be aware that, knowing that the reward may be high, significant challenges are also present.

Guidance

- Pick a target project and create narrowly defined activities that support the DevOps discipline. Assume the pilot team will encounter challenges and will push forward to solve. The second program built around DevOps will face new types of challenges. At some point, there will be a reasonably common understanding of the working process.

- Invest in appropriate tools to automate and orchestrate repeatable, proven processes. Evaluate, select, and deploy solutions with input and support across IT operations, development, and support.

- Create a dedicated DevOps team to capture best practices and to limit distraction among teams supported by established systems and applications.

Prediction 9: Skills and Staffing — By 2017, There Will Be a 9% Shift of IT Budget Away from In-House IT Delivery as More Third-Party Service Providers Are Used to Fill Cloud-Related Skills Gaps

Over the next 24 months, staffing for cloud services will become a strategic decision that involves more than the IT organization as will the choice of what external cloud professional services to use. Staffing is a large component of current in-house IT expenditures. So as these IT budgets shift, external service providers will benefit if they can provide the requisite cloud-related skills. These include both IT-heavy skills (such as using agile/DevOps approaches or next-generation containers) and business-heavy skills (such as compliance or managing the consumption of cloud services).

IDC expects that over the next four years, there will be a 40% increase in developers skilled in model-driven and deployment-centric frameworks, and masters of iterative code testing, hired by IT organizations in user firms. There will be a commensurate grab for developers skilled in mobile and commercial code development, familiar with declarative code frameworks and integrated PaaS development and deployment. Over the same period, the population of pure IT operations staff will drop by about 10% in user IT organizations, as more compute and storage workloads, and applications, are moved to cloud, and require fewer admins to manage physical architecture in customer datacenters.

Concurrently, jobber sites like Elance and oDesk, which list open jobs for contractors, specific tasks to be completed, provide a partial "clearing" mechanism to match the worldwide supply and demand of required cloud-related skills. IDC believes that more professional service providers will use crowdsourcing sites to meet customers' cloud-related demands, both as a way to tap skills currently unavailable within the service providers' organizations and as a way to clear their bench for professionals not currently billable. Some IT buyers will use crowdsourcing directly, but most of them will opt to have a third-party service provider worry about how to manage and integrate the efforts of individual contributions into a larger effort.

Associated Drivers

- Talent quest: High demand for next-generation business/IT skills, but scarce supply
- Modular IT: Modularization of IT through convergence, SD(X), hyperscale, and containers
- Rise of DevOps accelerates cloud-native application development

IT Impact

- In-house IT organizations will get smaller but more influential as keepers of the knowledge about enterprise architecture and as agents for the change management required to drive business transformation projects.

- IT buyers will become more reliant on both their cloud service providers and associated providers of cloud professional services; likewise, IT buyers will have to become savvier at managing their consumption of cloud services. Staff will focus more on compliance, the governance of IT, and managing a more select group of cloud service providers and cloud professional service providers.

- To attract and retain professionals with the new cloud applications, platform, or infrastructure skills, organizations will have to offer candidates a value proposition that cannot be easily copied by the cloud service, or cloud professional services, providers.

Guidance

- In the next 12 months, organizations must prepare to manage a significant change in their IT staffing and roles. Even if your organization does not experience a full 9 percentage point shift away from spending on in-house IT toward external service providers, the trend is in that direction. Don't be reactive by letting attrition or retirements drive the staffing profile of your IT professionals. Determine what roles should never be performed by a third party, and reskill your IT professionals to be more effective in a smaller organization that uses more third-party assistance. Invest more heavily in training and developing those professionals left in the new IT organization because their roles will be more strategic to long-term organizational success.

- In the next 12 months, choose vendors that understand the evolution to cloud services is not only about delivering IT at a lower cost but also about making IT more flexible and important to your overall business – in effect, choose cloud professional service providers that will help accelerate your internal IT organizational transformation by improving its agility, flexibility, and ability to govern IT on behalf of the entire organization. This includes selecting vendors that understand that cloud services need to be considered in the context of analytics, mobility, and social technology to envision what they can do, in combination, for your business. Vendors with hybrid cloud experience may be more important for companies with large legacy environments. In addition, for businesses that use specific applications that are not yet cloud ready, the partnering or alliance strategies of vendors may impact how quickly cloud services can be adopted.

- In the next 12 months, evaluate the systems integration (SI) skills and experience of your prospective vendors, and give them a relatively high weighting in comparisons, even if your initial project is simply a test or an assessment. This is because, the bulk of the downstream cloud professional services you will require will be related to the migration and integration of existing IT system with the newer cloud services. In fact, even if you are selecting a vendor only for a front-end assessment, it would be wise to consider its systems integration expertise as a measure of its ability to assess the complexity of building and implementing cloud services in your environment. This is especially true if you are considering using Open Stack-related implementations.

Prediction 10: By 2018, 25% of Global Enterprises Will Have Service Providers from Asia/Pacific as Part of Their Cloud Ecosystem

Cloud in different markets has developed in different ways because of factors such as market maturity, cultural preferences, and available infrastructure. The mature (Western) markets with their mostly advanced network infrastructure were able to quickly take advantage of large, state-of-the-art, centralized datacenters that offered the early cloud services. They were assured of good performance because of the delivery infrastructure and the relatively short distances, and data was mostly kept within national boundaries. In comparison, the emerging markets of the mostly eastern countries did not have the network coverage or quality to support use of public cloud services, except in the mature regional markets. However, they were still able to take advantage of the stepping stones toward clouds

of their own, especially enterprise private cloud and hosted private cloud services as they became the preferred model. This trend was also driven by long-held cultural preferences for IT asset ownership and management of the IT systems by the enterprise itself.

However, the changing global economic, social, and technical patterns of business will result in Asian businesses moving to cloud delivery models at an accelerated rate, and there will be significant development of the cloud ecosystem in Asia. According to Economist Intelligence Unit (EIU) Ltd., by 2050, three Asian countries (China – in first position, India – in third position, and Indonesia – in fourth position) will be in the list of top 5 economies globally. As a result, global and local businesses will turn to cloud solutions that offer them the competitive ability to grow and sustain the business. Since these markets will be the most competitive in terms of business, social, and technology parameters, it will result in these economies moving to cloud more rapidly than their global peers.

Following are key shifts in cloud ecosystem dynamics that will take place over the next three years:

- By 2016, 80% of Western major public cloud services providers (e.g., AWS, Microsoft, Google, salesforce.com, and IBM/Softlayer) will establish regional datacenter partnership with tier 1 and tier 2 telcos. This will be to address network infrastructure, security, privacy, and regulatory requirements. In comparison, local providers will move to offering enterprise private cloud and hosted private cloud services to gain share of cloud services market. IDC expects the local players to gain market share for IaaS and global majors to gain market share on PaaS (specifically for application development and testing for systems of engagement applications) and SaaS (specifically system of engagement workloads such as marketing/CRM, mobile applications, and solution accelerators such as cognitive computing, big data as a service, and IoT).

- By 2018, 25% providers within the cloud ecosystem of suppliers for large enterprises will be Asian cloud operators. The engagement with Asian cloud players will grow because of three key drivers:

  - MNCs operating in Asian countries will be required to adhere to local regulatory, compliance, and data privacy requirements. This will lead to more engagements with local cloud players – either directly or through alliance programs with global cloud majors.

  - Global network latency issues and security provisions in markets such as in China will require almost every business operating in Asia to engage with local cloud providers for their local Asian business requirements. While centralized systems would still continue to be with global partners, country-specific workloads (specific to local market dynamics) will be with local cloud players.

  - Improved performance levels and strong commercials will prove to be attractive to work with Asian cloud players. The region is a price-sensitive yet value-driven market; and these dynamics are best addressed and assured by local cloud players. These cloud players (specifically tier 1 telcos) will make significant enhancements in solution portfolio, delivery capabilities, and service reliance to gain business from local and global businesses. Influencing the enhancement of such capabilities will be technology majors such as VMware, Dell, Cisco, IBM, HP, SAP, and Oracle.

This transition will also influence the delivery model preference for cloud solutions. As compared with Western markets, Asia will demonstrate a much higher level of preference for virtual private and hosted dedicated private, cloud delivery models across enterprise workloads.

Associated Drivers

- East-West: Shifting global economic power, Balance, and influence
- Rise of DevOps accelerates cloud-native application development
- Talent quest: High demand for next-generation business/IT skills, but scarce supply

IT Impact

- Vendor evaluation and contracting will initially be a challenge, and IT departments will learn from experience and work better on this. However, financial management will be difficult. Access to system of engagement workloads (from Asian cloud service providers) will increase, and at commercial price points that are 30% lower than those at global majors.
- Implementation of hybrid cloud architecture and service management prove to be difficult yet a key imperative to achieve. Therefore, IDC expects external spend on service management, automation, and vendor management will increase.
- Business continuity (BC/DR) plans will have to be updated and, in several cases, revalidated.

Guidance

- In 2016, work with the C-suite stakeholders to build the Asian expansion strategy over the next three to five years. This should include business volumes, profitability, head count measures, financial performance metrics, joint venture opportunities, supply chain, and ecosystem implications. This should result in a cloud strategy that is closely aligned to business objectives.
- Ensure you are able to meet data residency, industry compliance, and country regulatory stipulations with your cloud partner for Asia as well as your headquarter market.
- Evaluate Asian vendors based on alliance and partner programs with your core technology partners or cloud service providers. In addition, explore onboarding regional SI that can undertake multivendor management and offer cloud brokerage.

ESSENTIAL GUIDANCE

Cloud continues to be a highly disruptive force, reshaping datacenter and application architectures and transforming the way the IT resources and applications are created, bought, and managed. Enterprise IT teams cannot ignore the challenges and opportunities created by cloud in its many shapes and forms.

As public, private, and hybrid cloud use becomes mainstream, and more and more enterprises rely on various types of cloud to support mission-critical business processes, it is imperative that IT teams join with business and developer partners to create a comprehensive set of cloud policies. Specifically, these groups need to agree on how to best satisfy corporate data and regulatory data management requirements, maintain consistent end-to-end service levels, and gain competitive advantage across all dimensions of the business.

By taking full advantage of cloud, IT decision makers can help their organizations become more agile, reduce IT operational costs, and improve business performance.

KEY DRIVERS

Many external factors have a direct or an indirect impact on datacenter operations and investments and on IDC's predictions for the future of the datacenter. They come from business, social, economic, and technological realms. IDC has identified seven drivers that represent significant forces affecting datacenter decisions within the enterprise. A more detailed discussion of the Key Drivers influencing global business and IT planning can be found in *Critical External Drivers Shaping Global IT and Business Planning: IDC FutureScape, 2016* (IDC #258644, September 2015).

Business Drivers

DX: Accelerating Business Disruption from Digital Transformation

DX experimentation for businesses goes mainstream and creates new business models with a seamless global reach. DX becomes a competitive requirement and the source of a massive wave of new investments in digitalizing business operations, communications, and services.

The term *digital transformation* has become so pervasive that it's easy to get confused about what it is and how it's impacting business strategy. DX is an "outside in" process of recognizing the accelerating external adoption of social digitalization and adapting business initiatives to leverage IT's increasingly sophisticated ability to provide machine intelligence and intelligent analytic cognition to B2B, B2C, and C2C relationships. Examples abound:

- Automobile manufacturers, having already integrated digital communications, IoT, and incorporated customer-led design, are exploring driverless vehicle technology.
- Department stores are deploying digital-enabled dressing rooms that enable shoppers to "try on" clothes by standing in front of a screen.
- Media companies routinely interact with customers to collect real-time feedback on changing tastes and habits.

The DX revolution is still in an early stage of its growth and not without its risks. High-profile examples of data hacking frequently make the news, making clear that data control and data placement will remain critical concerns when it comes to datacenter choices.

Awareness of digital innovation is essential for sound datacenter planning. Above all else, business and technology leaders must stay abreast of digital business initiatives that may have or are having an impact on their business ecospheres. Every business of every size risks fundamental disruption because of new technologies, new players, and new ways of doing business.

East-West: Shifting Global Economic Power, Balance, and Influence

The emergence of Asia as a counterbalance to Western economic (and technical) dominance is changing the flow of money, people, skills, industry, and influence while creating a dynamic tension and competitive imbalance regionally and internationally.

According to a report by the Economist Intelligence Unit in 2015, China is expected to overtake the United States in 2026 in nominal GDP (in terms of U.S. dollar). India is expected to replace Japan in third place. The consequence of shifting economic growth and influence from West to East has many moving parts, including the flow of IT talent (the so-called "reverse brain drain"), the placement of datacenter facilities, business leverage, and currency dominance. No matter where an organization is "headquartered," more and more of its customers will be in locations best served by datacenters

and/or clouds owned and operated by companies based in countries such as China and India. CIOs must begin to take steps to develop practices and processes that meet new governance conditions.

Technology Drivers

Cloud Platform Gravity Attracts IT Energy and Activity

Highly integrated cloud platforms offer developers highly integrated data storage, transaction processing, hosting, and new app creation capabilities via a common interface and unified pricing model (think Salesforce1). The common data model, governance, identity/role management, and so forth make it more tempting to single source new technology from providers. The cloud platform quickly becomes a black hole, consuming incremental technology spend for additional storage, development, analytics, and reporting – and starving out pure-play providers across the ecosystem.

At the same time, businesses everywhere are in the process of becoming data driven. We live in a connected world in which businesses have no choice but to quickly adapt. Businesses want to collect more data from more sources and analyze all of it to change user experiences and business outcomes.

The challenge for IT organizations is that a growing portion of this data is collected in and distributed from major cloud-based services such as Amazon Web Services, Facebook, Microsoft Azure, and Google. For reasons of latency and access to critical third-party data sets, business units will increasingly demand the placement of datacenter assets near these large content depots, forcing IT organizations to rethink current approaches to asserting control over corporate data.

Asserting "data control" is crucial for businesses to effectively transform themselves into data-driven entities. Data control means addressing the following needs:

- **Business needs:** Enabling data access and intelligent data placement across multiple internal and external data assets to accelerate use of data analytics in business processes
- **Information technology needs:** Enabling dynamic and automated deployment and management of infrastructure based on costs, performance, scalability, and data security
- **External needs/mandates:** Protecting data from unauthorized outside access or manipulation and managing data assets to meet governance, privacy, and regulatory requirements

Rise of DevOps Accelerates Cloud Native Application Development

DevOps becomes the dominant development method for new enterprise and cloud services applications, enabled by broad-based availability of modern, scalable self-service development platforms and increasing levels of comfort with cloud-native languages and application architectures. Containers and microservices enable continuous delivery and development. PaaS platforms and services and public API-based marketplaces enable developers to rapidly construct and deploy rich applications that take full advantage of cloud infrastructure flexibility and agility. Integration with conventional and legacy back-end systems is still frequently required, driving significant investment in back-end system modernization to ensure they can support increasingly unpredictable and dynamic integrations with cloud front-end applications.

Modular IT: Modularization of IT Through Convergence, SD(X), Hyperscale, and Containers

Today, virtually all business and technical innovation is occurring on what IDC calls 3rd Platform technologies. In the world of modular IT, speed and agility are key. No longer can business units wait weeks or months for the infrastructure required to deploy or scale new applications or services. They require the flexibility to quickly scale their compute capacity up or down for any particular app to respond to changing use cases and patterns of demand. Organizations that are still supporting legacy infrastructures face a number of several barriers to business agility, including:

- **Slow time to provision services.** Businesses cannot afford to wait for individual servers, storage volumes, and networking bandwidth to be provisioned for application development projects.

- **Inability to quickly ramp capacity to adjust to market conditions.** Just as important as the ability to develop and provision services rapidly is the ability to quickly scale those services up (or down) to meet the changing needs of the market.

- **Spending too much staff resources "keeping the lights on."** For many companies, more than half of their IT organization's time is spent on the day-to-day tasks required to manage the infrastructure.

In the coming years, IT will take advantage of a new set of more modular IT platforms that will reshape or, in some cases, eliminate datacenter infrastructure requirements:

- **Converged systems.** Pre-integrated bundles of compute, storage, and network capacity, which is becoming increasingly easy to deploy and operate with the maturation of software-defined infrastructure (SDI) portfolios from leading suppliers

- **Hyperscale-based cloud infrastructure.** The delivery of highly elastic compute and deep storage in an on-demand model by suppliers such as Aliyun, Amazon, IBM, Google, and Microsoft

- **Software containers.** New operating system and application software bundling and management deployment model that is widely used to enable faster, more predictable rollout of Web-scale applications

These shifts will enable the creation and delivery of thousands to millions of high-value, industry-transforming solutions and services. The shifts will also drive the development of entirely new business models, altering and improving customer experience and delivering vastly new insights that are the sources of competitive advantage.

Talent Quest: High Demand for Next-Generation Business/IT Skills, But Scarce Supply

The ability to acquire 3rd Platform competency is constrained by a talent pool that is growing too slowly to meet business demand and too concentrated geographically to access for many enterprises. Scarce IT skills are concentrated generationally, requiring leadership to manage distinct demographic workstyles and expectations about career and the future. Jobs optimized for robotic machine intelligence and repetitive work impact a growing segment of the talent pool.

In 2013, IDC surveyed CIOs about the skills they'd need to support enterprise strategies until 2018. The talent that was identified as most urgently needed included expertise in business intelligence (BI), analytics, mobile development, social developers, security, and business analysis. Not surprisingly, these are the skills necessary to drive digital transformation. IDC has identified the most significant

business areas in which increased IT spending is driving transformational change (see *Services Innovation: Future of IT Spending,* IDC #256556, June 2015).

CIOs and other technology leaders have found the previously mentioned skills to be in short supply, particularly when their business is remotely located from major cities or tech centers. As a result, there has been a dual-faceted trend to rely more on cloud-based service providers for scarce talent while also updating HR practices to make onboarding new hires more flexible and pertinent to the expectations of specific demographics (e.g., millennials). IDC's 2Q15 macroeconomic forecast states, "IDC believes that the availability and skill level of talent have a direct impact on markets as diverse as network security and outsourcing. In the long run, the optimization of the slow-growth labor pool argues for cloud computing."

The search for talent is shaped and constrained by the way businesses and IT organizations accomplish work. However, CIOs and business leaders must keep abreast of technology trends in their business ecosystem – the talent needs driving your business may have already changed since you last formulated your staffing strategy. As talent cannot be procured or created easily, anticipation and strategic planning drive how leaders will prepare for their next talent needs.

Social Drivers

Cloud Life: The Merging of Real Life with Digital Identity

All forms of personal data become available in the cloud, including financial, work, health, location, and family, and are increasingly managed as a single digital entity that people routinely interact with, update, share, and manage as part of everyday life. Business systems use their knowledge about an individual's personal habits and preferences to customize experiences and replace other people as trusted advisors. The statistics that underlie how extensively people use the Web in their daily lives only hint at the enormity of the social impact. Facebook now has over 1.3 billion active users. Tencent QQ supports over 820 million users, and the top 5 messenger/chat app sites combined have over 2.3 billion users (source: We Are Social, January 2015).

Beyond that, however, there is an increasing trend toward consolidating personal data; for example, Facebook, Google, Apple, Amazon, and Alibaba as well as a number of other service providers are offering a wide variety of services that were traditionally managed by distinct vertical industries – like banking, healthcare monitoring, location services, and online retail channels. One likely outcome of that trend is that people will place greater trust and reliance in a consolidator of their personal data that spans many boundaries of their personal, family, work, and political lives.

A direct consequence will be the merging of aspects of digital identity into a few or perhaps a single virtual doppelganger, a representation of an individual as data that will come to be known to the outside world as more "real" in terms of behavior, habits, and history than its flesh-and-blood counterpart or an individual with expanded capabilities and abilities.

Business leaders must keep pace with competitors that are leveraging deep knowledge of personal data and use this information for more targeted marketing and sales strategies; business leaders must also understand the new culture, allowing and enabling new ways of collaboration and adapting to expected experience levels for all the stakeholders. IT leaders are challenged to manage the enormous, ever-changing complex of data.

Related Research

- *Industry Clouds – A Vignette of Manufacturing Industry Adoption* (IDC #259564, October 2015)
- *A View of the Cloud Market: Segmenting Cloud Buyers Using End-User Data from IDC's CloudView Survey* (IDC #258963, September 2015)
- *Critical External Drivers Shaping Global IT and Business Planning: IDC FutureScape, 2016* (IDC #258644, September 2015)
- *Worldwide SaaS and Cloud Software 2015–2019 Forecast and 2014 Vendor Shares* (IDC #257397, August 2015)
- *Worldwide Competitive Public Cloud Platform as a Service Forecast, 2015–2019* (IDC #257391, July 2015)
- *Infrastructure and Cloud: A Proactive Approach to Enterprise Cloud Strategies* (IDC #256595, June 2015)
- *IDC PeerScape: Hybrid Cloud Management Practices for Enabling Workload Portability and Performance Across Public and Private Cloud Infrastructure* (IDC #256120, May 2015)
- *Business Strategy: Worldwide Cloud Adoption in the Manufacturing Industry* (IDC Manufacturing Insights #MI255221, April 2015)
- *Industry Clouds – A Primer on the Storm Brewing "Above the Cloud"* (IDC #253002, January 2015)
- *IDC MaturityScape: Hybrid Cloud Management* (IDC #253611, January 2015)

Synopsis

This IDC study presents the top 10 predictions for cloud computing. Each prediction is shaped by a common set of key drivers that provides a planning tool for technology leaders and their line-of-business counterparts to use in their IT strategic planning efforts.

According to Robert Mahowald, program vice president for IDC's SaaS and Cloud Software research practice, "Digitization and transformation to virtualized, on-demand provider-based services are driving very rapid internal IT change. IT buyers are shifting steadily toward cloud-also and cloud-first strategies, and nearly all are reconsidering their IT best practices to embrace hybrid cloud construction and operations, secure data management, end-to-end governance, updated IT skills, and improved multivendor sourcing. The dynamics we've discussed in this IDC FutureScape, and our recommendations, should be a foundation for how enterprise-class IT organizations think about managing their transformation."

About IDC

International Data Corporation (IDC) is the premier global provider of market intelligence, advisory services, and events for the information technology, telecommunications and consumer technology markets. IDC helps IT professionals, business executives, and the investment community make fact-based decisions on technology purchases and business strategy. More than 1,100 IDC analysts provide global, regional, and local expertise on technology and industry opportunities and trends in over 110 countries worldwide. For 50 years, IDC has provided strategic insights to help our clients achieve their key business objectives. IDC is a subsidiary of IDG, the world's leading technology media, research, and events company.

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