IDC FutureScape

# IDC FutureScape: Worldwide IT Industry 2018 Predictions

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IDC FUTURESCAPE FIGURE

FIGURE 1

IDC FutureScape: Worldwide IT Industry 2018 Top 10 Predictions
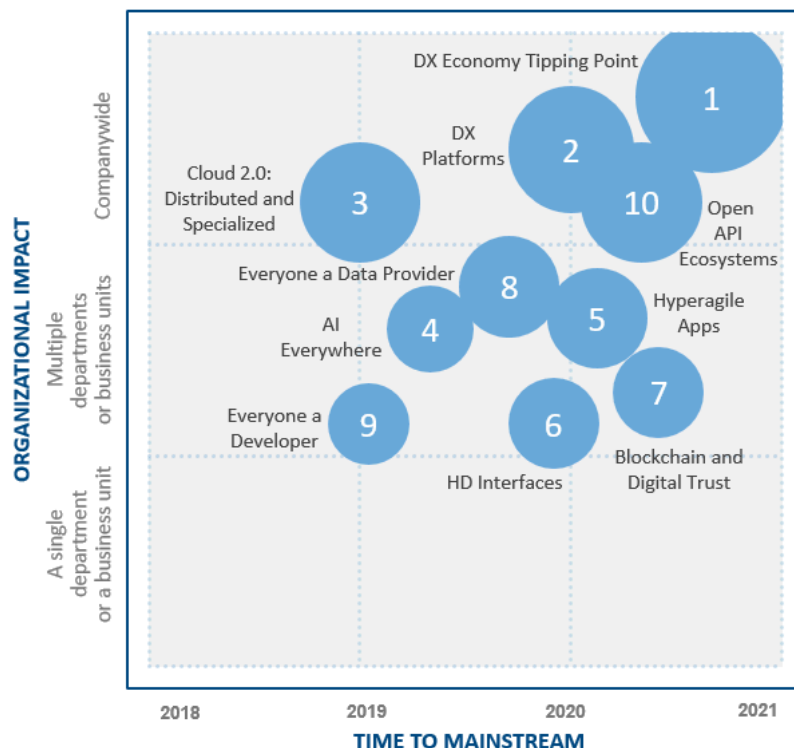
Note: The size of the bubble indicates complexity/cost to address.

Source: IDC, 2017

Figure 1 presents IDC's IT industry 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.

EXECUTIVE SUMMARY

This IDC study discusses our predictions that once again present a strategic blueprint for enterprises on their digital transformation (DX) journey, focusing on 10 key ingredients for becoming a digital-native enterprise. Six of these themes continue from last year but will show significant acceleration and evolution from 2018 and beyond. The other four predictions introduce critical new building blocks for becoming digital-native enterprises.

According to Frank Gens, IDC SVP and chief analyst, "In 2018, the key pieces of the 3rd Platform's second chapter will come together with even greater force, driving enterprises to multiply their digital innovation pace and scale through mastery of digital platforms, external digital developer communities, data-as-a-service (DaaS) marketplaces, expanding artificial intelligence (AI) services, blockchain as a service, new human-digital (HD) interfaces, and open API ecosystems."

IDC FUTURESCAPE PREDICTIONS

Welcome to IDC's 2018 predictions about the biggest IT industry transformation yet: the dramatic shift of IT spending toward 3rd Platform technologies and the digital transformation of the global economy through the innovative use of those technologies.

For the IT industry, 2018 will see the 3rd Platform's second chapter (see Figures 2 and 3) move into full stride, unleashing "multiplied innovation" through platforms, open innovation ecosystems, massive data sharing and monetization, hyperagile application deployment technologies, an expanding digital developer population, the blockchain-fueled rise of digital trust, richer AI services, deeper human-digital interfaces, and a much more diverse cloud services world.
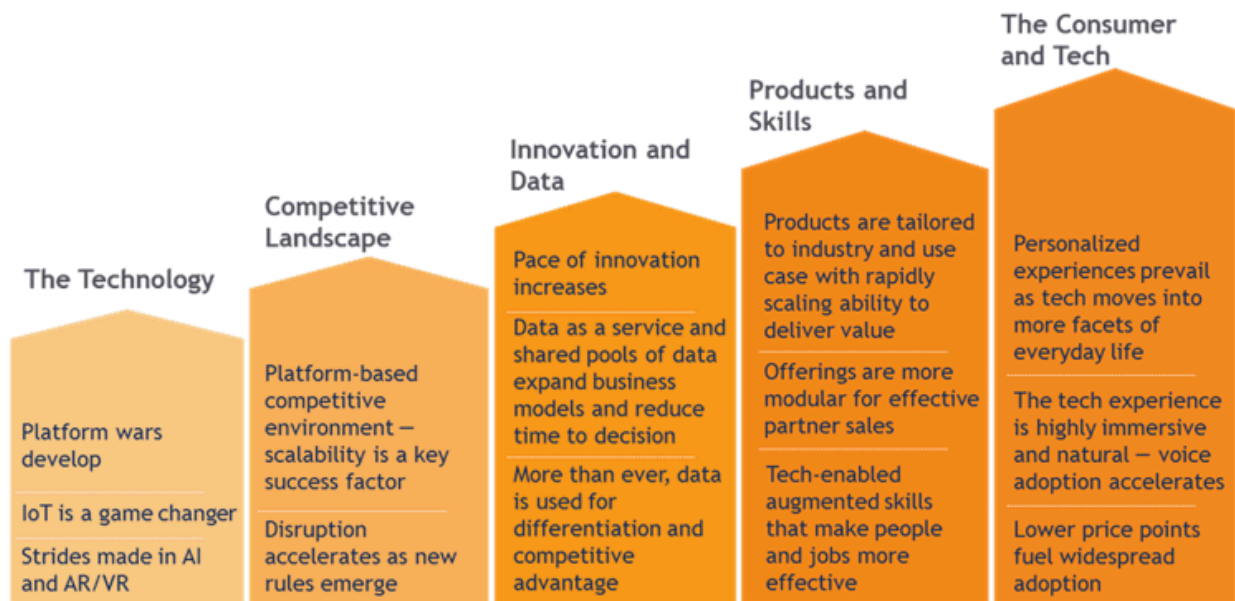
FIGURE 2

Three Chapters of the 3rd Platform Era
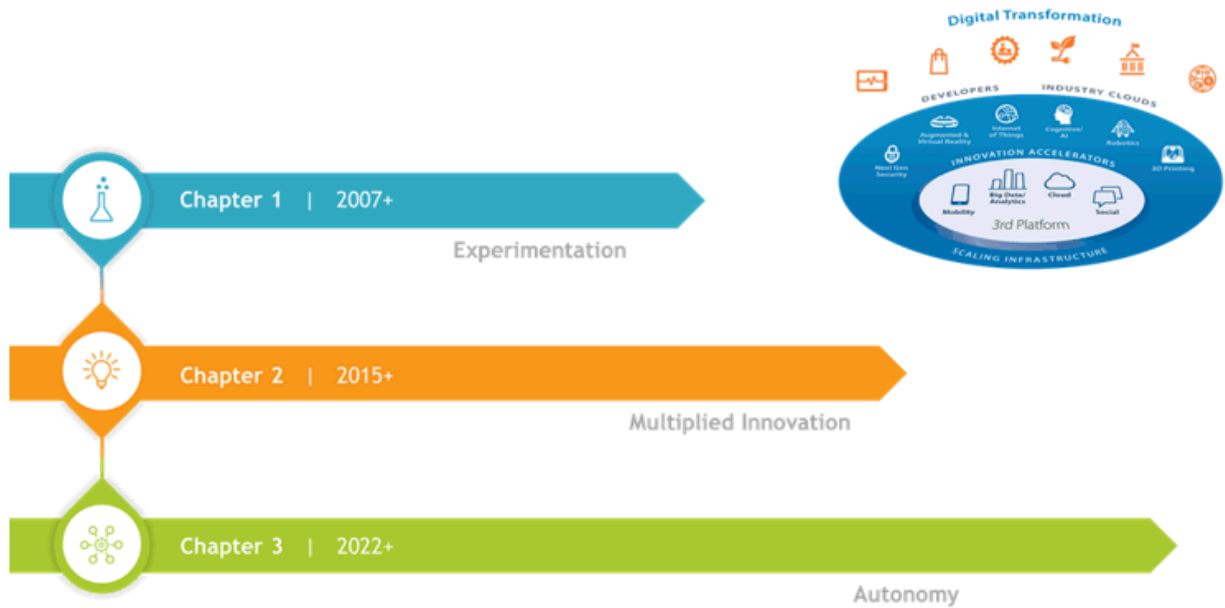
Source: IDC, 2017

FIGURE 3

### The Second Chapter: Multiplied Innovation for the DX Economy

Source: IDC, 2017

For enterprises taking advantage of these technologies, 2018 will see accelerating digital transformation journeys. We said last year that the rising digital economy means that all enterprises must operate like digital-native enterprises – that is, rearchitecting their operations around large-scale digital innovation networks, becoming, in effect, a new corporate species (see Figure 4).

FIGURE 4

Becoming a Digital-Native Enterprise: Digital Innovation Network
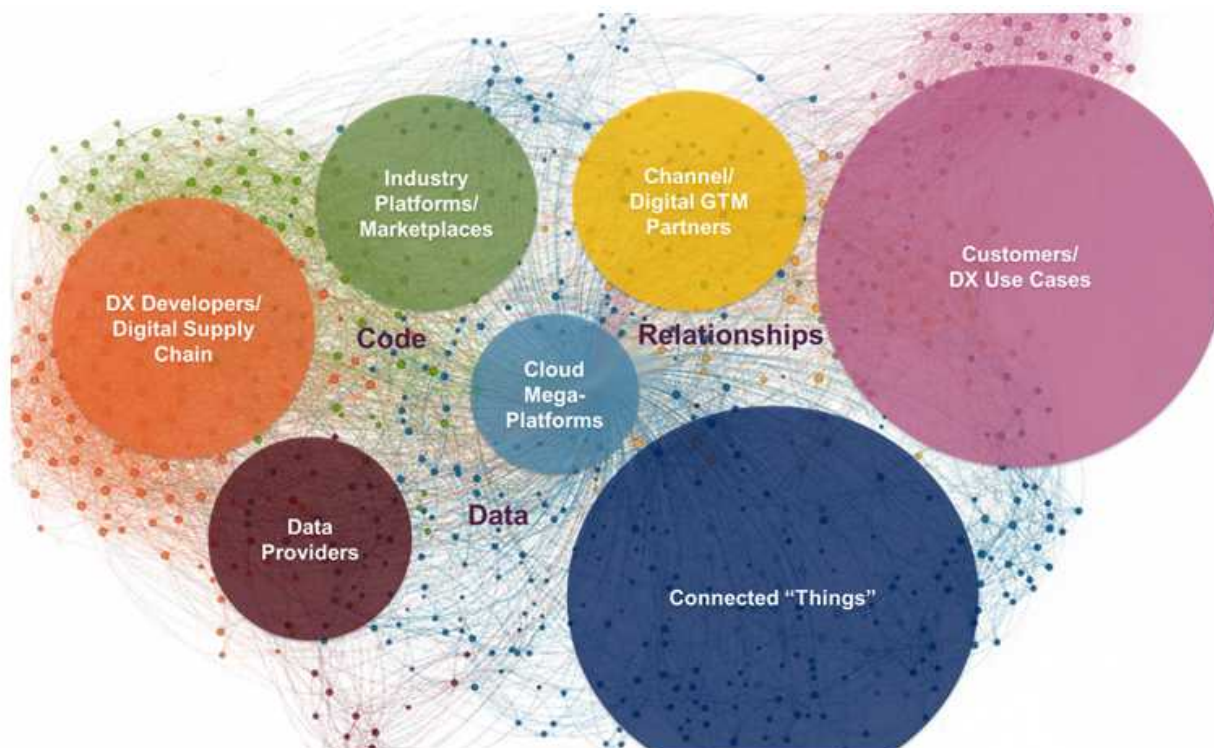
Source: IDC, 2017

This year, our predictions continue to lay out a strategic blueprint for enterprises on their digital transformation journey, focusing on 10 key ingredients for becoming a digital-native enterprise. Six of these themes – DX economy, Cloud 2.0, AI everywhere, HD interfaces, everyone a data provider, and everyone a developer – continue from last year but show significant acceleration and evolution. The other four predictions – DX platforms, hyperagile apps, blockchain and digital trust, and open API ecosystems – introduce critical new building blocks for becoming digital-native enterprises.

As you read these predictions, one repeating takeaway is that many enterprises' assumptions about what legacy and emerging 3rd Platform technologies can support are about to be blown away. Likewise, assumptions about who the leading IT suppliers are, what IT leadership within enterprises looks like, and what IT sourcing decisions are appropriate in the changing marketplace are about to be turned upside down.

Summary of External Drivers

Many external factors have an impact on technology operations and related investments and ultimately on IDC's predictions on the future of cloud. Business, social, economic, and technology trends all play a part in shaping the future. While dozens of external factors influence the future, IDC has identified 10 primary forces that are important to consider when projecting the future of cloud:

- **Accelerating DX:** Technology-centric transformation altering business and society
- **Pace of change:** Technology capabilities enable sustainable change at the speed of digital business
- **DX delta:** Leaders and disruptors widen performance gap
- **Human versus machine:** The impact of AI and automation
- **Sense, compute, actuate:** The new data-centric paradigm
- **Platform disruption:** Unleashing digital innovation's power for scale
- **Cyberthreats:** Theft, ransom, and cyberattack on the rise
- **Shifting economics:** Changing value structures and the rise of digital capital
- **The future workforce:** Global demand for digital talent
- **Innovation impasse:** Legacy systems constraining transformation

Collectively, these drivers helped lead to the 10 predictions discussed in this study. A more detailed description and explanation of each driver is provided in the External Drivers: Detail section.

Predictions: Impact on Technology Buyers

Prediction 1: By 2021, at Least 50% of Global GDP Will Be Digitized, with Growth in Every Industry Driven by Digitally Enhanced Offerings, Operations, and Relationships; by 2020, Investors Will Use Platform, Data Value, and Customer Engagement Metrics as Valuation Factors for All Enterprises

This prediction is about the forcing function that will drive most enterprises to become digital-native enterprises. It is about the "ticking clock" that is (or should be) running inside the heads of CEOs and other executives in every industry, driving them quickly along their digital transformation journeys.

Organizations slow to digitize their offerings and operations (i.e., to adopt a digital-native operating model) over the next three years will find themselves competing for only a minority – and a progressively shrinking minority – of their market segments' opportunities.

Another important source of pressure to accelerate digital transformation journeys will come from investors. Investor perceptions of the future value of companies (and hence the current stock price) are rapidly changing, with a new emphasis on key indicators of digital success – examples abound today in every industry. Several key metrics relevant to digital transformation will have a growing impact on company valuations:

- **Platform participation:** Measured by how well a company is drawing customers, channel partners, and developers to its offerings
- **Data value and monetization:** New mechanisms for putting a value on data under the company's control and, perhaps more importantly, its ability to enrich that data with advanced analysis
- **Customer engagement:** Digital measures of customer engagement are proliferating and rising in importance (e.g., net promoter score)

Although it is difficult to gauge with any precision, IDC estimates that 10-20% of valuations are already tied directly to digital efforts. However, there is a great disparity between traditional investors looking for return from established companies and those looking for growth from emerging digital companies like Tesla. Over time, this investor gap will wane, and by 2020, these digital measures will make up a large part of valuations for all enterprises.

Associated Drivers

- **Accelerating DX:** Technology-centric transformation altering business and society
- **Pace of change:** Technology capabilities enable sustainable change at the speed of digital business
- **Shifting economics:** Changing value structures and the rise of digital capital

IT and Business Impact

- Given the looming digitization of more than half of the global economy, digital transformation will continue to rise on CEOs' and line-of-business (LOB) executives' priority lists.
- The urgency to digitally transform will drive an increasingly large portion of ICT budgets. By the end of 2019, digital transformation spending is expected to reach $1.7 trillion worldwide, a 42% increase from 2017.

Guidance

- Make IT investment decisions in the broader context of enabling enterprises' competitiveness in the increasingly digitized economy — not within the narrow confines of traditional IT priorities and investment models.
- Work to make significant progress in transforming the IT organization — its technology infrastructure and its processes and skills — to a digital-native model over the next three years (see the following nine predictions). The time frame for transforming the IT organization to support enterprise DX goals is shorter than many executives realize.

For more predictions and further discussion about enterprises' digital transformation journeys, check out *IDC FutureScape: Worldwide Digital Transformation 2018 Predictions* (IDC #US43154617, November 2017).

Prediction 2: By 2020, 60% of All Enterprises Will Have Fully Articulated an Organizationwide Digital Transformation Platform Strategy and Will Be in the Process of Implementing That Strategy as the New IT Core for Competing in the Digital Economy

This prediction is about a new enterprise IT foundation for digital transformation: a new way of designing, sourcing, integrating, and running IT that accelerates digital innovation at the scale and pace required to compete in the DX economy.

IDC calls this new enterprise IT architecture the "DX platform," and it will rapidly emerge over the next three years.

IDC defines the DX platform as the future enterprise IT architecture enabling the rapid creation of externally facing digital products, services, and experiences, while aggressively modernizing the internal "intelligent core" environment in parallel. IDC believes that organizations that can "rearchitect for scale" on a DX platform design will stand out as most likely to emerge as a digital-native enterprise in the critical next three to four years.

The DX platform is primarily an externally facing, API-enabled platform – with the key objective to create a network or ecosystem of connected customers, partners, and suppliers that use (and pay for) the information and services available to them. A defining element of the DX platform is that it is "data driven," with an expanding variety of data pipelines plugged in from outside the enterprise and that data (along with the enterprises' own data) fueling the artificial intelligence-driven models and code that form the basis of the enterprises' core intellectual property (IP) in the digital economy.

While some enterprises have digital platforms in place for isolated functions like digital marketing or supplier management, less than 10% of enterprises have an integrated enterprisewide DX platform design or implementation in place.

Associated Drivers

- **Accelerating DX:** Technology-centric transformation altering business and society
- **Sense, compute, actuate:** The new data-centric paradigm
- **Platform disruption:** Unleashing digital innovation's power for scale
- **Innovation impasse:** Legacy systems constraining transformation

IT and Business Impact

- Although running a digital platform environment parallel to the enterprise, the IT environment might be a stepping stone in the process – the ultimate end goal is an integrated platform where the new "intelligent core" sits at the heart of the DX platform and is the foundation enabling sustainable digital innovation and ultimately enterprises' competitiveness in the DX economy.

- The architecture defined to underpin the DX platform strategy will be a key enabler for the longer-term success of the whole enterprise. More importantly, the data-driven nature of the platform will mean that IT will have to work hand in hand with the digital and business teams to redefine the way processes link to the services being delivered by the platform.

- The exponential growth of data "feeding" the platform will mean that the key differentiator for the organization will be the algorithms, the code, and the models that sit within the "intelligent core." IT should be a critical part of the digital team that defines and builds that core.

Guidance

- Tie DX investments and plans directly to corporate DX strategy. View the DX platform as a key enabler for key business outcomes and priorities being laid out by the board (and hopefully being driven by the CEO).

- Ensure the DX platform is not owned solely by IT. Although IT will definitely be an integral part of the team driving the DX platform, it should also span the digital and business teams. Hence it looks very different to the traditional IT architectures that CIOs and enterprise architects might have historically put in place.

- Focus on "scale" as the underlying design principle for the DX platform. The rate and extent to which your organization can roll out the DX platform should be directly correlated to your organizational DX maturity across the IDC-defined dimensions of leadership, omni-experience, information, operating model, and WorkSource.

For more predictions and further discussion about the DX platform, check out *IDC FutureScape: Worldwide Digital Transformation 2018 Predictions* (IDC #US43154617, November 2017) and *The DX Platform: Rearchitecting for Scale* (IDC #EMEA43147617, October 2017).

Prediction 3: By 2021, Enterprises' Spending on Cloud Services and Cloud-Enabling Hardware, Software, and Services Will More than Double to Over $530 Billion, Leveraging the Diversifying Cloud Environment That Is 20% at the Edge, Over 15% Specialized (Non-x86) Compute, and Over 90% Multicloud

As the adoption of the cloud expands dramatically over the next several years, the cloud is evolving to support a much wider variety of digital innovation use cases/workloads. 2018-2021 is a critical period for assessing cloud suppliers' ability to support the expanding Cloud 2.0 capabilities and use cases and to readjust enterprises' assumptions about what systems should run in the cloud.

Some examples of key changes in enterprises' cloud environments over the next several years are:

- **Multicloud management:** By 2020, over 90% of enterprises will use multiple cloud services and platforms, with more than one-third of these organizations having established mechanisms to operate their multicloud environments. A key area will be multicloud security management, where we predict increasing commonality across the major cloud platforms.

- **Cloud at the edge:** The cloud environment will expand to the edge, as IDC predicts that, by 2021, over 50% of companies in consumer facing will spend more each year on upgrades to their network, computing, and storage resources in edge locations than in their core datacenters, and over 20% of container instances will be running at edge locations, many serving Internet of Things (IoT) workloads.

- **Expanding specialized cloud instance hardware options:** By 2021, demand for non-x86 instances — including GPUs, TPUs, FPGAs, and quantum computers — will drive over 15% of public cloud demand, up from 5% or less today, as the cloud becomes the launch pad for hardware optimized for AI workloads, IoT workloads, simulation of real-life scenarios, computation of complex outcomes, and more. This will dramatically expand the number of use cases — traditional and new — for which the public cloud will be the best (and, in many cases, the only) platform.

Associated Drivers

- **Accelerating DX:** Technology-centric transformation altering business and society
- **Pace of change:** Technology capabilities enable sustainable change at the speed of digital business
- **Platform disruption:** Unleashing digital innovation's power for scale
- **Sense, compute, actuate:** The new data-centric paradigm

IT and Business Impact

- Cloud resource management and integration of resources across cloud platforms will grow to become critical technical capabilities at IT organizations driving DX at enterprises. Cloud providers and their ecosystems are recognizing this need to support customers' attempts to manage across complex and diverse cloud environments and are putting more focus on enabling multicloud communication and integration.

- The cloud is coming to a neighborhood near you — and your IoT devices, your customers, your campuses and branch offices, and anywhere else you need it to be. This emergence of "cloud at the edge" will open up vital new growth opportunities for many enterprises but will also create new requirements for IT planning and management — around new equipment types, new network connectivity requirements, and more complex management environments.

- Adopting the cloud is no longer primarily about economics and agility. It is becoming enterprises' most critical, and dependable, source of sustained technology innovations.

- There will be major IT supplier leadership realignments over the next several years, forcing IT leaders to reexamine the best fit for their businesses. Leading IT vendors will emerge around four platform "galaxies":
    - Cloud megaplatforms (global "IaaS + PaaS" platforms)
    - Enterprise application platforms (major application/SaaS offerings that provide platforms/APIs for developers to create extended/complementary solutions)
    - Cloud integrators/managers (independent software/cloud and services companies focused on multicloud and hybrid integration and management)
    - Industry cloud platforms (within every industry, companies vying to attract developers, data, and solutions and establish a digital innovation "power position")

Guidance

- Focus early on developing a structured integration framework across cloud platforms to reduce rework and reengineering of processes and retain agility in the IT platforms at the enterprise. Engage early with public cloud providers and integration service providers to help influence the dominant frameworks that will be used for this integration. This will be important for larger IT organizations.
- Become involved in the early stages of creation of new digital services to participate in the specification, design, and "fleet management" of large numbers of "edge" IT assets deployed in critical locations (e.g., hospitals, mines, transportation hubs, and factories).
- Think strategically about your vendor choices. Vendors in the cloud platform "galaxies" no longer represent just their own offerings but also large partner/innovators ecosystems — assess the scope and strength of their ecosystems as closely as you do their in-house capabilities.
- Look for vendors competing in the application platform and integrator/manager platform "galaxies" that demonstrate strong multicloud capabilities — beware of those that are too tightly hardwired to a single megaplatform provider.

For more predictions and further discussion about the cloud, check out *IDC FutureScape: Worldwide Cloud 2018 Predictions* (IDC #US42014717, November 2017), *IDC FutureScape: Worldwide Enterprise Infrastructure 2018 Predictions* (IDC #US43137417, November 2017), and *IDC FutureScape: Worldwide Datacenter 2018 Predictions* (IDC #US43152417, November 2017).

Prediction 4: By 2019, 40% of Digital Transformation Initiatives Will Use AI Services; by 2021, 75% of Commercial Enterprise Apps Will Use AI, Over 90% of Consumers Will Interact with Customer Support Bots, and Over 50% of New Industrial Robots Will Leverage AI

Last year, we had a prediction about "AI everywhere," but it would be impossible not to focus once again this year on the remarkably rapid adoption we see over the next several years — especially when it comes to AI-powered digital transformation initiatives (as noted previously).

The critical role of AI within almost half of DX initiatives will stress skills needs. Our DX research team predicts that, by 2020, 85% of new operation-based technical positions hires will be screened for analytical and artificial intelligence skills, enabling the development of data-centric digital transformation projects without hiring new data-centric talent.

The rapid adoption will continue to be turbocharged in 2018 by the cloud's "AI war" — that is, the ongoing battle among the major public cloud providers to outdo each other with an ever-expanding variety of AI-powered services.

Developers are the critical user population to watch in order to understand how and how quickly AI will take root in enterprises over the next several years. Our DevOps research team notes that the use of intelligence — cognitive, machine learning, deep learning, bots, and related technologies — will quickly become table stakes for development environments over the next 36 months. We predict that, by 2019, cognitive computing, artificial intelligence, and machine learning will become the fastest-growing segments of software development; by 2021, 90% of enterprises' own development teams will be using cognitive/AI and machine learning tools and services.

Among the enterprise use cases for AI that IDC's research team has identified as having the greatest traction over the next 36 months are applications (the app development process and — as noted in our previous prediction — AI services embedded in apps), advertising/marketing (hyper-personalized customer experiences [CXs]), manufacturing and retail supply chains, design/engineering, customer support (as noted in the previous prediction), and asset management.

Several key use cases for AI in the enterprise will be within the IT organization itself. By 2021, IDC predicts that 50% of enterprise infrastructure will employ some form of cognitive and artificial intelligence to improve enterprise productivity, manage risks, and drive overall cost reduction. Cybersecurity will also be a critical first-wave application of AI. IDC predicts that, by 2020, 60% of the G2000 will use AI-based security.

Associated Drivers

- **Accelerating DX:** Technology-centric transformation altering business and society
- **Sense, compute, actuate:** The new data-centric paradigm
- **Human versus machine:** The impact of AI and automation

IT and Business Impact

- AI embedded in almost all IT and business systems/solutions will enable accelerated improvement/enhancement cycles, through continuous learning and automation. Selecting digital services and apps without "AI inside" will put your organization at risk of falling behind competitors' pace of innovation.
- Talent, both AI engineers and data scientists, will be needed to support the large portion of DX initiatives that are AI dependent.
- Since AI effectiveness depends heavily on high-quality (and diverse) data inputs, IT will need to invest in technologies to ingest, profile, validate, and cleanse multiple streams of high-volume data that feed machine learning and cognitive apps. In addition, IT may need to invest in storage infrastructure capable of storing and retrieving petabytes of structured and unstructured data for the relevant application.
- Privacy and security concerns will present serious landmines for AI-based DX efforts. The IT organization will need to be among the enterprise's best and first use-case environments for AI — in development, infrastructure management, and cybersecurity.

Guidance

- Create an AI center of excellence to encourage discovery, learning, and cross-organizational collaboration between businesses, IT, and data scientists.

- Plan for creating technology capabilities – including platforms, technologies, processes, governance, talent, and data components – that will empower the enterprise.
- CIOs must create and continuously enhance an integrated enterprise digital platform that will enable new operating and monetization models (see prediction number 2).
- IT will need to ensure the availability of best-in-class API management tools that interface with data feeds for AI-powered applications and services. APIs are critical to machine learning and cognitive apps as a means of overlaying multiple data sources to enhance analytic accuracy and the sophistication of data-driven insights.
- Privacy and security will present serious land mines for AI-based DX efforts. Define robust privacy and security rules for cognitive computing apps that dictate what data can be collected by these applications and the set of permissible uses for that data.

For more predictions and further discussion about AI and cognitive technologies and solutions, check out *IDC FutureScape: Worldwide Analytics and Information Management 2018 Predictions* (IDC #US42619417, November 2017).

Prediction 5: By 2021, Enterprise Apps Will Shift Toward Hyperagile Architectures, with 80% of Application Development on Cloud Platforms (PaaS) Using Microservices and Cloud Functions (e.g., AWS Lambda and Azure Functions) and Over 95% of New Microservices Deployed in Containers (e.g., Docker)

As enterprises create many new services for the digital economy, they will need to deploy a rapidly increasing portion of them in an entirely new way – taking advantage of the scalability, flexibility, and portability of an emerging set of "hyperagile" application deployment technologies and approaches. Taken together, we refer to containers, cloud functions, microservices application architecture, open API management tools, greater leverage of external code/services ecosystems, and other emerging elements as the rising "hyperagile" application architecture. These technologies and approaches have been the hallmark of many "cloud native" applications, but they are evolving to have much broader applicability.

These new foundation technologies and approaches support a much greater level of modularity and allow a much more rapid pace of improvement and enhancement. They will be the foundation for 10X growth in a number of applications and microservices, driven by a new generation of hyper-verticalized digital solutions.

Importantly, containers and microservices (and the cloud functions used to implement many microservices) also lead the way for greater adoption of open source software in test and development environments to pave the way for a cultural change toward more openness, innovation, collaboration, and agility. In last year's predictions, we talked about how important this change in culture – with more greater leverage of external code sources – is for enterprises to keep up with the accelerating pace of digital innovation required in the DX economy.

Associated Drivers

- **Pace of change:** Technology capabilities enable sustainable change at the speed of digital business
- **Platform disruption:** Unleashing digital innovation's power for scale
- **Innovation impasse:** Legacy systems constraining transformation

IT and Business Impact

- New types of applications leveraging IoT and analytics will need a modern application architecture that optimizes infrastructure to a new level using microservices and application architectures needs to include these options.

- The move to container technologies requires an upgrade of IT skills in the organization, as containers are a relatively new technology and may force the introduction of the open source approach and culture.

- Fine-grained services will help application developers create applications in the right form factor to respond to data or application events, helping IT better meet the goals of an agile organization.

Guidance

- Deploy a microservice-architected, container-packaged application in a PaaS environment. Cloud-native computing has evolved quickly, and this is a safe, reliable way to deploy applications today and should be a target for most IT organizations.

- Develop effective container management strategies with application developers and operations teams (or, increasingly, DevOps teams). Doing so will allow for business innovation through application and workload portability.

- Conduct a detailed evaluation of function computing. This is still in its infancy, and there is a noted lack of interoperability with functions (and, hence, a real risk of lock-in), so this segment still carries a buyer-beware caution.

For more predictions and further discussion about containers, cloud functions, microservices, and other hyperagile technologies and approaches, check out *IDC FutureScape: Worldwide Developer and DevOps 2018 Predictions* (IDC #US42652317, November 2017).

Prediction 6: By 2020, Human-Digital Interfaces Will Diversify, as 25% of Field Service Techs and Over 25% of Info Workers Use Augmented Reality, Nearly 50% of New Mobile Apps Use Voice as a Primary Interface, and 50% of the Consumer-Facing G2000 Use Biometric Sensors to Personalize Experiences

The proliferation of more natural human-digital interfaces will allow enterprises to more deeply engage constituents, create hyper-personalized experiences and — as we've seen with voice-powered intelligent assistant devices and agents — approach a state of ubiquitous presence.

As noted in our previous predictions, we see augmented reality (AR), voice interfaces, and biometric sensors the most impactful over the next 36 months. In detail:

- **Augmented reality for field service workers:** To meet customer demands, service companies are equipping their field technicians with new tools such as tablets and smartphones that can help them extend their knowledge base, reducing dispatch and problem diagnoses enabling fast and agile fault resolution. However, IDC believes that augmented reality will be the primary platform that will revolutionize the role of the field service worker. According to IDC's 2016 *Commercial Survey,* at least 30% of IT buyers said that they were expecting to begin proof of concept or pilots of AR systems in the next 6-12 months. AR gives field technicians a rich set of options while at a job site including image overlay to ensure the most efficient means to access the fault area, access to a wide variety of technical updates, and visual and communication between supervisors and subject matter experts.

- **Augmented reality for information workers:** When IDC surveyed IT buyers, the top 3 reasons they were interested in bringing AR to their workforce was to drive increased efficiency, enable

hands-free work, and improve worker safety – three items that essentially require a head-mounted display or glasses. IDC believes that AR will fundamentally change the way workers interact with digital information. From input to manipulation to consumption of digital information, AR should remove friction and enable new, more efficient business processes. AR will also impact workers' ability to interact with physical objects, as the Internet of Things makes it possible to associate real-time data with machines that employees use. Finally, AR will drive new methods of collaboration, allowing remote employees to work on projects and interact with each other in new and meaningful ways.

- **Voice interfaces mainstream on mobile apps:** Since the inception of the mobile phone, we have witnessed physical input on devices moving from button to stylus to finger, and now voice is set to be the new go-to for a plethora of enterprise smartphone apps by 2020. The inclusion of voice will allow for greater mobility and efficiency while increasing worker productivity over the long haul. The ability to instantly check sales quotas, place orders, and record data via voice could play a fundamental role for enterprise users shortly. Intelligent assistant vendors need to move swiftly in order to grow a third-party developer community and spread awareness of their offerings in the widest range of devices possible.

- **Biometric sensor data to bring personalized customer experience to a whole new level:** Mobile devices including phones and health trackers already gather a wealth of very personal physical data. With so much biometric data available, it's only a short hop for its use in a whole new level of personalization. IDC's CX research team predicts that enterprises will compete on their ability to essentially read individuals' minds through biometric proxies and to deliver a much more targeted customer experience. Today's less "aware" personalized marketing will seem very old school three years from now.

Associated Drivers

- **Sense, compute, actuate:** The new data-centric paradigm
- **The future workforce:** Global demand for digital talent

IT and Business Impact

- While new interfaces promise to improve some workflows, other existing workflows may be disrupted. IT and LOB must consider the impact of friction to business processes during new interface and device deployment.

- AR, voice, and biometric sensing are all complex technologies that promise to revolutionize business processes, but they represent significant challenges for IT – including device procurement, device management, software development and integration, and software life-cycle management.

- Shifting to new interfaces requires users to negotiate an often steep learning curve, so expect complaints along with praise.

Guidance

- Build close relationships with AR hardware, software, and services vendors, as AR technologies (and suppliers) are still in early deployment stages. There is a wide range of vendors and capabilities in the AR world. Carefully assess vendors' own capabilities (e.g., many vendors are facing significant supply constraints – Can they meet required supply levels?), and assess their ability to support the broader range of your organization's needs (e.g., understanding/experience in your specific solution need and ecosystem of complementary suppliers [software, IT services, etc.]).

- Research and trial all available voice-powered platforms (Alexa, Google Assistant, Watson, Bixby, Siri, and Cortana) – not all platforms will produce the same results across the board.

Fully assess each vendor – and its ecosystems – to ensure maximum compatibility with your organization and your selected use cases.

- Prepare for the tsunami of data that will come from biometric devices, especially around security and privacy concerns. Conduct a risk assessment to identify risks (and perceived risks) associated with biometric data and devices.

- Involve those who will be the primary users of the technologies very early in and throughout the decision-making process. Employee advocacy and acceptance will be a defining aspect of the overall success of the deployment of any of these new user interface technologies.

For more predictions and further discussion about AR/virtual reality (VR), voice interfaces, and biometric sensing, check out *IDC FutureScape: Worldwide Connected Devices and Augmented Reality/Virtual Reality 2018 Predictions* (IDC #US43145617, November 2017) and *IDC FutureScape: Worldwide Customer Experience 2018 Predictions* (IDC #US43155317, November 2017).

Prediction 7: By 2021, at Least 25% of the G2000 Will Use Blockchain Services as a Foundation for Digital Trust at Scale; by 2020, 25% of Top Global Transaction Banks, Nearly 30% of Manufacturers and Retailers, and 20% of Healthcare Organizations Will Use Blockchain Networks in Production

By far, the biggest threat to the growth of the digital economy is the continuing erosion of trust, exacerbated by rising cybersecurity breaches. Strengthening digital trust – at scale – is a paramount priority for enterprises in the digitized economy.

Enter blockchain technologies, most famously known as the underpinning of the cryptocurrency bitcoin. At the core of blockchain is distributed ledger technology (DLT) that offers strong potential to broadly support digital trust at scale, in a wide variety of use cases, through:

- **One version of the truth:** Immutable and secure information
- **Transfer of value:** Provides secure ownership records
- **Faster settlement:** Cuts steps, time, and costs
- **Smart contracts:** Supports automated buying and selling

IDC believes the growing availability of blockchain as a cloud service will – as the cloud has helped do with AI technologies – turbocharge its adoption over the next several years.

IDC's blockchain research team predicts the following key use cases for blockchain adoption over the next 36 months:

- **Manufacturing supply chain:** Collaborative design, collaborative manufacture
- **Financial services:** Facilitate know-your-customer (KYC) regulatory compliance, accelerate supply chain finance, and drive small and medium-sized enterprise lending
- **Retail supply chain:** Provenance of goods, omnichannel orchestration
- **Data services:** Data validation/provenance
- **Healthcare:** Providers' supply chain and payers' patient identity
- **State and local government:** Reduce operational and processing costs, improve data integrity and sharing, and embed security and privacy protocols into registries and contracts

One super impactful, but still emerging, use case involves data provenance – that is, validating that information is from a trusted and authentic source. IDC's analytics research team predicts that, by

2021, 20% of data from sources on open networks will be registered on a public blockchain and corresponding APIs will have been made available for data consumers to validate these blockchain registrations, thus proving shared-data provenance and increasing trust in information. Examples of data sources may include internet-connected devices, commercial data-as-a-service providers, open data sources, or even data from individuals. There is evidence that data source authentication solutions will be a reality because blockchain-based data notarization solutions are already in the market.

IDC's IoT and blockchain research teams also predict that, by 2020, up to 10% of pilot and production blockchain distributed ledgers will incorporate IoT sensors. Even though 10% penetration is a small number, the IoT and blockchain relationship promises to be a very strategic one over time. This is because security of IoT devices and data has been the leading challenge to IoT deployments into production environments. Blockchain promises to deliver a major "upgrade" from today's RFID and barcode tracking (the technologies initially underpinning the manufacturing and retail supply chain use cases noted previously), with a much greater level of trust and more streamlined transactions.

Associated Drivers

- **Sense, compute, actuate:** The new data-centric paradigm
- **Shifting economics:** Changing value structures and the rise of digital capital
- **Cyberthreats:** Theft, ransom, and cyberattack on the rise

IT and Business Impact

- Blockchains are all about interconnected business networks. Organizations will need interconnectivity with various ledgers of others in their industry ecosystems (e.g., for manufacturers: retailers, wholesalers, and suppliers).
- As blockchain-based business networks and transactions become more widespread, organizations not participating in blockchains will be at significant speed and cost disadvantages.
- As the time frames (and adoption percentages) of our blockchain predictions show, establishing blockchain ledgers and interconnections will occur at a slow and steady pace over the next 36 months. Early adopters have the opportunity to establish very strong positions; slower adopters are not likely to be boxed out in the next 36 months but should be initiating early stage exploration about the technology and potential use cases.

Guidance

- Investigate various blockchain consortiums for potential peers and partners to help get your organization started.
- Ensure your organization has a blockchain strategy and plan in place if it is already pursuing an aggressive DX journey (i.e., maturity stage 3 or above). First use cases should already be identified and pilots should at least be in the planning stage. As noted previously, the most urgent industries and use cases include manufacturing and retail (supply chains) and financial services (compliance and SME lending).
- For slower-moving DX travelers: In 2018 start paying attention; learn about the technologies, suppliers, and early-adopter experiences; and develop scenarios about how your organization would most profitably use blockchain as a service.

For more predictions and further discussion about blockchain, check out *IDC FutureScape: Worldwide Supply Chain 2018 Predictions* (IDC #US43146317, November 2017), *IDC FutureScape: Worldwide Financial Services 2018 Predictions* (IDC #US41796017, November 2017), *IDC FutureScape:*

Worldwide Analytics and Information Management 2018 Predictions (IDC #US42619417, November 2017), and *IDC FutureScape: Worldwide Internet of Things 2018 Predictions* (IDC #US43161517, November 2017).

Prediction 8: By 2020, 90% of Large Enterprises Will Generate Revenue from Data as a Service — from the Sale of Raw Data, Derived Metrics, Insights, and Recommendations — Up from Nearly 50% in 2017

Our theme for this prediction is "everyone will be a data provider." As noted in Prediction 1, enterprises' ability to create, derive, and manage high-value data for their own use – and gain financial leverage by packaging some of that data for the marketplace – will be a key metric driving enterprise valuations. Relevant and high-value data will also be a key component of enterprises' value and power in the world of digital developers/ecosystems.

As more enterprises have begun to view data as an asset, they have begun to invest more in technology to gain greater awareness of the data they already own and to assess the value of that data – on its own or in combination with second- or third-party data. In addition, some enterprises are investing in data curators and other related staff to help package data assets.

IDC also predicts that enterprises' data-as-a-service go to market will also evolve, as a rapidly expanding number of private- and public-sector organizations will monetize data externally either directly or by wrapping their data-as-a-service offerings around other products and services by incorporating the price of DaaS into broader subscription contracts.

Associated Drivers

- **Sense, compute, actuate:** The new data-centric paradigm
- **Shifting economics:** Changing value structures and the rise of digital capital
- **Platform disruption:** Unleashing digital innovation's power for scale

IT and Business Impact

- The IT organization's responsibilities for data integration, aggregation, quality, and storage will become even more rigorous in enterprises that embark on monetizing data externally. Expect tightened controls and governance policies and procedures (including addressing data sovereignty and customer privacy issues) as the DaaS trend evolves.
- Customers will begin to view DaaS as an integral part of the purchased product or service, and service-level agreements around access to data will tighten as enterprises wrap DaaS around existing and new products and services.

Guidance

- Ensure a closer collaboration between IT and the line of business responsible for bringing DaaS to market. Successful external monetization of data will require not only the technical capability to aggregate, store, and process data but also the associated packaging, pricing, and distribution practices for various forms of DaaS as well as understanding data sovereignty laws and privacy regulations.
- Seek partnership with existing dedicated DaaS providers or with your preferred analytics and information management vendors to develop such as platform. While most organizations can simply send raw data sets to another party willing to pay for it, few enterprises have the technology platform to bring DaaS to market on their own.

- Don't forget last year's data-related prediction/guidance: all enterprises also need to hone their capabilities for brokering/curating the rising volume of external data sources required for your enterprise's digital innovation teams. Establishing a critical mass of external data feeds is a critical ingredient for maximizing the accuracy and value of your AI-based digital services and solutions.

For more predictions and further discussion about data, check out *IDC FutureScape: Worldwide Analytics and Information Management 2018 Predictions* (IDC #US42619417, November 2017).

Prediction 9: Improvements in Simple ("Low Code/No Code") Development Tools Will Dramatically Expand the Number of Nontech Developers Over the Next 36 Months; by 2021, These Nontraditional Developers Will Build 20% of Business Applications and 30% of New Application Features (60% by 2027)

Our theme for this prediction is "everyone will be a digital developer." This is an evolution of last year's prediction that enterprises would double or triple the number of DX developers in their organization. However, as noted this year, thanks to improvements in low-code/no-code developer tools, almost everyone has the potential to be a digital developer.

Low-code/no-code software frees business stakeholders from reliance on traditional models for application development that require support from the IT organization. As such, low-code/no-code software accelerates the software development process and gives business stakeholders an enriched toolbox for using technology to solve business problems.

The first wave of use cases for low-code/no-code software has included data visualization, outlier detection, predictive modeling, enhanced content management, key performance indicator (KPI) management, strategic planning, operational planning, forecasting, and mobile application design. However, increasingly linked (see prediction number 5) with increased availability and ease of use of APIs and API management tools, low-code/no-code developers have access to machine learning, natural language processing, and cognitive computing technologies, in addition to application life-cycle management and performance management tools.

This means that this expanding population of business (not IT)-rooted developers will be able to create increasingly sophisticated digital innovations. Successful enterprises will tap into that potential by maximizing access to simplified (no-code/low-code) tools and propagating an "everyone's a developer" culture in their organization.

Associated Drivers
- **Accelerating DX:** Technology-centric transformation altering business and society
- **DX delta:** Leaders and disruptors widen performance gap
- **Platform disruption:** Unleashing digital innovation's power for scale

IT and Business Impact
- IT will need to take responsibility for creating an infrastructure that allows for the dissemination of information and training-related materials regarding low-code/no-code apps within the organization. Such an infrastructure may take the form of an online marketplace where users can evaluate apps of interest or a portal that contains relevant information.
- IT will need to mature processes for authorizing the use of low-code/no-code apps and the data those apps access within an enterprise's IT infrastructure by ensuring that the apps comply with the organization's security and HR protocols.

Guidance

- Integrate API-based data into low-code/no-code applications, particularly if the data originates from company databases and systems.

- Designate an application owner to govern best practices around usage for each low-code/no-code application. Application owners assume the responsibility of evangelizing the application throughout the enterprise, leading the training of end users and coaching business users on how to build low-code/no-code apps.

- Define protocols and procedures for usage of low-code/no-code applications such as the number of concurrent users, role-based access privileges, identity and access management, data security requirements, and the usage of the application outside of the company's VPN. Determine who has access to the application and administrative rights.

For more predictions and further discussion about data, check out *IDC FutureScape: Worldwide Developer and DevOps 2018 Predictions* (IDC #US42652317, November 2017).

Prediction 10: By 2021, More than Half of the G2000 Will See an Average of One-Third of Their Digital Services Interactions Come Through Their Open API Ecosystems, Up from Virtually 0% in 2017 — Amplifying Their Digital Reach Far Beyond Their Own Customer Interactions

Our last, but certainly not the least important, prediction is about the signature element of a "digital native" operating model: creation of open APIs, and developer ecosystems around them, that allow enterprises to massively scale distribution of their digital platforms and services through third-party digital innovators, accelerating adoption, and revenue.

Joy's law simply explains why creating digital innovation ecosystems is so important to success in the DX economy. Sun Microsystems Cofounder Bill Joy noted that "no matter who you are, most of the smartest people work for someone else." That is, maximizing the value of your own intellectual property requires enlisting the ingenuity of many other smart people who can create additional value around it.

This is certainly not news to digital-native organizations. A January 2015 Harvard Business Review article, *The Strategic Value of APIs,* estimated that Salesforce.com at that time generated 50% of its revenue through APIs, eBay 60%, and Expedia 90%. Over 50% of items sold on the Amazon.com platform are from third-party sellers whose offers are integrated through the use of Amazon APIs. Google's digital services – like search, maps, and so forth – are also widely distributed through, and embedded in, third parties' digital sites and services.

However, for most enterprises on a DX journey – that have been primarily focused on creating their own digital services and learning how to better expand digital innovation supply networks – developing an open API-based distribution ecosystem has been a later, and perhaps the most challenging, step in getting ready to compete in the digital economy.

However, as our prediction states, in 2018 and over the next 36 months, DX leaders will start to put much greater strategic focus and investment on their open API-based external developer ecosystems and distribution networks. For example, a senior executive at a global bank recently told us that the "success metric for API banking is to enable, at a minimum, 25% of the bank's financial advisor and core banking transactions (retail and corporate) over the next two to three years."

In the financial services sector, regulatory pressure for "open banking" — including the EU's Revised Payment Services Directive (PSD2) and Japan's Partial Revision of the Banking Act (both require institutions to provide open API access to third parties and come into effect in 2018) — will accelerate this strategic trend. We will also see open API ecosystems rise as a digital transformation priority in government, manufacturing, retail, health, and most other sectors.

Associated Drivers

- **Shifting economics:** Changing value structures and the rise of digital capital
- **Platform disruption:** Unleashing digital innovation's power for scale
- **Accelerating DX:** Technology-centric transformation altering business and society

IT and Business Impact

- External APIs will allow enterprises to accelerate their innovation, by expanding their products and services — and by expansion, we do not mean just the number of products but also the type of product or service offered.
- Enterprises without aggressive, open API-based digital distribution strategies (and operations) will stunt their own growth and share in the digitized global economy — limiting their revenue to only what they themselves can develop and distribute. This is a fast track to marginalization in the DX economy.

Guidance

- Foster the right API mindset in your organization. Developing a successful open API digital ecosystem is not a "project" that is just about technical enablement and can be completed in 24-36 months — it is a new business model that requires sustained business focus and investment over multiple years.
- Acquire and develop strong processes and skills around API management solutions and platforms — they will be essential new ingredients for supporting open API ecosystems.

For more predictions and further discussion about open APIs, check out *IDC FutureScape: Worldwide Cloud 2018 Predictions* (IDC #US42014717, November 2017) and *IDC FutureScape: Worldwide Financial Services 2018 Predictions* (IDC #US41796017, November 2017).

ADVICE FOR TECHNOLOGY BUYERS

Each of our 10 predictions stand on their own, each on a strategic area of IT focus and investment over the next 36 months for enterprises pursuing a DX journey. Moreover, we've offered specific advice about each of these areas in the previous discussions that we need not repeat here.

However, it is also important to see these predictions in the broader context as the key ingredients of a "bigger picture" — a strategic blueprint for enterprises on their digital transformation journey, with the overarching goal of becoming a digitally transformed digital-native enterprise.

In this bigger-picture context, we offer the following observations and guidance:

- **See the IT connections.** Most of these predictions are interconnected, and therefore strategies and investments need to be considered together. For example, an open API ecosystem requires a well-developed enterprise digital platform strategy and implementation. Likewise, the innovation power of expanded low-code/no-code developer communities will be amplified

through investments in hyperagile application technologies and approaches. Further, a solid cloud plan is required to fully leverage strategic emerging technologies like AI and blockchain.

- **Rethink internal versus external sourcing assumptions.** These predictions, taken together, form a very large – and perhaps overwhelming – to-do list for enterprise IT leaders. The shift to this DX-centric, large-scale, and rapid pace IT world will require leaders to carefully reassess everything their organizations do today. This is the time to ask not only "What should we do?" but also, just as important, "What should we no longer do?" In other words, be ready to radically rethink your traditional "make versus buy" and "do versus externally source" assumptions.

- **Time for a new "IT organization."** Perhaps this is too obvious, but it bears repeating as we enter 2018. You can see that, within almost all of our predictions, the lines between traditional IT organizations, their line-of-business constituents, and newer digital business units are blurring more each day. It's time for a new generation of IT organization designed to more naturally interconnect and blend all three perspectives and skill sets. Prediction 2 about the emerging DX platform as a technology foundation and architecture is driven by this "IT/business/digital fusion" vision – organization, culture, sourcing strategies, and other nontech elements must transform similarly. By 2021, when 50% or more of the global economy is "digitized," seeing these three perspectives (and organizations) as distinct will be obsolete.

EXTERNAL DRIVERS: DETAIL

Accelerating DX: Technology-Centric Transformation Altering Business and Society

Description: Digital transformation refers to the continuous process by which enterprises adapt to or drive disruptive changes in their customers and markets (internal and external ecosystems) by leveraging digital competencies to innovate new business models, products, and services that seamlessly blend digital and physical and business and customer experiences while improving operational efficiency and organizational performance.

Context: In the past few years, we have witnessed the rise of digital transformation and the disruptions and opportunities it poses for traditional businesses and society. Organizations of every size and industry risk fundamental disruption because of new technologies, new players, new ecosystems, and new ways of doing business. Early success is met by the subsequent challenge of achieving digital business at scale. Business disruptions cascade into societal disruptions. IDC predicts that worldwide spending on digital transformation technologies will expand at a compound annual growth rate (CAGR) of 17.9% through 2021 to more than $2.1 trillion.

Pace of Change: Technology Capabilities Enable Sustainable Change at the Speed of Digital Business

Description: Today, survival of the fittest is not linked to size or strength but the ability to change. While digital transformation accelerates globally, the half-life of companies shrinks, disrupted by new business models and 3rd Platform technologies. The imperative is not just keeping pace with business change but also increasing the speed of business operations. In an attempt to go faster, organizations struggle under a forest of silos and business innovations stagnate with redundancy and inconsistency. Companies that don't adapt will become part of the carnage, while leaders get further ahead by

rationalizing and integrating their data and applications and leveraging DX capabilities to move faster and deliver better products and services.

Context: Over the past 50 years, the average life span of S&P 500 companies has shrunk from around 60 years to closer to 18 years. The rate of change is accelerating dramatically. Time to decide and act requires near-frictionless, fact-based decision-making processes. To survive, companies not only have to be digital transformers but must do so while improving adaptability and adopting changes. Digital capabilities provide modular, plug-and-play technology, business, and industry platforms, allowing businesses to quickly adapt and compete in digital transformation.

DX Delta: Leaders and Disruptors Widen Performance Gap

Description: The best-performing companies, armed with digital-native culture, tools, and process, are pulling away from the rest, creating a bifurcated and unequal landscape where a few firms exhibit high productivity and profits. Digitalized sectors are the most profitable as firms adopt new technologies and deliver winning products and services more efficiently. Having disrupted one sector, firms attack adjacencies to expand their markets and then protect their status through mergers, acquisitions, and R&D.

Context: The gap is widening more and more quickly between the thrivers – companies that are the best performers – and the survivors – those companies just hanging on. Thrivers, undergoing continuous self-disruption and innovation, are leveraging their capabilities to create new digital products and services, expand digital ecosystems, and foster digitally savvy workforces. While they experience double-digit growth in productivity, market share, and revenue, others are flat or declining. Technology-literate leadership, vision, and organizational and culture change are key to any digital business at scale.

Human Versus Machine: The Impact of AI and Automation

Description: Cognitive advances, combined with robotics and AR/VR, are now actively impacting experiential engagement, business and manufacturing processes, and strategies. Personal privacy is increasingly at risk as big data, facial recognition, and other technologies create deeper personal profiles. Automation is enhancing and, in some cases, replacing human decisions yet is less transparent and more difficult to understand or challenge. Many tasks can be automated, but tough management decisions must be made about if, how, or when. Automation can empower humans to be more intelligent and productive but may also redefine or eliminate job categories.

Context: Intelligent applications based on cognitive computing, artificial intelligence, and continual deep learning are the next wave of technology transforming how consumers and enterprises work, learn, and play. IDC forecasts that worldwide revenue for cognitive and artificial intelligence systems will reach $12.5 billion in 2017, an increase of 59.3% over 2016. Cognitive and AI solutions will continue to see significant corporate investment over the next several years, achieving a CAGR of 54.4% through 2020 when revenue will be more than $46 billion.

Sense, Compute, Actuate: The New Data-Centric Paradigm

Description: While data is at the core of the new digital economy, it's about how you sense the environment and manage the data from edge to core to cloud and how you analyze it in near real time, learn from it, and then act on it to affect outcomes. IoT, mobile devices, big data, machine learning, and cognitive/AI all combine to continually sense and collectively learn from an environment. What differentiates winners is how they leverage that to deliver meaningful, value-added predictions and

actions for personalized life efficiency/convenience, improving industrial processes, healthcare, experiential engagement, or any enterprise decision making.

Context: Clive Humby is credited with the statement "data is the new oil" (2006). However, like raw crude, value is only realized when it is extracted and processed. By the end of 2017, revenue growth from information-based products will double the rest of the portfolio for one-third of Global 2000 companies. Large and diverse data sets create new challenges, but when combined with AI technologies and exponential computing power, they create even greater opportunities. Any application, process, service, or organization that isn't part of, or all of, the new "sense, compute, actuate" paradigm is simply missing the boat with digital transformation.

Platform Disruption: Unleashing Digital Innovation's Power for Scale

Description: The "platform" is the new battleground for innovation, developers, and marketplaces. "Going it alone" is obsolete. Powerful network effects continue to entrench leaders and extend reach. Industry platforms layer on digital business platforms built on technology platforms. Market consolidation limits choices but increases the power to consumers as a critical mass of partners, customers, and solutions converge. Megaplatforms, fueling innovation, demand a widening cloud-based ecosystem, network, and business platform of connected things, channels, technology, data, and talent.

Context: Platforms have long played a key role in the IT industry. We are in a platform economy — one in which tools, capabilities, and frameworks based upon the power of information, cognitive computing, and ubiquitous access will frame and channel our economic, business, and social lives. The platform concept expands from microservices, technology stacks, and software bundles to PaaS to entirely new digital business and industry-specific platforms, ecosystems, and operating models.

Cyberthreats: Theft, Ransom, and Cyberattack on the Rise

Description: The dark net and hacker networks continue to grow and get more organized. Cybercrime hits a massive scale as illustrated by the WannaCry debacle, highlighting inadequate attention to basic security practices. Comparatively, the cloud looks pretty secure. While vigilant security practices can protect against most threats, governments and private institutions are actively using their digital power and weapons to affect outcomes. Bots and misinformation drive political and social change and divisiveness. The digital arms race expands as 3rd Platform technologies become tools or countermeasures to extend or resist coercion.

Context: Data breaches and cybercrime are in the news every day, followed only by state-sponsored cyberactions. IDC forecasts that global spending on security solutions will reach almost $105 billion in 2020, with a CAGR of 8.7%. "Contain and control" approaches, augmented with cognitive computing, replace outdated "protect and defend" models. Security initiatives need to employ new technologies and approaches to evaluate and mitigate the new array of risks while ensuring privacy, confidentiality, integrity, and availability.

Shifting Economics: Changing Value Structures and the Rise of Digital Capital

Description: The emergence of data as capital and currency as a replacement for physical money enables businesses, governments, and individuals to manage their transactional lives through digital channels without having direct contact or needing third parties. Blockchain and other technologies enable new business models and disintermediation that bypass traditional structures and boundaries,

disrupt industries, and avoid oversight while enabling transient business relationships and continuously shifting structures.

Context: The shift in value is redefining our underlying economic assumptions. Traditional intermediary roles and relationships are being eviscerated by new technologies. In a world used to tangible goods, the cost of data and transactions is difficult to calculate or valuate yet critically important. "Data as a service" and data marketplaces highlight the value now being placed on data. Return on assets (ROA) will become an important measure as it is extended to intangible assets, particularly information. "Owning" good sources of data will become a valuable enterprise asset, enabling new business models.

The Future Workforce: Global Demand for Digital Talent

Description: The ability to acquire a digital transformation mindset and talent is constrained by a shifting set of competencies and a limited talent pool. The ability to combine business and IT skills and to transform new technology into business outcomes is scarce and growing too slowly to meet business demand and is too concentrated geographically for many enterprises to access, exacerbating the divide between thrivers and survivors. "Free agents" and AI-assisted technologies will help fill some gaps, but talent will continue to distinguish the leaders from the rest.

Context: As market shifts and rapidly changing technologies transform businesses, companies that don't have up-to-date, evolving skill sets are falling behind. There is a "war" or at least a "grab" to attract the emerging skill sets needed to excel in digital transformation. Millennials, especially those with both business and IT skills, are increasingly in high demand – for leadership, analytics, coding, and managing projects to scale – yet universities are not turning out sufficient candidates to meet the needs. Employees who have the capability to work at scale (data, devices, traffic, and customers) are of huge value to leading and fast-growth companies as they take their businesses to the next level.

Innovation Impasse: Legacy Systems Constraining Transformation

Description: Technology has been enabling business for decades, and refreshing deployed systems has always been problematic. American businessman Dee Hock said, "The problem is never how to get new, innovative thoughts into your mind but how to get old ones out." This is true about digital transformation as well. Organizations are burdened with old systems that "run the business." Most cannot be retrofitted to the new digital ecosystem, leaving organizations with the unpleasant choice of either constraining their DX initiatives and environments or embarking on an expensive and disruptive upgrade of critical systems.

Context: Many organizations today are facing the challenge of maintaining or modernizing their trusted operational systems of record (SOR). Yet decades of changes have built up technical debt, making those systems fragile and expensive. Systems of engagement (SOE) don't go far enough to meet new customer expectations but add to the debt, complexity of upgrading, and the challenge of integrating existing systems with new digital transformation services. Legacy constraints and incremental fixes won't cut it any longer. Upgrades to intelligent, cloud-based systems offer the opportunity to leapfrog ahead. Doing so is problematic and expensive. Not doing so may be suicidal. Leading organizations are prepared to leave legacy behind where it is no longer relevant.

LEARN MORE

Related Research

- *IDC FutureScape: Worldwide Digital Transformation 2018 Predictions* (IDC #US43154617, November 2017)
- *IDC FutureScape: Worldwide Cloud 2018 Predictions* (IDC #US42014717, November 2017)
- *IDC FutureScape: Worldwide Enterprise Infrastructure 2018 Predictions* (IDC #US43137417, November 2017)
- *IDC FutureScape: Worldwide Datacenter 2018 Predictions* (IDC #US43152417, November 2017)
- *IDC FutureScape: Worldwide Analytics and Information Management 2018 Predictions* (IDC #US42619417, November 2017)
- *IDC FutureScape: Worldwide Developer and DevOps 2018 Predictions* (IDC #US42652317, November 2017)
- *IDC FutureScape: Worldwide Connected Devices and Augmented Reality/Virtual Reality 2018 Predictions* (IDC #US43145617, November 2017)
- *IDC FutureScape: Worldwide Customer Experience 2018 Predictions* (IDC #US43155317, November 2017)
- *IDC FutureScape: Worldwide Financial Services 2018 Predictions* (IDC #US41796017, November 2017)
- *IDC FutureScape: Worldwide Internet of Things 2018 Predictions* (IDC #US43161517, November 2017)
- *The DX Platform: Rearchitecting for Scale* (IDC #EMEA43147617, October 2017)
- *IDC FutureScape: Worldwide IT Industry 2017 Predictions* (IDC #US41883016, November 2016)

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