IDC FutureScape

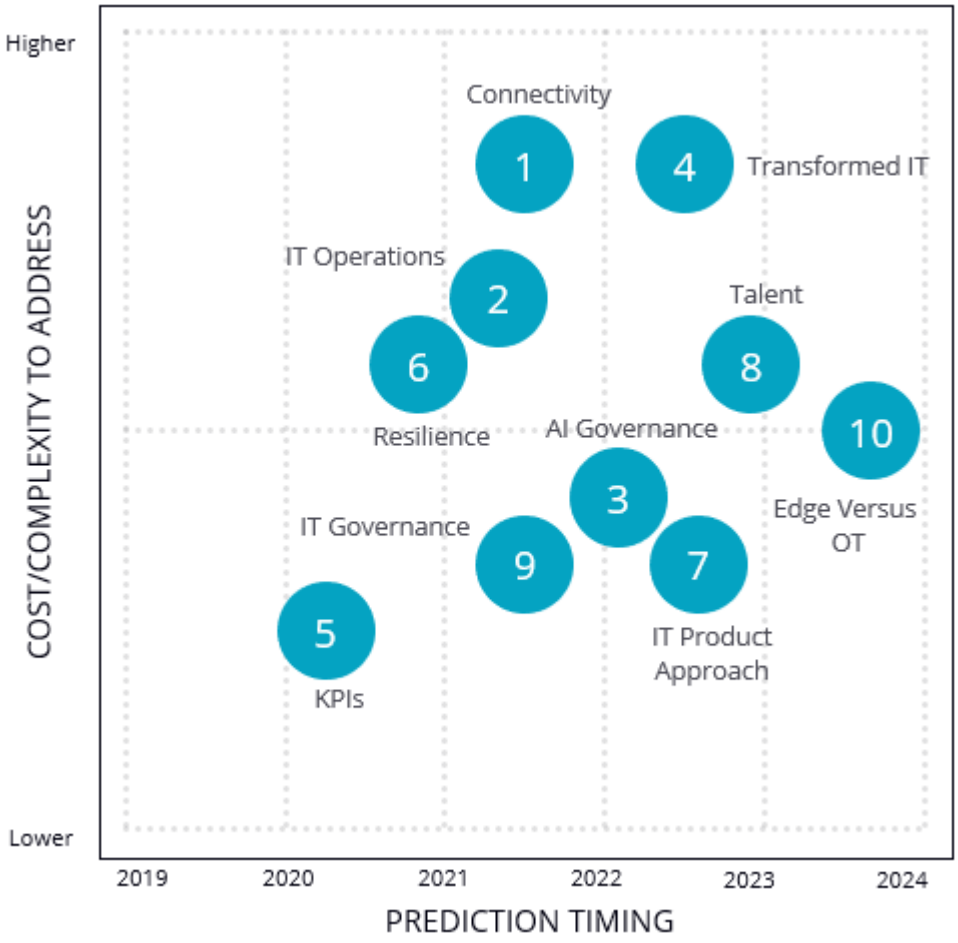
IDC FutureScape: Worldwide CIO Agenda 2019 Predictions

Serge Findling Marc Strohlein Joseph C. Pucciarelli

IDC FUTURESCAPE FIGURE

FIGURE 1

IDC FutureScape: Worldwide CIO Agenda 2019 Top 10 Predictions



Note: Marker number refers only to the order the prediction appears in the document and does not indicate rank or importance, unless otherwise noted in the Executive Summary.

Source: IDC, 2018

October 2018, IDC #US44390218

EXECUTIVE SUMMARY

In the multiplied innovation economy, enterprises are racing to reinvent themselves as the pace of digital transformation (DX) becomes exponential. The digital train is leaving the station, and CIOs are rushing to transform their IT organizations before they lose relevance to their businesses. The most effective CIOs are reinventing IT from top to bottom and creating new digital platforms with agile connectivity while modernizing and rationalizing to jettison the ballast of obsolete systems. They are also reinventing customer, employee, and partner experiences to strengthen trust and resilience while learning to live with and manage risks posed by AI and machine learning (ML) by reinventing IT governance. Moreover, they are reinventing IT leadership, by orchestrating armies of bots and automated processes in addition to leading people. CIOs are reinventing IT through IT transformation (ITX).

IDC FutureScapes present information about technologies, markets, and ecosystems that help CIOs better understand future trends and their impacts on the enterprise. They also present guidance on complex, fast-moving environments and offer prescriptive, actionable recommendations. Every year, IDC identifies the key external drivers that will influence businesses in the coming years. A FutureScape establishes 10 predictions derived from these drivers, analyses the impacts on the IT organization, and proposes recommendations for the next 5 years.

The 2019 predictions for the CIO agenda are:

- **Prediction 1:** By 2021, driven by LOB needs, 70% of CIOs will deliver "agile connectivity" via APIs and architectures that interconnect digital solutions from cloud vendors, system developers, start-ups, and others.
- **Prediction 2:** Compelled to curtail IT spending, improve enterprise IT agility, and accelerate innovation, 70% of CIOs will aggressively apply data and AI to IT operations, tools, and processes by 2021.
- **Prediction 3:** By 2022, 65% of enterprises will task CIOs to transform and modernize governance policies to seize the opportunities and confront new risks posed by AI, ML, and data privacy and ethics.
- **Prediction 4:** Through 2022, 75% of successful digital strategies will be built by a transformed IT organization, with modernized and rationalized infrastructure, applications, and data architectures.
- **Prediction 5:** By 2020, 80% of IT executive leadership will be compensated based on business KPIs and metrics that measure IT's effectiveness in driving business performance and growth, not IT operational measures.
- **Prediction 6:** By 2020, 60% of CIOs will initiate a digital trust framework that goes beyond preventing cyberattacks and enables organizations to resiliently rebound from adverse situations, events, and effects.
- **Prediction 7:** By 2022, 75% of CIOs who do not shift their organizations to empowered IT product teams to enable digital innovation, disruption, and scale will fail in their roles.
- **Prediction 8:** Through 2022, the talent pool for emerging technologies will be inadequate to fill at least 30% of global demand and effective skills development and retention will become differentiating strategies.
- **Prediction 9:** By 2021, 65% of CIOs will expand agile/DevOps practices into the wider business to achieve the velocity necessary for innovation, execution, and change.

- **Prediction 10:** By 2023, 70% of CIOs who cannot manage the IT governance, strategy, and operations divides between LOB-dominated edge computing, operational technology, and IT will fail professionally.

This IDC study provides IDC's top 10 predictions for the 2019 CIO Agenda. These predictions provide a strategic context that will enable CIOs to lead their organizations through a period of multiplied innovation and disruption over the next 5 years. They also lay out IDC's vision for the 10 most important shifts that will happen in IT organizations over the next 60 months and will help senior IT executives in the formation of their strategic IT plans.

"In a multiplied innovation economy built on emerging technologies, CIOs must reinvent the IT organization to enable their enterprise to take advantage of the most powerful wave of the digital transformation," says Serge Findling, vice president of Research for IDC's IT Executive Programs (IEP).

IDC FUTURESCAPE PREDICTIONS

Summary of External Drivers

- **Next chapter of DX:** Technology-driven transformation altering business and society
- **The race to innovate:** Speed of change, delivery, and operations separates thrivers and survivors
- **Platforms, platforms, platforms:** Industry competes for innovation at scale
- **Sense, compute, actuate:** Turning data into value
- **New nature of risk:** Innovation requires new thinking in security and risk management
- **The future of work:** Bridging the digital talent gap
- **Legacy inertia:** Retrofit the old into the DX world

Predictions: Impact on Technology Buyers

Prediction 1: By 2021, Driven by LOB Needs, 70% of CIOs Will Deliver "Agile Connectivity" via APIs and Architectures That Interconnect Digital Solutions from Cloud Vendors, System Developers, Start-Ups, and Others

Over the past few years, LOB executives and their organizations have evolved significantly in their demands on and relationships with IT. From earlier days of needing turnkey systems and solutions with full support from IT, many LOB organizations have struck out on their own with little or no IT involvement to adopt apps and solutions from cloud vendors, third-party service providers, and LOB developers. In short, LOB IT, formerly dubbed "shadow IT," has stepped into the spotlight and is a force to be reckoned with. Instead of trying to control or block LOB IT, savvy CIOs are working to make it an organic part of enterprise computing by supplying agile connectivity that functions as a flexible digital hub to interconnect a growing diversity of apps, systems, and technologies.

The digital arms race requires cloud, mobile, AI/machine learning, IoT, blockchain, and other technologies that all have to work together in a secure, cohesive manner. Trying to bolt together IT and third-party solutions one at a time is too slow and will result in a mishmash of brittle architectures and systems. To accelerate their digital transformation, LOB executives must be able to access and integrate a broad range of IT and third-party services in a seamless manner.

A flexible and adaptable digital platform with an advanced architecture must provide the connectivity, APIs, security, automation, and intelligence to allow it to easily add or retire capabilities. In this large evolving system, modularization and loose coupling is important to build resilience and limit risk propagation. Data must also be decoupled from applications and made accessible through an intelligent core to generate value. And complex, multicloud environments are a given — IDC's 2018 *Cloud and AI Infrastructure Perceptions Survey* found that, over the next two years, 40% of IT organizations will have multicloud low-interoperability environments and 20% will have high-interoperability environments. CIOs must have visibility on their level of multicloud interoperability by creating metrics for business application level of interoperability such as low, medium, and high; agreeing with LOB partners about targets; and sharing the progress on a regular schedule. Furthermore, business applications inventory needs to indicate the status regarding standard APIs and microservices. Metrics are essential communication tools to partner with LOB executives.

Associated Drivers

- **Next chapter of DX:** Technology-driven transformation altering business and society
- **The race to innovate:** Speed of change, delivery, and operations separates thrivers and survivors
- **Platforms, platforms, platforms:** Industry competes for innovation at scale

IT Impact

- Multicloud environments require specialized management and orchestration and may require new skill sets in IT.
- Plug-and-play capabilities ease complexity for LOBs but increase complexity for IT, and automated capabilities are needed to manage APIs and services at scale.
- Flexible, adaptable, and loosely coupled services replace monolithic, closed systems, making it possible to interconnect and increase the value of apps and technologies, but will require significant changes in IT architectures and operations.
- LOB no-code/low-code developers bring added muscle to IT organizations but will need IT training and support to maximize their positive impact.

Guidance

- Create COEs for LOB developers to ensure architecturally compatible, secure, scalable development.
- Invest in self-service, fully automated, and seamless intelligent connectivity; this will be necessary to achieve the scope, scale, and reach necessary to support enterprise DX.
- Develop metrics to communicate to management progress in delivering agile connectivity to LOB organizations.
- IT architects and developers will need to change their ways of thinking to design and develop flexible, extensible, and open DX platforms that support the development and operation of digital apps, products, and services.

Prediction 2: Compelled to Curtail IT Spending, Improve Enterprise IT Agility, and Accelerate Innovation, 70% of CIOs Will Aggressively Apply Data and AI to IT Operations, Tools, and Processes by 2021

CIOs have long aided LOB organizations in pursuing process and operational efficiency, speed, and agility, most recently by leveraging big data and AI. However, far fewer CIOs have harnessed those same tools to automate and add intelligence to IT operations and processes, despite the wealth of

opportunities. The confluence of digital transformation and the need for innovation, speed, and agility; growing scarcity of key IT talent; and the curtailment of IT spending leave CIOs no choice but to turn the big data/AI spotlight on their own organizations.

While automation requires investments in technology, change management, and skill sets, it also brings value far beyond resource redeployment. Applying AI and data to IT operations helps the organization build expertise and "muscle" in critical areas that will support enterprise digital transformation. It also creates vastly more scalable IT operations and services, drives down costs, and provides the opportunity to rethink, streamline, and improve IT operations and services. Moreover, IT can more easily understand the business case and use these initiatives to learn to live with AI and become more knowledgeable partners for the business.

Associated Drivers

- **The race to innovate:** Speed of change, delivery, and operations separates thrivers and survivors
- **Platforms, platforms, platforms:** Industry competes for innovation at scale
- **Sense, compute, actuate:** Turning data into value

IT Impact

- Automation frees up IT resources for enterprise DX initiatives and IT transformation, but operations personnel will have to be reskilled for new technologies and practices including machine learning and new change management approaches.
- Automation results in fewer mistakes and better and more efficient services, alleviates skills shortages, reduces operating costs, and makes it possible for services to be extended and scaled to higher levels.
- IT will be better able to support LOB AI initiatives by building data/analytics/AI expertise and experience.

Guidance

- Ensure that change management capabilities are solid and effective as key IT operations and processes are automated.
- Evaluate ITSM vendors that incorporate AI and machine learning into their tools.
- Don't just automate; rethink operations and processes in the context of data and AI-based optimization and potential changes in enterprise service needs. Use the IT4IT value delivery framework and value chains to identify IT contributions to the business.
- Capture lessons learned in automating IT, train, and educate to build competencies for enterprise DX so IT talent can move seamlessly among IT, LOB, and enterprise DX initiatives.

Prediction 3: By 2022, 65% of Enterprises Will Task CIOs to Transform and Modernize Governance Policies to Seize the Opportunities and Confront New Risks Posed by AI, ML, and Data Privacy and Ethics

AI, machine learning, IoT, and other digital technologies are rapidly becoming "must-have" technologies for enterprises but also engender some risks to people and businesses. Machine learning apps can become biased from flawed or skewed training data sets. AI apps may make flawed decisions because of faulty algorithms, while IoT devices collect unprecedented volumes and types of data that expose individuals to privacy invasion and personal harm.

In short, these technologies bring great power – but with that power comes great responsibility to make rational decisions. Moreover, data privacy and usage have become a highly visible concern as evidenced by the European Union's GDPR and the California Consumer Privacy Act of 2018. Businesses need to be principled and transparent in their use of intelligent technologies and sensitive data to maintain trusting relationships with employees, customers, and the public. They need to explain what data is collected; how it is collected; how it is analyzed, transformed, and used; and how technologies are used to make decisions – all in terminology that laypeople can understand.

CIOs must take leadership roles in preventing a headlong rush into potentially risky applications of digital technologies that expose employees, customers, the public, and ultimately businesses to extreme financial, legal, and reputation risks. They also must head off the inadvertent creation of jumbled systems and architectures created by uncoordinated and unrestrained adoption of new and emerging technologies. CIOs should help their businesses chart a course for the adoption of these technologies that balance the need for competitive advantage and business opportunities with the need to mitigate risks. At a time when innovation happens anywhere in the organization or at the edge, governance policies will go a long way to help everybody's awareness and engagement to do the right things and do them right. Governance must be viewed primarily as an enabler.

Measuring risks associated with AI requires a framework to identify, assess, control, monitor, and report. Monitoring includes relevant metrics to measure latent variables such as effectiveness, trustworthiness, or decision biases. Metrics will go a long way in improving the enterprise risk posture associated with AI. In many cases, control processes such as with human expert or redundant systems may be necessary.

Associated Drivers

- **Next chapter of DX:** Technology-driven transformation altering business and society
- **Platforms, platforms, platforms:** Industry competes for innovation at scale
- **Legacy inertia:** Retrofit the old into the DX world

IT Impact

- CIOs need to play a key role in protecting employees, customers, and the public with effective, comprehensive information governance that ensures privacy protection while preventing inappropriate use of data assets.
- CIOs must demonstrate leadership and prevent approaches to AI and machine learning that expose the business to risk and reputation damage.
- Machine learning and AI biases must be mitigated by quality processes instrumented with metrics that identify flaws and biases in data and algorithms.
- Policies are needed to guide decisions in where IT has little experience.

Guidance

- Create an enterprise COE for AI that includes access to expertise on data privacy and ethics.
- Create KPIs for AI/data risk management to measure and monitor risks to employees, customers, the public, and the business.
- Create policies for data privacy and ethics to guide decisions in deploying AI informed by consulting and obtaining guidance from external experts on ethics and privacy.
- Test AI-driven apps to ensure that they don't contain biases or flawed decision-making logic.

Prediction 4: Through 2022, 75% of Successful Digital Strategies Will Be Built by a Transformed IT Organization, with Modernized and Rationalized Infrastructure, Applications, and Data Architectures

Just as buildings can't be safely erected on shaky foundations, effective digital business strategies can't be built on cobbled-together legacy systems with brittle architectures. Some critical needs such as security or flexibility were not designed as part of some legacy systems and cannot be implemented as an afterthought. Modern systems also can't be built on legacy IT organizations using decades-old thinking and practices. Pressure from business leaders will drive some CIOs to try to build on those legacy foundations in the pursuit of speed but instead will exacerbate problems and ultimately end in costly failure.

CIOs need to start early in creating, driving, and executing the vision and rationale for rationalizing *and* modernizing infrastructure, apps, and data architectures before or at least in parallel to pursuing digital transformation initiatives. And they will need to devote significant time and energy to sell and evangelize that vision, rooted in business impact, outcomes, and benefits. As de facto owners of IT transformation, the creativity, persuasiveness, and perseverance of CIOs will be the difference between success and failure as LOB executives will want to invest in digital business transformation initiatives, not foundation-building IT transformation.

A key success factor for rationalization and modernization in support of DX is the transformation of the IT organization to new ways of thinking and working and the use of design thinking; lean, lean start-up; and other practices and disciplines that bring product and customer focus. Also critical is investment in modernized and rationalized infrastructure and applications. According to IDC's 2018 *CIO Sentiment Survey* of 150 IT executives in the United States, 37% of enterprises have inadequate infrastructures that are keeping their digital transformation efforts from progressing. And finally, IT can gain critical speed and agility by shifting from meeting checklists of requirements to creating "minimum viable products" – the critical mass of infrastructure, apps, and data that will meet the current needs of the business while preparing the foundation for the future.

Associated Drivers

- **Platforms, platforms, platforms:** Industry competes for innovation at scale
- **Sense, compute, actuate:** Turning data into value
- **Legacy inertia:** Retrofit the old into the DX world

IT Impact

- CIOs need to lead IT transformation initiatives to overhaul the foundations of the IT organization.
- Platform architectures are table stakes in successful enterprise DX and IT can't succeed at enterprise DX without total rationalization of infrastructure, apps, and data.
- CIOs will have to engage and persuade LOB executives to support and participate in transformation and rationalization.

Guidance

- Define a detailed vision of the transformed IT organization, what it does, and how it works.
- Create a road map for rationalization and modernization using prioritization based on the level of effort, cost, and business impact.
- Communicate with all stakeholders and agree on accountabilities.

- Create agile data architectures that can rapidly adapt to new data sources and applications.

Prediction 5: By 2020, 80% of IT Executive Leadership Will Be Compensated Based on Business KPIs and Metrics That Measure IT's Effectiveness in Driving Business Performance and Growth, Not IT Operational Measures

In many enterprises, there is a gap between how CIOs are measured by their business peers and how they measure themselves. The critical role of IT in enterprise DX is widening the gap further as the breadth and depth of demands on CIOs and IT continue to grow. Operationally focused CIOs point to uptime and availability, help desk tickets closed, and cost avoidance metrics that focus on operational excellence. Yet many business leaders are looking for the business impact of IT — how CIOs move the business forward by helping grow products, customers, and revenue, not just how well they keep the lights on. Operating metrics are essential but not sufficient to measure CIO and IT business impact.

As enterprises pursue digital transformation, disconnects become more acute as CIOs and IT "aren't there" when and where LOB executives need them for DX initiatives. At the same time, many CIOs struggle to shift their organizations to more customer-focused and product-focused thinking and seek ways to make that happen. Moreover, operational efficiencies and effectiveness are the price of entry to the DX strategy table and won't earn CIOs any bonus points as they are assumed and expected.

Savvy CIOs are already moving to adopt business-focused metrics and KPIs that emphasize how IT is impacting and contributing to business success and outcomes that are reflected in the metrics that business and LOB leaders use to measure themselves. Adopting similar or even the same metrics puts CIOs in the same league as LOB peers, shows an understanding of the business and IT role in moving it forward, and provides beacons for IT workers in tying their work to business outcomes. JetBlue's CIO has adopted the airline's Departure 0, which measures how many planes leave gates zero minutes late, as one measure of IT performance, along with traditional IT metrics. The metric forges a direct link between IT work and a key business result.

Associated Drivers

- **Next chapter of DX:** Technology-driven transformation altering business and society
- **Sense, compute, actuate:** Turning data into value
- **The future of work:** Bridging the digital talent gap

IT Impact

- CIOs need to focus on driving business growth and impact, not IT operations, and will increasingly be measured accordingly.
- IT metrics are a foundation for business impact metrics, not an end unto themselves, and IT leadership effectiveness KPIs and metrics are at the top of a hierarchy of IT measurement.
- Management of IT operations must continue to pursue excellence and remains critical to business success but must be viewed as a foundation for the true business value of IT.

Guidance

- Work with business leaders and LOB executives to identify "metrics that drive business" for the business and then create automated systems for capturing key business measurements and metrics. Sharing and co-owning business KPIs and metrics with LOB executives sends a powerful message that CIOs understand their role in business transformation.
- Use value stream analysis to identify IT contributions to each business metric and how to move the dial for business performance.

- Ensure that IT workers can link their work to the key metrics and the business outcomes they measure.

Prediction 6: By 2020, 60% of CIOs Will Initiate a Digital Trust Framework That Goes Beyond Preventing Cyberattacks and Enables Organizations to Resiliently Rebound from Adverse Situations, Events, and Effects

The frequency and severity of cyberattacks is increasing and will likely continue for the indefinite future. At the same time, trust and security are rapidly becoming synonymous with business brand and reputation as digital transformation continues to intertwine business and personal lives and interactions. While prevention of cyberattacks is still a crucial goal for CIOs, it isn't sufficient as the likelihood of successful attacks on many businesses continues to grow.

CIOs must take a lead role in creating enterprise resiliency by strengthening capabilities to respond to attacks and minimizing adverse impacts to the business and its reputation. Instead of putting all the eggs in the attack prevention basket, CIOs should help their enterprise leaders identify the profiles and impacts of different types of attacks along with necessary steps for the recovery of the business. CIOs also need to be prepared to orchestrate and lead recovery efforts, as they are often best positioned to coordinate organizations across the enterprise to ensure a fast and effective response. Yet they also need to ensure that all managers and employees accept and are accountable for enterprise security and resilience — security has to be everyone's job.

Beyond cyberattacks, businesses need to be resilient in the face of geopolitical, economic, climate, and other disruptive adverse events. Resilience is more than just the recovery of business functions and operations — it is regaining trust and reputation with employees, customers, and the public. Resilience is about using headwinds and turning them into competitive advantage.

Associated Drivers

- **Next chapter of DX:** Technology-driven transformation altering business and society
- **The race to innovate:** Speed of change, delivery, and operations separates thrivers and survivors
- **New nature of risk:** Innovation requires new thinking in security and risk management

IT Impact

- Prevention is not enough; every enterprise will be attacked or impacted by adverse events and CIOs must lead efforts to build resilience for response and recovery.
- Security products and solutions must be complemented with adaptive processes that respond to the changing nature of attacks.
- Security and trust are attributes of the business, so IT has a significant stake in brand and reputation management.

Guidance

- Bolster "sense and respond" measures with proactive approaches to security.
- Recognize that LOB organizations are key players in cyberattack risk and response and need to be an integral part of resilience building.
- Make security a highly visible and vital part of all IT and LOB workers' job responsibilities.
- Build resiliency by simulating attacks and testing responses on an ongoing basis.

Prediction 7: By 2022, 75% of CIOs Who Do Not Shift Their Organizations to Empowered IT Product Teams to Enable Digital Innovation, Disruption, and Scale Will Fail in Their Roles

IT governance has traditionally been a hierarchical command/control structure where CIOs and LOB executives prioritize projects, allocate resources, and track project status and completion. Top-down governance works reasonably well in stable, slow-moving business environments but can't unleash the innovation and productivity, let alone speed, that digital transformation imposes. Moreover, focusing on finishing projects on time and on budget to meet defined requirements can result in deliverables that don't meet stakeholder wants and needs. Product teams, in contrast, focus on understanding customers and their needs and finding innovative and viable solutions that are usable, valuable, and adopted.

In the product-focused DX era, resources need to be dynamically allocated as new digital business opportunities arise and success is measured by customer uptake and satisfaction of products and services — not on-time, on-budget completion. Empowered IT product teams in the right environment can unleash innovation and entrepreneurial behaviors that CIOs with traditional project teams can only dream of. Team empowerment is enabled by mission- and goal-driven governance where enterprise and IT vision, mission, and goals serve as a North Star that guides the decisions made by teams and workers.

Success in digital transformation requires that CIOs and LOB executives shift from top-down to a tiered approach where the executives focus on top-level strategy and goals while shifting responsibilities and authorities for execution and delivery to product teams that are closer to customers and their wants and needs. Budgets and resources need to be fungible and driven by business needs and opportunities, whether surfaced by product teams or executives.

Associated Drivers

- **The race to innovate:** Speed of change, delivery, and operations separates thrivers and survivors
- **Sense, compute, actuate:** Turning data into value
- **New nature of risk:** Innovation requires new thinking in security and risk management

IT Impact

- IT leaders need to build a product culture, moving away from projects. Product orientation produces results that meet customer needs and focus IT on what matters to the business, not just on completing projects.
- IT must learn to manage true agile teams and DevOps to achieve continuous integration, testing, and delivery.
- IT managers need to learn to cede control to product teams to harness their full power and energy.

Guidance

- Adopt goal-driven adaptive IT governance models to empower teams by granting authority to shape products and services to meet enterprise and customer needs.
- Invest in training and culture development to bring customer-centric product development capabilities to IT.
- Create KPIs to measure innovation and performance of teams, not just the ability to create deliverables on time and on budget.

Prediction 8: Through 2022, the Talent Pool for Emerging Technologies Will Be Inadequate to Fill at Least 30% of Global Demand and Effective Skills Development and Retention Will Become Differentiating Strategies

Just as the most promising digital technologies are becoming widely available and able to solve a plethora of business needs and problems, CIOs and businesses are facing a rapidly growing gap between the talent needed to deploy and leverage the technologies and the available and affordable talent. The CIOs that surmount DX-driven talent shortages will use divide and conquer strategies, not single-threaded recruit/hire models.

Successful CIOs will use enhanced recruitment and partnering to obtain the most esoteric and scarce talent; train, develop, and reskill IT staff for the next tier of technology skills; and mix outsourcing and AI/machine learning for IT work that can be at least partially automated like security monitoring, infrastructure diagnosis and repair, and some help desk functions.

CIOs will also realize that talent shortage will be a moving target driven by supply and demand and they will have to find adaptive, flexible approaches to meet changing needs. What doesn't change is that the best talent will be attracted to the best IT shops – those that use cutting edge technology and practices, treat workers well, offer opportunities for learning and advancement, and are part of businesses with solid reputations.

Associated Drivers

- **Next chapter of DX:** Technology-driven transformation altering business and society
- **The race to innovate:** Speed of change, delivery, and operations separates thrivers and survivors
- **The future of work:** Bridging the digital talent gap

IT Impact

- IT will lack the necessary capabilities to deploy and use critical new technologies including blockchain, AI, and IoT.
- IT is competing for talent with all organizations, from start-ups to global enterprises, and extreme salary increases for critical roles may decimate IT workforce budgets.
- CIOs have to focus on marketing their IT organizations to prospective IT employees.
- IT will have to replace traditional cumbersome recruiting and hiring practices with agile and transparent approaches.

Guidance

- Use start-up acquisitions and partnerships to seed emerging technology talent.
- Partner with universities to work on IT initiatives and create a "bench" of emerging technology talent.
- Create and publicize a brand and profile for the IT organization that emphasizes cutting-edge technologies and practices to attract talent.
- Dedicate substantial resources to reskilling internal staff and ensure they don't get left behind the newly acquired talent.

Prediction 9: By 2021, 65% of CIOs Will Expand Agile/DevOps Practices into the Wider Business to Achieve the Velocity Necessary for Innovation, Execution, and Change

IDC's 2018 *CIO Sentiment Survey* has found that 38% of CIOs report using agile/DevOps practices for IT development and many point to significant benefits over traditional waterfall approaches. In the digital era, agile/DevOps is essential to achieving velocity and agility in product and service delivery. Still, despite those successes, in most enterprises, agile practices are confined to IT organizations, leaving substantial "digital transformation money" on the table.

The real payoff from agile/DevOps is to apply the practices throughout the enterprise, making LOB executives and workers equal and essential agile partners. Picture a rowing team where the strongest and best rowers are all on one side of the boat. It will go very fast but will tend to move in circles, making little forward progress. By extending agile/DevOps into the business, all the workers — rowers — are equal in strength and can move the business forward in unison. Using agile practices throughout the enterprise brings additional benefits including:

- Establishing a common language and tools that streamline communications and increase interchangeability of team members among different product teams and initiatives.
- Synchronizing development and execution rhythms across the enterprise to improve coordination, collaboration, and delivery.
- Building shared learning and experiences to build true product organizations.

One model for extending agile/DevOps-like practices to the enterprise is "business operations" ("BizOps"), an approach used by a number of companies from start-ups to large enterprises. BizOps teams have a focus on getting things done by translating business goals into tactical operations and execution.

Despite the benefits of agile, making the transition from traditional serial waterfall to iterative agile practices can be a difficult shift. The CIOs that succeed at expanding agile to their businesses will have detailed plans and road maps, a focus on building agile culture along with skills, and the patience and fortitude to make agile stick.

Associated Drivers

- **Next chapter of DX:** Technology-driven transformation altering business and society
- **The race to innovate:** Speed of change, delivery, and operations separates thrivers and survivors
- **The future of work:** Bridging the digital talent gap

IT Impact

- IT needs to be "fully agile" in culture, practices, and thinking to promulgate agile governance to the enterprise.
- Expanding agile governance into the wider business helps IT and LOB organizations to work more closely, enabling the enterprise to respond to market changes through adaptation.
- LOB leaders and workers need to be schooled and coached in agile practices and building agile culture.
- CIOs and LOB executives need to be aligned with each other and with key DX initiatives to avoid conflicts and confusion.

Guidance

- Drive agile governance with clear goals, authorities, metrics, and accountabilities.
- Push decision-making down in the organization and out to customer-facing edges and BizOps in trust and verify pattern.
- School IT leaders in coaching and mentoring to replace directing and managing.
- Champion open collaboration between stakeholders with transparency, fact-based decisions, light planning, and continual portfolio optimization.

Prediction 10: By 2023, 70% of CIOs Who Cannot Manage the IT Governance, Strategy, and Operations Divides Between LOB-Dominated Edge Computing, Operational Technology, and IT Will Fail Professionally

As digital transformation unfolds, one unmistakable trend is that much of the digital action is occurring outside of IT datacenters and CIO oversight. The most powerful digital transformation initiatives involve new business and operating models and are often driven by LOB executives. At the same time, LOB technology spending is growing and the technical sophistication of LOB workers is growing, especially as millennials make up a greater portion of the workforce. The action is at the edge — IDC's *Cloud and AI Perceptions Survey* found that, over the next two years, 50%+ of all applications will be at remote/edge or provider datacenters.

CIOs that seek to control and block such trends will lose: The momentum and need for LOB IT is simply too great. Moreover, most CIOs don't have the know-how or political clout to own and run edge computing and operational technology (OT) initiatives. Notwithstanding, edge computing and OT can't be fully operational and effective without being integrated into IT managed systems and data. Moreover, without conformance to IT architectures, LOB technology initiatives will, over time, create byzantine and failure-prone systems. The onus is on CIOs to rationalize and integrate LOB edge computing and OT without compromising the integrity and security of IT infrastructure and applications.

The recipe for success for CIOs is to find a middle ground between absolute control and total abdication of edge computing and OT by working with LOB executives. CIOs need to understand why LOB executives are mounting initiatives that may be viewed as risky or undesirable to IT executives who are tasked with maintaining order and keeping the technology running. At the same time, LOB executives need to understand the criticality of technology architectures and integration to their success. Identifying shared goals and concerns is a building block to creating co-ownership and governance that keeps IT, LOB edge computing, and OT aligned.

Associated Drivers

- **The race to innovate:** Speed of change, delivery, and operations separates thrivers and survivors
- **Platforms, platforms, platforms:** Industry competes for innovation at scale
- **Legacy inertia:** Retrofit the old into the DX world

IT Impact

- Edge computing, OT, and IT have operated as separate entities but need to be integrated to succeed at enterprise-scale DX.
- IT now has responsibility for successful interoperation between edge computing, OT, and IT core systems.

- IT is accountable for core systems integrity but lacks control over LOB technology decision making that may impact that integrity.

Guidance

- Work with LOB executives to develop architectures and standards for edge computing and OT.
- Develop metrics and KPIs for connectivity, integration, and security along with business impact measures.
- Establish end-to-end ownership and accountability for performance, security, and scalability.

ADVICE FOR TECHNOLOGY BUYERS

IDC's 2018 *CIO Sentiment Survey* shows clear bifurcation between companies that are embracing digital transformation and increasing their competitive advantage and the rest that are still following reassuring but risky old ways of doing business. Also evident is the divide between CIOs that have the vision and leadership skills to reinvent their organizations from top to bottom and those that want to retain their operational focus. True IT reinvention and reinvigoration must pervade an entire organization, from infrastructure rationalization and modernization to enterprisewide agile practices, digital platforms, empowered IT product teams, and beyond. It's a very daunting and risky challenge but still much more attractive than business and professional failure. The race to reinvent is on, and CIOs are running out of time to either jump into the race with both feet or get left behind.

EXTERNAL DRIVERS: DETAIL

Next Chapter of DX: Technology-Driven Transformation Altering Business and Society

- **Description:** Digital transformation, the continuous process by which enterprises adapt to or drive disruptive changes in their operations, customers, and markets, has entered the next chapter — multiplied innovation. Now, competition is driven by platforms and ecosystems, and innovation feeds off itself. Ubiquitous changes affect business in markets, customer expectations, and operational efficiencies, while society sees improvements in daily life. But many businesses are implementing DX without success, and some will fail entirely. Societal impacts include disturbed trust, jobs, alliances, and new inequities. Companies that achieve multiplied innovation can thrive in the next chapter of DX.
- **Context:** In the past few years, we have witnessed the evolving of DX and the disruptions and opportunities it poses for business and society. Organizations of every size and in every industry must adapt to new technologies, new players, new ecosystems, and new ways of doing business. IDC predicts that, by 2021, at least 50% of global GDP will be digitized, with growth in every industry driven by digitally enhanced offerings, operations, and relationships. While most organizations are attempting DX, only a small percentage are getting it right. Early attempts are met by subsequent challenges of change management, budget, talent, platform, scale, and sustainability.

The Race to Innovate: Speed of Change, Delivery, and Operations Separates Thrivers and Survivors

- **Description:** Today, survival of the fittest is linked not to size or strength but to the ability to change — to move quickly, adapt, seize opportunities, and be agile. The best-performing

organizations — armed with digital-native culture, tools, and processes — are speeding away from the rest, creating a bifurcated and unequal landscape where a few firms exhibit high productivity and profits. The new imperative is to keep pace with business change while increasing the speed of business operations, the speed at which changes are delivered, and the speed and scale of innovation. In an attempt to go faster, many organizations struggle under a legacy of silos and innovations stagnate with redundancy and inconsistency. "At scale" innovation eludes all but the elite few while the distance between thrivers and survivors grows. Some organizations adapt to new models and ecosystems and move from automation to autonomy; others struggle with the basics and fall behind.

- **Context:** Over the past 50 years, the average life span of a company on the S&P 500 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 thrive, organizations need to be innovating simultaneously on multiple levels (industry change, delivery, operations) at a speed they are not used to. Digital capabilities provide modular, plug-and-play technology, business, and industry platforms, allowing businesses to quickly adapt and compete in digital transformation.

Platforms, Platforms, Platforms: Industry Competes for Innovation at Scale

- **Description:** Understanding and building a "DX platform" that can sustain, advance, and scale business and operations may be the most important decisions leaders make for the next 10 years. The platform is the new battleground for innovation, developers, and marketplaces as the industry rushes to enable its customers with a range of platforms. Leaders must discover what their own platform should look like, how they compete in the platform business economy, and what platform vendors they choose. Megaplatforms compete to own infrastructure and development environments. Application-centric platforms look for the network effect to expand their reach. Industry-specific platforms harness multiplied innovation to build niche ecosystems. Every business must incorporate these new options into its own DX platform.
- **Context:** Today, 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. Companies and industries must shift to compete in their own sectors — but also in the new, larger platform business economy. The DX platform concept expands from microservices, technology stacks, and software bundles to PaaS and entirely new digital business- and industry-specific platforms, ecosystems, and operating models. It lies at the heart of digital transformation strategy, providing the architecture that drives and accelerates every digital initiative.

Sense, Compute, Actuate: Turning Data into Value

- **Description:** Today, data and intelligence represent a unique opportunity for creating unimaginable value. IoT, mobile devices, big data — combined with historical data, systems of record, and global information — continually sense an environment and put it into new contexts. Combined with AI and machine learning, organizations are spreading intelligence from the edge to the core to turn data into value. However, it is harder than it appears. Winners are differentiated by the ways they leverage data to deliver meaningful, value-added predictions and actions for personalized life efficiency and convenience, improving industrial processes, healthcare, experiential engagement, data monetization, or any enterprise decision making.
- **Context:** By 2020, in over half of G2000 firms, revenue growth from information-based products and services will be twice the growth rate of the balance of the product/service

portfolio. Data as a service (DaaS) presents an expanding market for both providers and consumers. The volume, velocity, and variety of data and the large and diverse data sets create new challenges, but when combined with AI technologies and exponential computing power, they create ever-greater opportunities. Any application, process, service, or organization that isn't part, or all, of the new "sense, compute, and actuate" paradigm is missing the boat with digital transformation.

New Nature of Risk: Innovation Requires New Thinking in Security and Risk Management

- **Description:** Digital transformation has significantly changed organizations' risk tolerances and exposure to security risk. AI, IoT, automation, and networked ecosystems bring a broader risk exposure to all organizations. More organized threat actors exploit more vulnerable technologies that have larger attack surfaces. Ransomware, cybercrime, and even nation-state attacks are increasingly common events that cause significant business disruptions, costs, and reputational damage. At the same time, regulations, publicity, fines, and costs force risk tolerances lower, requiring new thinking, priorities, and vigilance.
- **Context:** Changes to the regulatory environment and innovation initiatives are pushing organizations to evolve their security and risk management functions, in particular to leverage advances in AI and analytics capabilities. Fiscal, business, and social repercussions from cyberattacks or breaches force risk tolerances lower, requiring higher levels of protection and compliance. Overcoming these challenges ensures that the business is operating at its optimal managed risk level. Leading organizations are developing security economics frameworks that measure "risk reduced per unit cost" to manage risk.

The Future of Work: Bridging the Digital Talent Gap

- **Description:** New talent management techniques and technology accelerators are fundamentally changing the concept of work and how it is done. The future workspace will be a mix of physical and virtual. Work culture will be more collaborative, while the workforce will be a combination of people and machines working together. But until that vision materializes, the demand for digital talent outpaces the supply and trends to limit free flow of workers localizes the problem. Platform providers are under pressure to address the talent crunch with new productivity environments such as low code/no code. AI may help increase efficiency for some tasks, but this is not the talent in short supply. Organizations need to equip up-and-coming generations for the future while they bring current workers up to speed to address workforce needs.
- **Context:** The demographic shifts led by millennials entering the workforce and technology advances are driving fundamental changes in the workplace. The future of work is humans and machines, instead of human versus machines. This impacts organizations' culture, required skills, talent sourcing, and workspace and the nature and makeup of the workforce itself. It requires organizations to leverage digital technologies, attitudes, and behaviors to reinvent the way businesses engage with their employees, partners, and customers to drive higher efficiencies and deliver superior experiences.

Legacy Inertia: Retrofit the Old into the DX World

- **Description:** Technology has been enabling business for decades, and refreshing deployed systems has always been problematic. While new technologies are transforming some aspects of the business, legacy systems are holding others back, limiting innovation, opportunity, and engagement. Every company in every sector is faced with balancing traditional and next-generation systems and technologies: Transformation at scale demands

the replacement of outdated systems. Mergers and acquisitions challenge industry leaders as they struggle to incorporate acquired technologies. Many organizations are retrofitting the traditional systems and technologies to meet the new requirements, while trying to create the flexible and adaptable DX platform of the future.

- **Context:** DX is becoming a competitive requirement and the source of a massive wave of new investments in digitizing business operations, communications, and services. Many organizations are facing the challenges of simplifying the current technology environment. The legacy systems and processes and change management issues often derail DX initiatives. Organizations should evaluate systems against business, financial, technology, and operations measures and create a road map for modernization.

LEARN MORE

Related Research

- *IDC FutureScape: Worldwide IT Industry 2019 Predictions* (IDC #US44403818, October 2018)
- *IDC FutureScape: Worldwide Digital Transformation 2019 Predictions* (IDC #US43647118, October 2018)
- *Critical External Drivers Shaping Global IT and Business Planning, 2019* (IDC #US44330818, October 2018)

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.

Global Headquarters

5 Speen Street
Framingham, MA 01701
USA
508.872.8200
Twitter: @IDC
idc-community.com
www.idc.com