IDC FutureScape

IDC FutureScape: Worldwide Digital Transformation 2020 Predictions

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IDC FUTURESCAPE FIGURE

FIGURE 1

IDC FutureScape: Worldwide Digital Transformation 2020 Top 10 Predictions
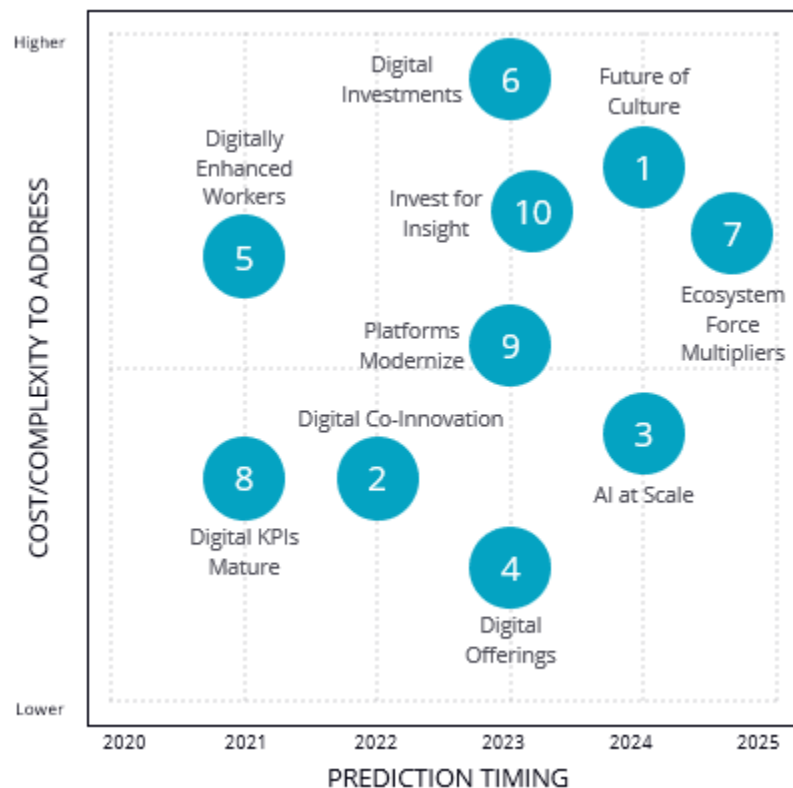
Note: Marker number refers only to the order the prediction appears in the document and does not indicate rank or importance, unless otherwise noted in the Executive Summary.

Source: IDC, 2019

EXECUTIVE SUMMARY

This IDC study provides IDC's top 10 digital transformation (DX) predictions for 2020 and marks the next set of inflection points and related consequences executive leaders should evaluate for inclusion into their multiyear planning scenarios as they map their organization's strategies, actions, and reactions to the cascading portfolio of new digital technologies that have quickly become our new reality. IDC continues to enhance its global leadership position as the top digital transformation market research firm. This IDC FutureScape is the update to IDC's 2019 DX predictions and is now in its fourth annual installment.

IDC defines digital transformation as transforming decision making with technology and remains a board-level initiative, and DX is at the heart of business strategies for companies of all sizes. As we studied the market and have surveyed over 6,000 companies through both our worldwide digital transformation executive sentiment, MaturityScape benchmark, and digital transformation investment guide studies, we continue to see specific trends and attributes that we categorize into two groups. Leaders in transformation (the digitally determined) are those organizations that have aligned the necessary elements of people, process, and technology, unlike laggards (the digitally distressed), which have not done so to date.

Our 2020 worldwide digital transformation predictions are:

- **Prediction 1: Future of culture.** By 2024, leaders in 50% of G2000 organizations will have mastered "future of culture" traits such as empathy, empowerment, innovation, and customer and data centricity to achieve leadership at scale.

- **Prediction 2: Digital co-innovation.** By 2022, empathy among brands and for customers will drive ecosystem collaboration and co-innovation among partners and competitors that will drive 20% collective growth in customer lifetime value.

- **Prediction 3: AI at scale.** By 2024, with proactive, hyperspeed operational changes and market reactions, artificial intelligence (AI)-powered enterprises will respond to customers, competitors, regulators, and partners 50% faster than their peers.

- **Prediction 4: Digital offerings.** By 2023, 50% of organizations will neglect investing in market-driven operations and will lose market share to existing competitors that made the investments, as well as to new digital market entries.

- **Prediction 5: Digitally enhanced workers.** By 2021, new future of work (FoW) practices will expand the functionality and effectiveness of the digital workforce by 35%, fueling an acceleration of productivity and innovation at practicing organizations.

- **Prediction 6: Digital investments.** By 2023, DX spending will grow to over 50% of all ICT investment from 36% today, with the largest growth in data intelligence and analytics as companies create information-based competitive advantages.

- **Prediction 7: Ecosystem force multipliers.** By 2025, 80% of digital leaders will devise and differentiate end-customer value measures from their platform ecosystem participation, including an estimate of the ecosystem multiplier effects.

- **Prediction 8: Digital KPIs mature.** By 2020, 60% of companies will have aligned digital KPIs to direct business value measures of revenue and profitability, eliminating today's measurement crisis where DX KPIs are not directly aligned.

- **Prediction 9: Platforms modernize.** Driven both by escalating cyberthreats and needed new functionality, 65% of organizations will aggressively modernize legacy systems with extensive new technology platform investments through 2023.

- **Prediction 10: Invest for insight.** By 2023, enterprises seeking to monetize benefits of new intelligence technologies will invest over $265 billion worldwide, making DX business decision analytics and AI a nexus for digital innovation.

This IDC study provides IDC's top 10 predictions for digital transformation for 2020.

"Direct digital transformation (DX) investment is growing at a compound annual growth rate (CAGR) of 17.5% from 2020 to 2023 and is expected to approach $7.1 trillion as companies build on existing strategies and investments, becoming digital-at-scale future enterprises. Organizations with new digital business models at their core are successfully competing in the digital platform economy," according to Shawn Fitzgerald, research director, Worldwide Digital Transformation Strategies. "Our 2020 digital transformation predictions represent continued thought-leading perspectives on the emergent trends we see through 2025."

IDC FUTURESCAPE PREDICTIONS

Summary of External Drivers

- **The age of innovation**: Driving the future enterprise
- **Accelerated disruption**: Navigating business challenges as volatility intensifies
- **The platform economy**: Competing at hyperscale
- **Intelligence everywhere**: AI's opportunity and implications
- **Rising customer expectations**: More convenience, customization, and control
- **The future of work**: Agile, augmented, borderless, and reconfigurable
- **Economies of intelligence**: AI, human, and organizational "learning" fuels asymmetrical advantage

Predictions: Impact on Technology Buyers

Prediction 1: By 2024, Leaders in 50% of G2000 Organizations Will Have Mastered "Future of Culture" Traits Such as Empathy, Empowerment, Innovation, and Customer and Data Centricity to Achieve Leadership at Scale

The biggest barrier to effective digital transformation is not technology, nor the lack of strategy or budget — it is something deeply rooted at the core of an organization: its culture. While culture has often taken a backseat in the broader context of business complexities and technology transformation priorities, it isn't without rethinking culture that organizations' leaders can instill true change into the minds and hearts of employees and the ecosystem. Culture, commonly defined as the accepted values, beliefs, and norms of an organization, can make or break the organization's ability to execute on its DX strategy.

Leading companies are racing toward becoming future enterprises, a journey where taking operations and innovation to scale is the measure of success. Relying on past accomplishments and inertia is no longer an option — to thrive, organizations need to build a culture that fosters change, and this means redefining commonly accepted values, processes, corporate structures, and metrics. Culture and leadership are interwoven, and since founders and leaders can imprint values and behaviors that persist for decades, they can also shape those values when change is required. In fact, strategy and culture are the key levers at leaders' disposal to drive organizational viability and effectiveness.

The market has reached an inflection point where organizations are looking at how they can realize more value from their DX projects, not only within their businesses but across their ecosystems. Therefore, they need a deeper and more sophisticated understanding of the extended ecosystem — from building empathy with customers and partners to adequately empowering the workforce, which now also includes machines. To build empathy, organizations' leaders need to become more data driven by leveraging the voice of the customer (VOC), CSAT, and similar satisfaction-related metrics as integrated pulse checks that aid in the understanding of customer experience (CX) contributions to business performance. Also, the leadership team needs to act in a way that shows its organization really puts the customer first.

Leading at scale requires leaders to imprint new values into the workforce, creating an adaptive culture that incorporates empathy, empowerment, innovation, and customer and data centricity as core attributes for the organization. These changes will eventually become the accepted norm and drive a more collaborative, data-driven, and culturally intelligent organization. In fact, IDC's 2019 *DX Leader Sentiment Survey* shows that 42% of organizations worldwide are already prioritizing change management, collaboration, and innovation culture as part of their DX strategies and road map — and we expect leaders in those organizations to focus on mastering all these "future of culture" traits to achieve leadership at scale.

Associated Drivers

- **The age of innovation:** Driving the future enterprise
- **The future of work:** Agile, augmented, borderless, and reconfigurable
- **Economies of intelligence:** AI, human, and organizational "learning" fuels asymmetrical advantage

IT Impact

- IT needs to help accelerate the organization's DX efforts. The CIO must be part of the DX core team to ensure proper governance when using DX technologies in support of innovative projects and services and establish an innovation lab to accelerate innovation services.

- Growing customer- and data-centric approaches will increase the pressure on IT to deliver data-related skills and capabilities. For AI-enabled technologies to deliver quality outcomes, quality data inputs and historical data sets are required. Hence data quality, data governance, and data utilization are essential areas of focus.

- IT must design a future technology architecture that underpins DX initiatives in the organization and allows for scale in the next five years. The architectural choice used to underpin the DX platform strategy will be critical and will be a key enabler for the longer-term success of the whole organization.

Guidance

- Assess the leadership's ability and willingness to foster a transformative culture. Challenge the organization to drive a culture of transformation powered by experimentation while ensuring organizational stability.

- Identify the key traits that constitute the culture of your organization today, and set clear goals defining the attributes that will determine the future culture of your organization. Develop a new employee performance scorecard combining traditional financial metrics but also incorporate new digital metrics to track progress against your goals.

- Perform a skills gap assessment to determine the skills your organization possesses internally and those you will require in the next three years. Commit resources for reskilling of workers to

use new platforms and technologies. Create cross-functional teams to encourage collaboration and knowledge sharing.

- Ensure your employee rewards and recognition systems are reinforcing the specific cultural traits you want and propose changes to them if they are not.

Prediction 2: By 2022, Empathy Among Brands and for Customers Will Drive Ecosystem Collaboration and Co-Innovation Among Partners and Competitors That Will Drive 20% Collective Growth in Customer Lifetime Value

By 2022, some well-known brands will be gone and the leaders will be working together in new ways that truly benefit the whole ecosystem. Leading partners will be rewarded for successfully serving joint customers better, and all will enjoy 20% collective growth in customer lifetime value, while the laggards struggle to stay in business. The empathy dialogue graduates from one of building one-to-one trusted relationships to one of building ecosystem collaboration and co-innovation and where the best path to growth depends on mutually beneficial relationships that are chosen because they best satisfy the end customer's needs.

Empathy is a thread that is shared among partners and all participants in the ecosystem. Ecosystem participants focus on their own organizational objectives, but by working with trusted partners — partners you hope grow with you, so that mutual interests and needs continue to be satisfied — sales, growth, and profitability follow. Ecosystem relationships are empathetic toward each other, but importantly, not exclusive, because the ultimate goal is to satisfy the customer and the customer's customer. For example, in retail, adding choice, speed, and flexibility in fulfilling customer orders has become as important as removing friction in the buying process. Many last-mile services have emerged, but what if, instead of aligning with one last-mile partner, retailers could truly act as one with their ecosystem partners, operating toward common objectives including delivering customer choice convenience, value, and satisfaction at every touch point? What if the ecosystem naturally rewarded the most efficient and customer service-oriented execution systems — a natural selection, enabled by AI, of the processes that get the job at hand done at the optimum cost, coupled with a high regard for garnering the highest customer satisfaction scores possible?

Essentially, this is a meritocracy for services and processes. Access to deconstructed services that connect to catalogs, inventory, reviews, order creation, fulfillment, and delivery options would be available to each ecosystem partner, and the partners that execute against objectives (support driving empathy) best would ultimately be rewarded with more traffic, more revenue, and more profitability.

Associated Drivers

- **Accelerated disruption:** Navigating business challenges as volatility intensifies
- **Rising customer expectations:** More convenience, customization, and control

IT Impact

- IT and line-of-business (LOB) teams need to move into the realm of AI-driven decision processes that link to external services, based on the likelihood of each decision meeting business objectives.
- IT must measure success against objectives regularly to ensure the robotic process automation (RPA) hasn't led the company astray.
- None of this is possible without solid cloud-based foundations, so the road map will need to reflect that this is what is possible at a late stage of digital transformation.

Guidance

- First, get your own house in order – execute against a plan and invest with intent.
- Start evolving relationships by following where the customer leads – enabling flexibility, speed, and choice in the services offered. Why offer one option when the best-performing option supports ecosystem growth best?
- Reach further into the areas where decisions improve outcome results – utilizing service A or B versus vendor 1 or 2, collaborating to innovate and improve the value proposition of services and products.

Prediction 3: By 2024, with Proactive, Hyperspeed Operational Changes and Market Reactions, AI-Powered Enterprises Will Respond to Customers, Competitors, Regulators, and Partners 50% Faster than Their Peers

Today, most organizations still acquire and apply knowledge in silos and one transaction, activity, or data point at a time. Furthermore, they lack visibility into end-to-end business processes and do not understand their internal networks and external stakeholders' communities. They also take too long to move from data to information and to wisdom. Overall, they have a suboptimal, partial, uneven, and out-of-sync view of customers and their behaviors. With poor institutional knowledge retention and dissemination, these organizations are unable to synthesize diverse internal and external data sources into information; as a result, they miss the opportunity for superior strategic decisions and risk management practices. The future of intelligence addresses an organization's capacity to acquire data combined with its ability to synthesize that data to create the information it needs in order to learn and to apply the resulting knowledge across the enterprise. The AI-powered enterprise learns as a single entity and at scale. In such an enterprise, the data generated from products, services, experiences, and ecosystems informs and drives the intelligent automation of processes as opposed to being simply a by-product of offline decision support systems.

Recent IDC research demonstrates that 67% of enterprises prioritize the creation of a data management capability to enable them to turn internal data into insight by organizing, maintaining, and refining data sets and data processes. However, 45% of organizations are still at a low level of maturity for data excellence – either level 1 (data silos) or level 2 (data warehouse and analytics). Only 19% of organizations reach the highest level: level 5 – intelligent core. (Survey data is from IDC's 2019 *CIO Sentiments Survey* and IDC's 2018 *DX Sentiments Survey*).

For CIOs, the challenge is twofold: They must empower the business with data and AI technologies, and they also must improve the IT organization itself and increase IT efficacy. Though many IT organizations struggle to acquire the necessary talent, they see IT operations and IT optimization as a win-win opportunity to both improve IT delivery and develop data and AI talent. IDC's *CIO Sentiments Survey* highlights that they see the most value of AI for IT operations automation (55%) and IT optimization (54%). Those enterprises that can achieve this economy of intelligence will have a competitive advantage – just as organizations in the past that achieved economies of scale had an enduring advantage over their peers.

Associated Drivers

- **Accelerated disruption:** Navigating business challenges as volatility intensifies
- **Rising customer expectations:** More convenience, customization, and control
- **Economies of intelligence:** AI, human, and organizational "learning" fuels asymmetrical advantage

IT Impact

- CIOs must drastically accelerate IT delivery of solutions and services.
- IT organizations need to create data excellence and AI capabilities.
- IT organizations have to automate both IT and business processes.

Business Impact

- Enterprises must monitor their business speed, improve dramatically their speed of response to customers, and adapt rapidly to all market changes.
- Data must be managed holistically and efficiently across the enterprise and its ecosystems.
- Enterprises must become AI powered to participate in the economy of intelligence.

Guidance

- Leverage a center of excellence approach to bring all LOBs together, encourage collaboration, and facilitate holistic, enterprisewide approach to AI solutions.
- Infuse IT operations and environment with intelligence to both learn and benefit from AI at the same time.
- Build security, compliance, and resilience with every initiative from the ground up.

Prediction 4: By 2023, 50% of Organizations Will Neglect Investing in Market-Driven Operations and Will Lose Market Share to Existing Competitors That Made the Investments, as Well as to New Digital Market Entries

Rapidly changing markets are forcing organizations to adapt to and invest in transformational technologies for operations. The operational organizations have to avoid being whipsawed around as those changes become a part of daily business life. The development of resilient decision-making capabilities that will stay ahead of the market-driven needs of the business becomes the focus of investment.

The digital transformation of the business, and its markets, is already underway more so than ever before through:

- **Personalized experiences:** The customer is expecting every engagement, whether services or product, to be personalized to them. Organizations must be constantly digitally monitoring customer interactions and experiences.
- **Connected products:** As IoT drives more connected products and the resultant visibility into product use and performance, businesses must react rapidly to support their customers in the field — but also be ready to take advantage of new revenue opportunities.
- **Connected customers:** Customers are not only becoming connected to their suppliers but also each other. Having the digital systems that can monitor customers and their interactions with each other gives great insight into individual customer experiences.

We predict that successful companies will shift investment away from large monolithic applications to digital operations platforms that provide digital insight into operations and into changing markets. As part of the change, the focus of operational organizations will shift from cost- and productivity-focused investments to investments in resilient decision making. Those that don't, won't last long. Companies that resist those investments will see significant loss in market shares.

Associated Drivers

- **Accelerated disruption:** Navigating business challenges as volatility intensifies
- **Rising customer expectations:** More convenience, customization, and control
- **Economies of intelligence:** AI, human, and organizational "learning" fuels asymmetrical advantage

IT Impact

- Organizations will shift investment from large and monolithic applications to platforms that provide the infrastructure and development environments for business staff to rapidly align digital business processes to changing markets.
- With skills of business leaders becoming more digitally driven and competent, IT leaders will be more business driven to stay ahead of the business demand for more advanced digital systems.

Guidance

- IT organizations must transition from supporting known enterprise app road maps to more dynamic and volatile development projects that require rapid skill development.
- To fill short-term skills gaps as markets volatility pushes the business in new directions, IT organizations must develop an ecosystem of partners that rapidly fill those skill gaps.
- Operations executives must invest in the digital technologies that support the resilient decision making needed to stay with their digitally transformed customers and markets.

Prediction 5: By 2021, New Future of Work Practices Will Expand the Functionality and Effectiveness of the Digital Workforce by 35%, Fueling an Acceleration of Productivity and Innovation at Practicing Organizations

Traditional team structures are beginning to change within high-performing organizations. New digital capabilities are being harnessed to increase worker productivity, operational efficiency, stakeholder engagement, and innovation and establish competitive differentiation in a dynamic business environment. Accelerated progress of technologies such as artificial intelligence/machine learning (ML), AR/VR, robotics, wearables, 3D printing, and RPA as well as new capabilities from current technologies including mobile and smart devices, workflow and next-gen document/content solutions, enterprise social, and collaboration tools offers new opportunities to amplify and augment the capabilities of workers. Augmentation, which goes far beyond automation, can be defined as the adoption of a set of technologies to enhance human mental and physical capabilities. There are three major areas of human augmentation. Senses augmentation looks at augmenting vision, haptic sensation, hearing, taste, and smell but also translates one sense into another, like sounds into vision. A second area of augmentation is cognition. It means using technology to augment human intelligence. For instance, through analytical tools, it is possible to interpret a human cognitive state and have a bot predict and provide what the person needs. And finally, action augmentation leverages technologies to increase or amplify human force or movement, which allows remote presence or teleoperation, speech capture, or gaze-based controls.

With the push to increase productivity, to reduce time to market, and to cope with the lack of talent and experienced workers, organizations will take advantage of technology evolution and will look for economic-viable options to enhance each worker's capabilities and give them tailored "superpowers." Organizations that are future of work leaders have already reaped the early benefits via the deployments of "augmentation" technologies. These organizations include DHL (via the use of drones

for faster delivery), DBS (via the use of video tellers for 24 x 7 branch banking convenience), and HaiDiLao (via the use of robots/AI in its "smart" hotpot restaurants for a different experience).

Cultural differences are creating different comfort and acceptance levels of human-machine collaboration. These differences impact the degree of automation and augmentation in workflows and the way products and services are delivered to customers. Relatively speaking, Europe and Australia/New Zealand are less comfortable with this trend while Asia – in particular, Japan, China, and India – is pushing ahead aggressively to drive higher productivity, faster innovation, and greater economic output. The key is really in "fit for purpose" augmentation. As digital transformation levels the competitive playing field for organizations and economies around the world, many understand the importance of human-machine augmentation/collaboration to drive new organizational value. This understanding shapes their drive and commitment in finding the "optimal" level of augmentation suited for their past heritage and future ambition. As we move forward into 2020 and beyond, organizations will need to evaluate the following to harness new digital capabilities (from both emerging and current technologies) to accelerate on productivity and innovation to win in the DX 2.0 era (i.e., to become a "future enterprise"):

- **Automation versus augmentation.** Are you pushing for automation to drive short-term gain in cost out? Are you pushing for automation to achieve longer-term gain in efficiency and effectiveness? Is it about augmentation of talent/resources? Is it about creating new possibilities (e.g., new organizational value) with augmentation that is otherwise not possible with human capabilities only?
- **Cultural challenge to human-machine collaboration.** What needs to be addressed – labor laws and regulations, workers' mindset, or process flows? What new values can be derived with this change, and how will they benefit the workers (as opposed to just the organization)?
- **Key performance and behavioral indicators.** With augmentation come new sets of challenges and expectations. Old habits will need to change. Success metrics that encourage this new operating model will be needed to drive up employee NPS and talent retention.

Associated Drivers

- **The age of innovation:** Driving the future enterprise
- **The future of work:** Agile, augmented, borderless, and reconfigurable
- **Economies of intelligence:** AI, human, and organizational "learning" fuels asymmetrical advantage

IT Impact

- IT departments must acquire and/or develop new skill sets related to the creation, deployment, and management of digital workers. Change management will be an essential part of the enablement process.
- IT support expands beyond technology acquisition, deployment, configuration, and support and must also consider security, privacy, and compliance implications.
- The IT department itself will become more automated, freeing up IT resources to focus on more strategic and growth-focused initiatives and activities.

Guidance

- Think humans and machines. Automation is not simply about replacement. Understand how intelligent automation technology can further augment human skills at your organization to achieve business outcomes.

- Develop a strategy for retraining and redeploying employees as well as for acquiring new talent. Pay special attention to change management and user adoption.
- Understand that workforce transformation is not "one and done." Focus on creating an organization that is agile, embraces change, and fosters continuous learning. Establish a cross-functional automation and augmentation center of excellence to cultivate and disseminate best practices and to identify those areas that could benefit employees and the organization.

Prediction 6: By 2023, DX Spending Will Grow to Over 50% of All ICT Investment from 36% Today, with the Largest Growth in Data Intelligence and Analytics as Companies Create Information-Based Competitive Advantages

The digital transformation investment growth is expected to be a CAGR of 17.5% versus a CAGR of 1.5% for all other ICT investments. While these growth rate contrasts are quite large, non-DX ICT investment represents a very large existing investment base, most notably in core non-DX hardware, software, and services still representing almost 78% of ongoing non-DX investment totals with continued higher growth in non-DX cloud (CAGR of 24.7%) and non-DX security (CAGR of 4.9%).

DX investment growth rates represent opportunities where traditional IT investments are "force multiplied" into digital capabilities that leverage existing traditional IT hardware, software, and services – creating digital process capabilities "at scale" for the digital economy.

Of direct DX investment, IoT represents almost 48% over the next five years as companies create "advanced digital twins" of themselves where data becomes universally available as fuel for big data analytics (BDA) and AI insights, with these technology sets seeing CAGRs of 18.7% and 38.0%, respectively.

Associated Drivers

- **The platform economy:** Competing at hyperscale
- **Intelligence everywhere:** AI's opportunity and implications
- **Economies of intelligence:** AI, human, and organizational "learning" fuels asymmetrical advantage

IT Impact

- Investment strategies for IT mirror and match the business' digital strategic imperatives, both near term and long term.
- Data management at scale continues to be the prerequisite competency ahead of implementing advanced analytics and AI for business benefit.
- The digital platform and related investments are the "system and design thinking" approach to digital investments for leveraging core IT, infrastructure, and applications.

Guidance

- Become a digital leader in your industry and markets through DX investment planning, a multiyear, multihorizon, and integrated process.
- Start with assessing both existing investments and technology life cycles against digital strategy for determining investment levels and priorities.
- Ensure clear investment alignment with business needs, and explicitly define performance criteria to ensure business and IT are aligned on the ROI criteria, levels, and timing.

Prediction 7: By 2025, 80% of Digital Leaders Will Devise and Differentiate End-Customer Value Measures from Their Platform Ecosystem Participation, Including an Estimate of the Ecosystem Multiplier Effects

Organizations will look to create differentiated competitive advantage by leveraging economies of information through their platform ecosystem, defining their relevance through the strength of information flows and number of connections across their customer and partner networks.

Because digital leaders have mastered their information and intelligence insights at scale, they are adept at leveraging the information so that it can be consumed over and over again. They have designed their ecosystem as the blueprint that describes how products, services, and information will be integrated and delivered to customers/constituents.

They have strategically built their ecosystem in such a way to understand and leverage the context in which they operate. They have planned and built their network to enhance the breadth and depth of coverage and provide information and services that can't be easily provisioned within their own organization.

Associated Drivers

- **The platform economy:** Competing at hyperscale
- **Rising customer expectations:** More convenience, customization, and control
- **Economies of intelligence:** AI, human, and organizational "learning" fuels asymmetrical advantage

IT Impact

- Development of the digital platform is a core strategic imperative to enable ecosystem participation and leadership.
- Coordinated strategic planning between the business and IT is necessary for establishing and aligning platform priorities and capabilities and differentiating value drivers for ecosystem participation.
- CIOs must understand the need to establish both strong and weak ties within the ecosystem network design as required by the business case.

Guidance

- Understand how ecosystem information is value-added for all constituents and participants (consumers, providers, connectors) and that measurable benefits are monetized.
- Understand that total ecosystem value is a function of the organization's value from digital plus the ecosystem value from connections, data flows, and so forth and that the net value of the organization and ecosystem is more than the sum of each organizations' contribution.
- Note that your ecosystem relevance is a function of the strength of information flows and number of connections across the ecosystem; like a biologic system where information is an analog to energy created and consumed.
- Establish both strong and weak ties within the ecosystem network as required, and build a diverse versus a dense network as a dense network may signal redundancy of services. A diverse network can extend services and increases visibility of efforts and services available.
- Include the qualities of authenticity and integrity, the lineage of the data, and the data's fit and goodness for use. Improve value as a function of abundance versus scarcity (traditional

commodity valuation framework), note age or time the information was created, and protect personally identifiable information as it is shared within the ecosystem.

Prediction 8: By 2020, 60% of Companies Will Have Aligned Digital KPIs to Direct Business Value Measures of Revenue and Profitability, Eliminating Today's Measurement Crisis Where DX KPIs Are Not Directly Aligned

Today, less than 29% of all organizations are using digital KPIs as the basis of making and measuring the efficacy of capital investment allocations and their corresponding business value. In addition, less than a third of all companies are monitoring business performance – either on a monthly, a quarterly, or an annual basis. Only 30% of companies are monitoring and incenting employees using digital KPIs. While digitally determined companies report higher rates of digital KPIs and incorporating them into their management systems, they still represent less than 42% of determined organizations overall. Failure to remediate this performance monitoring opportunity results in a persistent gap between investment and the corresponding business performance opportunities. In the digital era, unlike in William Edward Deming's time, we now have the ability to overcome those most important figures that one needs for management, which were previously unknown or unknowable. Successful management systems can and should account for them.

Associated Drivers

- **Accelerated disruption:** Navigating business challenges as volatility intensifies
- **Intelligence everywhere:** AI's opportunity and implications
- **Economies of intelligence:** AI, human, and organizational "learning" fuels asymmetrical advantage

IT Impact

- IT needs to collaborate on digital business KPIs using a value-stream mapping framework to identify the right measures and how they should be developed and applied.
- Data strategies should be aligned to measurement and analytic priorities, providing the business technology-enabled reporting without the need for manual intervention.
- The entire enterprise should take a design thinking approach to measurement technologies. Engage breakthrough thinking for KPIs, look to machine learning and AI without incrementing to more spreadsheets, or point to KPI approaches as an investment philosophy.

Guidance

- Data at scale drives process for the first time in business. Having digital KPIs and knowing how they fit into your management systems are required for sustaining competitive differentiation across processes, products, and services.
- The future enterprise, which is about digital at scale, requires you leverage your digital platform to both create, automate, and incorporate digital KPIs.
- Effective digital KPI deployment enables both performance monitoring and incentivizing mechanisms across your markets, customers, employees, and suppliers.

Prediction 9: Driven Both by Escalating Cyberthreats and Needed New Functionality, 65% of Organizations Will Aggressively Modernize Legacy Systems with Extensive New Technology Platform Investments Through 2023

During the era of experimentation for digital transformation, standalone projects based on emerging technologies were frequently driven by different business departments (LOBs) and were created in silos. Security was an afterthought for these initiatives, and so they exposed many vulnerabilities to the

organization. In addition, scarce innovation resources were spread across multiple pilots and many digital efforts were failing before they get to the production. In short, organizations were stuck in a proof of concept (POC) jail.

To try and "bridge the scale gap," organizations set up a new "digital" structure to focus on the "new," while ringfencing the "old" enterprise IT environment (seen as an operational bottleneck) to try and deliver some level of agility. Security teams also started to ask difficult questions of the digital innovation units about the level of risk they were creating for the organizations.

Hence it became clear that not only do these systems, processes, and people need to be integrated as part of an enterprisewide platform but the core needed to be modernized to provide the necessary agile backbone, infused with intelligence, to help redefine and create new business processes in a more dynamic fashion. Infrastructure, security technologies, databases, middleware, and applications need to be aggressively modernized and reduce the technical debt, improve the risk posture and, most importantly, deliver the agility to drive the scale for digital transformation.

Associated Drivers

- **The age of innovation:** Driving the future enterprise
- **Accelerated disruption:** Navigating business challenges as volatility intensifies
- **The platform economy:** Competing at hyperscale

IT Impact

- The lines between IT, digital, security, and the business will need to be blurred to ensure that budgets, stakeholders, and tech architectures are in an orchestrated fashion.
- Business case proposals for modernization need to include a significant cost take-out element to help create the compelling event to drive the necessary changes.
- The CISO and IT departments (and the CIO in particular) need to shift the mindset from technologies, projects, and security to use cases, outcomes, and digital trust.

Guidance

- Deliver a use case journey across a digital road map with different levels of innovation broken up into horizons (incremental, disruptive, and business model).
- Bring security teams into digital innovation projects. DevOps needs to become DevSecOps, and the CISO and CIO need to work with digital leaders to educate all stakeholders on the threats associated with launching new apps, services, or products without the necessary governance structure.
- Set clear deadlines for the modernization of all elements of the enterprise IT environment. Decision options (rehosting, retiring, re-architecture) need to be taken by the entire digital dream team.

Prediction 10: By 2023, Enterprises Seeking to Monetize Benefits of New Intelligence Technologies Will Invest Over $265 Billion Worldwide, Making DX Business Decision Analytics and AI a Nexus for Digital Innovation

Big data analytics and cognitive AI will grow from $124 billion in 2019 to over $265 billion by 2023, growing at CAGRs of 19% and 28%, respectively. As companies ramp up these investment levels, they must develop and employ semantic data models. Semantic model techniques are needed to contextualize their business ecosystem data and its interrelationships with other data across the entire

business ecosystem. Semantic data models define how the stored data relates to the real world, thus providing a true digital twin that BDA and AI can leverage for genuine insight.

Big data analytics and AI that use semantic data models serve purposes that include:

- Providing your overall view of data required to run the business that can be analyzed to identify and scope projects to build shared data resources
- Defining an application-independent view of validated end-user data that can be transformed into a physical database design for application in big data analytics and AI that are consistent and shareable while lowering development costs through effective data modeling
- Using a data model to represent the infrastructure of your organization on a number of levels that can be used to evaluate vendor software against a company's data model to identify inconsistencies between the software and infrastructure versus how the company actually does business
- Defining the contents of existing databases with semantic data models for the creation of an integrated data definition schema that can be used to control transaction processing in a distributed database environment

Associated Drivers

- **The platform economy:** Competing at hyperscale
- **Intelligence everywhere:** AI's opportunity and implications
- **Economies of intelligence:** AI, human, and organizational "learning" fuels asymmetrical advantage

IT Impact

- Data resources should be built to fuel big data analytics and AI to maximize the business case value from these technology investments.
- Shareable databases can leverage your digital platform framework and integrate various data sources for a unifying view of the business.
- Vendors and software should be evaluated to optimize applications and make sure business actually works.
- IT needs to integrate existing databases and manage the complexities of all data sets across the enterprise and its extended business ecosystem, including customers and supply partners.

Guidance

- Invest in a digital platform that supports a semantic data model and brings data together so that big data analytics and cognitive AI can be applied to all data in a consistent and accessible way.
- Develop a true business value case for these performance investments, including the data needed for insights beyond traditional metrics and KPIs.
- Rethink the role of KPIs in your management systems. Today, approximately 30% of all companies both have new digital KPIs and are using them for any type of planning, managing, or assessing their own digital performance and/or their digital transformation partners.
- Develop great measures that are directly correlated to business performance, predictive of future business performance, isolated to factors controlled by the group it is measuring, and comparable to market and competitive metrics

ADVICE FOR TECHNOLOGY BUYERS

Leverage the thought leadership from these 10 digital transformation FutureScape predictions and IDC's research in general to:

- Create your own fully articulated unified digital strategy that encompasses both the business and digital missions of your company.
- Position each prediction as a planning assumption when building a long-term plan.
- Further express how the digital mission manifests in mastering customer experiences, digital operations, and the monetization of information.
- Frame a set of use cases that will deliver digital customer experiences, digital operations, and monetization of information, and create a coordinated governance and investment plan.
- Leverage IDC's 1,000 DX business use cases spanning 22 industries and 8 functional areas to identify, prioritize, and use them as demonstrable transformation social capital for educating the organization on transformation.

EXTERNAL DRIVERS: DETAIL

The Age of Innovation: Driving the Future Enterprise

Description

Digital transformation – the continuous process by which enterprises adapt to or drive disruptive changes in their operations, customers, and markets – is now being driven by multiplied innovation. Competition is powered by platforms and ecosystems where network effects and innovation feed off themselves. But the changes and innovations aren't accidental; they are driven by data, analytics, and learning, which feed and multiply more innovation. Data drives intelligence yielding insight and knowledge, allowing for action and creating value. Automation and machine learning revolutionize operations, providing major increases in productivity and efficiency. To compete, companies must balance digital and industrial competencies and master them at scale. Yet these efforts will not succeed without leadership and talent and the enterprises' ability to affect change.

Context

With direct digital transformation investment spending of $5.5 trillion over the years 2018-2021, DX continues to be a central area of business leadership thinking. Industry leaders are transforming markets and reimagining the future through new business models and digitally enabled products and services. At the same time, companies that digitize their operating model may see a 40% increase in productivity. Purely digital opportunities aren't enough anymore. New opportunities will come increasingly from combining digital technology with physical assets. To succeed, digital natives need to adopt and transform the traditional world of industrialization and specialized assets. Industrial natives need to adopt and master digital technologies that could affect robustness, reliability, and safety.

Accelerated Disruption: Navigating Business Challenges as Volatility Intensifies

Description

Today, survival of the fittest is linked not to size or strength but to the ability to change – to move quickly, react, adapt, seize opportunities, and be agile. With the increasing uncertainty in economic rules, political stability, climate effects, and disruptive innovations in the marketplace, a sense of urgency pervades companies concerned about their competitiveness and longevity. Beyond that, organizations' ability to navigate the increasingly complex and uncertain business environment has become essential. The new imperative is to keep pace with business change by increasing the speed of business operations, the speed at which changes are delivered, and the speed and scale of innovation. Survival means understanding and adopting these new approaches quickly, throughout the organization.

Context

The best-performing companies are pulling away from the rest, creating a bifurcated and unequal landscape where a few firms exhibit high productivity and profits. The global superstar companies and the unicorn start-ups leverage innovation cultures, agile organizations, and disruptive approaches to everything from machine learning to talent acquisition to adapt to complex uncertainty; adjust their products, services, and operations; and seize opportunities.

The Platform Economy: Competing at Hyperscale

Description

Understanding and provisioning the platforms that will sustain, advance, and scale business and operations are essential for every business. The platform is where the future of software, infrastructure, and connectivity will evolve and where edge will be accessed, integrated, and optimized. Megaplatforms compete to own infrastructure, artificial intelligence, 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. Capturing profits will be highly dependent on controlling or participating in the right platform. Every business must incorporate these new realities into its platform strategy.

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. Leading organizations are shifting to platform thinking to evolve their business models and manage their technology architecture. Platform thinking is a fundamental shift in business strategy, moving beyond product differentiation and pricing toward ecosystem-based value creation. It is also a long-term, sustainable response to new realities in the DX economy, one in which organizations digitally transform themselves into digital-native enterprises.

Intelligence Everywhere: AI's Opportunity and Implications

Description

Accelerating progress in AI is impacting experiential engagement, business processes, strategies, and more – autonomously creating a significant portion of new innovations. But, as automation and augmentation increase, so do the ethical issues and opportunities for misuse, surveillance, invasions

of privacy, and more. Many future applications will be developed by AI without human supervision. Beyond that, augmented humanity – the fusion of digital technologies and humans – for improved mobility, sensing, and cognition will become routine. There are justifiable concerns and issues around AI-enabled applications, bias, transparency, and the long-term impacts of these on workforce transitions and the essential elements of being human. Social pushback is demanding accountability and rights. Business and governments need to address the ethical and legal issues of AI to realize its opportunities.

Context

AI innovation and application are being driven by massive investments in all kinds of industries. Hospitals are testing how AI can enhance care, school districts are looking at AI-equipped cameras that can spot guns, and human resources departments are using AI to sift through job applications. Government agencies, including law enforcement, are looking for ways to harness this next technological revolution to meet their ends, while others are demanding accountability and an "algorithmic bill of rights." With industries investing aggressively in projects that utilize AI software, IDC forecasts AI systems will more than double from 2018 to 2022 to $79.2 billion with a CAGR of 38.0%.

Rising Customer Expectations: More Convenience, Customization, and Control

Description

Customers accustomed to the personalization and ease of dealing with digital-native companies such as Google and Amazon now expect the same kind of service from every business in every industry. The changing expectations are most evident in the newest generations of customers, but all customers are demanding more convenience and personalization. At the same time, they want more control of what data is collected and how it is used. Intelligent customer agents will start to intermediate the relationship on the customer's behalf, taking more control from the vendor. Companies that systematically collect, measure, and analyze data to create exceptional, personal, relevant, and compelling experiences can set themselves apart from their competitors.

Context

With new customer expectations being set by thriving companies that disrupt markets, the previous levels of customer service are no longer good enough. New business, operational, and organizational models are required to meet continually growing consumer expectations. 38% of companies that are digital natives report that they are "almost constantly online" through their device of choice, the mobile phone, providing unparalleled access to behaviors and preferences, that they expect to be turned into customized engagement and experience. While there is also backlash, customers seem willing to relinquish some control over their data in exchange for a sufficiently engaging personalized experience.

The Future of Work: Agile, Augmented, Borderless, and Reconfigurable Description

Technologies are rapidly changing who or what – and where or how – work is being done. A new generation of workers have new expectations for work, culture, and space. 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. Organizations are using new contracting models to create an agile, borderless and reconfigurable workforce. However, the new skills required to thrive in this new era are still in short supply. To bridge the digital talent gap, organizations need to

retrain and reskill existing staff, develop access to new talent pools, and attract new resources. Society must equip and educate up-and-coming generations for the future while bringing existing workers up to speed to address current needs. Employees must become lifelong learners.

Context

The demographic shifts led by millennials entering the workforce and technology advances are driving fundamental changes in the workplace. Good pay, positive cultures, diversity, flexibility, and access to leading-edge technology are all important keys to keeping workers happy at work. The short supply of digital talent, particularly in data science, security, and customer experience design, is forcing organizations to adopt new approaches to work. IDC predicts that, by 2021, 60% of G2000 companies will have adopted a future workspace model — a flexible, intelligent, and collaborative virtual/physical work environment — to attract new talent and improve employee experience and productivity.

Economies of Intelligence: AI, Human, and Organizational "Learning" Fuels Asymmetrical Advantage

Description

Enterprise economies and the nature of competition have changed. While still important, economy of scale has been augmented with economies of scope and economies of learning. Now, leading companies are pursuing "economies of intelligence," the continual improvement, innovation, and variation based on leveraging data and AI technologies to identify and fulfill changing needs to enhance scale, scope, and customer engagement. This is changing the nature of intellectual property, whose value has shifted to where it's created rather than where it's realized and contributing to an asymmetrical accumulation of capital and innovation where an organization's capacity to learn has a distinct competitive advantage.

Context

As enterprises scale their use of modern technologies for complete instrumentation, integration, and insight, they are able to expand their scope by offering a wider variety of experiences that demonstrate increasing value as the organization learns what is most desirable and efficient. This enables the learning organization to capture more knowledge and increase its asymmetrical accumulation of capital and innovation.

LEARN MORE

Related Research

- *Critical External Drivers Shaping Global IT and Business Planning, 2020* (IDC #US45540519, October 2019)
- *IDC MaturityScape: Digital Transformation Platforms 1.0* (IDC #EUR145200419, July 2019)
- *IDC MaturityScape: The Future Enterprise 1.0* (IDC #US43646819, April 2019)
- *Analytics and Information Management Digital Transformation: Deriving Value from Data* (IDC #US44462218, November 2018)
- *IDC FutureScape: Worldwide Digital Transformation 2019 Predictions* (IDC #US43647118, October 2018)
- *IDC's Worldwide Digital Transformation Use Case Taxonomy, 2018: Human Resources* (IDC #US44247218, September 2018)

- *IDC's Worldwide Digital Transformation Use Case Taxonomy, 2018: Finance* (IDC #US44247318, September 2018)

- *Five Ways Digital Transformation Initiatives Vary Around the World* (IDC #US44155618, August 2018)

- *IDC Market Glance: The Digital Transformation Platform, 3Q18* (IDC #US44222118, August 2018)

- *IDC's Worldwide Digital Transformation Use Case Taxonomy, 2018: Customer Experience* (IDC #US43978418, June 2018)

- *IDC FutureScape: Worldwide Digital Transformation 2018 Predictions* (IDC #US43154617, October 2017)

- *The DX Platform: Rearchitecting for Scale* (IDC #EMEA43147617, October 2017)

About IDC

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

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