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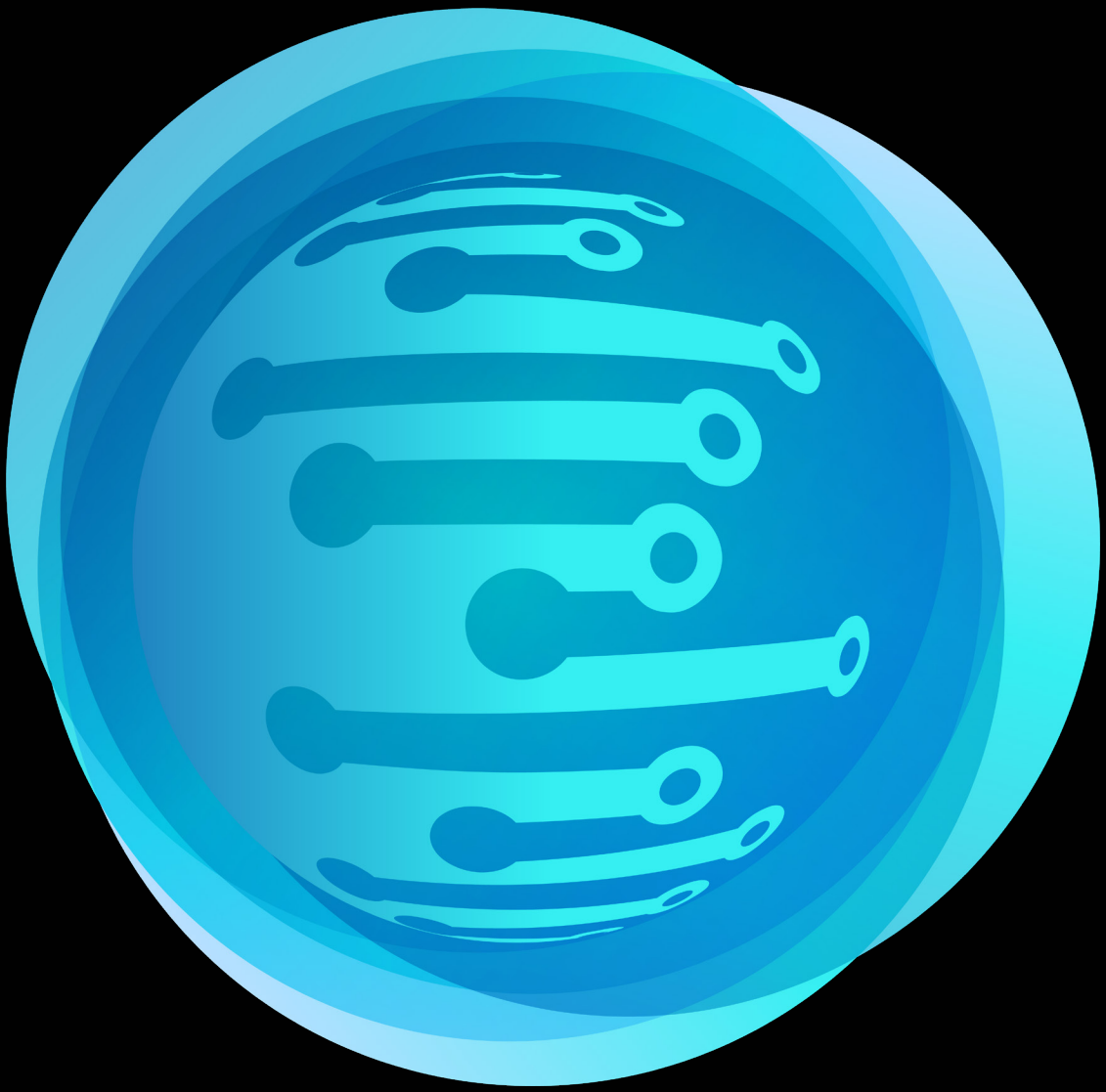

2022 technology industry outlook

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About outlooks
Deloitte's 2022 technology industry outlook seeks to identify the strategic issues and opportunities for tech organizations to consider in the coming year, including their impacts, key actions to take, and critical questions to ask. The goal is to equip US technology organizations with the information and foresight they need to position themselves for a robust and resilient future.

When the pandemic began two years ago, it catapulted many organizations into the future, rapidly accelerating digital transformation. Work environments changed overnight as remote work became commonplace and market demands evolved.

Deloitte urged technology organizations to upgrade their supply chains for greater transparency and resiliency and to embrace cloud, everything-as-a-service (XaaS), and edge intelligence to ramp up their transformation efforts. We also recommended they consider strategic acquisitions to bolster talent capabilities, especially in critical areas such as artificial intelligence (AI), robotic process automation (RPA), and cybersecurity.[1]

As 2021 began and many supply networks struggled, we advised technology industry leaders to reexamine where and how manufacturing happens and to focus on improving transparency, flexibility, and resiliency.[2] We recommended tech companies double down on their digital transformation efforts, emphasizing cloud infrastructure improvements, data and analytics capabilities, cybersecurity, and business model evolution. We also suggested that organizations reorient and reskill their workforces in order to optimize remote work capabilities and take full advantage of advanced technologies such as AI.

At the start of 2022, many of these issues remain front and center for technology companies, with one important difference: Leaders now have an opportunity to address these challenges more deliberately and purposefully. Instead of managing an immediate crisis, they can lay solid foundations for future innovation and growth.

Some of the specific themes we see playing a foundational role in 2022 and beyond include:

- **Taking cloud and everything-as-a-service to the next level.** As more companies embrace cloud and service-based IT to drive innovation and transformation, and as XaaS providers multiply, more work will be needed to manage the technical and operational complexities of hybrid, multi-cloud approaches.
- **Creating the supply chains of the future.** As technology companies continue to recover from pandemic-induced supply chain disruptions, they will start proactively preparing for future uncertainty and other systemic risks. To do it, they'll build systems with better visibility and resiliency.
- **Building the next iteration of the hybrid workforce.** With more experience utilizing a hybrid workforce under their collective belts, tech companies will evolve their cultures, accelerate experimentation with collaboration solutions, and develop better approaches to managing tax implications.
- **Leading the charge to create a sustainable future.** Although the tech industry is working to address critical sustainability issues, growing pressure from stakeholders and potential changes to environmental, social, and governance (ESG) reporting rules will incite tech companies to heighten their focus on reducing and reversing environmental impact.

The technology industry has largely thrived over the past two years, but that momentum may not be sustainable. To enable the next wave of growth, technology companies should rededicate their efforts to improving transparency, agility, collaboration, sustainability, and digital innovation.

Taking cloud and everything-as-a-service to the next level

Many technology companies have begun shifting to a service-based model for providing products and capabilities, with some major players planning to transition the bulk of their portfolios over the next few years.[3] At the same time, leaders across industries are embracing service-based IT—much of it delivered via cloud—for increased agility, new capabilities, and better management of capacity and costs. Workforce challenges and changing IT demands spurred by the pandemic are accelerating the shift to services: software-as-a-service, infrastructure-as-a-service, and platform-as-a-service will continue to gain popularity, and hardware-as-a-service will increasingly catch on as a way for businesses to provide integrated services to their hybrid workforces.[4] What's more, leaders view everything-as-a-service (XaaS) as critical to their digital transformation and key to creating new solutions and business models to thrive in the new normal.[5]

Cloud is rapidly becoming the preferred platform for enabling XaaS and spurring innovation—powering AI capabilities, intelligent edge services, and advanced wireless connectivity.[6] Many organizations are leveraging a hybrid, multi-cloud strategy to increase access to best-in-breed technologies, optimize costs, improve resilience and reliability, and minimize vendor lock-in.[7] Moreover, distributing workloads—across multiple clouds and on-premise—can help enterprises satisfy requirements around performance, data security and privacy, regulation, and cost, which can vary by application and geography.[8] The complexity of this multi-cloud, multi-vendor approach means organizations will need a way to seamlessly integrate and coordinate a multitude of cloud-based applications and data from a single platform or dashboard. Tech companies are stepping forward to meet this growing need for orchestration, and we expect the playing field for solutions to grow over the next few years.[9]

A recent Deloitte survey shows that XaaS adopters are seeking more consultative relationships with their vendors—and the deeper the engagement, the better the business outcomes.[10] At the same time, cloud and XaaS don't have the same level of vendor lock-in as traditional IT solutions, so customers can switch providers with relative ease if they feel they're not realizing optimal value from a solution or relationship. In order to retain satisfied customers, it's critical for tech providers to bring cutting-edge XaaS solutions to market and to strengthen the customer experience by helping adopters overcome usage challenges and derive maximum value.[11]

Reimagining the customer experience is just one challenge facing tech companies as they transition to the XaaS model. The model also introduces complexities in how revenue is recognized and new challenges in forecasting future revenue streams.[12] When it comes to the taxation of XaaS offerings, the location of infrastructure, employees, and processing raises challenges in managing global tax compliance and optimizing tax structure.[13] Furthermore, managing the myriad of risks in multi-cloud environments—including application and infrastructure security, data management, resilience and availability, governance, and compliance—is a shared endeavor between service providers and user organizations. Service providers can supply their customers and auditors with system and organization controls (SOC) reports to help build risk assurance, but clarifying responsibilities is crucial.[14]

Hybrid and multi-cloud solution options promise greater flexibility and may open up new opportunities for cloud providers beyond the biggest players. Only the future will tell which companies ultimately take the lead on cross-cloud orchestration: the hyperscalers or the independent cloud-management providers.

Strategic questions to consider:

- How will tech providers expand their multi-cloud orchestration capabilities, such as developing their own products and services, acquiring other companies, or partnering?
- How can XaaS providers better understand their customers' needs and behavior, improve their experience, and become trusted partners?
- How can XaaS providers collaborate with user organizations and stakeholders to fully understand the risk environment and to clarify who bears responsibility for which risks? How can they better utilize assurance reporting?

Creating the supply chains of the future

The supply chain disruption that occurred amid the pandemic affected everything from automotive production to consumer appliances, medical devices, and even toys. Its impact extended far beyond the semiconductor sector, exposing the tech industry's critical chokepoints across complex distribution and supply chains.[15]

With critical chips and components in short supply throughout 2021, many companies in the technology sector—including branded PC, laptop, and smartphone companies, data center infrastructure providers, and IT distributors—experienced significant shipment and order delays. Wait times for certain high-end smartphones ranged between four and eight weeks as of the third quarter of 2021.[16] Select laptops and PC brands experienced lead times as high as 20 weeks—roughly seven to ten times higher than the normal.[17] Even worse, network equipment products such as broadband routers reported delays of more than a year.[18]

There is good news for the new year, with lead times expected to marginally improve by the second half of 2022.[19] However, supply chain challenges may not fully untangle themselves until 2023.[20] Amid such a dynamic and fluid environment, tech companies should start preparing for the next wave of unknowns. Their preparation should take into consideration supply chain disruptions, systemic risks, and other uncertainties, including natural disasters and geopolitical instabilities that could create impacts of even greater magnitude.

Supply chain bottlenecks have affected the indirect channel partners and distributors of tech companies as well. Rising product prices have led them to take financial hits in the form of higher discounts offered to customers, and potentially losing business to tech companies' direct sales channels.[21] In 2022, tech companies should work with their channel partners to review channel performance and relationships, change and adapt channel programs, and figure out new ways to go to market together.

To effectively deal with future (and potentially greater) supply chain challenges, tech companies should build their supply networks with the ability to offer granular visibility across all tiers and levels.[22] Incorporating advanced technologies such as 5G, robotic automation, blockchain, and AI can provide sales, distribution, and channel executives with near-real-time insight, and better visibility into diverse areas across their supply chain, logistics, and channel operations. As part of digitizing their supply networks, tech companies have an opportunity to revamp traditional organizational silos in order to better connect R&D, sales and marketing, indirect channels, suppliers, internal operations, and other facilities. Revamping supply chain operations to make them more agile and flexible will likely create new tax implications that tech company executives should be mindful of. Depending on the location of specific business units, functions, and operations (wherever changes are executed), relevant local- and state-level tax laws and policies could apply. Here is where enterprise resource planning (ERP) and other advanced financial systems, powered by predictive analytics, can help track all of the underlying transactions to help ensure compliance with regulatory requirements.

Strategic questions to consider:

- What parts of company sourcing operations can be moved in-house or outsourced to nearshore third-party contractors and service providers?
- What new analytics capabilities do tech companies need to enable live intelligence sharing and enhance preparedness for future disruptions?
- What business and channel partnerships and alliances do tech companies need to reassess, terminate, expand, or build from scratch to capture new markets and customers?

Building the next iteration of the hybrid workforce

Many have said that 2021 was the year of the "Great Resignation," driven by changing employee attitudes and expectations because of the pandemic. Why the massive shift? Employee burnout, loss of work/life balance, demand for work-from-home opportunities, and a desire for more meaningful work are just a few reasons. And while the tech industry is accustomed to high turnover, intense competition for talent, and critical shortages in emerging technology experts, it's has nonetheless been hit especially hard.[23] What makes this year different is that hybrid work is now the norm. In an anywhere/anytime work model, environments should be more collaborative, intuitive, and accessible. Over the next year, we will continue to have deeper, fundamental conversations around reimagining the workplace and workday.

To attract and retain talent, technology companies are trying to capture the best of both the at-home experience and the in-office one, balancing the flexibility their employees are demanding with the business needs of their organization. Company cultures should quickly evolve to take full advantage of both environments. Tech companies that do not adapt may struggle to maintain a unified culture, feeling of belonging, and sense of fairness among their employees, with respect to advancement and compensation.

To address this challenge, companies should focus on three areas: creating equivalence between in-person and virtual work, driving purposeful engagement, and establishing rules on how and when to co-locate. Equivalence ensures that all employees can be equally involved regardless of location, individual sensitivities, and working styles. Purposeful engagement requires engineering moments that matter in order to build strong connections. Co-location rules require broad agreement on what talent needs to be concentrated in one location, when to have in-person interactions, and how to make the most of them.

Not only will cultural changes get attention, but new technologies that go beyond the current generation of collaborative applications will begin to emerge.[24] Tech companies will drive experimentation in this area, using themselves as test subjects. We expect to see increased use of spaces that blend physical and virtual environments, such as Google's Campfire concept, which brings in-person and remote attendees together on a more level playing field.[25] There will also be increased focus on interoperability across collaboration platforms and integration with other software, creating more seamless connections across organizations. These new collaboration tools aren't just about better meetings; developers and engineers will also have access to advanced applications that enable them to collaborate virtually on highly technical design, engineering, and simulation projects. For example, Nvidia's Omniverse platform helps enable collaboration in virtual worlds for disciplines that include industrial design, urban planning, and technical simulation.[26]

As employee flexibility increases, tax leaders should understand the nuances of remote, hybrid, and in-office work. Potential tax implications include corporate tax, transfer pricing, employment tax, sales and use tax, and property tax, as well as credits and incentives resulting in new filing and withholding requirements, shifting tax costs, and tax risk management. These issues could significantly impact company tax risk profiles and financial statements. Technology companies should focus on governance, case management, and tracking and compliance, including more granular tracking capabilities and better approaches to assessing future risks.

Leading the charge to create a sustainable future

Technology industry leaders recognize the imminent threat posed by climate change. According to Deloitte's 2021 Climate Check Survey, eight in ten tech executives are concerned about the crisis, and a majority believe the world is at a tipping point to act.[27] Nearly three in ten reported their organization is already confronting a scarcity of resources due to climate change, and nearly one-quarter said they are facing operational impacts. The rising threat of extreme weather events, for example, makes it an imperative for many tech companies to step up their efforts to protect properties and infrastructure such as data centers through emergency planning and risk mitigation.[28] In 2022, tech organizations are also likely to face growing challenges from changing regulatory landscapes and increasing pressure from employees, investors, and customers to operate more sustainably.

Tech leaders are aware of the environmental impacts from current technology systems. Manufacturing processes, billions of connected devices, and proliferating data centers come with enormous energy demands. As a result, the tech sector may be responsible for 2%–3% of the world's greenhouse gas emissions.[29] Semiconductor fabrication and data center cooling are both prodigious users of water, with a typical data center consuming as much water daily as a city population of 30,000–50,000.[30] The rapid obsolescence of consumer electronics and a dearth of recycling options are contributing to the growing worldwide crisis of toxic e-waste.[31]

Thankfully, technology leaders are already taking bold actions to drive essential change. Several have set ambitious goals for reducing their carbon footprints, and we expect tech giants will continue to be top global buyers of renewable energy in 2022.[32] Some tech companies are tackling the e-waste problem, using more recycled materials in their products, designing them for better repair and recycling, and promoting a circular economy for electronics.[33] Perhaps most significantly, we expect tech companies to accelerate the creation of digital innovations that track and mitigate the effects of climate change.[34] For example, environmental monitoring satellites, IoT, data analysis, blockchain, and AI can be used to increase efficiencies of buildings, manufacturing, and agriculture; improve data center management; and reduce traffic congestion.[35] Data analytics and robotics can help optimize supply chains, reduce manufacturing error rates, and decrease energy consumption.[36]

Global climate-change efforts, such as the 2021 United Nations Climate Change Conference (COP26), have further propelled tech companies to take necessary actions to curtail emissions and adopt sustainable business models in 2022 and beyond.[37]

Investors and stakeholders are demanding greater transparency that will enable them to gauge companies' resilience to climate impacts. Furthermore, many US government agencies are discussing climate-change policies, signaling that global sustainability reporting standards and environmental, social, and governance (ESG) disclosure regulations are coming.[38] Remarkably, some large tech companies are themselves calling for mandatory disclosures—recognizing that being sustainable may be critical to safeguarding their future access to investment and high-quality talent.[39] In the coming months, tech companies should prepare for regulatory change by proactively improving their governance and data management processes and controls to help ensure thorough and accurate disclosures.

Signposts for the future

In 2022, the technology industry will likely continue to grapple with pandemic-driven challenges such as supply chain disruptions, hybrid workforce issues, and fluctuating IT needs, as well as the increasingly urgent need to address climate change.

These issues provide plenty of opportunities for savvy companies to mitigate their risks and innovate to fuel the next wave of growth—not just for their own industry, but for others as well.

In the coming year, tech companies should be on the lookout for the potential signals of change in the market, including:

- New approaches, vendors, and evolving leaders for multi-cloud orchestration.
- Advances in risk management for multi-cloud, multi-vendor environments.
- Changes in the predictability of product lead times that could make it more difficult for tech companies to manage prices for products.
- Potential trade policy changes between the United States and other key regions that could affect how tech companies source products and contract with global suppliers and distribution channels.
- The evolution of enhanced employee benefits, well-being programs, and flexible, hybrid workplaces.
- Activity in the collaboration technology market, including acquisitions, partnerships, and significant new upgrades and enhancements to established products.
- Regulatory discussions and potential decisions around ESG reporting—which may require tech companies to allocate more resources to comply with the evolving rules.
- Emerging technology-driven innovations to combat climate change and increase sustainability.

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