accenture

Start at the center:
Network-led transformation for growth

How communication service providers
make networks run faster, better and cheaper

Contents

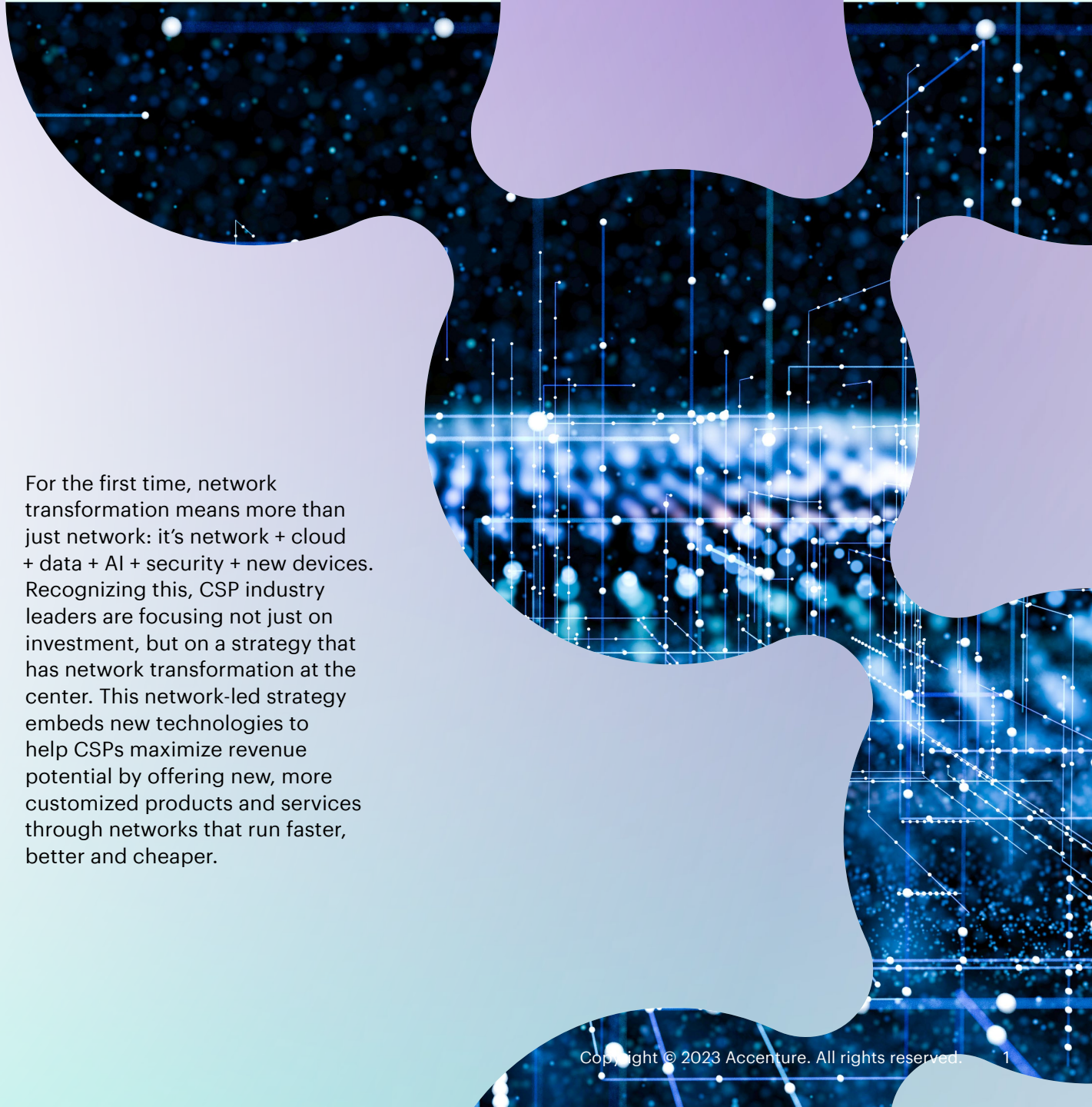
Extracting new **telco network value**

Communication service providers are moving beyond generational upgrades with a new network transformation approach

The telecommunications industry's evolution is closely tied to innovation in networking technologies and infrastructure. Communication service providers (CSPs) are currently investing heavily in network infrastructure—the majority on physical builds across fixed and wireless technologies. These investments, including advanced network technologies such as 5G, are deploying across markets, but without clear differentiation. It's evident something more is needed for communication service providers to drive more value from network investments.

Outside of telecommunications, other industries have been moving to the cloud, changing the rules of speed, agility, flexibility and the way their products and services are consumed and deployed. For CSPs, cloud and other digital technologies like data analytics and artificial intelligence (AI) offer emerging opportunities to deploy and run their networks differently and in a way that extracts new value.

For the first time, network transformation means more than just network: it's network + cloud + data + AI + security + new devices. Recognizing this, CSP industry leaders are focusing not just on investment, but on a strategy that has network transformation at the center. This network-led strategy embeds new technologies to help CSPs maximize revenue potential by offering new, more customized products and services through networks that run faster, better and cheaper.



Embracing a **holistic approach**

$1.8 tn
of capital expenditure incurred by CSPs globally on wireline and wireless network infrastructure in the last six years (2017–2022)[2]

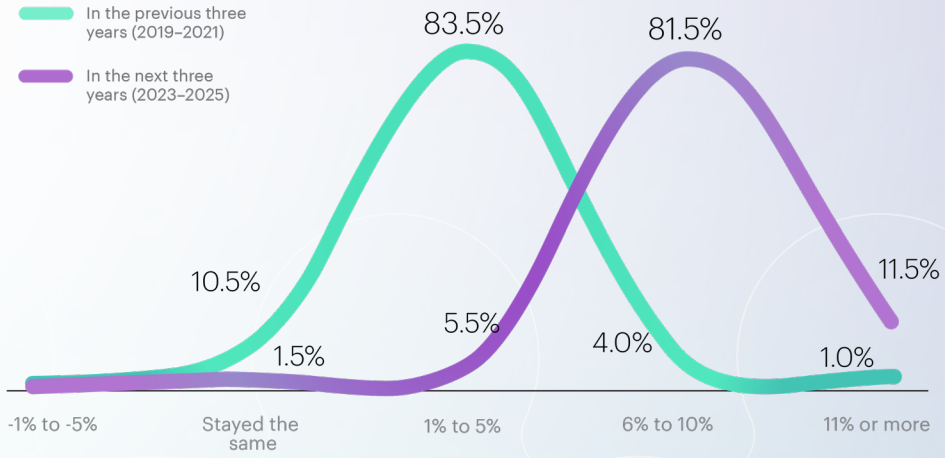
CSPs continue to invest billions in networks, both fixed and wireless. Not only are CSP leaders continuing the investment they've begun, 82% expect to increase network spending by 6 to 10% over the next three years. The challenge at hand is how to finish the current network transformation in a way that goes beyond a generational upgrade, instead reinventing the organization to continuously improve and leverage new technology.

Our recent survey of 200 global telecommunications companies found technology, product and finance leaders want to:

1. Create more flexible, agile networks
2. Run their networks more efficiently
3. And create network environments that enable innovation and new products.

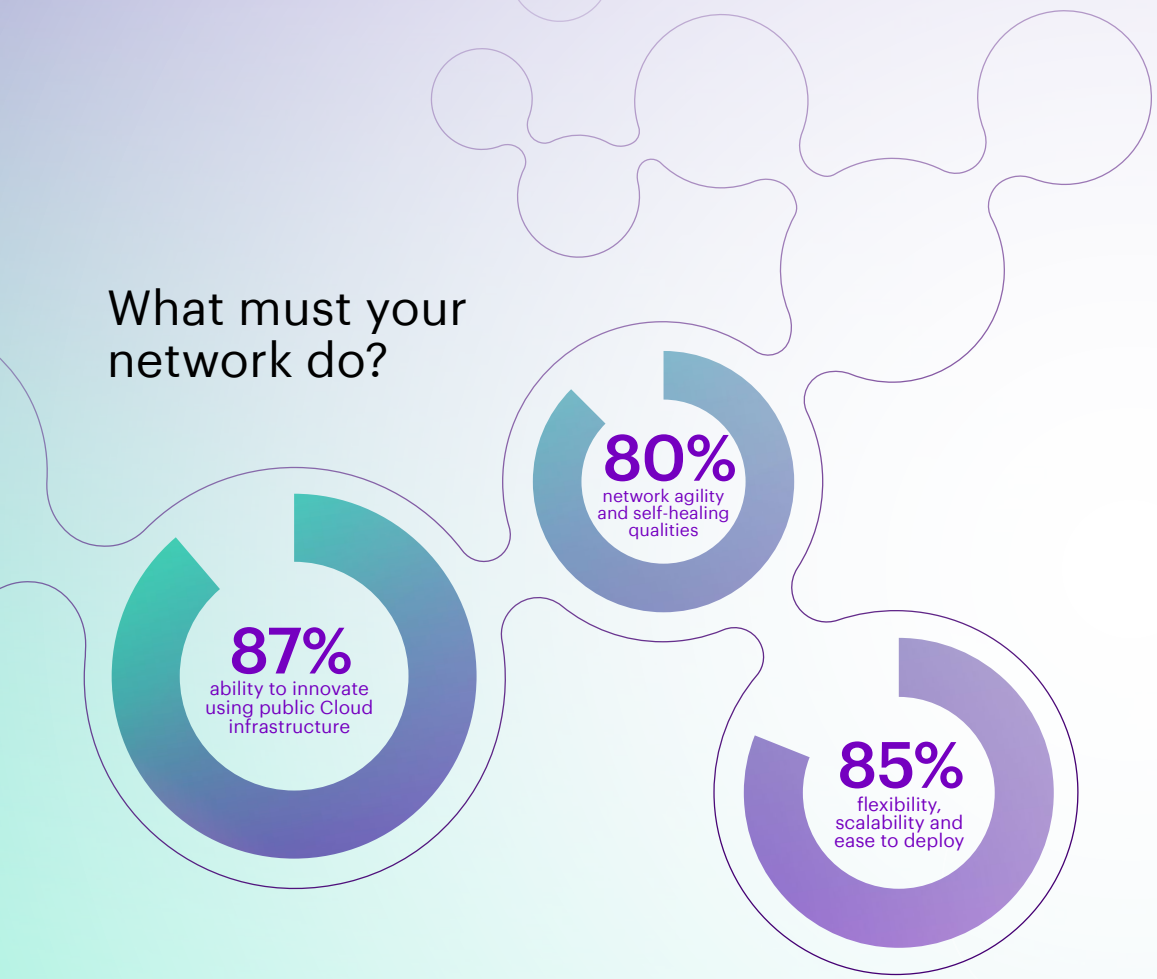
Accomplishing all three of these objectives is possible, but only through an enterprise-wide network transformation. Notably, such transformation offers returns across C-suite agendas.

Network transformation spending change (% change)[1]
(% CSP executive respondents)



Source: Accenture CSP Network Transformation Study, N=200 (Global)

What must your network do?



CSP executives' responses to the question, "What must your network do?" show how their priorities require a targeted transformation built around network flexibility, agility and optimization. Our study found 90% of CSP finance executives believe improved network availability and network total cost of ownership (TCO) optimization are significant business priorities.

As with most industries, software and cloud are the foundations for CSP networks, something interviewed executives acknowledge in the context of their goals. 95% of our survey respondents see cloudification as important in achieving a cost-efficient, flexible network. 86% of CSP financial leaders believe network cloudification will have high to transformational impact on their organization to achieve business objectives. 80% feel the same about network APIs.

Some CSPs have already started working on these areas. They have begun to virtualize and cloudify their networks, gaining operational efficiency and flexibility as a result. Now, they are layering in automation, AI, software engineering and cloud-native principles to simplify operations and accelerate how quickly they can deploy new applications.

What we're learning from CFOs

As a preferred approach to build cost-efficient networks,

- **94%** of CSP financial executives consider using analytics to optimize capex in network deployment
- **92%** of CSP financial executives consider using AI and automation in networks to decrease network opex

90% of CSP financial executives believe that improved network availability and network TCO optimization are significant business priorities for their organization

A cloud-based, flexible network enables CSPs to create new, more customized products and services.

Network slicing, for instance, supports multiple virtualized and independent networks on a common physical architecture. Each slice or portion of the network can be tailored to meet predetermined specifications in terms of characteristics such as quality of service (QoS), latency and bandwidth, serving specific use cases and creating differentiated experiences for customers.

Likewise, some CSPs that have opened their network interfaces have identified key new network capabilities and offered them as simple APIs in a centralized API catalogue to third-party developers. This enables greater flexibility and encourages innovation for enhanced service delivery and tailored customer experiences.

Surprisingly, for a technology-forward industry, half of our surveyed CSPs have not implemented use cases that rely on network automation and analytics, a cornerstone of transformation today. In addition, when it comes to enabling and innovating from cloud-based solutions, only 6.5% of respondents believe their company has the right skills and internal culture to manage advanced networks.

These realities aside, telecom companies have a comprehensive commitment to, and expectation for, their network's value since it is their main strategic asset. While this puts pressure on the entire business, it also presents an important opportunity to position CSPs back on the growth curve.

Innovative **network foundations**

Leveraging new technologies to enable continuous reinvention

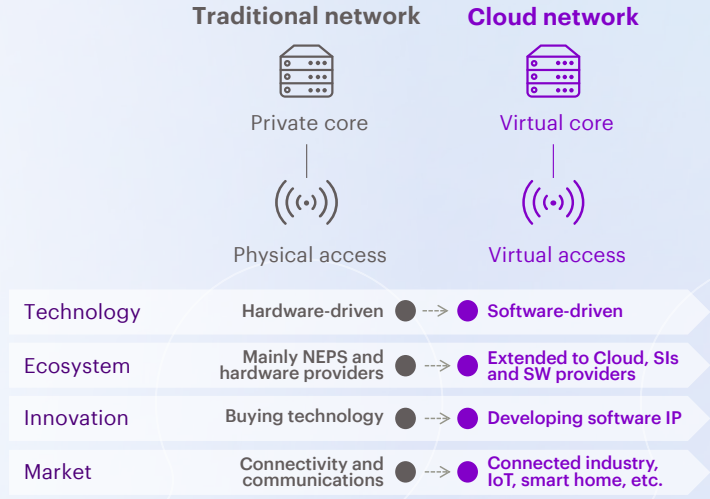
Among CSPs, cloud-network integration is gaining prominence. Telecom companies across the globe are realizing the cloud's promise of computing power, agility and intelligence necessary to unlock a new set of network capabilities. Cloud enables the integration of advanced technologies such as AI, automation and internet of things (IoT) into the network, thereby enhancing network flexibility and customer experience.

As a result, **CSPs are accelerating and shifting network investments into software and cloud**. In fact, the cloud penetration is forecast to reach 43% of total CSP network infrastructure spending by 2027, up from just 15% in 2021.[3]

Placing the cloud at the network's center allows for end-to-end flexible, scalable network delivery. It propels innovation for the network itself and the products and services that run on it. Leading CSPs are building their network as a platform that is software-defined, cloud-based, AI-driven, open and API-ready, which enables them to create an effective digital core.

Network-led transformation

A continuous reinvention strategy to redesign and re-architect the network by combining cloud-based technologies (along with the associated operating models, processes and talent) to achieve a flexible and agile network, capable of scaling new growth with advanced network capabilities and continuously optimizing network costs and operations. It is not a one-size-fits-all approach, but depends on specific priorities, network assets owned and the CSP's stage of readiness for reinvention.



Start at the center: Network-led transformation for growth

Network-led **transformation**, a key component of Total Enterprise Reinvention

Starting with the cloud, network-led transformation not only opens the network to offer new products and services and manage network operations more efficiently, but it is also one of the key components of how CSPs reposition themselves with limitless forward-looking capabilities. We call this Total Enterprise Reinvention (TER)[4], a deliberate strategy to achieve perpetual innovation and create new value through a strong digital core.

Digital cores are critical to every industry, and network is an essential component of any strong digital core. CSPs are positioned to drive Total Enterprise Reinvention for themselves and others by providing next-generation networks. How they build out their networks defines how—and which—industries will use their services, directly impacting their bottom lines.

What we're learning from CTOs

When asked about top business priorities:

- **83%** of CSP technology executives cited network infrastructure flexibility as a significant priority for their organization.
- **84%** of CSP technology executives cited improving time to market for new products/services as a significant priority for their organization.

85% of CSP technology executives cited that the ability to scale and innovate using public cloud infrastructure is an important criterion for modern network in their company.

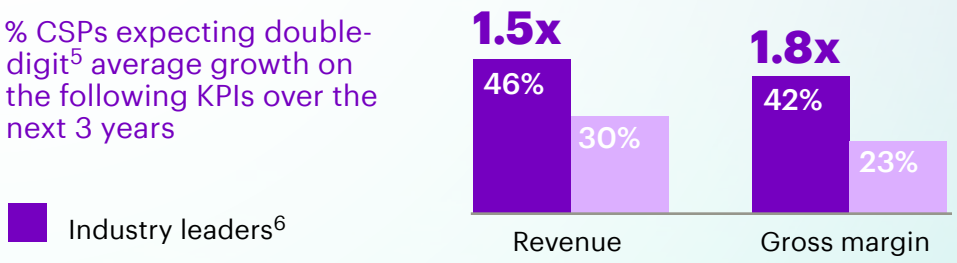
Learning from **early leaders**

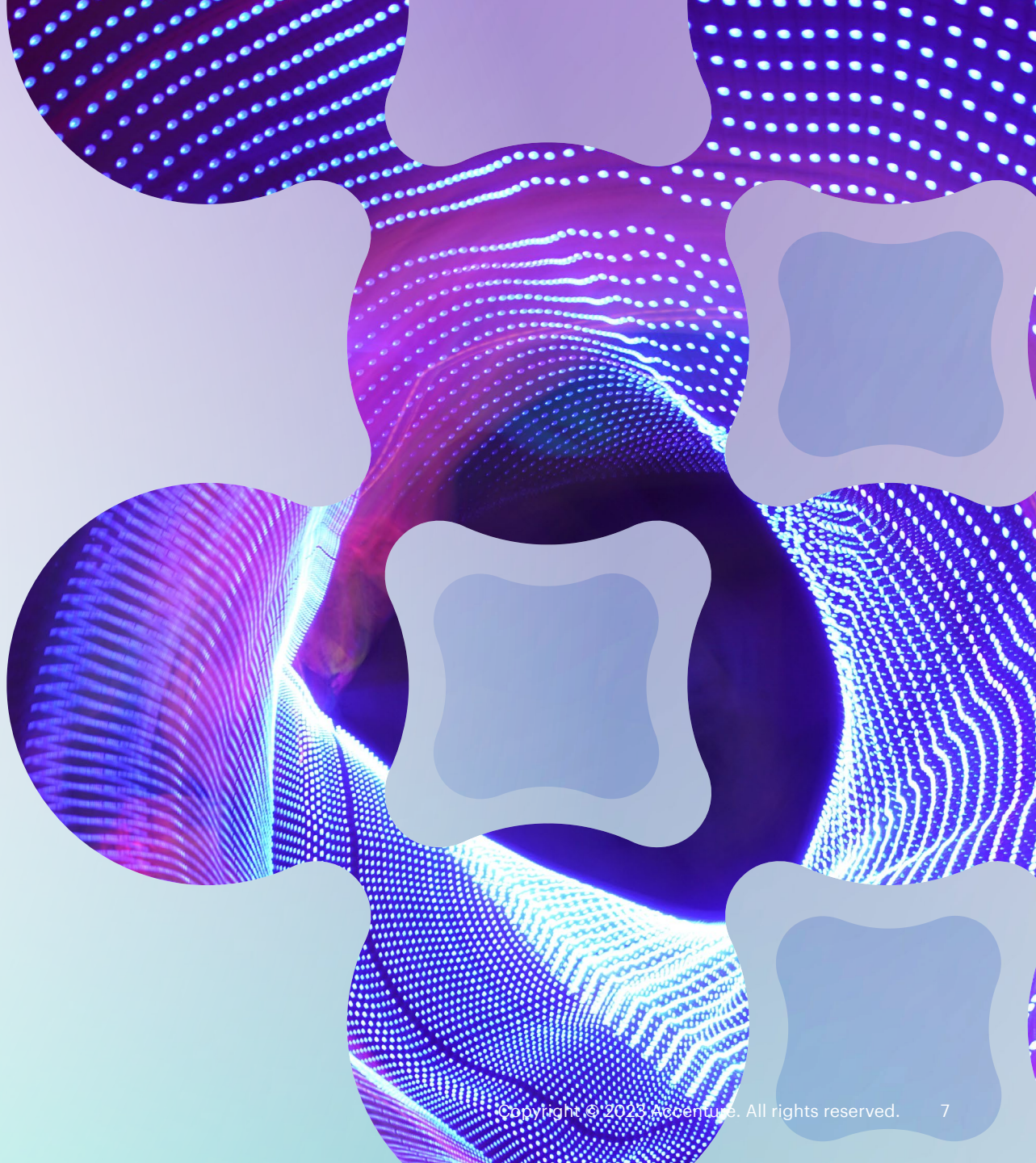
Early leaders spur results through 3 key agenda areas

CSPs leading network transformation are expecting tangible results from their investments. In our study, 77% of executives believe the network transformation efforts currently in place will have a high impact on their revenue and margin performance in the next three years.

Only 13% of those surveyed, however, are accelerating their investments in next-generation networks. These leaders have higher expectations about their future performance. We identified this leading group based on their positive projected financial and operational outcomes for the next three years. Specifically, they expect 1.5 times revenue and 1.8 times gross margin over others in that timeframe.

% CSPs expecting double-digit[5] average growth on the following KPIs over the next 3 years





These leading CSPs have the following in common:

1

Higher investments in network, with focus on cloud-based technologies

They have increased network investments by at least 6% in the last year and intend to increase investments in cloud, AI and APIs over the next three years, prioritizing a network-led technology strategy that will transform their entire business.

2

Wider implementation of use cases with next-generation network technologies

They are demonstrating deliberate network builds to enable a flexible architecture and offer new products and services. They have widely or partially implemented use cases that rely on next-generation network technologies such as network cloudification, network APIs, automation and analytics, Open RAN, or 5G SA.

3

Talent and operating model alignment with future priorities

Consistent with their view that technologies are enablers for critical core operation, innovation, scale and growth, these CSPs are aligning talent and operating models with future network environments and the new ways of working they entail.

Proceeding with **purpose**

Leveraging emerging opportunities to deploy and run networks in a way that extracts new value

Accenture's proprietary research and client experiences offer some practical recommendations CSPs can employ to achieve network-led transformation that will advance their progress in Total Enterprise Reinvention.

At a high level, CSPs should pursue building their network as a platform to enable continuous innovation and optimize operations. To enable this reinvention, organizational redesign is key, and includes rethinking about talent and processes. For instance, software product development capability, developer ecosystem skills, AI/analytics skills, new Software Development Life Cycle (SDLC) models, etc. go a long way in building the organization and capability to make this enterprise-wide network transformation a reality.

To achieve this, we put forward three specific recommendations, understanding that each CSP's implementation of this network-led transformation will depend upon its own business priorities and assets owned.

Network-led transformation

A key component of Total Enterprise Reinvention

What we're learning from CHROs[7]

Modern Cloud Champions revealed that those cloud leaders who invest in both people and technology are reaping on average **60% greater workforce and cloud transformation benefits**, when compared to their peers.

- **3x more gains across employee productivity** and cross-functional collaboration and communication.
- **2x enhanced organizational agility** and innovation and improved customer experience.

Organizations that prioritize people and culture as a part of their cloud transformation achieve **60% greater value by increasing their speed and agility.**

1

Re-engineer the network in a cloud-based environment for flexibility and agility

Not every CSP needs network cloud transformation in the same way. Each CSP should define its own network evolution strategy based on its core business strengths, TCO and growth ambitions and stage of transformation relative to 5G, cloud, virtualization, open APIs, operating models and partnerships.

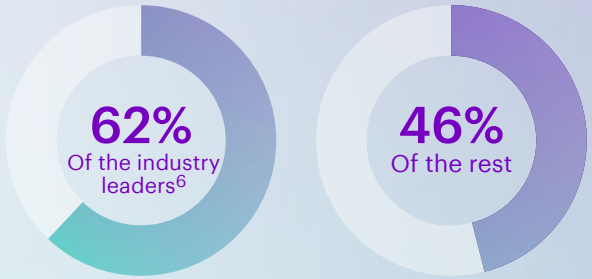
After charting an appropriate strategy, CSPs should further define their ideal future state and, from there, build a roadmap to achieve such. Short and long-term operating models should be flexible enough for agile network evolution.

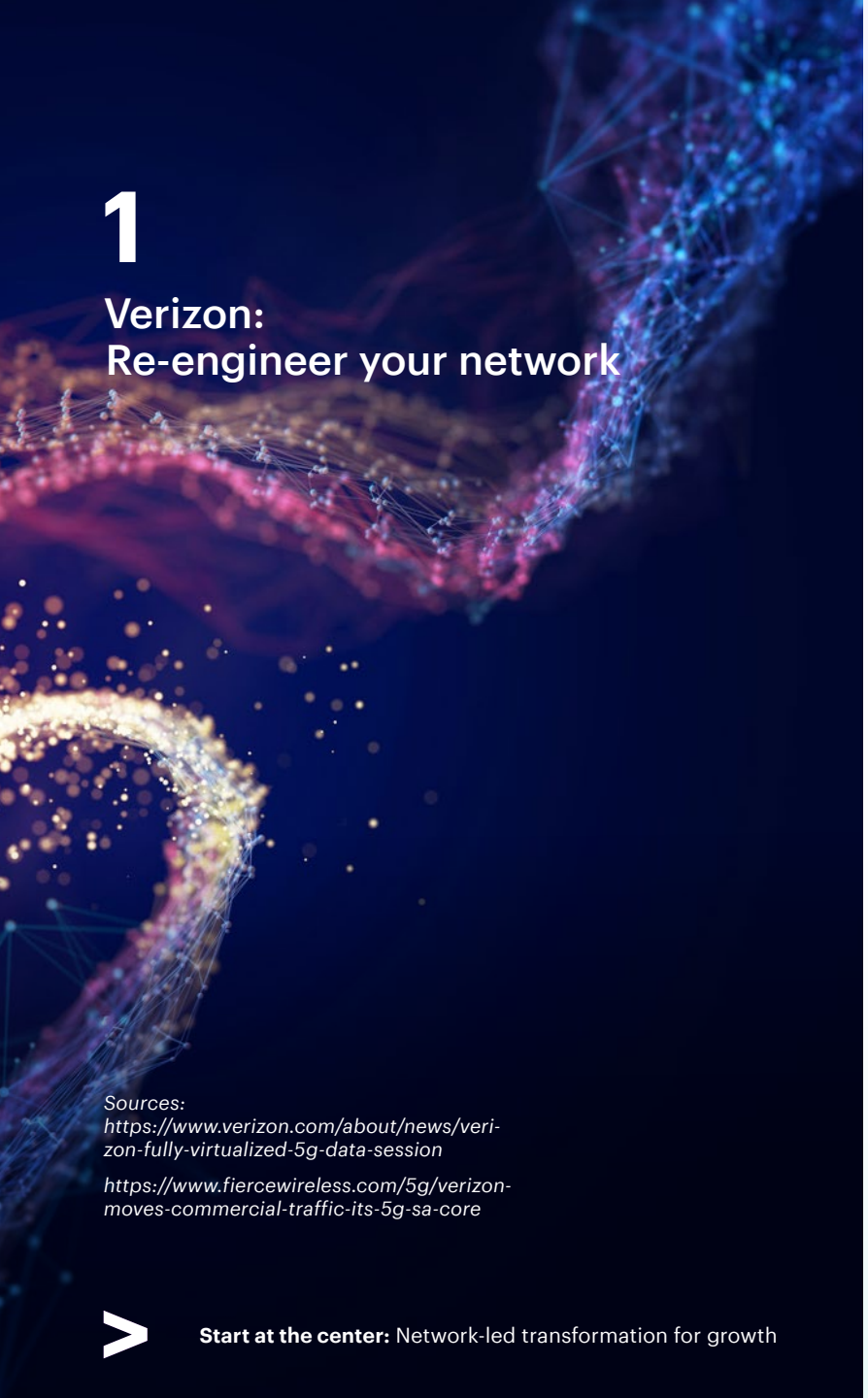
Executing on transformation strategy goes beyond operating models to include relevant processes. A cloud-based tech architecture, for example, must be supported by a talent strategy that ensures applicable skills and vendor management.

Moreover, the ways of working and processes in a CSP organization also need to shift towards an agile mindset. For instance, the adoption of agile software development and operations (DevOps) processes is the first step towards building this cloud-based environment. The design and deployment of cloud-based network that consists of modular microservices requires a highly automated, consistent and reliable set of workflows. End-to-end DevOps automation that spans continuous integration, testing and deployment (CI/CT/CD) pipelines is essential for decreasing the time to market for new services and for eliminating human error in a complex cloud environment.

Of the 13% of survey respondents identified as industry leaders, **62% are widely implementing network virtualization use cases,** versus just 46% of the rest of the sample.

Widely implementing network virtualization use cases





1

Verizon: Re-engineer your network

Verizon, one of the largest communication technology companies in the world, headquartered in the United States, recognized that a traditional network architecture was not sufficient to meet the demands of the digital age, where customers expect fast, reliable and secure connectivity across multiple devices and platforms.

It therefore invested heavily in building a next-generation network, enabled by transformation efforts including virtualization, cloudification and use of advanced analytics and AI capabilities to improve operations. Replacing traditional hardware-based network functions with software-based virtual functions created a more flexible and scalable network infrastructure that quickly deploys and manages new services. While cloud allows the network to scale up or down as needed, advanced analytics and AI capabilities help monitor and manage network performance as well as detect and troubleshoot network issues in real time.

In late 2022, the company began to move customer traffic onto its new cloud-native, containerized 5G core. Its 5G core is built on the Verizon Cloud Platform (VCP), a telco cloud that the carrier built internally based on software-defined networking technology. Verizon runs VCP in its own data centers. VCP will allow Verizon's 5G core to support 5G standalone, hybrid 4G/5G non-standalone and voice over New Radio (VoNR) services. The 5G standalone core's cloud-native virtualized applications support automated network configuration changes, including the ability to scale up or scale down network capacity for different use cases. It allows for real-time resource management of radio access network functions and supports network slicing.

Verizon's network re-engineering efforts serve as a powerful example of how CSPs can leverage new technologies to re-imagine their network infrastructure and differentiate themselves in a highly competitive market. **By embracing virtualization, SDN, cloud computing and network analytics, CSPs can create a more agile, flexible and scalable network that can meet the demands of the digital age.**

Sources:
https://www.verizon.com/about/news/verizon-fully-virtualized-5g-data-session

https://www.fiercewireless.com/5g/verizon-moves-commercial-traffic-its-5g-sa-core

2

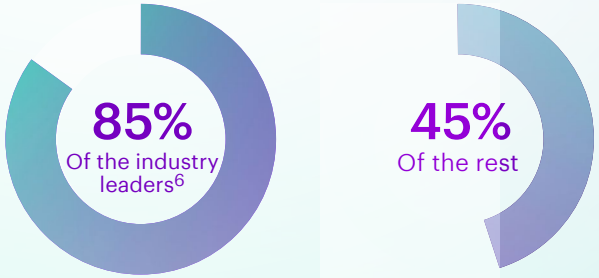
Optimize network deployment and operations with the power of automation and analytics

Applying advanced AI and analytics in network deployment can help boost efficiency, optimize capital and operating expenditures and unlock funds in the short term to reinvest in other growth-focused areas.

Intelligent network deployment facilitates automation, which can lower TCO and time-to-market. It can also lower the cost of legacy technologies through right-sizing, rapid automation and aaS partnerships. Meanwhile, today's AI optimizes network planning, deployment and orchestration. Generative AI has the potential to bring new benefits such as designing and automating network site configurations. Easier validations and fine-tuning will further speed up time-to-market.

When it comes to implementing use cases based on network automation and analytics, 85% of the companies we identified as leaders are widely on this path, while 55% of the remaining respondents are only piloting or partially implementing these technologies.

Widely implementing use cases based on network automation and analytics



2

Bharti Airtel: Data-driven business outcomes using predictive, autonomous network operations model

Sources:
https://inform.tmforum.org/research-and-analysis/case-studies/airtels-data-driven-transformation-journey/

https://www.ericsson.com/en/press-releases/2020/7/airtel-renews-pan-india-managed-services-partnership-with-ericsson

Airtel, the second largest CSP in India, wanted to stay ahead in a hypercompetitive market fraught with low Average Revenue Per User and high churn rates, and looked to its network as a point of competitive differentiation. Tracking customer complaints as a network performance measure, its traditional approach was not up to the task of maintaining and improving the customer experience. The reactive approach proved too people- and OpEx-heavy.

To solve for this and secure a stronger future, Airtel embarked on a 3-year transformation journey in partnership with Ericsson to shift network operations to a predictive, autonomous model. By deploying closed loop automation and optimization to deliver next-generation networks with zero touch operations, Airtel increased network efficiency, controlled costs and improved the customer experience.

Doubling the amount of automation in its network (including fully automating 69% of their alarms) and using cloud technology for an end-to-end view of operations produced dramatic results in service uptime and service fulfillment metrics Airtel reduced work orders per node, mean time to repair (by 29%) and network unavailability (by 47%), contributing to customer experience improvement of 26%.

Airtel's use of data to predict and resolve potential network issues mitigates disruption before the customer is even aware. The company's transformation journey continues as Airtel moves towards fully automated, predictive operations.

3

Strategically open the network to enable new products and offerings

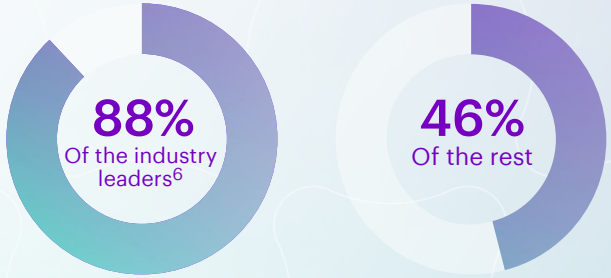
Standardized network APIs encourage third-party developers to build solutions on an existing network platform. This can drive innovation by giving developers access to data collected within the network to build new solutions and reduces time-to-market. Designing and launching advanced network solutions also supports new use cases leveraging tailored Service Level Agreements.

Efforts to enable this kind of collaboration are already underway. For example, the global mobile trade association, GSMA, has launched the Open Gateway framework. Backed by 21 leading network operators, Open Gateway allows the developer community to create new applications and CSPs to open new models of consumption and monetization for their networks, thereby accelerating innovation in the telecom industry. Examples of services supported by the introduction of GSMA Open Gateway include Edge Site Selection and Routing to support autonomous vehicles and verify location for fleet management and incident reporting. Open Gateway also supports SIM Swap to combat financial crime and QoD for drones, robotics, extended Reality (XR) and immersive online gaming.

The key to this open network strategy is embracing the fact that new products and offerings require an accompanying product strategy. The network design and organizational design will run hand-in hand to deliver the success.

88% of the companies we identified as leaders widely implemented use cases that rely on network APIs versus 54% of the rest of the sample that are still in the pilot or planning stage.

Widely implementing use cases based on network APIs



What we're learning from CPOs

When asked about top business priorities:

- **82%** of CSP offering/customer experience/product executives cited enhancing overall end user experience as a significant priority for their organization.
- **86%** of CSP offering/customer experience/product executives cited improving network availability as a significant priority for their organization.

88% of CSP offering/customer experience/product executives cited that the ability to enable extendable functionalities through network APIs is an important criterion for modern network in their company.

3

Vodafone: Open network capabilities to scale and monetize the new

Sources:
https://www.gsma.com/newsroom/press-release/gsma-open-gateway/

https://www.vodafone.com/what-we-do/technology/network-as-platform-naap

https://careers.vodafone.com/life-at-vodafone/projects-stories/flexible-accessible-simple-welcome-to-vodafones-network-as-a-platform-naap-service/

In 2022, Vodafone launched 'Network as a Platform (NaaP)' to provide its own product creators and software engineers as well as third-party developers and businesses access to its advanced network capabilities—data transmission at gigabit speeds with minimal latency, accurate location-tracking of specific devices, cloud-based services and more.

Vodafone's strategy is to identify key network features and capabilities, develop microservices to abstract all the underlying complexity in the networks and present those capabilities as simple APIs in a centralized cloud-based API catalogue. For each additional network capability, Vodafone develops a simple plug-and-play API in a format that is easy to integrate into new products or services. As the API catalogue is deployed on modern cloud platforms, it gives third parties access to these APIs, allowing them to innovate with advanced network functionalities and custom-build new products and services.

NaaP gives developers access to application programming interface (API)-rich environments to create new applications and unlock new sources of revenue. **This modern, cloud-based strategy translates into a short time-to-market and gives Vodafone the flexibility to modify, update or innovate its product portfolio.** NaaP lowers the entry barrier for new services, encourages innovation and enhances customer experience.

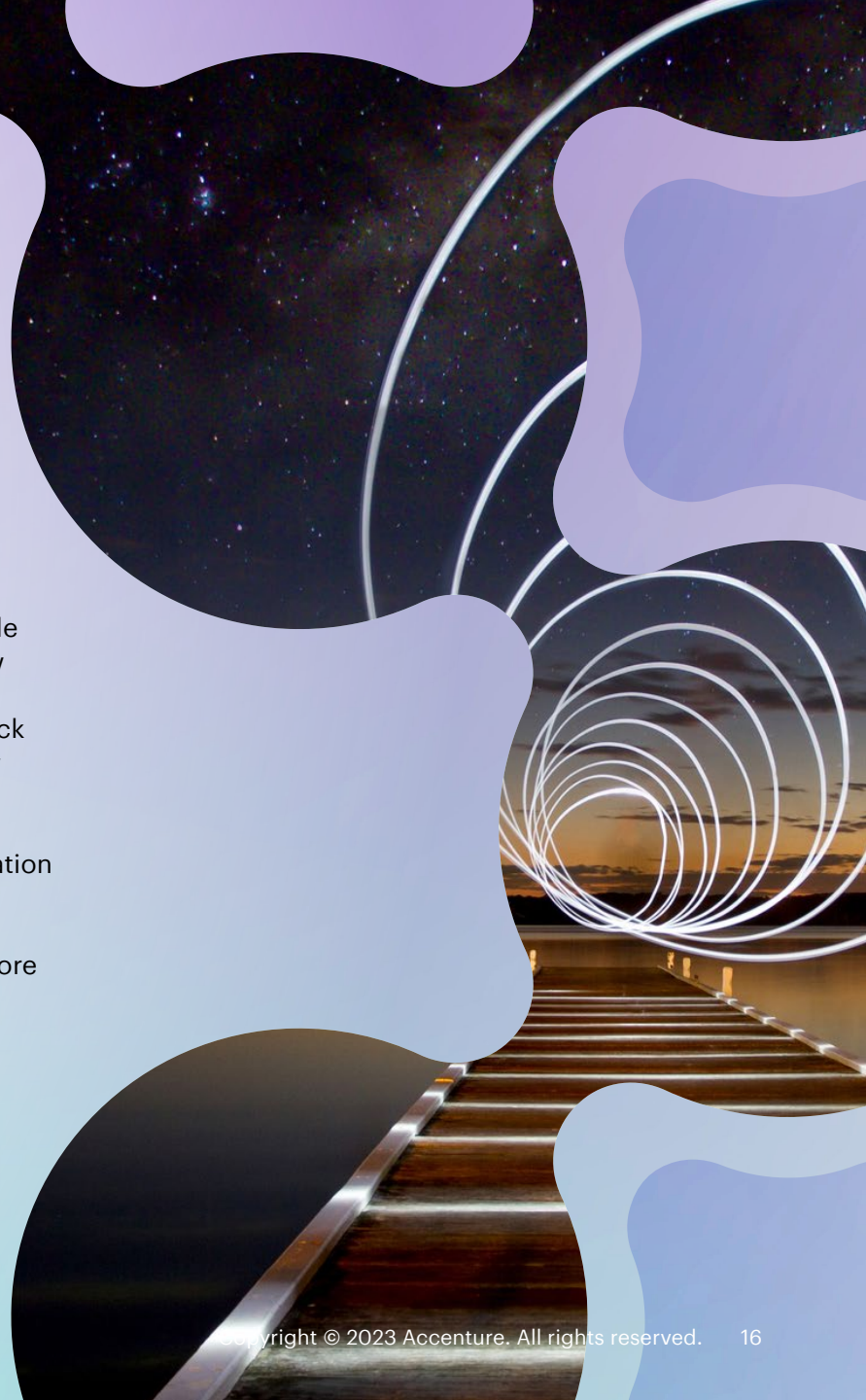
Sharper, smarter, **repositioned**

In yesterday's world, CSPs made heavy investments in physical network infrastructure, across both fixed and wireless business. A new approach from successful industry leaders, illustrates a mindset shift to a forward-looking investment strategy with network transformation at its center. In this new approach, network includes cloud, data, AI and other next-generation technologies with the explicit intent to build new opportunities for CSPs to extract more value.

To truly maximize return on network investments and optimize network life cycle, CSPs must focus on network-led transformation. In practical terms, CSPs do this by building their network as a cloud-based platform that will enable them to innovate and deploy advanced technologies while scaling network delivery. This naturally facilitates an environment that optimizes operations and network costs. Networks will run faster, better and cheaper. Across the enterprise, network-led transformation bolsters a range of C-suite objectives, maximizing revenue potential and supporting new, more customized products and services for end users.

There is no single network transformation path for all CSPs, yet each must adopt an approach that redesigns the network to enable continuous innovation through new technical capabilities. As these capabilities advance, they will unlock radically new opportunities for new value creation.

CSPs with a network-led transformation strategy not only open their central asset to offer new products and services and manage operations more efficiently, but also drive network innovation that will become the vehicles for business growth.



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About **the research**

Accenture employed a multi-method research approach. Specifically, the research program included primary survey, case study research and Accenture expert insights.

Survey
Accenture conducted an online study of 200 global CSP senior technology, business & financial and offering & customer experience executives in November-December 2022 across 18 countries, to understand their perspectives on managing existing networks as well as modernizing and investing in advanced networks. The study covered four primary topics:

- CSP network priorities and vision of modern network & differentiation
- CSP network strategy and investment priorities
- Drivers and expected value from CSP network transformation
- Challenges on network transformation journey and solution provider landscape

Eighteen countries were included: Australia, Brazil, Canada, France, Germany, India, Italy, Japan, Netherlands, Poland, Singapore, South Africa, Spain, Sweden, Switzerland, United Kingdom, United Arab Emirates and United States.

Case study research and Accenture expert insights
To complement the survey findings, Accenture collected case studies focusing on the evolution of advanced CSP networks, its transformative impact on the business, and the best practices. The research team drew further insights from Accenture executives' experience actively working with clients on their plans for CSP network transformation.

References

[1]Investment on network transformation includes spend on network design, build, operations, management across hardware, software, and services excluding cost and spectrum licenses.

[2]Analysys Mason: Telecoms capex: worldwide trends and forecasts 2021–2027

[3]Analysys Mason: Network cloud infrastructure: worldwide forecast 2022–2027

[4]Accenture Total Enterprise Reinvention (Jan 2023), https://www.accenture.com/us-en/insights/consulting/total-enterprise-reinvention

[5]Respondents which expect a growth of 11% or more

[6]**Industry leaders (13% of the respondents)** Accenture identified a select 13% of the respondents on the path of network-led transformation. The analysis is based on a customized weighted index created on three foundational pillars: next-gen network tech adoption and planned investments, effectiveness in adopting new technologies/capabilities and network workforce put through training & certification programs to reskill and upskill for modern network environment.

[7]https://www.accenture.com/us-en/insights/consulting/cloud-workforce

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