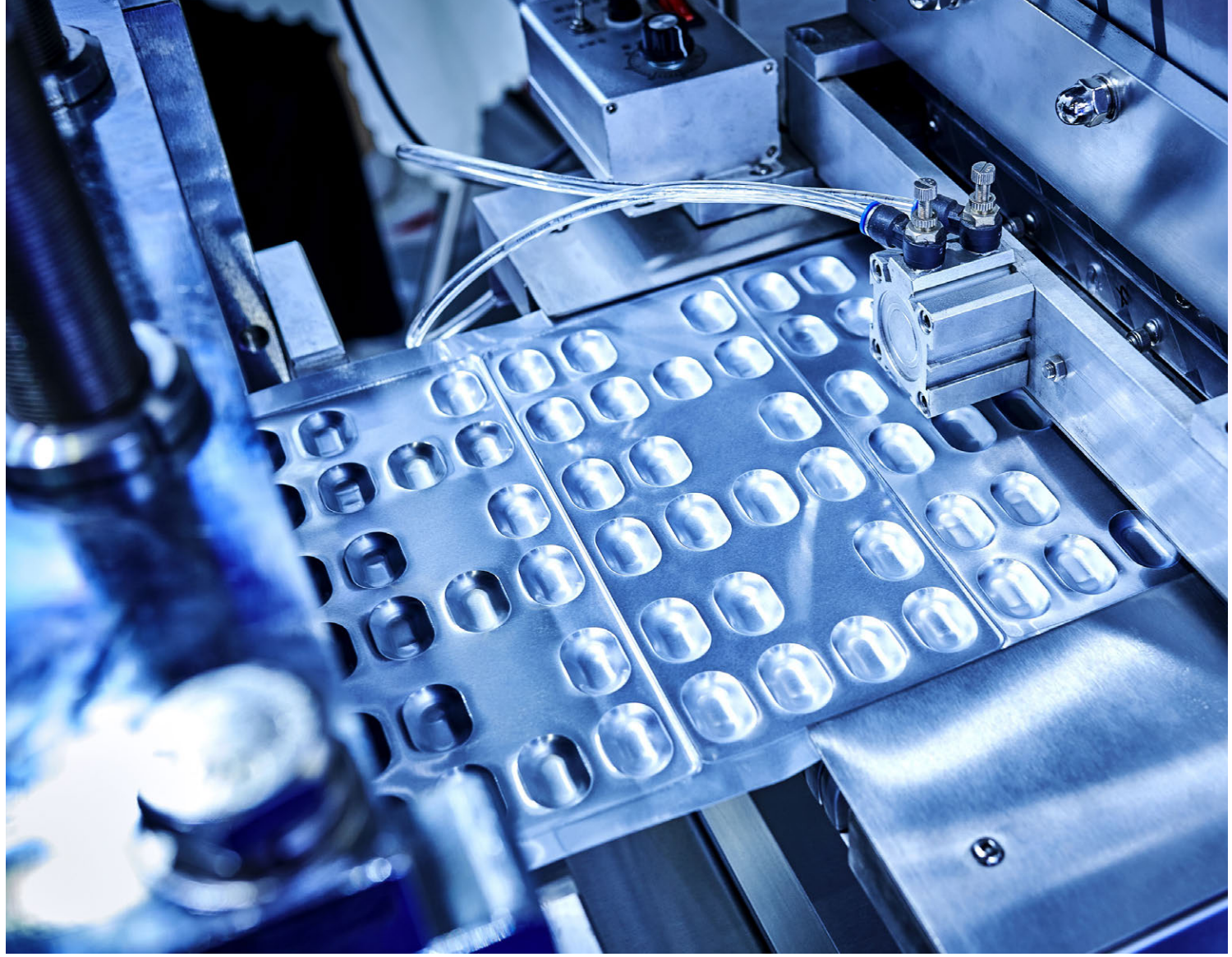
Modern Networks

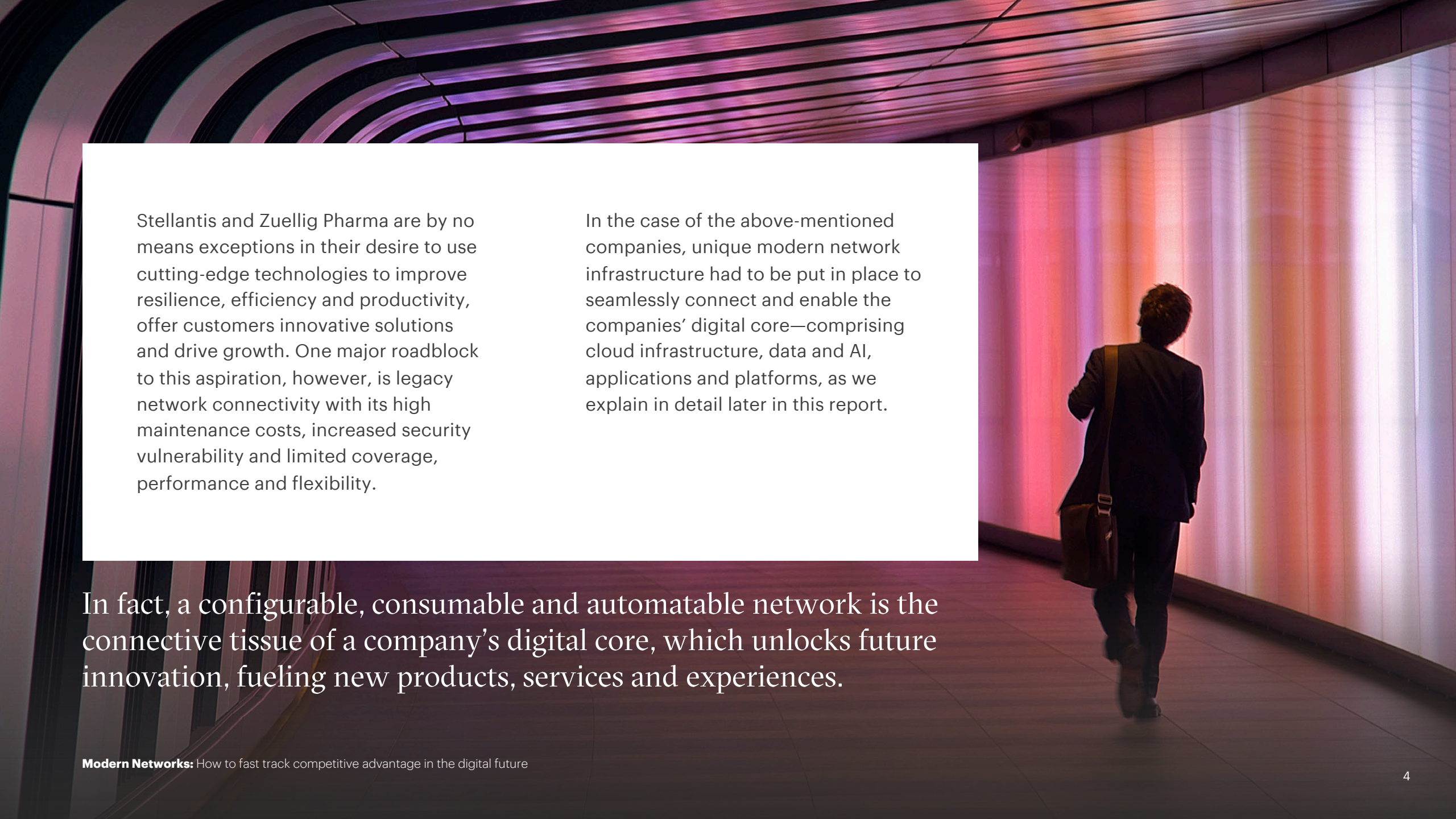
How to fast track competitive advantage in the digital future

New technologies and a digitalized world require a modern network

Zuellig Pharma, one of the world's largest healthcare services companies, located in Asia, wanted to implement automated solutions in its warehouse to improve efficiency, inventory visibility, worker safety and, crucially, order throughput—the number of orders fulfilled from a single warehouse at any point in time. For instance, "picking"—the process of manually selecting items for shipping—was labor intensive, especially as orders increased in volume and variety. It was therefore ripe for automation. Possible solutions included AR vision picking and drone inventory management (using drones to conduct inventory counts).

Halfway across the world, in a very different industry, **Stellantis, a leading global automaker,** was looking to integrate artificial intelligence, video analytics, cloud computing and Internet of Things (IoT) to power innovative, customized solutions for its clients and to improve productivity. For example, it wanted to use video analytics to continuously capture images of a vehicle's movement along the production line. This would help them conduct quality inspections and seamlessly visualize different iterations of their car models on the assembly line itself to customize components and accessories to client requirements.





Stellantis and Zuellig Pharma are by no means exceptions in their desire to use cutting-edge technologies to improve resilience, efficiency and productivity, offer customers innovative solutions and drive growth. One major roadblock to this aspiration, however, is legacy network connectivity with its high maintenance costs, increased security vulnerability and limited coverage, performance and flexibility.

In the case of the above-mentioned companies, unique modern network infrastructure had to be put in place to seamlessly connect and enable the companies' digital core—comprising cloud infrastructure, data and AI, applications and platforms, as we explain in detail later in this report.

In fact, a configurable, consumable and automatable network is the connective tissue of a company's digital core, which unlocks future innovation, fueling new products, services and experiences.

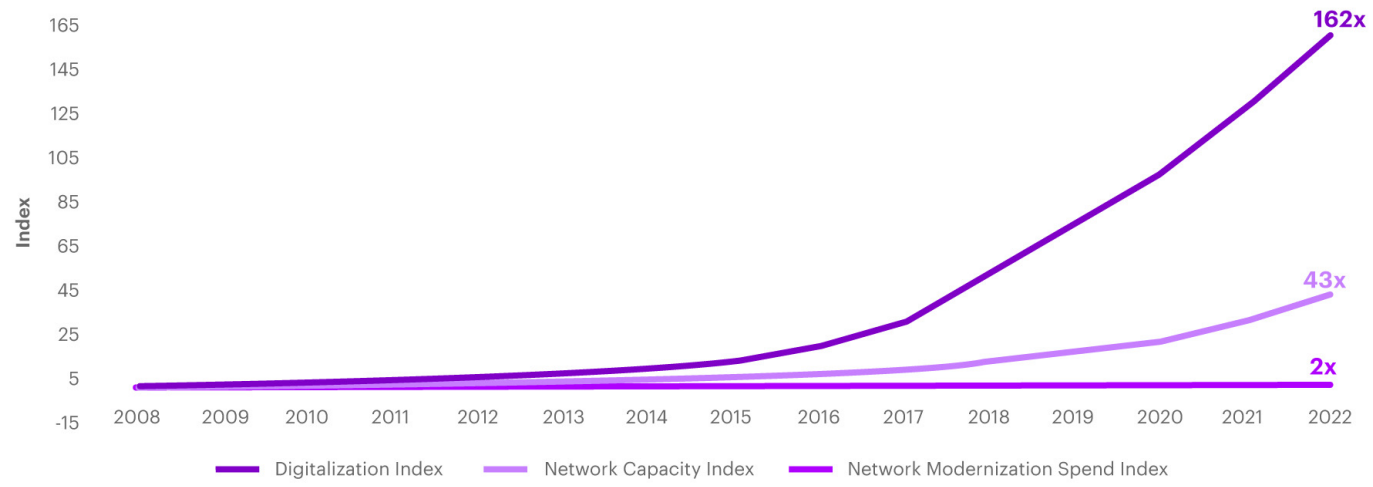
Rapid digitalization calls for a sea change in network

The benefits of next-gen technologies are driven at least in part by rapid digitalization of every aspect of business, and indeed, everyday life. Their adoption has led to an aggressive rise in enterprise data generated, shared and processed, as well as expanded enterprise workloads and higher storage and computational requirements. While it has provided a unique opportunity for businesses to drive innovation and growth, this explosion of digitalization combined with the surge in new technologies available to enterprises (and the volume of data generated and used) has put a strain on current networks which, for the most part, haven't kept pace with evolving business needs.

As Figure 1 shows, digitalization has increased exponentially, growing 162 times during the last 15 years, as measured by the adoption of digital technologies and growth in data, devices, storage, cloud, compute and connected endpoints. But network capacity (growing 43 times) and innovation spend on network (growing just two-fold) have clearly fallen behind.

Figure 1

Digitalization Index vs. Network Capacity Index vs. Network Modernization Spend Index



- **Digitalization Index** is a metric that measures the level of digital adoption and transformation of enterprises. This index considers various indicators, including adoption/increase in enterprise cloud, data, storage capacity, IoT devices, device penetration and connected endpoints.
- **Network Capacity Index** is a metric that measures the maximum capacity of data transmitted across all networks globally.
- **Network Modernization Spend Index** is a measure of innovation spend by enterprises on network and connectivity infrastructure.
  It is developed using primary survey data for four years (2019-2022), and prior historical data assumes similar average growth rates.

Businesses are aware that current networks are becoming a bottleneck to enterprise reinvention.

87%

of respondents in our global survey of 1,000 business and IT executives said the growing data demands of their new AI systems have outstripped the current capabilities of their networks.

These demands will only grow faster. Enterprise data is expanding at breakneck speed and scale. By 2026, data generation will jump more than 2.5 times to 7.0 Petabytes per second from 2.7 Petabytes per second in 2021.[1] Moreover, technologies such as generative AI and large language models (LLMs) are putting new and heavier demands on networks.

For instance, modern LLMs require massive amounts of data to learn the patterns and structures of natural language, and training them calls for congestion-free, high-capacity networks that are available, efficient, reliable and secure and can keep up with the speed of business.

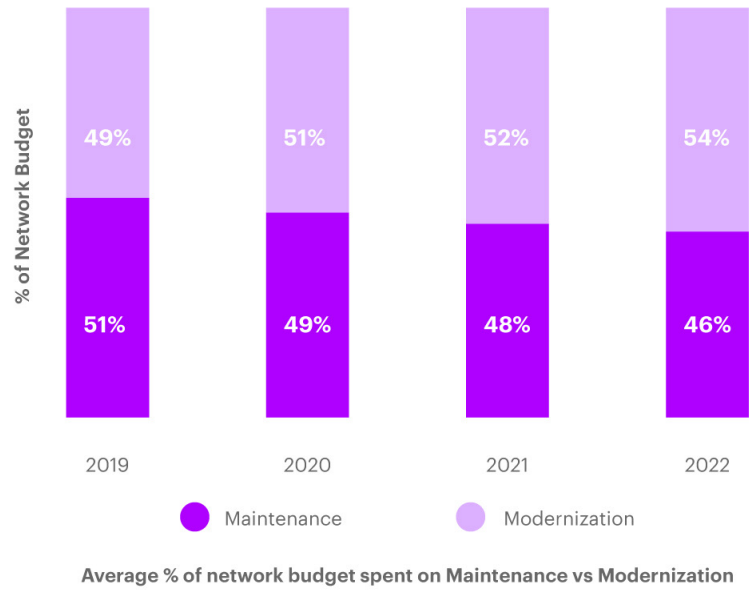
An overhaul of enterprise networks is overdue

To understand how aware enterprise executives are of their connectivity needs and what their plans are regarding network upgradation, we conducted an online survey of 1,000 senior technology and business executives and carried out detailed interviews with 11 subject matter experts from various industries. In the online study, we explored their perspectives about managing existing networks as well as modernizing and investing in advanced networks. (See the About the Research for more.)

We learned that leading companies are making sizeable investments, spending close to 24% of their total IT budgets, to bolster network connectivity. Forty-five percent of executives said they have seen 6% or more growth in network investment during 2021-22, while a greater number, 75%, said they are planning to grow investments by that amount during 2022-25.

Executives also acknowledged that a modern network is a pre-requisite to transforming the business, enabling better outcomes for companies' workforce, customers and partners. Eighty-four percent cited increasing customer value, improving productivity and lowering costs as the top three business impacts expected from network transformation. Two-thirds of the executives confirmed having a unified network strategy in place at their organizations instead of ad-hoc or local management of issues and increasing network investments.

Yet, current investments are heavily weighted towards maintaining legacy networks. Evaluation of companies' maintenance and modernization budgets for the last four years shows that almost half of overall network budgets are still spent on maintenance activities. While the share of maintenance has been on the decline, the pace of change is too slow.



Average % of network budget spent on Maintenance vs Modernization

As a result, the adoption of new network technologies—for example, 5G, Private Cellular Networks, Cloud Wide Area Network (Cloud-WAN), Low-Earth Orbit (LEO) Satellite Networks, Wi-Fi 6E, etc.—and advanced network solutions (for example, cloud, edge and AI-based operations) is low. For instance, 45% of surveyed enterprises have not yet adopted SD-WAN solutions. When it comes to wide implementation of advanced wireless technology use cases across the organization, progress is limited:

- 37% of companies have widely implemented 5G use cases
- 17% have widely implemented Wi-Fi 6 use cases
- 15% have widely implemented Wi-Fi 6E use cases
- Only 4% of enterprises are planning to set up a “new” campus network

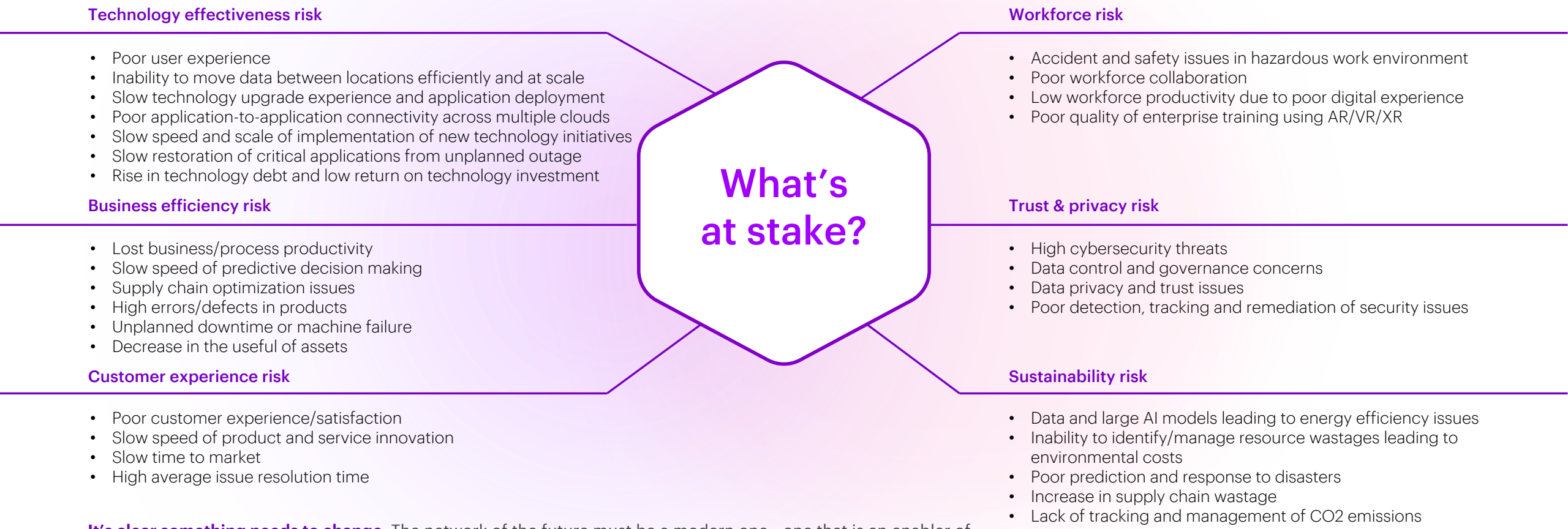
This slow pace of network modernization often leads to a downward spiral of technology debt, limited innovation, escalating costs and added security holes. As network teams make incremental modifications to a system over time without removing obsolete functions or rearchitecting, the system becomes increasingly complex, less predictable, difficult to maintain and upgrade and nearly impossible to scale quickly. Adding complexity may often be tactically correct at a given time—but strategically wrong.

More than half of the executives surveyed cited security breaches, high cost of deployment/maintenance, inconsistent availability and low capacity as the top issues bogging down current network infrastructure. **These factors can result in the bulk of networks underperforming** and contributing neither to innovation nor to resilience.

A staggering 64% of surveyed companies face significant risks across various domains due to network deficiencies. Six domains stand out as likely to be most affected (as seen in Figure 2): technology effectiveness, business efficiency, customer experience, workforce, trust & privacy and sustainability.

Figure 2

Business risks due to inadequate network infrastructure



It's clear something needs to change. The network of the future must be a modern one—one that is an enabler of future technologies and innovation, not a cost center that confines the enterprise to the present.

What a modern network looks like

A modern network enables various layers of a company's digital core comprising cloud infrastructure, data and AI, applications and platforms and incorporating other new technologies that will enable forward-looking capabilities. A modern network helps drive flexibility, resilience, innovation and, ultimately, Total Enterprise Reinvention.

Enterprises' expectations from a modern network

89%

of enterprises see a modern network as an enabler of trusted, secure IT architecture.

84%

cited improved security and data governance as a significant business outcome of network modernization.

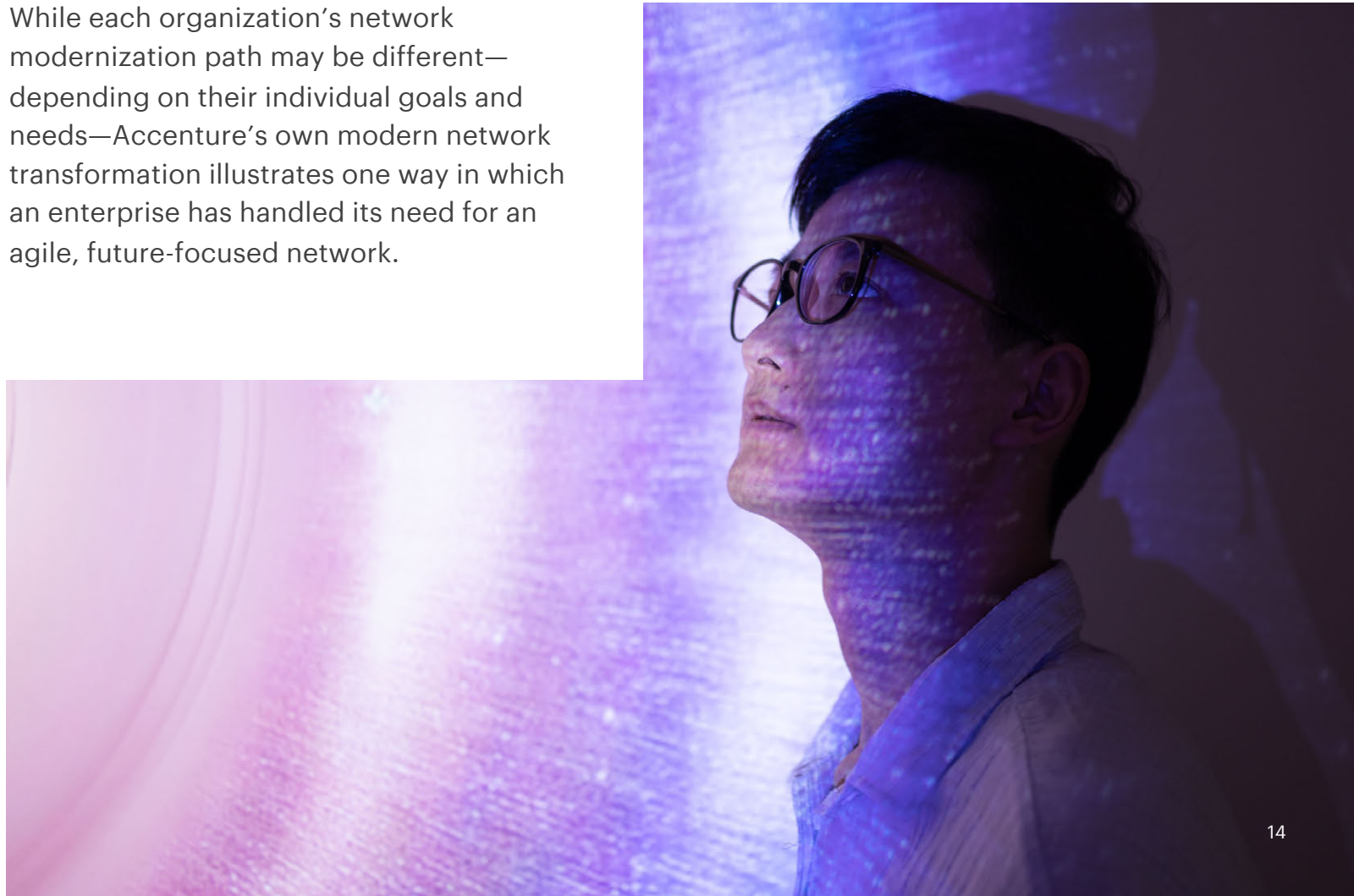
88%

consider it a determinant of how enterprises move data between locations efficiently and at scale.

80%

or more expect a modern network to provide superior user experience in the cloud, be easy to deploy/ consume and enable critical applications.

While each organization's network modernization path may be different—depending on their individual goals and needs—Accenture's own modern network transformation illustrates one way in which an enterprise has handled its need for an agile, future-focused network.



Rethinking Accenture's enterprise connectivity to achieve an agile, secure and cost-efficient network

Accenture's enterprise network is critical to connecting its workforce of 738,000+ employees serving clients across 120 countries to business applications and collaboration tools. It needs to connect 200 cities with Accenture locations and operations, 575,000+ unique network users and 50,000+ managed network devices and support 15 million daily employee authentications. Over the years, Accenture has been making major and consistent investments to grow, change and improve its enterprise network to handle these demands. This resulted in a global private network of considerable size and complexity with significant operational overhead.

Seeing the global enterprise network as a potential limiting factor for growth, Accenture's Global IT organization developed a program to address the need for a more agile network, future-focused sustainability, reduced cost and a refocusing of the people running its current network.[2]

Accenture's enterprise network transformation program envisages phasing out the traditional network and instead taking full advantage of the cloud WAN and using a global infrastructure-as-a-service like everything else supported on cloud.

The vision is to create an integrated WAN and/or 5G architecture that operates not only between all its enterprise locations, but also between all cloud locations (public, private and hybrid).

This provides flexibility across the network to pick and choose the most suitable cloud services for the organization's specific needs.

Accenture's network transformation is projected to reduce its asset-heavy core and fixed costs. The change enables it to operate in a highly optimized consumption model, only paying for what it needs, with supply aligned to demand in real time.

It is estimated to **generate cost savings of $15–$20 million per year owing to a highly optimized consumption model.** The new security approach is to decouple security from infrastructure and drive by identity and zero trust, where proper and continuous validation between systems and points of access of activity of people is implemented all the time.

Accenture has gained business agility from having an enterprise network that is highly consumable with capacity that can flex up and down in real time. This corporate network for offices and global delivery centers built over multiple years is creating a powerful case study and acts as a north star for its clients as they transform to becoming cloud first.

How can companies build a modern network?

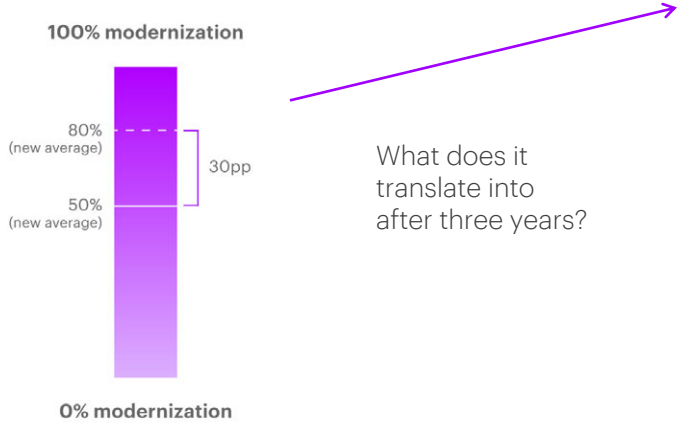
In our research, we found that companies are approaching network transformation differently and with varying degrees of success. Results showed that the companies achieving higher business resilience, cost efficiency and innovation are following three imperatives: They are flipping their budget towards network modernization, adopting a multi-step network transformation approach and making focused progress on advanced network practices that enable a company's digital core.
What does this look like in action?

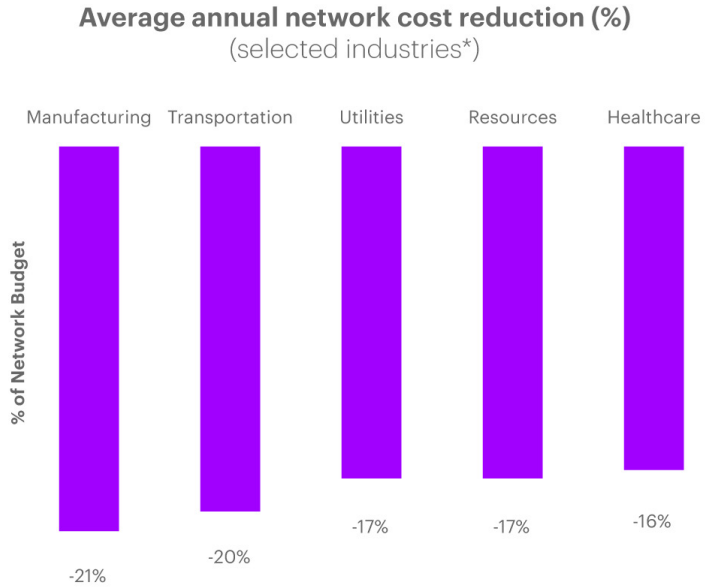
I. Flipping budget toward network modernization

Simply investing more is not the answer; companies need to flip the budget in favor of new, modern networks instead of repairing old, legacy ones. For example, British Sugar (see the case study below) realized that fixes to the legacy system would not help it achieve its Industry 4.0 goals; instead it invested in a holistic network strategy.

This kind of thinking will result in several benefits, creating significant impact across the enterprise. First, shifting budgets towards network modernization reduces capital and operational costs. From the results of our econometric analysis, we found out that companies that shift spend away from maintenance of legacy systems see a decrease in their total annual network spend over the long run.

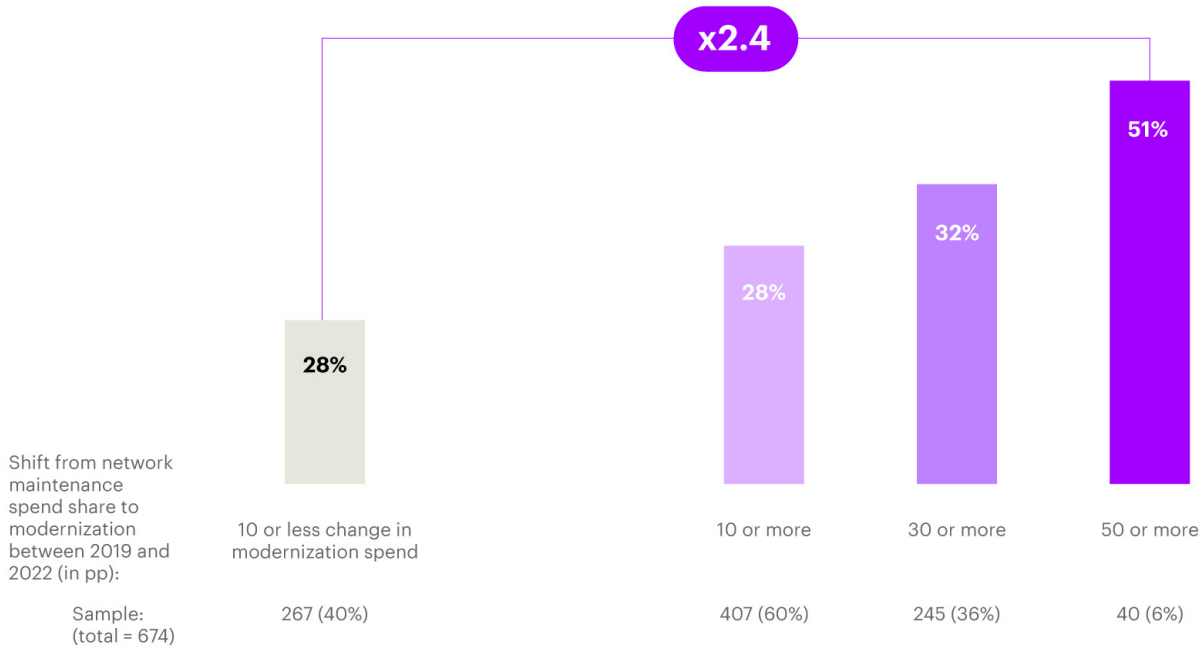
The modelling outcome shows that a typical company that shifts network spend from maintenance of legacy systems to modernization by 30 percentage points over three years, can expect its annual total network spend to decrease by up to 21%. This varies from industry to industry, based on the dynamics of capital and operational cost for each vertical industry.





*Based on 4244 companies of annual revenue size 1bn-10bn USD: Manifacturing (2744), Transportation (385), Utilities (409), Resources (303), Healthcare (403).

Likelihood of being in top 25% among industry peers for innovation spend to revenues ratio in 2022



Secondly, network modernization can take companies one step ahead by helping them drive innovation-led growth in the future. Companies that shifted their network spend towards modernization by 50 or more percentage points are 2.4 times more likely to be top industry spenders on innovation than their peers (top 25% of companies in a given industry when it comes to technological innovation spend-to-revenues ratio).

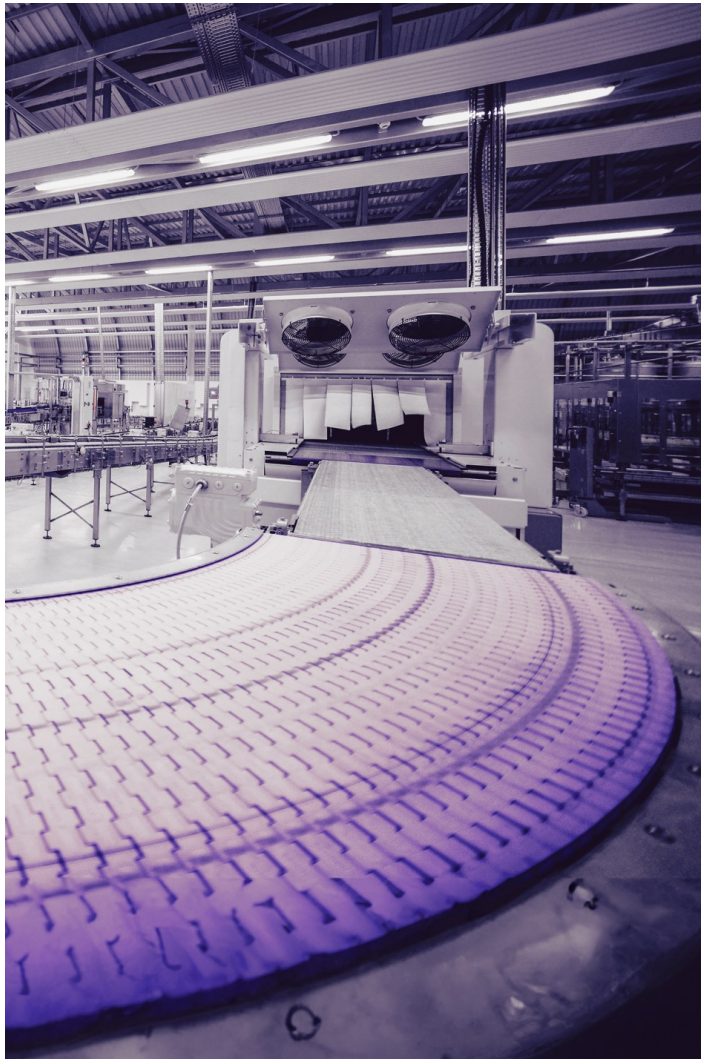
Dedicated next-gen network infrastructure investment in multi-site private mobile network powers British Sugar's Industry 4.0 vision

British Sugar, a subsidiary of Associated British Foods and the sole British producer of sugar from sugar beet as well as medicinal cannabis, identified a need for modern network connectivity to achieve its wider goal of Industry 4.0.[3] The company understood that ad-hoc legacy network fixes will not work. It implemented a unified network strategy and focused on flipping network budget towards modernization to enable its Industry 4.0 ecosystem.

In 2022, it switched on a private mobile network, spanning multiple factory sites across a large geographical area. The new private network provides dedicated, secure 4G connectivity for all British Sugar's manufacturing facilities, as part of a major "factories of the future" upgrade.

Using a 4G private network helped British Sugar increase security and control, and enable seamless, high-bandwidth connectivity in a complex factory setting where introducing Wi-Fi is challenging (due to a highly metallic factory environment with a requirement for both indoor and outdoor coverage across various factory sites).

The network allows British Sugar to **implement next-generation manufacturing techniques** at its sites, **including automated production lines, driverless ground vehicles and connected drones** that can monitor tall structures such as silos and lime kilns remotely. This will help increase productivity, boost efficiency and improve health and safety on site.



As part of this, British Sugar will fully embrace the Industry 4.0 ecosystem, with **more than 15 different digital manufacturing use cases in plan.** The new private network has been designed to be **future-ready and easily upgradable to 5G** where necessary, as British Sugar looks to introduce more complex processes that will benefit from the higher speeds and lower latency of 5G.

The 4G private network is operational at British Sugar's Wissington site in Norfolk, and benefits are already being realized.

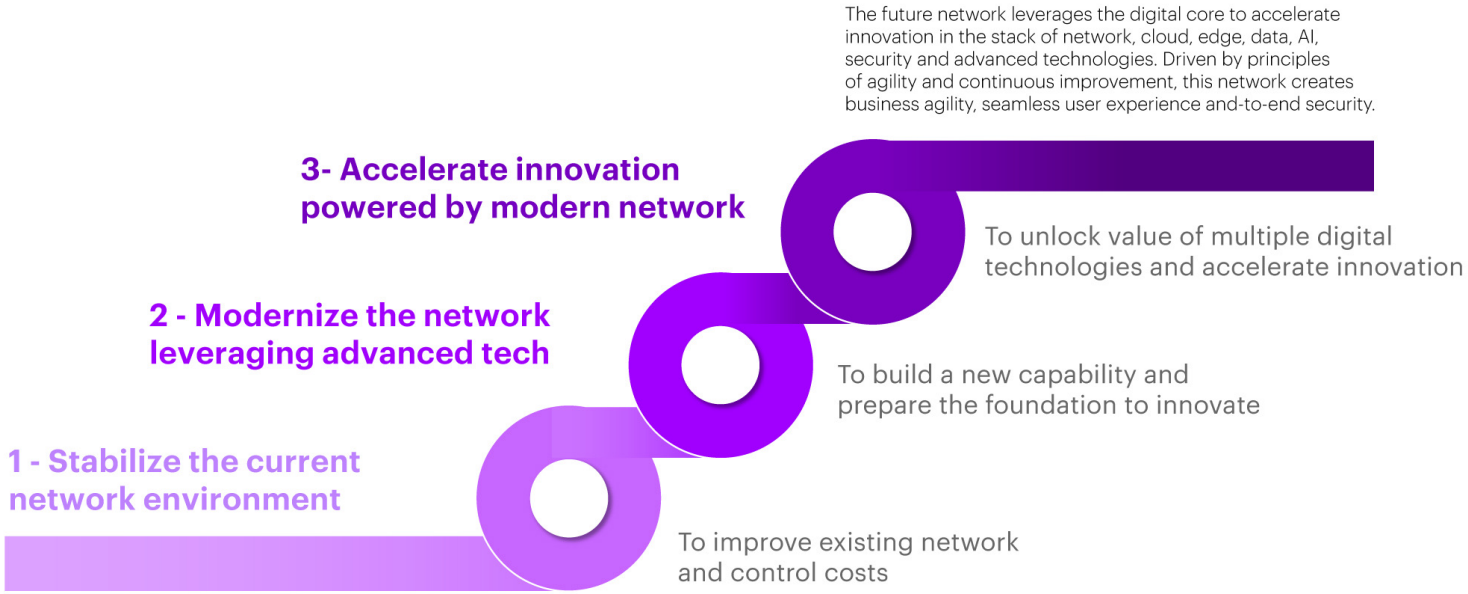
"During testing we were encouraged by the early results seen and as we have begun to roll out the targeted priority use cases to our users, they have been quick to feedback the time savings they have seen—with new plant commissioning, plant testing and day-to-day diagnostic processes being highlighted in particular." - *Nick Smalley, Program Manager at British Sugar*

II. Stabilizing the current network, then modernizing it and accelerating innovation

While there's no one-size-fits-all approach, network transformation can be visualized as a continuum of multiple steps: stabilizing, modernizing and accelerating, while optimizing the network at every step. These steps should be adapted to suit the company's specific business priorities and stage of readiness for transformation.

The first step is to stabilize the existing network vis-a-vis application performance in an increasingly hybrid cloud environment to reduce incidents, eliminate network inefficiencies and enhance user experience. Once stabilized, modern elements such as software-defined, cloud-based network infrastructure can be introduced to manage connectivity across different parts of the enterprise and prepare the foundation for innovation.

Last comes accelerated deployment of advanced use cases such as real-time asset tracking, AI environmental monitoring and predictive maintenance powered by the modern network and multiple digital technologies—such as digital twin, IoT, AI, analytics—which ultimately leads to disruptive business impact. Each step enables the next one, releasing the benefits of business resiliency, efficiency and innovation-led growth.



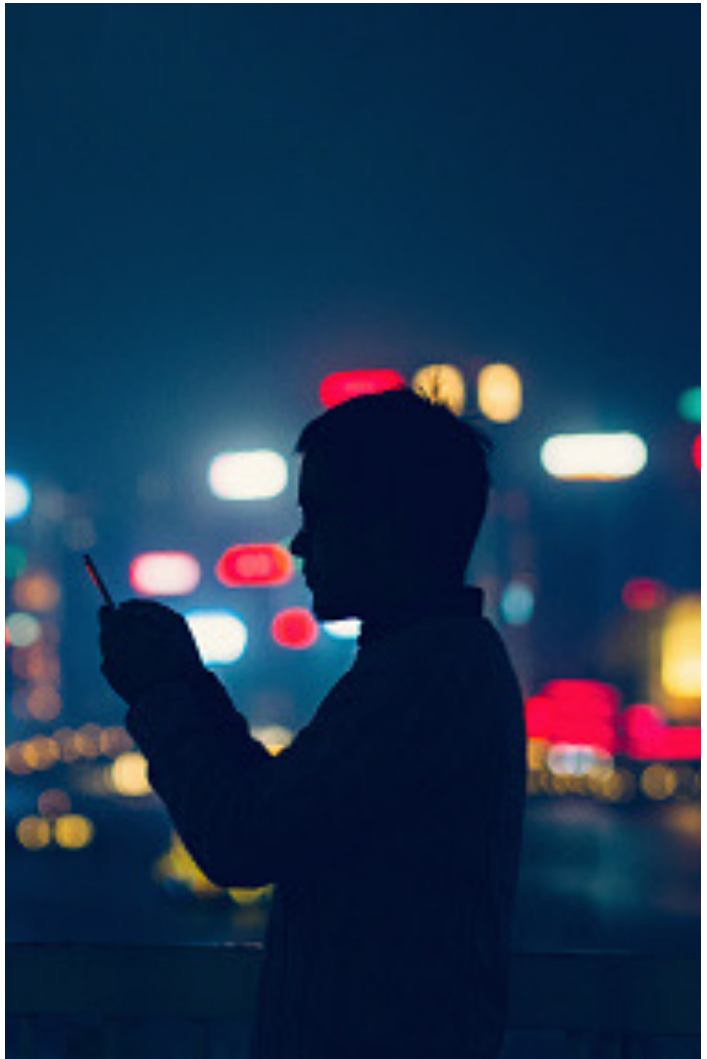
Stabilizing the current network environment involves fixing inefficiencies in the network, reducing incidents, cutting down on operating expenses and harmonizing operations within the legacy network, as in the case of the financial services company which sought to improve its security via a network upgrade (see the case study below). Stabilizing the network can help companies optimize network costs, build resiliency and make operations easier to manage. At this stage, optimization involves automated resolution of network performance issues enabled by real-time data analytics to ensure a stable network.

A financial services company uses cloud-based and automated next-gen network infrastructure to build resilience

Increase of agility in the infrastructure space was one major driver for a global financial services company looking to build a robust resilient software defined network infrastructure. Since a substantial portion of the company's sales come through brokers and agents, a good network is critical for clients and brokers to connect to the system. In such an environment, moving or spinning up new sites is an everyday challenge. With the use of SD-WAN, the provisioning time of sites could be reduced by 75%, based on a lean, cloud facing, architecture and infrastructure backbone.

Accenture partnered with the client to rethink its global network infrastructure spanning across 1000+ sites, 105,000 users, 240,000+ access ports, 6000 router/switches and 4500+ Wi-Fi access points. The SDN transformation involved moving its global network infrastructure onto a single global SD-WAN estate and making the overall architecture cloud-ready via built-upon carrier-neutral colocation services and Internet-as-Transport. Accenture also partnered with the financial services company to execute a large-scale transformation program of the complete data center LAN towards a highly automated software-defined network.

Using transformation factory and tools, the client transformed 1,038 sites to SD-WAN, across 66 countries with 49 business units to next generation network infrastructure. Powered by automation, analytics and advanced infrastructure, this transformation helped the company to achieve substantial TCO reduction while increasing resiliency of the network infrastructure.



The next step is to modernize the network leveraging advanced technologies and capabilities. Even when a legacy network is fulfilling the current needs of an organization, given the pace of technological change, a time will soon come when it will be a bottleneck to business transformation, as can be seen in the case of Stellantis below.

In this stage, companies widely adopt modern network technologies across the organization. This could vary based on enterprises' needs.

For instance, deploying advanced network technologies and capabilities such as 5G, private cellular networks, LEO satellites, Wi-Fi 6E; widely adopting software-defined cloud-based network infrastructure (for example, Software-Defined Wide Area Network (SD-WAN), Cloud-WAN) and embedding advanced controls for security resilience (for example, Secure Access Service Edge (SASE)). In this step, optimization involves proactive network management, continually evaluating the network topology and designing automated improvements to address bottlenecks/ performance issues.

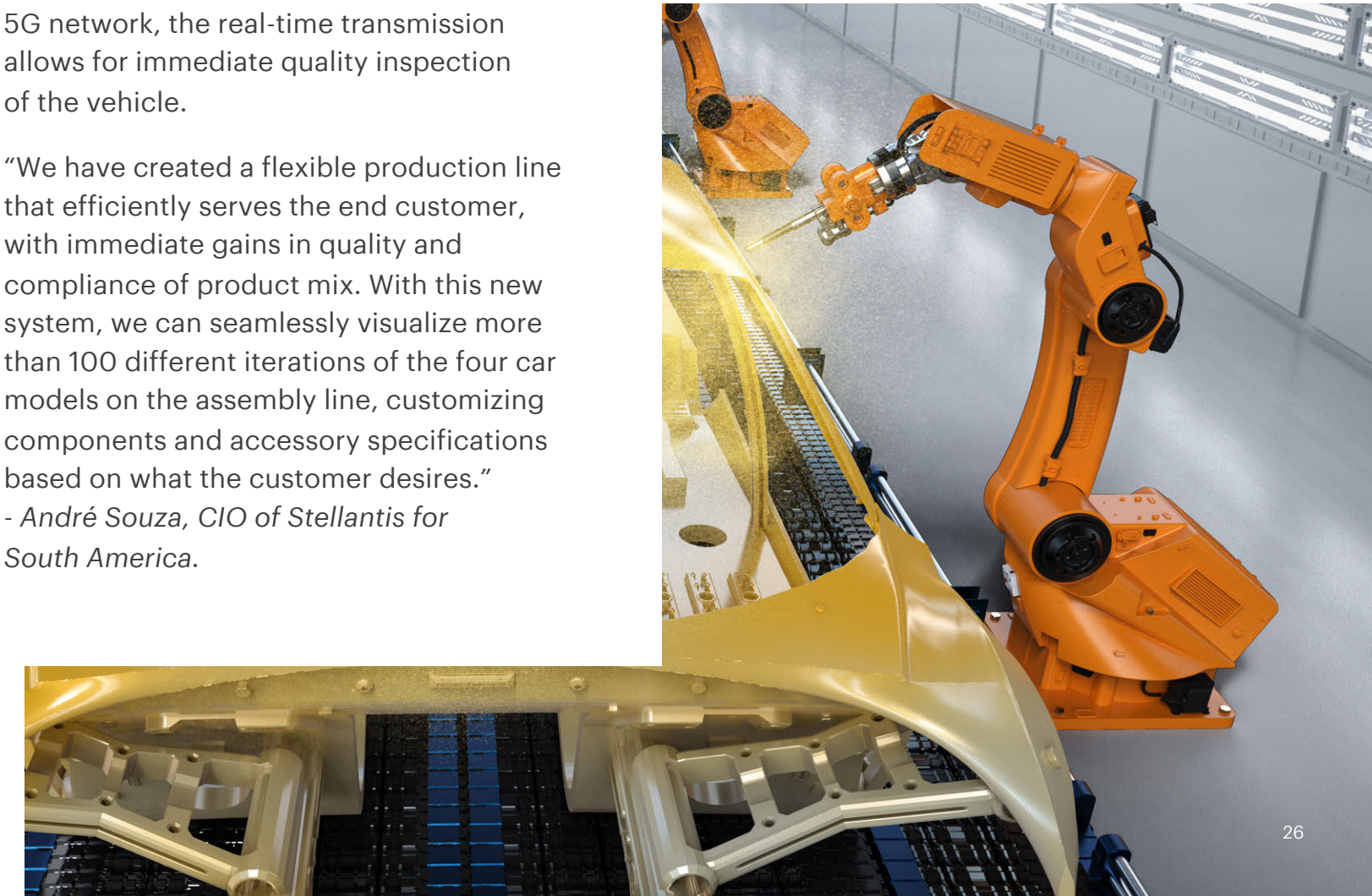
Stellantis modernizes network to support innovation, customization, and higher productivity

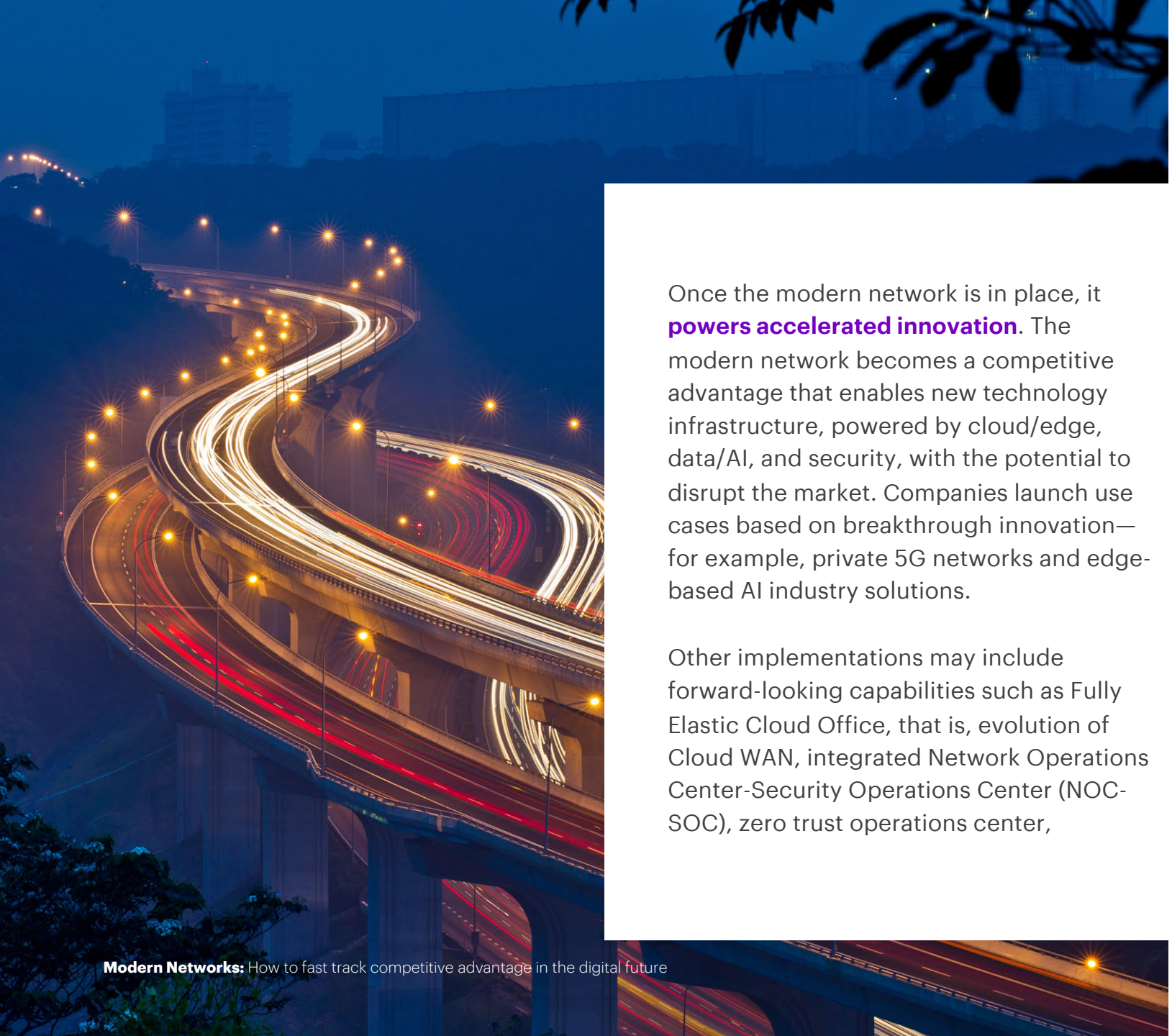
The automaker, Stellantis, wanted to innovate its manufacturing assembly line to offer tailored products to its customers.

To achieve better customization and improve customer satisfaction, Stellantis implemented a private 5G network pilot project at its Brazilian industrial plant.[4]

In partnership with Accenture and TIM Brazil, this implementation integrates artificial intelligence, video analytics, cloud computing and Internet-of-Things into Stellantis' manufacturing processes on the shop floor. For example, Stellantis is using a Private 5G network and video analytics to capture images of a vehicle's movement along the production line—with low latency and the high data threshold of the Private 5G network, the real-time transmission allows for immediate quality inspection of the vehicle.

"We have created a flexible production line that efficiently serves the end customer, with immediate gains in quality and compliance of product mix. With this new system, we can seamlessly visualize more than 100 different iterations of the four car models on the assembly line, customizing components and accessory specifications based on what the customer desires."
- André Souza, CIO of Stellantis for South America.





Once the modern network is in place, it **powers accelerated innovation**. The modern network becomes a competitive advantage that enables new technology infrastructure, powered by cloud/edge, data/AI, and security, with the potential to disrupt the market. Companies launch use cases based on breakthrough innovation—for example, private 5G networks and edge-based AI industry solutions.

Other implementations may include forward-looking capabilities such as Fully Elastic Cloud Office, that is, evolution of Cloud WAN, integrated Network Operations Center-Security Operations Center (NOC-SOC), zero trust operations center, intent-driven autonomous network, Automated Moving Target Defense (AMTD), that is, evolution from Secure Access Service Edge (SASE).

At this stage, optimizing means forecasting future network demands through active monitoring and predictive forecasting and enabling fully automated, proactive network operations based on live and historical network data.

The example of Zuellig Pharma below illustrates how companies can use a modern network can fuel next-level innovation.

Zuellig Pharma builds a future connected warehouse with an innovative Private 5G Network platform

Zuellig Pharma, one of the largest healthcare services companies in Asia, was looking to improve warehouse efficiency, inventory visibility, worker safety and, crucially, throughput—how many orders the company fulfills from a single warehouse at any point in time.

In partnership with Accenture, SingTel and Ericsson, the company developed a 5G warehouse vision centered around using GENIE, a portable 5G platform that comes in a suitcase-sized container, to test using custom augmented reality goggles to select items for shipping (AR Vision Picking) and 5G-enabled drones to conduct inventory counts (Drone Inventory Management).[5]

AR Vision Picking delivered:

- 30% improvement in pick productivity
- 100% pick accuracy, plus overall increase in safety

Drone inventory counting delivered:

- 95% counting accuracy
- 9 times faster counting speed

"5G has enabled our warehouse operations to be more efficient, productive, transparent and flexible. Its adaptability can help support Zuellig Pharma's evolving needs as we continue to make healthcare more accessible to the communities we serve." - *Maikel Kuijpers, Executive Vice President – Distribution, Zuellig Pharma.*

III. Adopting network best practices across the lifecycle

Accenture's client experiences and proprietary research into various companies' network journeys show that enterprises that have adopted network best practices are also more resilient because of significant mitigation of their risk exposure. The impact is multi-dimensional, covering not only business resiliency but also cost efficiency and innovation. These best practices include the following:

THE NETWORK DIMENSIONS OF SUCCESS

Sync the network strategy with the C-suite agenda

- Sync business strategy and goals at the very foundation of network strategy
- Design unified network modernization and orchestration strategy to meet hybrid connectivity needs
- Strengthen technology infrastructure to enable advanced use cases

Create an elastic, configurable and consumable cloud-first network infrastructure

- Embrace software-defined cloud-based network infrastructure to manage connectivity across multiple clouds
- Embed a 'security first' approach, procedures, and controls for security resilience
- Automate manual processes in the network lifecycle to reduce incidents and reap efficiency benefits
- Accelerate advanced network technology deployment such as 5G, Private Cellular Network, Cloud WAN, LEO Satellite, WiFi 6E, AI drive network automation, etc.

Build future network talent and operational model enablers

- Enable workforce with modern network engineering skills by talent reskilling or working with partner networks
- Sync operating model and processes with the modern network
- Manage effectiveness of network transformation, i.e., speed to launch, ability to scale, and cost efficiency to continuously improve business impact

Sync the network strategy with the C-suite agenda: The first step in modern network planning is to align the company's network strategy with the overall vision of the business, so that connectivity can play the role of an anchor in achieving business objectives. In most cases, enterprises have multiple and varied network requirements in different parts of the organization (for example, IT network for enterprise use vs. OT network for operational use), so designing a unified network modernization and orchestration strategy to meet hybrid connectivity needs is extremely important.

Lastly, a modern network cannot transform unless the broader technology infrastructure is in place as it all works in tandem to enable use cases powered by a next generation network.

In the case of British Sugar, the firm identified that a modern network was essential to achieve its wider goal of Industry 4.0, and as part its "factories of the future" upgrade, it opted for a custom-built private cellular network to give it the reliable, fast and secure connectivity it needs to implement next generation manufacturing techniques at all its sites.

Create an elastic, configurable and consumable cloud-first network infrastructure: Software-defined, cloud-based architecture is the foundation of a modern network, as it enables flexibility and agility in network infrastructure and helps manage connectivity across multiple clouds. Automation and security are built on top of this cloud-first network infrastructure with unique benefits. For instance, automation of manual processes in the network lifecycle can help reduce incidents, and embedding a "security-first" approach, procedures and controls will build resilience in the network. Once the foundation of the next generation network is in place, the network will seamlessly evolve with advanced network deployments such as 5G, private cellular networks, Cloud WAN, LEO Satellite, Wi-Fi 6E, AI and analytics-based networks, and innovative use cases will solve business problems and fuel business growth.

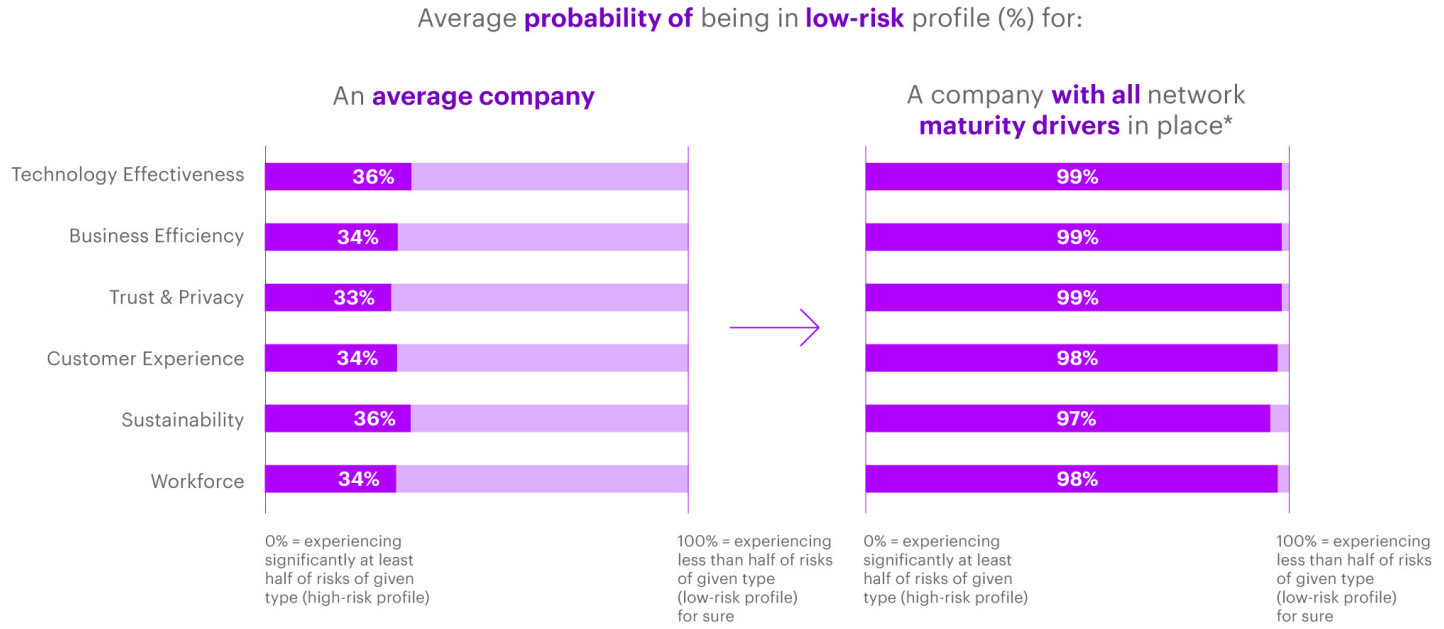
In the case of Zuellig Pharma's network modernization, a future warehouse vision powered by a 5G platform (5G coupled with other technologies such as AR, data, analytics, drones) offered significant improvements in warehouse item picking productivity, counting accuracy and worker safety.

Build future network talent and operational model enablers: For the full value of network transformation to be accomplished, modern network technical enablers should be closely intertwined with appropriate operating model and process transformation. It also requires a workforce equipped with modern network engineering skills either through training or by working with partners. As technology continues to evolve at a rapid pace, companies need to assess the effectiveness of current network transformation—the speed to launch, ability to scale, cost-efficiency, improved business impact. They will also need to plan future technology evolution cycles required to keep pace with business and technological advances.

In our research analysis, we found that focusing on these three advanced network practices is key for progressing on network maturity and business resiliency.

Econometric analysis of the surveyed enterprises suggests that companies successfully applying network best practices substantially mitigate risk exposure across all risk types. For a typical company, the probability of experiencing low-risk exposure is 33-36% across the six categories of risk. Simulating the introduction of best practices across all network maturity drivers dramatically increases this probability to 97-99%.

In short, those companies that master network maturity across all relevant drivers gain near certainty of low-risk classification and the corresponding business benefits that accompany it.



Adopt modern networks now to clear the way for the future

Staying ahead of the competition requires companies to keep an eye on the horizon and think ahead of the times. But how can companies thrive and grow when their network is the choke point?

The way forward is clear. Make your network a competitive advantage by modernizing it.

Modernizing networks and strengthening the digital core is essential for any company's Total Enterprise Reinvention. But it isn't easy. A modern network is one which is built on the foundation of flexibility and agility, designed to seamlessly upgrade and innovate. It requires companies to constantly keep a finger on the pulse of technology and business needs and adapt their networks to keep pace with these changes.

This approach can not only prepare a company for the next level of performance but is flexible enough to continually evolve for the future, releasing the benefits of business resiliency and efficiency and driving innovation-led growth.

The future network paradigm is an environment of accelerated innovation, driven by principles of agility and continuous improvement. In this state, the network leverages the digital core to accelerate innovation in the stack of network, cloud, edge, data, AI, security and advanced technologies.

About the Research

Methodology

We employed a multi-method research approach. Specifically, the research program included primary survey, econometric analysis, expert interviews and case study research.

10
Countries

15
Industries

1000
Executives

Survey: We conducted an online study of 1,000 global enterprise senior technology and business executives across 15 industries and 10 countries in November 2022, to understand their perspectives on managing existing networks as well as modernizing and investing in advanced networks. The study covered four primary topics:

- Current enterprise network strategy, pain points and the need for modernization
- Perceived value and benefits to unlock from enterprise network modernization
- Enterprise challenges on the network modernization journey
- Enterprise preferences for network providers and solutions

The 15 industries covered in the survey included Industrial, Automotive, High Tech, Consumer Goods, Chemicals, Healthcare Payor & Providers, Banking, Insurance, Metals & Mining, Oil & Gas, Retail, Transportation, Utilities and Government/Public Services.

The ten countries included in the survey were Australia, Canada, France, Germany, Italy, Japan, Singapore, South Africa, United Kingdom and United States.

Econometric analyses:

1. Resiliency analysis

This analysis was based on our proprietary survey data and was conducted separately for each of the six categories of enterprise risks, covering the sub-categories as mentioned on page 12 “Business risks due to inadequate network infrastructure”.
In the first step, we marked in our sample companies which are exposed to significant risks in all sub-categories of six enterprise risk pillars.

Then, for each respondent, we calculated a sum of risks of a given type that a company reported significant or very significant exposure to.

A company that is exposed to at least half of the sub-category risks of given type has been classified as high-risk profile company, the remaining ones to low-risk profile.

We controlled for company size, industry and HQ country.

We applied a logistic regression algorithm to understand how application of modern network maturity drivers is related to the probability of being classified as a low-risk company for each of the six types of risks.

We analyzed 25 detailed maturity drivers categorized under the following broad practices:

- Syncing the network strategy with the C-suite agenda
- Creating an elastic, configurable and consumable cloud-first network infrastructure
- Building future network talent and operational model enablers

2. Cost analysis

For this analytical framework, we leveraged our proprietary survey responses on the share of overall network spend that is dedicated to modernization of the network over time (opposite to maintenance of the legacy systems). We analyzed how the size of the shift towards modernization is related to the overall level of network-related costs at the end of the three-year period since the start of the shift.

The analysis was conducted with the application of OLS regression and was controlled for company-specific factors such as size, location of head quarter and industry a company operates in.

Econometric analyses:

3. Innovators analysis

To understand the relation between the size of the shift towards modernization in network budget and the probability that a company is classified as technological innovation leader, we applied a blend of our proprietary survey data and IDC wallet data.

We used IDC data of Big Data & Analytics and Innovation Accelerator spend (our definition of innovative technologies spend) to build a proxy of technological innovation leadership.

First, we calculated the share of innovative technology spend in 2022 to revenues ratio and then for each industry, we calculated the top 25% percentile for this indicator. Companies that fall above the percentile thresholds are classified as innovation industry leaders.

Finally, we applied the logistic regression algorithm, controlling for company size, industry and country of company headquarter, where level of modernization share shift over a three-year time horizon, was a key variable we tested.

Expert interviews: We drew insights from expert interviews with 11 enterprise technology and business leaders with direct knowledge of their company's network plans and performance. In addition, we interviewed many Accenture executives who are working directly with clients on their plans for network transformation.

Case study research: To complement the survey findings, we collected case studies focusing on the evolution of organizations towards the modern network, its transformative impact on the business, and best practices.

Indices:

1. Digitalization Index is a metric that measures the level of digital adoption and transformation of enterprises. This index considers various indicators, including adoption/increase in enterprise cloud, data, storage capacity, IoT devices, device penetration and connected endpoints. It is calculated as indexed weighted average of various indicators, to reflect the overall growth in enterprise digitalization. Sources used are IDC, Statista, Analysys Mason, International Telecommunication Union (ITU).

2. Network Capacity Index is a metric that measures the maximum capacity of data transmitted across all networks globally. It is indexed value of international bandwidth usage (Tbit/s) data, sourced from International Telecommunication Union (ITU).

3. Network Modernization Spend Index is a measure of innovation spend by enterprises on network and connectivity infrastructure. It is indexed value of network modernization spend by enterprises. It is developed using primary survey data for four years 2019-22, and prior historical data assumes similar average growth rates.

About the Authors

Jefferson Wang

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Jefferson is the lead author of the best-selling book, "The Future Home in the 5G Era." He is Accenture's Global 5G and Networks Lead.

For over two decades, Jefferson has been at the intersection of business and technology.

He has focused on new network technologies and architectures, such as 5G, Private Cellular, Edge Networks, SD-WAN and SASE, that will unlock the cloud continuum. Jefferson builds businesses on his belief that success comes from big picture thinking mixed with detail-oriented execution.

His ability to identify new technology patterns helps his clients navigate constant change. He works with global leaders to break down complex problems into compelling stories, define a roadmap of use cases based on technology capabilities, create innovative business models and build new addressable markets. He then rolls-up his sleeves to mobilize teams and deliver through launch.

Jefferson is a regular speaker at Mobile World Congress (MWC) and Consumer Electronics Show (CES) and has appeared on CNN, CBS, NBC, ABC and Mobile World Live TV. His perspectives are featured in publications that include The Wall Street Journal, USA Today, Forbes, Fortune, New York Times and Washington Post.

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Ed Wood is an advisor and industry subject expert in enabling enterprise digital transformation through cloud networking, zero-trust networking and Secure Access Service Edge, which is the convergence of software defined networking, cybersecurity, and cloud/edge computing.

Ed has extensive cross-industry experience, working in telecommunications, technology, financial services, federal and critical infrastructure.

Ed has worked in both large enterprise and in startup-environments, including complex turnarounds, working across all stakeholders, optimizing business operations, product roadmap, platform strategy, corporate strategy, strategic partnerships, business development and fundraising.

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Accenture is a leading global professional services company that helps the world's leading businesses, governments and other organizations build their digital core, optimize their operations, accelerate revenue growth and enhance citizen services—creating tangible value at speed and scale. We are a talent and innovation-led company with 738,000 people serving clients in more than 120 countries. Technology is at the core of change today, and we are one of the world's leaders in helping drive that change, with strong ecosystem relationships. We combine our strength in technology with unmatched industry experience, functional expertise and global delivery capability. We are uniquely able to deliver tangible outcomes because of our broad range of services, solutions and assets across Strategy & Consulting, Technology, Operations, Industry X and Accenture Song. These capabilities, together with our culture of shared success and commitment to creating 360° value, enable us to help our clients succeed and build trusted, lasting relationships. We measure our success by the 360° value we create for our clients, each other, our shareholders, partners and communities.

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Accenture Research creates thought leadership about the most pressing business issues organizations face. Combining innovative research techniques, such as data science led analysis, with a deep understanding of industry and technology, our team of 300 researchers in 20 countries publish hundreds of reports, articles, and points of view every year. Our thought-provoking research developed with world leading organizations helps our clients embrace change, create value, and deliver on the power of technology and human ingenuity. For more information, visit www.accenture.com/research