



The network that thinks for every customer

Building autonomous networks for
personalized telecom experiences

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Authors



**Tejas
Rao**

**Managing Director,
Network Lead,
Communications,
Media and
High Tech**

[LinkedIn](#)

Tejas Rao is Accenture's Global Network Practice Lead, responsible for the growth strategy and delivery of network and AI infrastructure services across the full lifecycle for leading communications, media and high-tech companies.



**Boris
Maurer**

**Senior Managing
Director, Global
Communications
Industry Lead**

[LinkedIn](#)

Dr. Boris Maurer leads Accenture's Communications Industry Practice and is the Strategy and Growth Lead for the Communications and Media practice. With over three decades of experience, he has advised telecoms and high-tech firms on large-scale transformation and AI adoption.



**Jacopo
Sebastiani**

**Senior Managing
Director,
Global Lead,
Communications
and Media**

[LinkedIn](#)

Jacopo Sebastiani is Accenture's Global Communications and Media Industry Lead. With more than 28 years of experience, he has led business and technology transformations for some of Europe's largest telecommunications and media companies.



**Swati
Vyas**

**Research Senior
Principal, Global
Communications
and Media
Research Lead**

[LinkedIn](#)

Swati Vyas is the global research lead for Accenture's Communications and Media industry. She specializes in uncovering emerging tech and business trends and has co-authored several flagship Accenture thought leadership reports.



**Andrea
Orlando**

**Research Manager,
Communications
and Media Research**

[LinkedIn](#)

Andrea Orlando brings more than 10 years of quantitative and qualitative research experience across communications, media and technology, helping shape Accenture thought leadership for clients.

Telecom operators are entering a new era

Customers no longer judge networks simply by speed, coverage or latency but by whether connectivity remains resilient when it matters most. As AI reshapes expectations across every industry, customers increasingly demand networks that are tailored to their individual needs.

The opportunity for telcos is to move from operating one network for millions of customers to creating a network of one: a tailored experience in which the network understands each customer's context, anticipates their needs and acts before disruption occurs.

There is industry consensus that autonomous networks can create substantial value for telecom operators across cost, operational performance and customer experience.

Our research includes a survey of 250 telecom executives from 28 countries, interviews with senior telecom network experts and case studies. It shows that executives expect higher levels of autonomy to deliver significant gains in network economics, revenue growth and experience tailored to every customer. But fragmented leadership, data readiness gaps, AI skills shortages and legacy operating models built for humans, not AI, continue to hold back autonomy at scale.

There is industry consensus that autonomous networks can create substantial value for telecom operators across cost, operational performance and customer experience.

Reaching higher levels of autonomous network maturity requires moving beyond isolated technology initiatives toward a CEO-led enterprise-wide transformation. Telcos must first establish the foundations that enable autonomy to scale. This means building an intelligence layer that pools network and customer experience data and orchestrates agents to resolve problems for each customer with closed-loop automation.

Change should start in areas such as the network operations center (NOC) where AI can demonstrate value quickly. Only then should new capabilities be extended across network domains to enable the network to operate as a single, coordinated intelligent system.

Research snapshot

Our research draws on a January 2026 survey of 250 senior telecom executives across 28 countries, in-depth interviews with Accenture telecom networks subject matter experts and case studies of network transformations. Together, these inputs provide a multidimensional view of telecom operators' readiness for autonomous networks.

For more details on the research methodology,
see "About the research" on page 29.



From a network for many to a network of one

In an experience-driven world, reliable and personalized service defines value. For telecom customers, that means calls that never drop, live streams that never buffer, factory floors that never stall, deliveries that never get lost.

The telco that gets this right becomes something more than a network provider. It can deliver a “network of one”: a tailored customer experience resulting from autonomous capabilities that monitor customer requirements, remember context, anticipate needs and prevent disruption. Imagine a network that knows each customer, understands what they need before they ask, continuously adapts in real time and becomes smarter with every interaction.

Instead of delivering a one-size-fits-all service, the network understands the context of every customer, device and moment, dynamically shaping the experience around individual needs. That's how network intelligence becomes a real-time relationship with every customer.

For networks still built around response, this is a whole new challenge. No longer can telcos lead through speed, latency or coverage. Rather, by customizing the network to every customer, they should aim to make the network their most differentiated asset, the one thing a competitor cannot replicate. The question is not just whether they can build such a network but whether they can change their operating and commercial models to do so.

Network complexity is up. Consumer tolerance is down.

67%

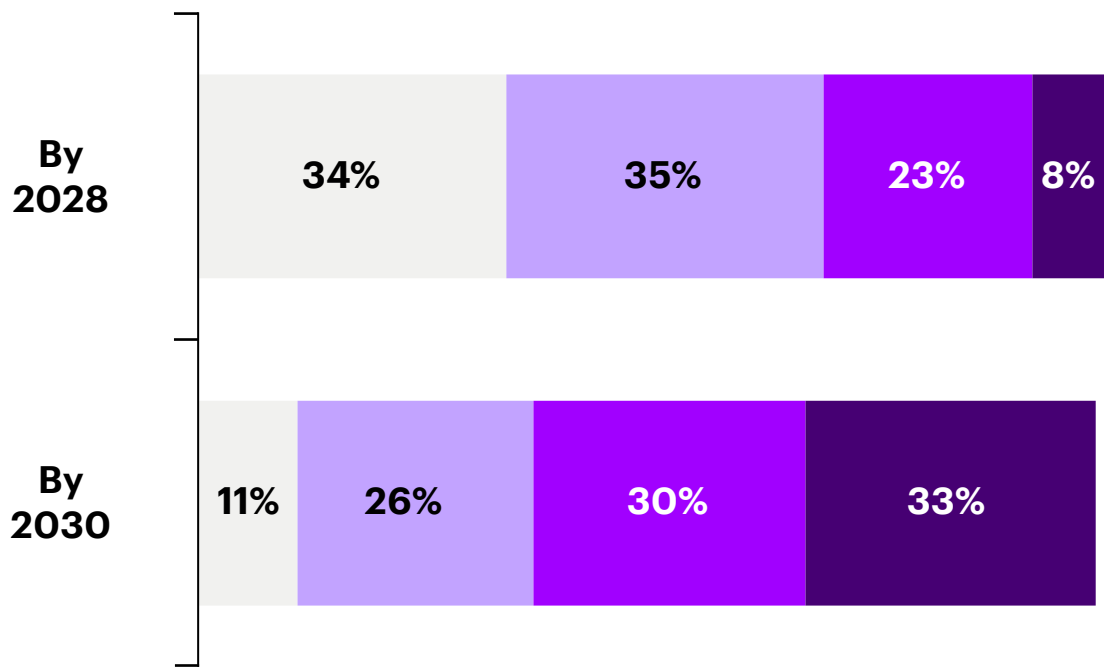
of people
ranked reliable
network quality
as the most
important
factor

In an earlier Accenture study of 6,800 telecom consumers across 15 countries, 67% ranked reliable network quality as the most important factor when selecting a telecom provider and 64% identified service outages as one of their biggest frustrations.¹ A separate Accenture survey found 40% of enterprise customers are dissatisfied with connectivity services, citing network reliability and real-time threat detection as key concerns.²

At the same time, modern networks are becoming harder to operate. Network infrastructure today spans telecom, content delivery networks, data centers and cloud, making even foundational connectivity services complex to deliver. AI, edge workloads and livestreaming traffic have grown threefold over the last five years.³ Multi-vendor environments have also driven new traffic patterns and an operational burden that is beyond the limits of human-driven control.

In our research of 250 telco executives globally, only one in four reports end-to-end visibility across network domains and lifecycle stages. Incident response is another weak point: just 26% believe they can rapidly isolate and recover from outages. Proactive prevention is rarer still, with only one in five extensively using AI, analytics or automation to prevent disruptions. Looking ahead, just one in three executives expect their company’s network to become highly or fully autonomous, reaching levels four or five under the TM Forum’s digital maturity framework, by 2030 (Figure 1).⁴

Figure 1: Telco’s expectations for autonomous network maturity by 2030 (L0 to L5)



TM Forum maturity levels

- | | | |
|--|--|------------------------------|
| L0 Manual operation and maintenance | L1 Assisted operation and maintenance | L2 Partial autonomous |
| L3 Conditional autonomous | L4 Highly autonomous | L5 Fully autonomous |

Source: Accenture Communications Industry Network Research Executive Survey, 2026. n=250 telco executives.



How agentic AI changes what networks can do

If we asked those same 250 executives today, they would likely be more optimistic, given the pace of agentic innovation this past year. Stanford's AI Index 2026 reveals a widening gap between what AI can do and how prepared we are to manage it.⁵ But technological advances don't automatically lead to autonomous networks. Telecom operators still need to get their foundations and organization in place.

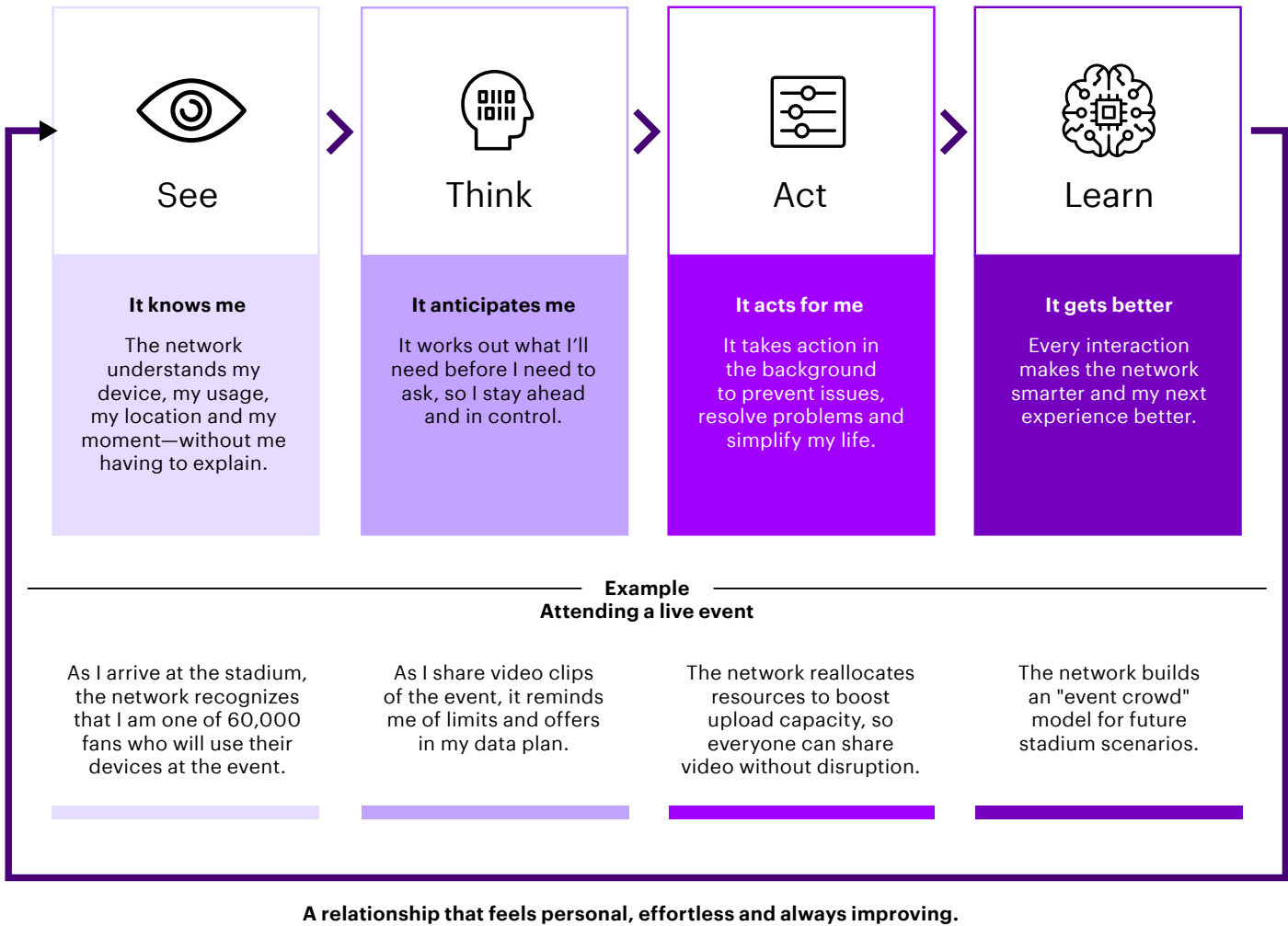
The same is true of personalization. With the right approach to data and architecture, autonomous networks can go beyond optimizing around averages and help operators build a real-time relationship with each subscriber through what we term a "network of one" (Figure 2).

Stanford's AI Index 2026 reveals a widening gap between what AI can do and how prepared we are to manage it.⁵

By continuously combining customer, service, network and operational context, they can anticipate demand, prevent disruption and personalize experiences before issues surface. The infrastructure stays the same. What changes is the data, its source, its richness and the agentic architecture that puts it to work.

For many telcos, the idea of a network that knows each customer individually has yet to land. Most telecom companies are in the middle stages with automation still confined to specific tasks or domains, with human intervention central to diagnosis, decision-making and execution.

Figure 2: How the network of one improves the customer experience



Source: Accenture analysis.





Three barriers hold telcos back

Executives are relying on autonomous networks to fundamentally reshape customer experience and network economics.

In our research, they say they expect autonomous networks to deliver approximately 30% lower network operational expenses, 17% lower network capital expenditure and 11% higher revenue by 2030. In line with these targets, companies expect to nearly double AI's share of network budgets from about 9% to 17% by 2028.

While executives are confident in the outcomes and agentic AI is accelerating what's possible for autonomous networks, technology alone will not be enough. Three structural barriers stand between telcos and truly autonomous networks.

Barrier 01

Fragmented ownership keeps AI transformation siloed

13%

of organizations have an enterprise-wide autonomous network strategy

Organizations need unified ownership for AI initiatives to have enterprise-wide impact. Without it, they remain fragmented across domains, limiting impact to isolated improvements. However, as our research shows, only 18% of telco executives say that network transformation in their organization is CEO-led and just 13% have an enterprise-wide autonomous network strategy. Most organizations still drive AI efforts within technology and network functions rather than elevating their transformation strategy to an enterprise-wide business priority.

Barrier 02

Data readiness and talent remain key constraints

Modern telecom networks span radio access network (RAN), core, transport and edge domains, each operating with different data models, operational processes and technology stacks. To make decisions across these domains in real time, AI systems rely on trusted, high-quality data. Yet our research found that 81% of executives identify data quality as the biggest challenge to scaling autonomous networks.

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Talent is emerging as the next foundational constraint. As AI agents increasingly execute operational decisions, people must shift from performing tasks to designing policies, supervising autonomous systems and orchestrating cross-domain operations. Yet many operators are not building these capabilities fast enough. Our research shows that 77% of telecom executives say hiring AI specialists is highly challenging, while 51% cite reskilling network engineers for AI as a major obstacle. Without closing these gaps, investments in autonomous networks risk falling short of their potential.

Barrier 03

Operating models have yet to catch up with AI

17%

of operators are pursuing end-to-end network processes redesign

AI stalls in legacy operating models. Unlike previous technology shifts, AI must coordinate decisions across legacy infrastructure, multi-vendor interfaces, network and IT functions. To enable trusted, closed-loop operations, telcos must redesign how the business runs, from processes to governance.

Only 17% of operators are pursuing end-to-end network processes redesign. Most continue to operate in exploratory, incremental or hybrid modes, embedding AI into existing workflows to improve individual use cases such as predictive maintenance, traffic forecasting and anomaly detection. Without end-to-end redesign, AI remains a point solution, not a transformation.



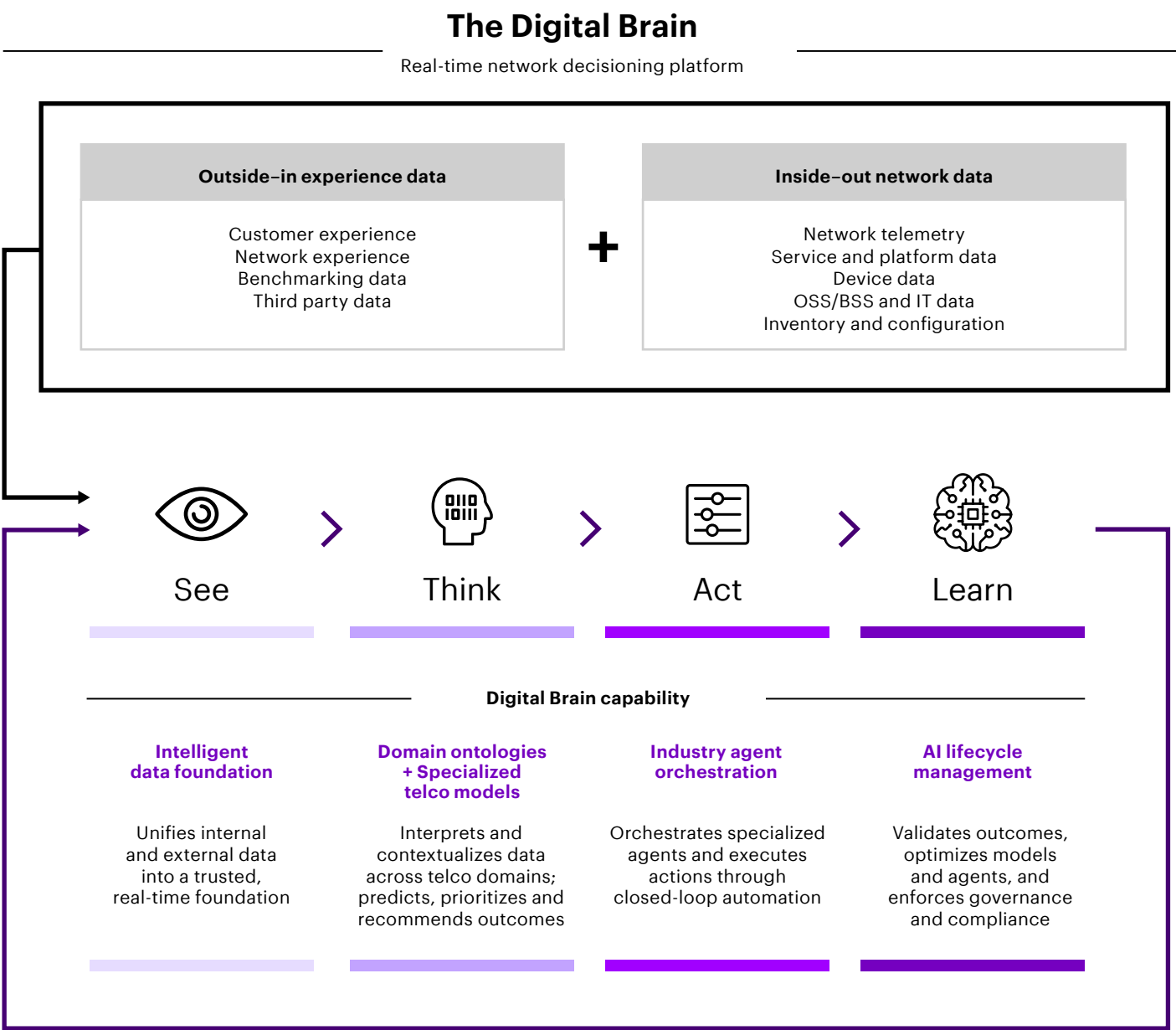
The intelligence layer that powers autonomous networks

To deliver on the promise of the network of one, telcos need a shared intelligence and orchestration layer that connects data, AI models, agents and controls.

Our research suggests this vision is widely recognized across the industry. Nearly three-quarters (71%) of telcos say developing a unified AI network platform is a strategic priority. Central to this is what we call a Digital Brain that senses changing conditions, reasons across domains, orchestrates the best response and continuously learns from outcomes (Figure 3).⁶

The Digital Brain enables operators to build more resilient networks while creating new sources of growth, including sovereign AI services, business-to-business-to-X (B2B2X) models and outcome-based network offerings. Yet for most operators, it remains aspirational.

Figure 3: How the Digital Brain brings intelligence to the network of one



The five building blocks of the Digital Brain

At the Digital Brain's core is an **intelligent data foundation**—a continuously updated view of every customer, device, service and network condition. **Domain ontologies** give AI the contextual understanding to interpret relationships, dependencies and customer impact across network domains. **Specialized telecom models** apply industry-specific intelligence to predict issues, optimize performance and recommend action. **Industry agent orchestration** coordinates AI agents to execute closed-loop actions across the network lifecycle. Finally, **AI lifecycle management** provides the governance, security and continuous learning that keeps autonomous decision-making trusted, explainable and continuously improving.

Working together, these capabilities enable the network to see, think, act, and learn as a single intelligent system.

At the Digital Brain's core is an intelligent data foundation—a continuously updated view of every customer, device, service and network condition.



Three moves to scale the network of one

The Digital Brain is the fundamental technology platform for autonomous networks, but technology alone doesn't deliver the network of one.

Reaching true autonomy requires a broader strategic approach that translates network intelligence into sustainable business outcomes. Success depends on three moves: build the foundations, prove the value, then scale.

Move 01

Build the enterprise foundations for scale

Telecom leaders should first get the enterprise ready for AI at scale. This means aligning executive ownership, operating models, data, governance and workforce capabilities around a common autonomy agenda.

- **Executive ownership.** Autonomous network transformation must be a CEO-office priority, not a technology initiative, with clear accountability across network, technology, data and operations and shared objectives tied to operational, customer and business outcomes.
- **Operating model.** Most telcos remain organized around separate network domains, such as RAN, core, transport and operations support system (OSS), each with its own teams, processes and performance measures. This limits the cross-domain visibility and coordination that autonomous operations require. Telcos should redesign accountability around end-to-end services and outcomes such as service reliability, mean time to restore, customer experience and service-level agreement performance.
- **Data readiness.** As explored in our previous research, *From Data Debt to Enterprise Intelligence*, much of operators' network data is fragmented, inconsistently governed or updated too slowly to support real-time decisions.⁷ Telcos should move toward an AI-native data architecture that unifies and governs data in near real time. They can also use AI to accelerate the cleanup of existing unstructured data. The silos that fragment the organization also fragment the data. Organizational redesign and data modernization should advance together.

- **Governance.** As AI assumes greater operational responsibility, governance should evolve with it. Telcos should clearly define which decisions AI agents can make independently, where human approval remains necessary and how exceptions should escalate. They should establish audit trails, performance thresholds, override mechanisms and accountability for consequential decisions before scaling autonomy, rather than retrofitting these controls later.
- **Workforce.** With AI agents taking on more repetitive analysis and execution, network engineers will increasingly focus on defining policies, supervising autonomous systems and intervening in complex or exceptional situations. Workforce transformation must keep pace with technology transformation. Telcos should identify these future roles early and invest in reskilling, particularly in AI operations, data literacy, model oversight and cross-domain service management.

Move 02

Prove value in the network operations center

The NOC is a natural starting point because it concentrates operational cost, complexity and manual effort across the network. Every day, it processes thousands of alarms, coordinates activities across multiple domains and relies on engineers to investigate, diagnose and resolve incidents. Telcos should redesign selected NOC processes around predictive, closed-loop operations, using the Digital Brain to connect data, interpret events across domains and coordinate action. They should prioritize areas such as alarm correlation, root-cause analysis, outage prevention, fault management and service assurance.

Operators can introduce autonomy progressively. Initially, AI agents can support engineers with alarm filtering, context assembly, faster diagnosis and recommended remediation. As operators strengthen governance and validate performance, agents can move to supervised execution and ultimately coordinate autonomous decisions and actions within defined policy guardrails.

Telcos should measure success through operational metrics—lower handling costs and faster mean time to restore—alongside direct business outcomes: fewer service-impacting incidents, greater reliability and better customer experience.

T-Mobile offers an early glimpse of what this shift can look like under real-world pressure. During Winter Storm Fern in North America, January 2026, its AI-powered Self-Organizing Network continuously monitored changing conditions and automatically adjusted network performance, rerouting traffic, optimizing signal strength and prioritizing critical connections.

The network made tens of thousands of automated adjustments during the event, with 68% of affected customers reconnected within the first hour and 98% within eight hours. The system also helped keep network sites operating for more than 250,000 additional minutes by conserving battery power and optimizing performance.⁸

Move 03

Scale autonomy across the network

With foundations in place and value proven, the task is to scale. Operators should scale progressively across network domains, processes and workflows. They can first extend proven capabilities such as alarm correlation, fault management and service assurance into adjacent processes, then connect these workflows across radio, transport, core, cloud, OSS and business support systems (BSS). At each stage, the Digital Brain should provide the common data, models, agents and governance needed to coordinate decisions across organizational and technical boundaries.

Telcos should scale autonomy around four guiding principles:

- **Standardization.** A workflow-first design and development model, built on reusable workflow templates, reference architectures and AI engineering patterns, lets telcos replicate autonomous workflows consistently across network and service domains. This creates a repeatable model that accelerates deployment of autonomous workflows and avoids rebuilding from scratch.
- **Parallel execution.** Autonomous capabilities can be built independently across multiple network domains while the Digital Brain coordinates data, models and AI agents. This accelerates deployment without creating new operational silos.

- **Continuous learning.** Feedback loops, drawing on real-time data, governance and AI agent orchestration, let every incident, decision and operational outcome inform future actions.
- **Outcome optimization.** Progressively connecting autonomous capabilities across the network lifecycle will improve resilience, service assurance, resource utilization and customer experience. A performance issue, for example, may originate in one part of the network but require coordinated action across several others, so outcomes are only achieved when the network responds as one system.

Telcos should track how deeply autonomy has scaled across the network, not by the number of AI use cases deployed, but by the proportion of incidents predicted or resolved autonomously, the share of workflows coordinated across domains, reductions in service-impacting events and sustained improvements in customer and business outcomes.

As autonomy scales, telcos should shift from alarm-driven operations to intent-driven management. Instead of waiting for faults to trigger a response, operators can define outcomes such as service availability, latency, energy efficiency or enterprise service-level agreement performance. The network can then continuously assess conditions, anticipate risks and coordinate actions to maintain those outcomes within defined policy guardrails.

Client story: autonomize network operations

A leading telecoms operator set out to advance the autonomy of its network operations. Its long-term vision is an autonomous network in which planning and design, construction, deployment, operations and optimization are connected through common data and tools, enabling systems to make decisions automatically. However, its existing environment was fragmented across domains such as IP, Ethernet and optical networks, with siloed systems and data and complex custom integrations. Critical activities such as root-cause analysis and response decisions still depended heavily on human intervention, contributing to service onboarding delays, errors, higher operating costs and longer restoration times.

The operator's target was end-to-end autonomous service lifecycle management, connecting customer service intent with service fulfillment, SLA management, incident management and customer notification in a unified autonomous lifecycle.

To achieve this, the operator adopted TM Forum Open APIs as a common integration standard, connecting business operations and service operations across Commercial off-the-shelf (COTS) platforms. It then introduced agentic AI and Model Context Protocol (MCP) to automate decisions and interactions that had previously required human intervention. Natural-language customer requests could be translated into service orders and then flow automatically through service decomposition, resource ordering, network configuration and activation. Following provisioning, network resources could also be automatically discovered and registered, with AI reconciling the actual network state against inventory records.

The operator also applied autonomy to network fault management. Alarms from multiple network domains were collected and enriched, while AI agents performed multi-layer root-cause analysis. Based on the results, the network could automatically reroute traffic and generate incident tickets, creating a closed-loop operational process. Inventory and incident data were then aggregated with SLA information to automate customer reporting as well.

Network inventory reconciliation was accelerated from days to minutes.

The proof of concept demonstrated significant potential benefits. Order fallout and activation issues were reduced by approximately 95%, while service design efficiency improved by 83%. Network inventory reconciliation was accelerated from days to minutes. SLA violations were reduced by approximately 50%, mean time to repair or restore (MTTR) by approximately 57%, and the customer reporting workload by approximately 65%.

This example shows that moving toward autonomous networks requires more than applying AI to individual tasks. By combining standardized APIs, common data and agentic AI to connect service delivery, network operations and fault recovery in closed loops, telecom operators can reduce operational burden, accelerate NaaS delivery and create a scalable operating model based on open, reusable standards rather than vendor-specific integrations.



Toward a network that thinks for every customer

Speed has long defined network performance. The next era will be defined by autonomous networks that are more efficient, resilient and cost-effective while continuously anticipating and responding to the needs of every customer.

By automating operations that once relied on manual intervention, telcos can reset their cost base, freeing capital to move beyond selling connectivity as a commodity toward monetizing outcomes: guaranteed latency, uptime, security and service assurance for consumer experiences and AI-critical enterprise workloads.

They can also capture a larger role in the emerging AI value chain by supporting sovereign AI services that combine connectivity, compute, data governance and security.

The real breakthrough is moving beyond operating one shared network for millions of customers to a network of one that knows every customer, anticipates every need and responds before disruption occurs.

Customer experience becomes the primary driver of autonomous networks, and the network is set to become the operator's most valuable and differentiated asset.

How Accenture can help

Accenture helps communications providers accelerate the journey to autonomous networks by reinventing the way networks are designed, operated and managed, enabling them to optimize network costs, deliver more resilient customer experiences, and scale new AI-enabled services faster.

At the heart of this transformation is real-time network decisioning. It combines outside-in intelligence—customer experience, benchmarking, and competitive insights—with inside-out, real-time network telemetry to create a single, continuously updated view of network performance.

By fusing these perspectives into one decisioning engine, operators can anticipate customer needs, determine the optimal response in every moment, and coordinate actions seamlessly across network domains. Accenture helps clients build the strategy, technology, operating model, governance and data foundations needed to operationalize this capability safely and at enterprise scale.

Accenture's Reinvention Services help operators move from isolated AI pilots to enterprise-scale autonomous networks with speed and confidence. We help clients accelerate AI-enabled transformation across network life cycle, reduce network operational expenditure through outcome-based cost transformation, and build the intelligent foundation required to unlock resilient customer experiences, AI-enabled services, and the next generation of telecom growth.

About the research

Our multi-method research approach integrates a primary survey, interviews with subject matter experts at Accenture and case studies.

Accenture communications industry network research

Executive survey: In January 2026, Accenture surveyed 250 senior telecom executives across 28 countries to assess the industry's readiness for autonomous networks. The study examined network automation maturity, AI adoption and investment priorities, expected business outcomes, talent implications, implementation challenges, platform strategies and partner preferences for building autonomous networks.

Expert interviews: We conducted in-depth interviews with senior Accenture telecom networks subject matter experts to uncover how forward-looking operators can rearchitect their network strategy, technology, processes and talent to accelerate AI readiness. These discussions also yielded actionable insights and strategic recommendations to help telcos drive tangible transformation outcomes.

Case studies: To complement our findings, we gathered case studies of companies that Accenture helped with network transformation and leading examples from across the industry. These examples illustrate the impact of network reinvention and highlight the factors critical to successful transformation.

We use generative AI in our research production process. Our research experts review and validate the generative AI outputs with traditional research methods where possible, applying Accenture's Responsible AI standards.

For more information, visit
www.accenture.com/research



The authors extend special thanks to the following subject matter experts:

Tunc Yorulmaz
Aurelio Nocerino
Takumi Hashimoto

Research and Editorial

Ramani Moses
Abrar Khan
Harshal Patil

Marketing + Communications

Elisabeth Edvardsen
Laurence Mackin
Matthew McGuinness
Ed Maney

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About Accenture

Accenture helps the world's leading enterprises reinvent by building their digital core and unleashing the power of AI to create value at speed for organizations across industries. Our strategy is to be the reinvention partner of choice for our clients and lead in the safe, widespread adoption of AI, and to be the most client-focused, AI-enabled, great place to work in the world. We bring together the talent of our approximately 814,000 people with proprietary assets and platforms, deep process and industry expertise, and leading ecosystem relationships to deliver end-to-end solutions and measurable outcomes at scale. Through our Reinvention Services, we offer broad expertise across Cybersecurity, Digital Core, Finance, Industry and Enterprise, Song, Supply Chain and Engineering, and Talent, with advanced capabilities in AI and Data, Industry and Process, and Technology. We serve approximately 9,000 clients and generated approximately \$74 billion in FY26 revenue.

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